

Building Rural Primary Schools

Towards Improved Designs



The DPEP Experience

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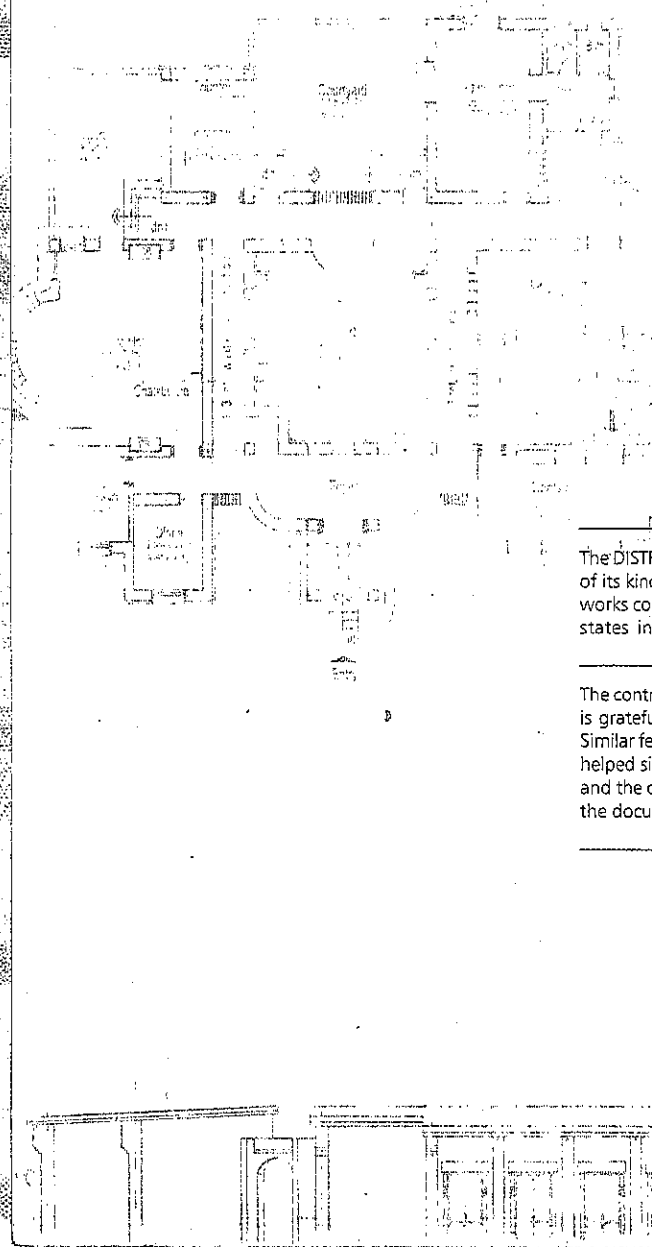
Or

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The DISTRICT PRIMARY EDUCATION PROGRAMME is one of the largest primary education programmes of its kind in the world. This document deals with the experience of *Design Renewal* within the civil works component of the programme. Design Renewal has been an extensive exercise involving all the states in the programme to develop a new set of designs for schools and resource centres.

The contribution of all the states, both during the exercise and during the preparation of this document is gratefully acknowledged. The inspiration and feedback of the DPEP Bureau has been invaluable. Similar feedback provided by various units of the Technical Support Group throughout the preparation helped significantly. In particular, the clear vision provided by Shri R.S. Pandey, Joint Secretary (DPEP) and the continuous support and insights of Shri Dhir Jhingran, Deputy Secretary (DPEP) have enabled the document to be what it is.





Ministry of Human Resource Development
Department of Education
Government of India
New Delhi - 110 001

February 20th, 1999

FOREWORD

"Primary Schools" compiles the efforts of different states under the Education Programme (DPEP) in development of new designs for school buildings and Resource Centres which are sensitive to the local environment of a good teaching-learning environment.

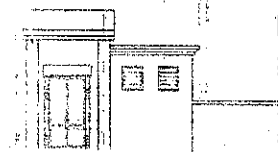
The programme has brought out a large number of improved school designs which are being used in the construction of school buildings in various DPEP

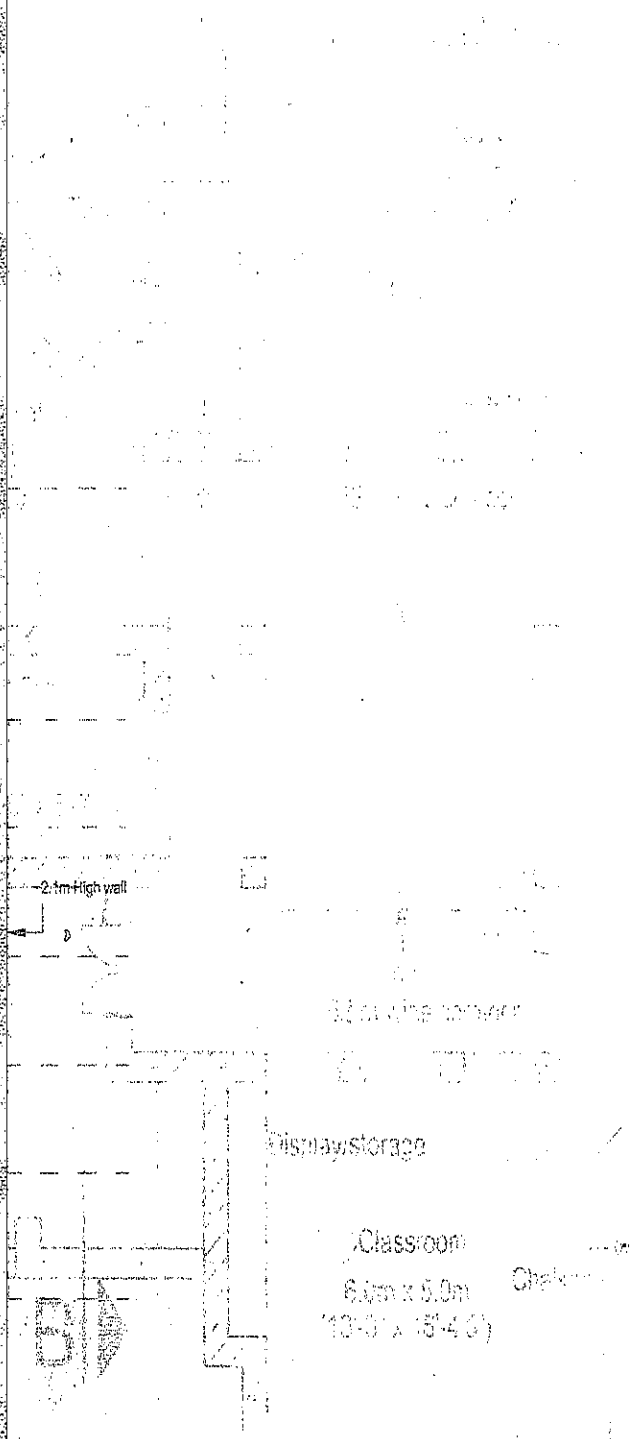
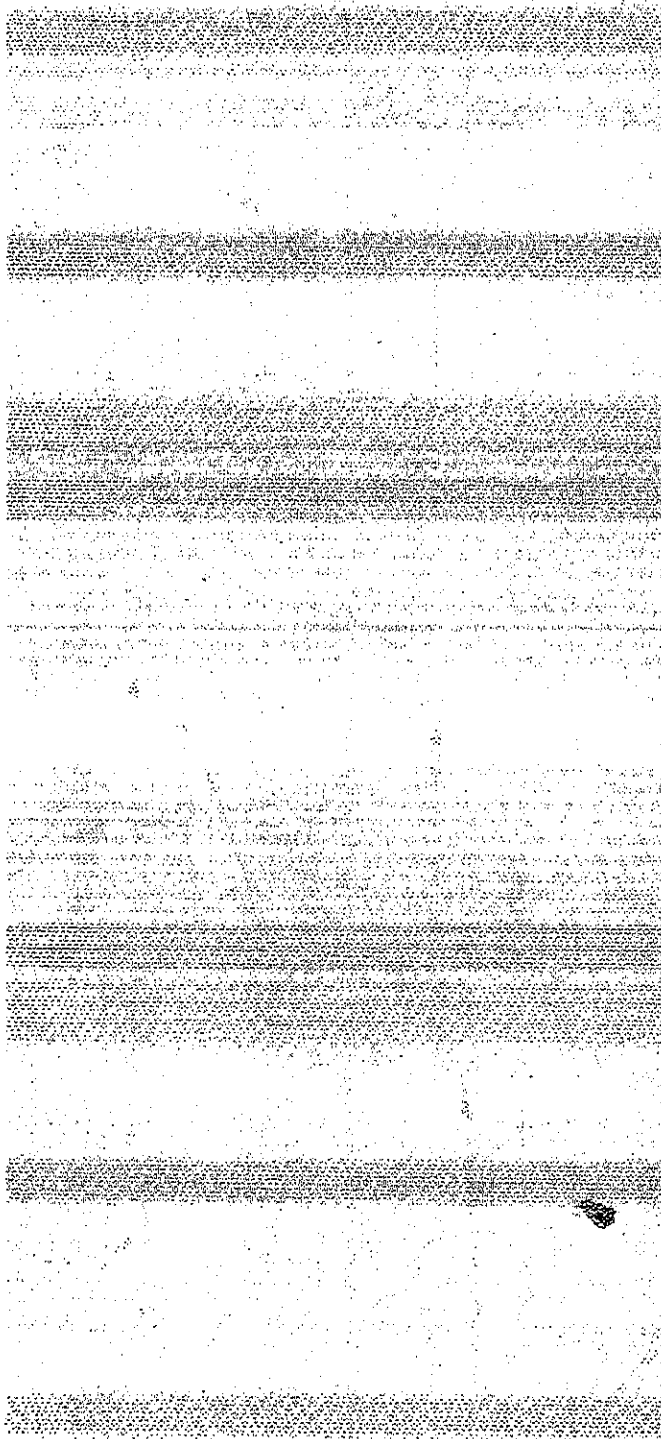
programmes for provision of school infrastructure in rural areas.

M. C. Satyawadi
(M. C. Satyawadi)

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Classroom
6.0m x 5.0m
(19'-6" x 15'-4")

Chalkboard

Display storage

2.1m High wall

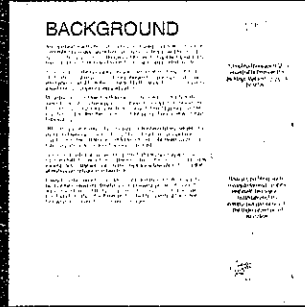
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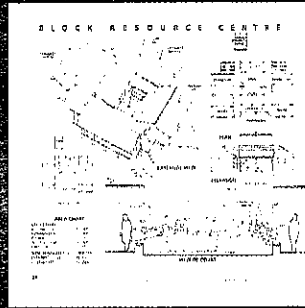
DOCUMENT MAP

It consists of four sections:

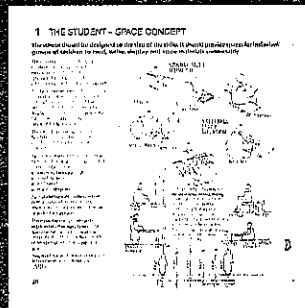
1. **Background** provides an insight into the construction of DPEP including the magnitude of work, types of construction and systems of construction. Further, the design process undertaken in DPEP in the last two years is



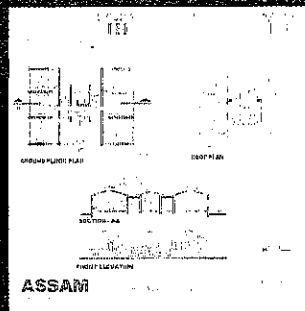
2. **Design highlights** consists of Design highlights. This contains a synopsis of some of the interesting designs. Design highlights a few of the unique features of these designs as well as aspects like storage and display provisions in all DPEP designs.



3. **Design process** describes the design process undertaken in DPEP and in some ways the essence of the DPEP at the New Primary School. In a step-by-step manner it reveals how there can be a qualitative improvement in learning environments provided by any of these ideas are further developments of the exercise. What is significant is that they are easy to implement nor more difficult to construct. Community participation and the use of appropriate materials could even save costs.



4. **Designs** contains the compilation of designs from the last two years. It includes drawings, a description of the designs, and details of the designs. This section gives a very visible sense of the scale and variety of designs. It would be worthwhile to note that due to the large number of designs, all designs could not be included. In fact, the program is still producing additional designs.



ABSTRACT

The construction of school buildings often forms an important part of a primary education programme. They are a basic requirement for ensuring the universal access and enrollment of children. The need for new school buildings and additional classrooms in a country like India is large. While meeting the requirement of providing space, it is extremely important that the primary school building programme is sensitive to the pedagogical and local context.

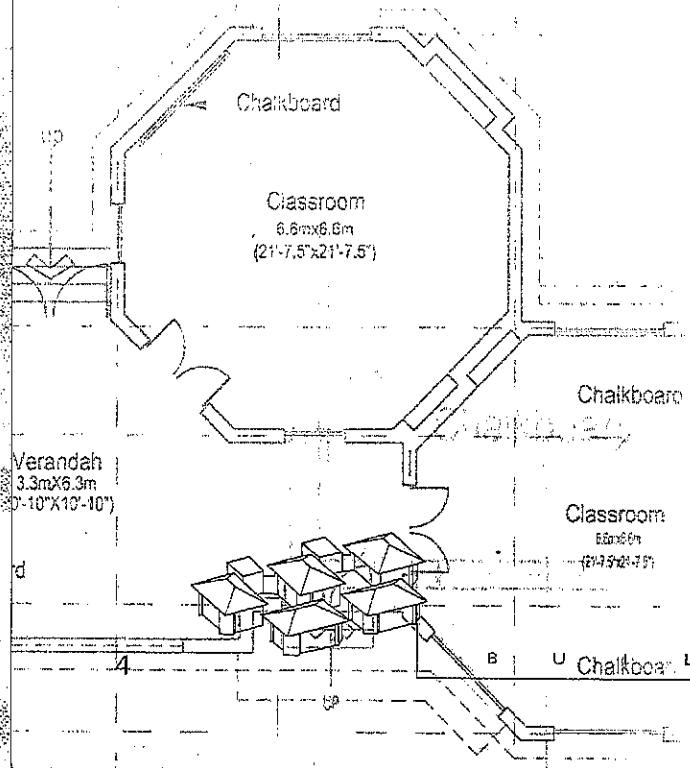
Conventional belief has it that schools are prevented from being more 'sensitive' due to financial constraints. There is definitely some truth in this. Yet, what is more restrictive is the fact that school buildings are seldom expected to be more than buildings that just happen to be schools. How and why should a classroom be different from any other room? And what prevents it from being so - is it a financial constraint or is it a limitation of our understanding of what a school building can be?

It is this understanding which has been expanded in DPEP (District Primary Education Programme) through the design renewal exercise. All DPEP states have undertaken a review of their designs. This has provided the first opportunity for state and district specific school designs to be prepared across the country. Through the involvement of local consultants a large number of designs have been and are being prepared.

This document tries to convey the essence of the DPEP experience. These designs, ideas and further developments (as indicated in *The New Primary School* section) can well result in a qualitative improvement of learning environments. Such holistic designs are highly achievable. They do not necessarily require additional resources or a change in the systems of implementation in practice.

It is this message that has driven the documentation effort. It is aimed at decision-makers at the district, state and national levels who are in charge of construction programmes across the country.

There is much to be learnt from each other. This document aims to facilitate such learning both within and outside DPEP. The collective efforts of the states has resulted in a better understanding of the primary school building - one that is probably greater than what had been realised so far. It is a vision that DPEP shares.



B U I L D I N G R U R A L

BACKGROUND

ONE

Primary education is the foundation of human development. In the long run, it contributes to various social and economic benefits like improved health and increased family earnings. For the girl child the significance is even greater. It has been linked to the higher use of health facilities and decreased fertility rates.

It is also very important because primary education is the first step in the ladder of education. Children who do not complete even their primary education are effectively eliminated from the possibility of further study. There is, consequently, a need to ensure universal primary education.

Many developing countries face this challenge. In order to meet it, both the demand side as well as the supply side of the problem needs to be tackled. On the one hand, there are impediments in the way of the child gaining access to education. On the other, there are issues of the quality of education which have to be addressed.

Of the many issues that need to be tackled, one fundamental requirement is for children to have easy access to schools. Often school buildings have to be provided. In addition, there is a need for basic facilities like drinking water and toilets. Educational resource centres are also required.

As a result, providing or supplementing school infrastructure may well be a significant part of an education programme. After all, the school building and its environs are the stage within which teaching actually takes place. It is here that all strategies and programmes bear fruit.

However, construction is the means to an end - not the end itself. It needs to facilitate the achievement of the basic aim of universal primary education. This implies a sensitisation of the building construction programme to the larger objectives of education. It is, therefore, important to understand the context from which the construction programme emerges.

School buildings are seldom expected to be more than buildings that just happen to be schools.

However, buildings are the means to the end - not the end itself. This implies a sensitisation of the construction programme to the larger objectives of education.



Traditionally, construction agencies have been divorced from the rest of the educational system. Child friendly designs have therefore not been emphasised.

The Indian Context

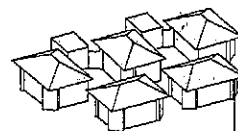
School infrastructure in the states has, over the years, been augmented by various programmes. This has included schemes like Operation Blackboard (OB), Jawahar Rozgar Yojana (JRY), Employment Assurance Scheme (EAS), etc. In most states, agencies like the state Public Works Department, the District Rural Development Agency (DRDA) and the Panchayats are involved with primary school construction. However, the development of education and school infrastructure has been restricted by low budgetary allocations and the fact that much of this has been spent on paying teachers' salaries. Qualitatively, construction agencies have been divorced from the rest of the educational system. Child friendly designs have therefore not been emphasised.

The National Policy on Education, framed in 1986, explicitly recognised the need to make a concerted effort to expand and improve basic education. As an outcome, various schemes were initiated. Operation Blackboard was launched in 1986. It focussed on providing additional classrooms, additional teachers in single teacher schools and a package of teaching / learning materials and aids. District Institutes of Education and Training (DIETs) were established in each district through a centrally sponsored scheme in 1988. The DIETs look after teacher training, planning & management, materials & curriculum development, research & evaluation as well as educational technology aspects at the district level. The Total Literacy Campaign was also launched in 1988. Grants were provided to district administration to organise intensive campaigns and mobilisation drives for literacy.

Various states also initiated basic education projects around this time. The Andhra Pradesh Primary Education Programme (APPEP) was the first of its kind. The Lok Jumbish Project was initiated in Rajasthan. Bihar and Uttar Pradesh also started basic education projects. Although these projects vary in their design, they share the objectives and strategies of the 1986 policy.

In 1992, the Central Advisory Board on Education completed a revision of the National Policy on Education, calling for an integrated approach to the development of primary education focussing on the district level. Learning from previous programmes and this need for an integrated approach, the District Primary Education Programme (DPEP) was launched in 1994. DPEP represents a significant shift from the past as various inter-related aspects of primary education are covered in a single programme operational in many states.

DPEP has a holistic vision and the flexibility to address variations in needs and generate area specific strategies. It is this larger vision that brings in an element of understanding amongst all areas, including civil works, to the overall educational objectives of the programme.



District Primary Education Programme

The District Primary Education Programme (DPEP) emerged as a response to various challenges in the primary education sector. DPEP has the essential ingredients required to universalise access & retention, improve learning achievement and reduce disparities among social groups.

The programme seeks to 'universalise' primary education by revitalising the existing system. It seeks to identify and tackle 'inefficiencies' by integrating innovative practices and approaches. Adopting an 'area-specific approach', with a district as the unit of planning, the key strategies of the programme have been to retain the contextuality and sensitivity to local conditions and to ensure the full participation of the community. There is a marked focus on sustainability, equity and local ownership.

The emphasis on participative planning, management and capacity building are clearly articulated. Acknowledgement of the fact that the programme would continue to evolve as it progresses, makes it flexible and dynamic in nature, providing room for experimentation and accommodating felt needs through innovations. The scope to pilot and either scale-up or withdraw the various approaches tried out has been built into the programme.

The criteria for selection of districts are:

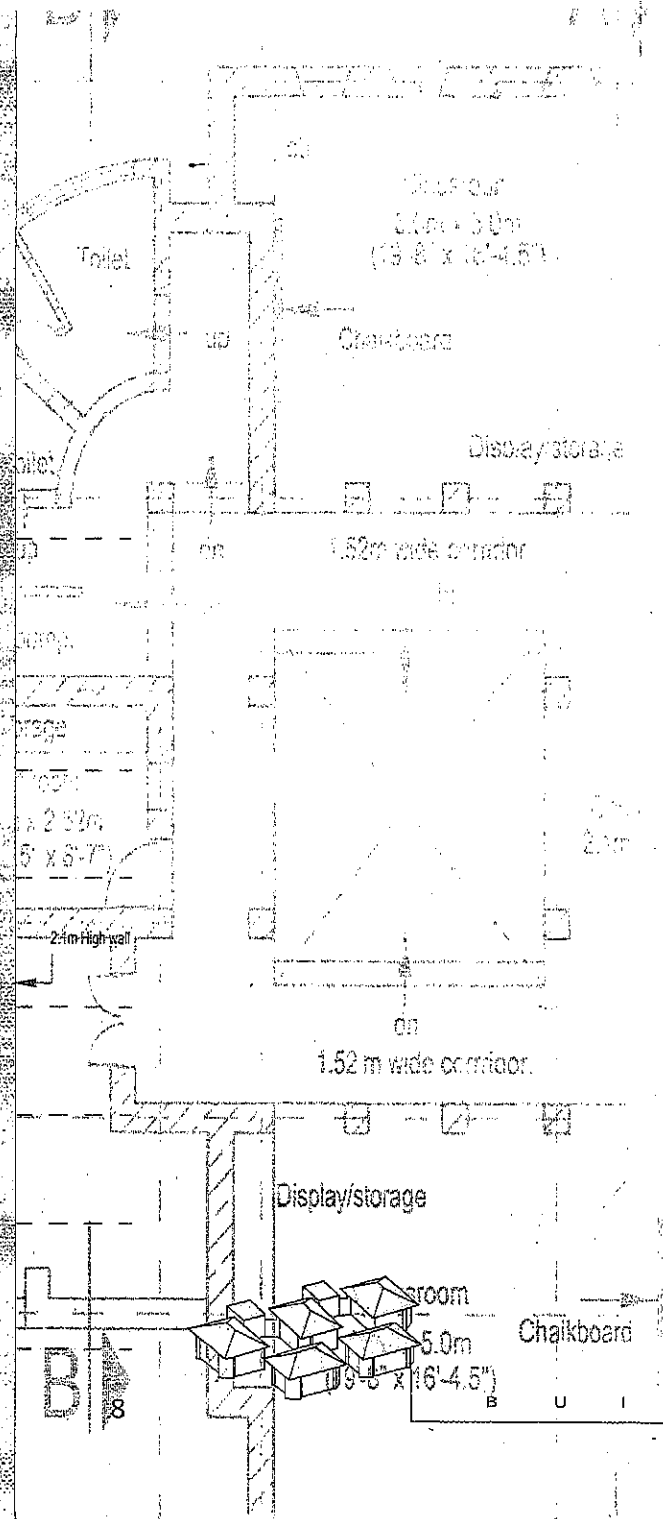
- Backward districts with female literacy below the national average
- Districts where Total Literacy Campaigns (TLCs) have generated a demand for elementary education.

Since its initiation in November, 1994, when DPEP covered 42 districts in 7 states, its reach has spread to 163 districts in 14 states. Expansion to another 50 to 60 districts, which is in the pipeline, will bring the total number of districts to over 200. In addition, similar basic education projects cover 18 districts in Uttar Pradesh (UPBEP) and 75 blocks in Rajasthan (Lok Jumbish Parishad).

While various programme components address different issues, all areas are directed by the same guiding vision. Fundamental principles of community involvement, local specificity, decentralisation, etc. find expression in the civil works programme as well.

DPEP adopts a holistic approach to universalise access & retention, improve learning achievement and reduce disparities among social groups.





B U I L D I N G R U R A L

CIVIL WORKS

TWO

DPEP is a large programme. Its scale becomes clear from the fact that it reaches out to as much as 55% of the child population (6-11 years) in the country and is due to expand further.

The challenge of providing primary school infrastructure is stiff. Infrastructure gaps in many areas are quite large. Further, much of this construction is required in remote areas. Educational provisions must also be comprehensive. It has to include Resource Centres, school buildings, repairs as well as 'smaller' requirements like toilets and drinking water. Consequently, construction is characterised by a large number of very small works spread over a very large area. Besides all this, there is the need for local specificity to address the problems - even though the programme is spread across the length and breadth of the country! The construction programme under DPEP has to necessarily address all these challenges.

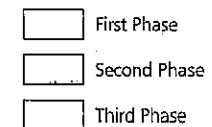
Programme details

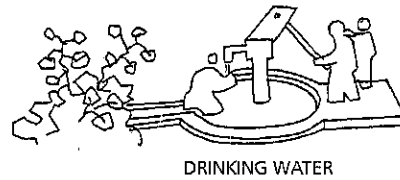
DPEP's coverage and targets (see Map of India, right and table on page 11) are large. In an average district as much as Rs. 10 crores from the programme's funds are being spent on infrastructure. To implement such a large programme over a large area requires flexible systems. The programme does not prescribe a uniform system of construction throughout the country. What it has is broad guidelines within which state and district specific construction systems are adopted. In many states, these have been modified and strengthened as the programme proceeds.

Flexibility in implementation comes through a variety of construction, supervision and monitoring systems. Construction can be done through a contract system, through a government agency or, as in the majority of cases, through representatives of the local community (See box page 11). Most states have created an in-house engineering cell with engineers for providing technical supervision at the sites of work. In three states, government department engineers supervise the works. (See box page 12). However, no two states have exactly the same engineering set-up.

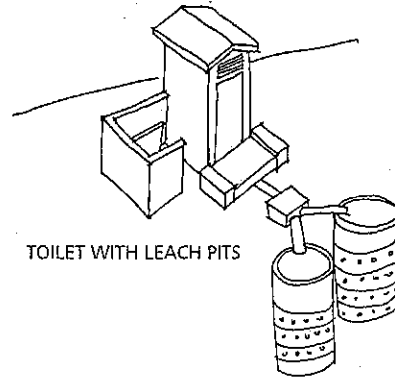
DPEP provides for various types of constructions. The details of these are given in the box overleaf.

DPEP is a large programme. Its scale becomes clear from the fact that it reaches out to as much as 55% of the child population (6-11 years) in the country.

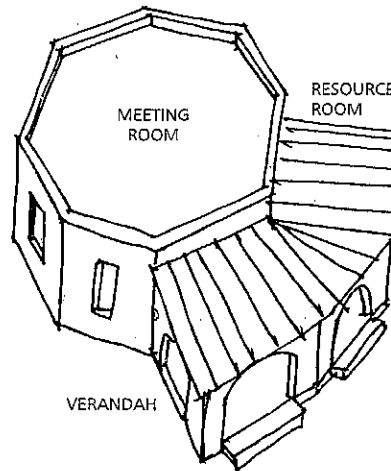




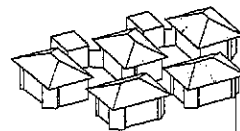
DRINKING WATER



TOILET WITH LEACH PITS



CLUSTER RESOURCE CENTRE



Buildings for New Schools & for schools without one

New school buildings mostly have two classrooms, a teachers' room and a verandah. Verandahs are also used for teaching and are of an area comparable to that of the classroom. In some cases three rooms or two verandahs are provided. The area is generally about 1000 sft. The cost is between Rs. 2.5 lakhs to about Rs. 3.0 lakhs.

Additional Classroom

The additional classroom is normally a single room with a verandah. The area is generally about 450-500 sft. The cost is about Rs. 1.3 to Rs. 1.5 lakhs. One or more additional classrooms are provided to a school based on the need.

Repairs

Most DPEP states have a provision for repairs in their works. No specific unit costs are fixed for repairs as site specific estimates need to be prepared. Various districts and states have undertaken repairs well. Cooch Behar (West Bengal) and Himachal Pradesh are two examples. Gujarat in particular has undertaken an exemplary programme. This includes the survey, estimation and computerisation of data for all schools in DPEP districts. This has covered 3292 of 5608 schools in ten months with a staff of 15 engineers.

Toilets & Drinking Water

Toilets and drinking water are an integral part of the provisions of a school. Apart from providing these in newly constructed schools, the programme attempts to provide / supplement requirements in older schools as well. The cost of drinking water provisions is generally about Rs. 10,000/- to Rs. 15,000/-; However, the depth of boring, providing motorised pumps, etc. would cause variations of cost. Toilets mostly cost between Rs. 5,000/- to Rs. 25,000/- depending on the design.

Cluster Resource Centres (CRC)

A Resource Centre is provided at the cluster level (8-10 villages). This is basically a meeting room with a small store and verandah. It serves as a place for the monthly meetings of teachers of the cluster. In many states, the CRC is treated as an additional classroom as teachers meetings can be held only after school hours or on holidays when classrooms are not in use. The cost is about Rs. 1.5 lakhs.

Block Resource Centres (BRC)

The BRC is a resource centre which co-ordinates teacher training and is responsible for the pedagogical activities in the block. It consists of a training hall, office & store space. In residential BRCs dormitories (for about 40 persons) and cooking spaces are normally provided. In most cases courtyards and informal activity areas are provided. The area of a BRC varies between about 2000 to 3300 sft. and about Rs. 5.5 lakhs to Rs. 10 lakhs depending on the design.

SCERT/SIEMT

In some states, DPEP also provides for the augmentation of the civil infrastructure of the SCERT (State Council of Educational Research and Training) and SIEMT (State Institute of Educational Management and Training). Where new buildings are to be provided, the programme meets a part of this cost, the rest being contributed by the state government.

Civil Works targets under DPEP (Phases I, II & III)

	Assam	Haryana	Karnataka	Kerala	M.P.	Maharashtra	Tamil Nadu	Orissa	Gujarat	Himachal	A.P.	W.B.	U.P.	Bihar	Total
No. of districts	9	7	11	6	34	9	6	8	3	4	19	5	15	27	163
BRC	46	53	106	55	369	73	105	87	23	23	986	117	215	200	2458
CRC	612	543	1055	167	-	-	-	1068	-	235	-	818	2109	1798	8405
New school	65	244	1083	59	5498	1351	429	960	310	608	4963	728	2360	2288	20946
Building-less school	957	62	-	40	-	-	-	407	-	-	2566	221	28	1138	5419
Additional															
Classroom	809	1305	125	1315	4226	1017	805	645	100	11	4238	955	3729	3187	22467
Toilets	1682	3720	1434	266	-	3850	1851	2892	1500	462	2050	675	5985	9601	35968
Drinking water	1469	1641	1434	359	2969	3750	1851	270	710	520	736	450	4581	6892	27632
Repairs	1529	1812	220	376	1886	1600	862	1291	1315	570	-	1660	18826	316	32263

Thrust Areas Under Civil Works

Due to the decentralised nature of the programme staffing, supervision and monitoring systems are state specific. Contextuality comes into the implementation of works in terms of the designs and materials of construction. The use of professional inputs and external consultants at the district, state and national level has greatly facilitated this.

There is an attempt to 'converge' with other schemes and resources so as to supplement the funds for infrastructure. In many states, a part of the funds (especially for drinking water / toilets) comes from other sources like Jawahar Rozgar Yojana, Employment Assurance Scheme, Operation Blackboard, etc.

DPEP recognises the need for the acceptance and adoption of its innovations by other state schemes and agencies. A fund of Rs. 50 lakhs is also available to each state specifically to promote innovations in construction.

Yet, the most significant aspects of the programme are the thrust on community participation in construction and the focus on pedagogical aspects in the building design.

Community Participation

Community participation is a significant departure from conventional systems of construction. It recognises the community as the major 'stake-holder' in the provision of the infrastructure. It facilitates the creation of this sense of ownership in the village by handing over the power and responsibility of getting the works done to the community. The community is involved from the stage of making a site available for construction upto the completion of the building. DPEP focuses on providing the necessary funds and technical supervision so that the community can build its own infrastructure.

Construction can take place through:

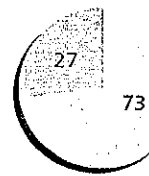
- 1. National Competitive Bidding (NCB)** This is essentially a procedure for contracting out the works. While all DPEP works can be undertaken through a bidding process, for works above Rs. 8 lakhs bids must be invited.
- 2. National Shopping Procedure (NSP)** (Works below Rs. 8.0 lakhs only) - This is also a contract system similar to NCB but hastens the process by allowing the bids to be invited from a minimum of three registered contractors.
- 3. Community Participation** - Individual works upto Rs. 8 lakhs may be undertaken through representatives of the village community like the Village Education Committee.
- 4. Force Account** - Works can also be implemented by a government department like the Public Works Department (PWD), Zilla Panchayat Engineering Department, (ZPED) etc.



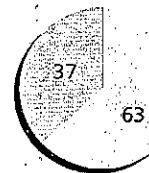
Different supervision systems have been adopted by the states. These include:

1. **In-house engineers** - In most cases, states have their own engineers on contract to supervise the works. Most states have one engineer per block. In a few states, engineers are appointed for every 5-6 works.
2. **Government Department Engineers** - In Uttar Pradesh, Madhya Pradesh & Karnataka government departments like the Rural Engineering Services, etc. provide supervision to the sites of work.
3. **External Agency** - In Kerala, an external agency, the Small Industries Development Corporation Ltd. had been hired to provide supervision for the initial phase. In the next phase the state has adopted a combination of in-house engineers and district specific consultants for design and supervision.

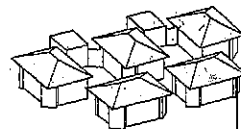
Some of the most significant aspects of the civil works programme are the thrust on community participation and the focus on pedagogical concerns.



Physical targets in DPEP-I



Financial targets in DPEP-I



The Procedure

Formally, the community is represented by the Village Education Committee. In most states, a sub-committee of the VEC undertakes the construction work. Financial powers are vested in two members who remain the co-signatories. In most cases, the head teacher of the school is one of the co-signatories.

Funds are normally released to the VEC in three advance installments of 50%, 35% and 15% of the total estimated cost. (For smaller works like drinking water, toilets, etc. funds are released in two installments of 75% and 25% respectively.) Community Construction Manuals have been prepared in most states in order to provide the VEC with necessary information of the works. In many states this includes the provision of simple, graphical, technical checklists.

The Experience

Community Participation has by and large been accepted as a successful system of work. Initial apprehensions about the interest and capability of the community were clearly unfounded. On the contrary, voluntary contributions of land, labour and materials can be seen in various places across the country. Communities have participated in the development of the school campus, provision of additional facilities like boundary walls, etc. There are examples of the community making contributions to complete the construction of Early Childhood Care and Education (ECCE) centres.

In Andhra Pradesh community contribution over the last two years (1996-97 & 1997-98) amounted to Rs. 1.09 crores against a total DPEP expenditure of Rs. 13.56 crores (about 7.5% of the total expenditure). In the few sites taken up in Tamil Nadu, the savings of cost by the community has been about 15% - 20% allowing them to provide additional facilities within the same estimate. In some other states like Haryana, community constructions have been found to be of better quality than works taken up by government agencies.

Pedagogical Concerns

DPEP seeks to create appropriate teaching-learning environments in the school buildings. Therefore the focus has been on creating schools and classrooms that have adequate storage & display space, can allow multi-grade teaching, cater to high enrolment, single teacher situations, etc. The focus in BRCs & CRCs is to provide conducive environments for meetings and trainings of teachers. These concerns have been addressed through the 'Design Renewal' exercise which has also attempted to prepare designs that are area specific.

DESIGN RENEWAL

THREE

In the initial phase, DPEP commenced using minor modifications of school designs that were being employed by different schemes and agencies in the states. In most cases these were simple designs consisting of two rooms and a verandah which were easy to construct. However, they did not address the pedagogical concerns that are central to DPEP.

These designs were sometimes lacking in adequate light, ventilation and especially functional accessories like display, storage etc. Consideration of area specificity, use of local materials and skills were also not incorporated.

These shortcomings became apparent as the programme progressed and the pedagogical renewal process took root. The need for design renewal emerged from the focus on pedagogical renewal. The objective was to prepare designs consistent with the pedagogical requirements. To initiate the exercise a fund of Rs.50 lakhs was allocated to each state.

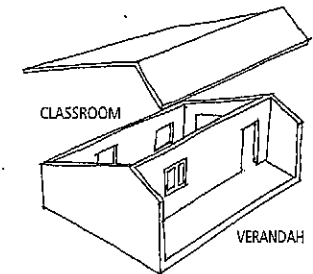
The national level role was primarily that of facilitating the process. This included aspects like providing an indicative list of consultants to the states and preparing outlines of tasks, etc. The Vidyalayam (APPEP) workshop, in November 1996, attended by all state representatives, provided an opportunity to see the Cost Effective Construction Technology Project first hand and draw lessons for their own programme.

Participatory workshops to evolve design briefs were organised at the state level. These workshops were characterised by the participation of school teachers, members of PTA and in some cases school going children. It was hoped that this would ensure a more responsive design.

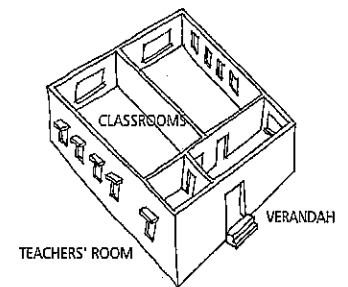
Initiation

In late 1996 and early 1997 West Bengal, Kerala and Uttar Pradesh conducted design workshops to evolve clear guidelines for school design. A similar two day national workshop on classroom design was organised involving prominent educationists, architects and some state representatives. This provided a generic brief for the designs in the second phase. A handbook (A Guide to Design for a Better Learning Environment) resulted from these workshops. This document was shared with the states in mid-1997 and served as an illustrative guide to the state engineers and consultants. Similar workshops and consultative meetings were held at the state level through the design renewal process for briefings and the appraisal of designs.

The need for design renewal emerged from the focus on pedagogical renewal. The objective was to prepare designs consistent with the pedagogical requirements.



INITIAL PHASE SCHOOL - ASSAM



INITIAL PHASE SCHOOL -
MADHYA PRADESH



There was a conscious attempt to develop state and district specific designs. It has been a large collaborative effort between the engineers, architects and educationists.

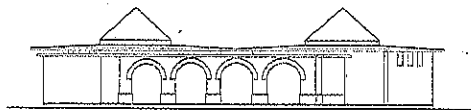
Orissa and Madhya Pradesh were amongst the first states to appoint consultants and initiate the design renewal exercise. In many states the process was initiated with workshops to discuss design issues and provide consultants with a clear understanding of state concerns. In some states (Madhya Pradesh, Himachal Pradesh, Kerala, Assam and Haryana) district specific consultants were appointed. In most cases, district studies were also included in the scope of work of the consultants. In Assam, Haryana and Uttar Pradesh this has taken the form of a resource mapping exercise.

The objective of the resource mapping exercise has been to obtain a better idea of the materials, labour skills and construction technologies available and suited to an area. These studies formed the foundation for the design renewal exercise in some states.

Professional Inputs

DPEP states also benefitted from the experience of consultants who were involved with similar education programmes in the past. Andhra Pradesh refined APPEP designs for DPEP. The states of Haryana, Madhya Pradesh, Andhra Pradesh, Himachal Pradesh and Uttar Pradesh have had the involvement of consultants with the experience of programmes like APPEP and Lok Jumbish behind them. Tamil Nadu and Maharashtra on the other hand have undertaken the design renewal exercise through the offices of their respective Chief Architects in the government.

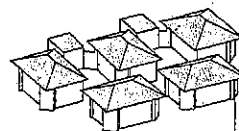
Although Bihar has not yet undertaken the design renewal exercise under DPEP as such, its Bihar Education Project (BEP) experience is of significance here. After an initial reliance on government agencies, BEP began strengthening its own civil works staff. This included engineers as well as architects as district consultants. A BEP 'design renewal' exercise was undertaken about two years ago and resulted in a new school and BRC designs. Of particular significance is the Block Resource Centre design, which has influenced the brief for residential BRCs in other states.



SECOND PHASE SCHOOL -
KARNATAKA

State Specificity

There was a conscious attempt to develop state and district specific designs. As a rule, designs from one state were not adopted by other states. However, at fora like the Cross State Sharing Workshop (Kerala, August 1997) and at certain state workshops, the best designs were shared with other states to better direct the design renewal exercise. In some cases, consultants who have been involved with



one state, were also associated in briefings and orientations for other states/consultants. States like Gujarat, which initiated the design renewal exercise later than other states have benefited from the experience of other states which had already undertaken the exercise.

The SPO and state engineers have played a significant role in coordinating the exercise. In some cases, (Assam in particular) the SPO was able to give the consultants a clear direction for the design as well as the resource mapping exercise. Such awareness and direction to the consultants has been very important in ensuring the quality of the new designs.

The role of consultants has varied from state to state. In a few cases it has been limited to the preparation of designs. In most states, it has extended to some other activities including district studies, supervision of prototype constructions, suggesting alternate technologies and the preparation of construction manuals.

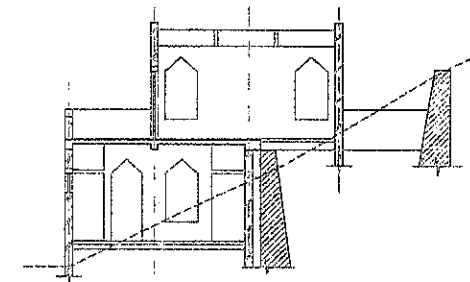
The Experience

In effect, the design renewal has been a large collaborative effort between the engineers, architects and educationists. Much effort has been put in. In many cases, the exercise was initiated with some scepticism of what the design renewal process could achieve. By and large such doubts no longer exist. In some cases the designs are already being examined by other state programmes.

By now, most states have either completed the exercise or are in the process of doing so. A large number of consultants have been involved so far in the various states - close to a hundred designs have been approved, many more were generated. Most of these designs show a distinct improvement over the traditional box-type schools, having provisions to facilitate activity based learning.

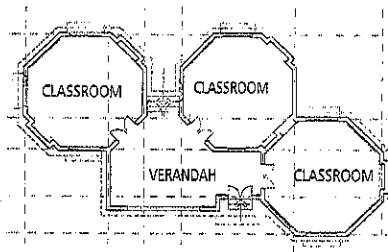
All new designs provide for teachers as well as childrens chalkboard, storage and display spaces in the classroom. The designs focus on the rural/village context of the school. Specific considerations include designing for multigrade situations through the provision of additional chalkboards? Designs have also been prepared for situations where the number of teachers is less than the number of classrooms. Attempts have been made to mitigate the effect of overcrowding by providing informal teaching spaces in conjunction with classrooms. District and state specific conditions have been kept in mind. Local architecture, materials and techniques of construction find expression in some of these designs.

A large number of consultants have been involved - close to a hundred designs have been approved. Most of these designs show a distinct improvement over the traditional box-type schools.



SECOND-PHASE SCHOOL - HIMACHAL PRADESH





SECOND PHASE SCHOOL -
TAMIL NADU

Other Initiatives

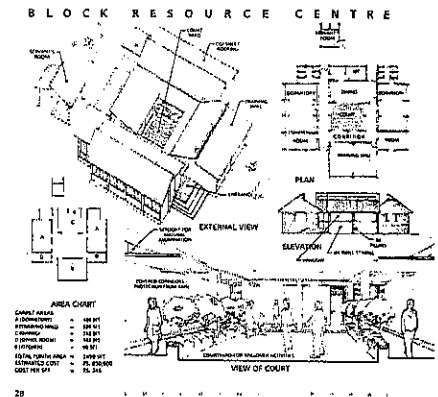
The exercise has paved the way for other innovation fund interventions like the use of alternate technologies and the rationalisation of structural designs. The use of alternate materials is not an issue in places where the materials are locally available. The use of alternate technologies requires special skills and systems which local engineers may not be familiar with. This brings in the need to train engineers.

This process has begun. Bihar, with the experience of BEP is undertaking all constructions through alternate technologies. Kerala, Karnataka and Andhra Pradesh are using alternate technologies in some of their constructions. This is a focus area in other states as well. Prototype constructions are to commence shortly in some of the states and would be used to instruct and train DPEP engineers. An initiative has recently been undertaken, in a collaborative effort of the national level with Himachal Pradesh, Haryana, Guajrat, Orissa and agencies like HUDCO, National Council of Cement and Building Materials, etc. to undertake construction with appropriate systems on a large scale in these four states. All engineers in the states are to be trained (in phases, as per the states convenience).

The optimisation of the structural designs may also bring cost savings. Over design of structural members (like roof slabs, columns, etc.) and over specification leads to an unnecessary increase of cost. An exercise has been initiated to examine the designs (with support from the national level) so as to bring in cost reductions. DPEP Haryana has already initiated this process. The exercise has also been undertaken in Orissa and Tamil Nadu. In Orissa it has been found that it could result in savings of upto Rs. 58,000/- in every two room school building which amounts to about 25% of the total cost.

SECTION II

This section provides a graphical glimpse of some of the interesting designs generated. It highlights some of the unique features of these designs as well as aspects like storage and display which are basic provisions in all DPEP designs.



DESIGN HIGHLIGHTS

FOUR

Primary Schools

A few designs from various states have been highlighted over the next few pages. Each one is interesting for some reason or the other. Most designs incorporate the ideal of 'value addition'. The school designs show different ways in which additional, open learning spaces can be created without increasing costs. Local specificity of designs, materials and construction is also visible. Concerns of security and enclosure are visible in the designs of Gujarat. The designs by Mr. Laurie Baker (Kerala) provide two options for each site and take particular care to preserve existing site conditions and trees in particular. Concept designs from Uttar Pradesh have also been presented.

There has been a specific focus on provisions within the classroom for storage and display. It is now standard to provide two teachers chalkboards in every classroom (to facilitate multigrade teaching, if required). All classrooms have children's chalkboards either at sitting or at standing height. Storage provisions are given in terms of open and lockable shelves. Display features include hooks and battens, display ledges and niches.

Put together, the case studies provide a glimpse of the designs and the variety of state specific solutions. A compilation of a majority of designs developed is included in the Section IV of the document.

Block Resource Centres

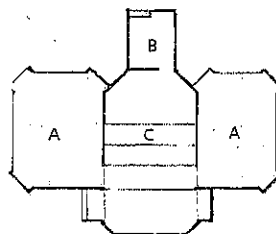
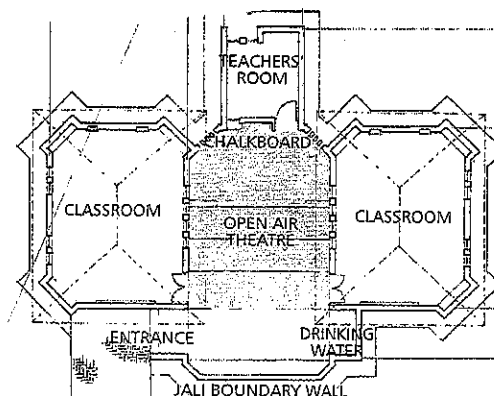
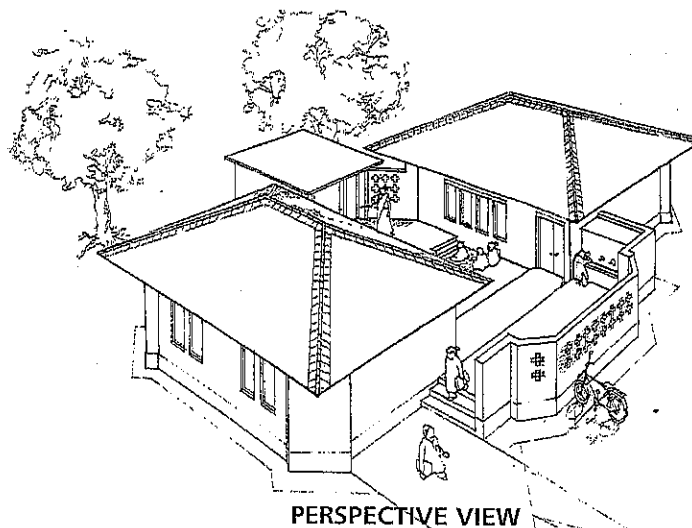
The BRC is a resource centre for school teachers and a location for their training. In all states, the BRC contains a training hall, an office and a store room. In most states, it is residential and has provisions for about 40 persons to stay over-night. Semi covered cooking spaces and open dining areas are provided in many cases.

The designs have attempted to generate the environment of a small but important resource centre. In most cases, rooms are arranged around a courtyard which also provides the area for informal activities.

Area specific designs have been developed for BRCs as well. The design in Assam uses local materials and has climatic and architectural features in keeping with local construction. In the Madhya Pradesh and Gujarat designs attention to detail is visible in terms of the provisions like small backyards for the drying of clothes, storage cupboards in the dormitories etc.

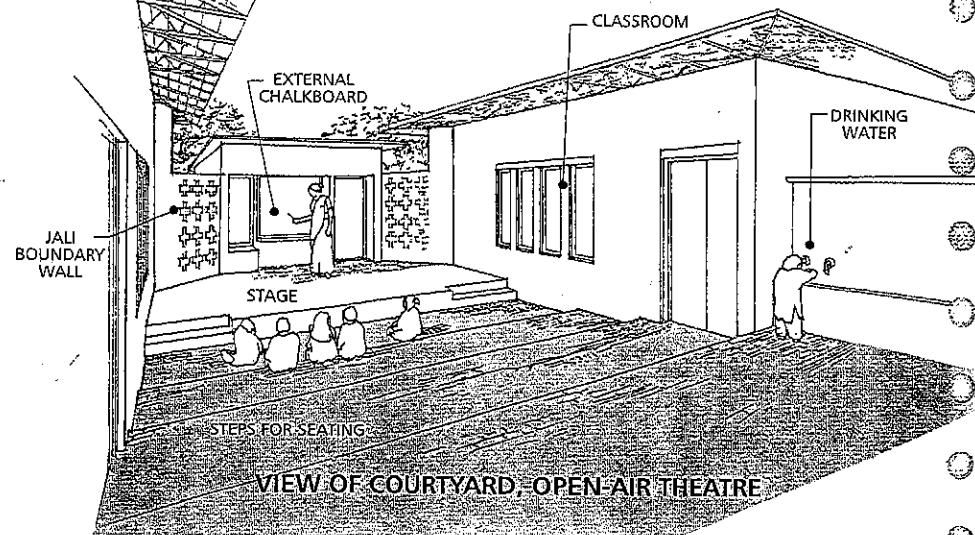
Most designs incorporate the ideal of 'value addition'. This has been achieved in various different ways.

NEW PRIMARY SCHOOL



AREA CHART

CARPET AREAS	
A (CLASSROOM)	= 302 SFT
B (TEACHERS' ROOM)	= 88 SFT
C (COURTYARD)	= 425 SFT
TOTAL PLINTH AREA	= 1079 SFT
ESTIMATED COST	= RS. 230,000
COST PER SFT	= RS. 213



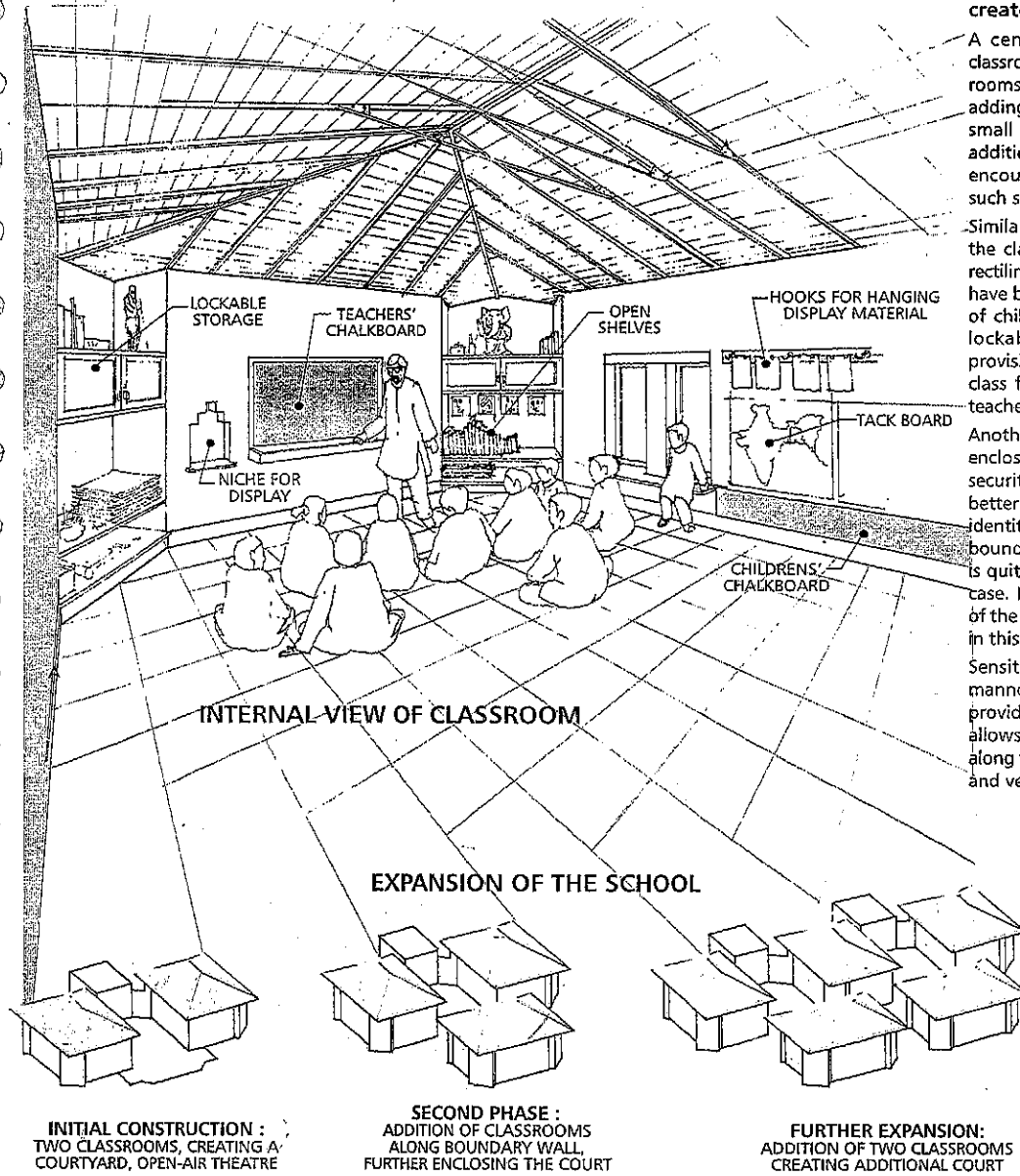
The design is a fine example of how additional learning spaces can be created at minimal cost.

A central court (of a similar size as the classrooms) has been created between the two rooms. (facing page, bottom right) By simply adding stepped seating this court becomes a small open air theatre! Not only is this an additional teaching area but also a space that encourages plays, performances and other such student activities.

Similar attention to detail can be seen inside the classroom. While the room is essentially rectilinear, sufficient display and storage spaces have been provided. (right) This is in the form of childrens' chalkboards, hooks for display, lockable & open shelves and niches. The provision of storage at three corners of the class facilitates freer usage of the spaces by teachers and students alike.

Another valuable feature is the creation of an enclosed school. This provides the school with security, prevents misuse of the rooms, allows better maintenance and generates a sense of identity for the school. Normally, the length of boundary wall required to enclose the school is quite large, making it uneconomical in this case. Prudent design has reduced the length of the boundary wall, and made it economical in this case.

Sensitive design can also be noticed in the manner in which a small water place has been provided within the school. The design also allows for an additional classroom to be built along the boundary wall without reducing light and ventilation to the other classrooms.



INTERNAL VIEW OF CLASSROOM

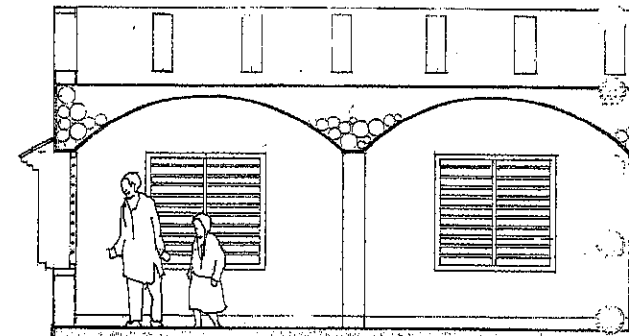
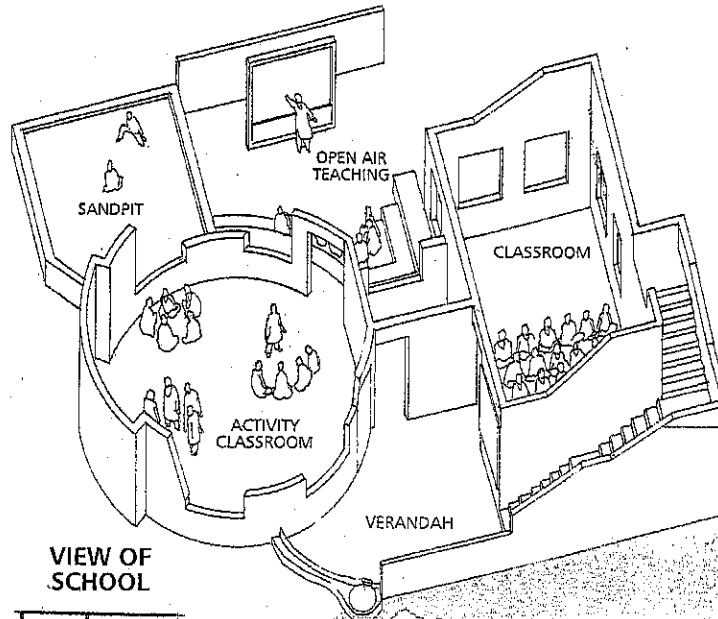
EXPANSION OF THE SCHOOL

INITIAL CONSTRUCTION :
TWO CLASSROOMS, CREATING A
COURTYARD, OPEN-AIR THEATRE

SECOND PHASE :
ADDITION OF CLASSROOMS
ALONG BOUNDARY WALL,
FURTHER ENCLOSING THE COURT

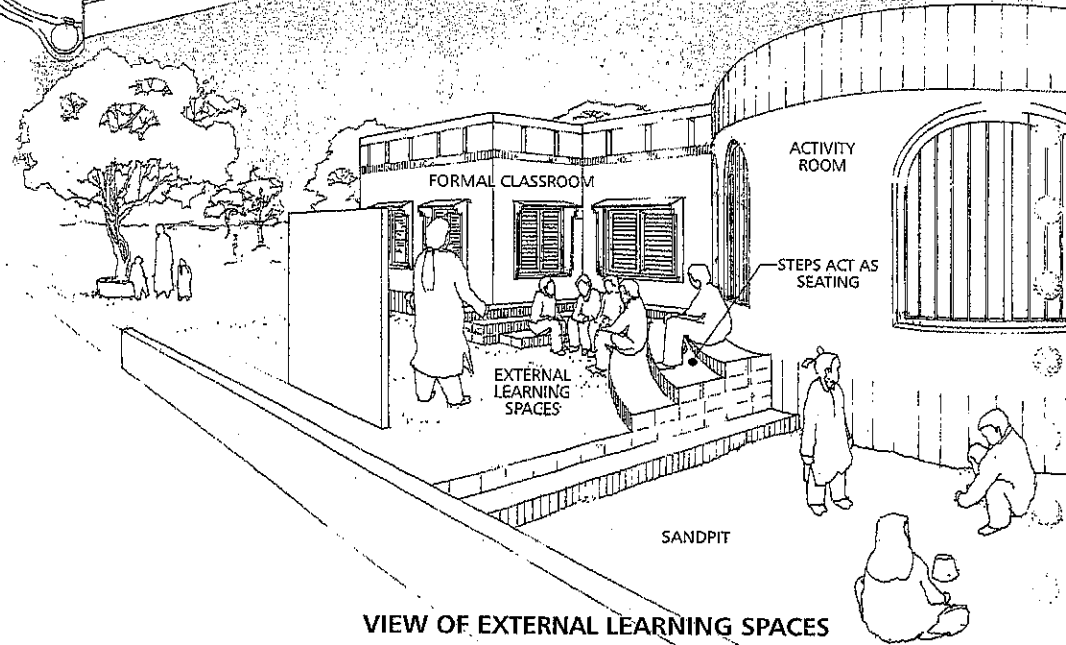
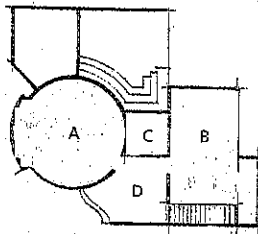
FURTHER EXPANSION:
ADDITION OF TWO CLASSROOMS
CREATING ADDITIONAL COURT

NEW PRIMARY SCHOOLS



SECTION THROUGH CLASSROOM
THE DESIGN PROPOSES CONSTRUCTION OF JACK-ARCHED ROOFING WHERE SKILLED LABOUR IS AVAILABLE

VIEW OF SCHOOL



VIEW OF EXTERNAL LEARNING SPACES

AREA CHART

CARPET AREAS	
A (CLASSROOM)	= 449 SFT
B (CLASSROOM)	= 349 SFT
C (TEACHERS' ROOM)	= 47 SFT
D (VERANDAH)	= 184 SFT
TOTAL PLINTH AREA	= 1211 SFT
ESTIMATED COST	= RS. 231,000
COST PER SFT	= RS. 191

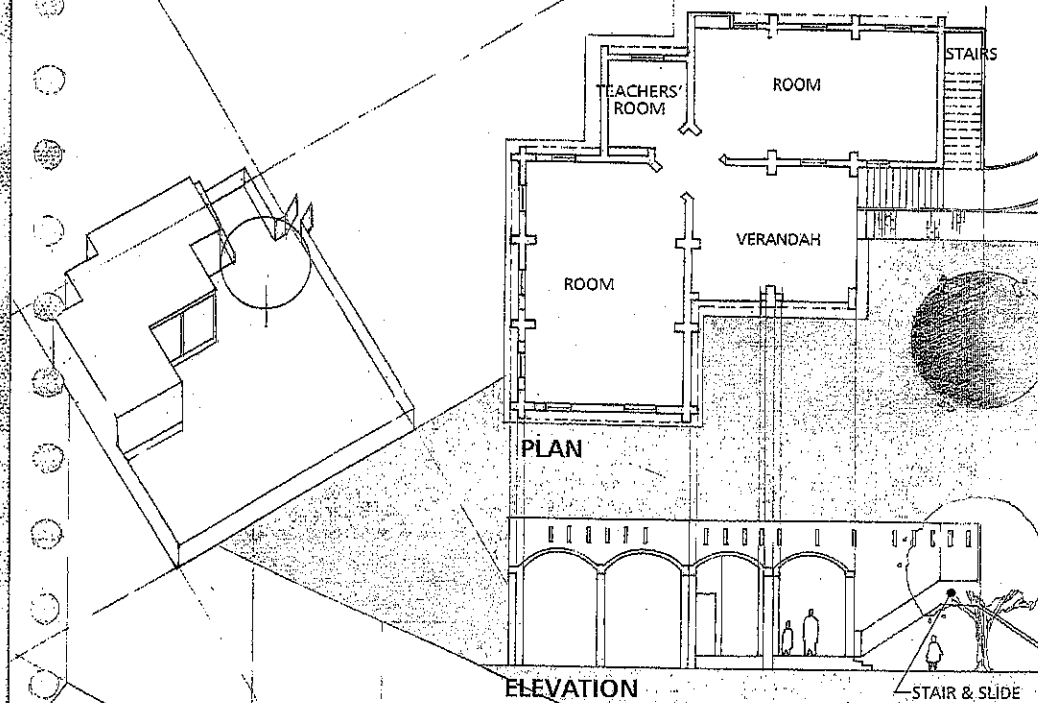
MADHYA PRADESH

The two designs for Khandwa, Madhya Pradesh, focus on the creation of external teaching spaces, judicious provision of storage & display and the use of local construction materials and systems.

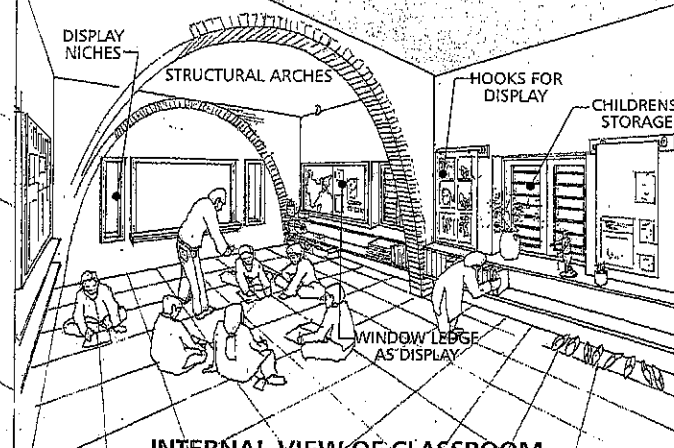
As per the brief, one larger size classroom (for lower classes and activity based learning) and one regular size classroom was to be provided. In the first design, (facing page) one larger sized circular classroom has been provided along with another rectilinear classroom. Activity-based learning is facilitated by the creation of open-air teaching spaces and a sand-pit. (facing page, bottom).

In both designs, single teacher situations (in the absence of the second teacher) have been addressed through the arrangement of classrooms and verandah. It is easier for a single teacher to 'monitor' two classes if required (facing page, top left and plan left). The shape of the verandah (squarish rather than linear) also makes it more conducive for teaching.

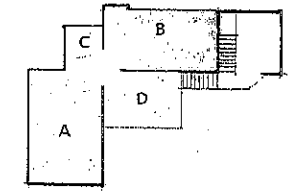
Attention to detail can be seen in terms of small details like the provision of space to keep a water-pot, making the roof accessible for maintenance and the creation of a slide for the children from this staircase. The sensitive and meticulous detailing of storage/display facilitates activities and self-learning in both classrooms (bottom right). The use of local systems of construction including jack arch roofing (facing page, top right) have also been suggested by the consultant.



WINDOW DETAIL
 THE CHAJJA (OVERHANG) IS MADE OUT OF LOCALLY AVAILABLE STONE SLAB. CORBELLING IS A LOCAL ARCHITECTURAL FEATURE



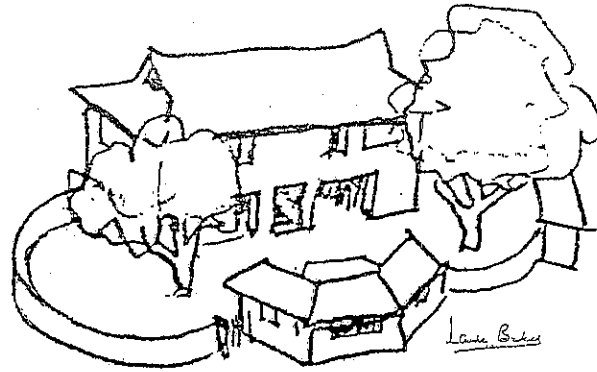
INTERNAL VIEW OF CLASSROOM



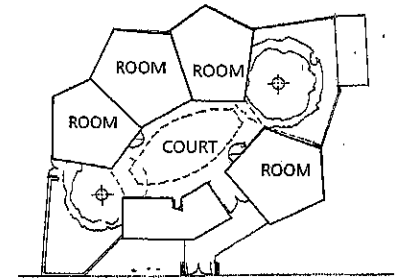
AREA CHART

CARPET AREAS	
A (CLASSROOM)	= 437 SFT
B (CLASSROOM)	= 361 SFT
C (TEACHERS' ROOM)	= 86 SFT
D (VERANDAH)	= 272 SFT
TOTAL PLINTH AREA	= 1242 SFT
ESTIMATED COST	= RS. 230,000
COST PER SFT	= RS. 185

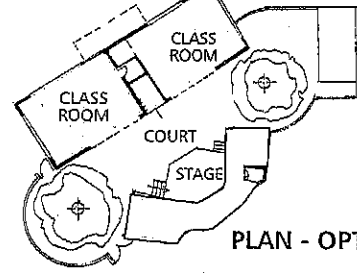
NEW PRIMARY SCHOOLS



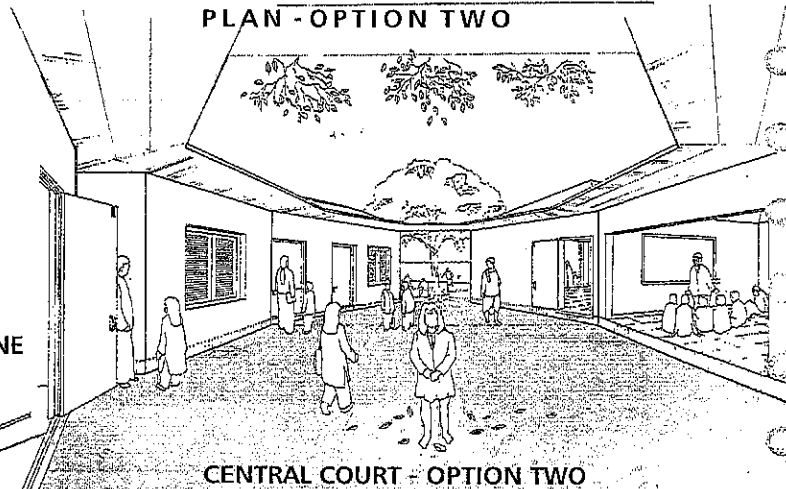
OPTION ONE - EXTERNAL VIEW



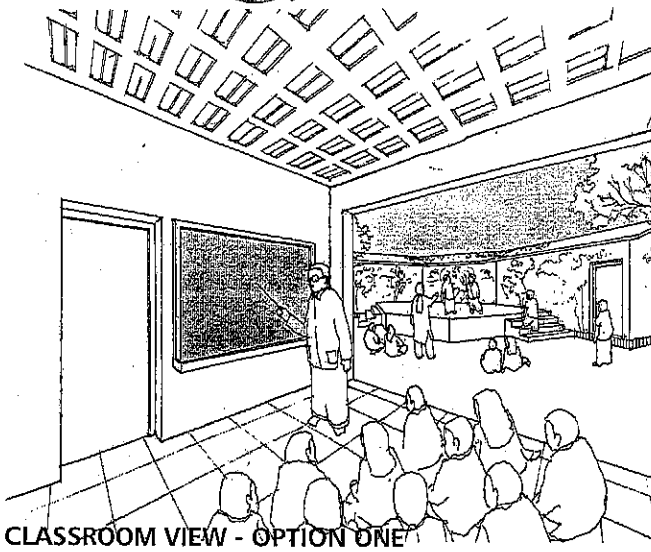
PLAN - OPTION TWO



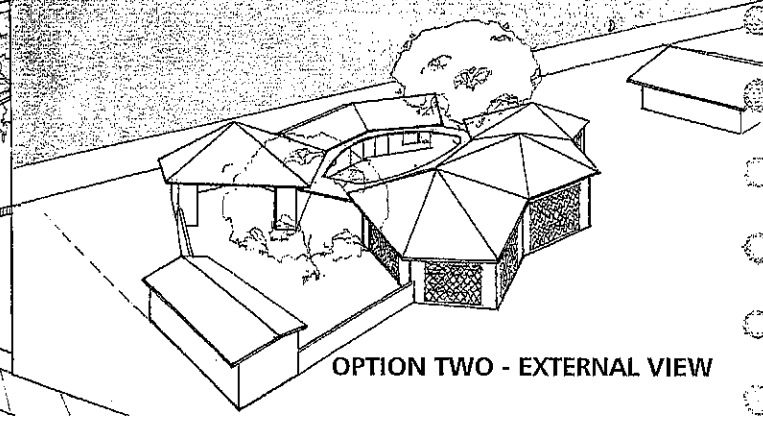
PLAN - OPTION ONE



CENTRAL COURT - OPTION TWO

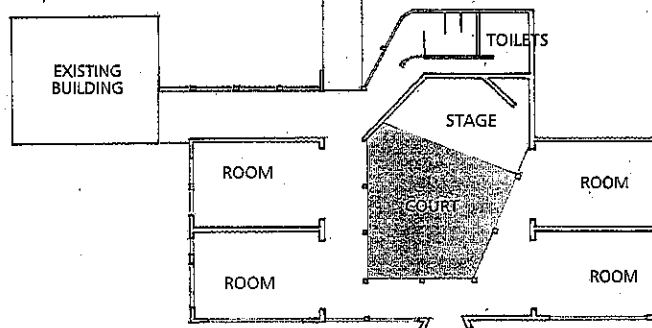


CLASSROOM VIEW - OPTION ONE

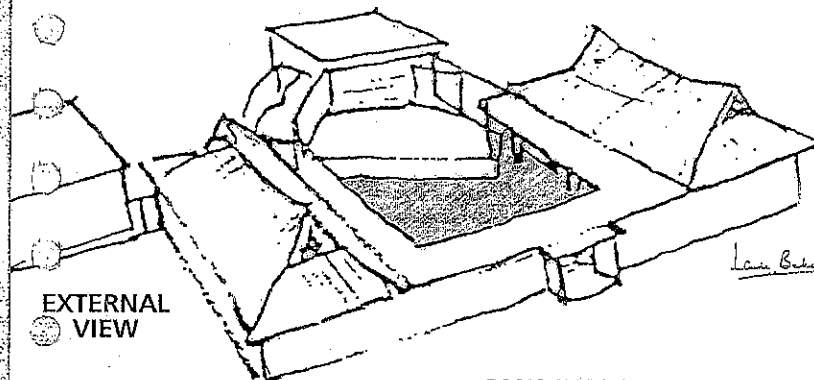


OPTION TWO - EXTERNAL VIEW

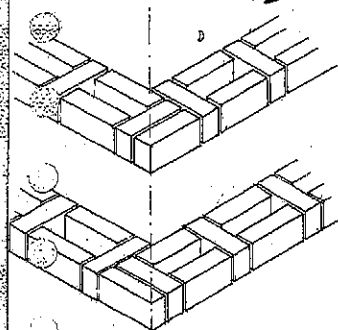
K E R A L A



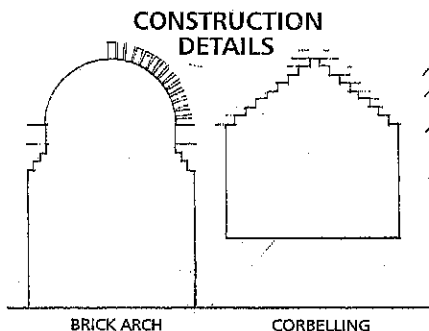
PLAN



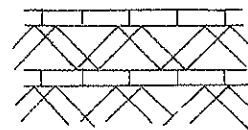
EXTERNAL VIEW



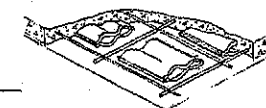
RAT TRAP BOND



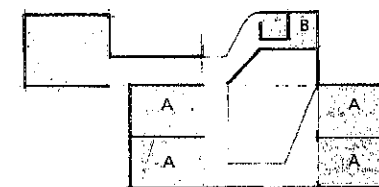
COST EFFECTIVE SYSTEMS OF SPANNING OPENINGS



JALI WALL



FILLER SLAB



AREA CHART

CARPET AREAS	
A (CLASSROOM)	= 340 SFT
B (TOILETS)	= 150 SFT

A few of the designs for DPEP Kerala have been prepared by Mr. Laurie Baker (on behalf of Costford). The designs emerge from the site conditions and try to make the most of the potential of the site.

The designs facing page present two possible options for the same site (at Wayanad, Kerala). Both preserve the natural environment of the site. The first design has the four classes provided on two floors (facing page, left). The trees 'define' the central space, with the teachers' room and toilets enclosing space for a stage next to the open area.

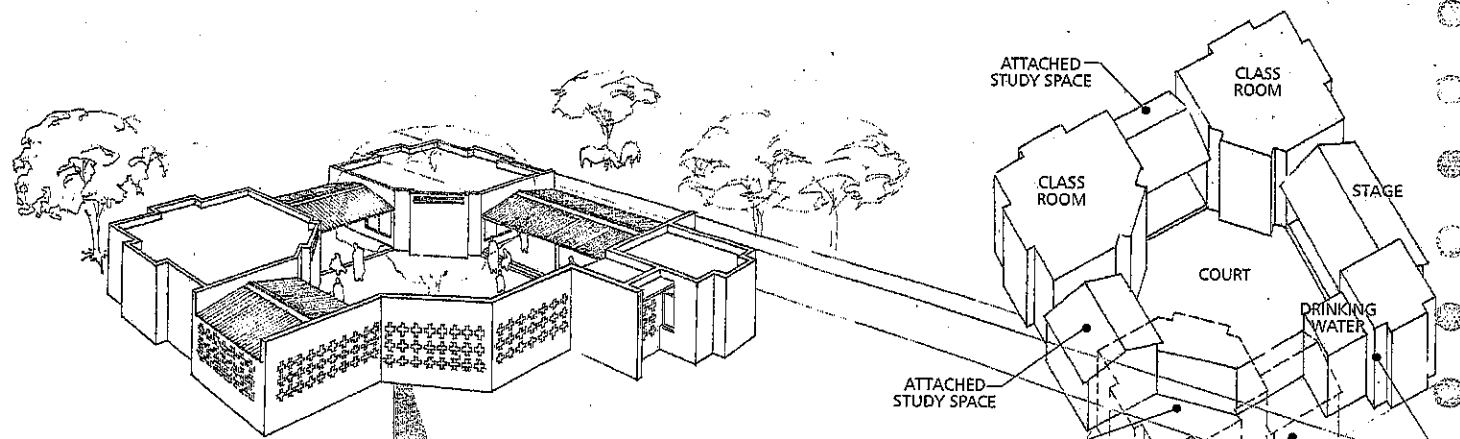
In the second option (facing page, right) all classrooms are on the ground floor and enclose a courtyard. Each classroom opens into this central court. The classrooms at either end also open out to the mango trees!

One of the two designs proposed for another site, (at Kottathara) is also shown (this page). The design is a valuable example of how 'additional value' has been created in a constrained site. Within the compact design for a narrow site (approximately 30 feet wide), the design provides for a courtyard as well as a stage.

All three design options have sloping roofs, jalis and large openings. These are in response to the high rainfall and humid conditions wherein there is a need to maximise ventilation.

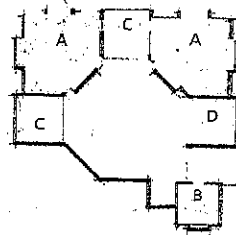
The use of appropriate systems of construction is another standard feature in these designs. This includes the use of rat-trap bond masonry, filler slabs, jalis and arches/corbelling. These are established systems that save on materials (brick and cement) and thereby cost.

NEW PRIMARY SCHOOL



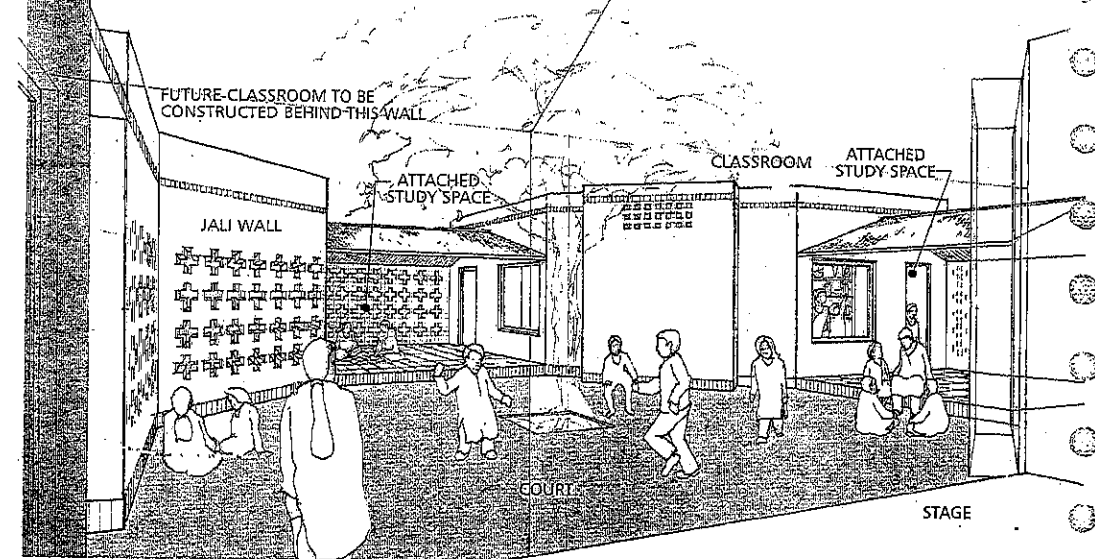
EXTERNAL VIEW

3D VIEW SHOWING EXPANSION



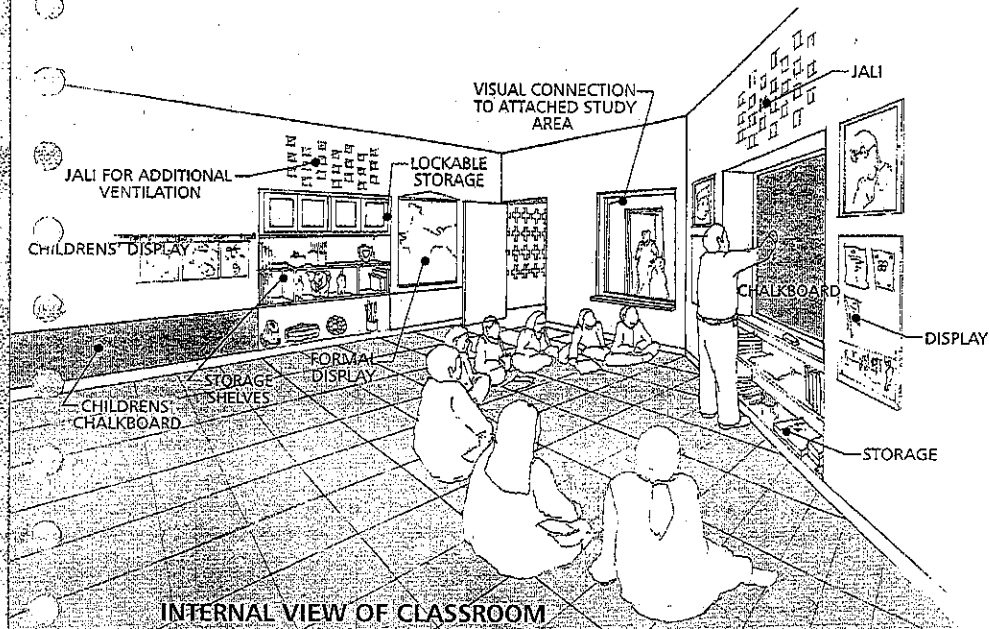
AREA CHART

CARPET AREAS	
A (CLASSROOM)	= 502 SFT
B (TEACHERS' ROOM)	= 97 SFT
C (STUDY AREAS)	= 150 SFT
D (STAGE)	= 150 SFT
TOTAL PLINTH AREA	= 2303 SFT
COST TO BE FINALISED	

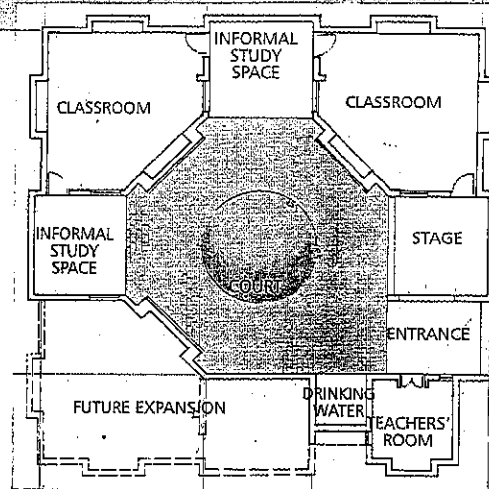


VIEW OF COURTYARD & STUDY SPACE ATTACHED TO THE CLASSROOMS

G U J A R A T



INTERNAL VIEW OF CLASSROOM



PLAN

P R I M A R Y S C H O O L S

The school design has many positive features. It re-examines the classroom and its relation to informal study & play areas. It provides for the expansion of the school, creates a secure, enclosed environment, and incorporates internal storage and display features.

The school provides three distinct learning areas — the classroom, the attached semi-covered study space and the central courtyard (facing page, bottom right). Each classroom opens into two semi-covered spaces. The teacher can also monitor the attached space from the classroom through the window if required.

This makes it easy for the teacher to divide the class for group work as well as deal with a situation of overcrowding if it occurs. The attached study spaces can also act as independent study/ activity areas.

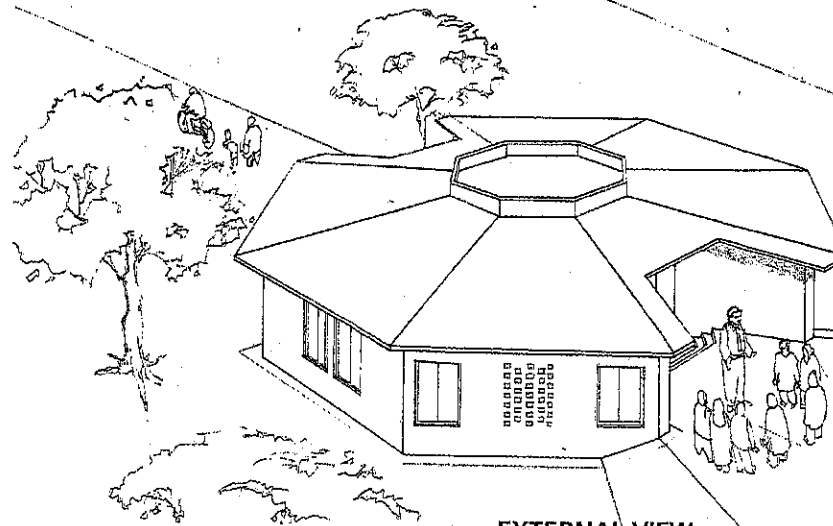
The classroom also has a variety of display and storage facilities on three walls allowing freer access to materials by students and teachers alike. (See view left)

The design follows a modular pattern with the possibility of adding a third classroom in the future along the boundary wall without disturbing the existing rooms or their light and ventilation.

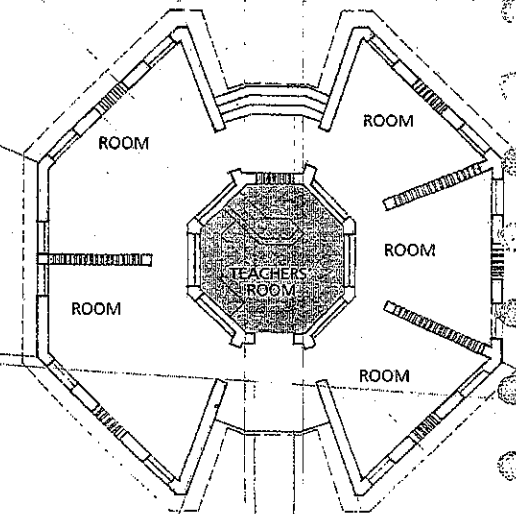
The arrangement of rooms also encloses a courtyard thereby creating an additional usable space. Yet, it manages to enclose the school with a minimal length of a boundary wall!

This enclosed area also contains a drinking water spot. Jalis are provided on the boundary walls and the classroom walls to increase ventilation and also bring about small cost savings.

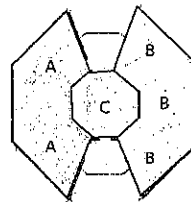
P R E L I M I N A R Y D E S I G N S



EXTERNAL VIEW

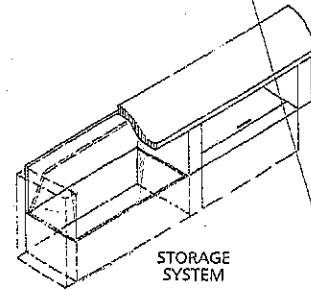


PLAN 1

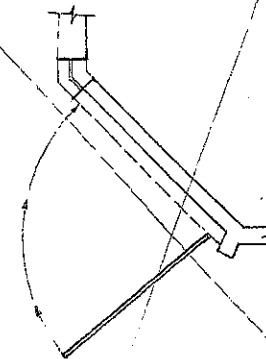


AREA CHART⁹

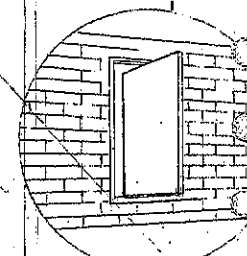
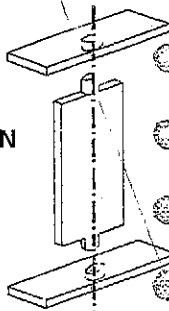
CARPET AREAS	
A (CLASSROOM)	= 192 SFT
B (CLASSROOM)	= 121 SFT
C (TEACHERS' ROOM)	= 153 SFT
TOTAL PLINTH AREA	= 1025 SFT
ESTIMATED COST	= RS. 176,000
COST PER SFT	= RS. 172



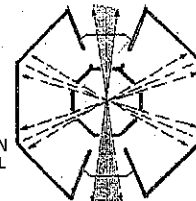
STORAGE SYSTEM



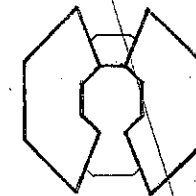
CONSTRUCTION DETAILS



PIVOTED WINDOW.

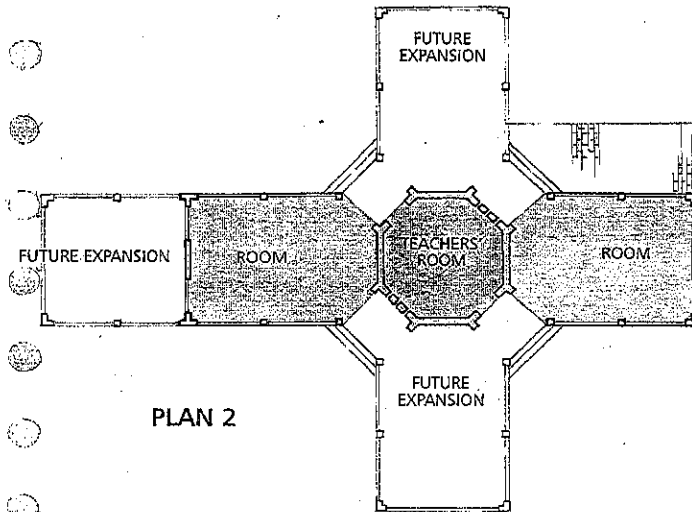


A SINGLE TEACHER CAN CONTROL ALL THE CLASSES

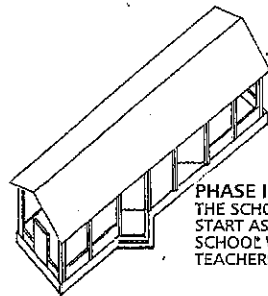


THE INTERNAL PARTITIONS ARE FLEXIBLE SO THAT THEY CAN BE REMOVED WHEN A LARGER SPACE IS REQUIRED

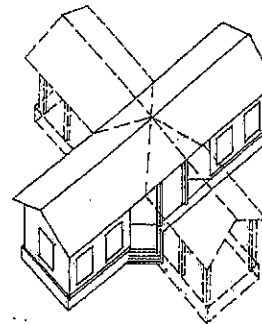
U T T A R P R A D E S H



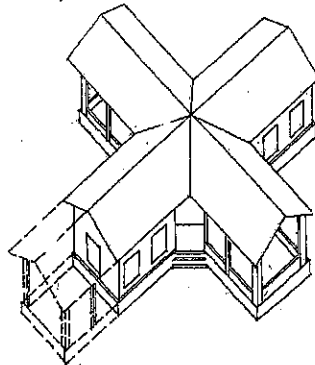
PLAN 2



PHASE I
THE SCHOOL MAY
START AS A 2-ROOM
SCHOOL WITH A
TEACHERS ROOM



PHASE II
TWO PAVILIONS CAN
BE ADDED WHEN
STUDENT STRENGTH
INCREASES.



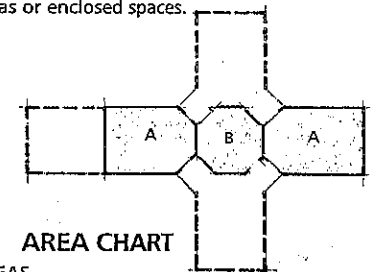
PHASE III
THE PAVILIONS CAN BE MADE
INTO COMPLETE CLASS ROOMS
AND THEN A PAVILION MAY BE
CONSTRUCTED ADJACENT TO THE
EARLIER ROOMS.

The concept designs from Uttar Pradesh explore a few new ideas. This includes a focus on areas with low populations, pedagogical provisions in classrooms and the expansion of the school with time.

Tribal and hilly areas tend to have scattered populations. The first design (facing page) focuses on such areas where the number of students is very few but may be spread over different classes. As shown, upto five classes can be accommodated in the same area as would normally cater to two classes. The shape of each 'class' and the location of the teachers' room is such that it is easier for one teacher to interact with more than one 'class' at the same time.

The design proposes flexible partitions so that larger class sizes can be created if required. Systems of display, storage and construction systems have also been examined. The chalkboard has been designed such that storage shelves are provided behind it (see figure overleaf). Flexible storage systems and frame-less and cost effective window details have also been shown.

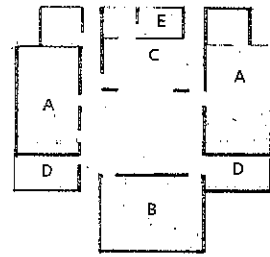
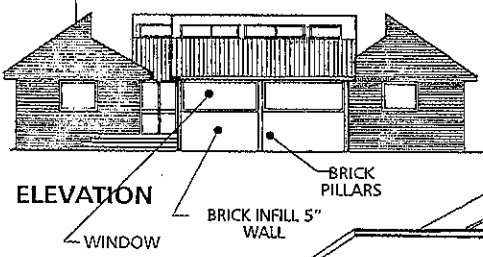
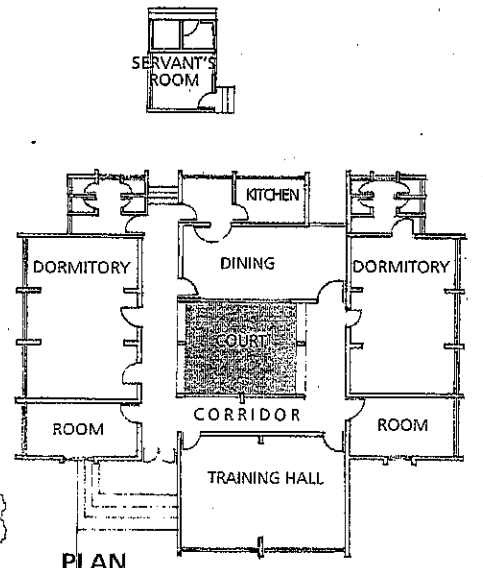
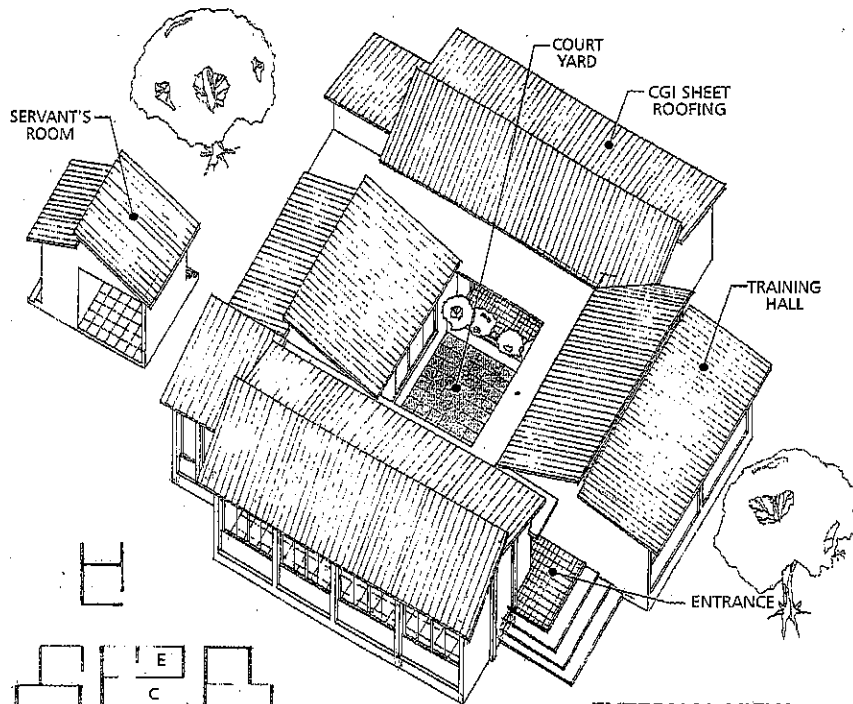
The second design consists of two classrooms with a central teachers' room at the first stage. (Left) In the second stage, two pavilions (floor and roof with low walls) are provided. If required these can be made into complete rooms with an additional pavilion provided in the final stage. However, it is interesting to note, that unlike the Gujarat designs, the school does not create well-defined external areas or enclosed spaces.



AREA CHART

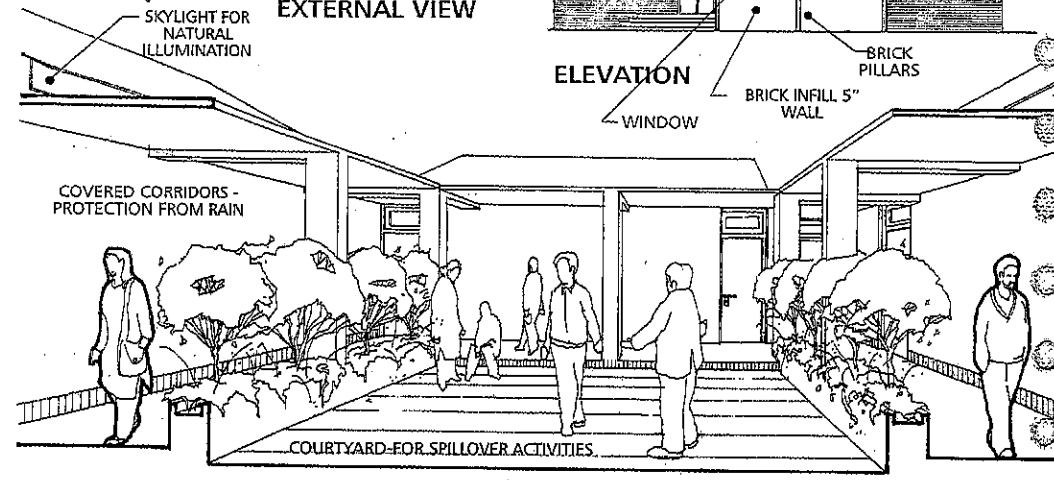
CARPET AREAS	
A (CLASSROOM)	= 343 SFT
B (TEACHERS' ROOM)	= 213 SFT
TOTAL PLINTH AREA = 989 SFT	
ESTIMATED COST	= RS. 190,000
COST PER SFT	= RS. 192

B L O C K R E S O U R C E C E N T R E

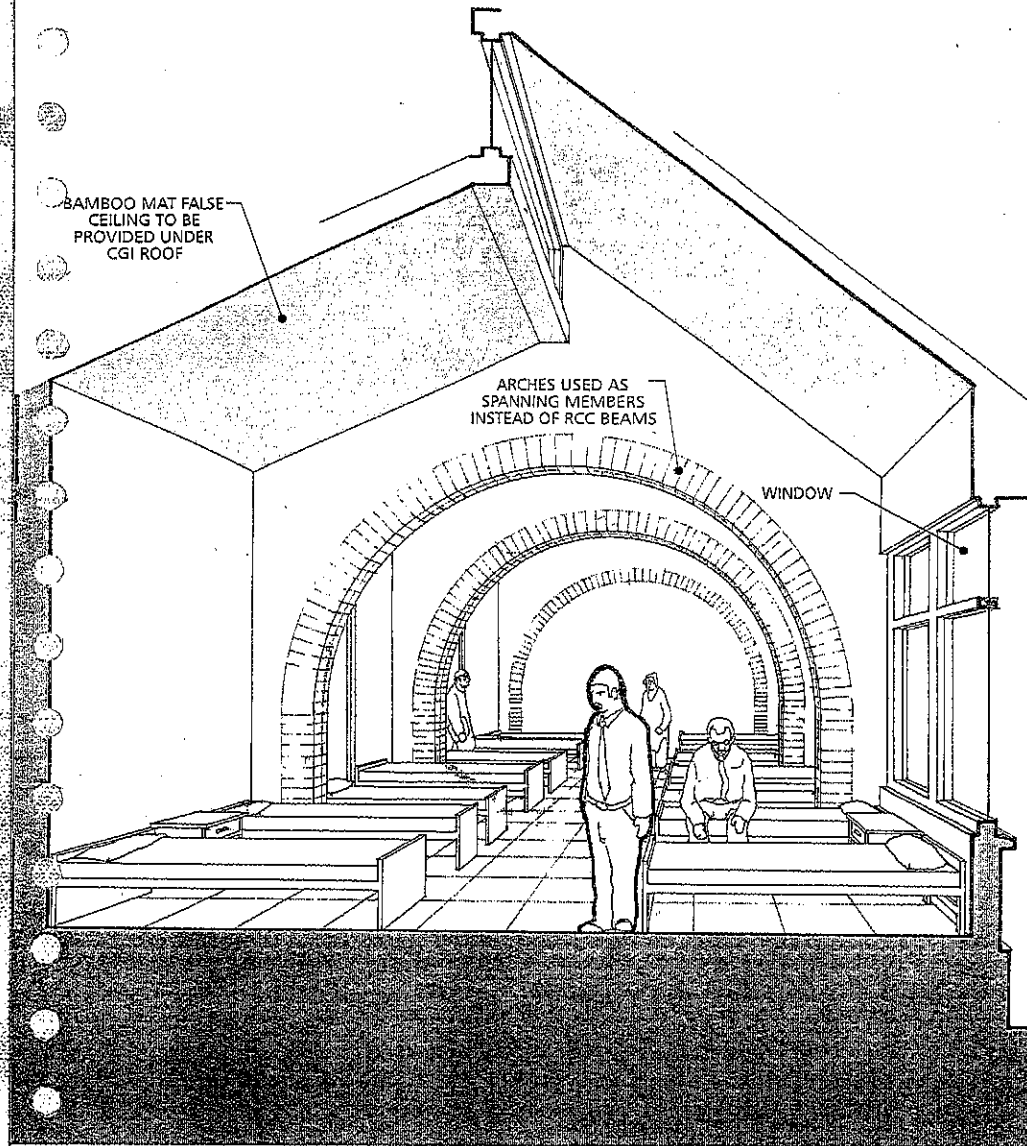


AREA CHART

CARPET AREAS	=	
A (DORMITORY)	=	486 SFT
B (TRAINING HALL)	=	520 SFT
C (DINING)	=	312 SFT
D (OFFICE ROOM)	=	162 SFT
E (KITCHEN)	=	96 SFT
TOTAL PLINTH AREA	=	3450 SFT
ESTIMATED COST	=	RS. 850,000
COST PER SFT	=	RS. 246



VIEW OF COURT



INTERNAL VIEW OF DORMITORY

The design provides for the basic functions of a Block Resource Centre and more, through a design and construction system that is contextual.

The design is for a residential BRC and provides a training hall for teachers, two dormitories, an office room, store, kitchen, dining and a guard's room. In addition the design also creates a central courtyard which can serve the purpose of informal training activities as well as an interaction area for the trainees.

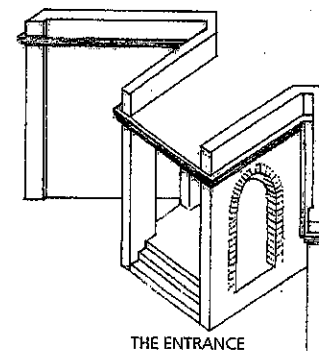
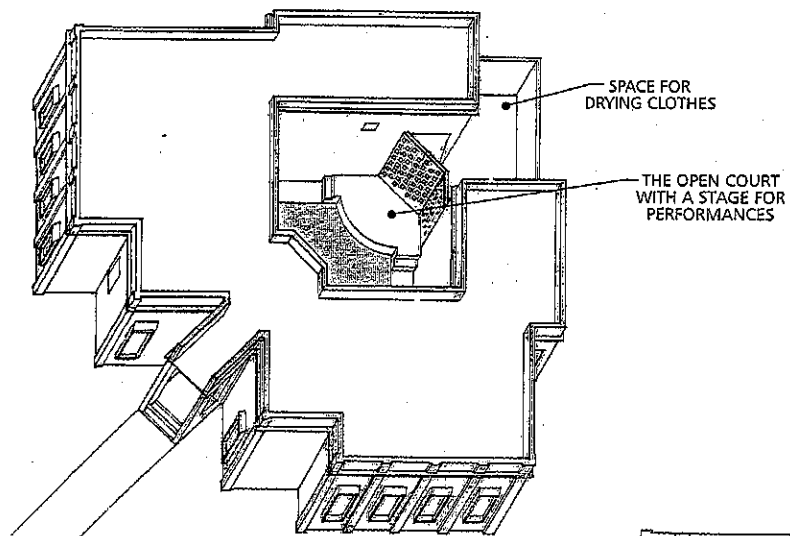
An important aspect of the design is the use of local materials in construction. The local system of construction in Assam has largely been wood and bamboo based. Concrete has been a relatively less used material, especially in rural areas. The design has therefore explored other materials, keeping in mind the need for permanence in the context of heavy rainfall.

Tubular steel trusses have been used in place of wooden trusses to support the roof and brick arches have been suggested as spanning materials. The roofing material is Corrugated Galvanised Iron (CGI) sheets as per local practice. Bamboo mat false ceilings and brick pillars with 5" infill walls have also been proposed.

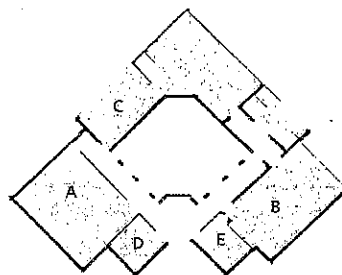
Attention has been paid to the climatic conditions of the state. Skylights have been provided in the training halls, dormitories and the kitchen for light & ventilation in the generally overcast and humid conditions. The design also has a covered corridor around the courtyard. This provides protection during rains.

Such attention to contextual and state specific concerns creates a more comfortable and familiar environment for the users.

B L O C K R E S O U R C E C E N T R E

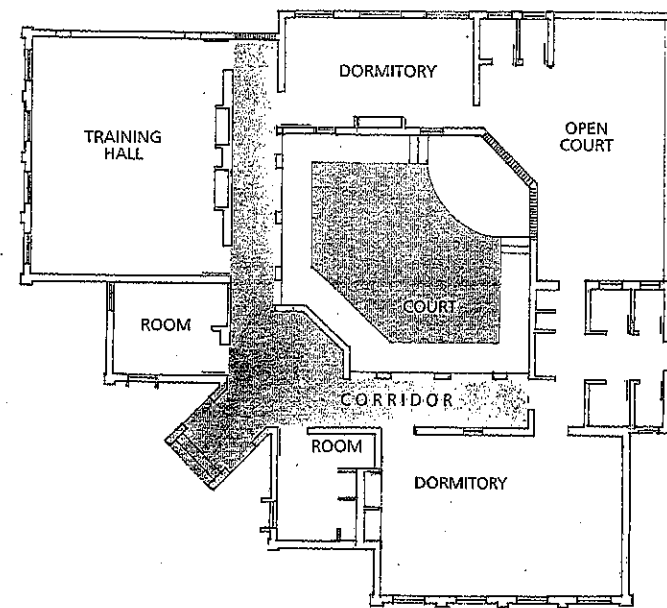


EXTERNAL VIEW



AREA CHART

CARPET AREAS	
A (TRAINING HALL)	= 507 SFT
B (GENTS' DORMITORY)	= 488SFT
C (LADIES' DORMITORY)	= 190 SFT
D (OFFICE)	= 113 SFT
E (STORE)	= 113 SFT
TOTAL PLINTH AREA = 2682 SFT	
ESTIMATED COST = RS. 625,000	
COST PER SFT = RS. 233	



PLAN

MADHYA PRADESH

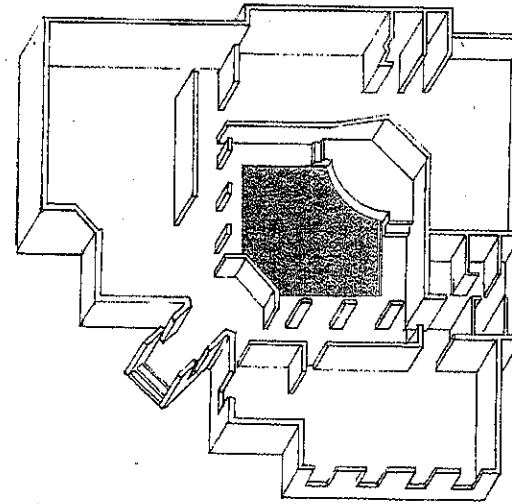
The BRC is one of two designs prepared for Morena in Madhya Pradesh. The building has been designed with local materials (stone) and neatly accommodates the various functions of the Resource Centre.

This example displays a fine demarcation of spaces. The rooms are arranged so as to create a courtyard. What is also significant is the scale of the court which is just right for the size of the building and the occupants. The provision of a formal stage with steps, and a level difference of one foot along the periphery creates an informal sitting area and facilitates activities in the court.

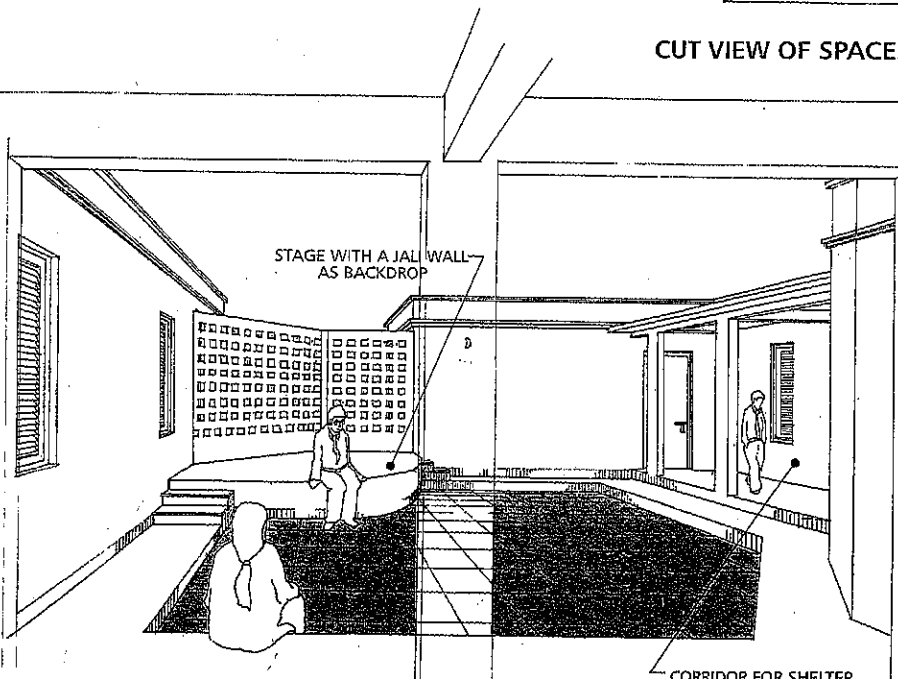
The design also provides for a training hall, male and female dormitories, an office room and a store. Apart from enclosing the central courtyard, a small backyard for the washing and drying of clothes has also been created.

The training hall and dormitories have the necessary provision of display and storage spaces. The backyard is an important and sometimes overlooked facility in a residential BRC.

An important aspect of the design is the use of locally available stone, which has been proposed for the foundation, chajja & lintels, roofing and flooring.

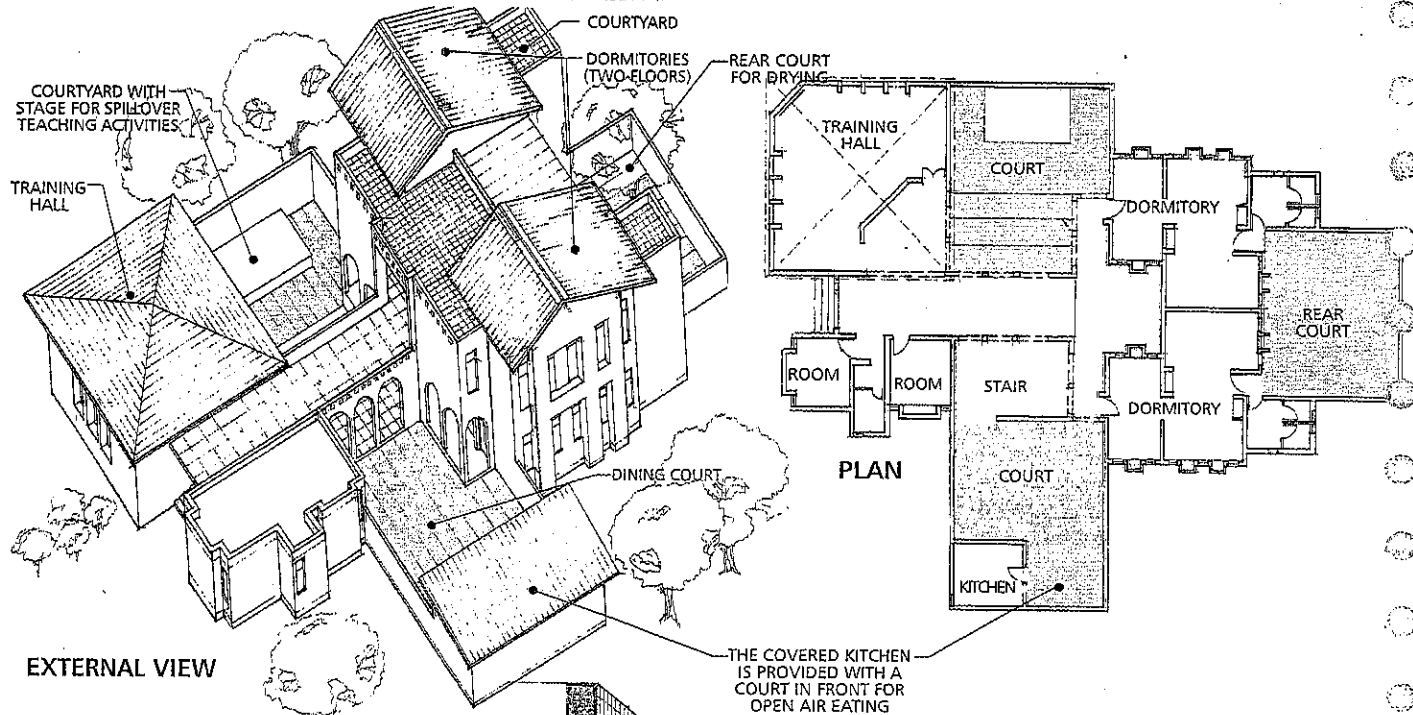


CUT VIEW OF SPACES



A VIEW OF THE COURTYARD.

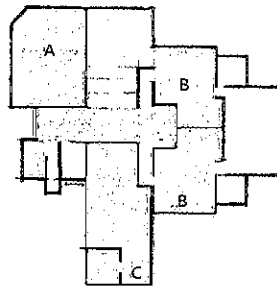
B L O C K R E S O U R C E C E N T R E



EXTERNAL VIEW

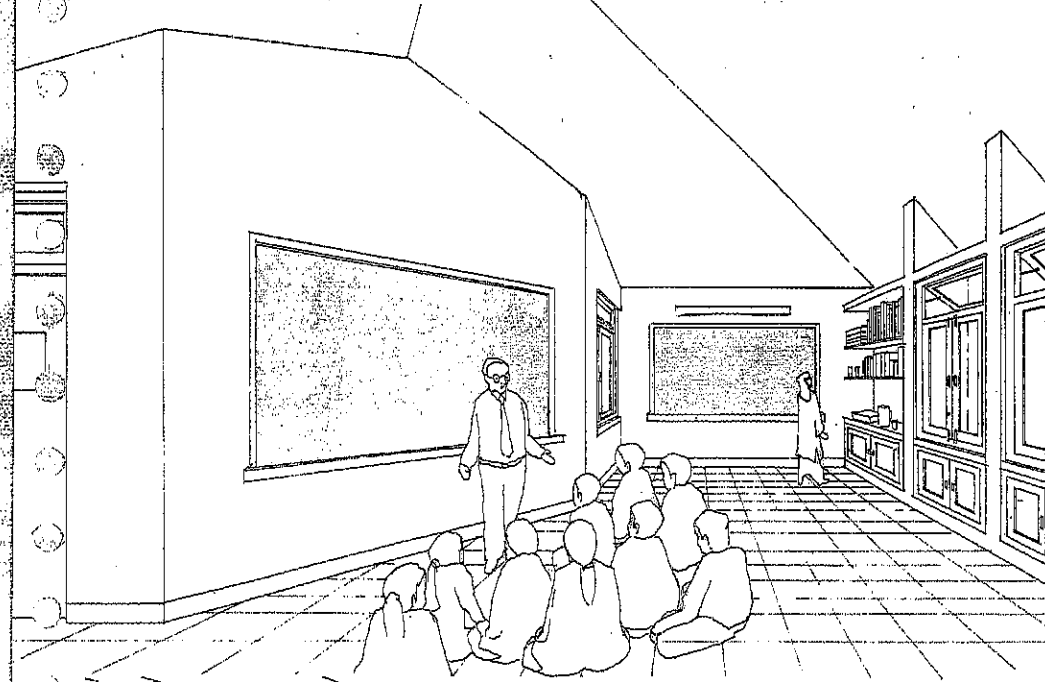
PLAN

A VIEW FROM THE COURT

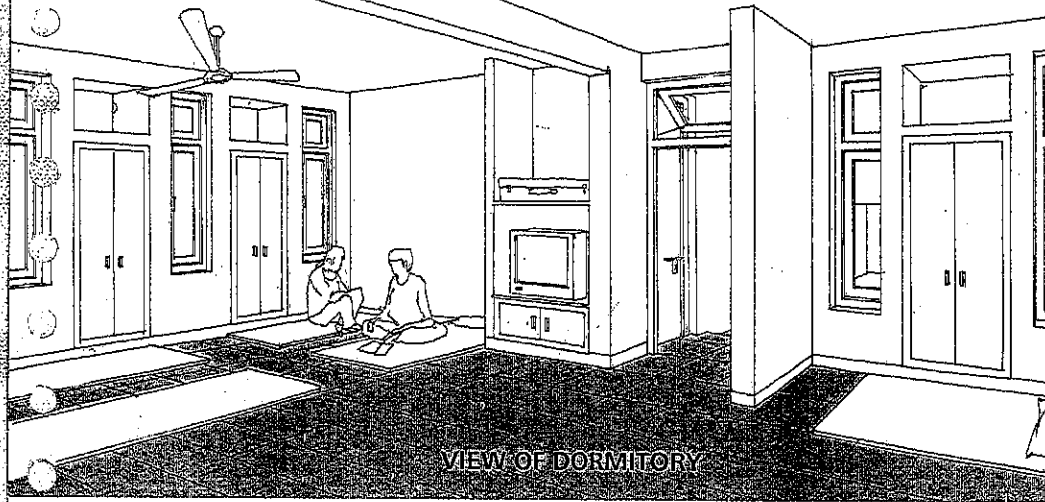


AREA CHART

A (TRAINING HALL)	=	510 SFT
B (DORMITORY)	=	292 SFT
C (KITCHEN)	=	112 SFT
TOTAL COVERED AREA	=	3282 SFT
ESTIMATED COST	=	RS. 925,000
COST PER SFT	=	RS. 282



VIEW OF TRAINING HALL



VIEW OF DORMITORY

The BRC for Deesa has provided for all the requirements of a resource centre and also has additional features like courts and open-air theatres.

The design has a training hall, dormitories (on two floors), an office, store, a kitchen, a dining court and a small open air theatre and stage.

It manages to create the ambience of a small institution through its design. The open air theatre (facing page, bottom) is an additional feature that significantly improves the environment of the BRC. It pre-empts and facilitates informal as well as formal activities. The dining court provides a well defined eating area without adding the cost that a formal dining hall would require. When required the space could also be covered with a shamiana (tent).

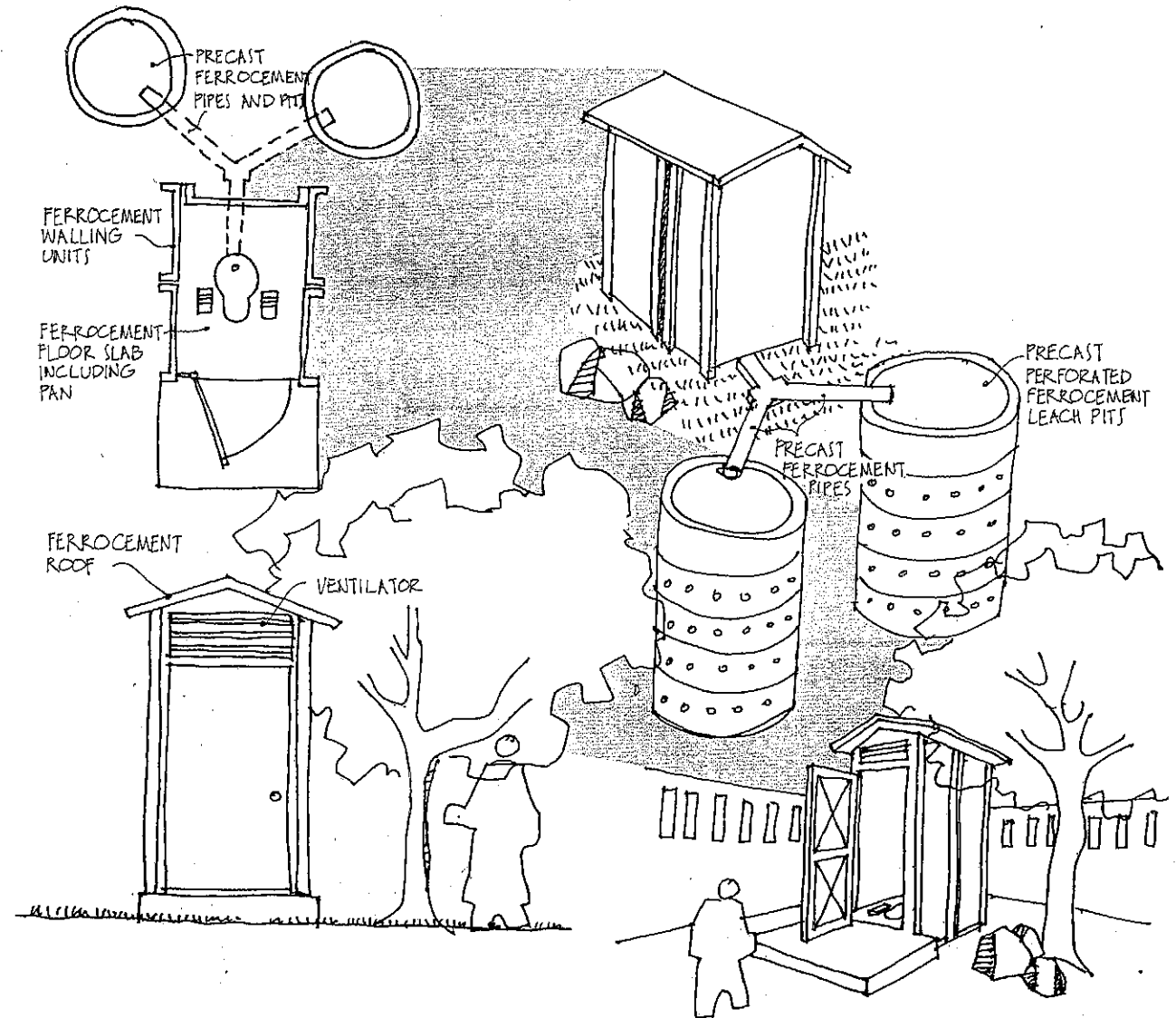
The shape of the training hall allows participants to work in three smaller groups if required. Ample display and storage facilities have been provided (left, above). The training hall also opens into a smaller informal activity area.

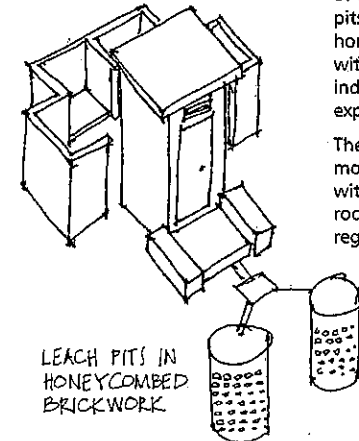
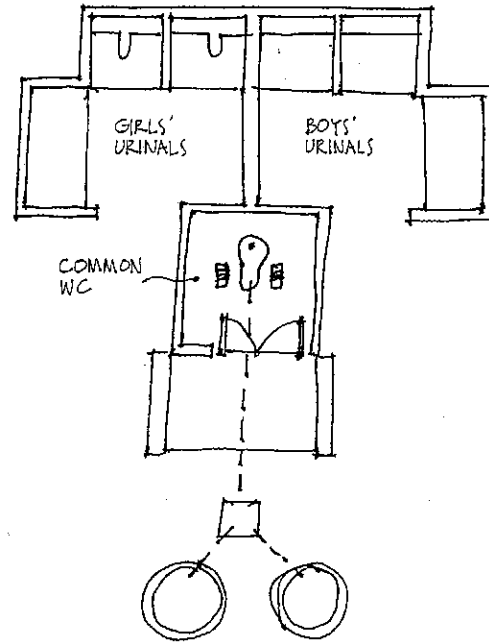
The dormitories are a very important part of a residential BRC. The design attempts to create a comfortable accommodation for the occupants. Each occupant has been provided a separate storage space. Rear courts/terraces have also been provided to wash and dry clothes.

Working with the basic requirement of spaces, the design manages to create an environment that facilitates the training activities and residential nature of the BRC.

T O I L E T P R O V I S I O N S

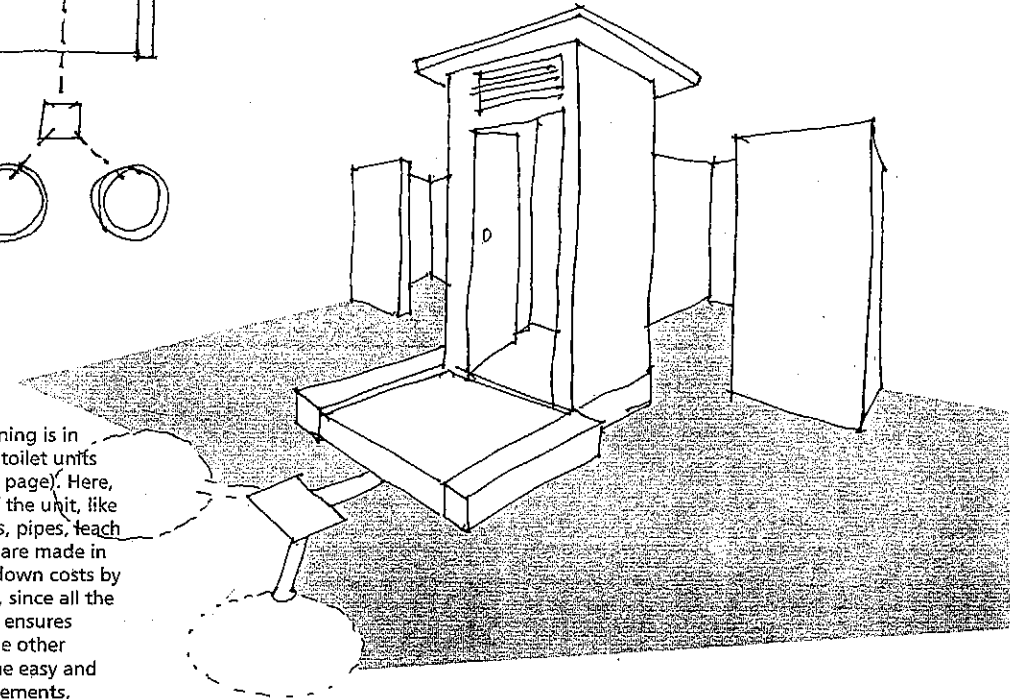
The basic toilet designs do not vary much across the states. However, the provisions range from being very basic (provision of just one WC) to more extensive (provision of separate Girls' and Boys' urinals and WCs as shown).





Due to the absence of sewer lines in most villages, the self-sustaining system of double leach-pits is mostly used. The pits are generally made of honeycombed brick or stone work, with precast RC roofs. Other independent systems are also being experimented with.

The building technologies that are most commonly used are brick walling with precast RC slab or stone slab roofing. Minor variations exist from region to region.



One design worth mentioning is in Bihar, where Ferrocement toilet units are being installed (facing page). Here, all the several elements of the unit, like the pans, walls, roof, slabs, pipes, leach pit tanks and water tanks are made in Ferrocement. This brings down costs by a significant amount, and, since all the elements are precast, also ensures quality in construction. The other significant advantage is the easy and quick installation of the elements, which result in a single unit being put up completely in 3 days or less.

Chalkboard

Classroom
6.6m x 6.6m
(21'-7.5" x 21'-7.5")

up
Chalkboard
Classroom
6.6m x 6.6m
(21'-7.5" x 21'-7.5")

Verandah
3.3m x 6.3m
(10'-10" x 20'-10")

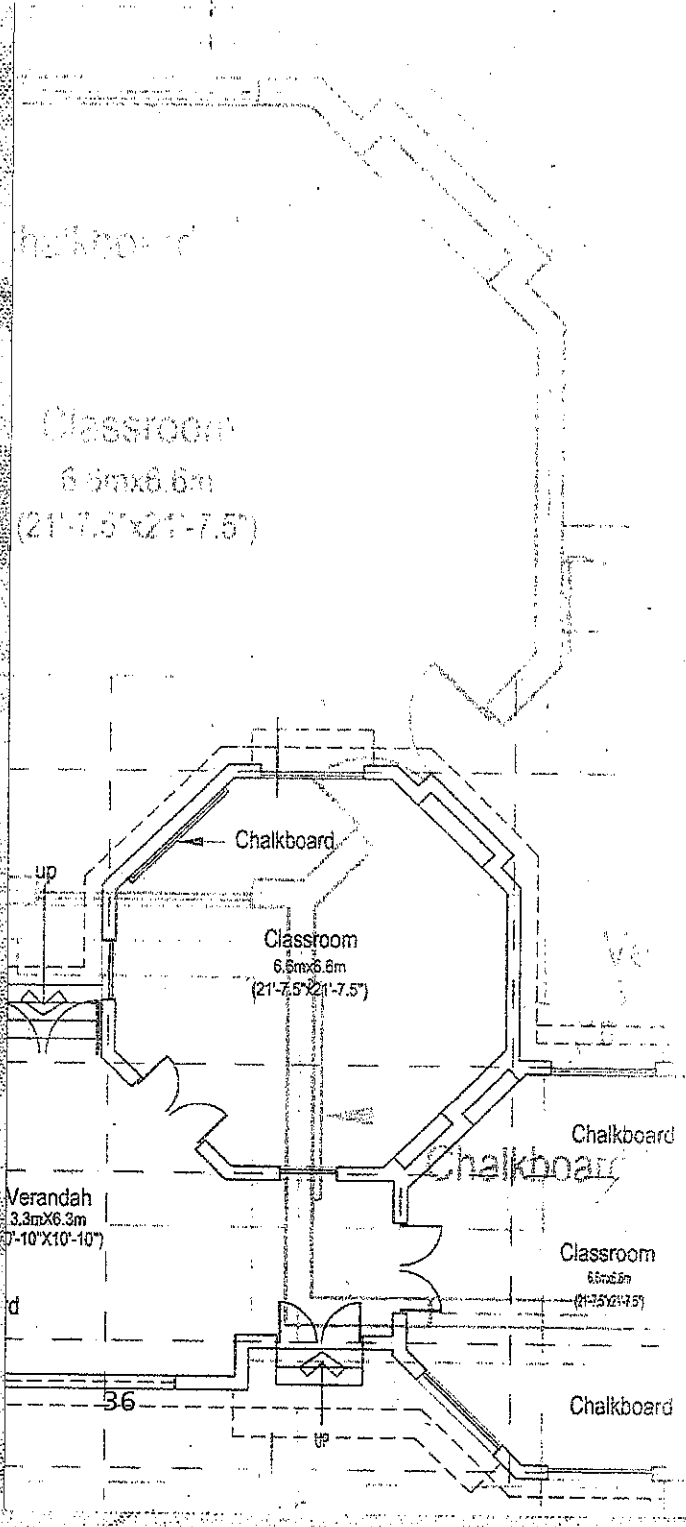
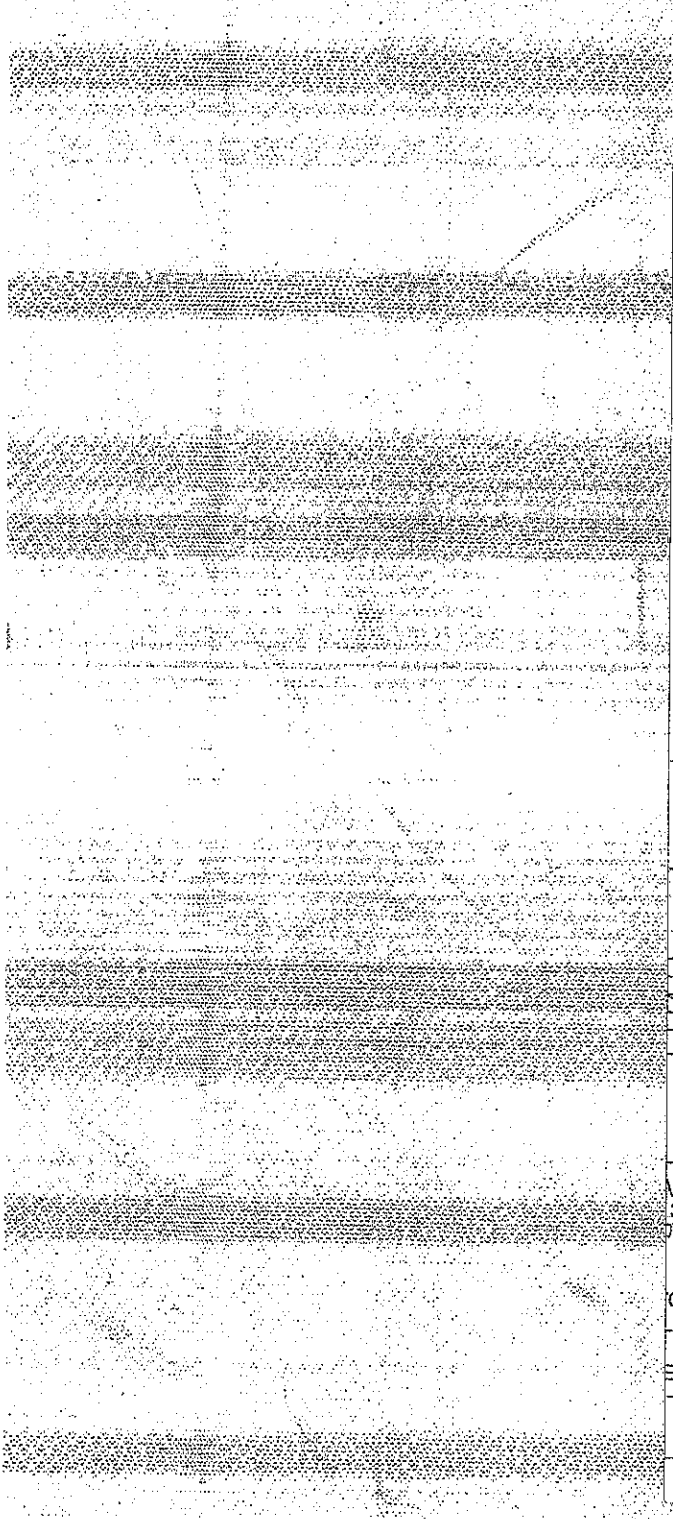
Chalkboard

Classroom
6.6m x 6.6m
(21'-7.5" x 21'-7.5")

Chalkboard

36

up



This section, in some ways, puts forth the essence of the DPEP experience. In a step-by-step graphical manner it reveals how there can be a qualitative improvement in learning environments provided by buildings. Many of these ideas are further developments made after the exercise. What is significant is that they are neither costlier to implement nor more difficult to construct. With community participation and the use of appropriate materials, they could even save costs.

1 THE STUDENT - SPACE CONCEPT

The school should be designed to the size of the child. It should provide spaces for individual groups of children to read, write, display and store materials comfortably.

The main reason for considering school buildings in this manner is a qualitative improvement in the child's life. One part of this improvement is achieved by the learning space concept. The basic idea behind the student space concept is that the child should be able to sit at the level and height of the material itself. This is important to individual children of different heights because of the way they sit and work.

The aim is to provide spaces that include learning activities. One possibility of doing so is indicated below.

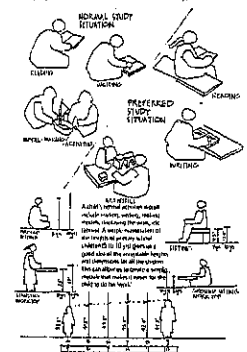
By ensuring the correct height and size, a student space can be created. This can be done as:

- a reading space
- a writing space
- a storage space

Such student spaces can be used for both group work as well as individual study. They can be provided in the open or under a roof structure.

The student space concept can be improved in other ways as well. The functional need to look at the requirements of the normal child, both in terms of his growth as well as his size.

Height of Indian children sources from Survey of Indian Children - 1961.



THE NEW PRIMARY SCHOOL

FIVE

The design renewal exercise has marked a significant shift from the situation wherein a few designs were replicated across the country. It is the first step towards developing sensitive and sensible designs in various states. The *New Primary School* section incorporates the ideas generated during the exercise. More than that, it presents the insights that have been gained through the course of this exercise and the interactions with various states. Many of these ideas have not emerged directly from the new designs. They represent the larger understanding that has come about.

The DPEP experience has shown that there are two sides to the issue - one, the complexity of concerns to be addressed, and two, the simplicity of solution required. This is presented as a step by step explanation, from the internal requirements of a classroom, to those of a complete school. At each step, the concern as well as the nature of the solution is expressed.

The simplicity of the solution has been maintained by ensuring that cost implication is minimal. The solutions refer only to square or rectangular rooms. They can be applied irrespective of construction agency and technologies used. It must be noted that variations of classroom shape, alternate technologies and community participation would create additional possibilities of design and cost savings.

In essence, what it communicates is the ideal of value-addition through design.

COST ASSUMPTIONS

Through each step, the cost implication for each suggestion has been mentioned. Detailed estimates were done for each. It may be noted that the costs indicated must be treated as average costs. Minor variations may occur from state to state. The costs have been worked out taking rates from *Schedule of rates, PWD Bangalore Circle, 1997-98*. The rates will naturally differ slightly from area to area.

The costs indicated are the amounts that would be required if the facilities are provided during the initial construction of the school. However, most of these elements can also be easily included as add-ons in existing schools with a small increase of cost. Most of the elements are simple add-ons, no special materials or construction process are required (eg., the students' chalkboards, the jali walls, the open-air theatre, etc.).

The DPEP experience has shown that there are two sides to the issue - one, the complexity of concerns to be addressed, and two, the simplicity of solution required.

1 THE STUDENT – SPACE CONCEPT

The school should be designed to the size of the child. It should provide spaces for individual/ groups of children to read, write, display and store materials comfortably.

The main reason for constructing school buildings is to provide a conducive environment for the child to learn in. One part of this requirement is addressed by the student space concept.

The basic idea behind the student space concept is that school design should begin at the level and scale of the individual child. This is in contrast to traditional notions of design where the basic unit is a classroom, typically designed for 40 students.

The aim is to provide spaces that facilitate learning activities. One possibility of doing so is indicated overleaf.

By ensuring the correct height and size, a multi-use student space can be created.

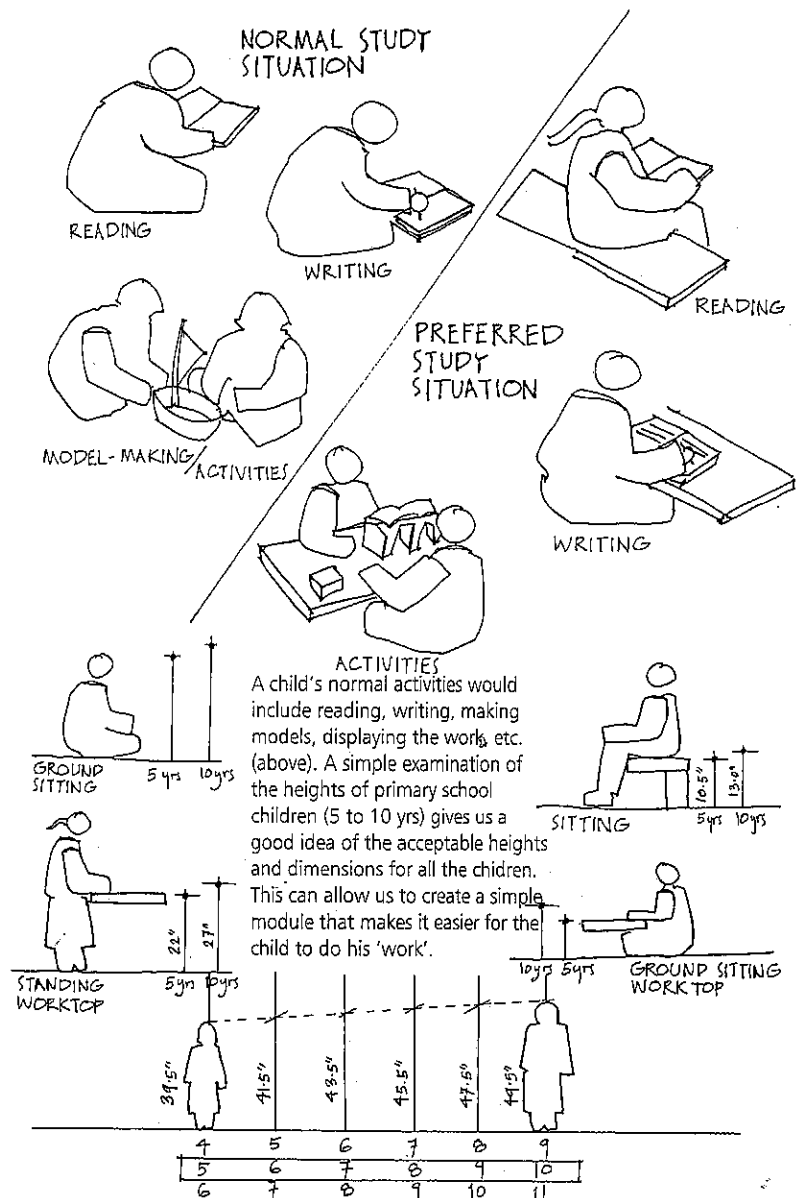
These can be used as

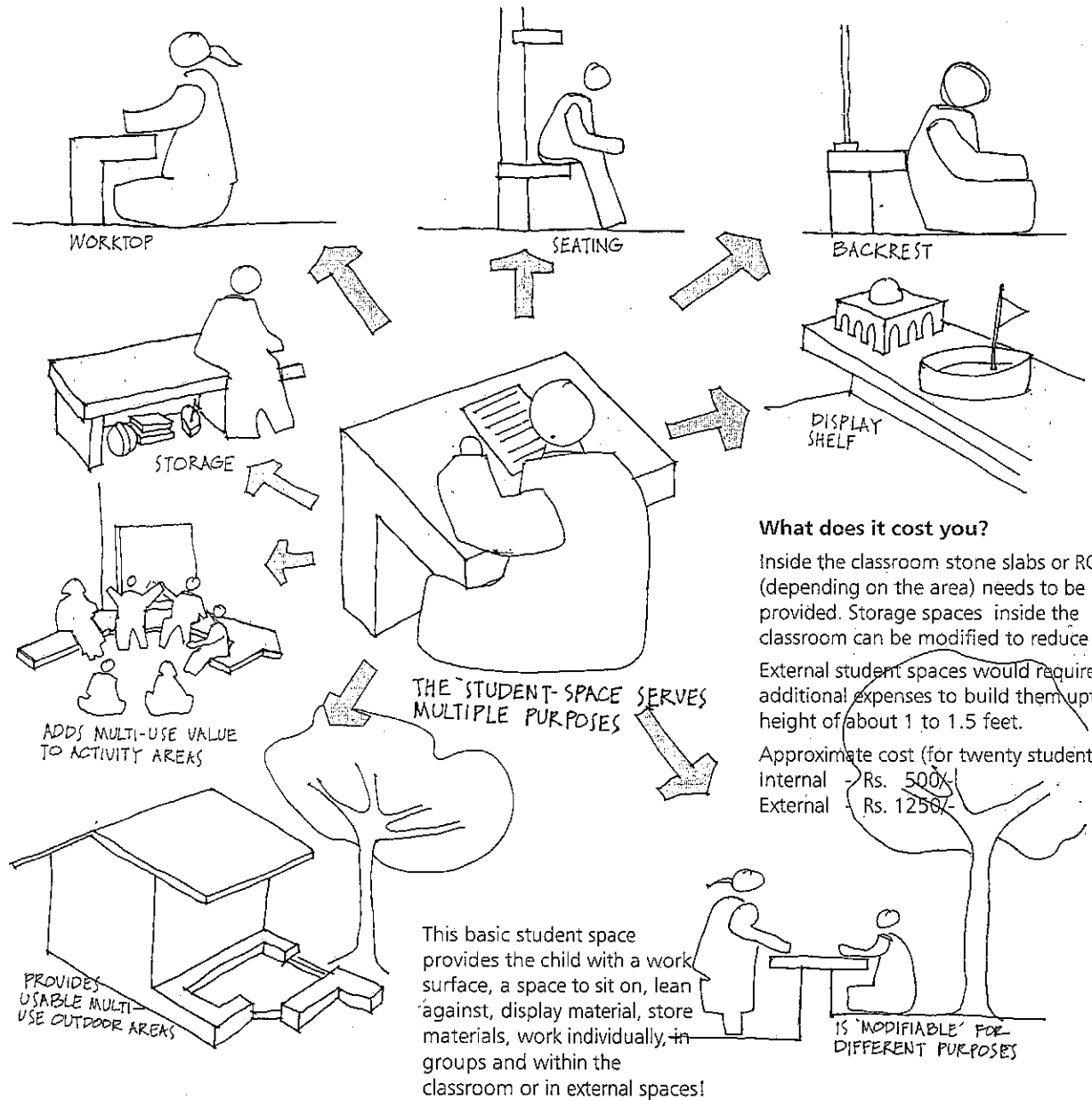
- a work surface by a child
- a seating space
- a display are
- or a storage space

Such student spaces can be used for both group work as well as individual study. They can be provided in the open or within the classroom.

The student space concept can be expressed in other ways as well. The fundamental need is to look at the requirements of the individual child both in terms of his activities as well as his size.

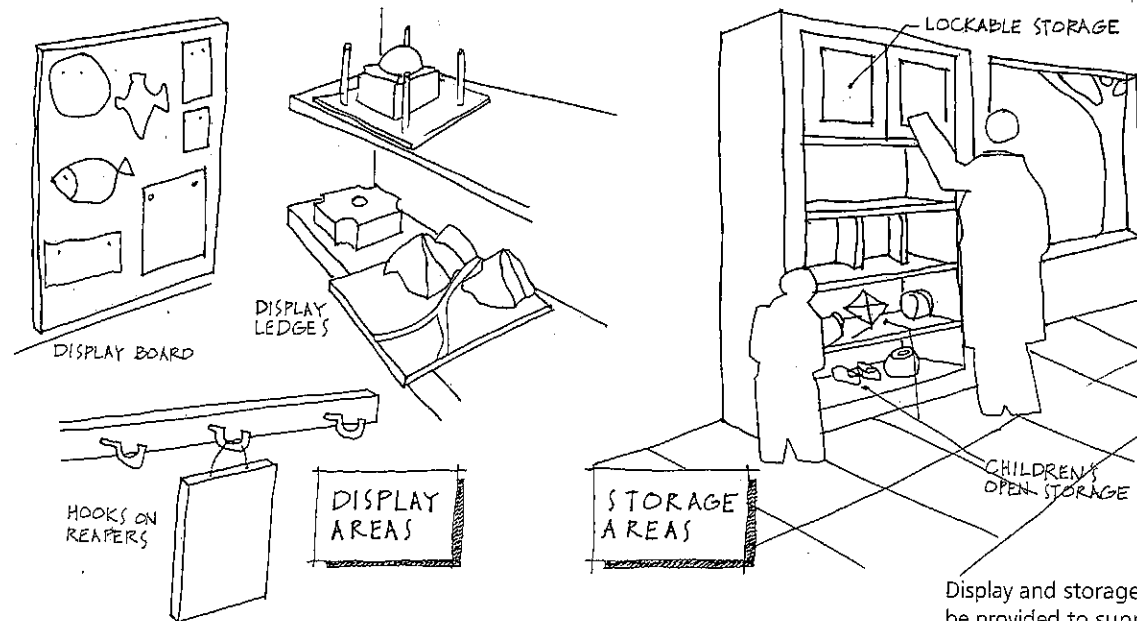
Heights of Indian children sourced from *School Furniture Handbook Vol. 1, UNESCO*





2 DISPLAY AND STORAGE SPACE

A variety of display and storage provisions should be made in the classrooms and verabdahs.

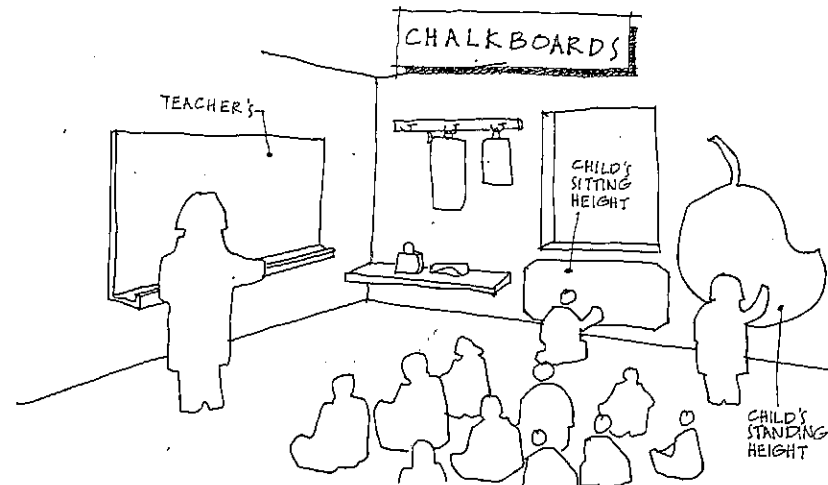


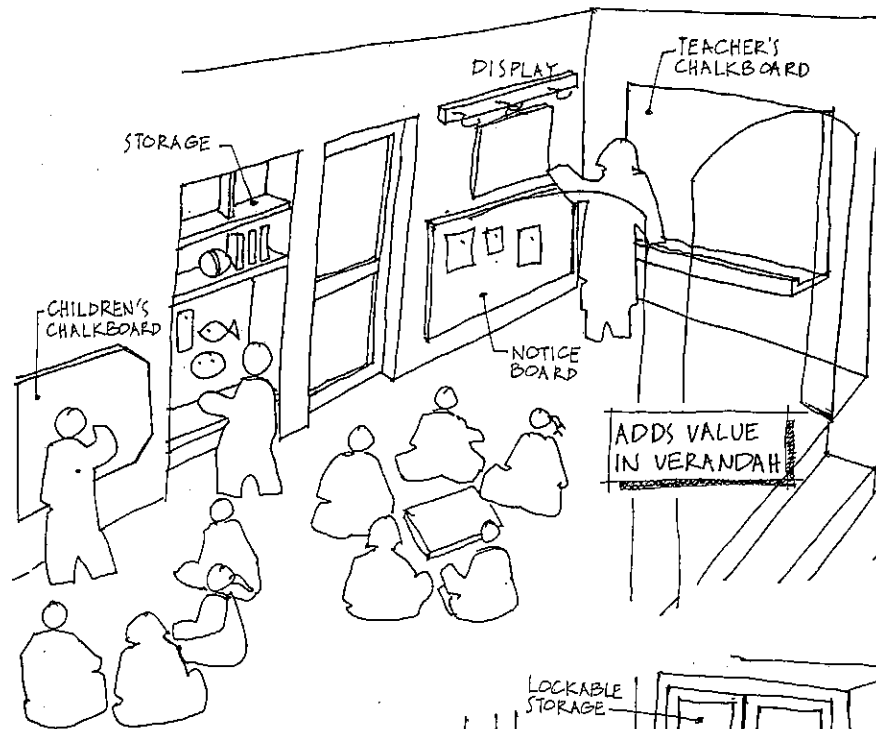
Display and storage spaces need to be provided to support teaching learning activities.

Display (top, left) needs to be in the form of notice boards, tack boards, ledges and shelves. The provision of battens with hooks can be effective. String tied to the hooks can be used to display materials.

Chalk boards (left) are a very important teaching aid. In addition to the teachers chalk board, childrens' chalkboards are also required. This can be provided both at sitting or at standing height and can be in interesting shapes.

Storage spaces (both lockable and open) also need to be provided (above).



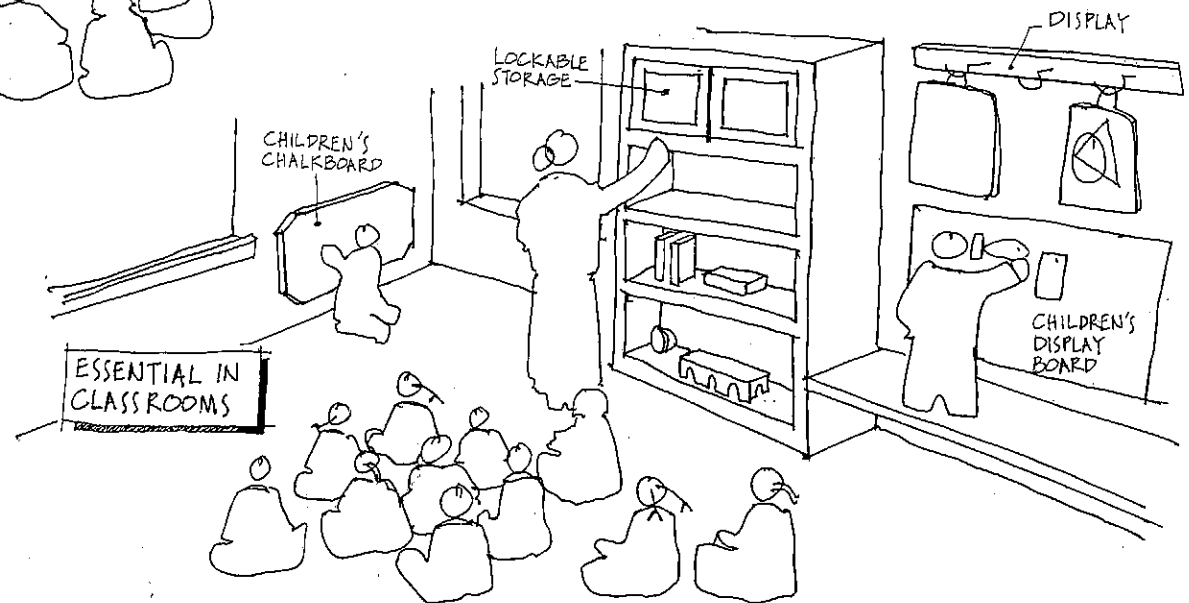


What does it cost you?

The provision of display and storage materials is not optional, it is essential. However, providing for them in a more imaginative manner helps create additional value. For instance, children's chalkboards can be of different shapes, 'learning corners' and display areas can be provided in places like the verandah.

Approximate costs

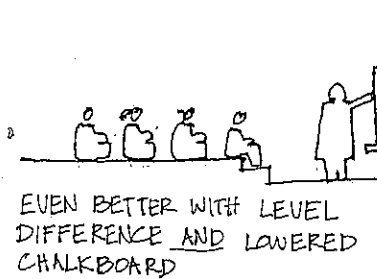
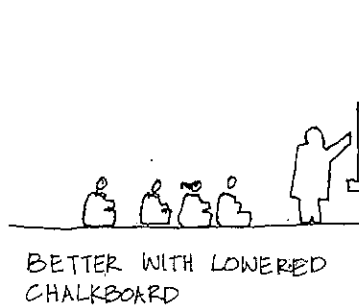
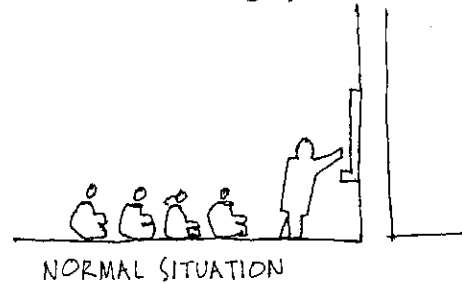
Children's chalkboard (1 sft.)	- Rs. 50/-
Batten (1 rft.)	- Rs. 15/-
Display ledge (1 sft.)	- Rs. 20/-
One cupboard	- Rs. 400/-



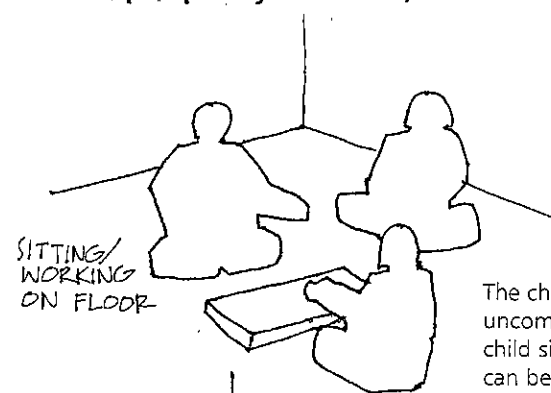
Display and storage spaces in the classroom is a must. In addition, providing such spaces in 'unsupervised areas' like a corridor or verandah can make the children use the display / teaching materials more freely.

3 FURNITURE-LESS SITUATIONS

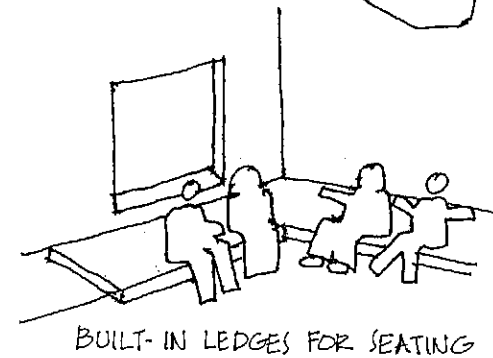
The design should respond to furniture-less situations by examining the chalkboard height, provision of sitting spaces, standing work tops, quality of floors, etc.



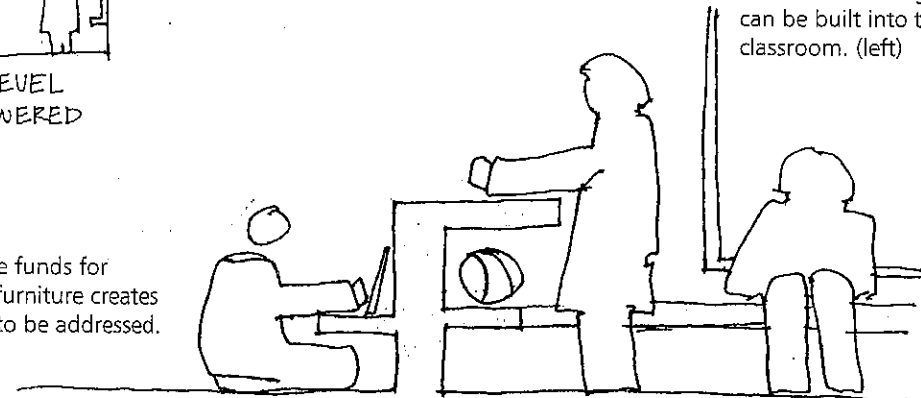
Many schools will not have funds for furniture. The absence of furniture creates some concerns that need to be addressed.

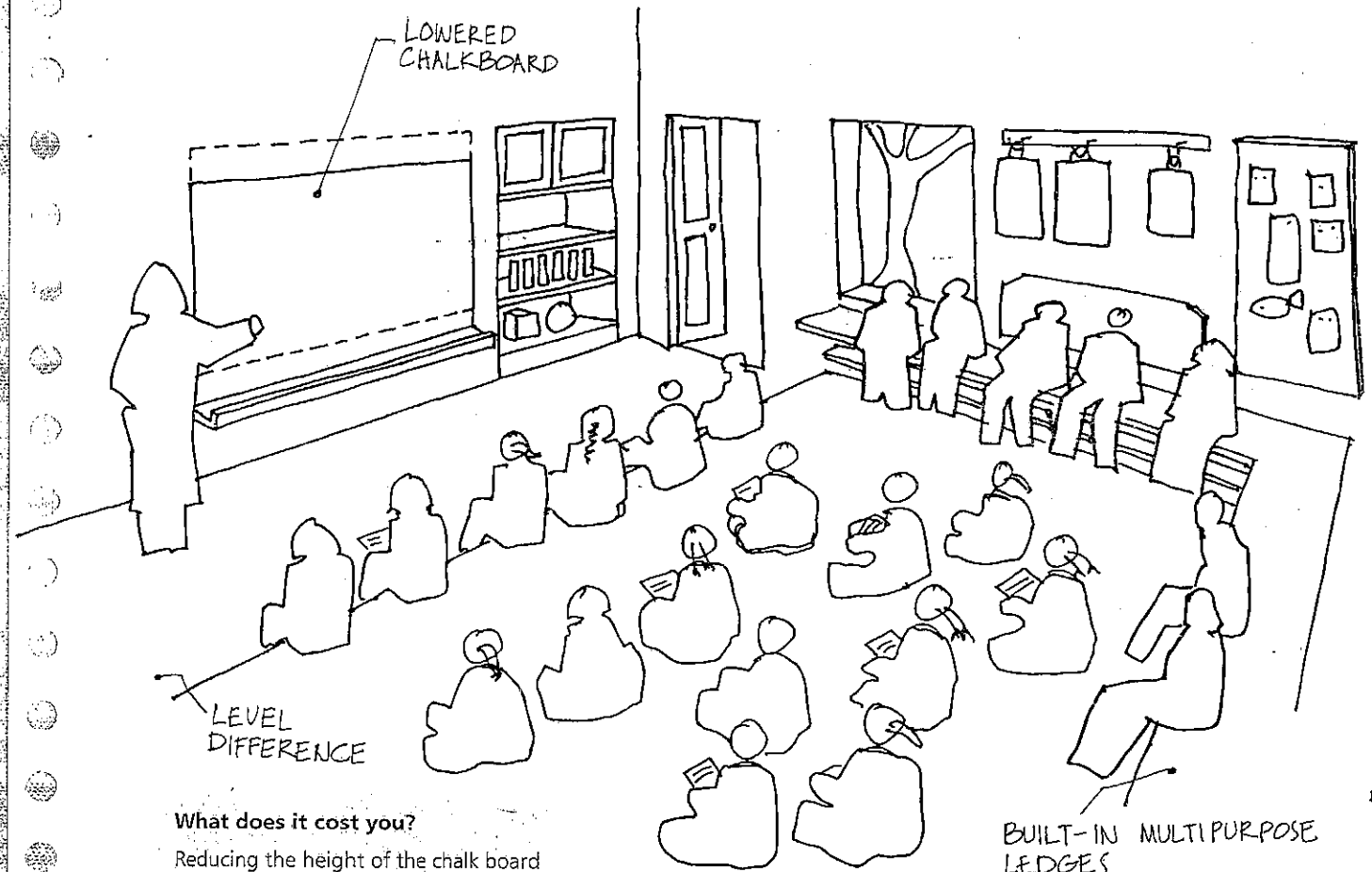


The chalkboard can be uncomfortably high for a child sitting in front. This can be helped by reducing the height of the bottom of the board to 2'6". Creating a level difference of about one foot can make the height of the board even more comfortable for the children. (far left)



Sitting on the floor for a long period of time can be uncomfortable. Some amount of seating space can be built into the classroom. (left)





What does it cost you?

Reducing the height of the chalk board by 6" costs nothing but makes it easier for children to look at the board.

Creating a level difference next to the blackboard would imply an increase of earth filling alone.

Approximate cost of creating a level difference of one foot in one classroom - Rs. 910/-

4 THE LEARNING SPACE

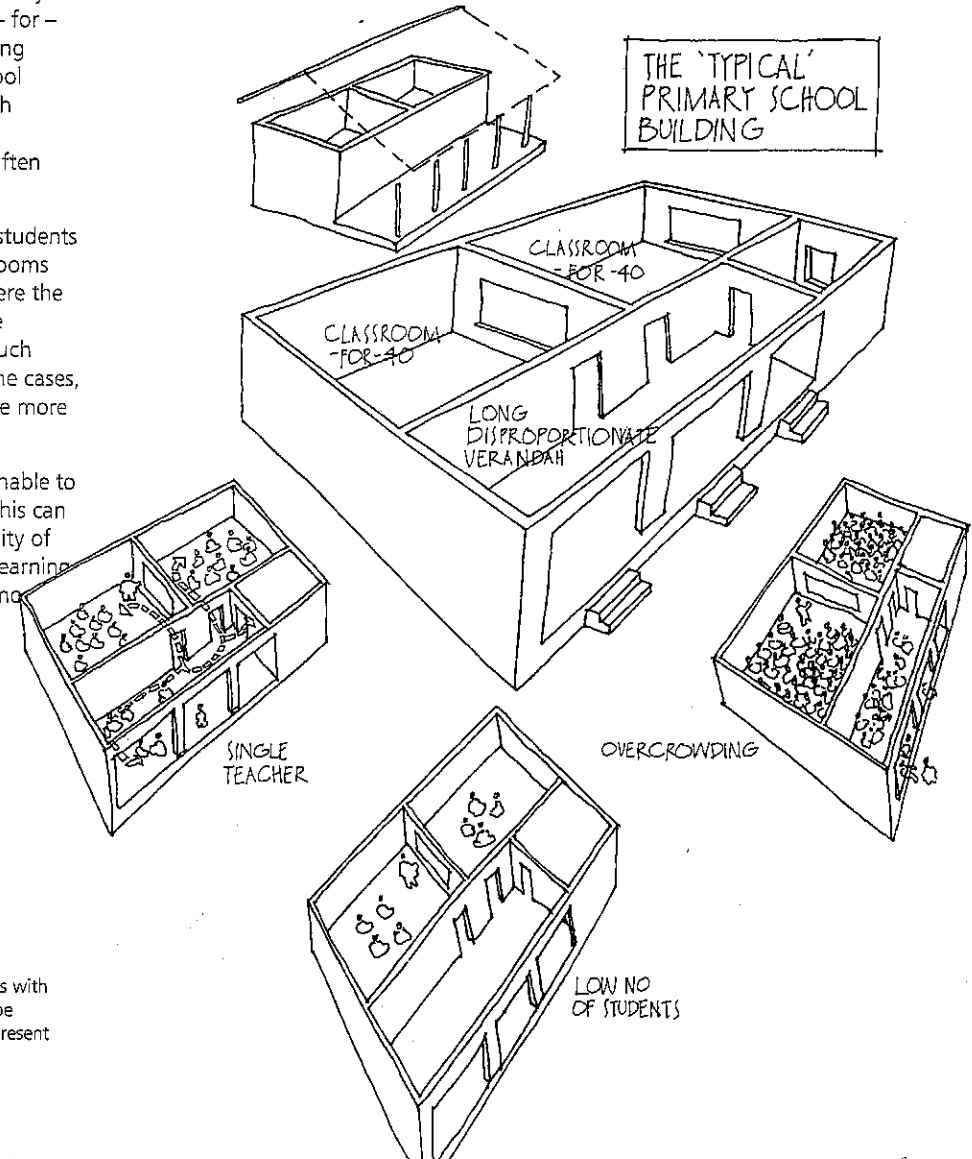
The learning space must be designed for single teacher situations*, multi-grade conditions, overcrowding or small class sizes, etc. as the case may be.

Primary school buildings are mostly designed with the 'classroom - for - 40 - students' being the learning space. The typical primary school building would have a few such rooms, a teachers' room and verandahs. Actual conditions often vary from this ideal.

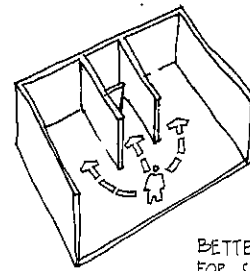
In some cases, the number of students are much larger and the classrooms are over crowded. In areas where the habitations are quite small, the number of students may be much lower than the capacity. In some cases, single teachers need to manage more than one classroom.

The 'typical' school design is unable to cater to these real situations. This can be very detrimental to the quality of education. The design of the 'learning spaces' must therefore be far more sensitive to the actual conditions that can or do prevail.

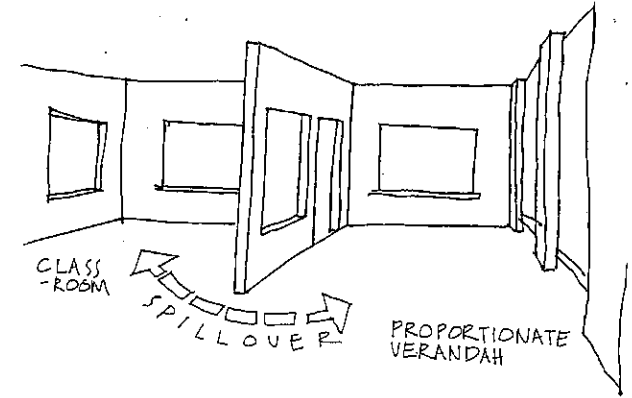
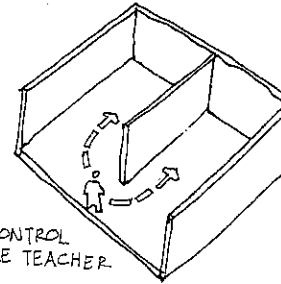
(*Even though few states have schools with only one teacher allotted, there may be situations where only one teacher is present due to other obligations)



Situations may exist where one teacher needs to handle more than one group of students. This makes it necessary to have 'nodal points' or places from where the teacher can control two or more groups if required. (below)



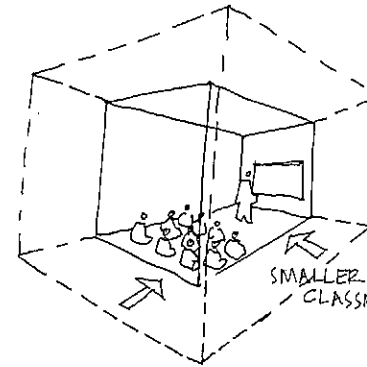
BETTER CONTROL FOR SINGLE TEACHER.



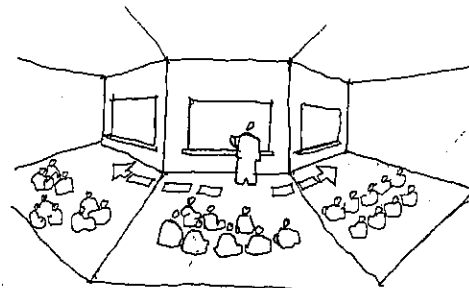
Low student population could be addressed in a variety of ways. For one the size of the classroom could be reduced. However, it needs to be ensured that the smaller size does not become a restriction in the future. (right)

Alternatively, partition walls can be used to create smaller learning spaces inside a larger hall. The shape of the classroom could also be altered to similarly allow for smaller areas.

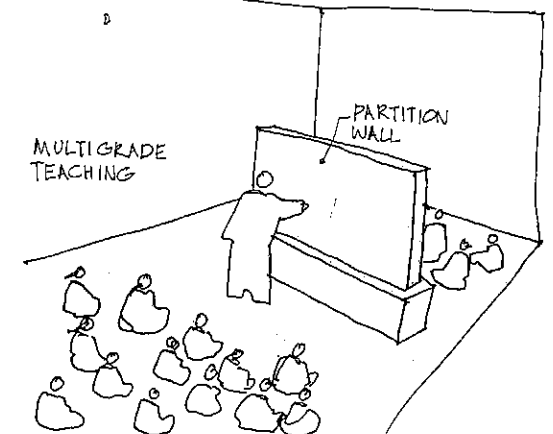
The basic requirement of multigrade teaching (where two groups of students are taught in the same room) is that at least two teachers chalkboards must be provided in the classroom.



Minor overcrowding can be addressed by using the verandah as a study space. However, to allow for that eventuality, the verandah should be of a shape and size similar to the classroom. Narrow spaces are not good as it can be uncomfortable for students to see the chalkboard. (above)

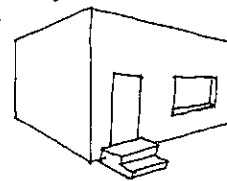


BETTER ACCESS

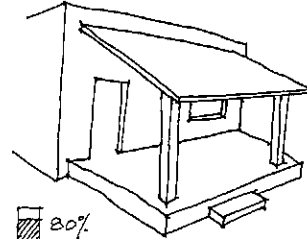


THE LEARNING SPACE (Continued)

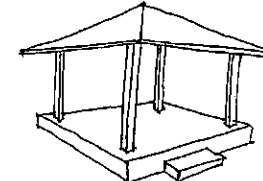
To provide adequate learning spaces within limited resources, schools may be a combination of covered spaces, verandahs, pavilions and platforms/ courtyards.



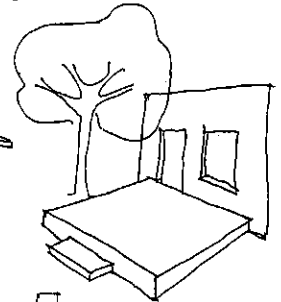
100%
CLASSROOM



80%
VERANDAH



60%
PAVILION



20%
PLATFORM

The NCA Concept

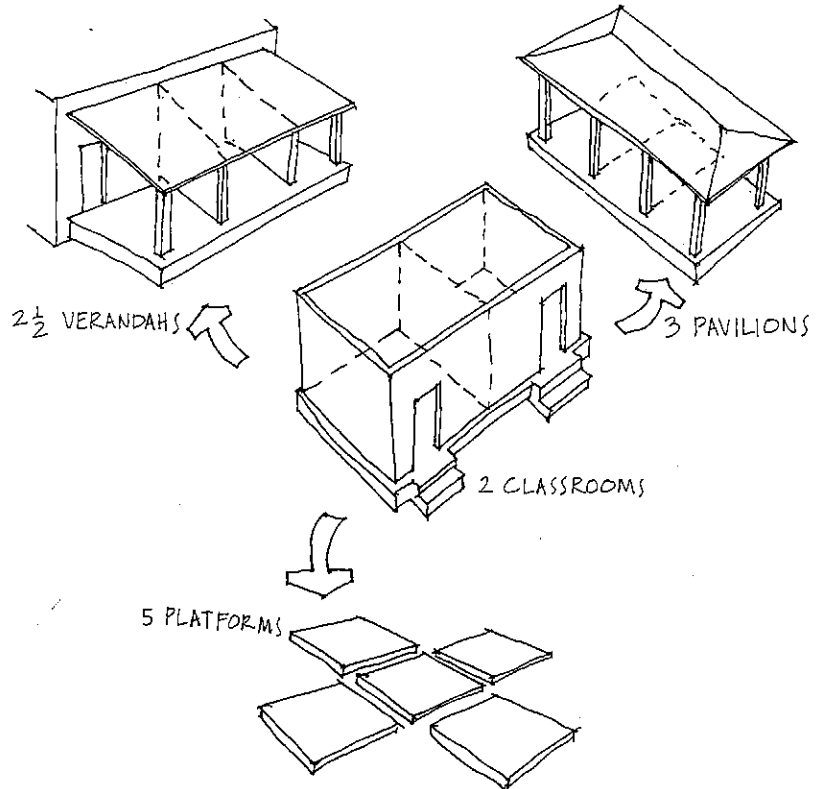
The Normative Carpet Area Concept has been used in Lok Jumbish. Essentially, the NCA concept recognises the fact that teaching actually happens (and can happen) in spaces other than the classroom. This includes verandahs, pavilions, courtyards and platforms. These spaces require less construction than a classroom and therefore cost less.

For the Lok Jumbish blocks, it was found that the cost of construction of a verandah, pavilion, and platform were 80%, 60% and 20% respectively of the cost of a similar size classroom.

This is a pragmatic way of looking at the problem of overcrowding in schools. In areas where there is a severe infrastructure shortage, a combination of spaces allows us to create more learning spaces at the same cost. Additionally, verandahs, pavilions, courtyards and platforms are an intrinsic part of our traditional life style.

Going by the Rajasthan experience, this means that for the cost of two rooms we could have 2.5 verandahs, 3.3 pavilions or upto 5 platforms.

The exact figures may vary slightly from state to state, however, the NCA concept of providing different types of enclosures provides a flexible approach that can respond better to resources and climatic conditions.



What does it cost you?

Applying the NCA concept does not cost any extra money.

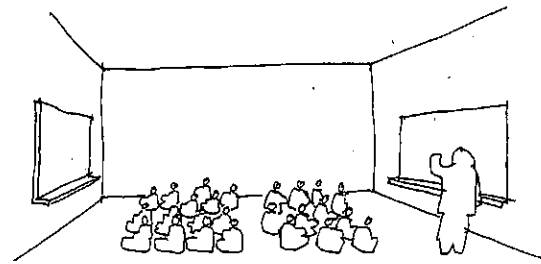
· Making additional chalkboards is essential and the cost implied is insignificant. Creating a design that allows a teacher to control different groups of students better does not necessarily imply additional costs.

Approximate costs

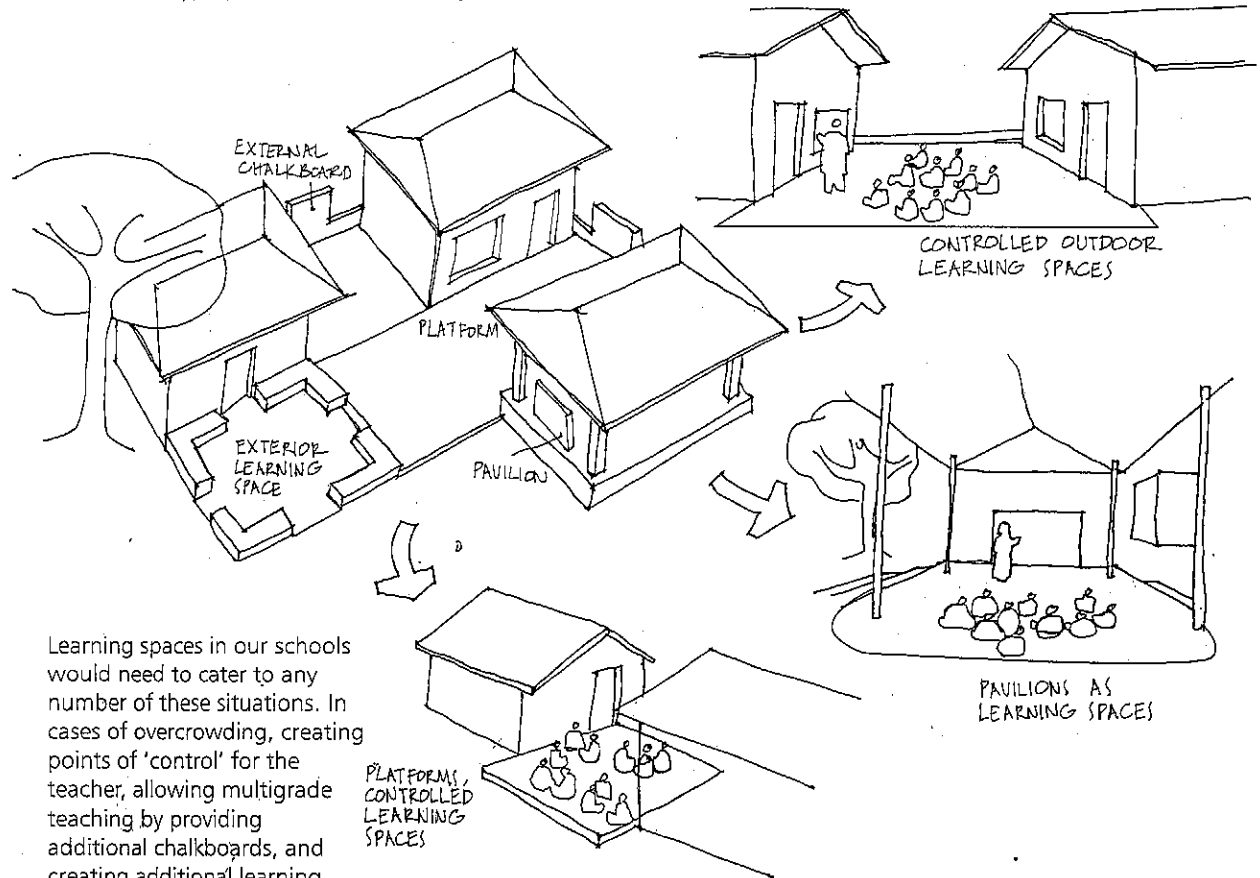
Open space of classroom size with chalkboard walls and steps

- Rs. 20,000/-

External student spaces - Rs. 60/- per child



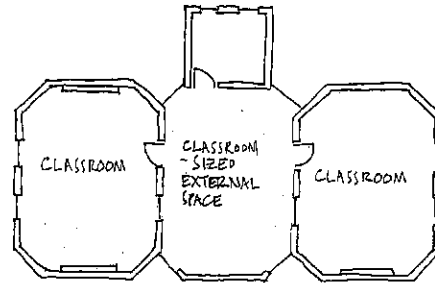
ADDITIONAL CHALKBOARDS



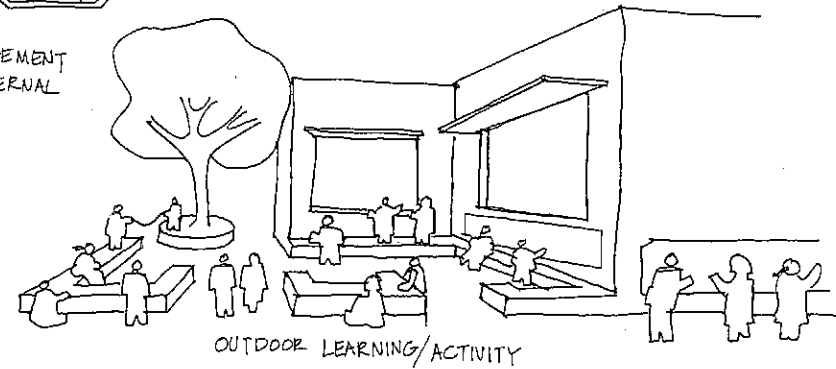
Learning spaces in our schools would need to cater to any number of these situations. In cases of overcrowding, creating points of 'control' for the teacher, allowing multigrade teaching by providing additional chalkboards, and creating additional learning spaces can create a school with more usable and effective learning spaces.

5 EXTERNAL SPACE

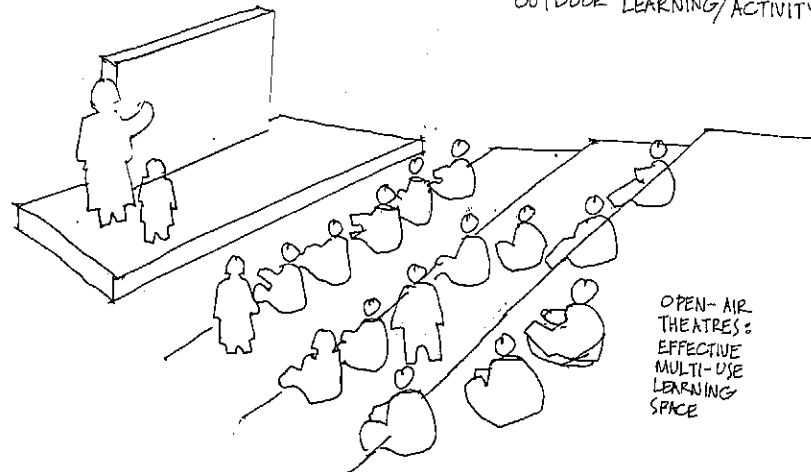
External spaces should also be designed. These could be treated as a combination of formal teaching spaces, student-space-activity areas, open area theatres, courts, etc.



SIMPLE EFFECTIVE ARRANGEMENT
TO CREATE VALUABLE EXTERNAL
SPACE.



Teaching learning activities often happen in open external spaces. Yet, school designs seldom try to use the external spaces as an additional learning area.



Creating different 'kinds' of external spaces facilitates different kinds of teaching learning activities.⁹

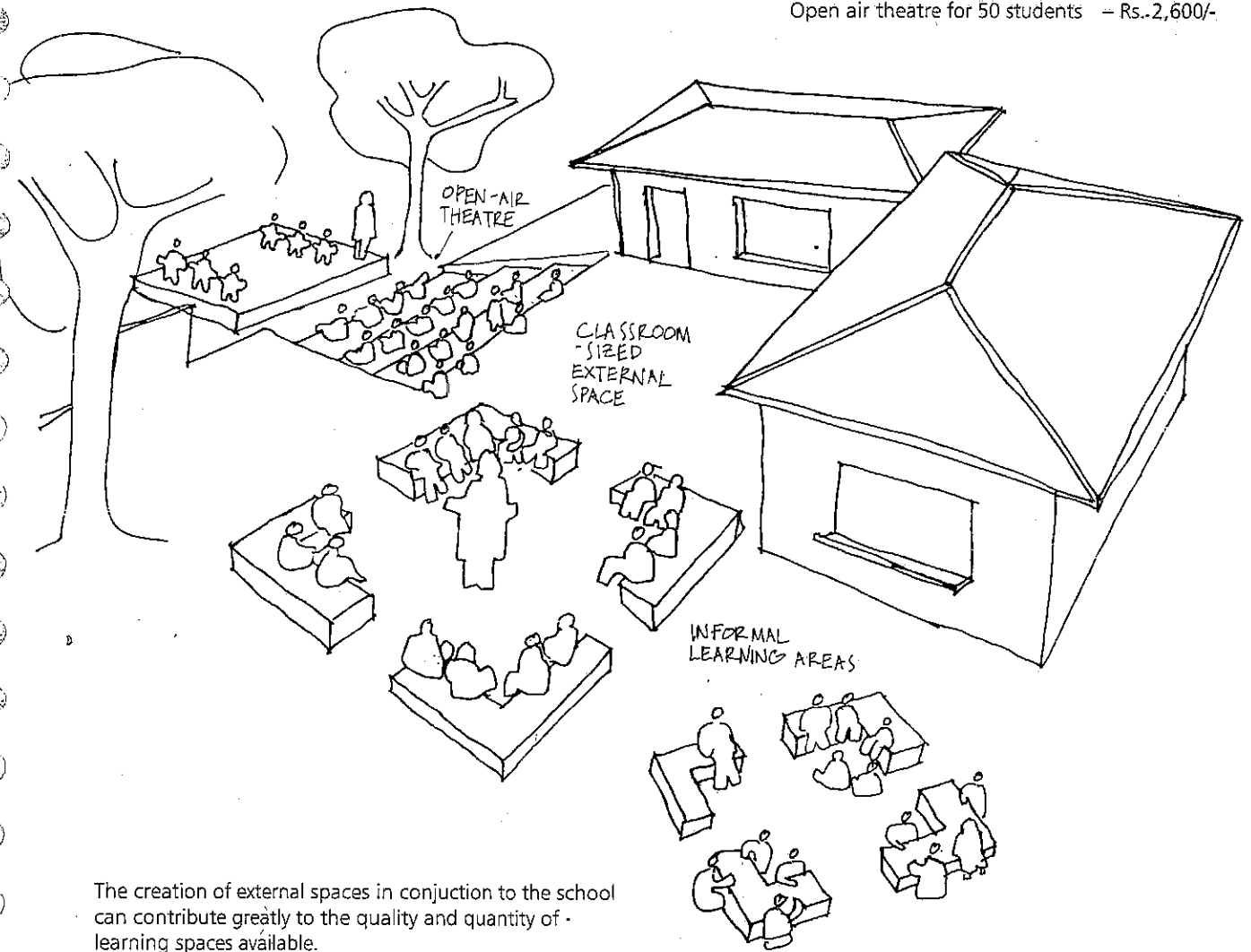
The simple arrangement of rooms can create open spaces of the scale and size of the classroom (top, left). Such spaces can function effectively as open air classrooms. External student spaces or stub walls can 'define' external spaces, provide sitting / gathering space and facilitate outdoor learning activities (above). Open air theatres can greatly facilitate performances and other informal activities (left).

What does it cost you?

Creating external classrooms does not imply a significant increase of costs.

Approximate costs:

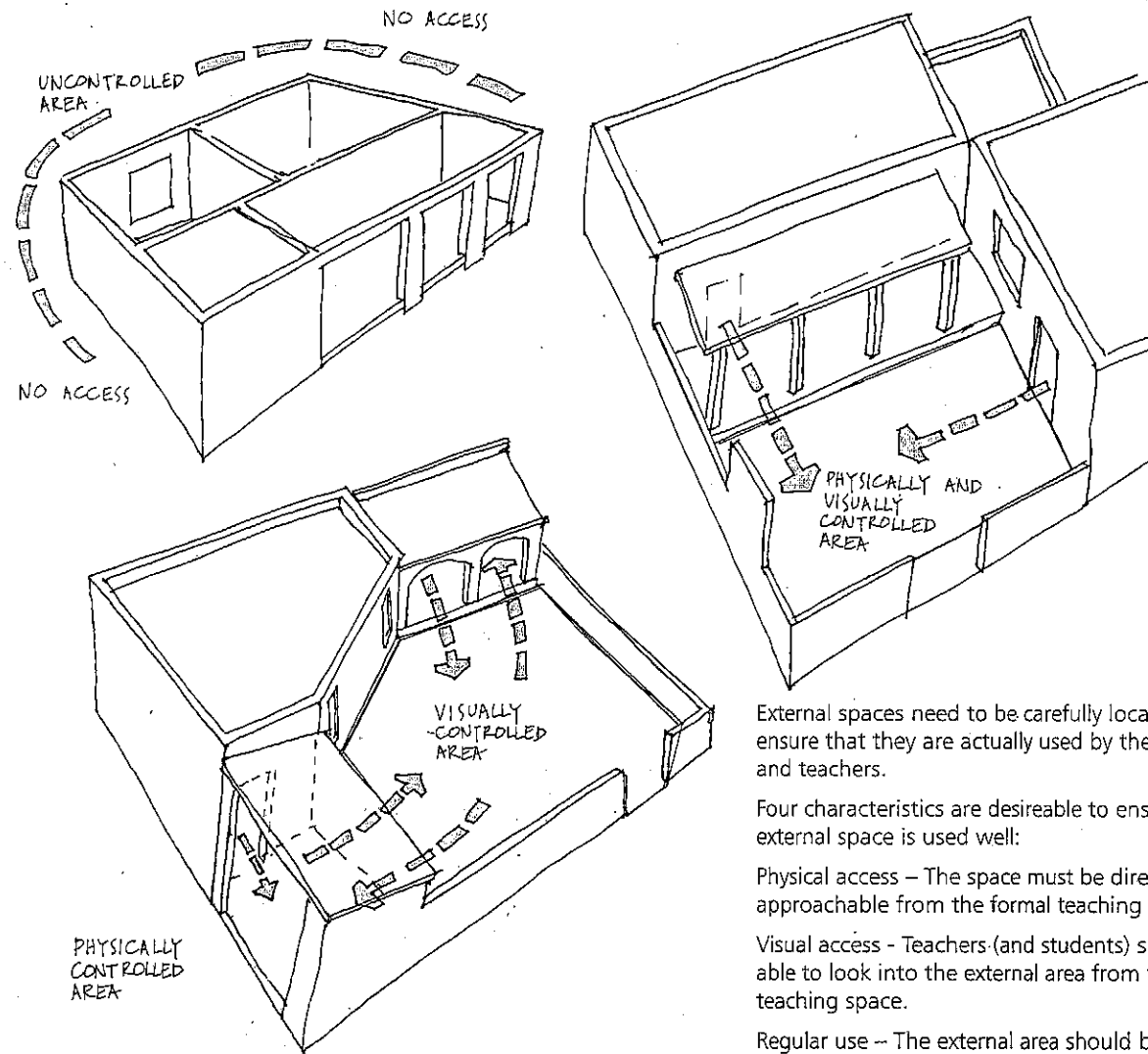
- Student spaces for 20 children – Rs. 1,250/-
- Open air theatre for 50 students – Rs.-2,600/-



The creation of external spaces in conjunction to the school can contribute greatly to the quality and quantity of learning spaces available.

6 EXTERNAL-INTERNAL INTERFACE

External activity areas should be physically & visually accessible from internal areas. They should be controllable and in regular use.



External spaces need to be carefully located to ensure that they are actually used by the students and teachers.

Four characteristics are desirable to ensure that an external space is used well:

Physical access – The space must be directly approachable from the formal teaching area

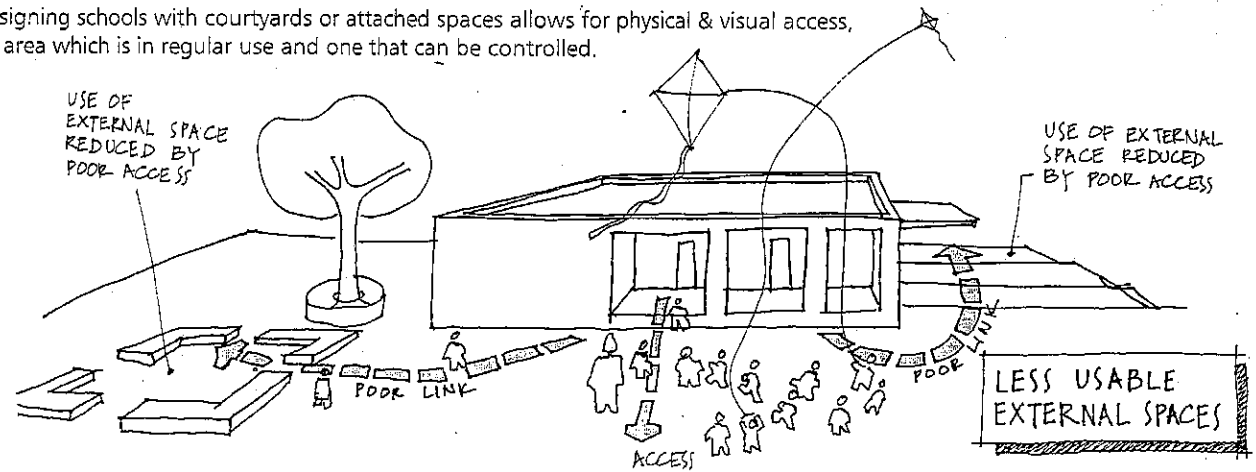
Visual access – Teachers (and students) should be able to look into the external area from the formal teaching space.

Regular use – The external area should be located such that the space is in regular use.

Control – The external space should be a defined area that is easier to control.

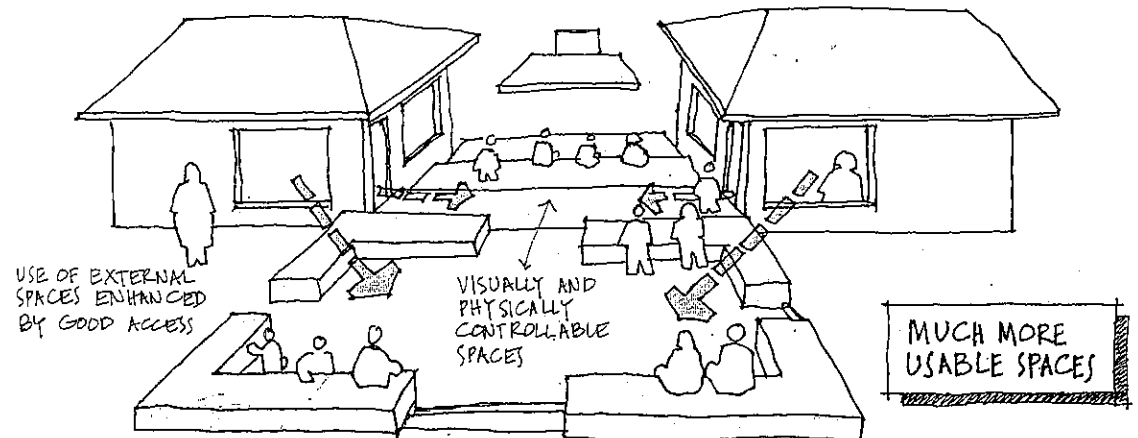
The traditional school does not allow physical access to three sides. Visual access is limited to the front and rear only. While the rear of the site is not normally in regular use, the front of the school requires control.

Designing schools with courtyards or attached spaces allows for physical & visual access, an area which is in regular use and one that can be controlled.



The mere creation of external activity areas does not ensure that the spaces will be used. (above) Lack of direct access by the teacher (and students) tends to reduce the utility of such spaces.

Creating such spaces as an integral part of the school (below) can greatly increase their utility and ensure their proper use.

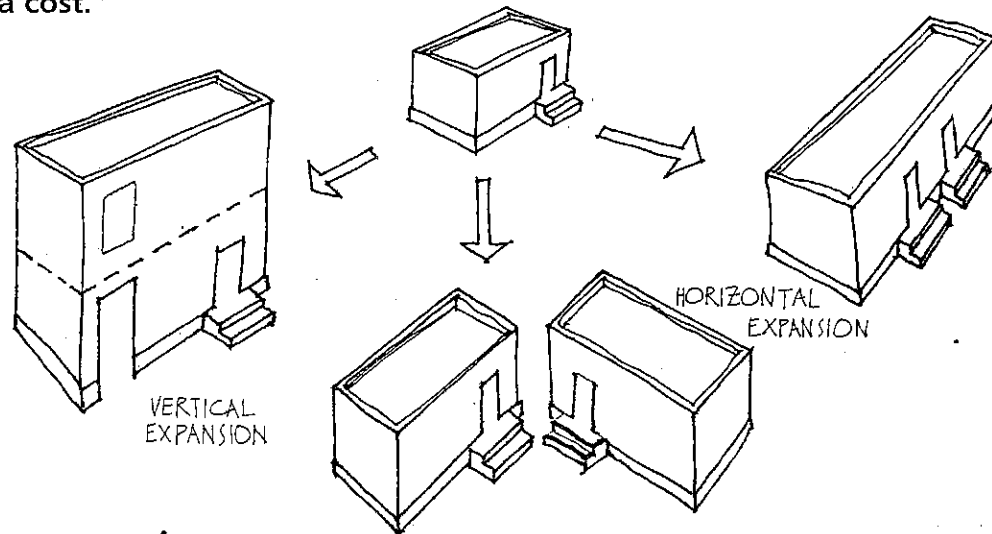


What does it cost you?

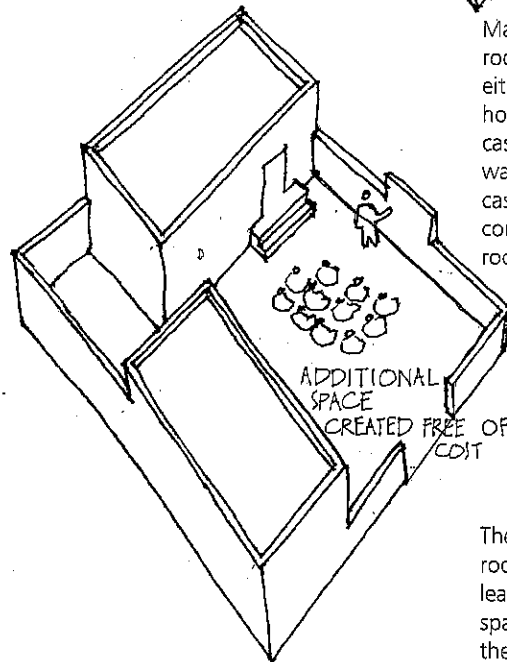
Creating physical and visual access, regular use and control requires sensitive design. It does not imply an increase of cost – but it can give the school a much nicer learning environment.

7 EXPANDABILITY

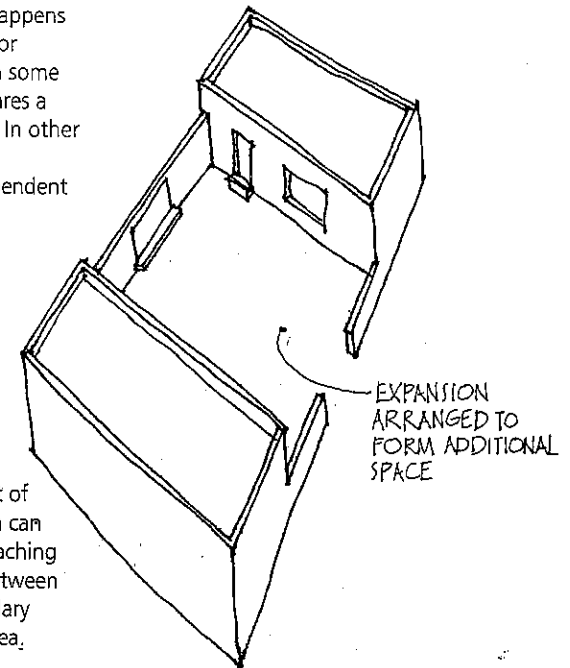
Expansion should be designed to provide additional learning/activity spaces at minimal extra cost.



Many schools need additional rooms over time. This happens either through vertical, or horizontal expansion. In some cases the new room shares a wall with the old room. In other cases, the new room is constructed as an independent room.



The simple arrangement of rooms during expansion can lead to an additional teaching spaces being created between the rooms. Small boundary walls can enclose the area.



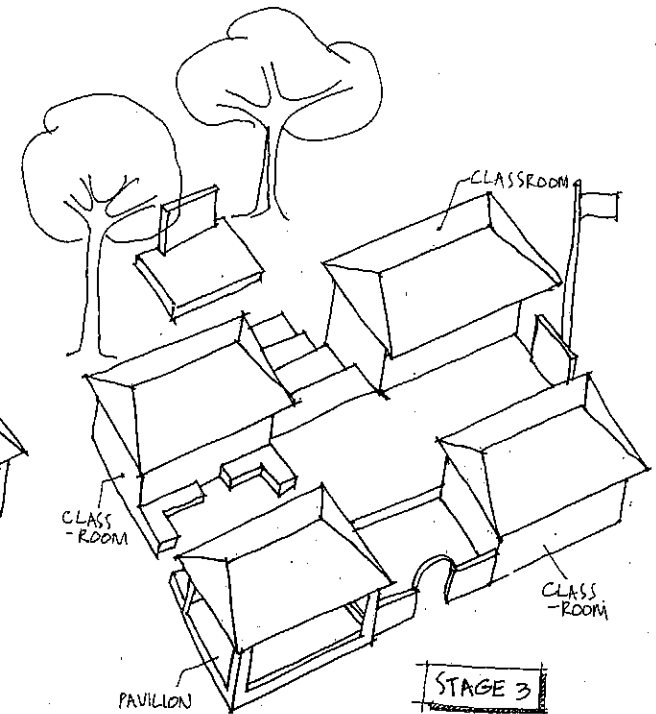
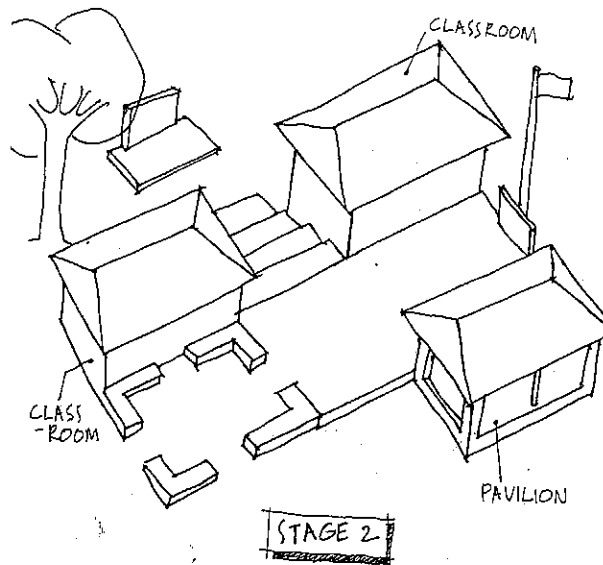
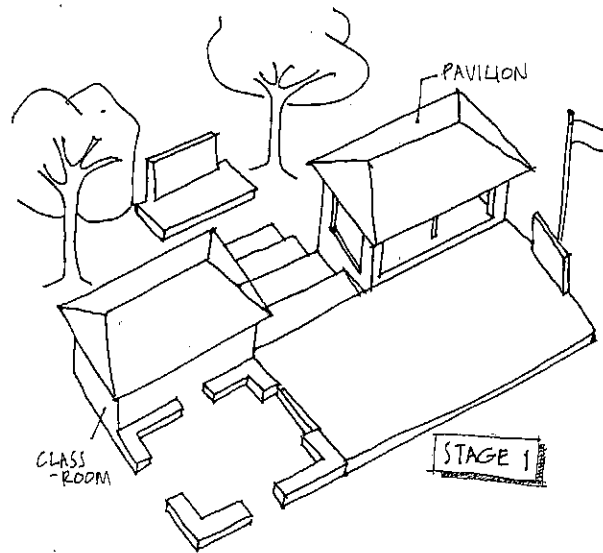
Additional rooms can be added to any school that has ample land. Planning for sensitive expansion would allow us to create additional value in the same cost.

The three stages of expansion shown alongside explain this point. At the first stage a room, a pavillion, an assembly space and external students spaces are constructed. This is roughly equivalent to a two classroom school.

At the second stage a pavillion is added and the earlier pavillion is completed into a room. This is equivalent to adding one room. In the process the assembly space is better enclosed by the new pavillion.

In the third stage another pavillion is constructed and the previous pavillion completed. In the process all external spaces are well enclosed by the rooms. The entire school can be enclosed by providing minimum boundary walls.

Other such designs can be developed that consider the expansion of schools and also create better external and internal learning environments in the process.



What does it cost you?

Nothing!!

8 INCLUDING THE SPECIAL CHILD

The school should incorporate necessary features to facilitate both access and learning by the special (disabled) child.

It is essential that our schools are sensitive to the needs of the disabled child.

DPEP deals with five basic categories of disability, namely:

1. Visual (Seeing)
2. Auditory (Hearing)
3. Locomotor (Movement)
4. Mental Retardation
5. & Learning Disability

The emphasis in the Integrated Education Programme (IED) is on mild and moderate disability where students can be integrated with other children.

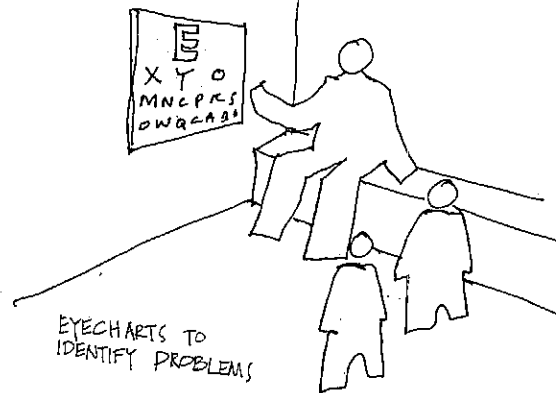
Our schools can cater to disability in two ways:

- Identification of disability
- Integration of the special children

Low Vision

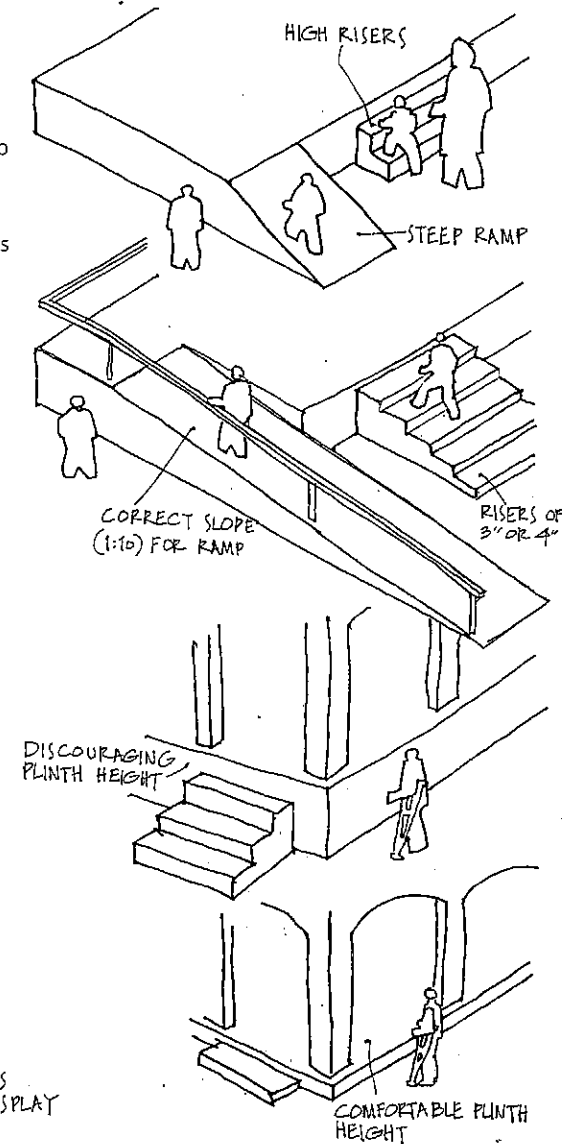
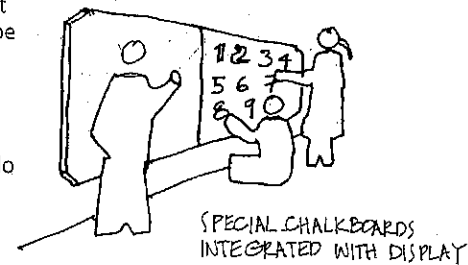
Eye Charts can enable teachers to check if some of the children have low vision problems.

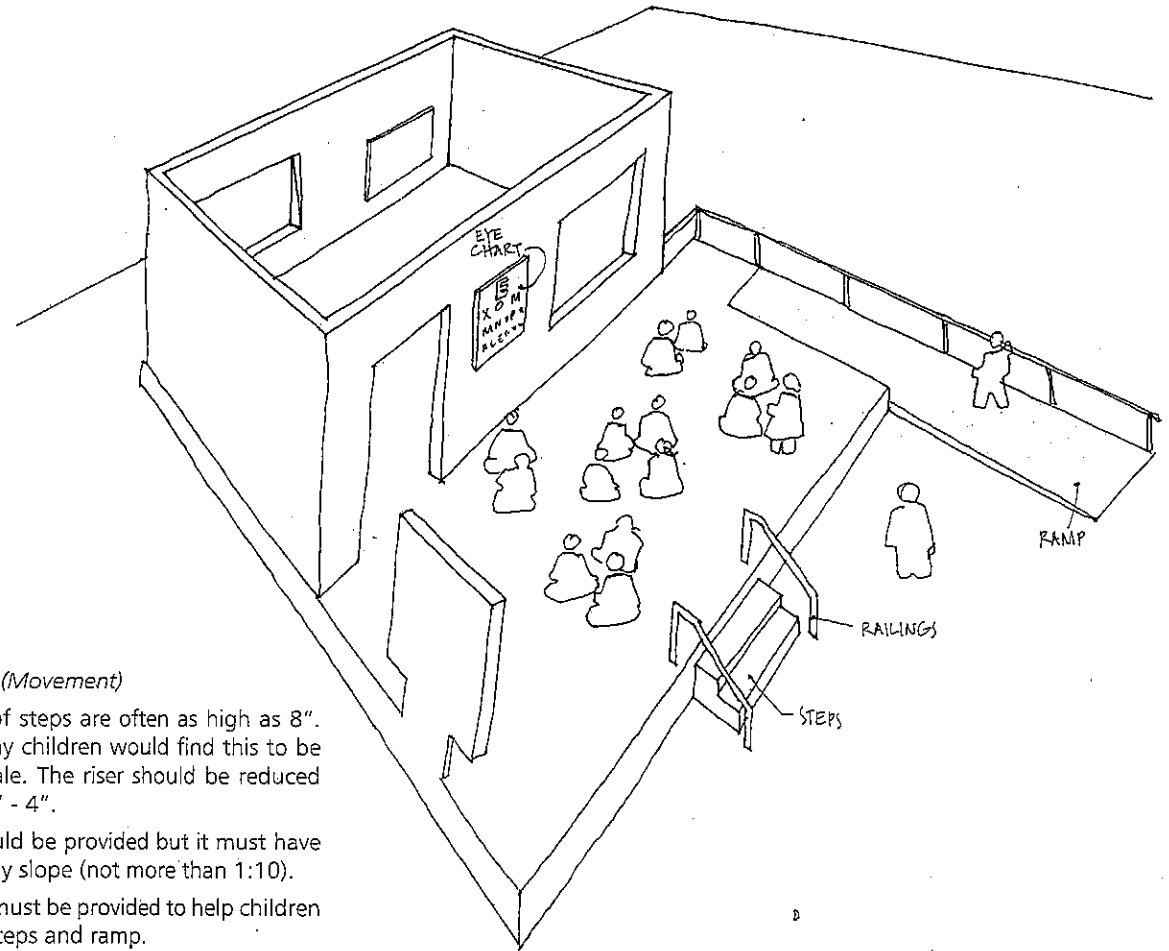
One of the children's chalkboards could have letters and numbers in plaster for children to recognise.



Colours of teaching aides painted in the school should be such that they have adequate contrast to be recognised by the children

Games with shapes and sizes on the plaster board should be provided so that these children do not get left out.





Locomotor (Movement)

The risers of steps are often as high as 8". Even healthy children would find this to be uncomfortable. The riser should be reduced to about 3" - 4".

A ramp could be provided but it must have a very gently slope (not more than 1:10).

Hand rails must be provided to help children climb the steps and ramp.

Seating spaces must be created in a few places inside and outside the classroom so that the students can sit more comfortably.

Level differences are sometimes created between the classroom and verandah, etc. These should be eliminated.

In low lying and flood prone areas, a high plinth is required in the schools. High plinths can be quite daunting for the disabled child and so should be minimised where possible.

What does it cost you?

Some additional expenses have to be borne to make the school handicapped friendly.

Approximate costs

Ramp for height of two feet – Rs. 3,600/-

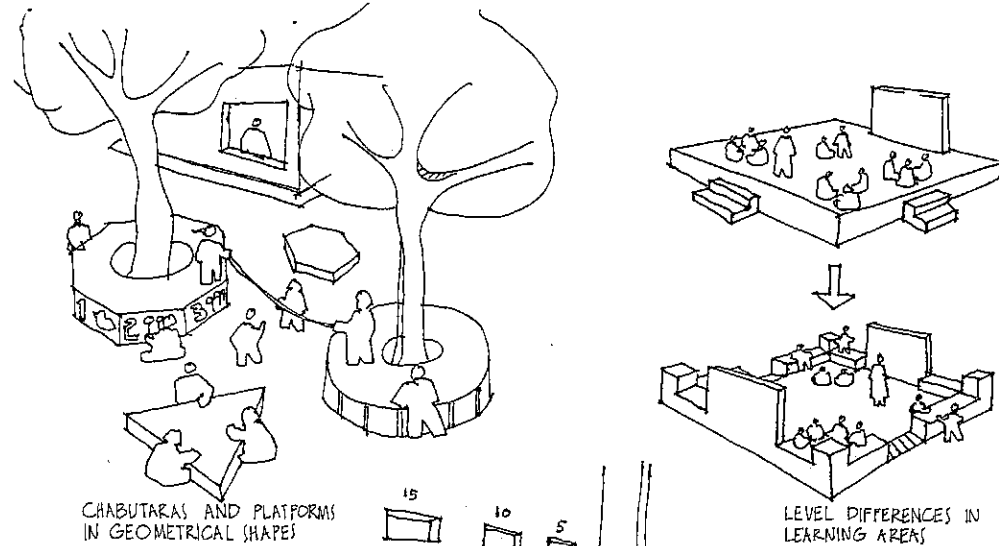
Extra for height of 4" for height of two feet – Rs. 150/-

Handrail for ramp – Rs. 2250/-

Handrail for steps – Rs. 825/-

9 PROVIDING LEARNING ELEMENTS

Simple and thoughtful additions/ modifications must be provided in the design details to facilitate learning activities. Such learning elements could include patterns in the flooring, *akhar gachhis*, etc.



In some BEP schools, letters and numbers are painted on the chabutras (platforms) around trees. The chabutras are also constructed in different shapes. This becomes a very effective teaching aid for both arithmetic and language. Gujarat has also adopted this in its repair works.

Teaching aids can also be creted through geometrical shapes, letters and numbers on the classroom floor.

Teaching aids can improve the learning environment of the school with minimal cost implications.

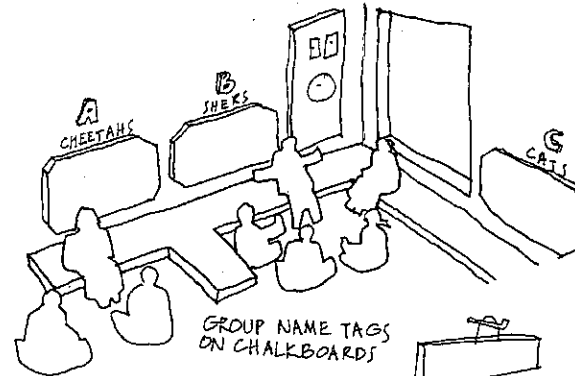
What does it cost you ?

Very little. Chabutras are mostly constructed with leftover/ savings from the normal construction. The cost of paint is minimal.

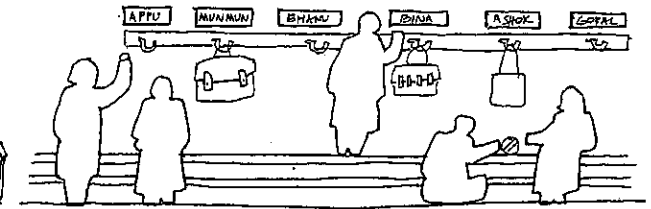
Lettering on floors would be with local stone and essentially covered in the cost of the flooring.

10 PERSONALISATION OF SPACE

The provision of small storage & display spaces, niches, nameboards, etc. is very important and can give the child 'his own space' in the school.

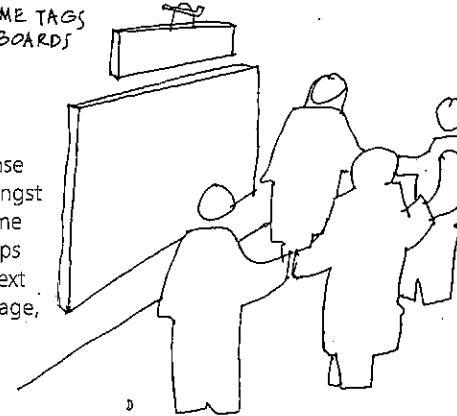


GROUP NAME TAGS ON CHALKBOARDS



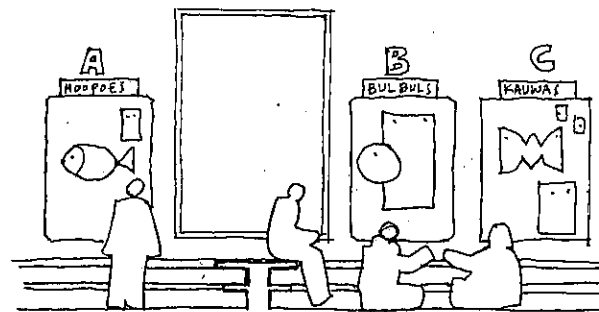
INDIVIDUAL TAGS ON BAG HOOKS

It is important to encourage a sense of belonging and ownership amongst the children. Providing simple name tags can allow individual (or groups of) children to write their name next to 'their' chalkboard, display, storage, hooks, etc.

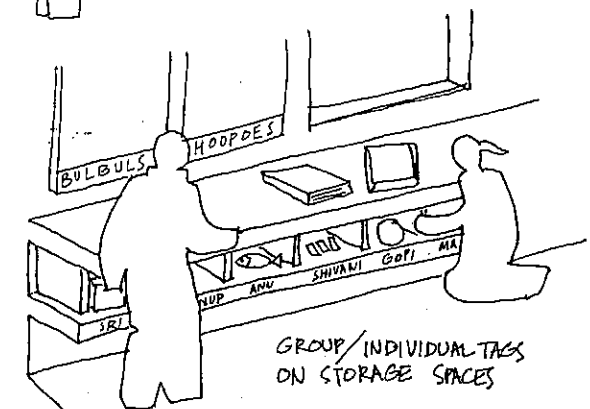


What does it cost you?

Virtually nothing!!

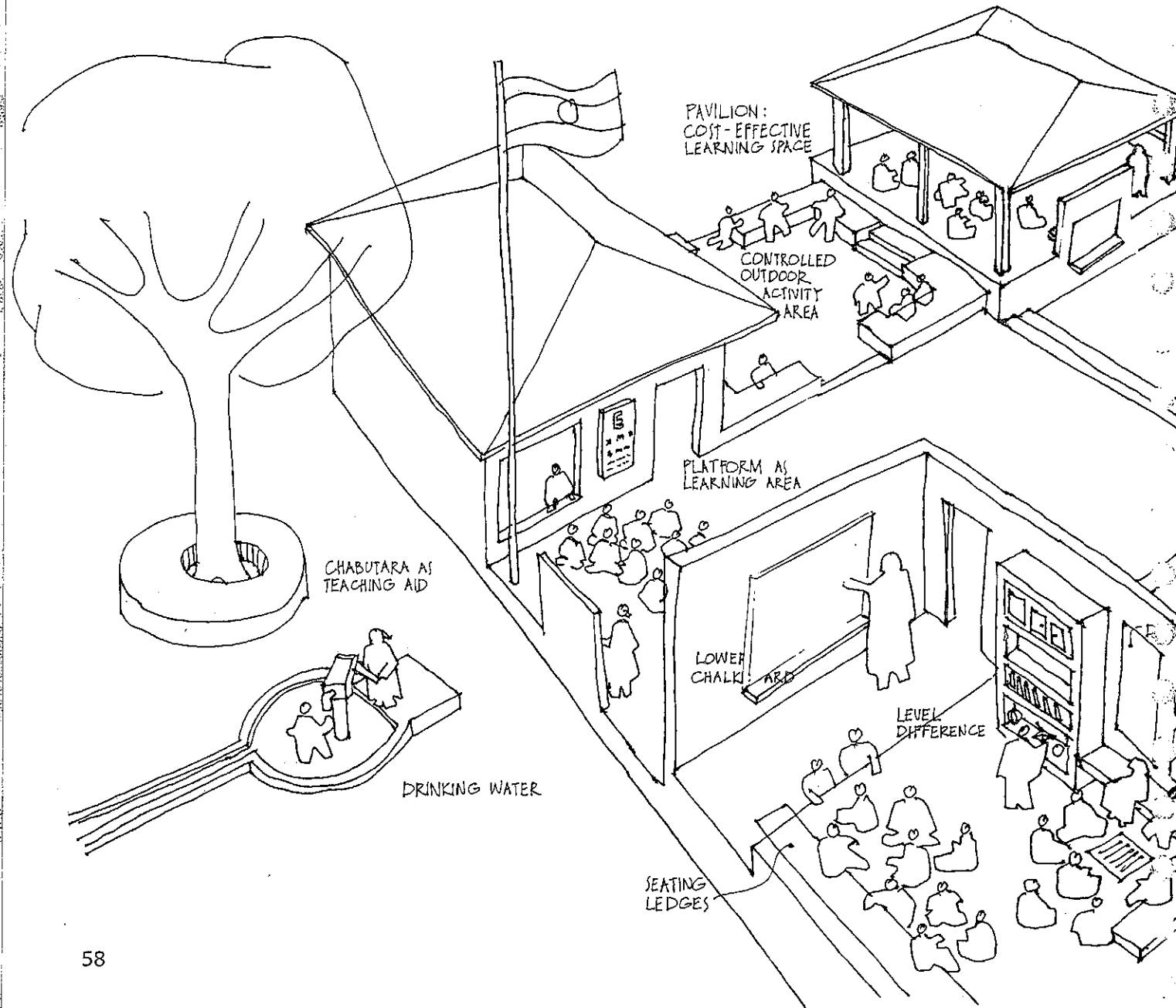


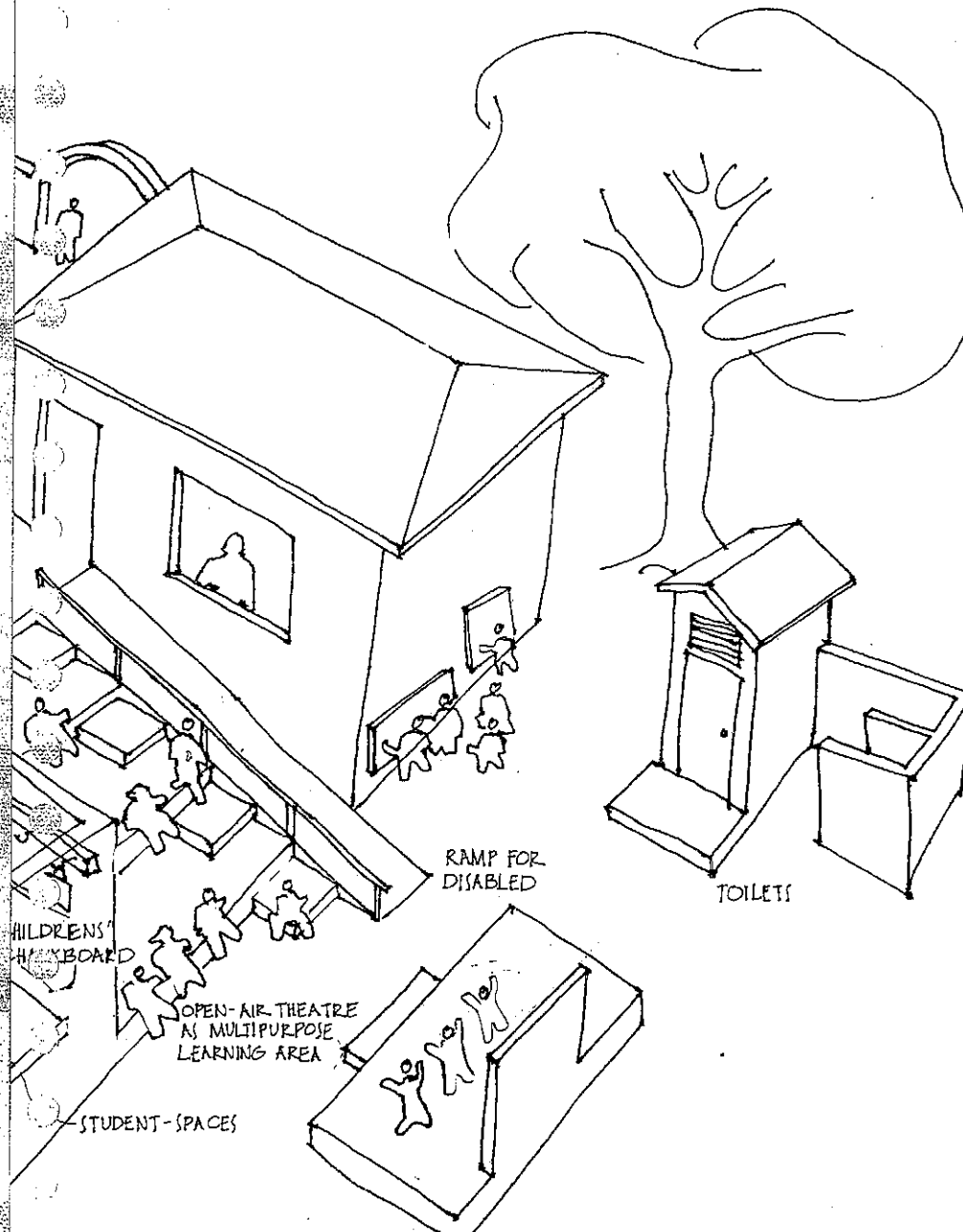
GROUP TAGS ON DISPLAY AREAS



GROUP/INDIVIDUAL TAGS ON STORAGE SPACES

THE NEW PRIMARY SCHOOL





Various issues have been raised in the previous pages. Some simple solutions have also been suggested. The school shown here incorporates all the ideas presented over the last few pages.

It serves the simple purpose of showing that all the issues raised can be addressed in the same school.

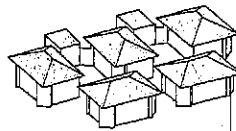
There has been significant 'value-addition' in the design. The school provides a student his/her space, display, storage, furnitureless provisions, appropriate learning spaces, external learning areas, caters to the requirements of the special child and creates learning elements in the school. It simply goes to show how much more our school buildings can be. The school shown would be of a cost comparable to a three classroom and one verandah school.

However, this particular design is not important - it is not the solution. What is important is the various issues that have been raised. All school designs need to address these issues.

While it does not require an extremely large site area, it is clearly not the design for a cramped site. Designs would need to be prepared for a variety of conditions, hilly terrains, constrained sites, one or two room schools, etc. This section merely provides a clear idea of some of the issues to be addressed and the possible solutions. The actual design for your school may be similar in intent but not necessarily in design.

The New Primary School IN A NUTSHELL

- The school should be designed to the size of the child. It should provide spaces for individual/ groups of children to read, write, display and store materials comfortably.
- A variety of display and storage provisions should be made in the classrooms and verabdahs.
- The design should respond to furniture-less situations by examining the chalkboard height, provision of sitting spaces, standing work tops, quality of floors, etc.
- The learning space must be designed for single teacher situations, multi-grade conditions, overcrowding or small class sizes, etc. as the case may be.
- To provide adequate learning spaces within limited resources, schools may be a combination of covered spaces, verandahs, pavillions and platforms/ courtyards.
- External spaces should also be designed. These could be treated as a combination of formal teaching spaces, student-space-activity areas, open area theatres, courts, etc.
- External activity areas should be physically & visually accessible from internal areas. They should be controllable and in regular use.
- Expansion should be designed to provide additional learning/ activity spaces at minimal extra cost.
- The school should incorporate necessary features to facilitate both access and learning by the special (disabled) child.
- Simple and thoughtful additions/ modifications must be provided in the design details to facilitate learning activities. Such learning elements could include patterns in the flooring, *akhar gachhis*, etc.
- The provision of small storage & display spaces, niches, nameboards, etc. is very important and can give the child 'his own space' in the school.



IN CONCLUSION

SIX

The design renewal exercise will result in a large number of schools being constructed with a specific focus on being child friendly. Each such school being built is itself a small success. Yet, it would be valuable to examine the larger gains possible from this exercise.

The exercise as a whole reveals many small and big ways in which our schools can be more child friendly. It reveals the role of design in achieving this. What we can get from our school buildings, what we must aim for, and what we can ask for, have all become clearer through this process.

Design renewal began with a clear aim of incorporating display, storage and other such classroom facilities. It also had the objective of achieving child friendliness. As more and more such schools get constructed, it is necessary to ensure close attention to detail during actual construction. States like Bihar and Kerala, have appointed district specific architectural consultants. This would allow the design renewal process to develop into the next stage - a more informal, internal and ongoing process in each state/district. The exercise would be greatly enriched if the benefits of this exercise reaches a larger audience of educationists and administrators. The present document attempts to achieve this.

Most of the elements mentioned under the 'New Primary School' chapter do not cost too much but can go a long way in improving teaching-learning environments. Teachers can themselves incorporate some of these pedagogic elements (through various other funds the school may receive) and create a child friendly environment in the school. The understanding of the teacher on the various aspects of a child-friendly school should go a long way in improving school environments. Some of these aspects could well be included in the regular training programmes.

The new primary school is in effect a basic guideline of issues to be considered in the design and construction of rural primary schools. Most of these would be of relevance in an overwhelming number of cases. They form a basis for discussion and debate so as to improve school environments throughout the country.

On the face of it, this is not the first time the issue has been addressed. Schools with a high quality learning environment do exist, though small in number. What makes this exercise significant is that it tries to expand similar concerns across the length and breadth of the country. The exercise, like the Programme itself, is neither small nor inward looking. The possibilities too are neither few nor limited. By accepting constraints (of costs, ease of construction, etc.) yet recognising the requirements of school buildings, a range of possibilities have been generated. They present a very real opportunity to improve the quality of learning environments across the country.

The exercise as a whole reveals many small and big ways in which our schools can be more child friendly. It reveals the role of design in achieving this.



It is seldom that we come up with a wrong solution - mostly it is the wrong 'problem' that we are addressing. Our concern is not merely to provide two rooms and a verandah - our concern is to help the child to learn and the teacher to teach.

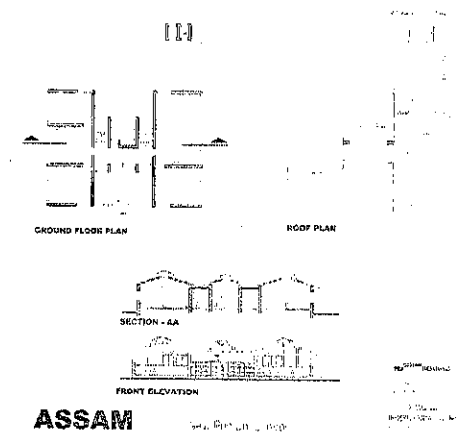
There is a simple point to be made - it is seldom that we come up with a wrong solution - mostly it is the wrong 'problem' that we are addressing. It is not financial constraints that prevent us from achieving 'sensitive' solutions. It is first an inability to recognise what our concerns really are and secondly an inability to recognise the possibilities in addressing them.

Our concern is not merely to provide two rooms and a verandah - our concern is to help the child to learn and the teacher to teach. Our buildings need to answer this concern. However, buildings by their sheer sense of permanence are very easily accepted the way they are - unchanging and unchangeable. Yet, buildings are built by design. They are and will be what we want them to be. The question is - *what do we want?*

It is often missed that the school building is the most significant, lasting and fundamental teaching resource. The New Primary School tries to reveal ways in which the building can be this resource, ways in which it can address basic issues that affect pedagogy. It is not to be seen as a design solution. No one design can attempt to address all issues across the country. What the section provides is an insight into the concerns of rural primary school buildings. What it shows is that they can be successfully addressed within our constraints of limited resources and the various systems of implementation. What is important is that we address the issue with a commitment to both our concerns and our constraints.

SECTION IV

This section compiles designs from different states. It contains drawings, a description of the processes followed and details of the designs. Photographs of some of the completed works are also included. This section brings out, in a very visible sense the scale and variety of the exercise. It would be worthwhile to note that due to the sheer volume, all designs could not be included. In fact, some states are still producing additional designs.



COMPILATION OF DESIGNS

Ideally, the design of each school should be site specific. Significant variations could occur from site to site, village to village and school to school. However, the shortfall of primary school buildings in the country is very large, and hence to provide a site and school specific design is logistically very difficult.

Therefore, the issue is not merely one of site specificity - it is one of recognising the various issues that need to be addressed. This includes overcrowding, multigrade situations, storage and display, community involvement, single teacher situations, etc. A design for each site is by itself no virtue in the absence of the recognition of the other major concerns that need to be addressed.

All the designs compiled have attempted to address some of these issues. Yet, in many of the designs that were not finally adopted, the lack of awareness of these issues was apparent. It also needs to be accepted that even the designs compiled here have not necessarily recognised some of these issues. Put together, however, they have responded to a variety of concerns and limitations. Taken together, there has been a broadening of vision.

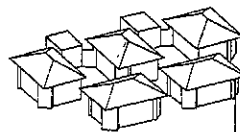
Barring Himachal Pradesh and Kerala, DPEP would not necessarily be preparing site specific designs. What it does do, is to attempt to address the generic issues that school buildings face.

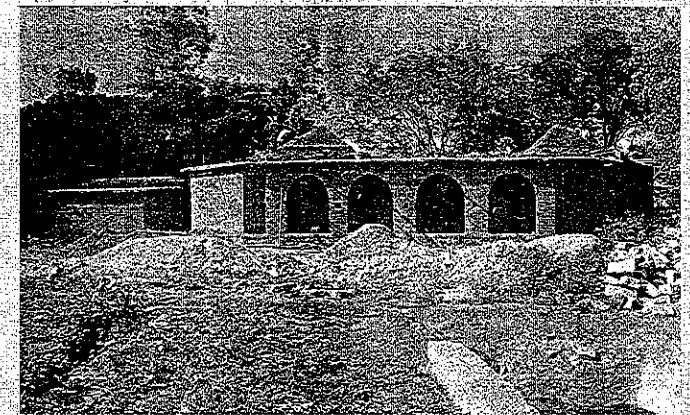
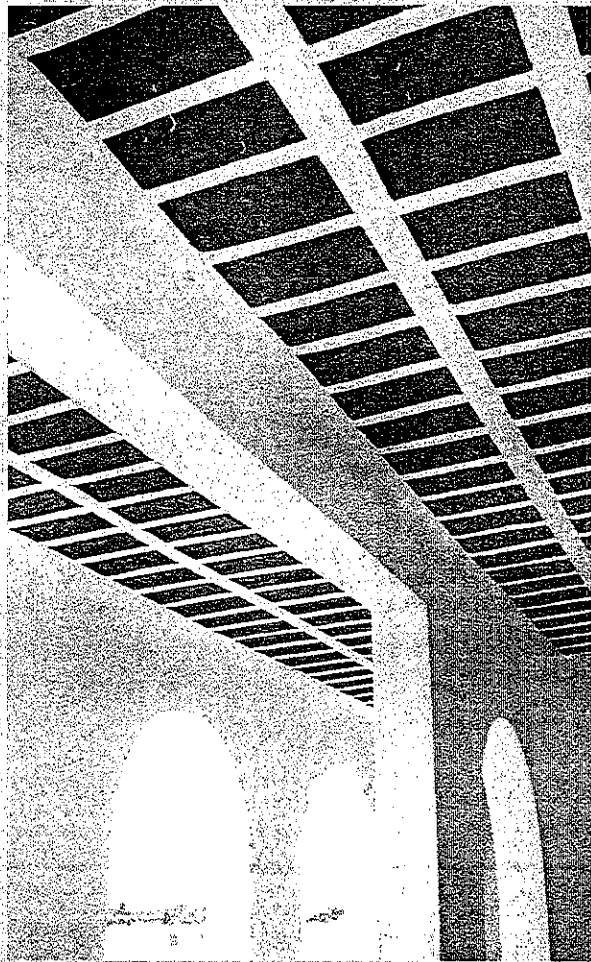
Various state specific systems and processes have been followed to prepare the designs. One constant has been the involvement of consultants in the development of the designs. In most cases at least three to four consultants have been involved in a state. In some cases one consultant has been appointed for each district. Two states have prepared designs through the Chief Architect of the State Government.

Construction using these designs has commenced in a majority of the states. Photographs of some of the completed buildings are included in the following pages.

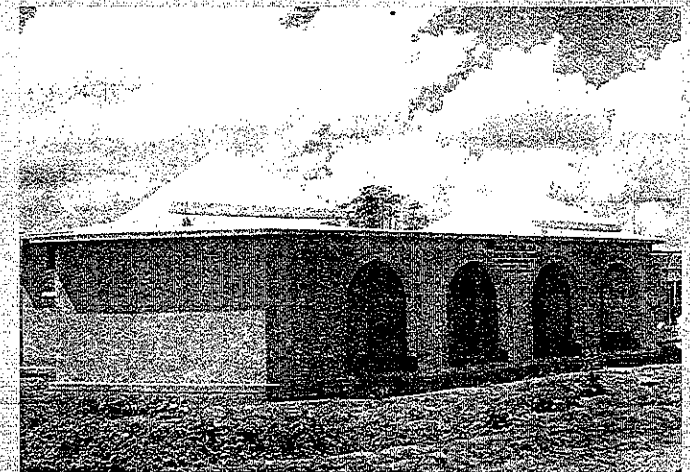


Block Resource Centre in Aurangabad, Maharashtra
Constructed by the Centre for Science in Villages, the BRC provides large semi-covered spaces. Cost effective systems of construction have been adopted. This includes the use of guna tile roofing and unburnt mud bricks for the walls.





During construction

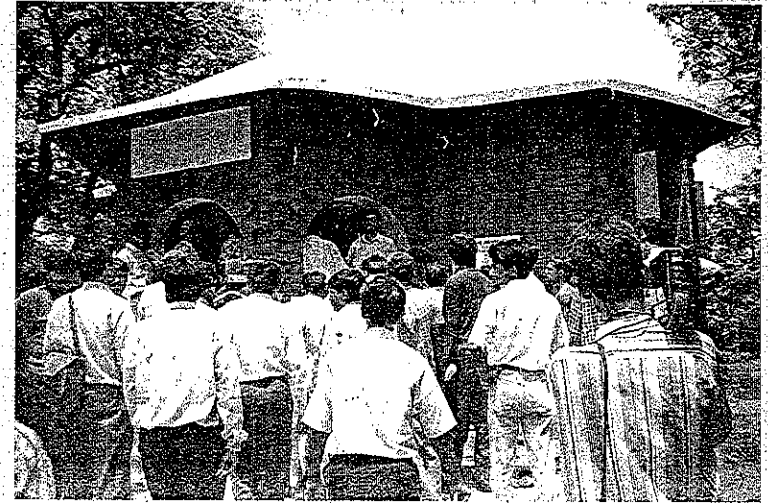


After construction

New primary school in Bangalore Rural district, Karnataka. The design includes the use of filler slab RCC roofs (left) and rat-trap bond walls to reduce the cost of construction.



Cluster Resource Centre, Muzaffarpur district, Bihar.
The CRC has a training hall, Resource Room and Verandah. The designs were prepared by consultants, through interaction with teachers and the local community. The use of cost effective construction systems were initiated in BEP and are now being used in all DPEP works.



Block Resource Centre in Kaza, Lahaul Spiti, Himachal Pradesh.

At the initiative of the district, the construction was undertaken using alternate materials and incorporating passive solar design features. The walls are made of mud bricks. As can be seen, large windows have been provided on the south face of the building to capture the sun's heat. Double glazing with silicone sealants and roof insulation minimises heat loss. The building requires minimal heating even during the harsh winters.



ASSAM

PROCESS

DPEP Asam undertook the design renewal exercise in late 1997. The exercise included the resource mapping of all three DPEP-II districts prior to the preparation of designs. Five private firms were involved in the exercise and each one undertook the resource mapping of all districts. A suggested format was provided to each consultant for the resource mapping. This included information on material and labour costs, transportation costs, material suppliers, etc. for each district. This provided the base for a concise and informative resource mapping exercise.

Following this, designs were prepared by the consultants. A design review and shortlisting was undertaken by the SPO. Two BRCs and two school designs (apart from the design for a 70 bedded hostel) were forwarded all of which were accepted with minor modifications.

DESIGN FEATURES

The BRC designs of Assam are both residential and include a formal kitchen and dining space. Of the two designs shortlisted by the SPO, one was a modification of the DPEP-I BRC design.

The design prepared by the consultant is for relatively compact sites. The training hall, dorms and offices are located around a courtyard which provides an informal activity area.

The schools are designed for four rooms and are to incorporate all basic facilities in terms of display, storage, childrens chalkboards, etc.

The designs are marked by their local character and take into account the climatic conditions as well as local construction skills. A conscious decision was taken to use permanent materials in the onstruction of the walls, as against the commonly used bamboo panels.

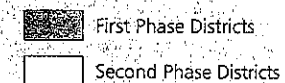
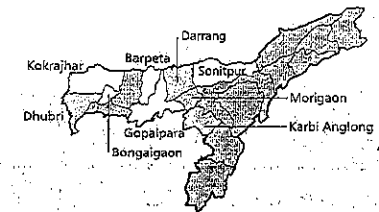
CONSTRUCTION AGENCY

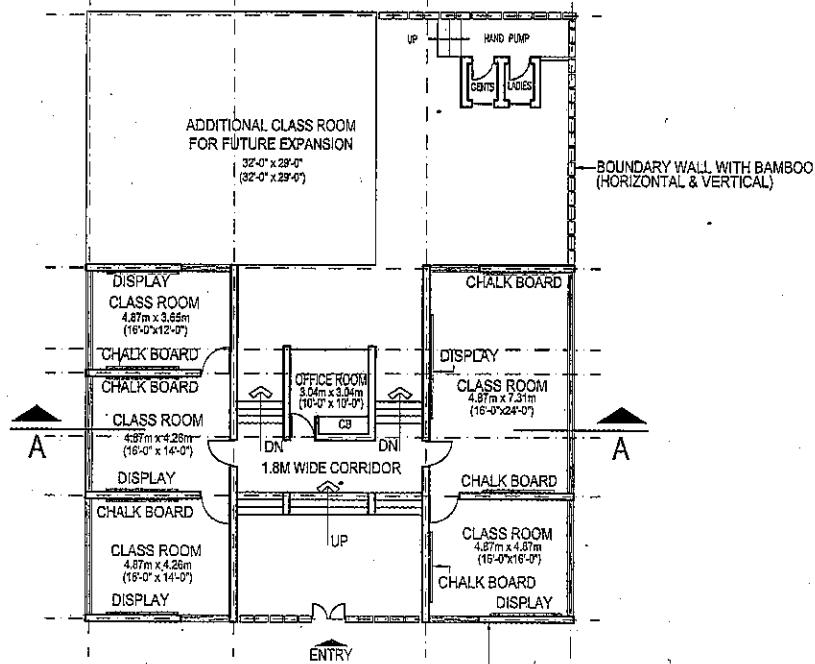
Construction is to be undertaken through in-house contract engineers as in DPEP-I. One engineer is being appointed for each block.

All works are being done through community participation except BRCs.

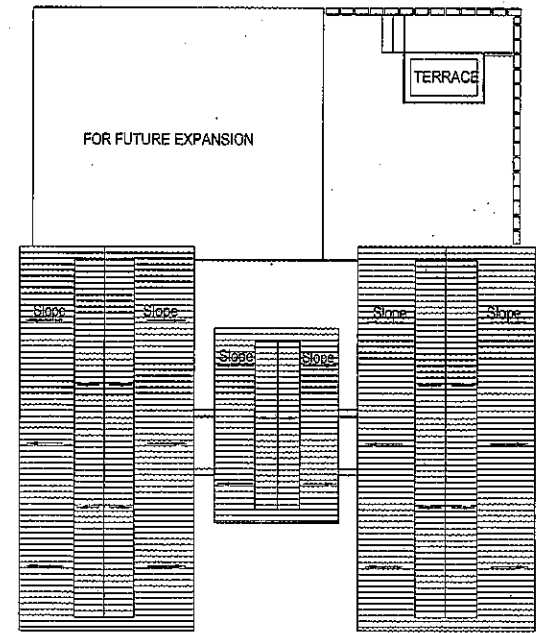
UNIT COSTS

Estimates of the designs have been finalised in only one case. For the rest, preliminary estimates are indicated on the drawings.

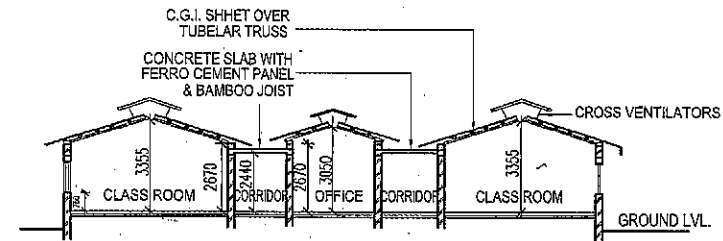




GROUND FLOOR PLAN



ROOF PLAN



SECTION - AA

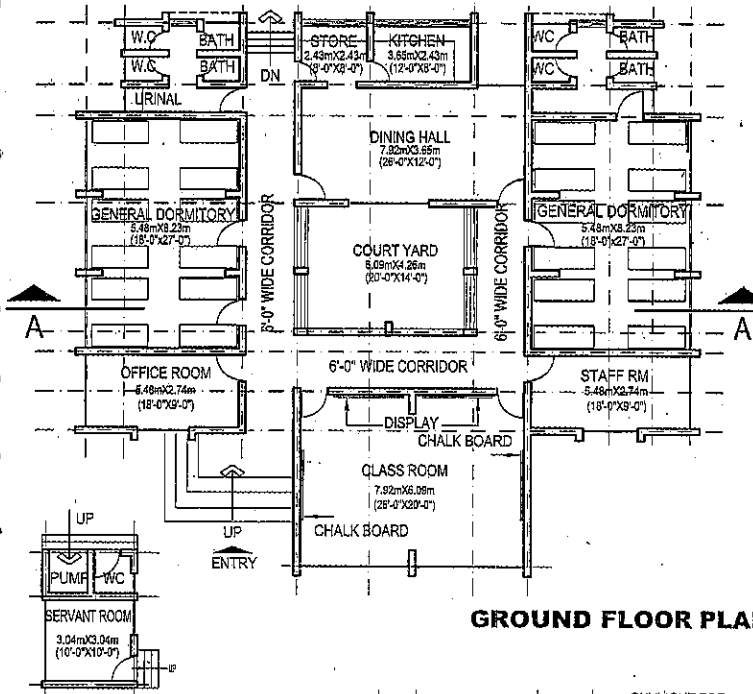


FRONT ELEVATION

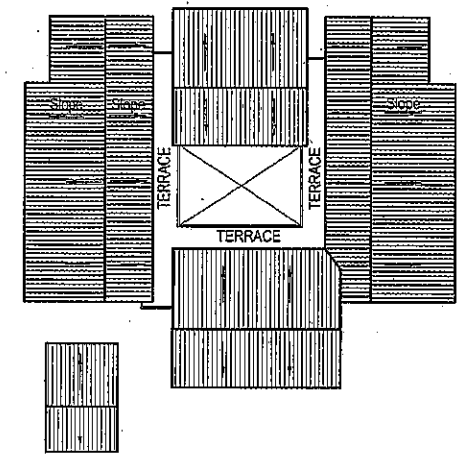
Plinth area.	1560 sq ft
Estimated cost	Rs. 250,000
Cost per sq. ft.	Rs. 160
Architects	
TIKENDRAJIT SAIKA / DESINO guwahati	

ASSAM

New Primary School



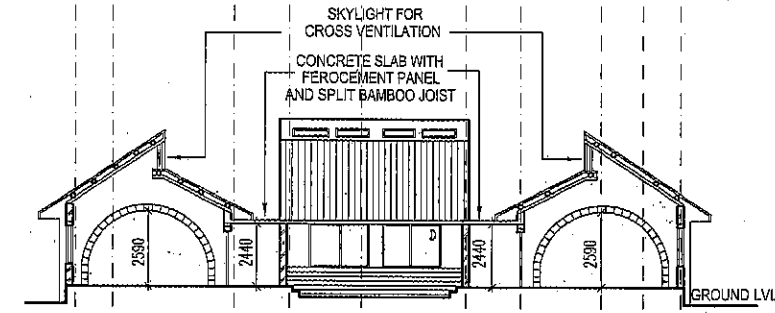
GROUND FLOOR PLAN



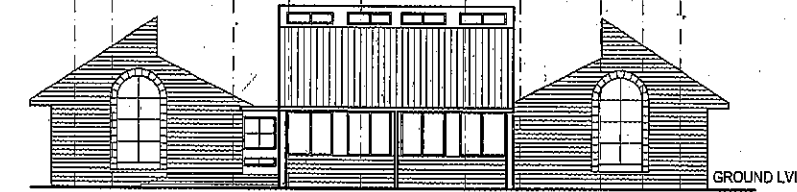
ROOF PLAN

BRIEF SPECIFICATION

- * BRICK WALLS
- * ARCHES AS SPANING MEMBERS
- * ARCH HATCH
- * C.G.I. SHEET OVER TUBELAR TRUSS FOR ROOFING
- * C.C FLOORING



SECTION -AA



FRONT ELEVATION

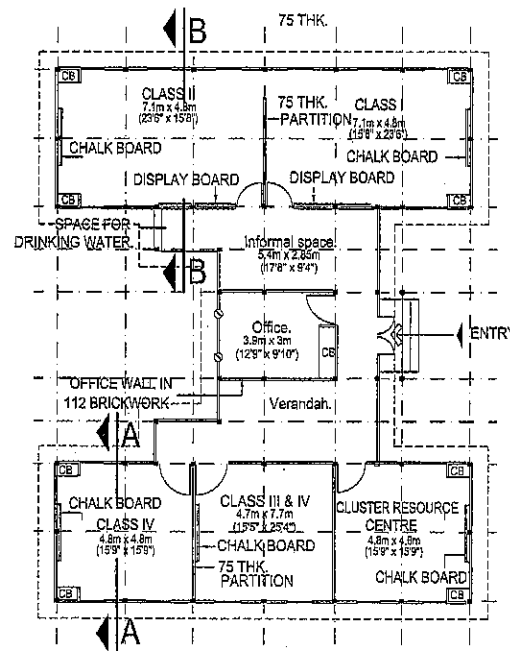
0 1M 3M 6M

Ploor area. 3450 sq ft
 Estimated cost Rs. 850,000
 Cost per sq. ft. Rs. 246

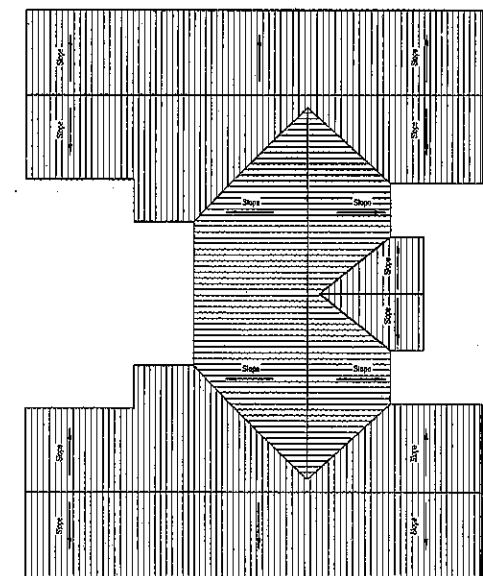
Architects
 TIKENDRAJIT SAIKA / DESINO
 g u w a h a t i

BRC Building

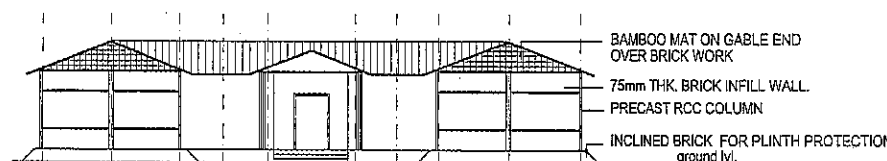
ASSAM



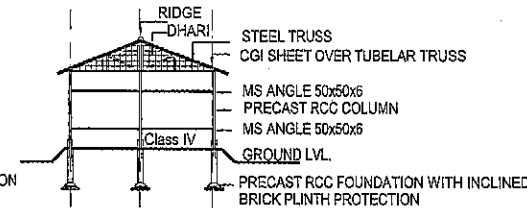
GROUND FLOOR PLAN



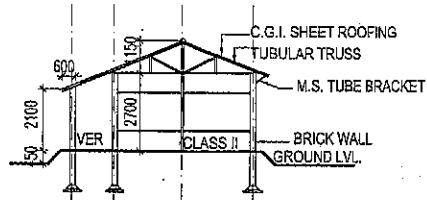
ROOF PLAN



FRONT ELEVATION



SECTION -AA



SECTION -BB

Plinth area.	2085 sft
Budgeted cost	Rs. 2,50,000
Cost per sq. ft.	Rs. 120
Architects DESIGN FORUM guwahati, assam	

ASSAM

New Primary School for flood prone (char) area .

HARYANA

PROCESS

The design renewal exercise was undertaken towards the end of 1997. One consultant was appointed for each of the three districts for the preparation of designs. The resource mapping of all three districts is also being undertaken by one of the consultants. The consultants are to be involved in the construction of prototype schools as well.

Along with this, initial designs were prepared by Chief Architect as well as by the DPEP engineering cell. Two school designs were finalised in January 1998 while the BRC was finalised in June.

The new designs are to be taken up for construction from 1999.

DESIGN FEATURES

The BRC design presents a minor variation of the original design and includes a dormitory and necessary display and storage spaces in the training hall

Both school designs incorporate the necessary pedagogical facilities. One of the design has two hexagonal class rooms. This creates a more centric space in the classroom which encourages activity based learning. It incorporates a similar verandah that provides a conducive pace for an extra class to take place. As in DPEP-I, the buildings are to be of exposed brick construction.

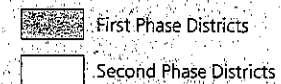
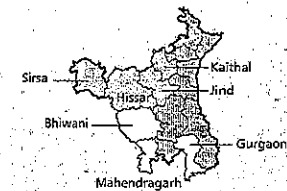
CONSTRUCTION AGENCY

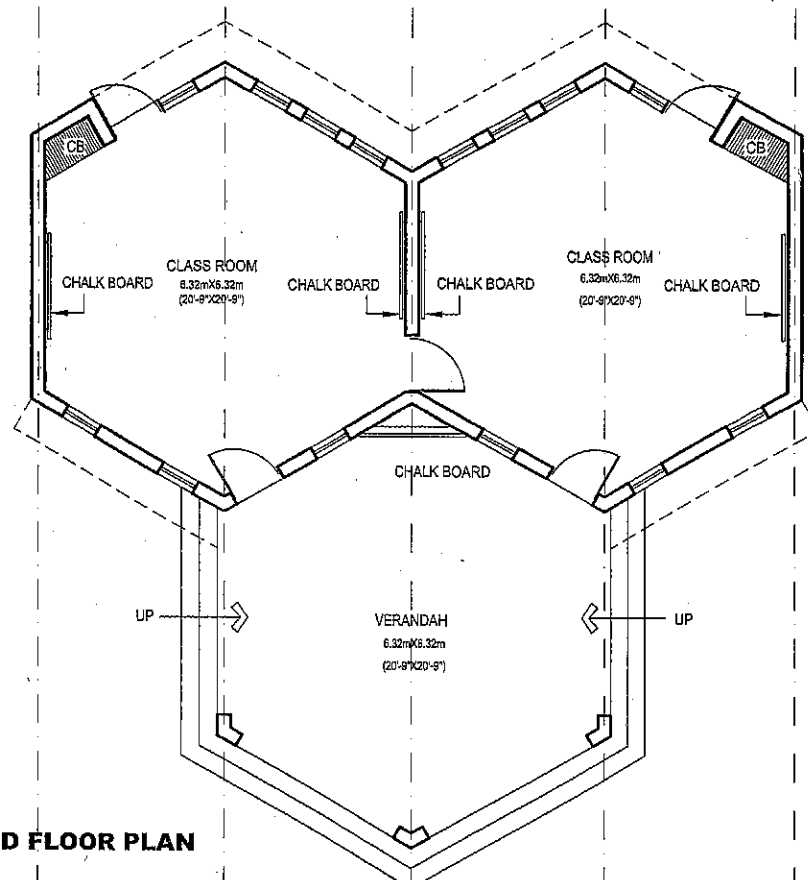
Haryana has an in-house engineering cell. This is composed of engineers on deputation as well as contract Technical Resource Persons (TRPs). The state has one or more engineer per block, depending on the work load.

Most works are being done through the community while the BRCs and some schools are being contracted out.

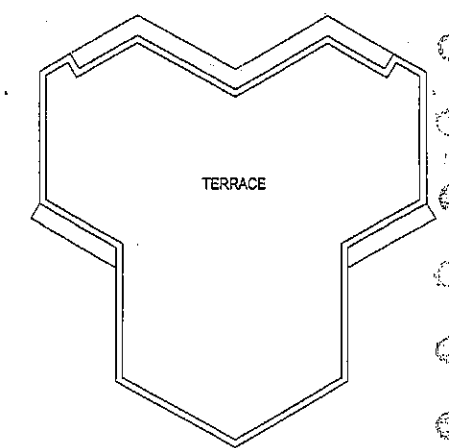
UNIT COSTS

The estimated cost of the present designs are indicated. The detailed costings for these designs are in the process of being prepared. The budgeted costs (as per the state's workplan) are indicated on the drawings.

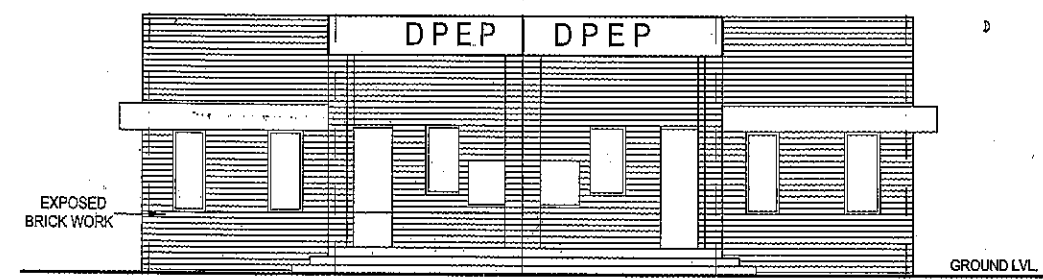




GROUND FLOOR PLAN



TERRACE PLAN

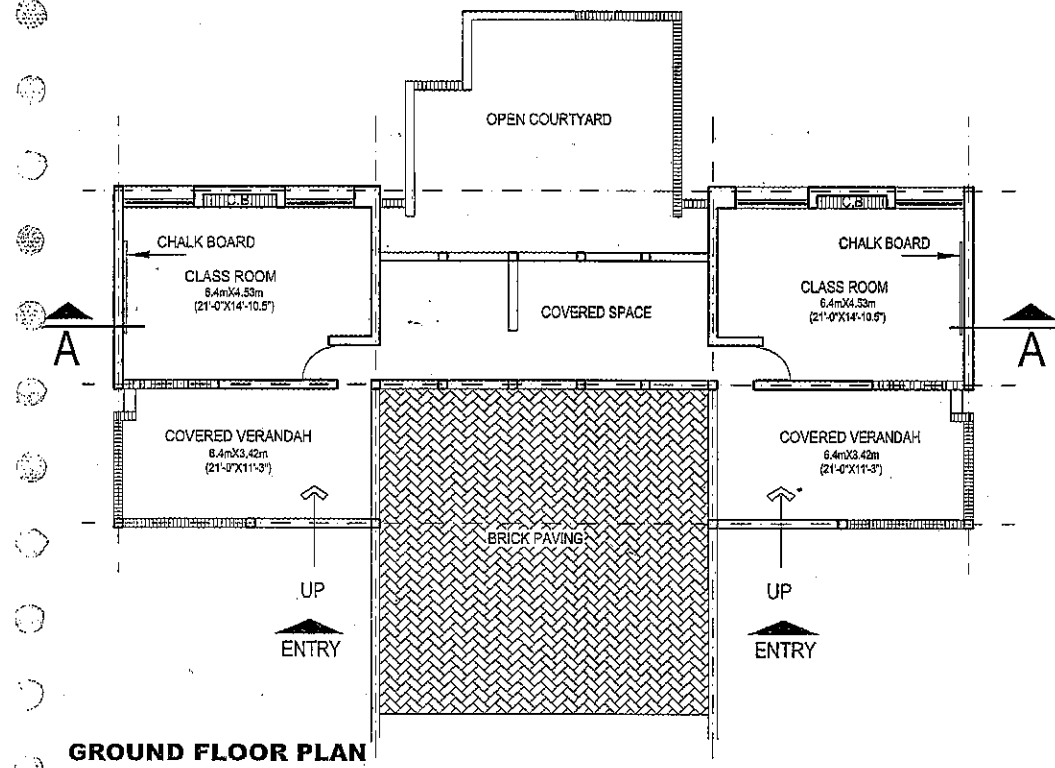


FRONT ELEVATION

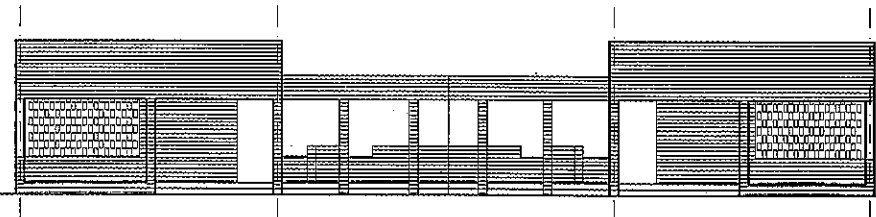
0 0.5M 1.5M 3M	
Plinth area.	1270 sqft
Budgeted cost	Rs. 275,000
Cost per Sq. ft.	Rs. 217
Architects	
CHIEF ARCHITECT haryana	

HARYANA

Standard Design for Primary Schools.

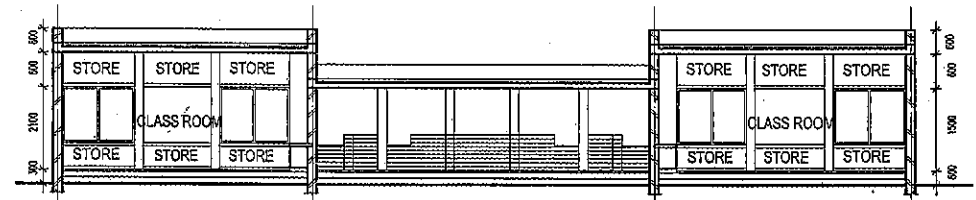


GROUND FLOOR PLAN



FRONT ELEVATION

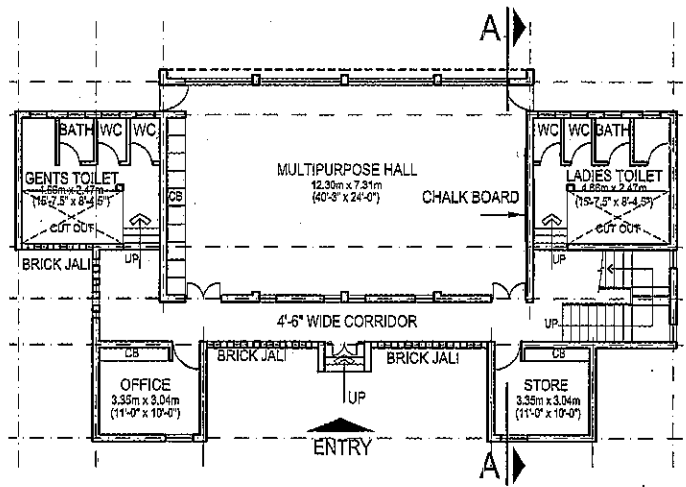
Plinth area.	1627.5 sft
Budgeted cost	Rs. 275,000
Cost, per Sq. ft.	Rs. 169
Architects	
CHIEF ARCHITECT	
haryana	



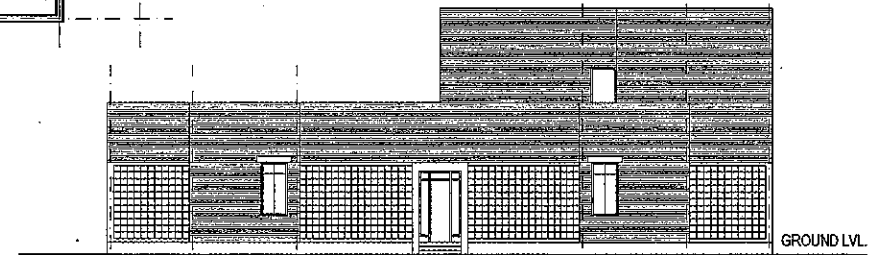
SECTION AA

New Primary School

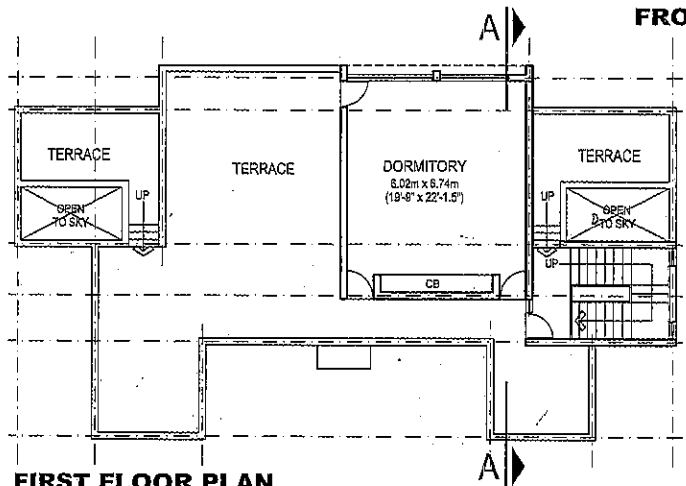
HARYANA



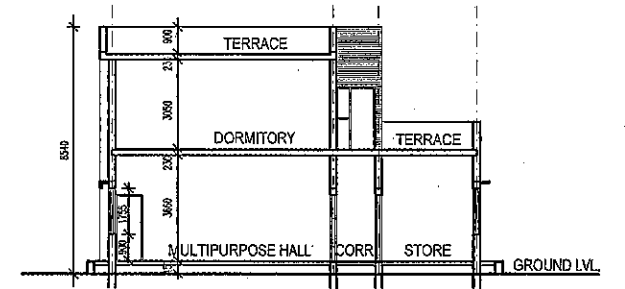
GROUND FLOOR PLAN



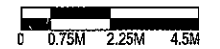
FRONT ELEVATION



FIRST FLOOR PLAN



SECTION - AA



Plinth area. 1627.5 sqft
 Budgeted cost Rs. 275,000
 Cost per Sq. ft. Rs. 169

Architects
CHIEF ARCHITECT
haryana

HARYANA

Block Resource Centre.

KARNATAKA

PROCESS

The design renewal exercise commenced in the second half of 1997 when the state appointed three consultants for the preparation of designs. Alongside, the identification of alternate materials of construction and the construction of prototypes was given to another agency.

The designs were finalised by late 1997 and construction commenced in February 1998. Some schools have already been constructed. A few alternate systems like the use of filler-slabs is being undertaken in some districts (like Bangalore Rural and some schools have already been completed).

Prototype construction has just commenced and the training of engineers is to be taken up shortly.

DESIGN FEATURES

Apart from the standard features, the school designs have focussed on creating informal learning spaces within the classroom and outside.

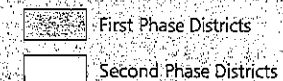
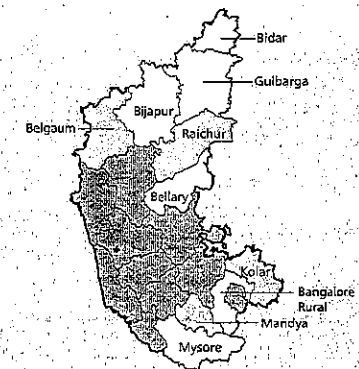
CONSTRUCTION AGENCY

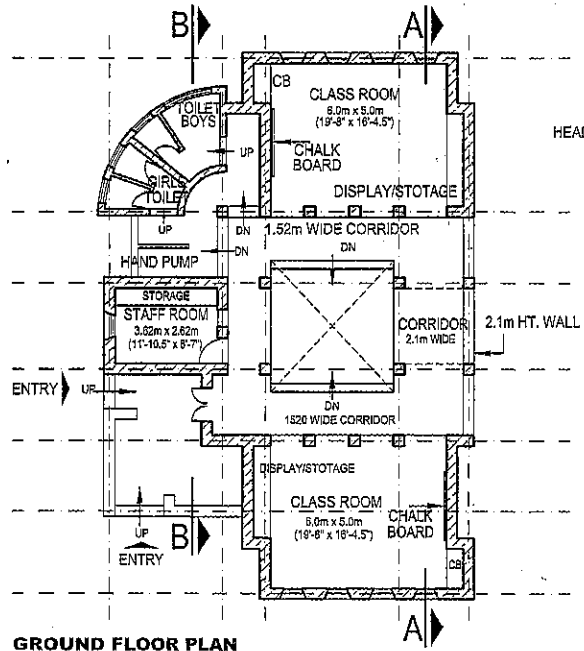
Zilla Parishad engineers at the block level are undertaking the supervision of works on site. District level engineers for the monitoring of DPEP-II works are also being appointed on contract.

The Works are being undertaken through Force Account.

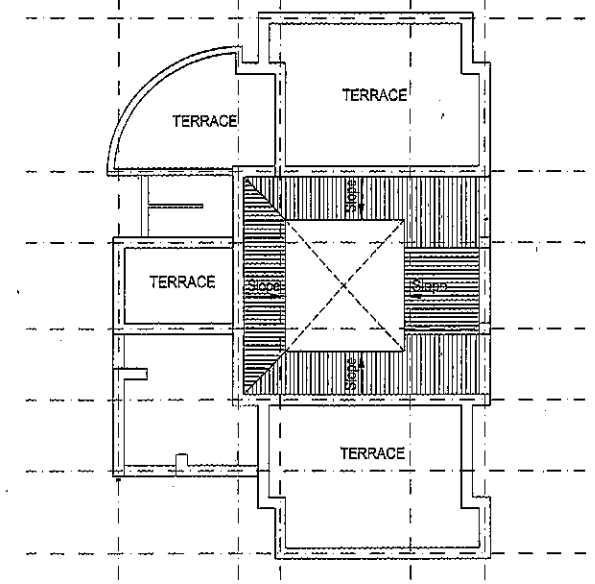
UNIT COSTS

Estimates for the designs as worked out by the consultants are indicated on the drawings.

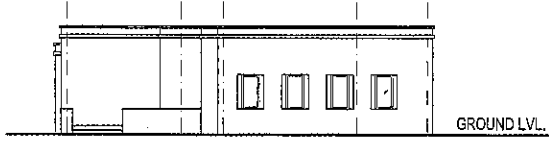




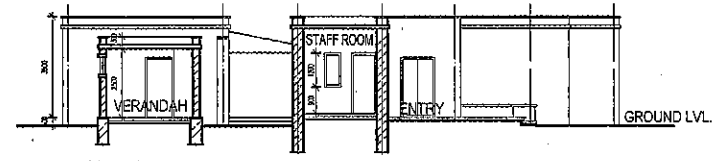
GROUND FLOOR PLAN



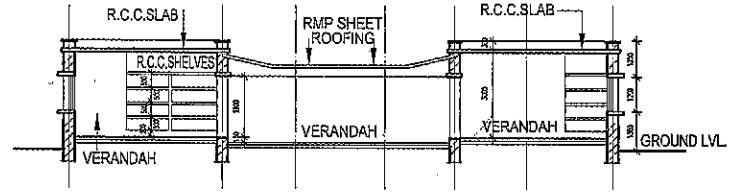
TERRACE PLAN



FRONT ELEVATION



SECTION B-B



SECTION A-A

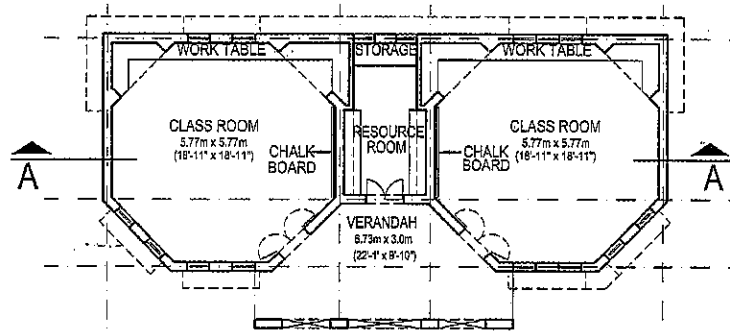
0 1M 3M 6M

Plinth area. 2142 sqft
 Estimated cost (brick) Rs. 301,017
 Estimated cost (stone) Rs. 310,732

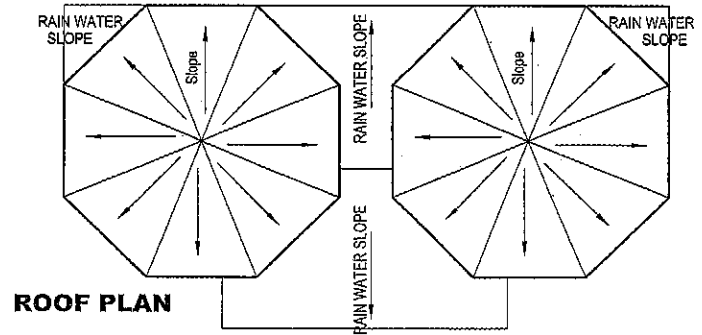
Architects
RAO & MANDREKAR
 bangalore

KARNATAKA

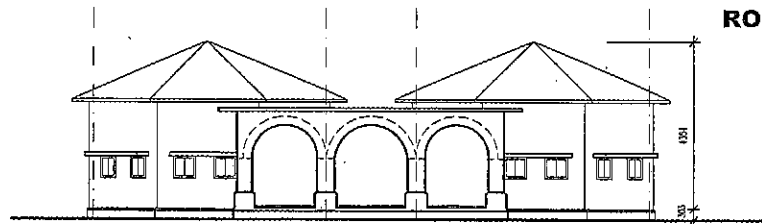
New Primary School.



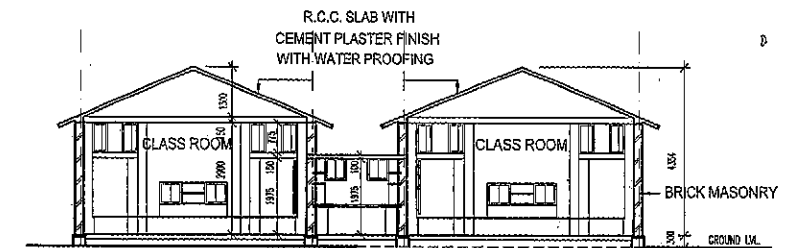
GROUND FLOOR PLAN



ROOF PLAN



FRONT ELEVATION



SECTION A-A

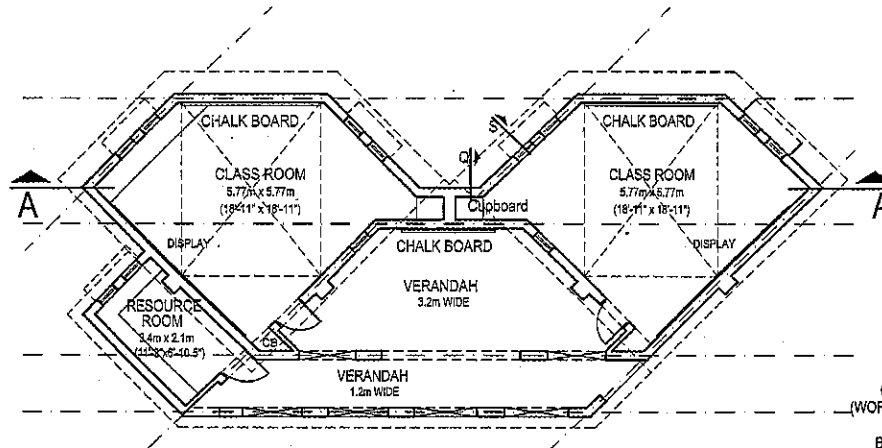
0 0.75M 2.25M 4.5M

Plinth area. 1058 sft
 Estimated cost (brick) Rs. 326,431
 Estimated cost (stone) Rs. 340,000

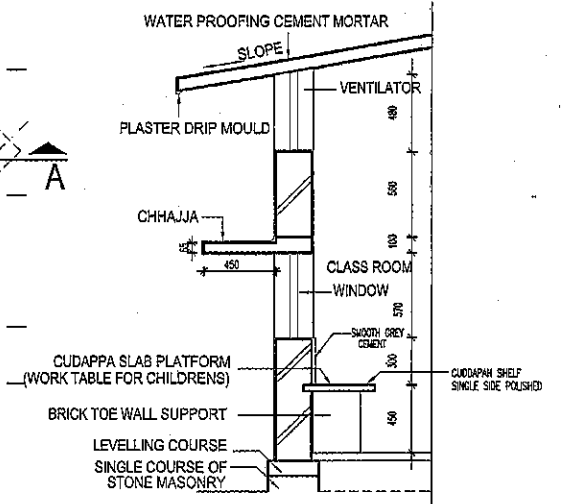
Architects
MATHEW & GHOSH
 bangalore

New Primary School.

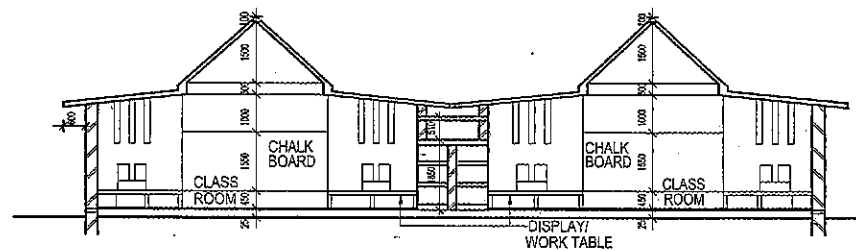
KARNATAKA



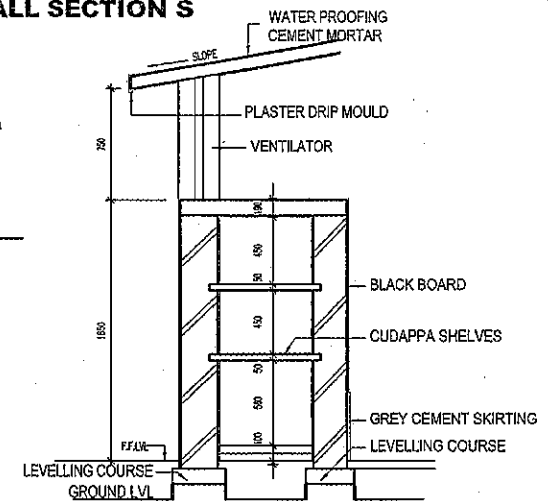
GROUND FLOOR PLAN



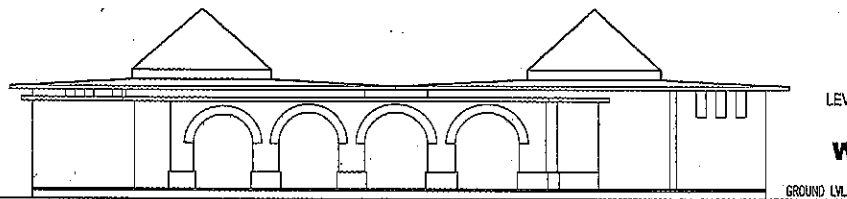
WALL SECTION S



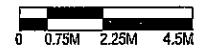
SECTION AA



WALL SECTION Q



FRONT ELEVATION



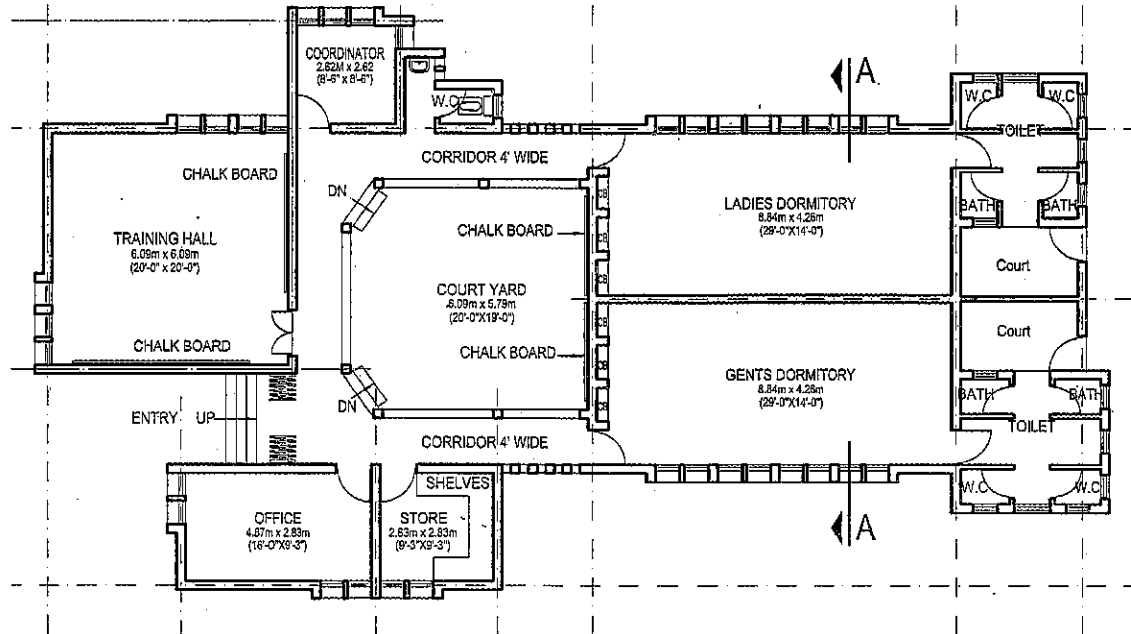
Plinth area. 1310 sft
 Estimated cost (brick) Rs. 295,048
 Estimated cost (stone) Rs. 314,121

Architects

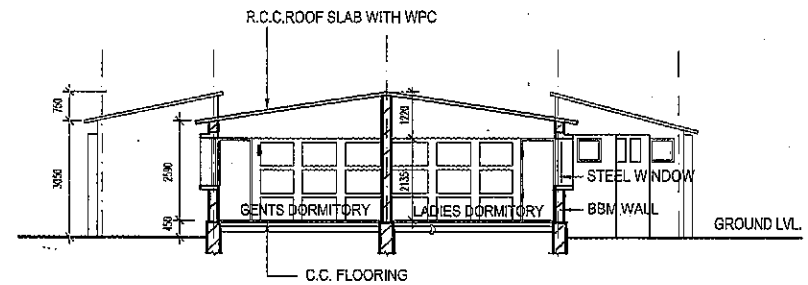
MATHEW & GHOSH
 bangalore

KARNATAKA

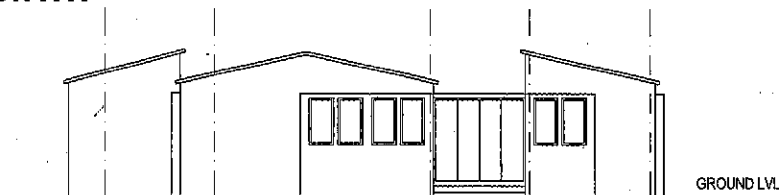
New Primary School.



GROUND FLOOR PLAN



SECTION A-A



FRONT ELEVATION

Plinth area.	2500 sq ft
Estimated cost	Rs. 779,000
Cost per Sq. ft.	Rs. 312
Architects	
SUDHA J GOPINATH kothadaram	

Block Resource Centre

KARNATAKA

KERALA

PROCESS

Kerala has not undertaken a formal design renewal exercise. However, Kerala was one of the first states to initiate the exercise through workshops involving the Parent Teachers Association (PTA) and, students and consultants. Three consultant agencies, COSTFORD, Nirmithi Kendra (Idukki) and Habitat Technology Group are responsible for preparing the designs for two districts each (one in the initial phase and one in the next).

DESIGN FEATURES

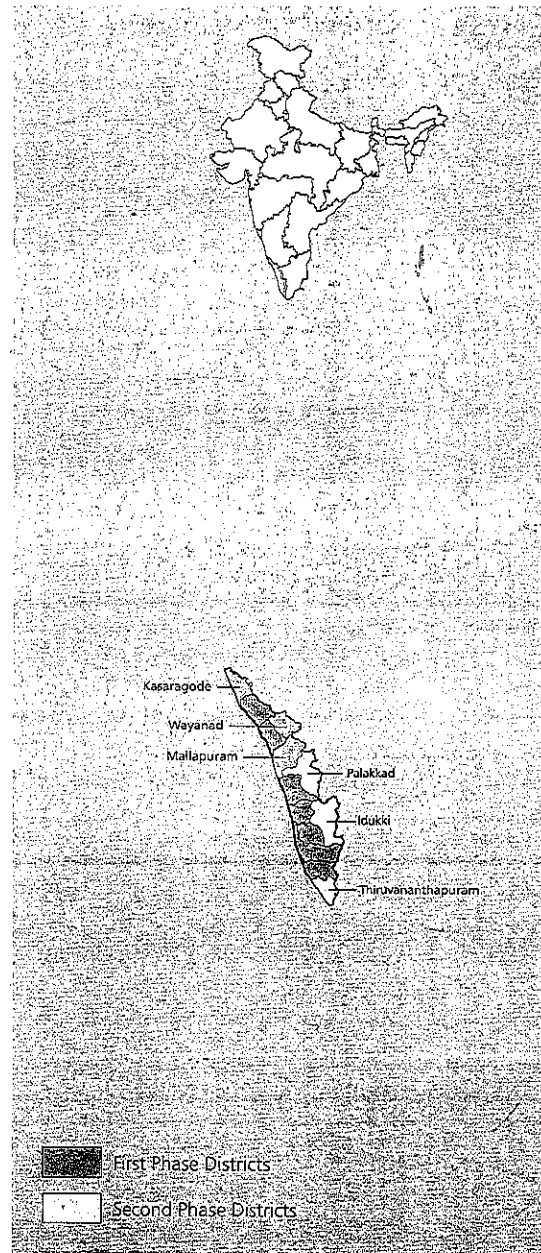
One significant aspect is the fact that site specific designs have been prepared in many cases. This has been partly necessitated by the fact that conditions vary significantly from one site to another. There is also the use of appropriate materials and technologies on some of the sites.

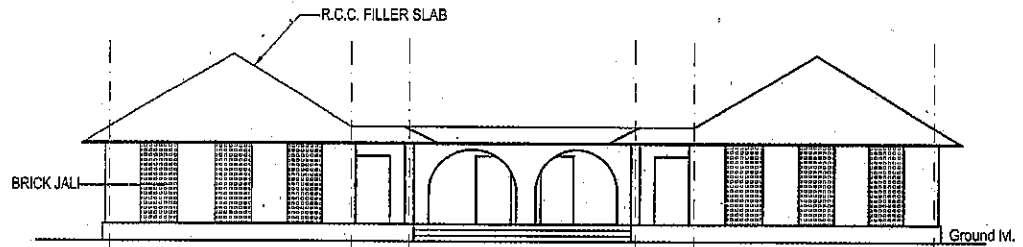
CONSTRUCTION AGENCY

The works have been undertaken through the PTA/MTA. Technical supervision was initially provided by SIDCO (Small Industries Development Corporation). Since end 1997, the design agencies have had the responsibility for on site supervision as well.

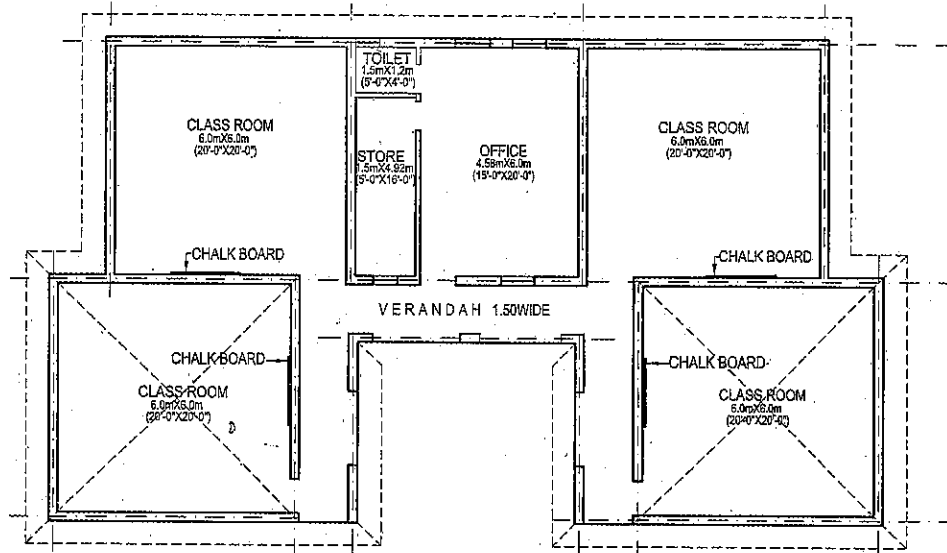
UNIT COSTS

The unit costs of buildings vary from site to site as the designs (and in some cases, the provisions) vary.





FRONT ELEVATION

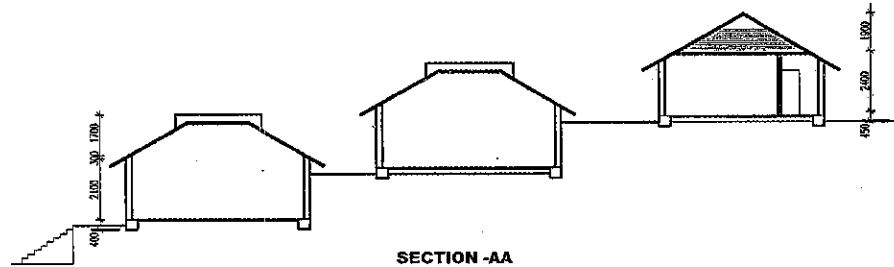


PLAN

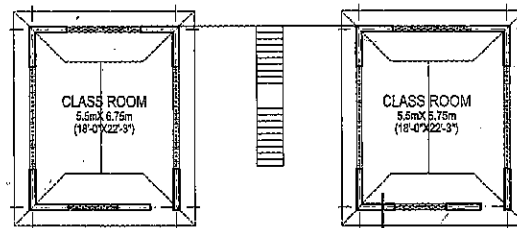
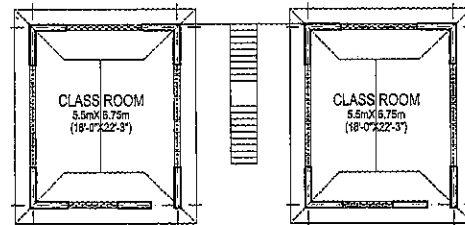
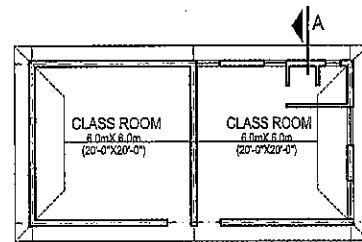
Plinth area.	2484 sqft
Cost	Rs. 500,000
Cost per sqft	Rs. 202
Architects	
COSTFORD	
thiruvananthapuram	

Primary School Building

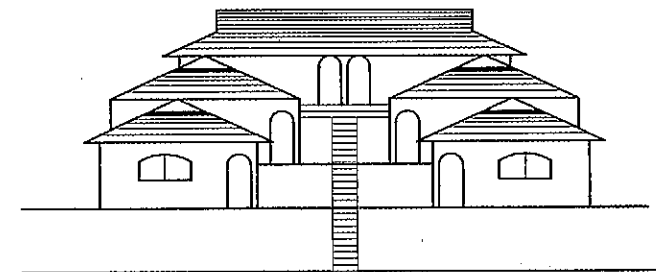
KERALA



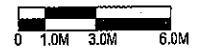
SECTION -AA



GROUND FLOOR PLAN



FRONT ELEVATION

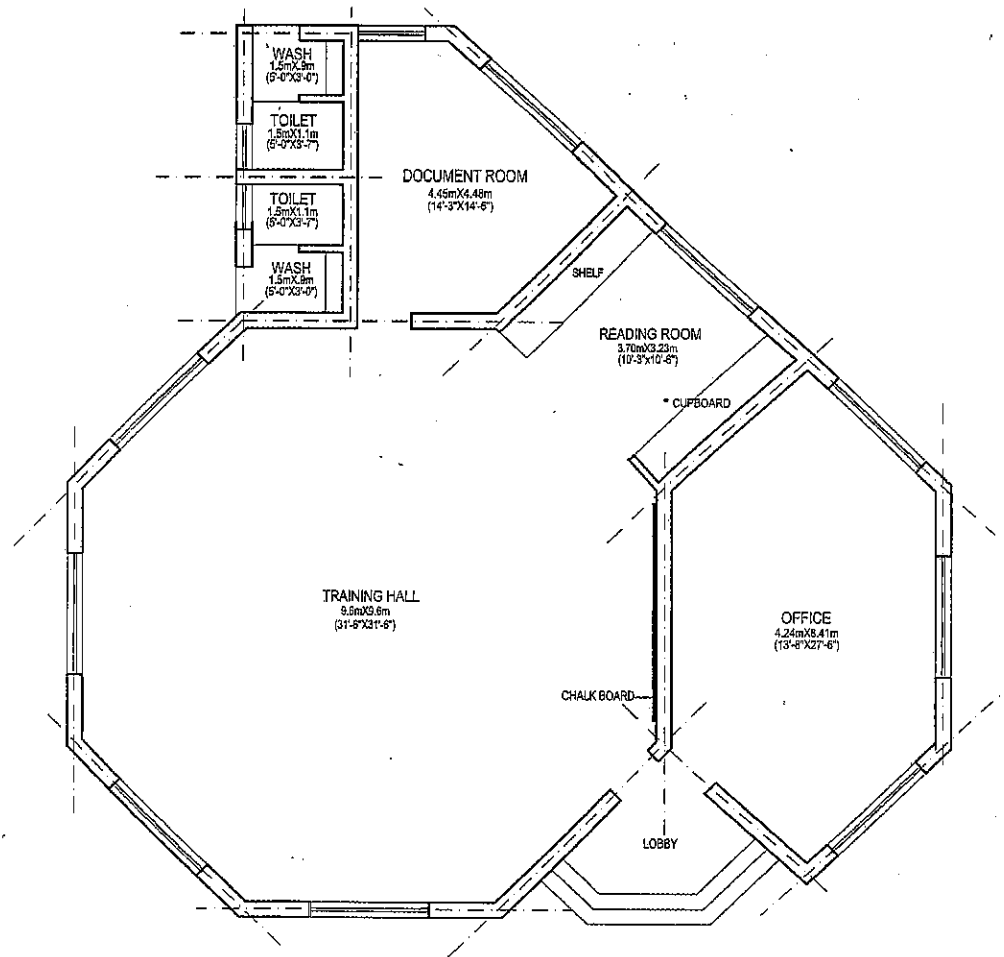


Plinth area. 3149 SqFl
 Estimated Cost Rs. 650,000
 Cost per sqft. Rs. 206

Architects
COSTFORD
THRISSUR

KERALA

Replacement of Rented Building



Plinth area.	1672 SqFt.
Estimated Cost	Rs. 536,000
Cost per sqft	Rs. 320
Architects	
HABITAT TECHNOLOGY GROUP TRIVANDRUM	

Block Resource Centre

KERALA

MAHARASHTRA

PROCESS

After some delays, the design renewal exercise was recently initiated. Designs were prepared by the DPEP engineering cell with support from the Chief Architect.

At present only one school design has been finalised while other school designs and the BRC designs are being prepared.

CONSTRUCTION AGENCY

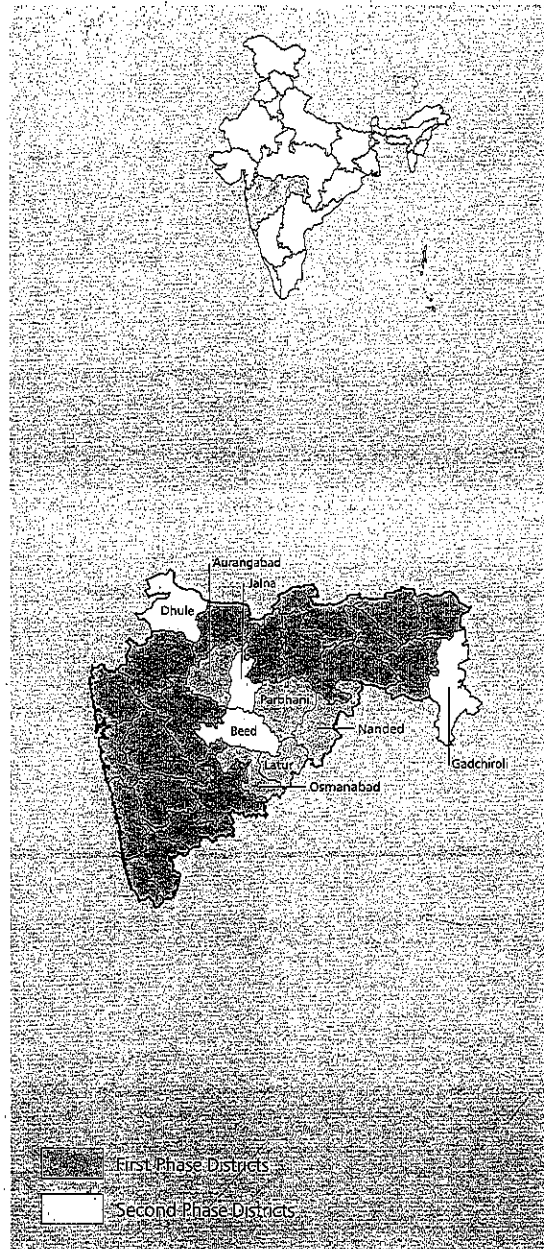
One in-house contract engineer is being appointed in each block. Engineers on deputation / contract are present in the state and district offices.

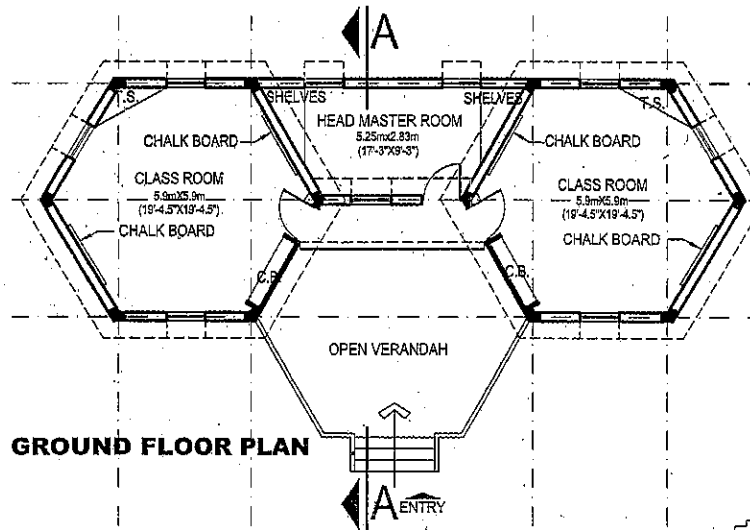
Construction is to begin shortly after the appointment of the engineers.

The works are being undertaken through the Gram Panchayats.

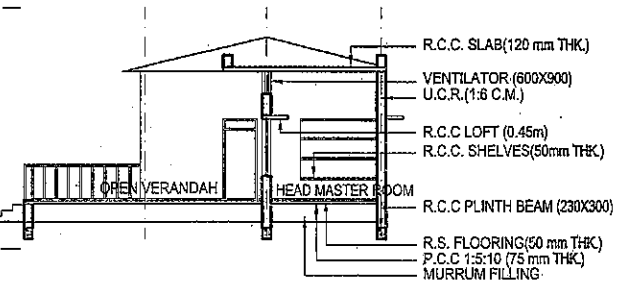
UNIT COSTS

Estimates of the designs are yet to be finalised.

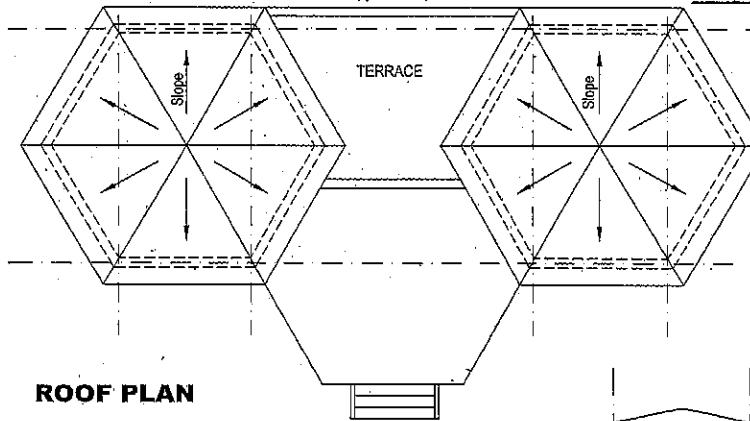




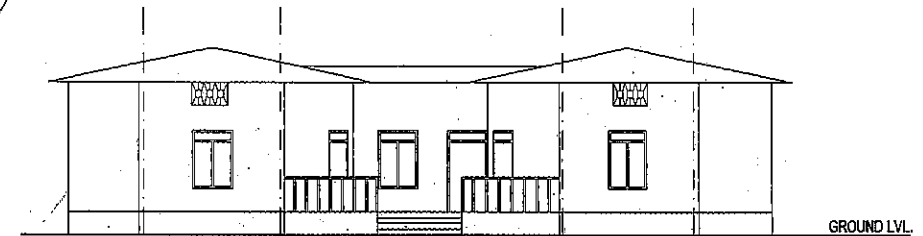
GROUND FLOOR PLAN



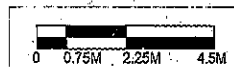
SECTION-AA



ROOF PLAN



FRONT ELEVATION

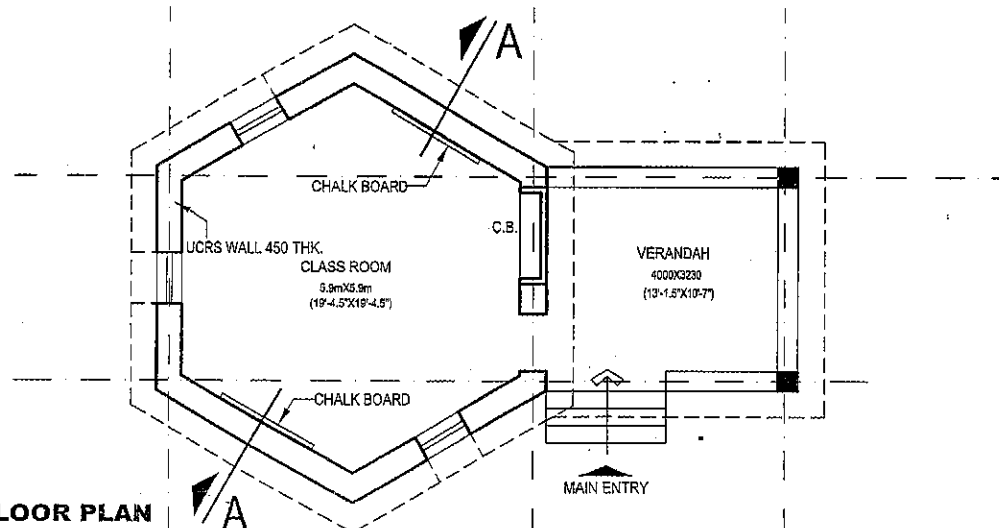


Plinth area. 1093.25 sq ft
 Estimated cost Rs. 287,000
 Cost per Sq. ft. Rs. 263

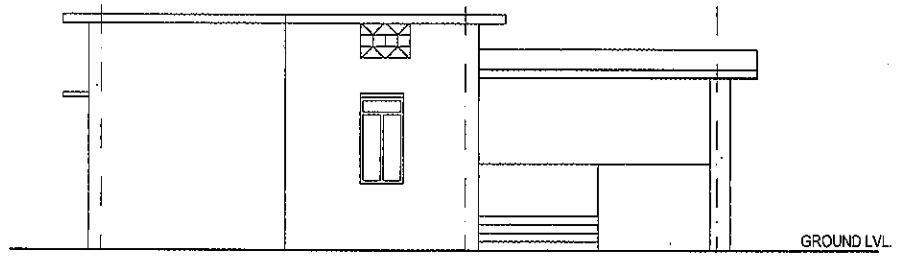
D P E P
 maharashtra

Two Room School

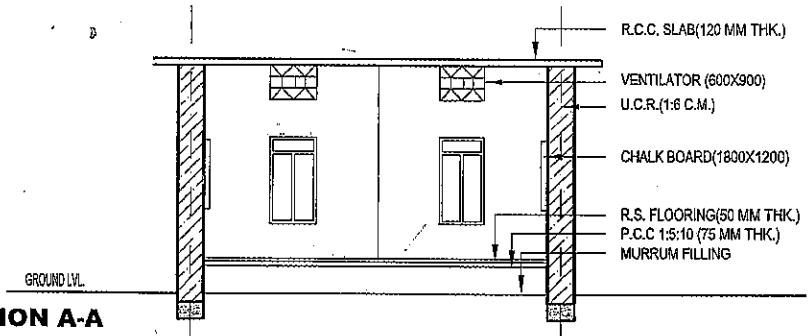
MAHARASHTRA



GROUND FLOOR PLAN



FRONT ELEVATION



SECTION A-A

Plinth area.	614.88 sq ft
Estimated cost	Rs. 145,000
Cost per Sq. ft.	Rs. 236
D P E P maharashtra	

MAHARASHTRA One Room School

MADHYA PRADESH

PROCESS

RGPSM appointed EPCO for the first stage wherein 11 empanelled consultants were involved in the preparation of district specific designs. The exercise commenced in early 1997. District studies and reports were prepared by consultants before the preparation of preliminary designs. Each consultant prepared two options each for schools and BRCs.

A workshop was held in April 1997 wherein district studies as well as designs were discussed and modifications were suggested. The modified designs were discussed in another workshop in November 1997 where a total of about 15 designs were finally adopted.

These designs were then sent to the districts for selection. The designs are now being implemented in various districts through the RES. In some cases the designs use alternate materials (primarily stone, wherever available). In others, the buildings are being constructed with conventional materials. Construction began in April 1998 and some buildings have been completed since.

DESIGN FEATURES

Some valuable designs (especially BRCs) emerged from the design renewal exercise in Madhya Pradesh. The designs are residential and have dormitories. Kitchens which were a part of the earlier brief were eliminated due to cost considerations.

The BRCs that are being implemented have created informal spaces / courtyards that would encourage informal interactions during residential programmes.

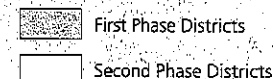
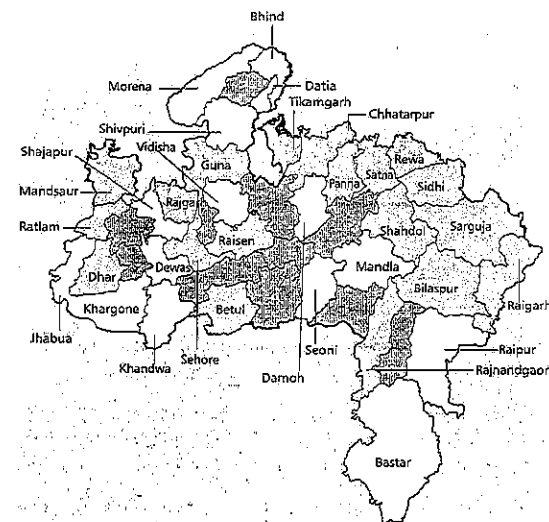
Attention has been paid to the incorporation of various classroom facilities in the school designs. These schools have been designed on the brief that one of the rooms would be used for linear teaching while the other should have provision for activity based teaching.

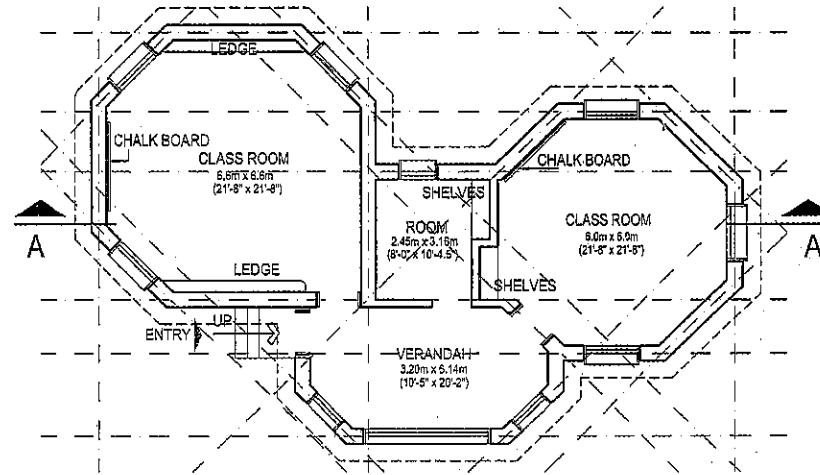
CONSTRUCTION AGENCY

Supervision is being undertaken by RES engineers or engineers from other government departments. Financially, construction works are being undertaken through the community.

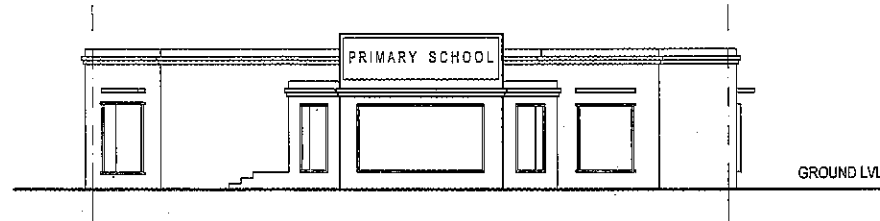
UNIT COSTS

Preliminary estimates of the consultants as well as the range of the final estimates have been indicated on the drawings.

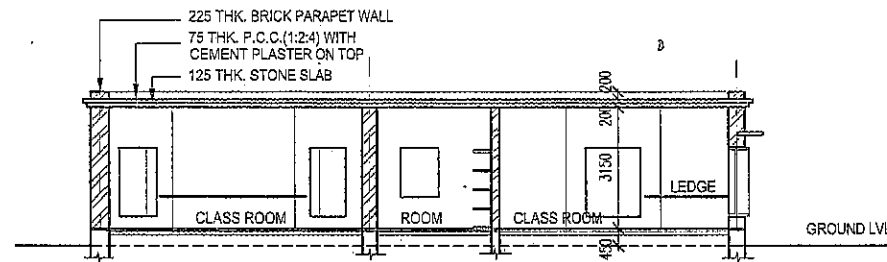




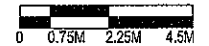
GROUND FLOOR PLAN



FRONT ELEVATION



SECTION - AA



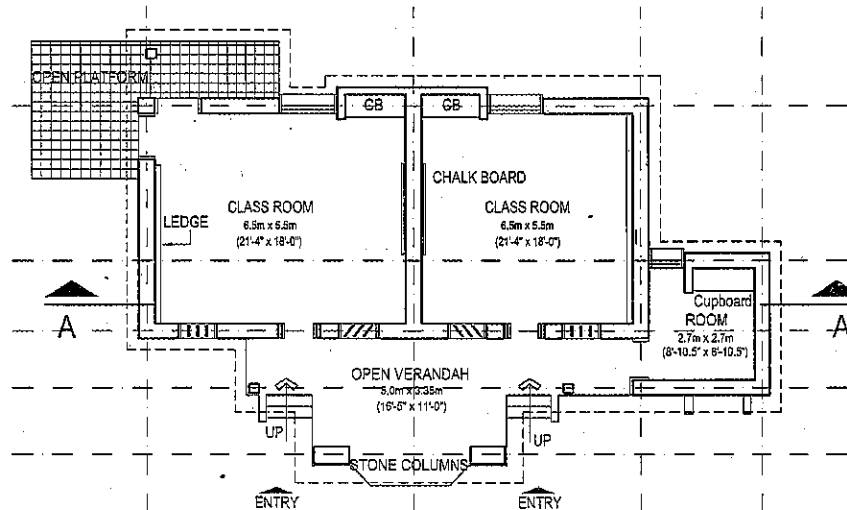
Plinth area.	1337.27 sq
Estimated cost	Rs. 235,000
Cost per Sq. ft.	Rs. 176

Architects

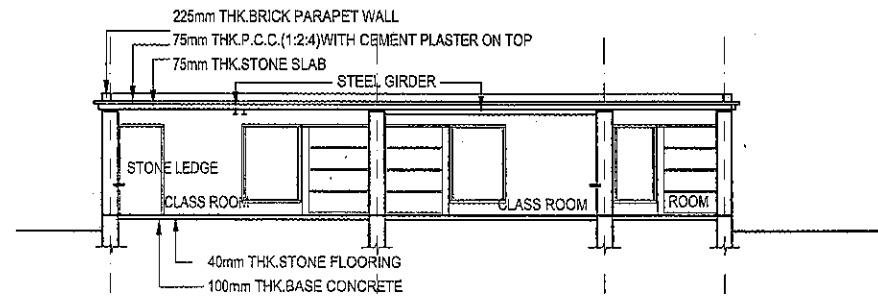
SRIJAN CONSULTANTS
b h o p a l

MADHYA PRADESH

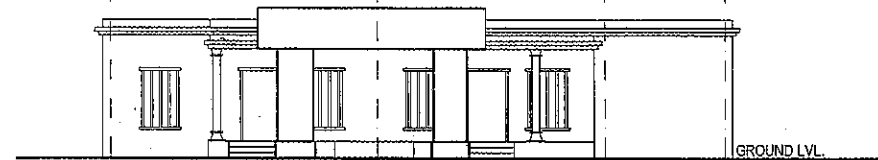
School for RGPSM at Shivpuri



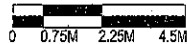
GROUND FLOOR PLAN



SECTION - AA



FRONT ELEVATION

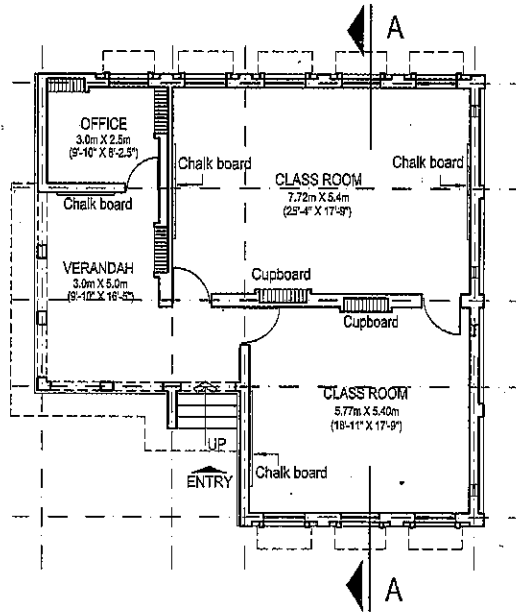


Plinth area. 1329.75 sq ft
 Estimated cost Rs. 253,000
 Cost per Sq. ft. Rs. 190

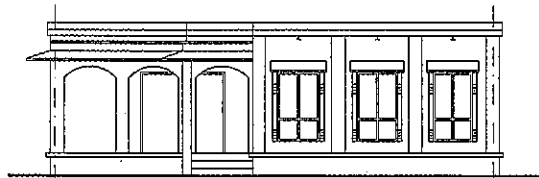
Architects
SRIJAN CONSULTANTS
 b h o p a l

School for RGPSM at Shivpuri

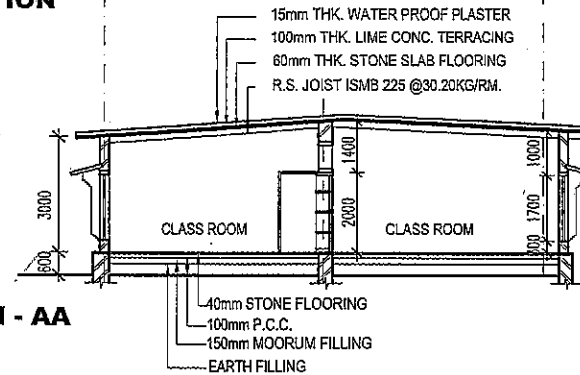
MADHYA PRADESH



GROUND FLOOR PLAN



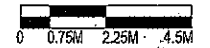
ELEVATION



SECTION - AA

- 15mm THK. WATER PROOF PLASTER
- 100mm THK. LIME CONC. TERRACING
- 80mm THK. STONE SLAB FLOORING
- R.S. JOIST ISMB 225 @30.20KG/RM.

- 40mm STONE FLOORING
- 100mm P.C.C.
- 150mm MOORUM FILLING
- EARTH FILLING



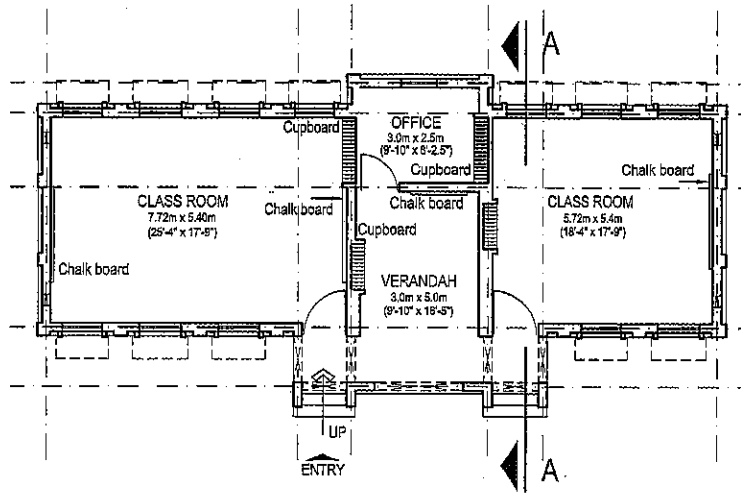
Plinth area. 1246.97 sft
 Estimated cost Rs 241,000
 Cost per Sq. ft. Rs. 193

Architects

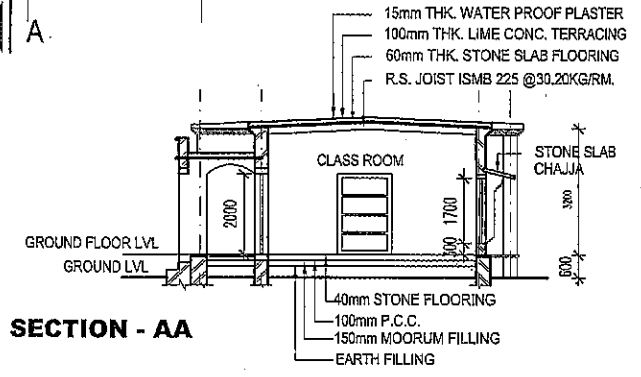
SRIJAN CONSULTANTS
 bhopal

MADHYA PRADESH

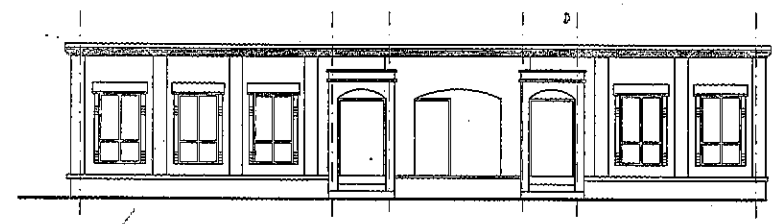
Primary School at Morena



GROUND FLOOR PLAN



SECTION - AA



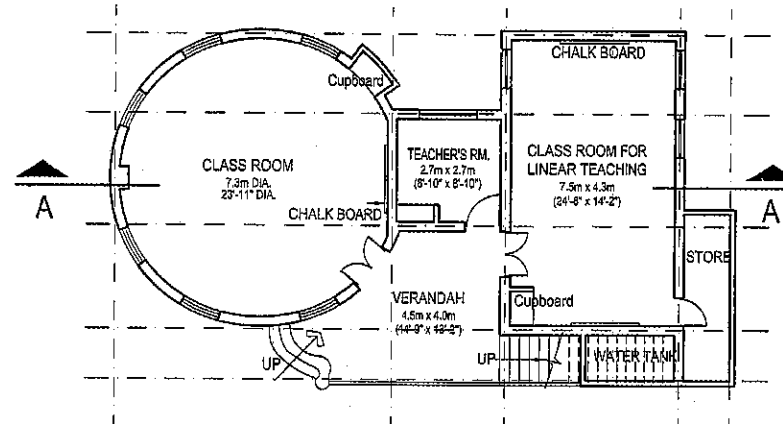
ELEVATION

0 0.75M 2.25M 4.5M

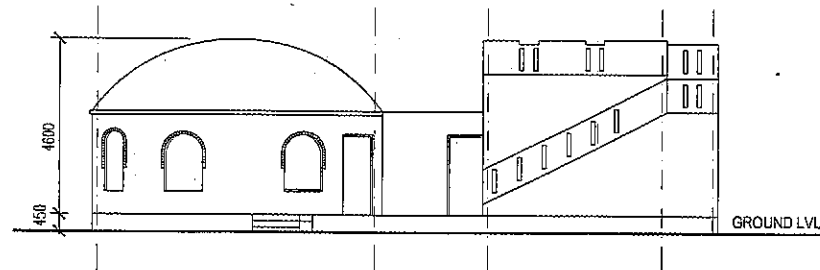
Plinth area. 1225.47 sqft
 Estimated cost Rs. 255,000
 Cost per Sq. ft. Rs. 208

Architects
 SRIJAN CONSULTANTS
 b h o p a l

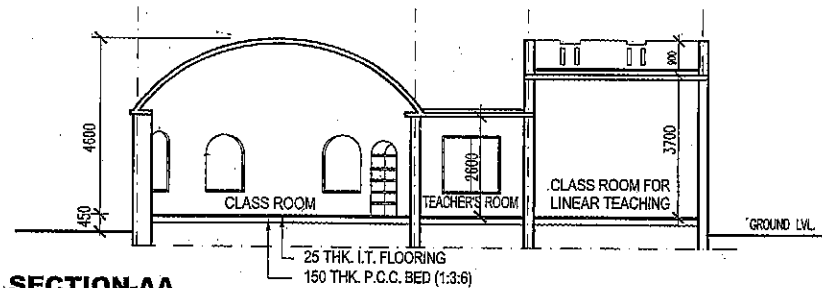
Primary School at Morena **MADHYA PRADESH**



GROUND FLOOR PLAN



FRONT ELEVATION

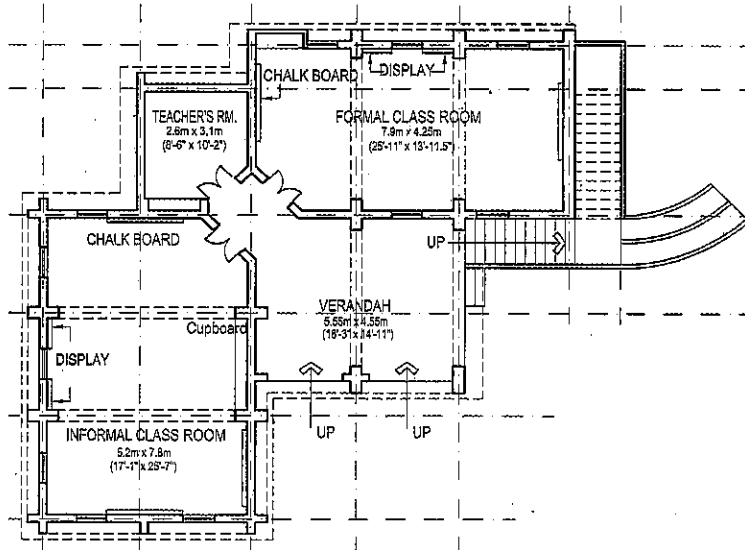


SECTION-AA

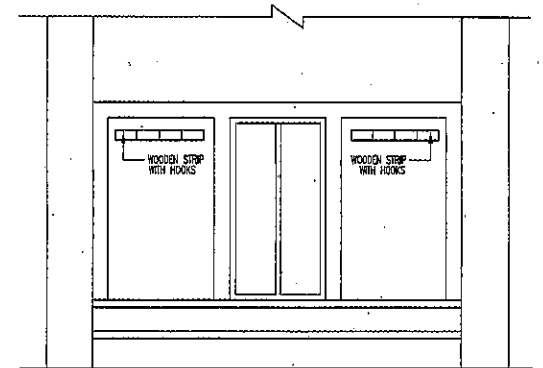
0 0.75M 2.25M 4.5M	
Plinth area.	1211 sqft
Estimated cost	Rs. 231,000
Cost per Sq. ft.	Rs. 191
Architects	
DESIGN AVENUES	
b h o p a l	

MADHYA PRADESH

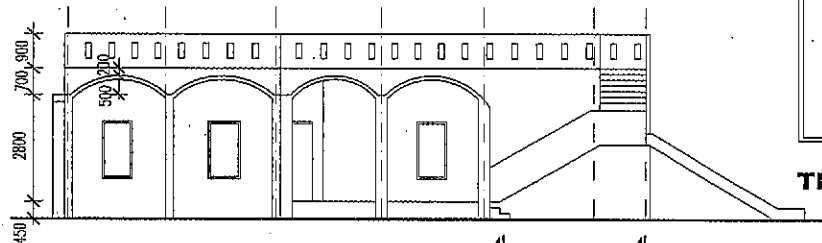
Primary School at Khandwa



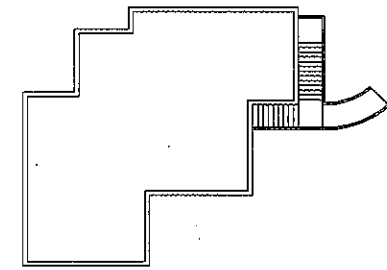
GROUND FLOOR PLAN



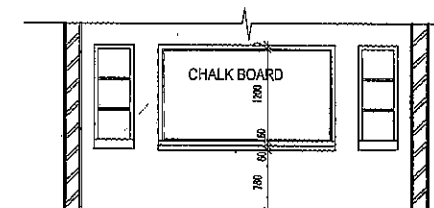
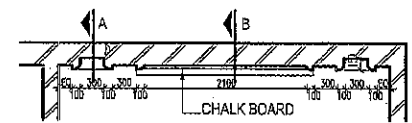
ELEVATION OF DISPLAY PROVISIONS



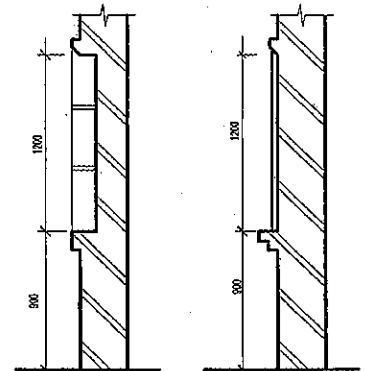
FRONT ELEVATION



TERRACE PLAN



DETAIL OF CHALKBOARD



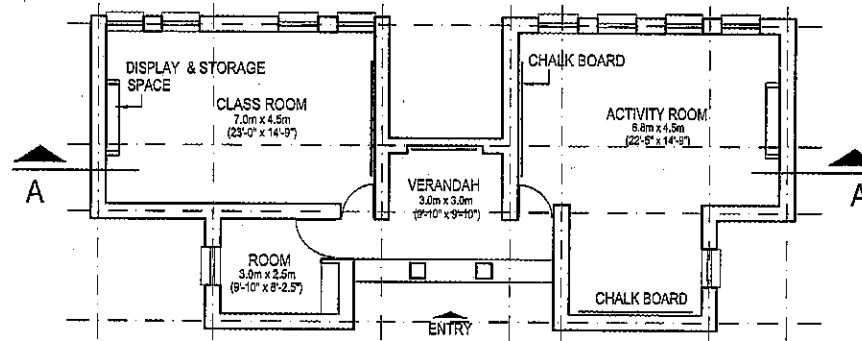
SECTION A

SECTION B

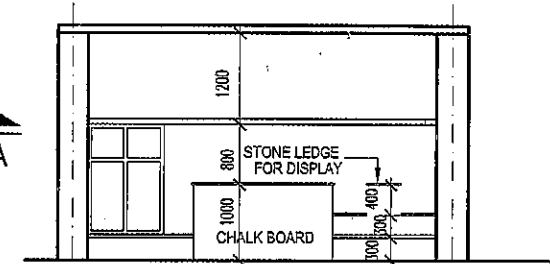
Plinth area.	1241.60 sqft
Estimated cost	Rs. 230,000
Cost per Sq. ft.	Rs. 185
Architects	
DESIGN AVENUES	
b h o p a l	

Primary School at Khandwa

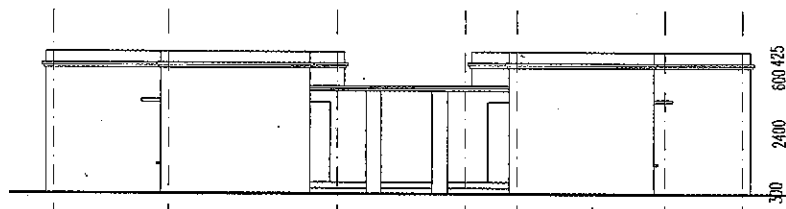
MADHYA PRADESH



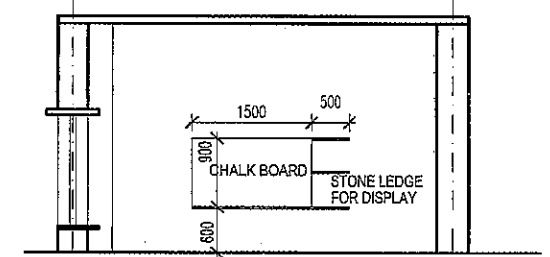
GROUND FLOOR PLAN



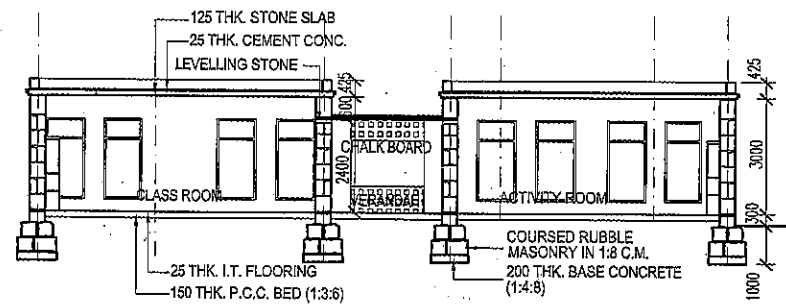
CLASSROOM WALL ELEVATION



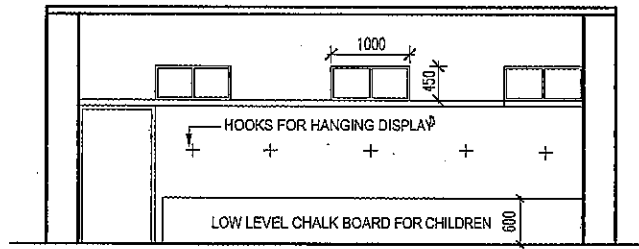
FRONT ELEVATION



CLASSROOM WALL ELEVATION



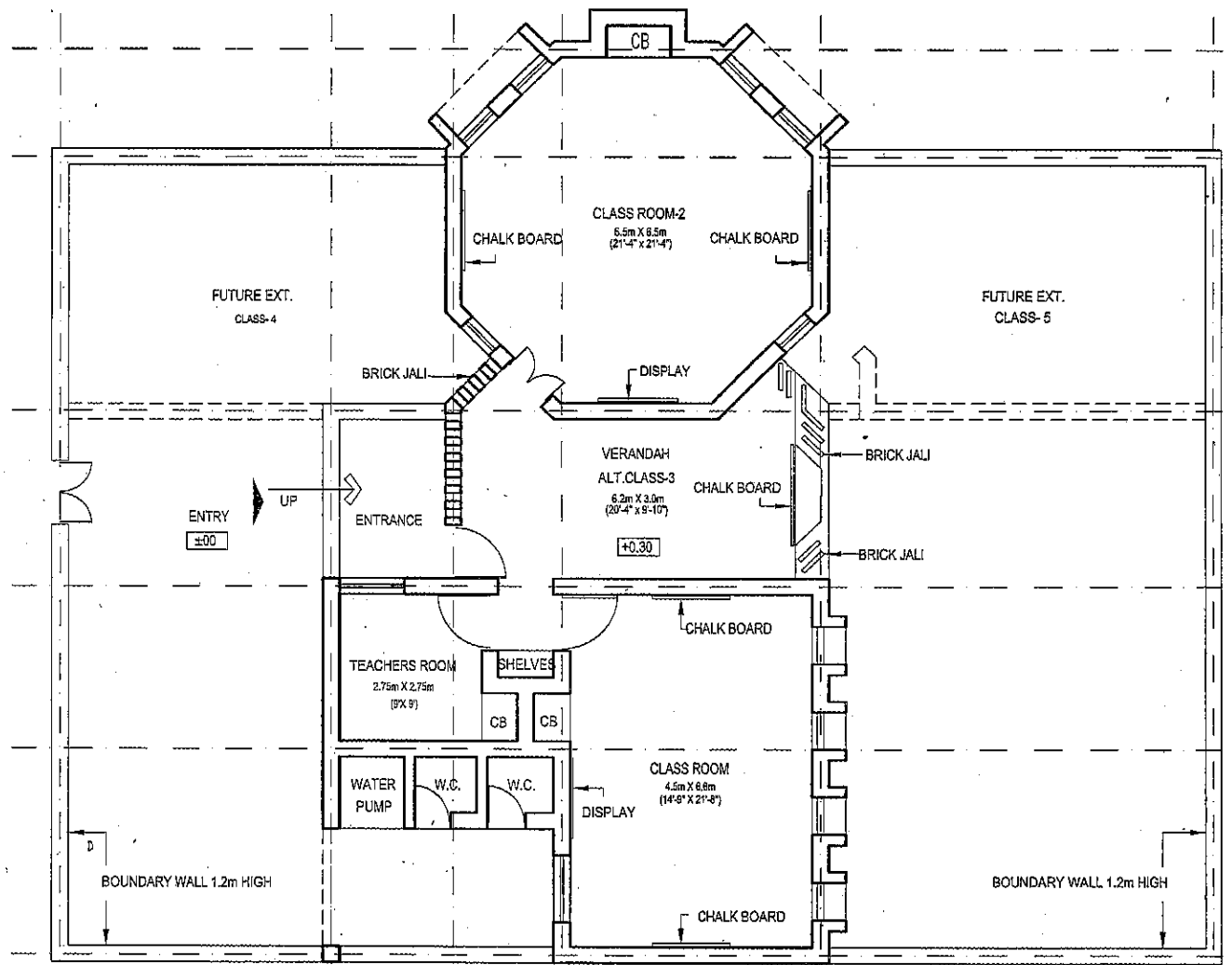
SECTION -AA



CLASSROOM WALL ELEVATION

0 0.75M 2.25M 4.5M	
Plinth area.	1218.02 sft
Estimated cost	Rs. 235,000
Cost per Sq. ft.	Rs. 193
Architects	
D I P A L I	

MADHYA PRADESH Primary School at Vidisha District

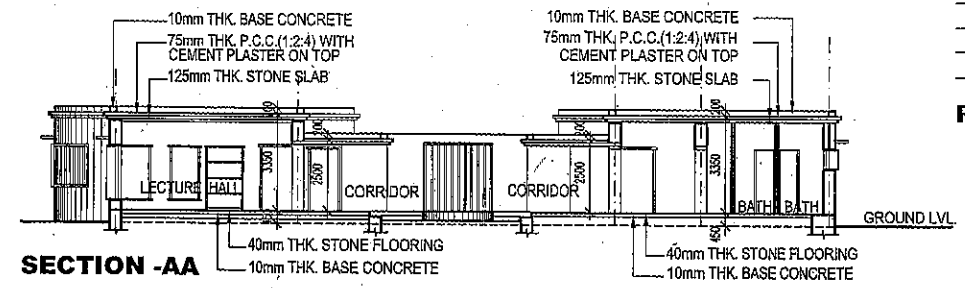
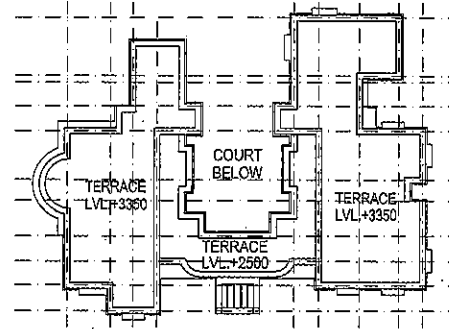
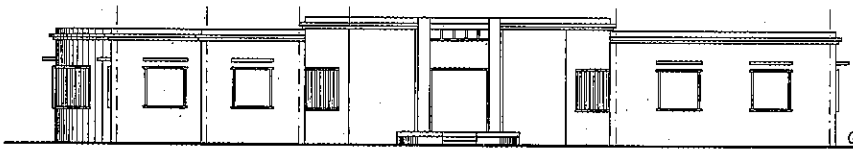
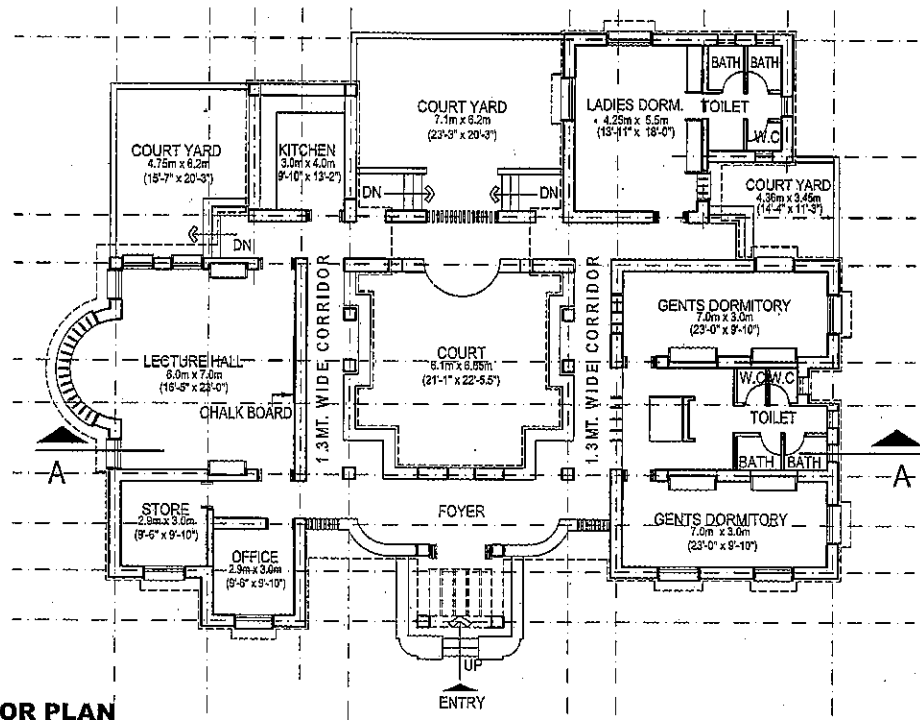


GROUND FLOOR PLAN

Plinth area.	1375.9 sft
Estimated cost	Rs. 228,000
Cost per Sq. ft.	Rs. 166
Architects	
CORBU. GROUP b h o p a l	

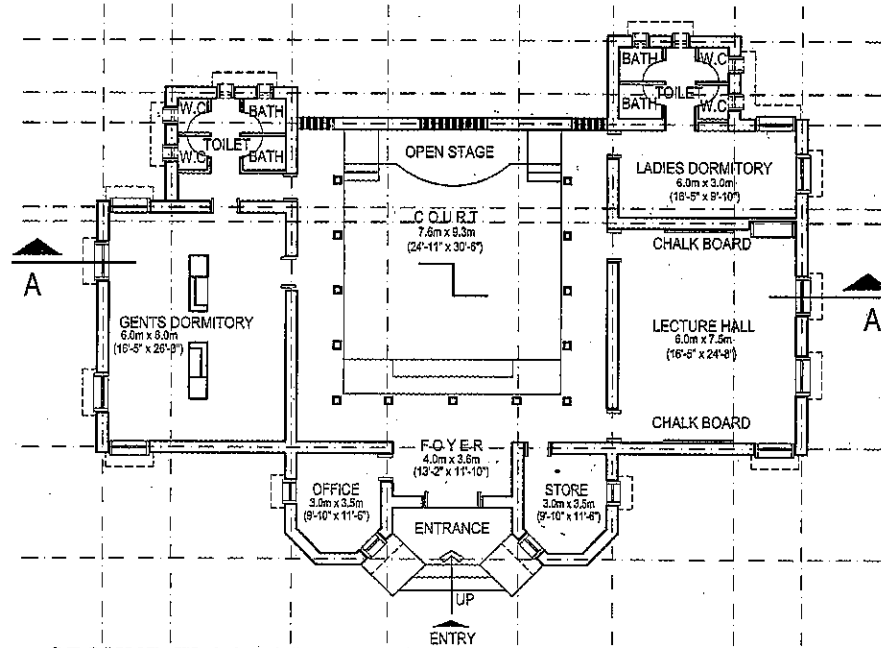
New Primary School, Raipur

MADHYA PRADESH

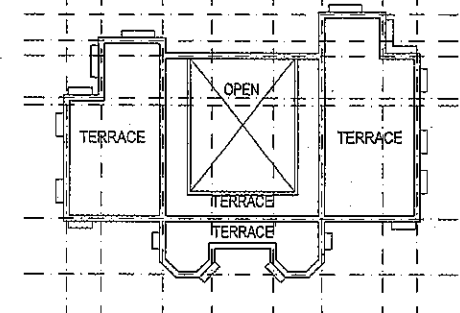


0 1M 3M 6M	
Plinth area.	3544 sq ft
Estimated cost	Rs. 577,000
Cost per Sq. ft.	Rs. 163
Architects	
SRIJAN CONSULTANTS	
bhopal	

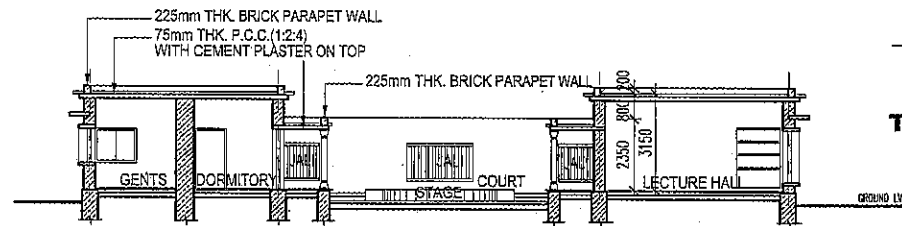
MADHYA PRADESH BRC for RGPSM at Shivpuri



GROUND FLOOR PLAN

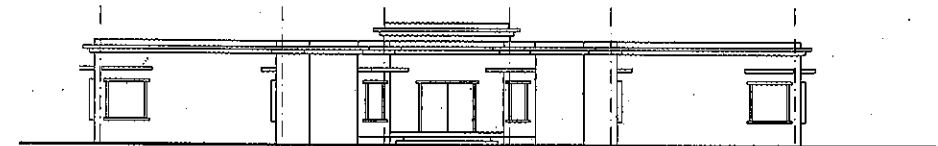


TERRACE PLAN



SECTION - AA

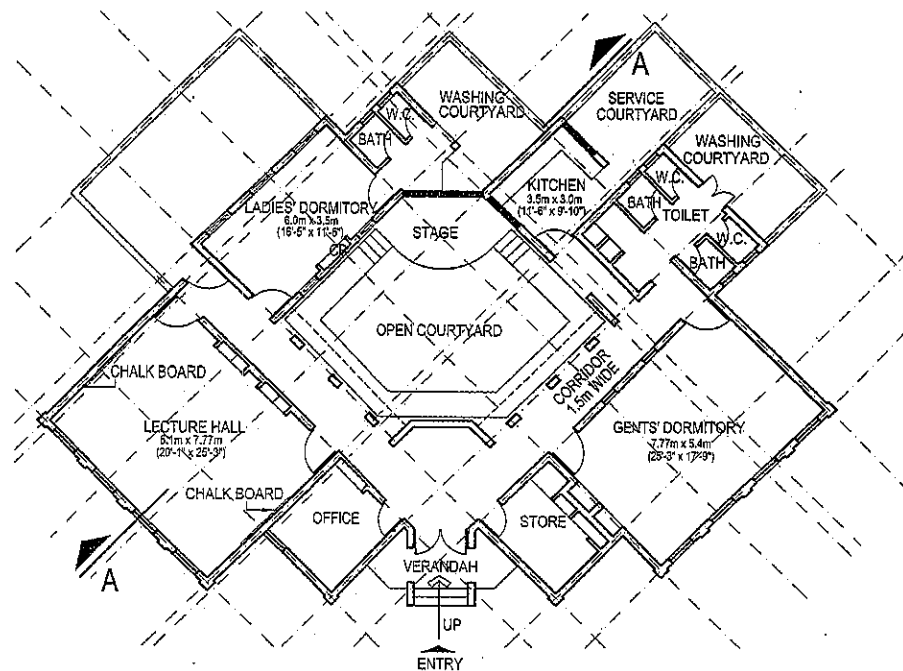
Plinth area.	2844.78 sft
Estimated cost	Rs. 553,000
Cost per Sq. ft.	Rs. 194
Architects	
SRIJAN CONSULTANTS b h o p a l	



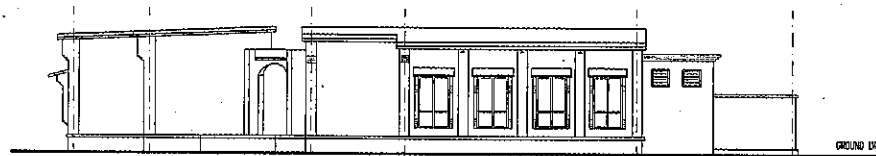
FRONT ELEVATION

BRC for RGPSM at Shivpuri

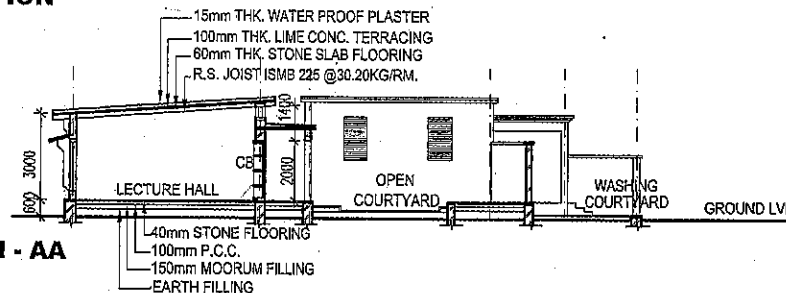
MADHYA PRADESH



GROUND FLOOR PLAN



ELEVATION

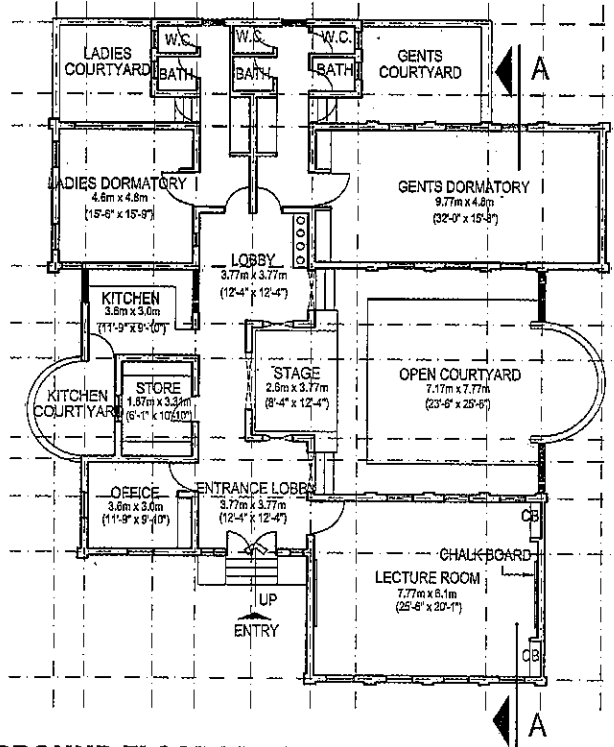


SECTION - AA

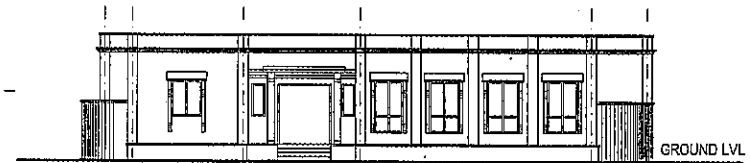
- 15mm THK. WATER PROOF PLASTER
- 100mm THK. LIME CONC. TERRACING
- 60mm THK. STONE SLAB FLOORING
- R.S. JOIST ISMB 225 @30.20KG/RM.
- 40mm STONE FLOORING
- 100mm P.C.C.
- 150mm MOORUM FILLING
- EARTH FILLING

Plinth area.	2682.07 sq ft
Estimated cost	Rs. 625,000
Cost per Sq. ft.	Rs. 233
Architects	
SRIJAN CONSULTANTS bhopal	

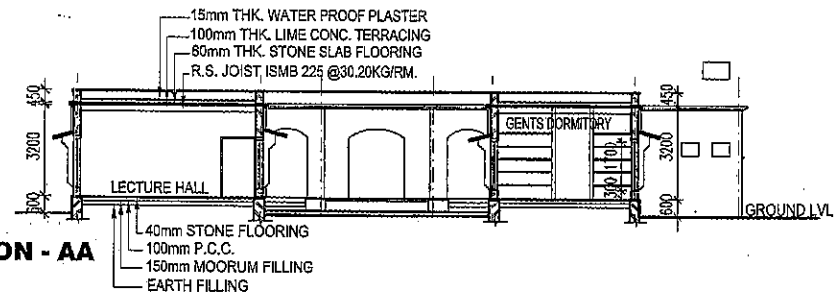
MADHYA PRADESH BRC for Morena District.



GROUND FLOOR PLAN



ELEVATION

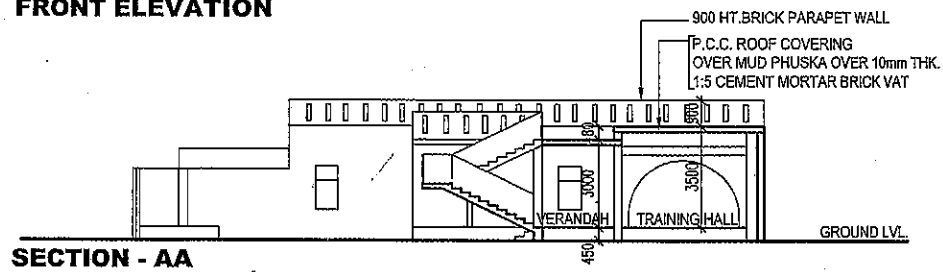
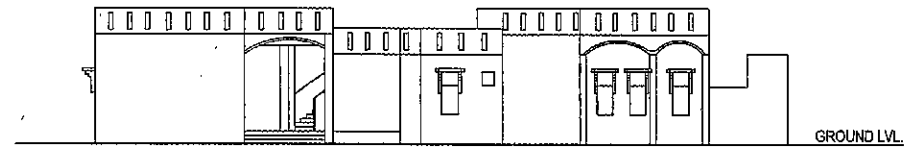
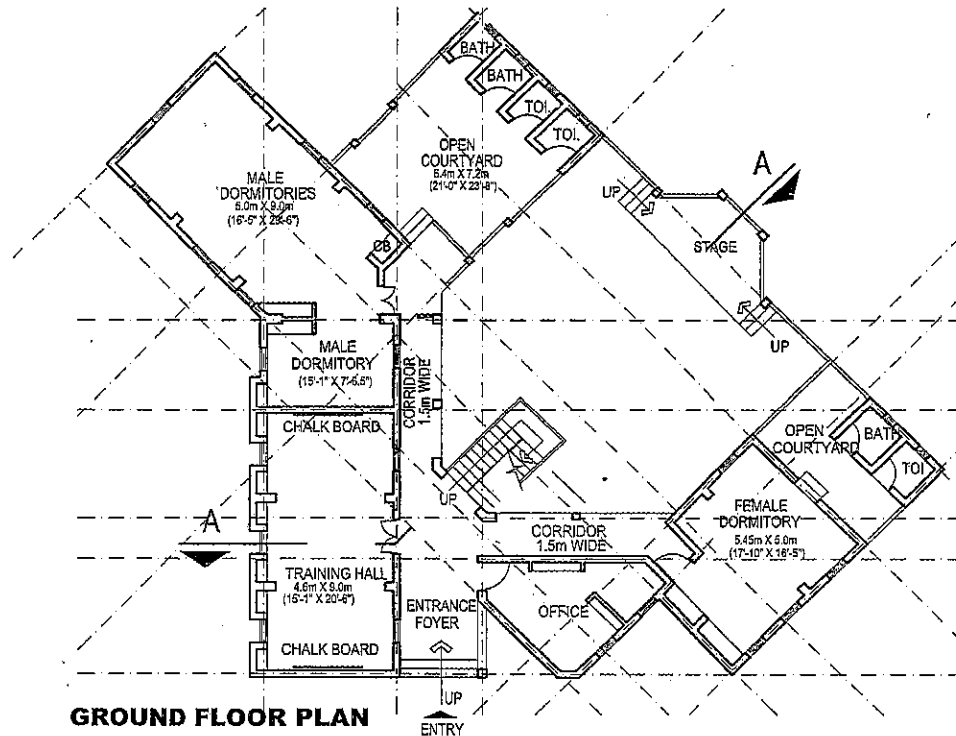


SECTION - AA

Plinth area.	2627.25 sqft
Estimated cost	Rs. 618,000
Cost per Sq. ft.	Rs. 235
Architects	
SRIJAN CONSULTANTS b h o p a l	

BRC for Morena District

MADHYA PRADESH



0 1M 3M 6M	
Plinth area.	2382.86 sq
Estimated cost	Rs. 459,000
Cost per Sq. ft.	Rs. 194
Architects	
DESIGN AVENUES	
b h o p a l	

MADHYA PRADESH BRC for Khandwa District.

TAMIL NADU

PROCESS

The design renewal exercise was initiated in late 1997 through the offices of the chief architect PWD. The designs were finalised in early 1998. Construction began in April 1998 and some constructions have since been completed.

DESIGN FEATURES

Schools incorporate all the features that are now standard, namely, display, storage, etc. Specific efforts have been made to cater to the constrained site conditions that often exist.

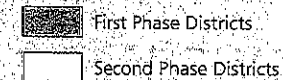
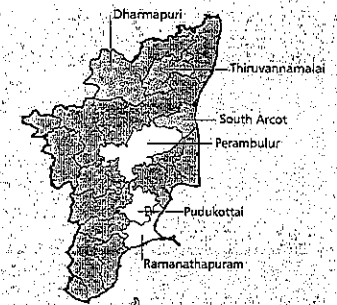
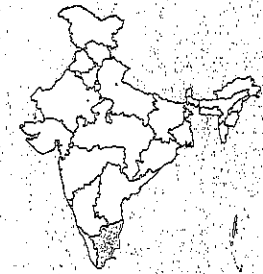
All designs have been modified for different site orientations. Minor modification of window locations and blackboard positions were provided to the engineers. Site planning options were also prepared for typical site conditions.

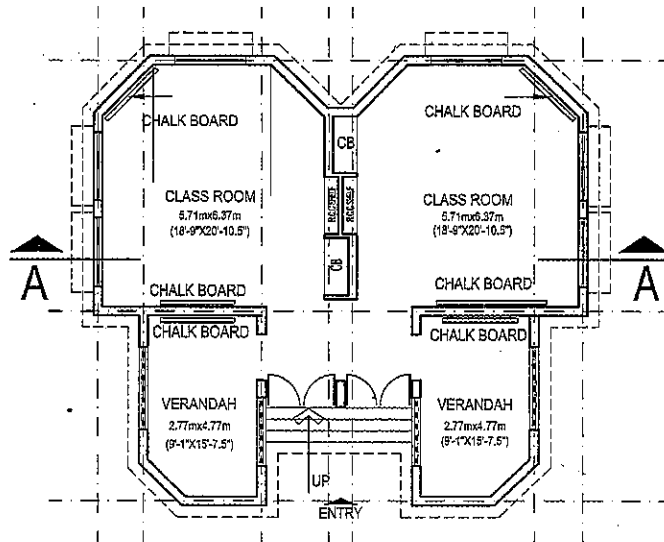
CONSTRUCTION AGENCY

Construction is being undertaken by the PWD (Buildings) which is bidding out the works. A few community participation works are being undertaken by the DPEngineer at the district level.

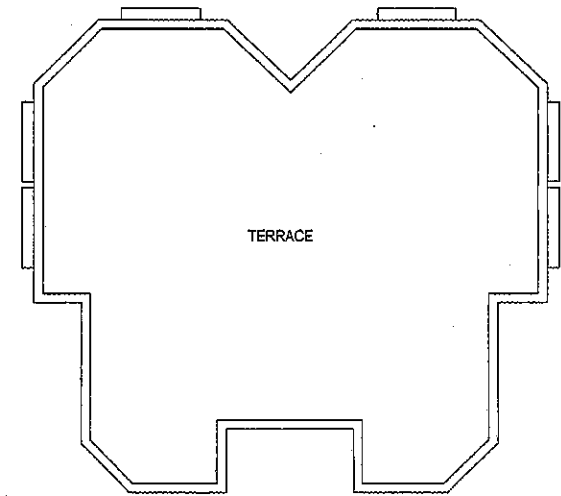
UNIT COSTS

Estimates of the designs are indicated on the drawings.

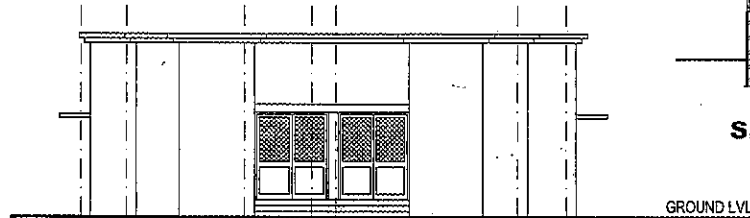




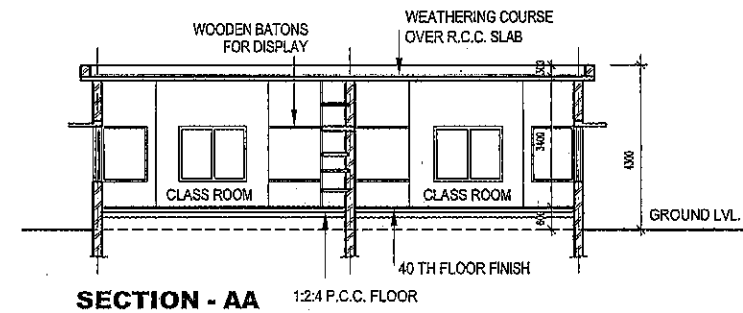
GROUND FLOOR PLAN



TERRACE PLAN



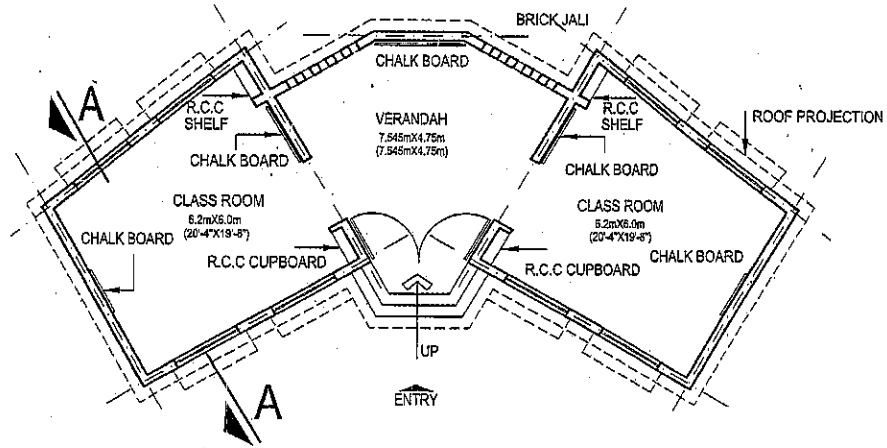
FRONT ELEVATION



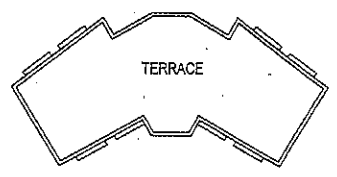
SECTION - AA 1:24 P.C.C. FLOOR

0 0.75M 2.25M 4.5M	
Plinth area.	1362.00 sft
Budgeted cost	Rs. 330,000
Cost per sft	Rs. 242
Architects	
CHIEF ARCHITECT	
p.w.d., chennai 5	

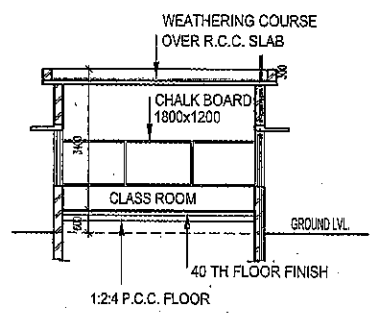
TAMIL NADU Two Room School with two Verandahs



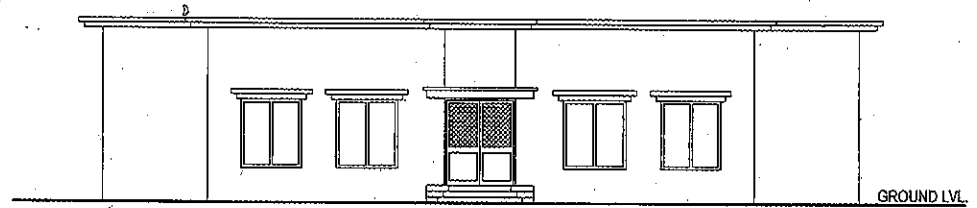
GROUND FLOOR PLAN



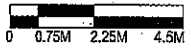
TERRACE PLAN



SECTION - AA



FRONT ELEVATION

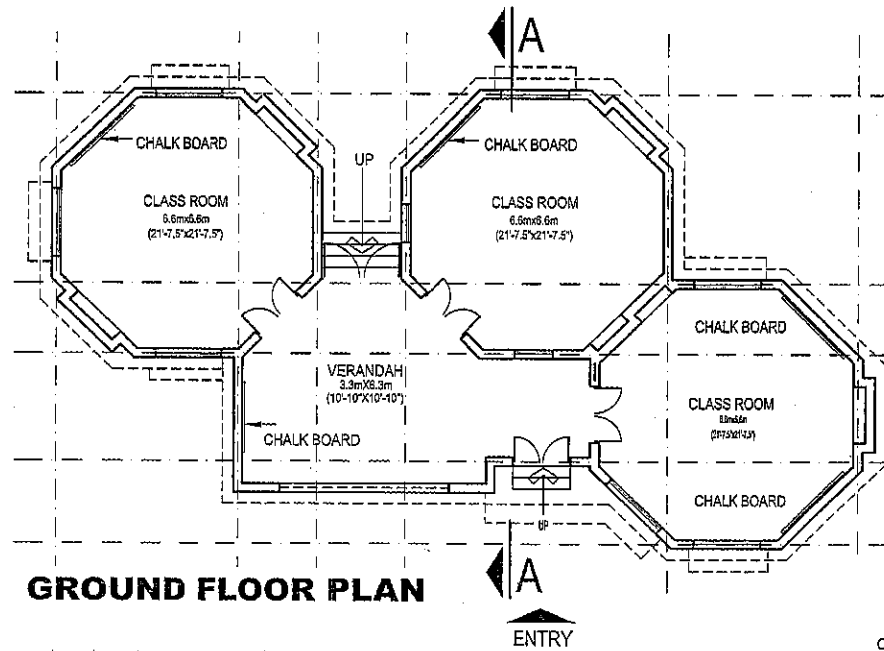


Plinth area. 1059.28 sqft
 Budgeted cost Rs. 330,000
 Cost per sqft Rs. 312

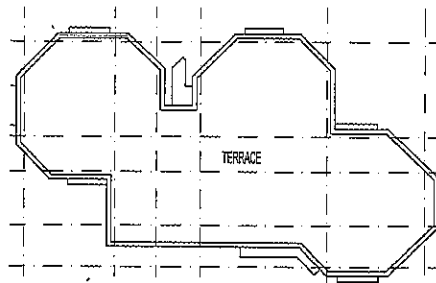
Architects
 CHIEF ARCHITECT
 p.w.d; chennai 5

Two Room School with one Verandah

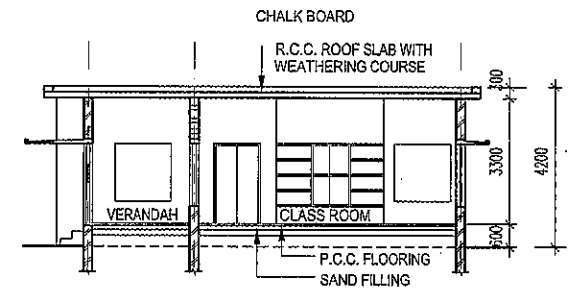
TAMIL NADU



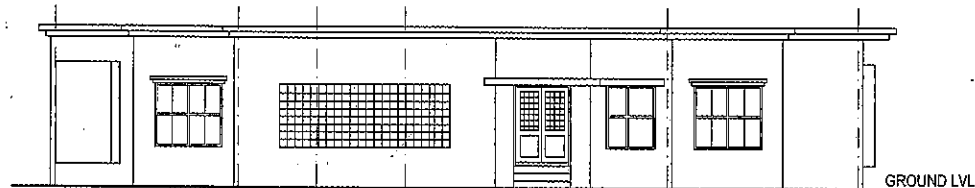
GROUND FLOOR PLAN



TERRACE PLAN



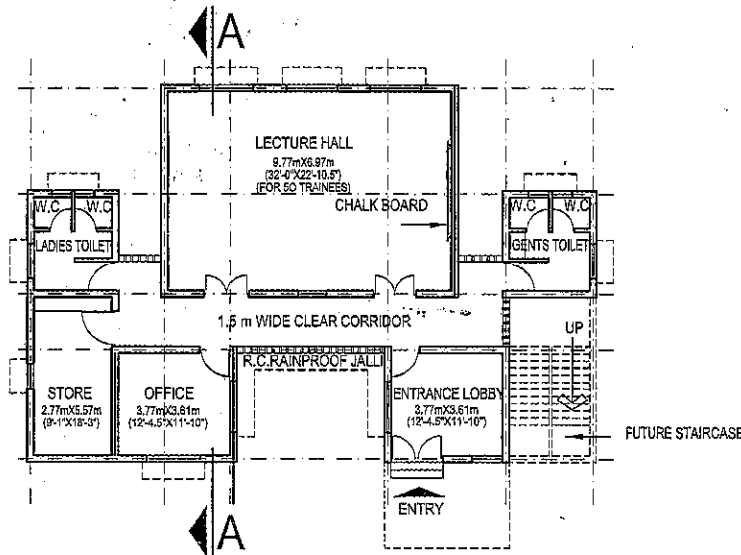
SECTION - AA



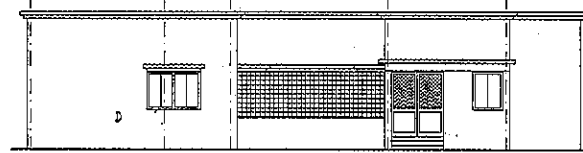
FRONT ELEVATION

Plinth area.	1739.85 sft
Budgeted cost	Rs. 450,000
Cost per sft	Rs. 259
Architects	
CHIEF ARCHITECT	
p.w.d., chennai 5	

TAMIL NADU Three Room school with one Verandah



GROUND FLOOR PLAN



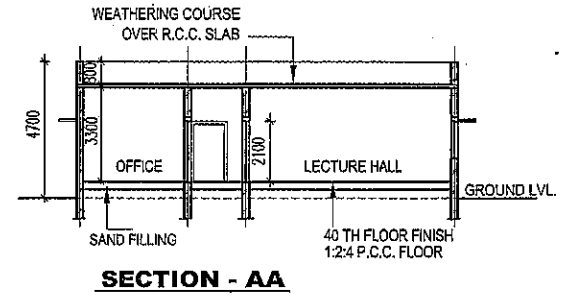
FRONT ELEVATION

0 1M 3M 6M

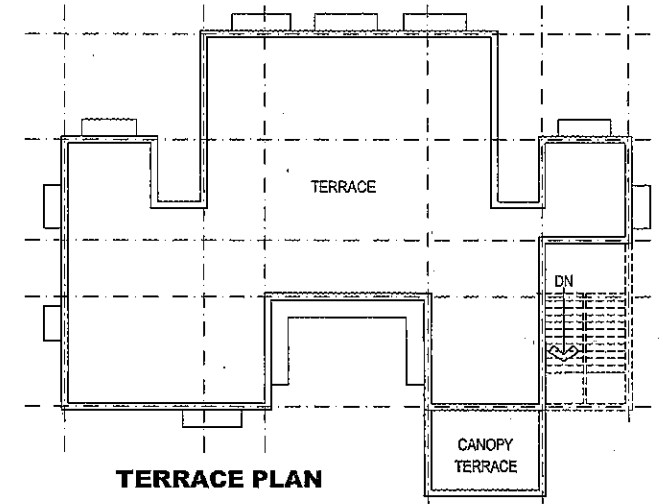
Plinth area.	2158.56 sqft
Estimated cost	Rs. 750,000
Cost per sqft	Rs. 347

CHIEF ARCHITECT
p.w.d., chennai 5

Block Resource Centre



SECTION - AA



TERRACE PLAN

TAMIL NADU

ANDHRA PRADESH

PROCESS

Consultant agencies were involved in the design renewal process and the school designs were finalised by early 1997. Construction of schools and MRCs commenced in mid 1997 and early 1998 respectively.

DESIGN FEATURES

School designs are modified version of APPEP designs. One hexagonal design APPEP prototype buildings with cost-effective technologies is being used in DPEP. Initially consultant developed BRC designs which were not adopted due to conversion of BRCs into MRCs. MRC design was developed by DPEP Engineering cell itself.

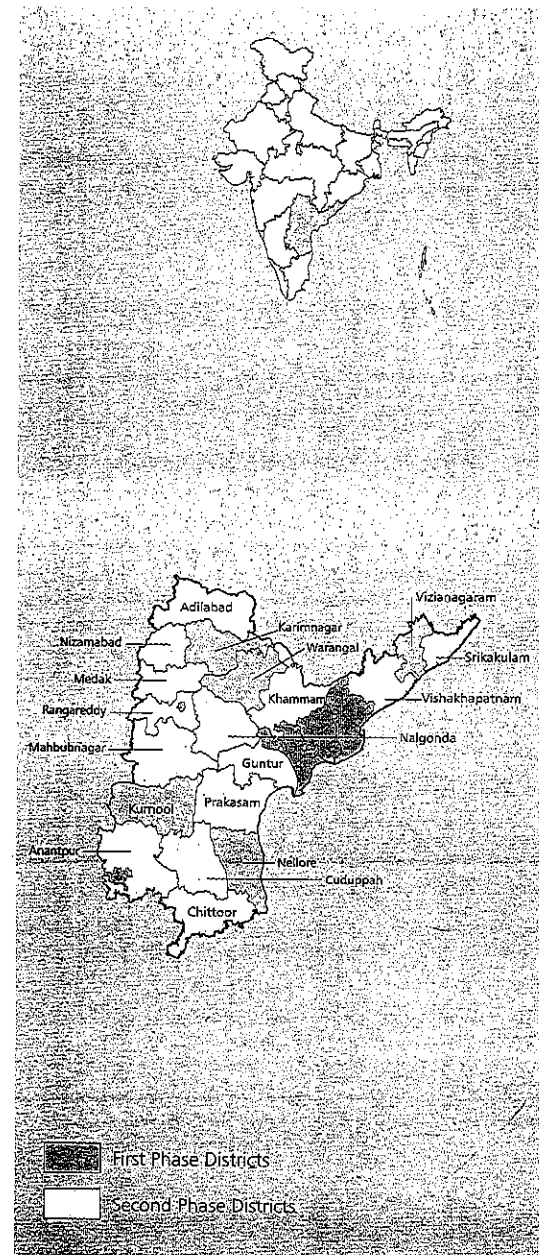
APPEP designs were modified by incorporating pedagogical features like storage, display etc and adopting sloping roof as required.

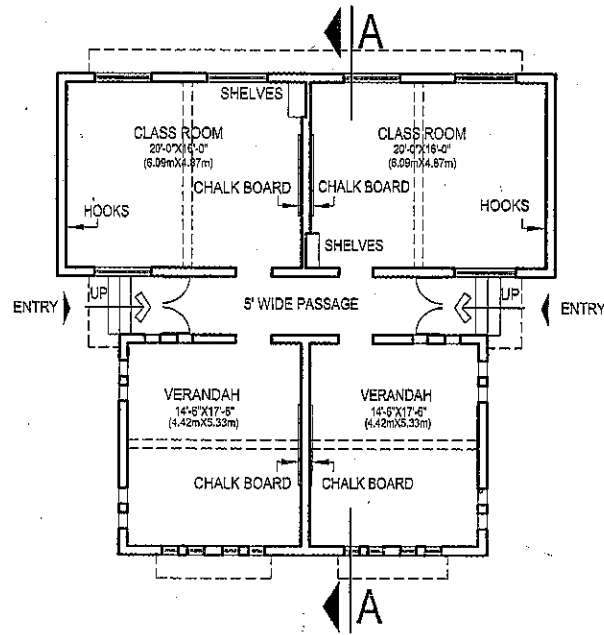
CONSTRUCTION AGENCY

Engineers on contract are undertaking the supervision of works. One engineer is appointed for every 5 to 6 works. The construction work is being undertaken through the community.

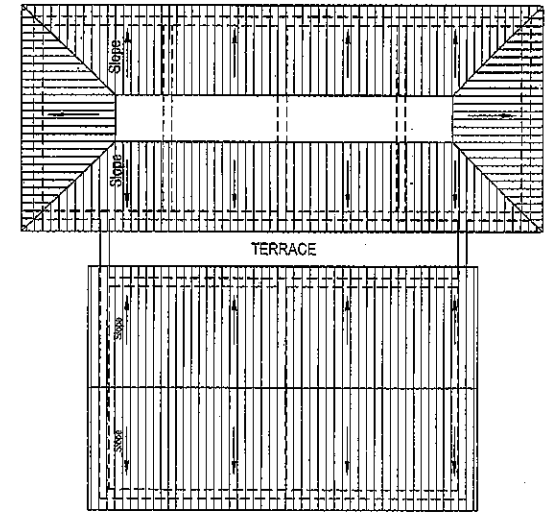
UNIT COSTS

Estimates of the designs are indicated on the drawings.

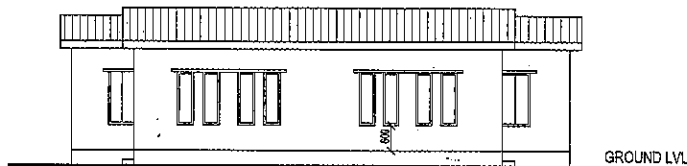




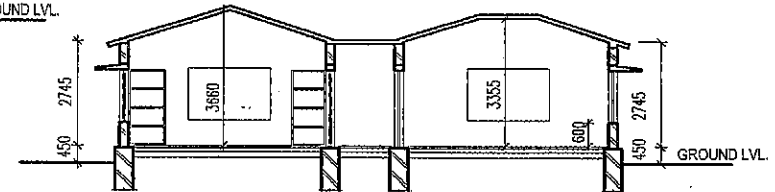
GROUND FLOOR PLAN



ROOF PLAN



FRONT ELEVATION



SECTION - AA

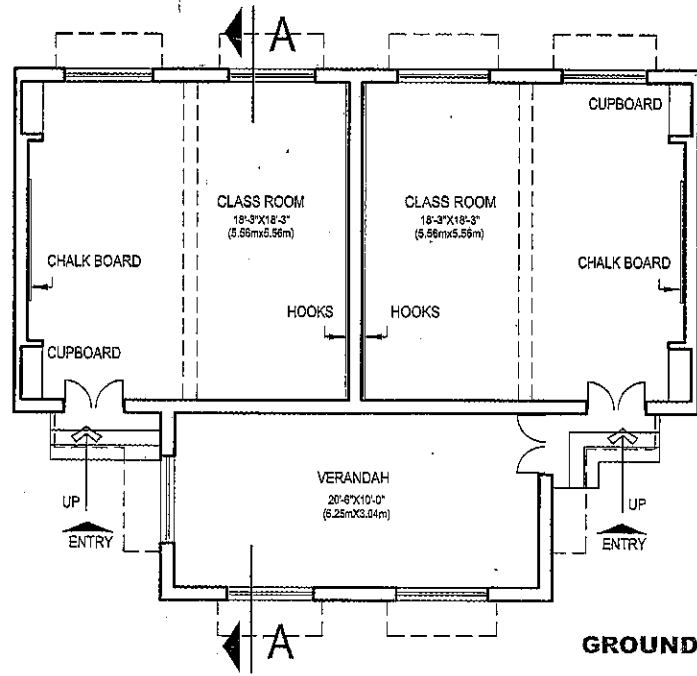
0 0.5M 1.5M 3M

Plinth area. 1450 sft
 Estimated cost Rs. 250,000
 Cost per Sq. ft. Rs. 172

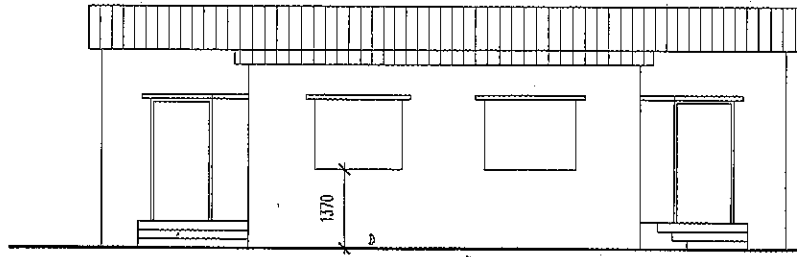
D P E P
 andhra pradesh

Two Classroom School

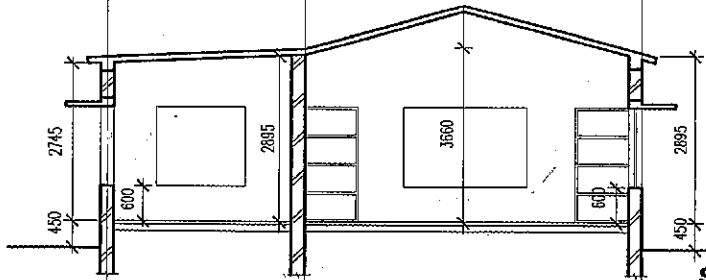
ANDHRA PRADESH



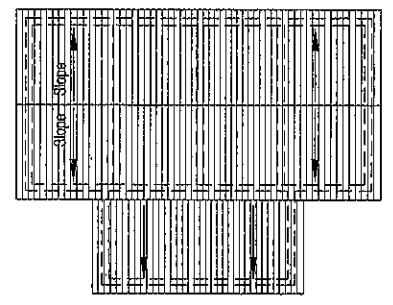
GROUND FLOOR PLAN



FRONT ELEVATION



SECTION - AA

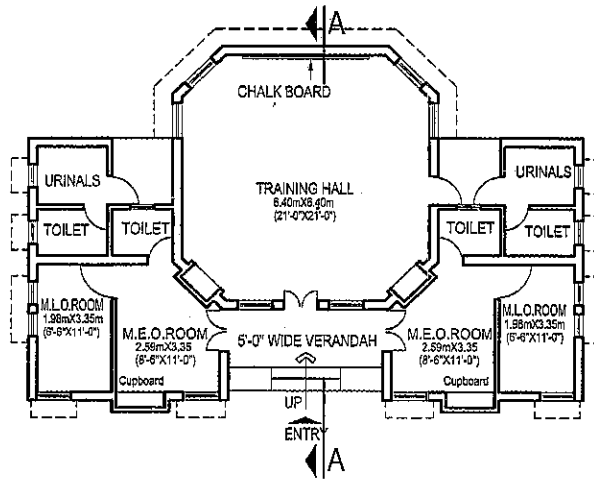


ROOF PLAN

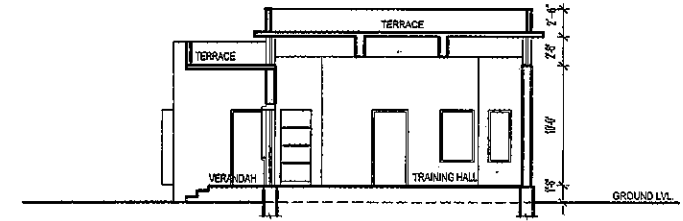
0 0.5M 1.5M 3M	
Plinth area.	996 sft
Estimated cost	Rs. 175,000
Cost per Sq. ft.	Rs. 176

ANDHRA PRADESH

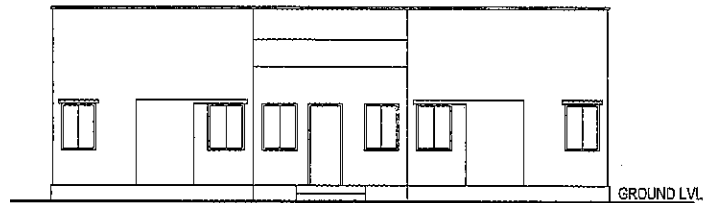
Two Classroom School



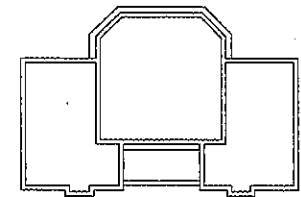
GROUND FLOOR PLAN



SECTION - AA



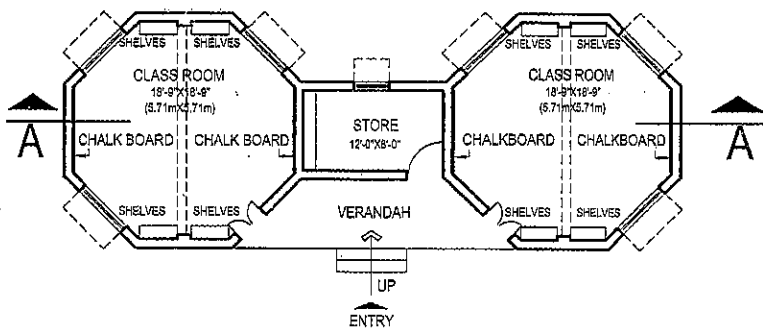
FRONT ELEVATION



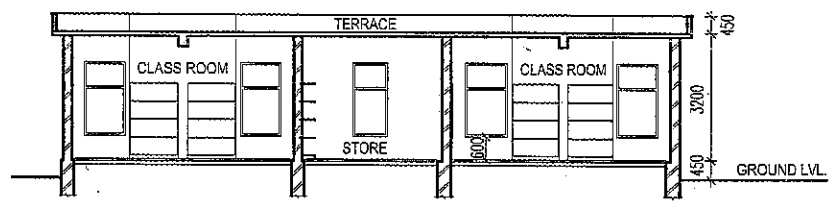
ROOF PLAN

Plinth area.	1211 sq. ft.
Estimated cost	Rs. 300,000
Cost per Sq. ft.	Rs. 248
D P E P andhra pradesh	

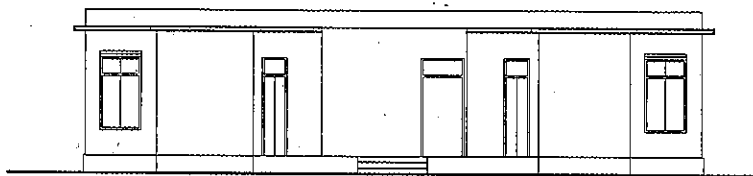
Mandal Resource Centre **ANDHRA PRADESH**



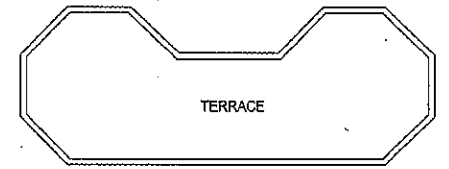
GROUND FLOOR PLAN



SECTION AA



FRONT ELEVATION



FLAT ROOF PLAN

Plinth area.	996 sq ft
Estimated cost	Rs. 175,000
Cost per Sq. ft.	Rs. 176
D P E P andhra pradesh	

ANDHRA PRADESH

Two Classroom School

GUJARAT

PROCESS

One consultant was involved in the design renewal process. An initial design renewal workshop was held in July 1997. A further design briefing was held in February 1998. Soon after, the initial school designs were prepared and approved in March-April 1998. Presently school construction is to commence and BRCs contracts are in the process of being awarded for five sites.

DESIGN FEATURES

The designs from Gujarat have been able to fulfill the requirements of the design brief to a significant extent. All designs cater to requirements of attractive display and storage spaces for the children.

Classrooms facilitate activity based learning, the designs are sensitive to the need for expansion and do so without affecting light and ventilation while at the same time creating courts and additional teaching spaces. The aspect of security was a concern to DPEP Gujarat. All designs can be entirely secured through by locking the main door. Enclosed school compounds have been created which require minimum boundary walls.

BRCs have been designed to cater to the need for informal activity spaces, including courts with stages. While a formal kitchen is not provided, a semi-enclosed cooking area and a separate dining court has been provided in all BRCs. All dormitories have individual storage spaces and attached toilets with a smaller court for washing and drying clothes.

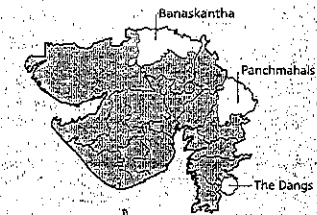
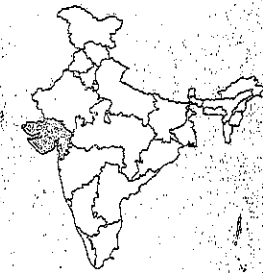
CONSTRUCTION AGENCY

In-house contract engineers (TRPs) are undertaking the supervision of the work. The original staffing of one TRP for two blocks for repairs is now being increased.

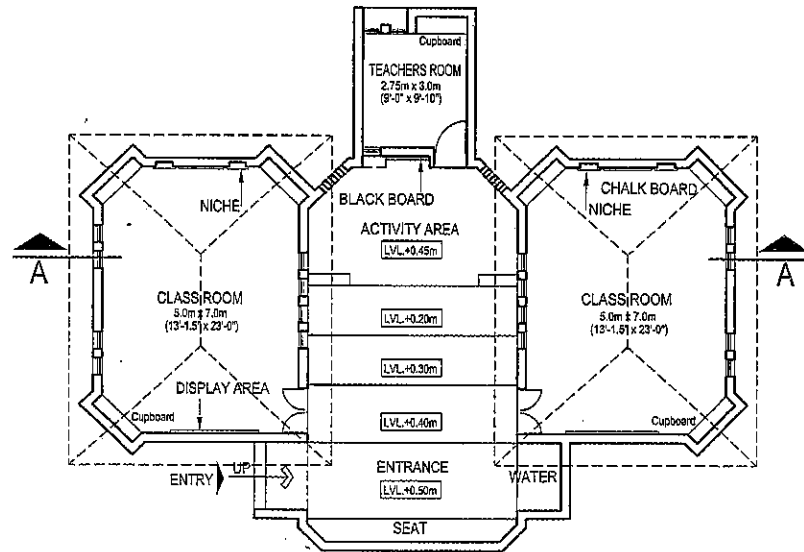
BRCs are being contracted out. Most of the other works are being taken up through the community while a few are being undertaken through National Shopping Procedure.

UNIT COSTS

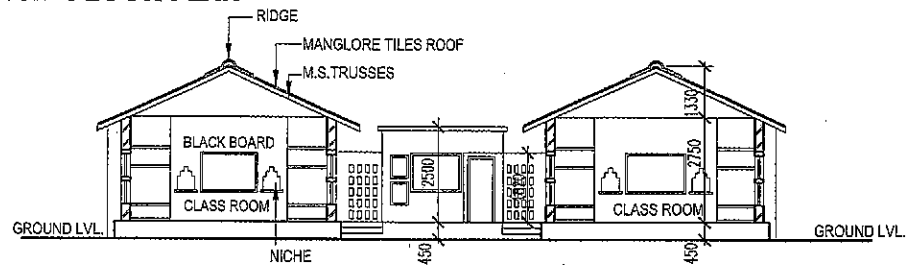
Estimates of some of the designs are finalised and indicated on the drawings. In others, minor design modifications are being made so as to optimise the costs.



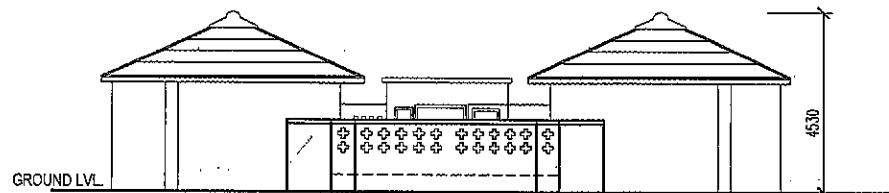
DPEP Districts



GROUND FLOOR PLAN



SECTION - AA

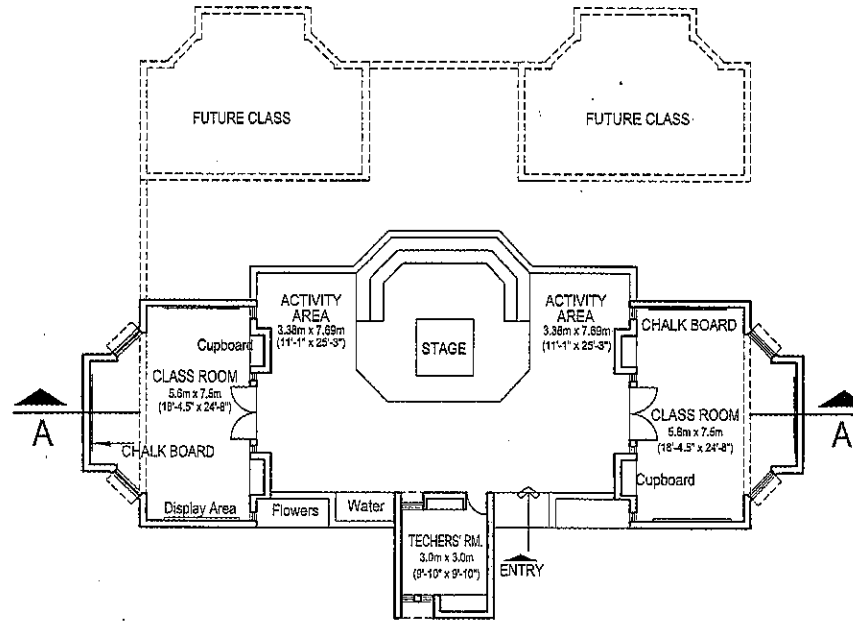


FRONT ELEVATION

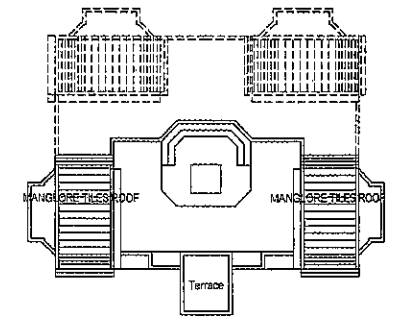
0 0.75M 2.25M 4.5M	
Plinth area.	1079 sqft
Estimated cost	Rs. 230,000
Cost per sq. ft.	Rs. 213
Architects	
AHMEDABAD STUDY ACTION GROUP	
a h m e d a b a d	

GUJARAT

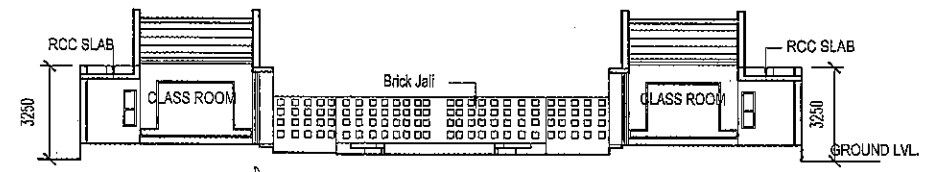
New Primary School



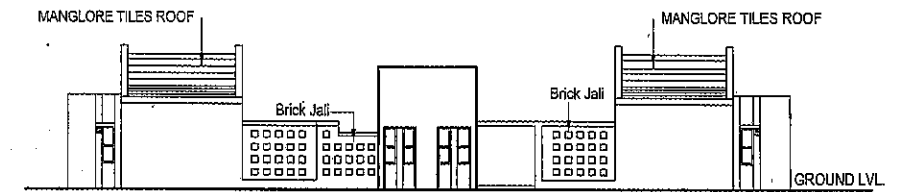
GROUND FLOOR PLAN



ROOF PLAN



SECTION - AA

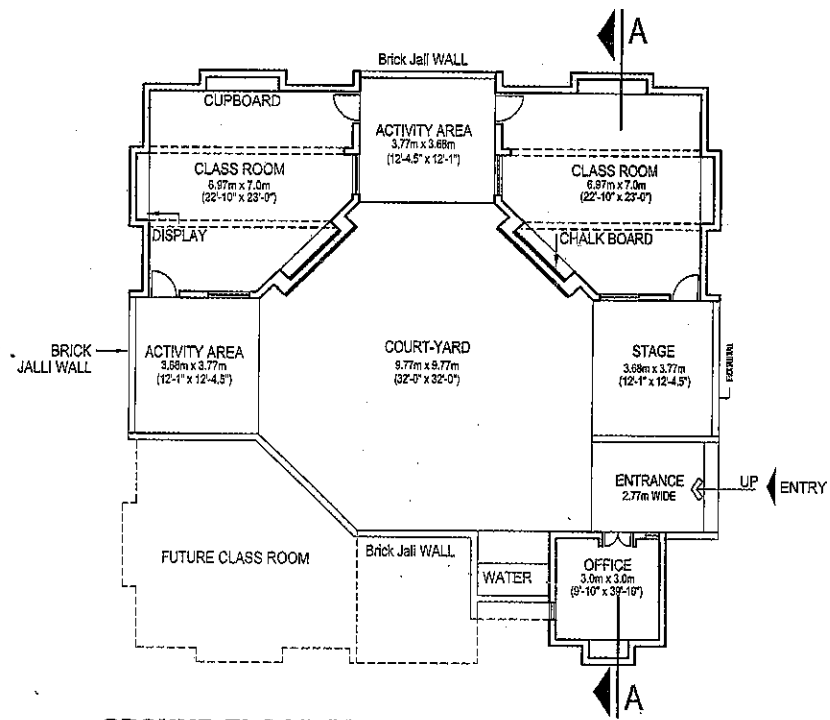


FRONT SIDE ELEVATION

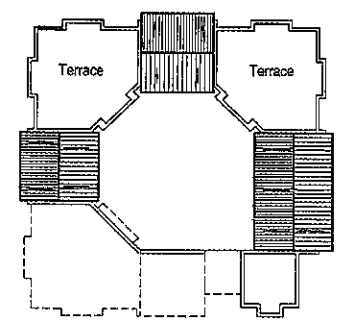
0 1M 3M 6M	
Plinth area	1161 sq ft
Estimated cost	Rs. 250,000
Cost per sq. ft.	Rs. 215
Architects	
AHMEDABAD STUDY ACTION GROUP	
a h m e d a b a d	

Activity Based Primary School .

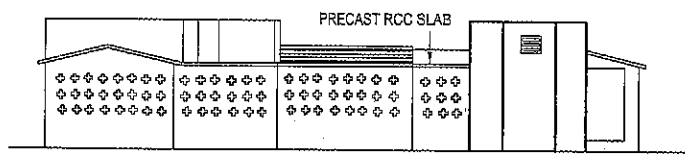
GUJARAT



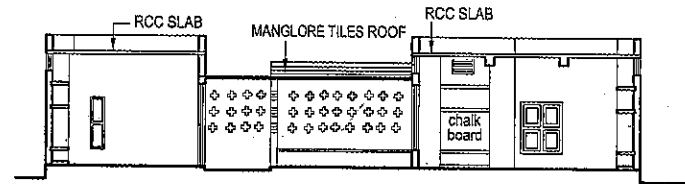
GROUND FLOOR PLAN



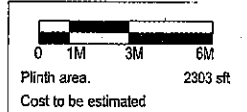
ROOF PLAN



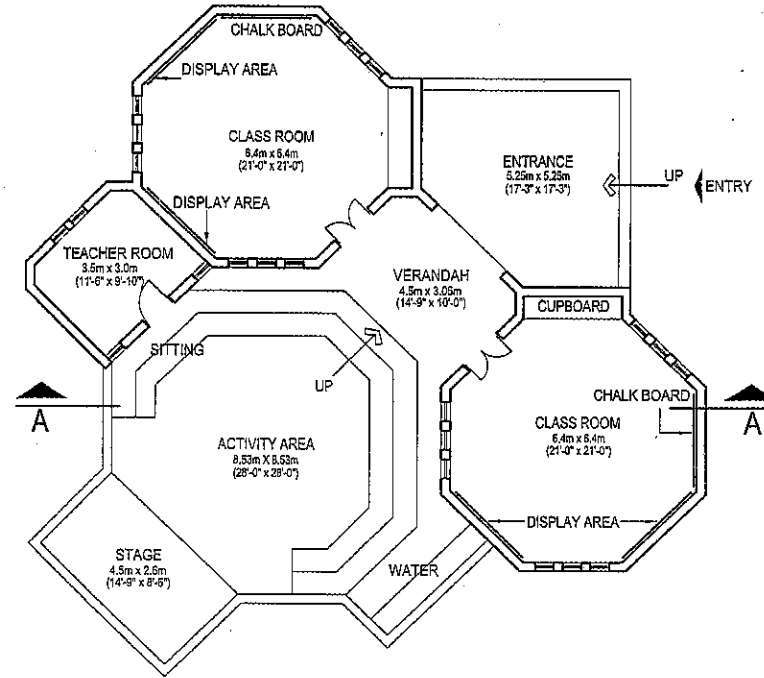
ELEVATION



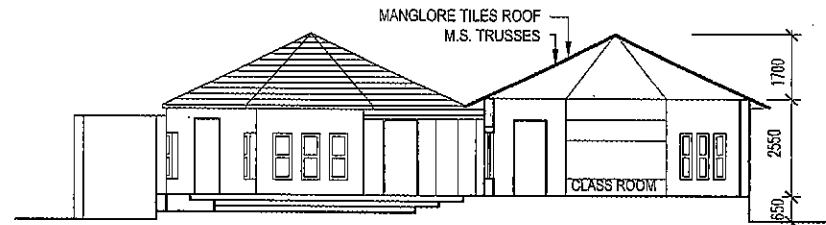
SECTION - AA



GUJARAT New Primary School for Dry & Arid Regions
 Architects
 AHMEDABAD STUDY ACTION GROUP
 a h m e d a b a d



GROUND FLOOR PLAN

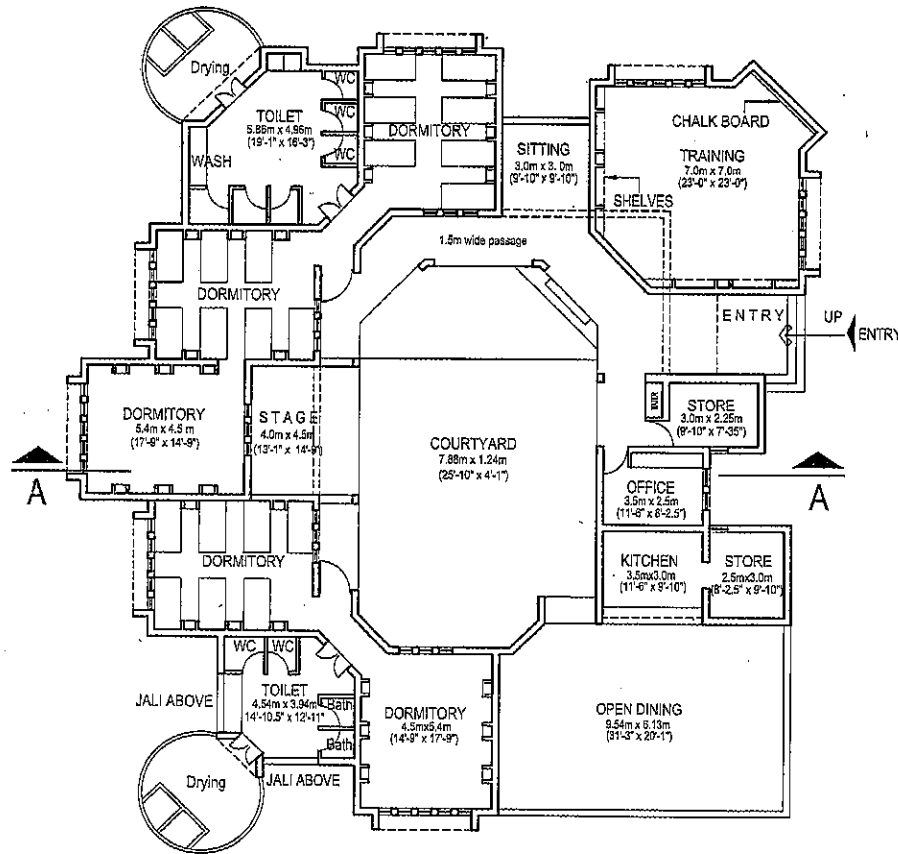


SECTION - AA

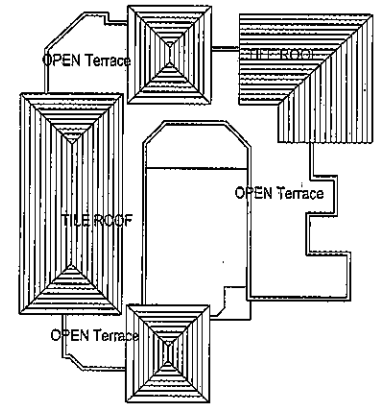
0 0.75M 2.25M 4.5M
Plinth area. 1238 sft
Cost to be estimated
Architects
AHMEDABAD STUDY ACTION GROUP
a h m e d a b a d

Activity Based Primary School .

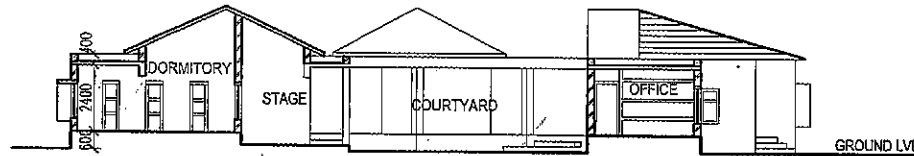
GUJARAT



GROUND FLOOR PLAN



ROOF PLAN

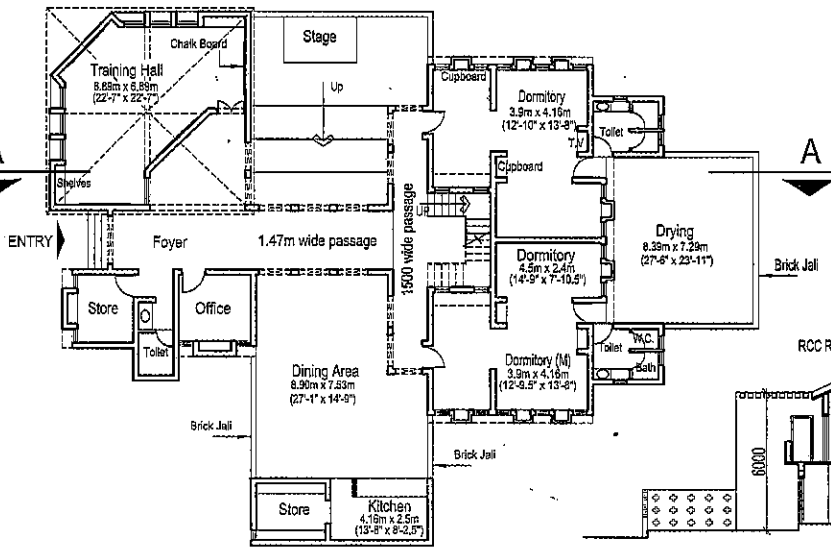


SECTION A-A

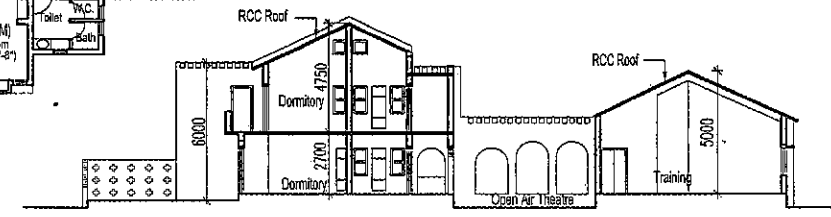
GUJARAT

Block Resource Centre.

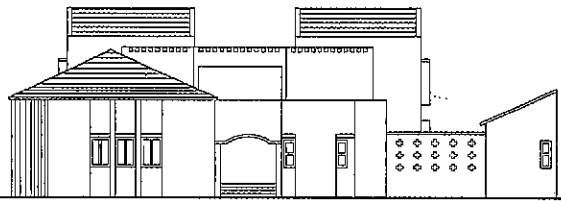
0 1M 3M 6M	
Plinth area.	3918 sq ft
Estimated cost	Rs. 950,000
Cost per sq. ft.	Rs. 242
Architects	
AHMEDABAD STUDY ACTION GROUP ahmedabad	



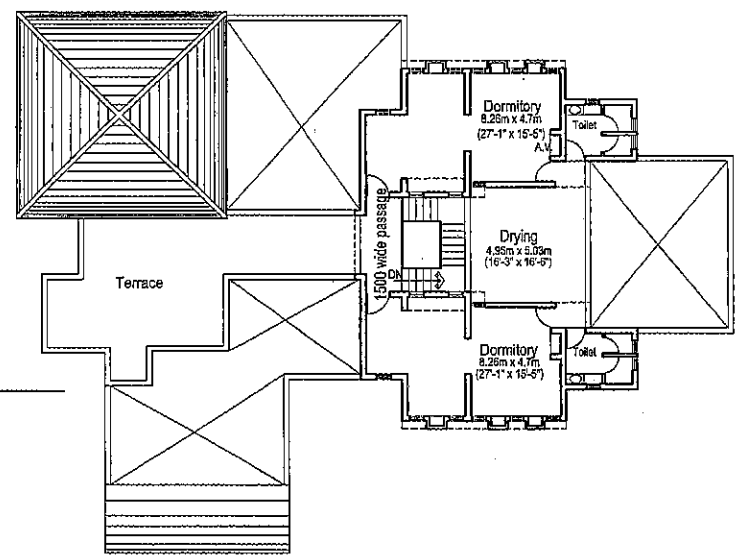
GROUND FLOOR PLAN



SECTION AA



FRONT ELEVATION



ROOF PLAN

0 1.25M 3.75M 7.5M

Plinth area. 3282 sqft
 Estimated cost Rs. 925,000
 Cost per sq. ft. Rs. 282

Architects
 AHMEDABAD STUDY ACTION GROUP
 a h m e d a b a d

Block Resource Centre - Deesa, Banaskantha

GUJARAT

HIMACHAL PRADESH

PROCESS

One consultant was appointed for each district except Chamba in late 1997. Initial designs were prepared for two districts in end 1997 and finalised in early 1998. The other two district designs have been recently finalised.

Construction of schools with the new designs are yet to commence. Bid documents for the BRCs are being finalised.

DESIGN FEATURES

The designs are essentially site-specific with adequate flexibility of getting modified for other site conditions. All the designs exhibit the basic characteristic of buildings in hilly regions. Sloping roofs have been provided due to the heavy precipitation. Orientations are largely to the south with large glazings to increase the heat gain. Local materials are proposed in most designs.

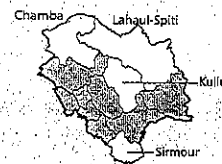
The designs incorporate the features necessary in the classrooms.

CONSTRUCTION AGENCY

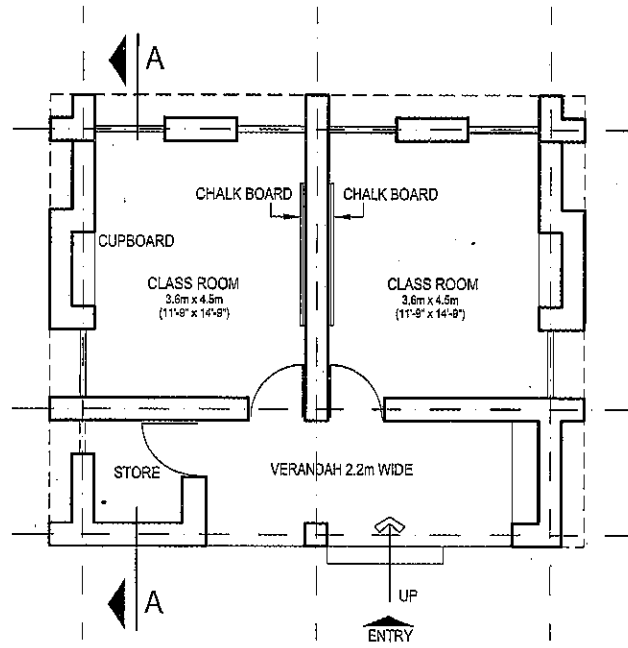
Supervision for all works are being provided by in-house contract engineers (one per block). The works are to be undertaken through different agencies. The BRCs are being contracted out. Some of the other works are to be taken up through the community while some would be undertaken by the in-house engineering cell.

UNIT COSTS

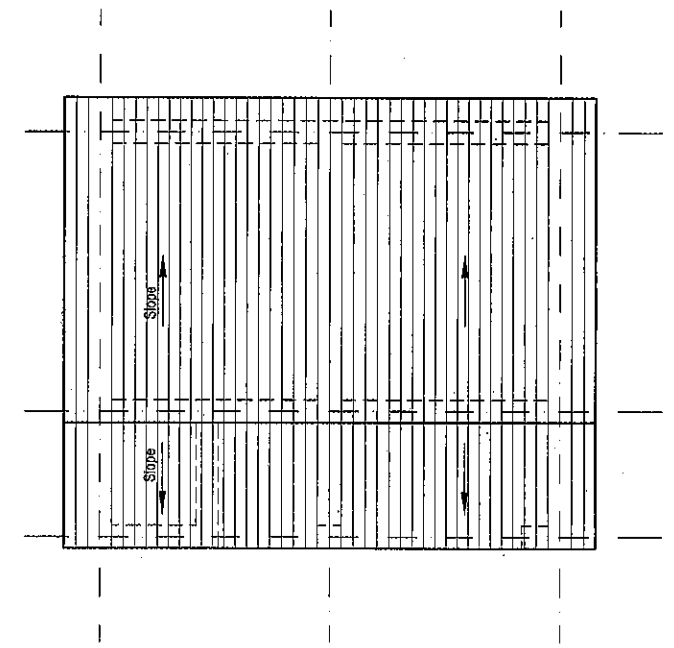
Estimates of the designs are yet to be finalised. The official unit costs are in the process of being revised.



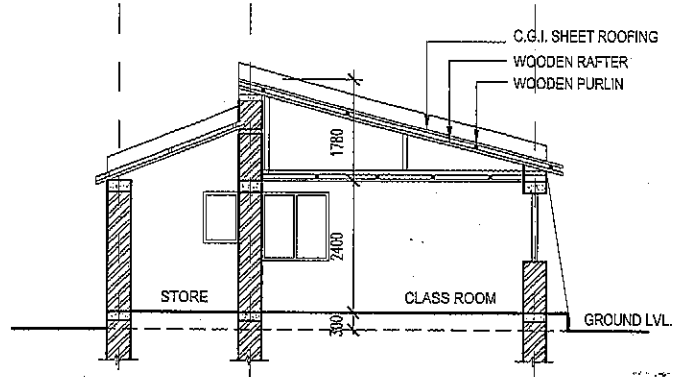
 DPEP Districts



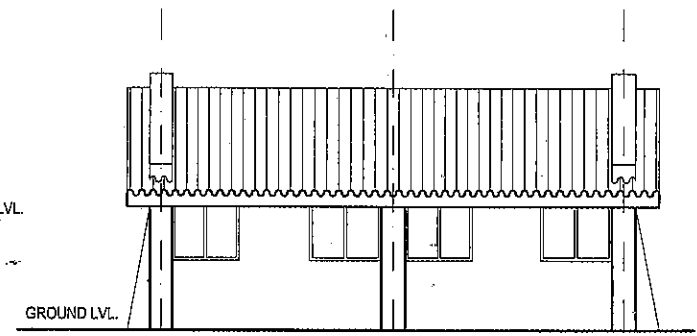
GROUND FLOOR PLAN



ROOF PLAN



SECTION AT A-A



REAR ELEVATION

0 0.5M 1.5M 3M

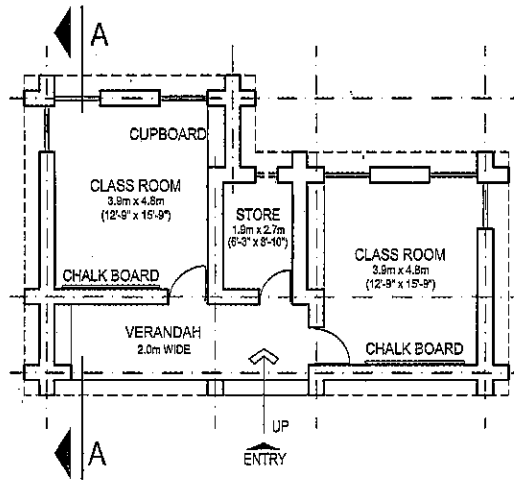
Cost to be estimated

Architects

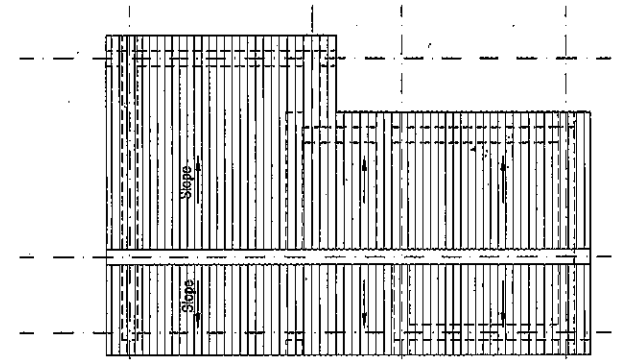
SAI ENGINEERING FOUNDATION
s h i m l a

Two Classroom School Lahaul & Spiti

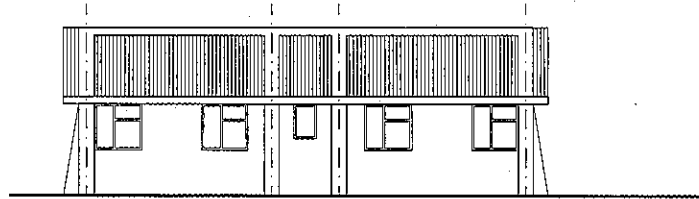
HIMACHAL PRADESH



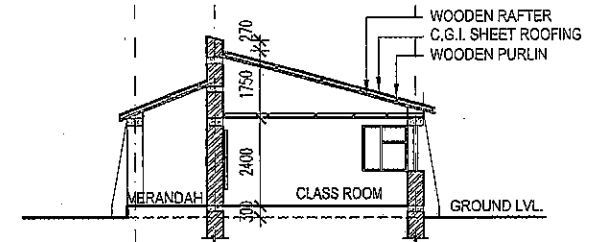
GROUND FLOOR PLAN



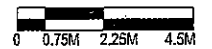
ROOF PLAN



REAR ELEVATION



SECTION AT A-A

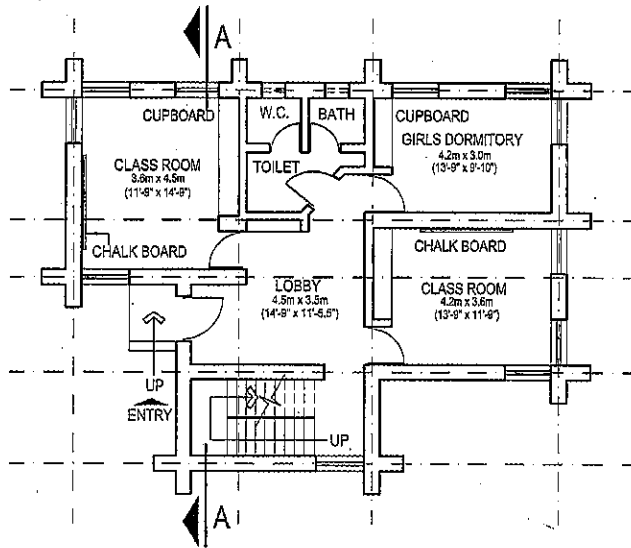


Cost to be estimated

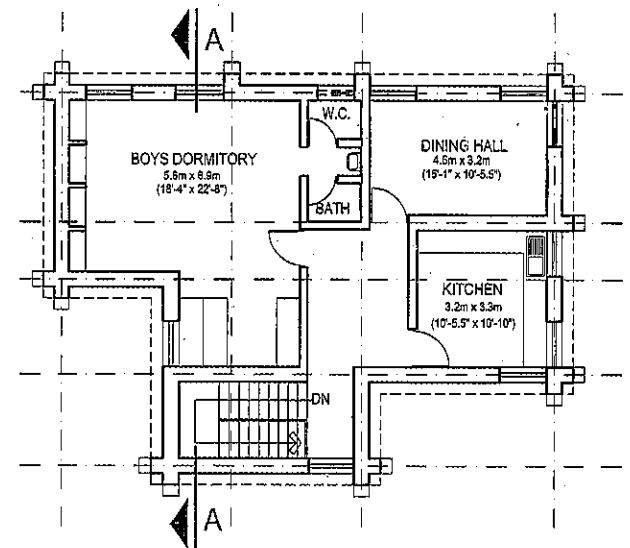
Architects

SAI ENGINEERING FOUNDATION
s h i m l a

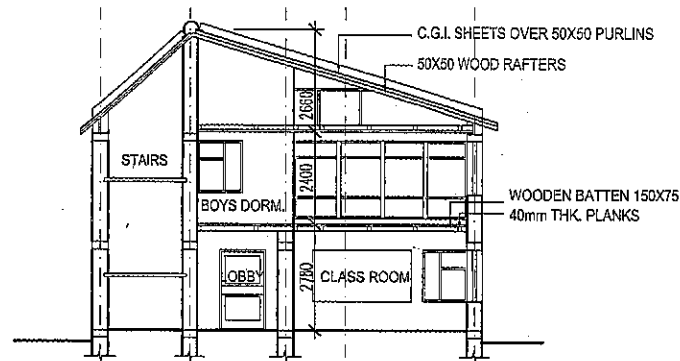
HIMACHAL PRADESH Two Classroom School ,Lahaul & Spiti.



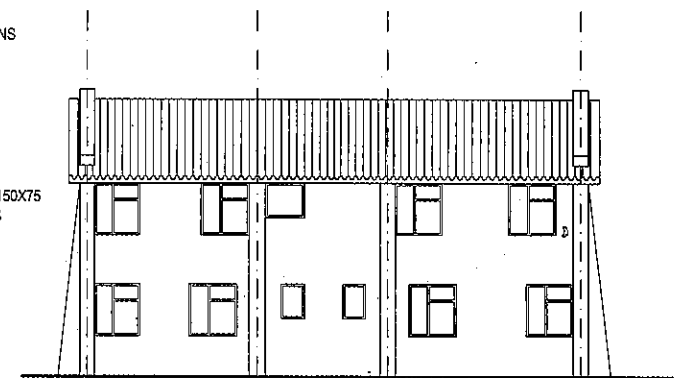
GROUND FLOOR PLAN



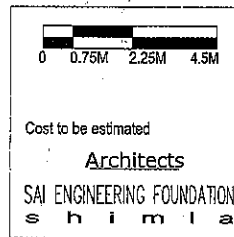
FIRST FLOOR PLAN



SECTION A-A

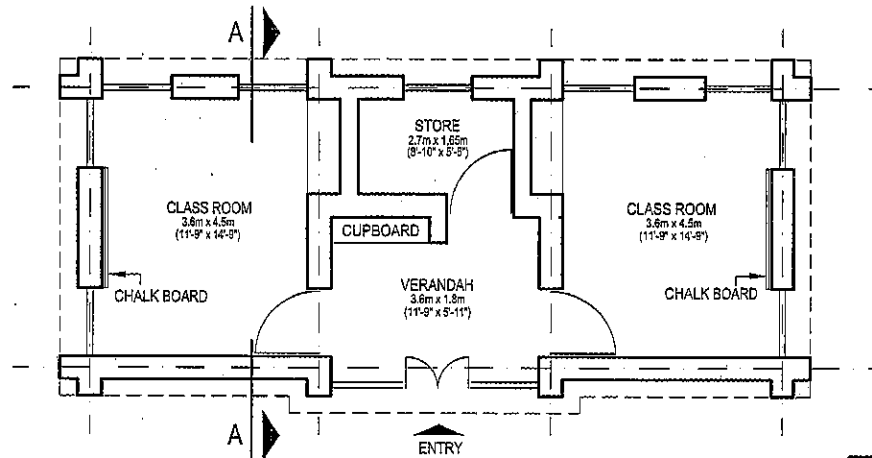


REAR ELEVATION

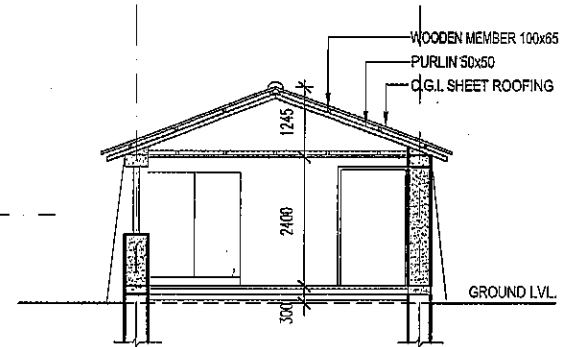


Ashram School, Lahaul & Spiti.

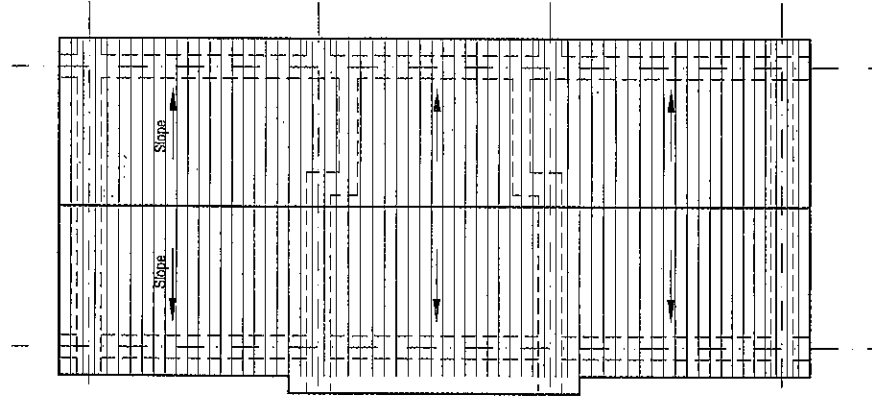
HIMACHAL PRADESH



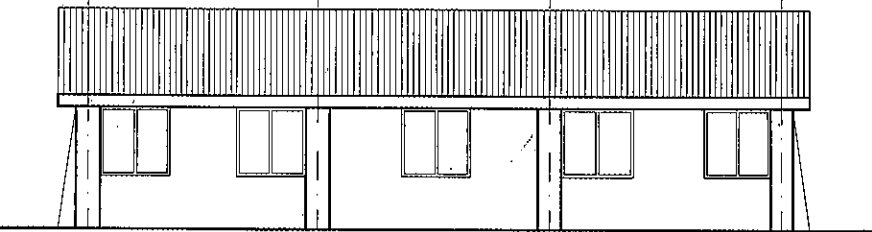
GROUND FLOOR PLAN



SECTION AT A-A



ROOF PLAN



REAR ELEVATION

0 0.5M 1.5M 3M

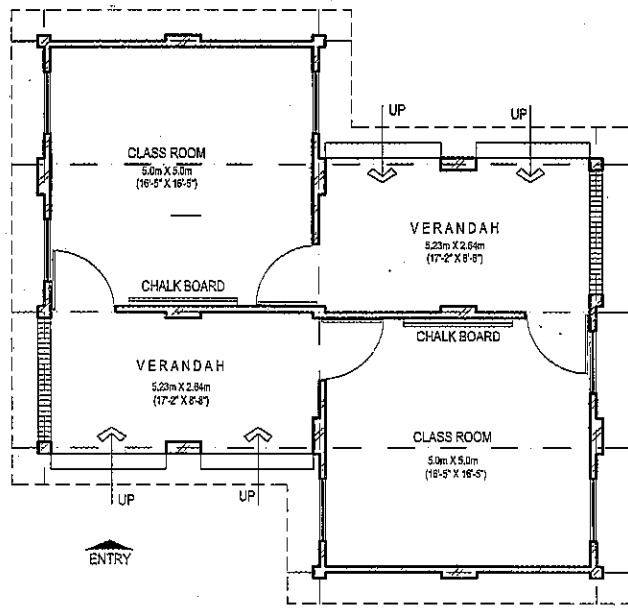
Cost to be estimated

Architects

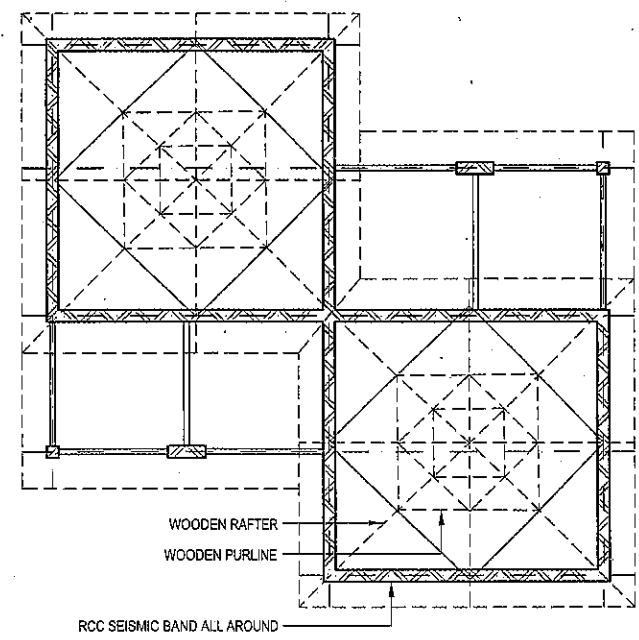
SAI ENGINEERING FOUNDATION

s h i m l a

HIMACHAL PRADESH Two Classroom School, Lahaul & Spiti



GROUND FLOOR PLAN



ROOF PLAN

0 0.5M 1.5M 3M

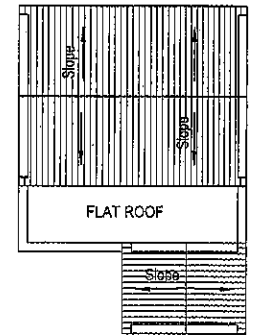
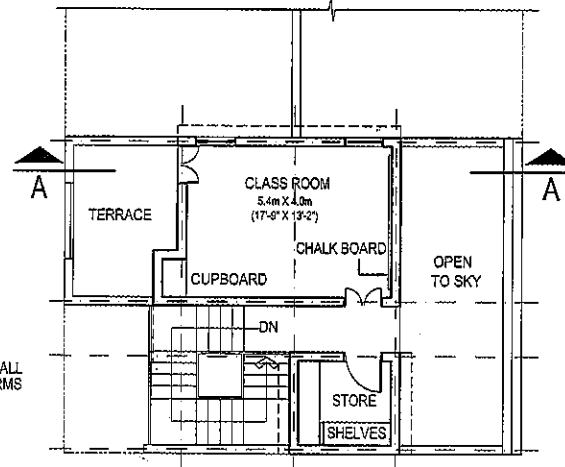
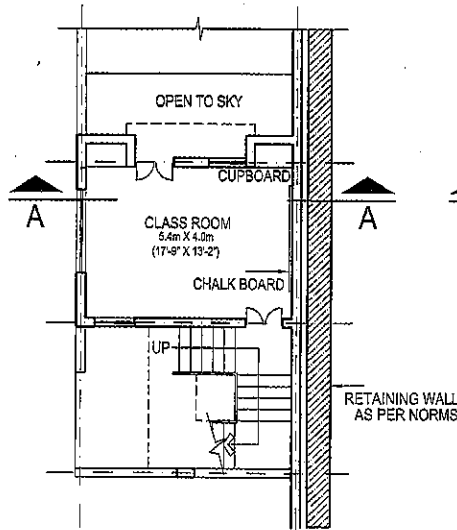
Cost to be estimated

Architects

SHILPA
the mall, shimla

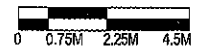
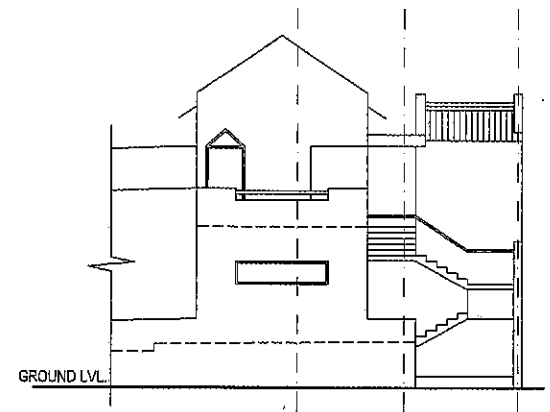
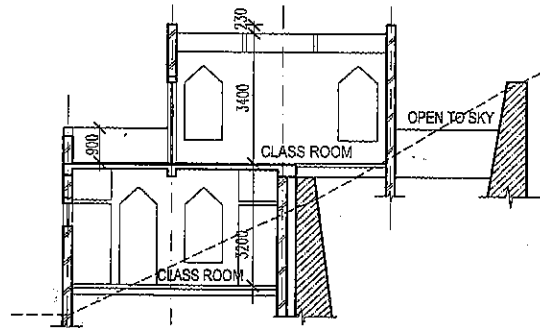
Two Classroom School (Sirmaur)

HIMACHAL PRADESH



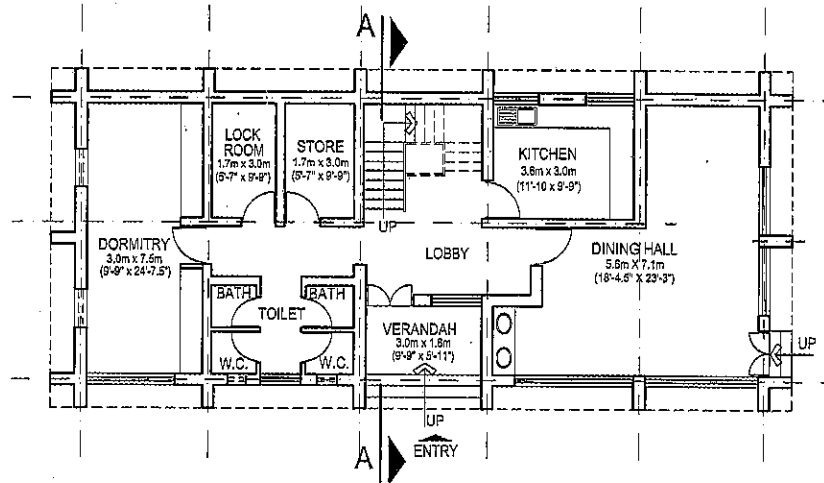
LOWER LVL PLAN

UPPER LVL PLAN

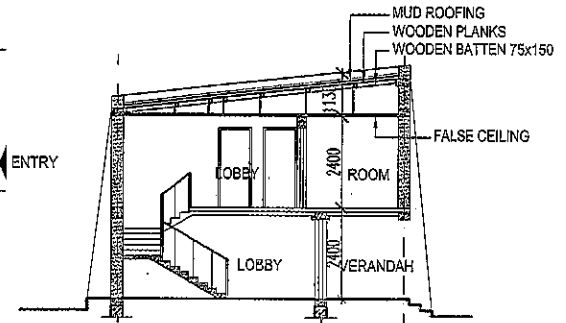


Cost to be estimated
Architects
ASHOK GROVER & ASSOCIATES
 noida, uttar pradesh

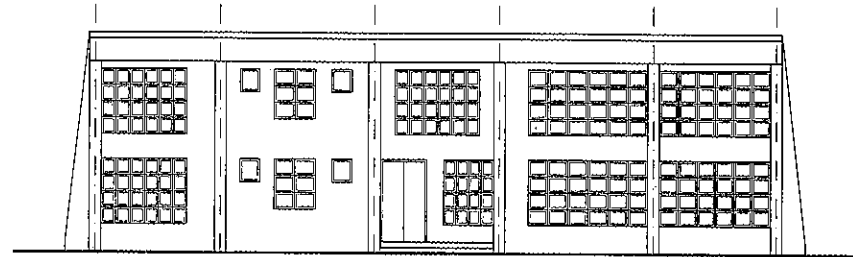
HIMACHAL PRADESH Two Room School at Lunekh, Chamba



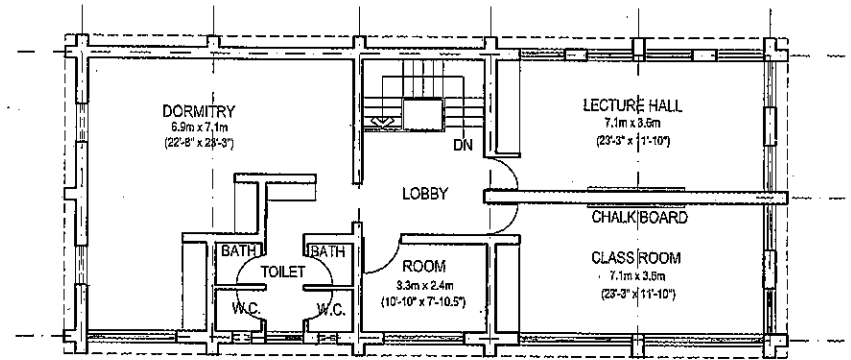
GROUND FLOOR PLAN



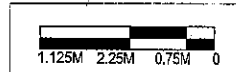
SECTION AT -AA



FRONT ELEVATION



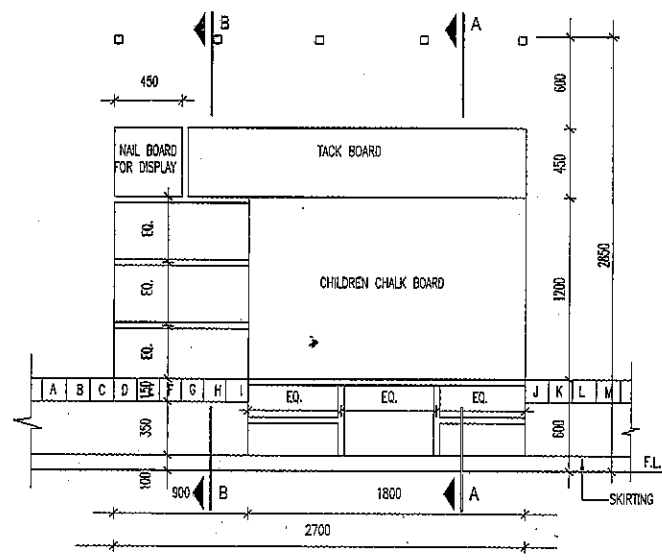
FIRST FLOOR PLAN



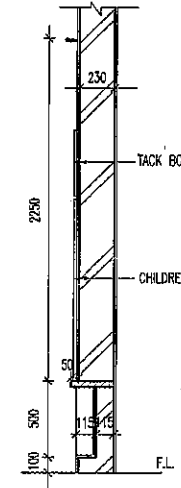
Cost to be estimated
 Architects
 SAI ENGINEERING FOUNDATION
 s h i m l a

Mini Diet, Kaza, Lahaul & Spiti.

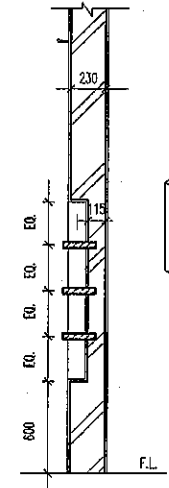
HIMACHAL PRADESH



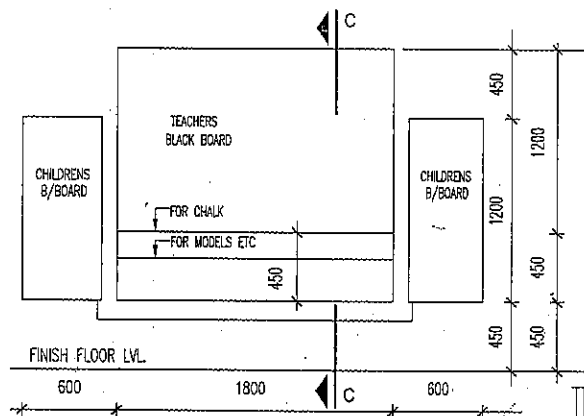
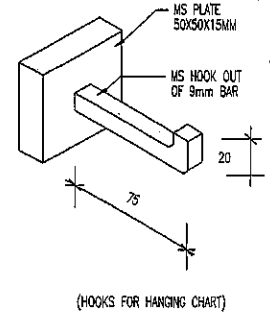
DISPLAY BOARD (D1)



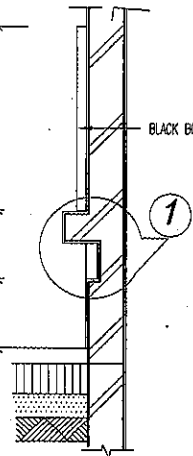
SECTION AA



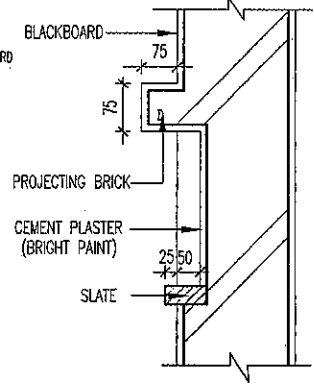
SECTION BB



ELEVATION

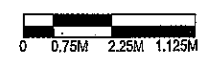
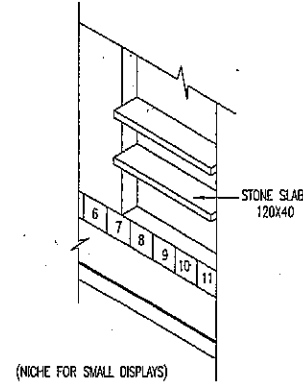


SECTION CC



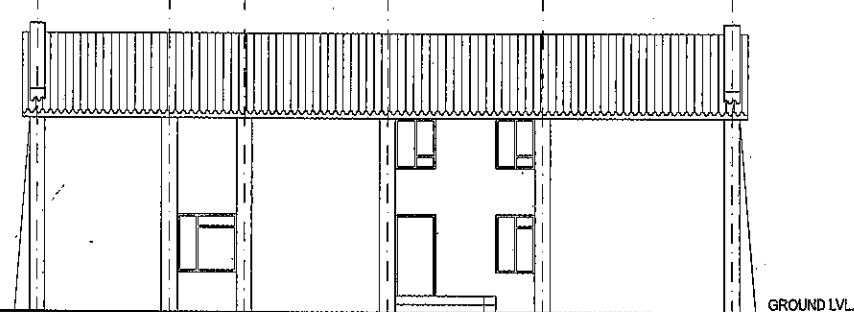
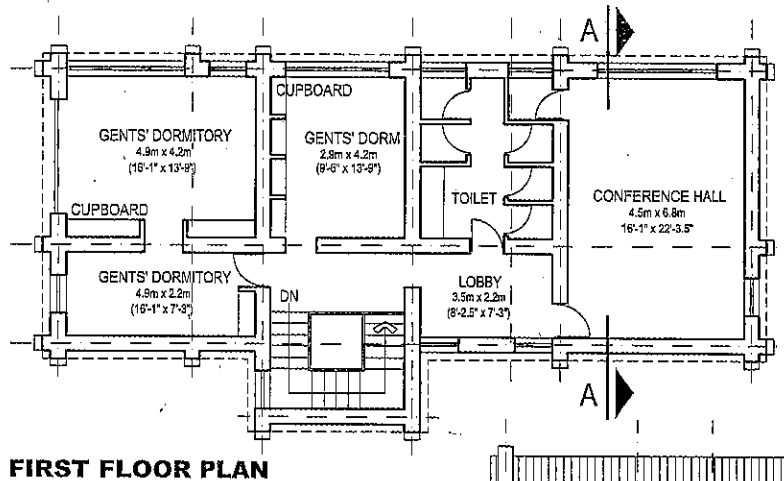
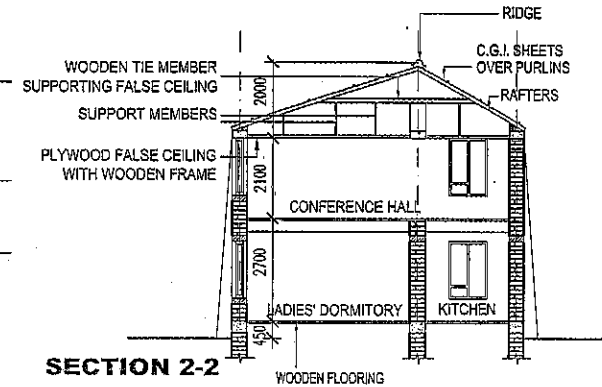
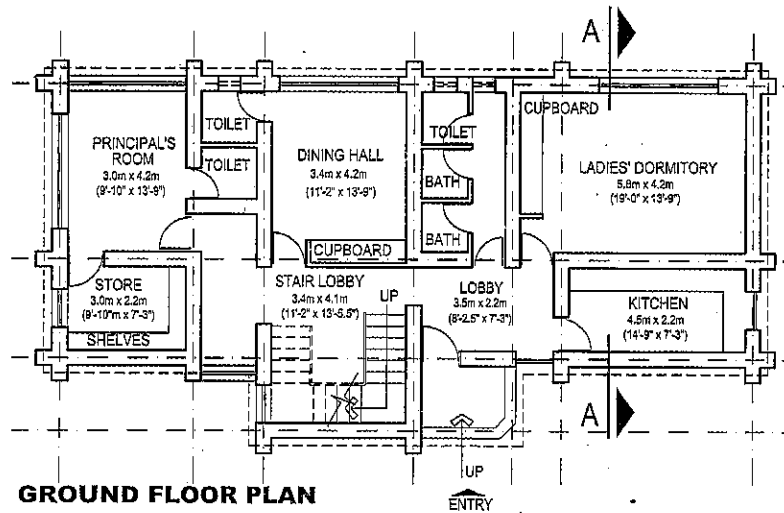
DETAIL 1

Scale(1:10)



Cost to be estimated
Architects
ASHOK GROVER & ASSOCIATES
noida, uttar pradesh

HIMACHAL PRADESH Two Room School at Lunekh, Chamba

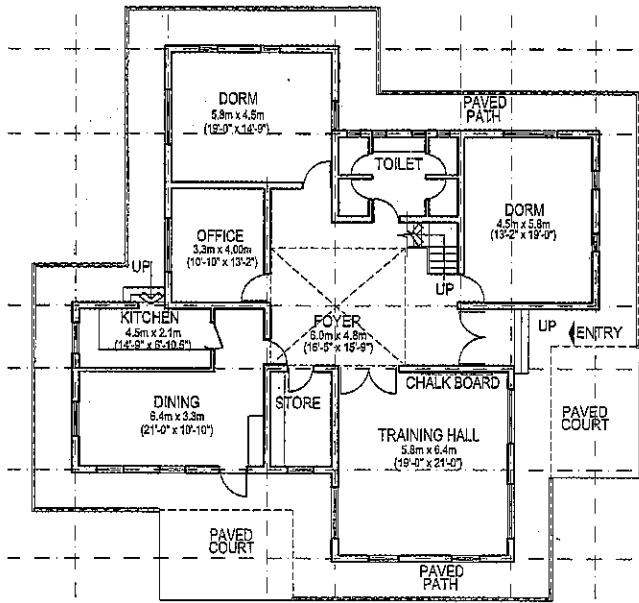


0 0.75M 2.25M 4.5M

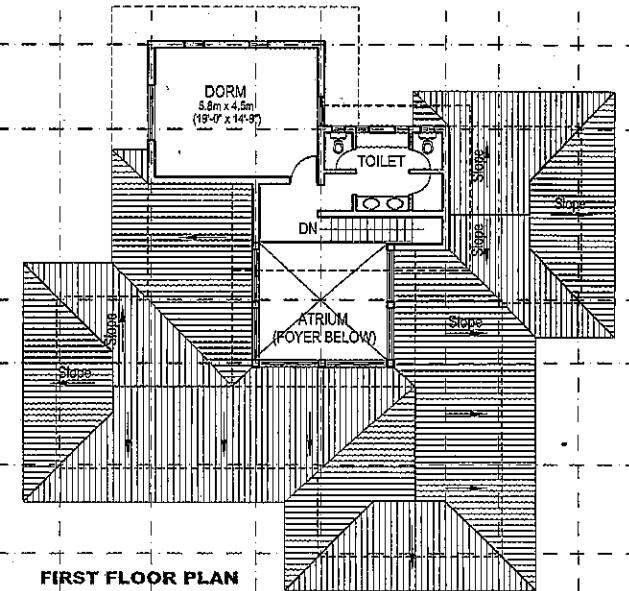
Cost to be estimated

Architects
SAI ENGINEERING FOUNDATION
shimla

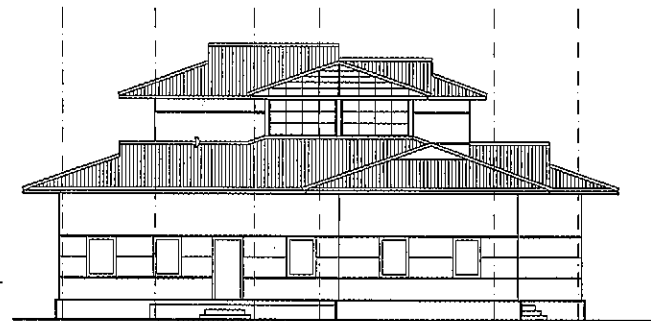
BRC for Keylong, Lahaul & Spiti. **HIMACHAL PRADESH**



GROUND FLOOR PLAN



FIRST FLOOR PLAN



WEST ELEVATION

0 1M 3M 6M

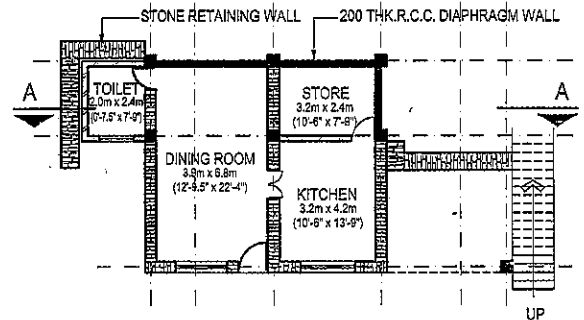
Cost to be estimated

Architects

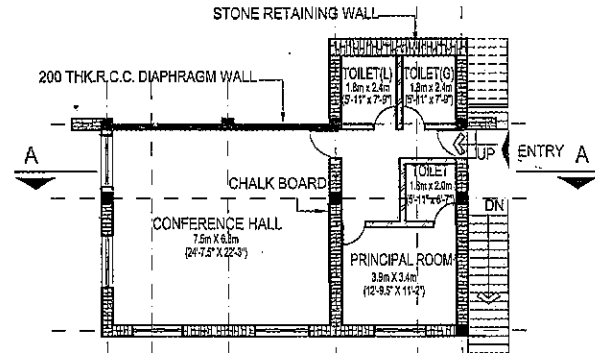
VASTUKALP
paschim vihar, new delhi

HIMACHAL PRADESH

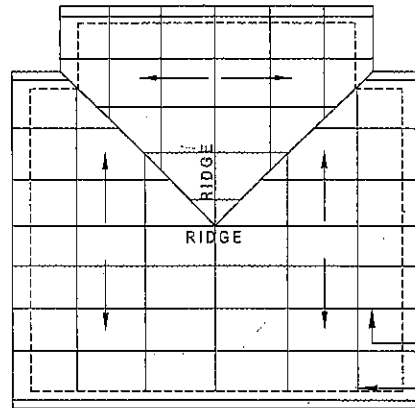
BRC for Kullu District.



GROUND FLOOR PLAN



FIRST FLOOR PLAN



ROOF PLAN

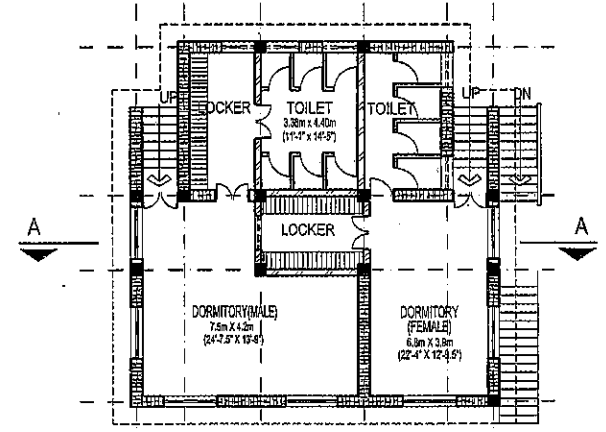
0 1M 3M 6M

Cost to be estimated

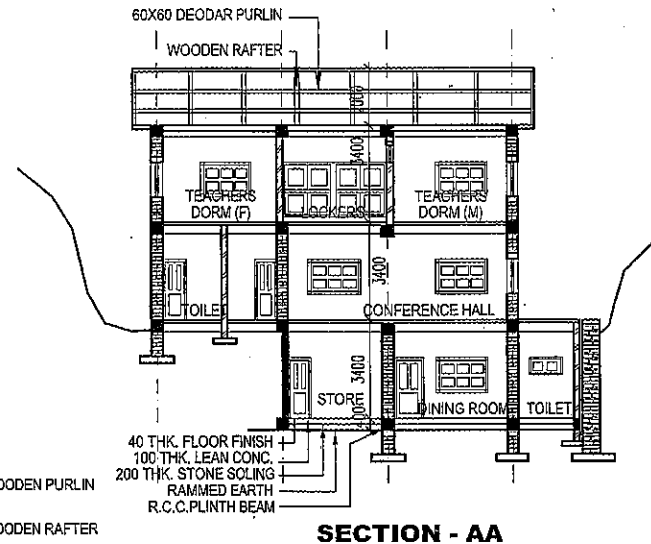
Architects

S. H I L P A
the mall, shimla

BRC for Surlaha, Sirmaur District.

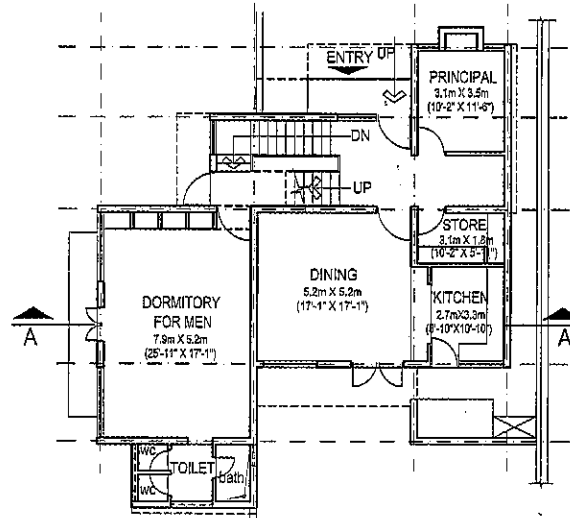


SECOND FLOOR PLAN

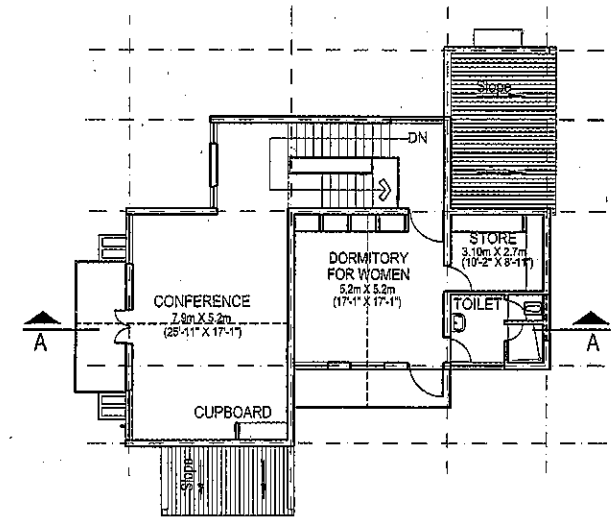


SECTION - AA

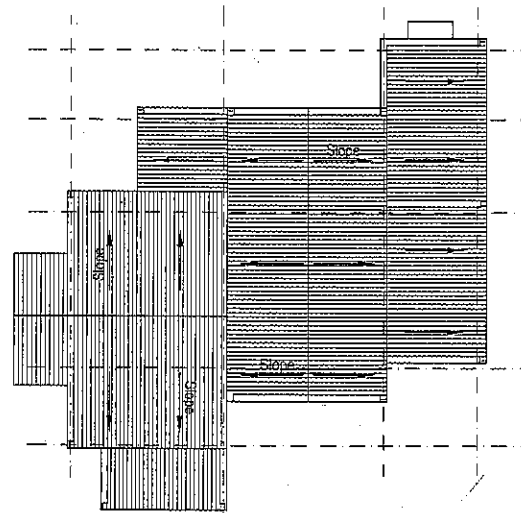
HIMACHAL PRADESH



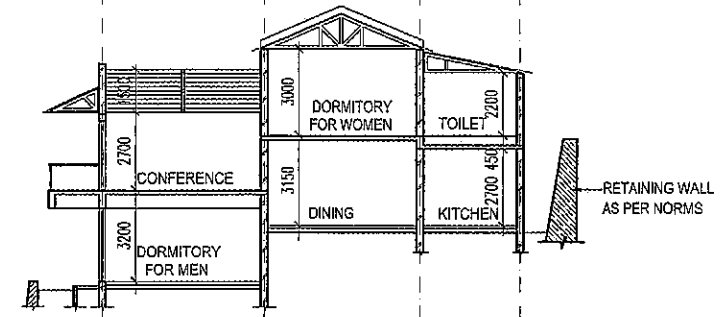
PLAN AT LOWER LVL



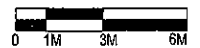
PLAN AT UPPER LVL



ROOF PLAN



SECTION A-A



Cost to be estimated

Architects

ASHOK GROVER & ASSOCIATES
noida, uttar pradesh

HIMACHAL PRADESH BRC for Bhanjradoo, Chamba District.

ORISSA

PROCESS

Two consultants were involved and after an extended process the designs were finalised in mid 1997.

Construction of schools and CRCs is underway.

DESIGN FEATURES

Initially the designs developed by the consultants are too conventional. Later these designs were modified with the help of Design guide and briefing given by the TSG. As the cost of BRC is exceeding the approved unit cost, the BRC design was modified recently to keep the cost within the limits.

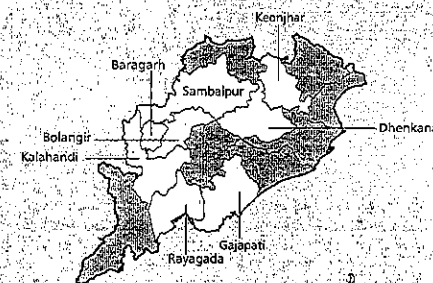
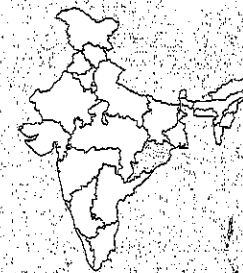
The modified designs are comprising all the features like storage, display, learning corners etc.

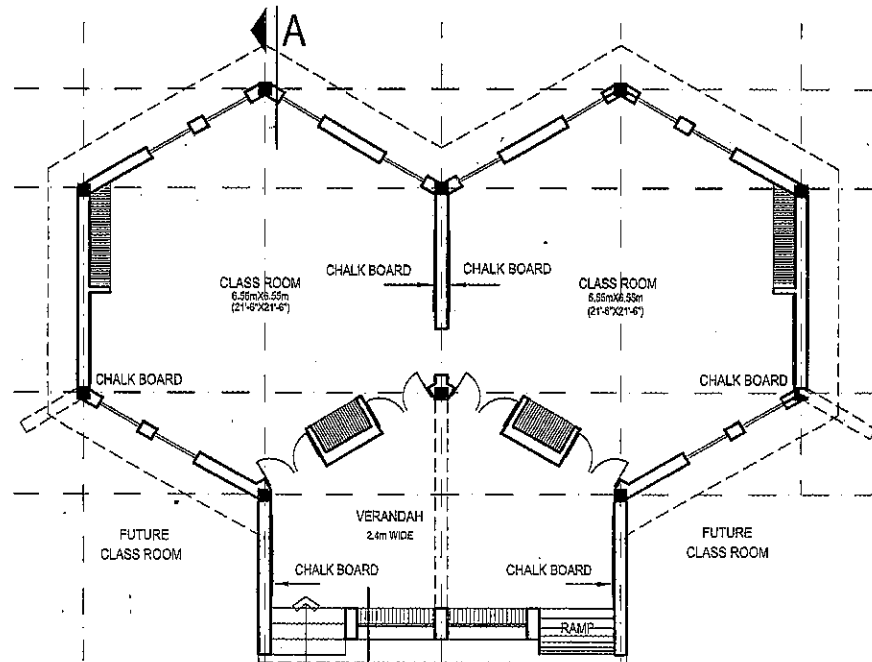
CONSTRUCTION AGENCY

81 in-house contract engineers have been appointed in 86 blocks. Works are largely undertaken through the community except for BRCs which are to be finalised and given on contract.

UNIT COSTS

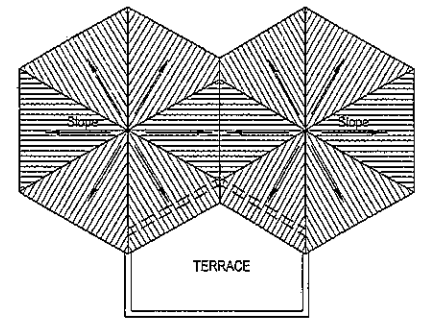
Estimates of the designs are indicated on the drawings.



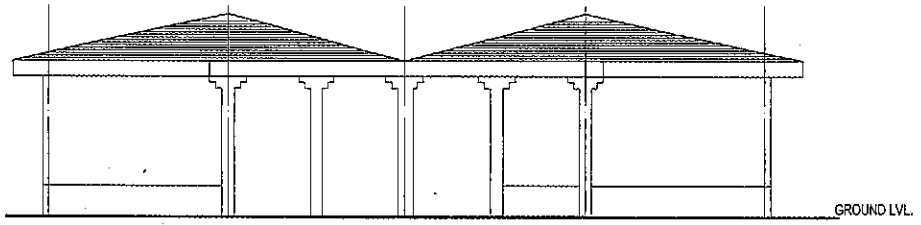


GROUND FLOOR PLAN

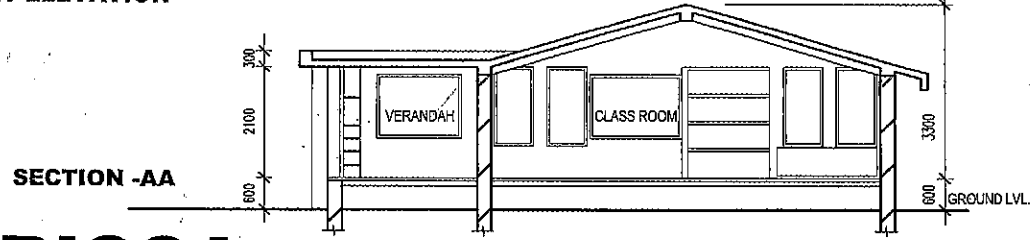
ENTRY



ROOF PLAN



FRONT ELEVATION

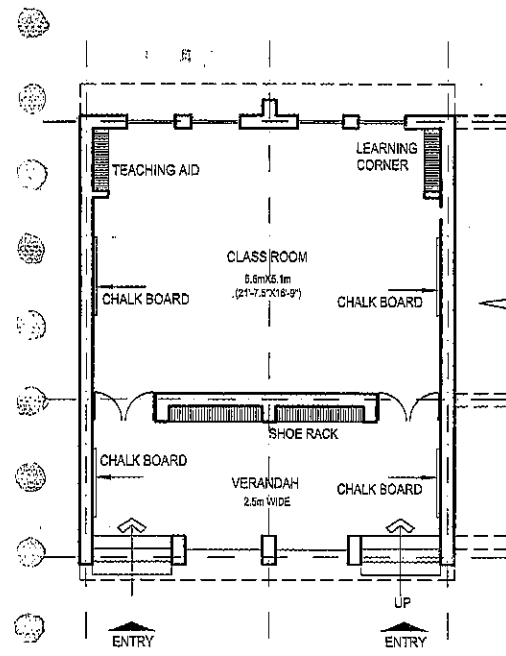


SECTION -AA

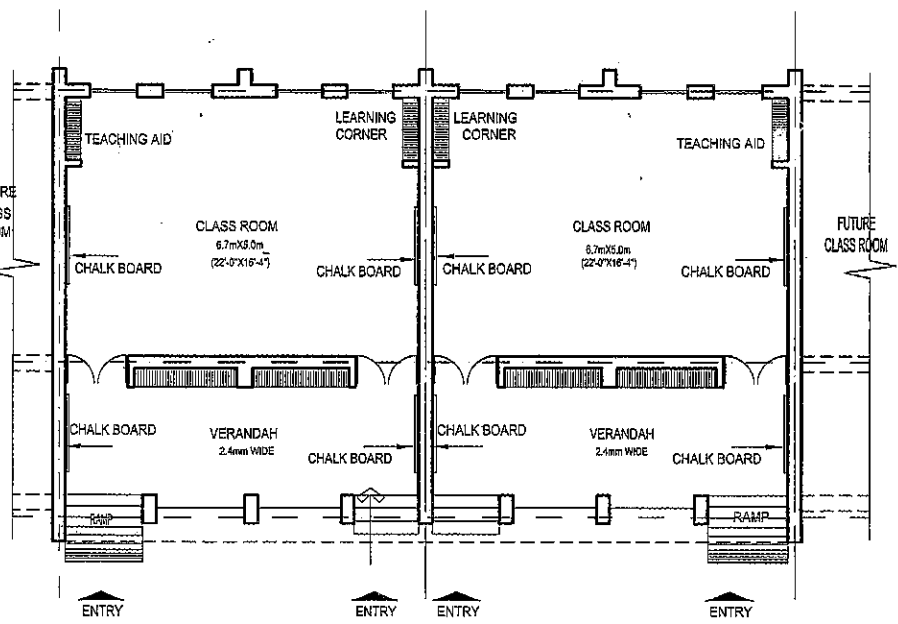
Plinth area.	1022 sqft
Estimated cost	Rs. 241,000
Cost per Sq. ft.	Rs. 236
Architects THE ENGINEERS bhubaneswar	

ORISSA

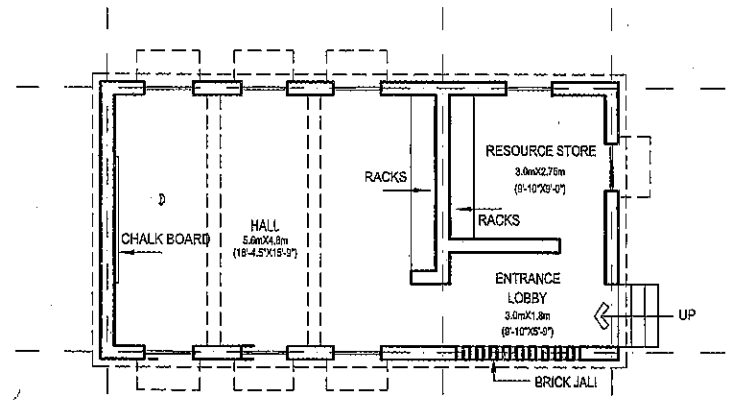
Two Classroom School



GROUND FLOOR PLAN



GROUND FLOOR PLAN



CRC BUILDING PLAN

0.5M 1.5M 3M

Plinth area.	1200 sqft
Estimated cost	Rs. 242,000
Cost per Sq. ft.	Rs. 321

Architects
THE ENGINEERS
bhubaneswar

Two Classroom School

ORISSA

UTTAR PRADESH

PROCESS

Seven consultants were involved in late 1997 in the design renewal exercise. Prior to this a Resource Mapping exercise was undertaken which identified suitable techniques and materials of construction. Designs were approved in early 1998. Construction using the new design are to begin in 1999.

DESIGN FEATURES

Pedagogy, classroom details and the use of alternate technologies are the primary focus. Most of the designs have placed particular emphasis to the details of display and storage systems. Classrooms are of different shapes and sizes that are intended to facilitate activity based learning.

The designs also incorporate various 'alternate' systems of construction. Prototypes of the same are to be constructed prior to the training of engineers.

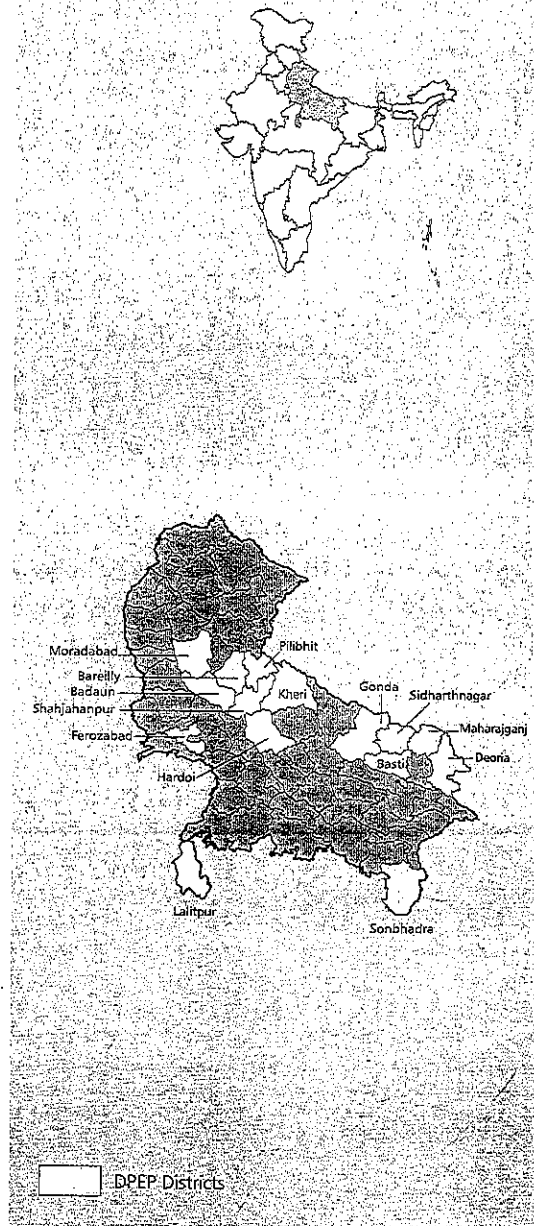
CONSTRUCTION AGENCY

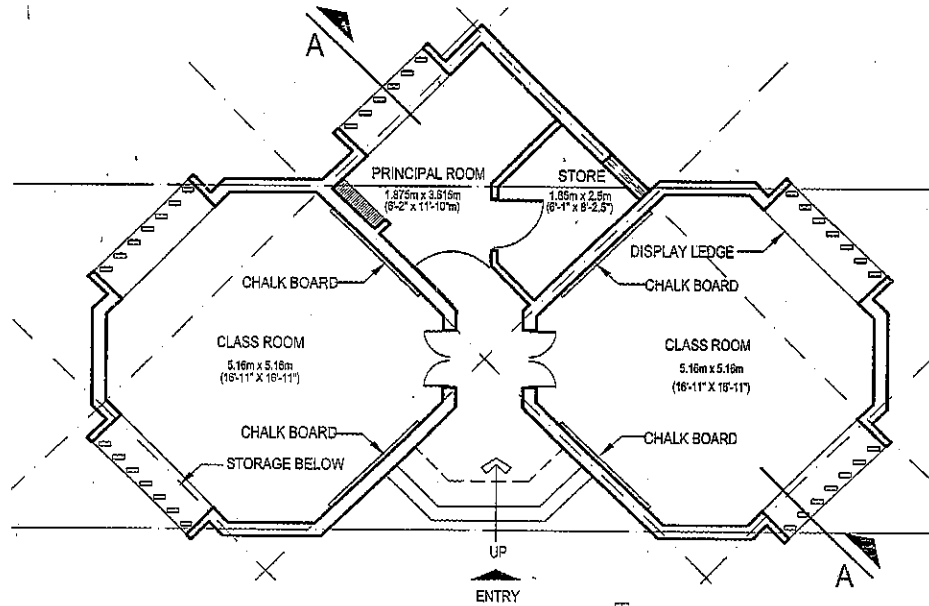
The regular works are largely being supervised by RES engineers. However, the prototypes of the new schools will first be constructed with the supervision of the consultants. Other engineers are to be trained in the alternate systems during this construction so as to be able to employ these systems on a larger scale.

Most works are being undertaken through the community. Some works like the provision of drinking water facilities is being undertaken by an external agency.

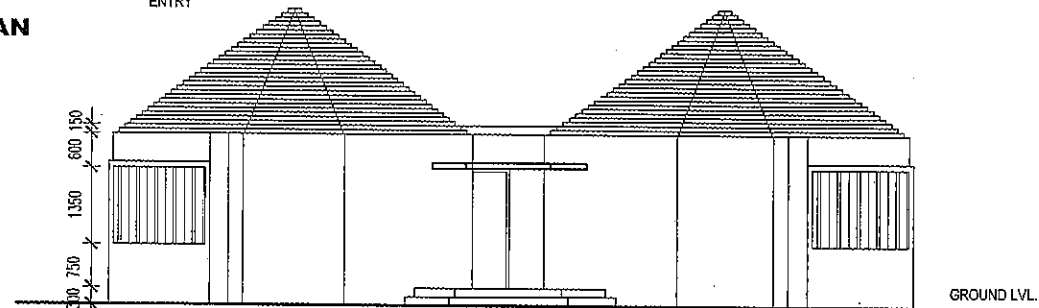
UNIT COSTS

The cost of the BRC is approximately Rs. 8.0 lakhs while the cost of the two room school cum building-less school and CRC are Rs. 1.91 lakhs and Rs. 0.65 lakhs respectively. The additional classroom costs Rs. 0.55 lakhs approximately.

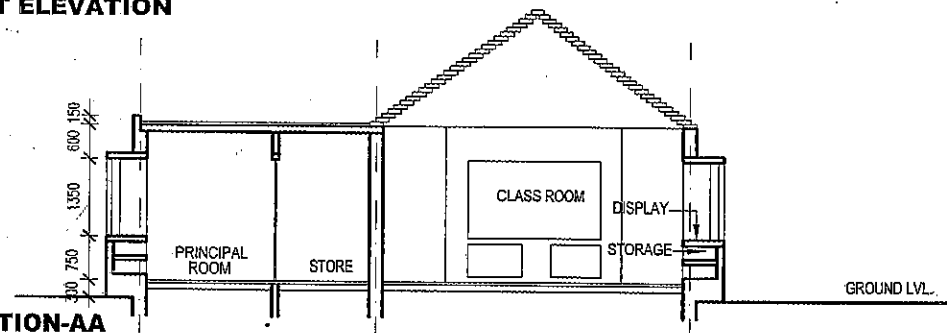




GROUND FLOOR PLAN



FRONT ELEVATION

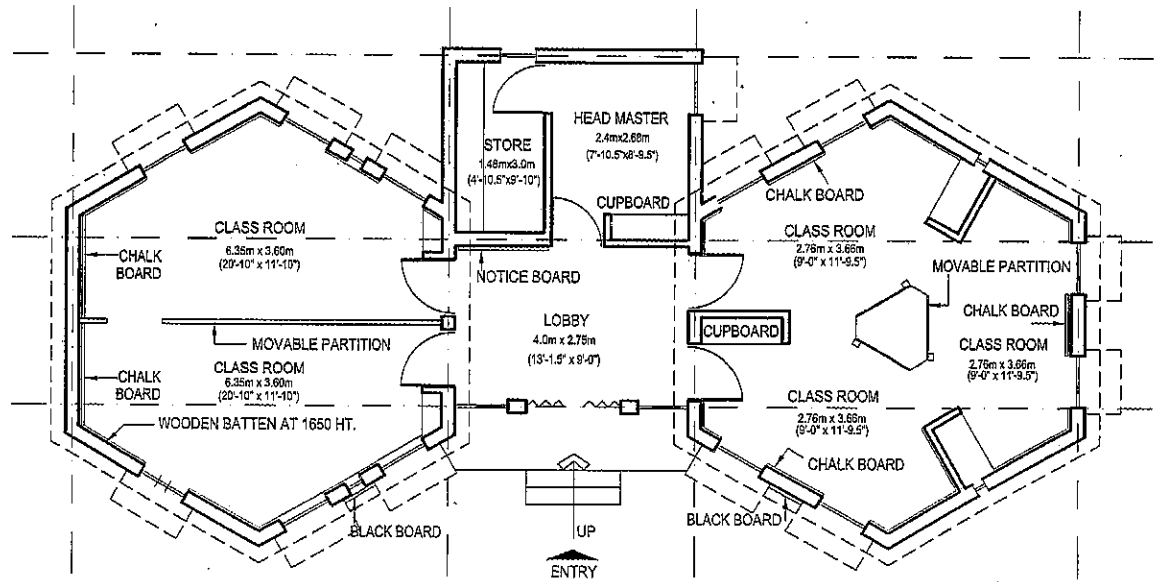


SECTION-AA

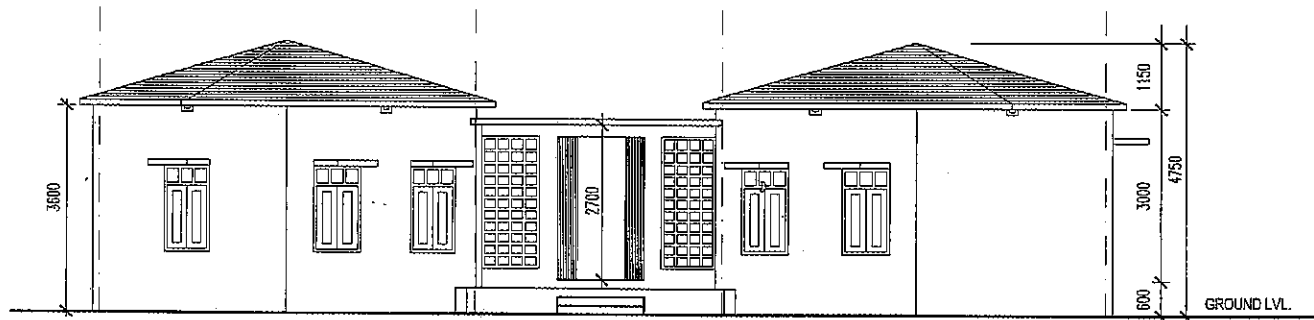
Plinth area.	881 sft
Estimated cost	Rs. 176,000
Cost per sft	Rs. 204
Architects	
P O I N T	
l u c k n o w	

Primary School, Hardoi
Concept Design

UTTAR PRADESH



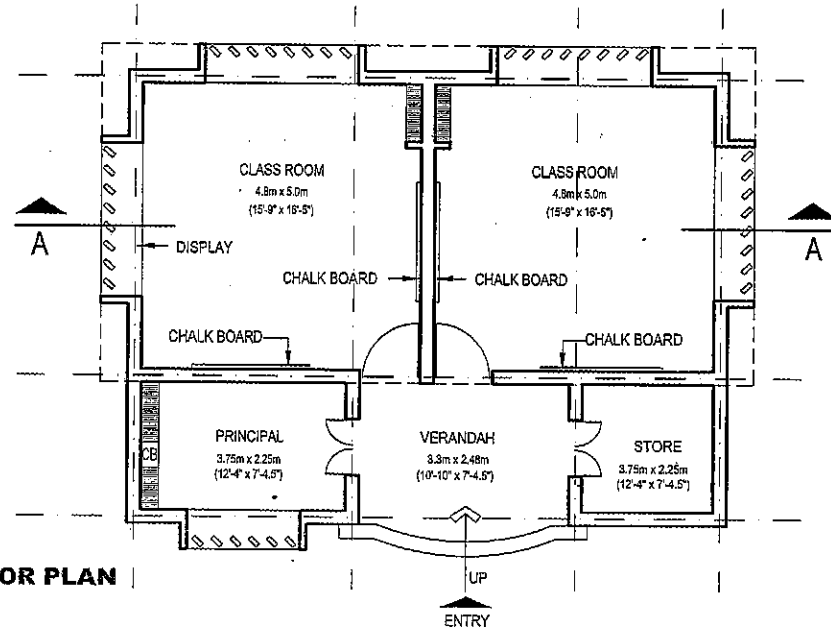
GROUND FLOOR PLAN



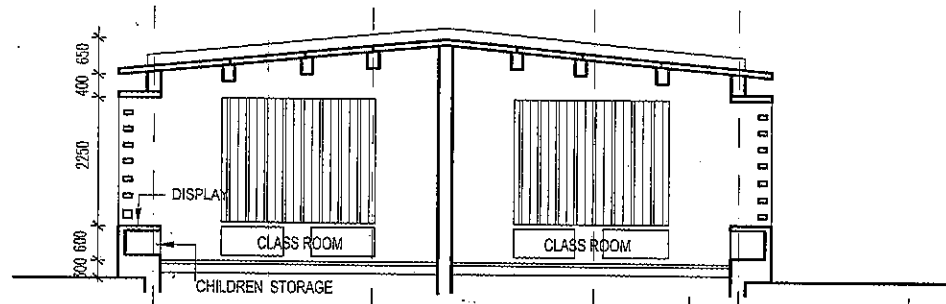
FRONT ELEVATION

0 0.5M 1.5M 3M	
Plinth area.	1144 sft
Estimated cost.	Rs. 195,000
Cost per sft.	Rs. 170
Architects	
CADD CONSULTANTS kanpur road, lucknow	

UTTAR PRADESH New Primary School Concept Design



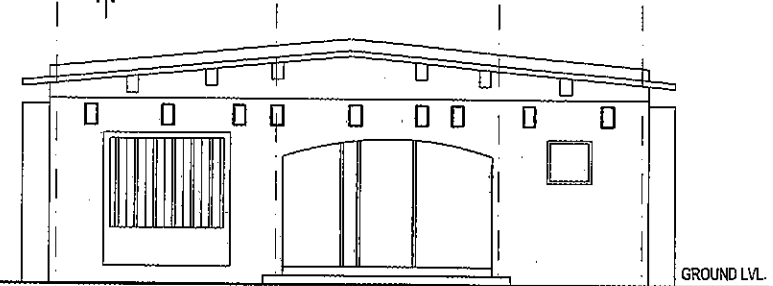
GROUND FLOOR PLAN



SECTION-AA

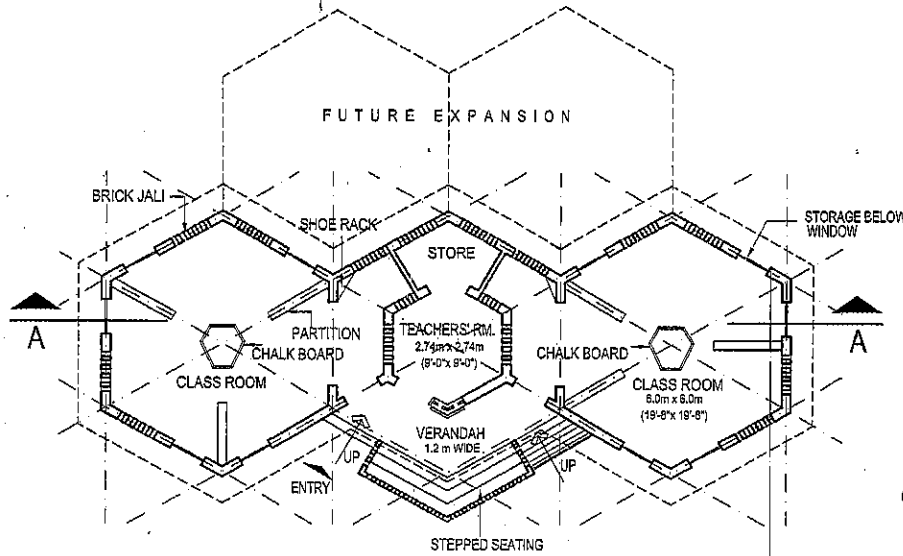
Plinth area.	860 sq ft
Estimated cost	Rs. 170,000
Cost per sq ft	Rs. 198
Architects	
P O I N T	
LUCKNOW	

FRONT ELEVATION

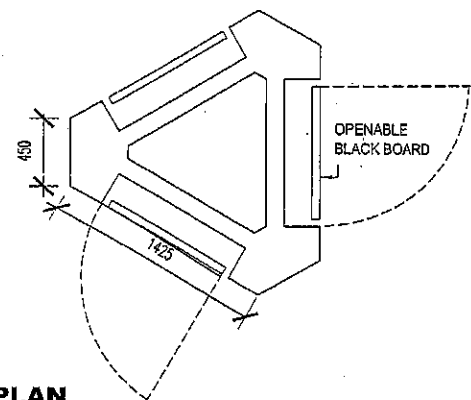


New Primary School, Jhansi.
Concept Design

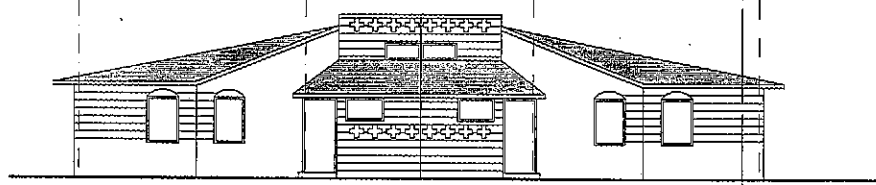
UTTAR PRADESH



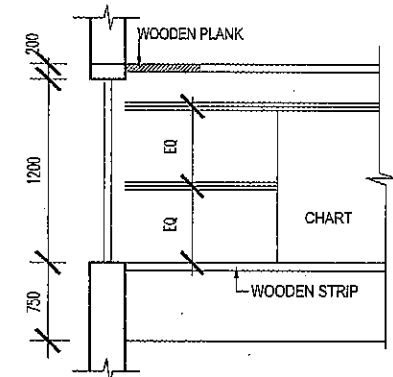
GROUND FLOOR PLAN



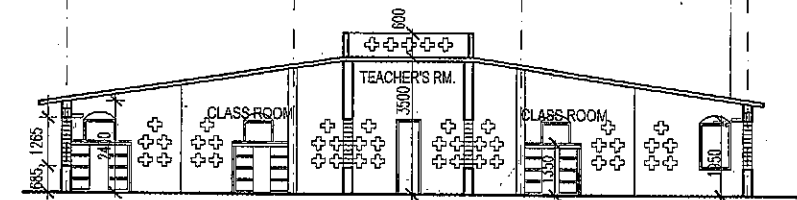
**PLAN
OPENABLE BLACK BOARD.**



ELEVATION



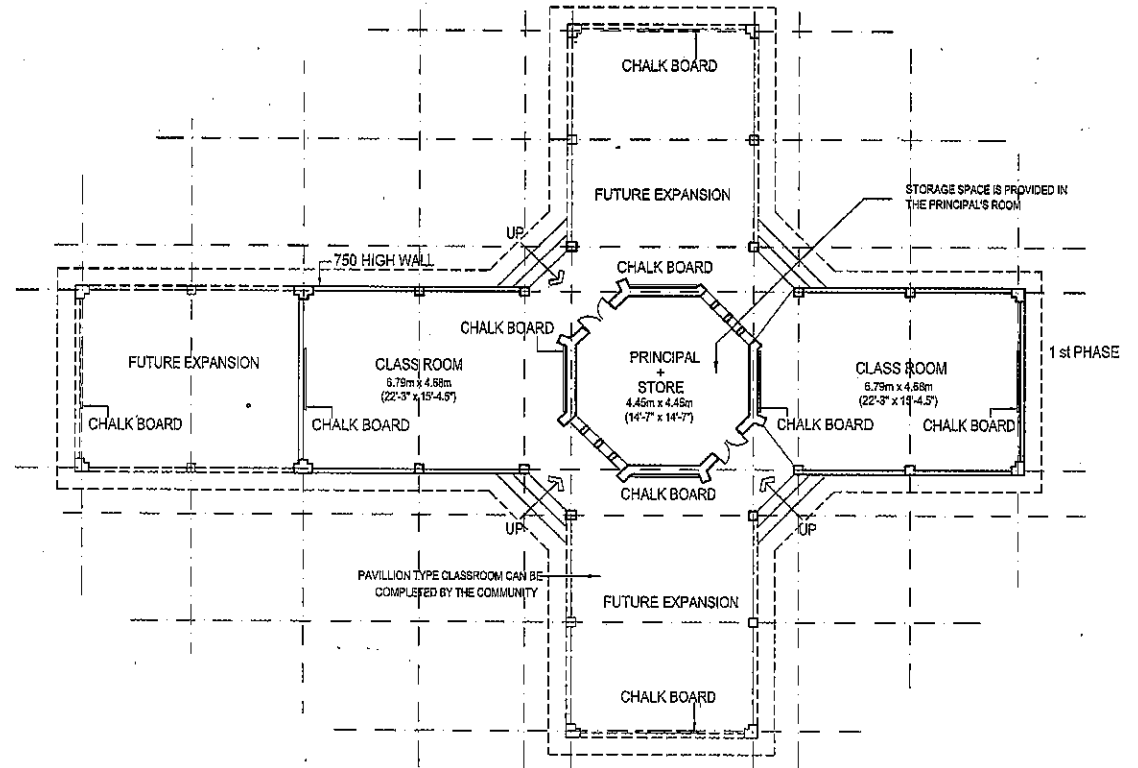
WALL DETAIL



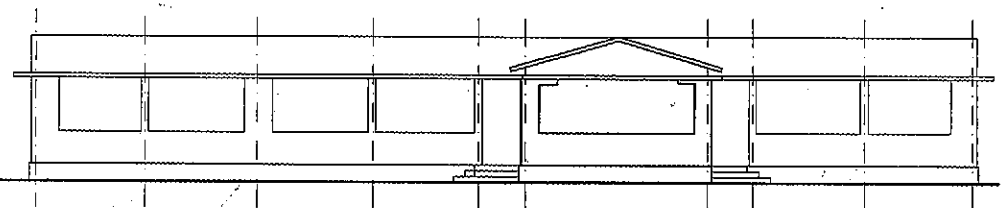
SECTION - AA

0 0.75M 2.25M 4.5M			
Plinth area.	1013	sq ft	
Estimated cost	Rs. 188,000		
Cost per sq ft	Rs. 188		
Architects			
SKETCH CONSULTANTS			
k a n p u r			

UTTAR PRADESH New Primary School Concept Design



GROUND FLOOR PLAN

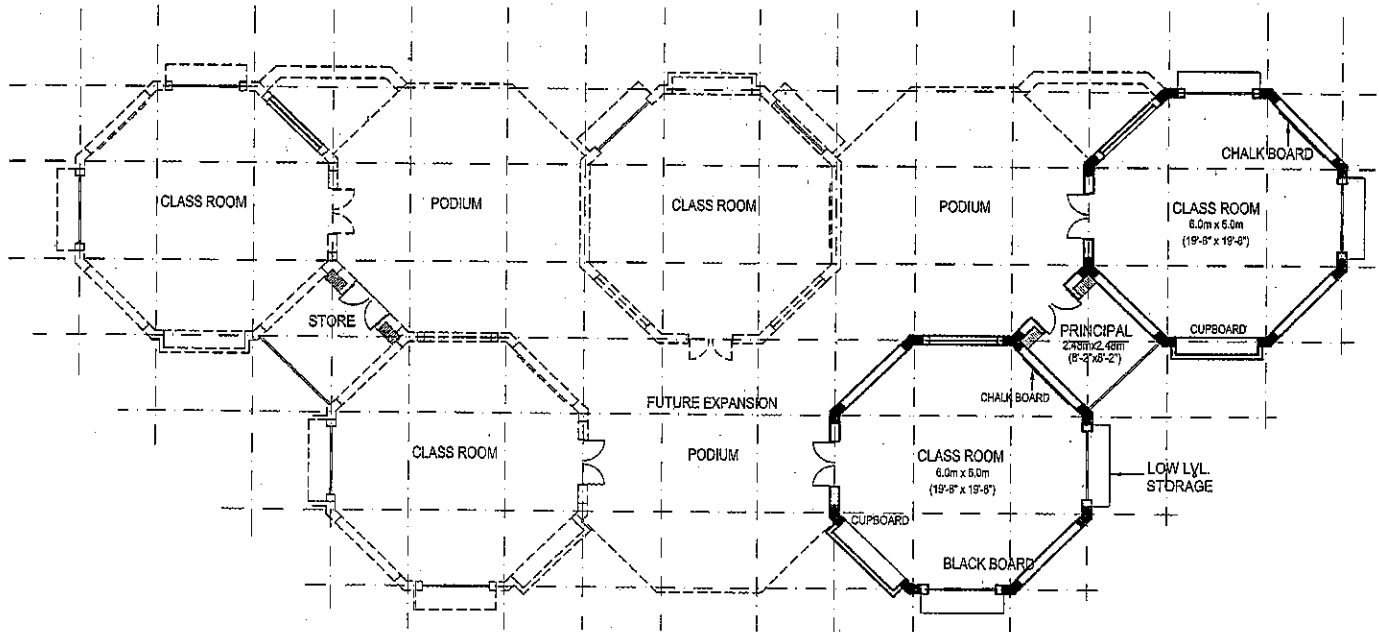


FRONT ELEVATION

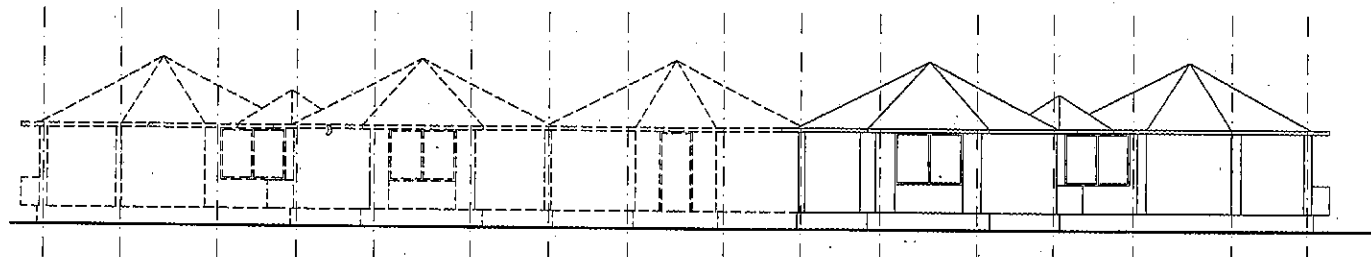
Plinth area.	989 sft
Estimated cost	Rs. 190,000
Cost per sft	Rs. 192
Architects	
P K - P E U D A S	
h 1483, cr park, new delhi	

New Primary School
Concept Design

UTTAR PRADESH



GROUND FLOOR PLAN



FRONT ELEVATION

0 0.75M 2.25M 4.5M			
Plinth area:	789 sft		
Estimated cost	Rs. 188,000		
Cost per sft	Rs. 238		
Architects			
PK - PEU DAS			
h 1483, or park, new dethi			

UTTAR PRADESH

New Primary School
Concept Design

WEST BENGAL

PROCESS

West Bengal was one of the first states to have a design development workshop. Various aspects of child friendly designs were discussed. Designs for additional classrooms and new school buildings were prepared in-house in mid 1998 incorporating essential pedagogical elements.

Four consultants were appointed soon after to prepare more options for the schools as well as the BRCs. Preliminary designs from these consultants have recently been finalised. The state proposes to extend the process further by decentralising the designs to the district level with each district developing its specific set of designs.

DESIGNS

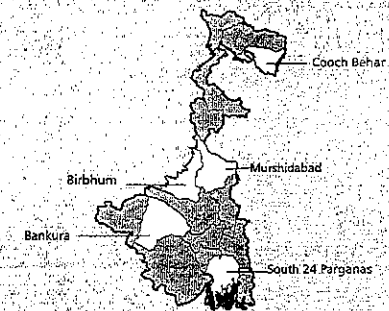
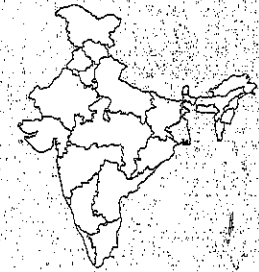
West Bengal has a major problem of overcrowding of schools. Consequently the number of classrooms required is higher. All the school designs have therefore been prepared as a combination of open, semi-open and covered classrooms. Provision of water supply and toilets will also be made in all school through funds from other schemes. These have been built into some of the designs. Most of the designs are however at a conceptual stage and require further detailing.

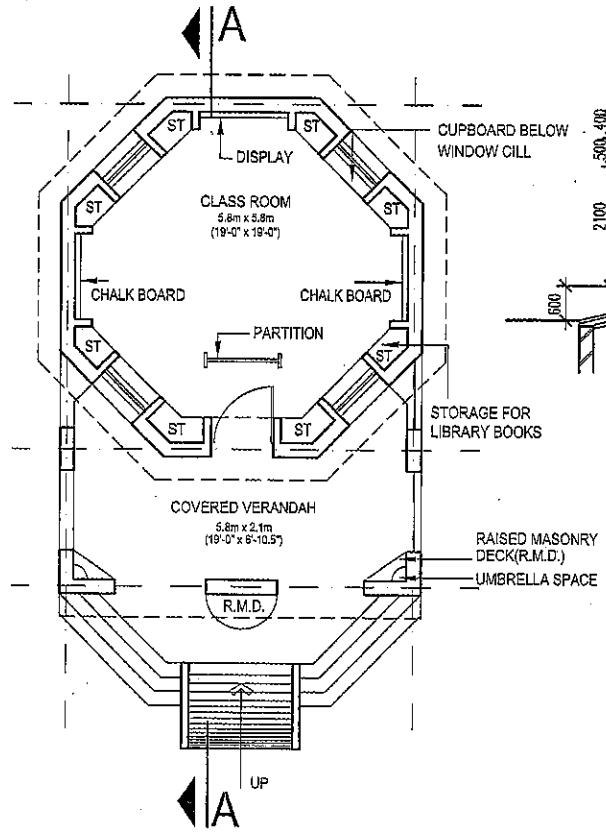
CONSTRUCTION AGENCY

Works are being supervised by contract engineers. At the district level one engineer has been appointed for each block. The engineering staff is, however, yet to be appointed in one district. Construction would be undertaken through the community.

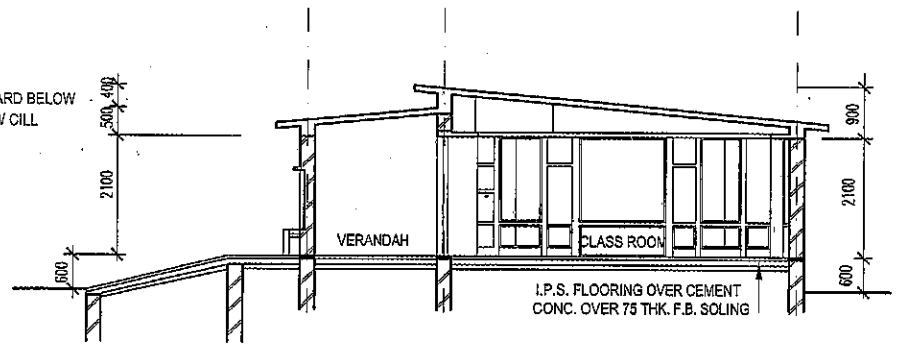
UNIT COSTS

Estimates for all the designs, except for the initial school and additional classroom design are yet to be worked out.

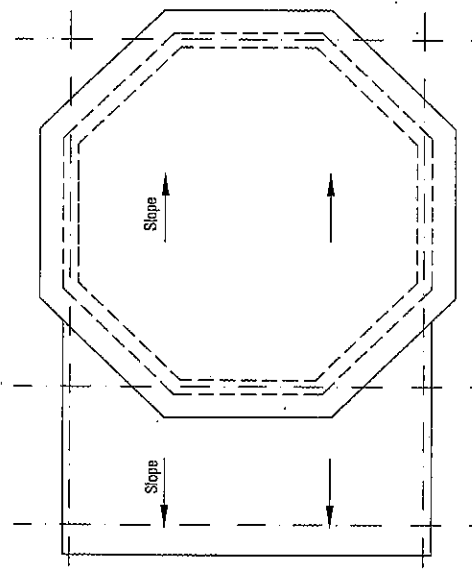




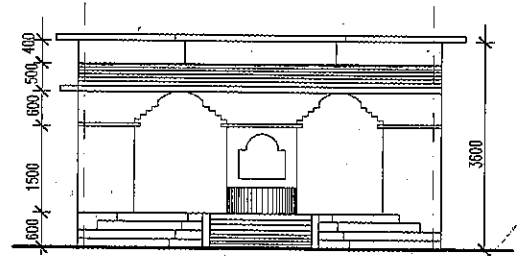
GROUND FLOOR PLAN



SECTION-AA



TERRACE PLAN



FRONT ELEVATION

WEST BENGAL

Single Classroom Extension

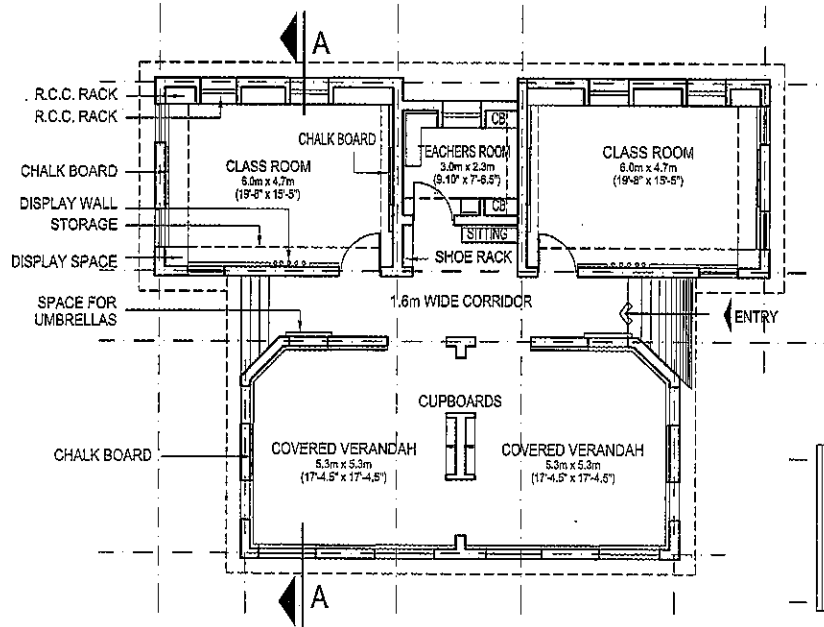
0 0.5M 1.5M 3M

Cost to be estimated

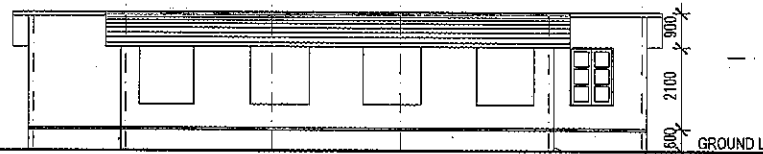
Architects

D P E P

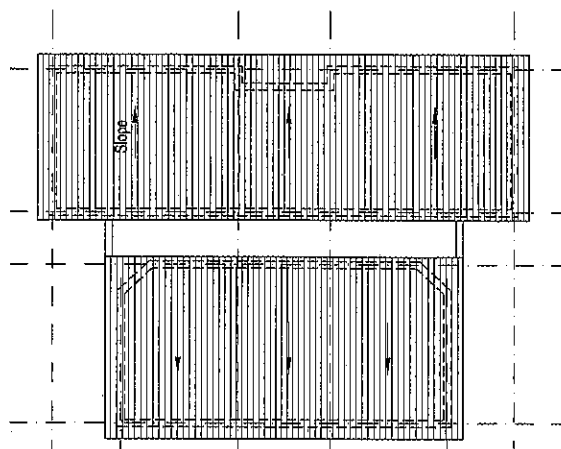
west bengal



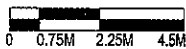
GROUND FLOOR PLAN



FRONT ELEVATION



ROOF PLAN

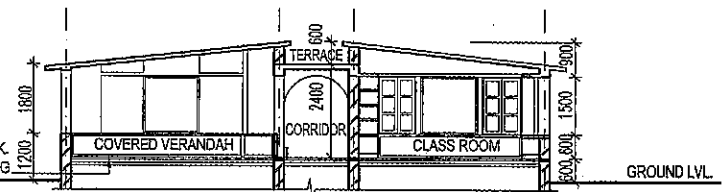


Plinth area. 1746.09 sq. ft.
 Estimated cost Rs. 235,000
 Cost per Sq. ft. Rs. 134

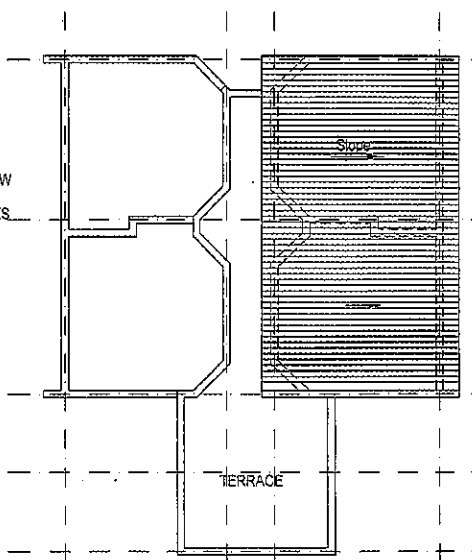
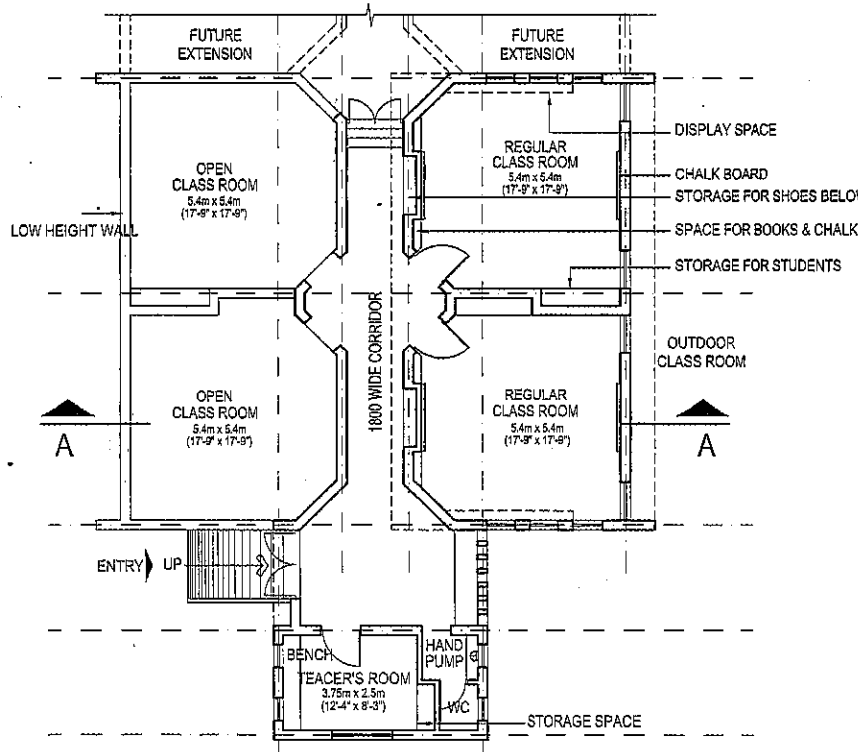
Architects
D P E P
 west bengal

I.P.S. FLOORING OVER 100 THK
 CEMENT CONG. OVER 75 F.B. SOLING

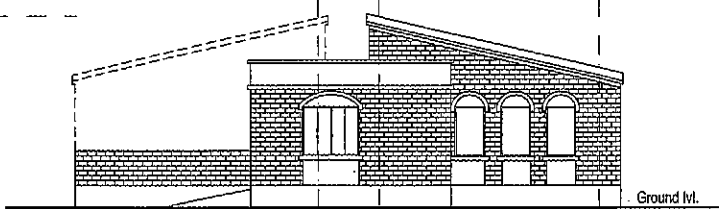
SECTION - AA



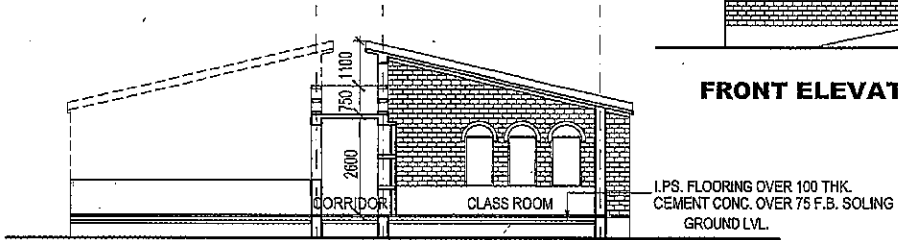
Primary School Building I. **WEST BENGAL**



GROUND FLOOR PLAN.



FRONT ELEVATION



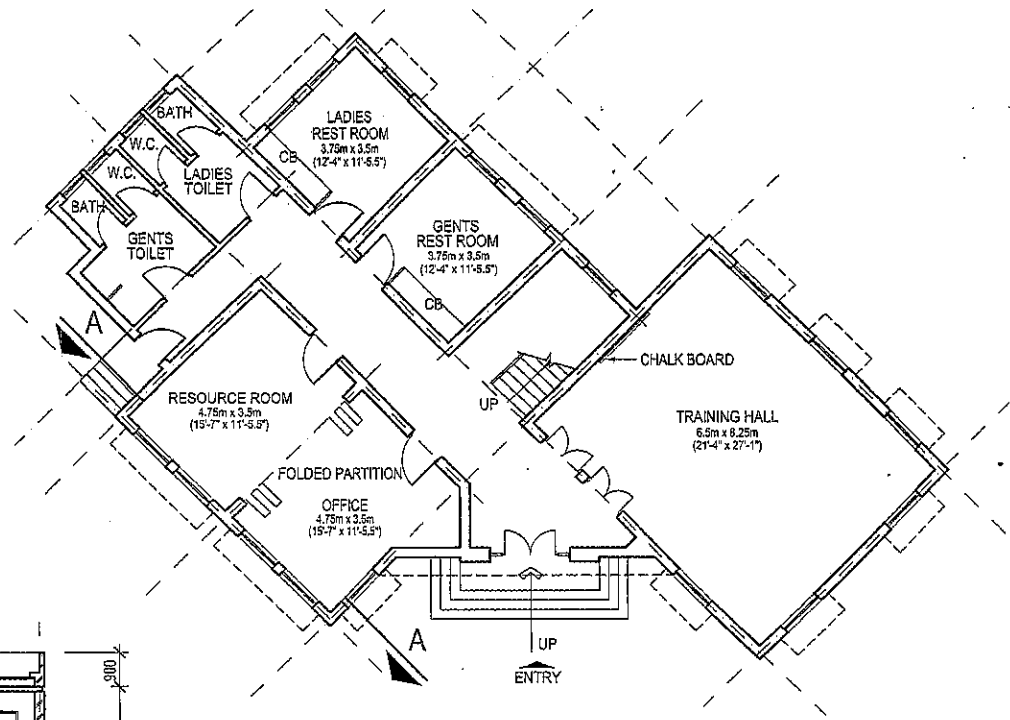
SECTION-AA

0 0.75M 2.25M 4.5M

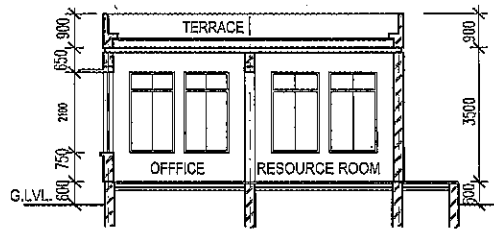
Plinth area. 1971.51sf
Cost to be estimated

Architects
D C L
west bengal

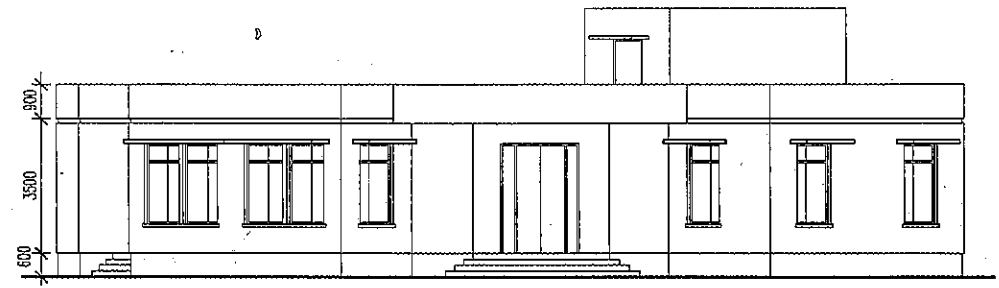
WEST BENGAL Primary School Building II.



GROUND FLOOR PLAN



SECTION-AA



FRONT ELEVATION

Plinth area. 2257.45 sqft

 Cost to be estimated

Architects

ACME CONSULTANTS

 calcutta

BRC West Bengal.

WEST BENGAL

BIHAR

PROCESS

Bihar is the most recent state to join DPEP (with the exception of Rajasthan). It is yet to undertake the design renewal exercise under DPEP. However, a similar process was followed under the Bihar Education Project (BEP) as well. Consultants were appointed for specific districts who undertook district studies and prepared designs which were discussed with teacher, students and the local community before finalisation. BRC, CRC and New school designs were prepared for the education project.

DESIGN FEATURES

The school designs are based on a hexagonal module. Pedagogical requirements of the teachers chalkboards, students chalkboards, display and storage facilities have been provided. The Block Resource Centre provides for a training hall, office, store dormitories, a library (on an upper floor), a kitchen, dining room and a formal courtyard.

On important aspect of the BEP experience was the use of appropriate materials and technologies in a large of buildings. This has provided the base for the state to take up all works through appropriate technologies in DPEP.

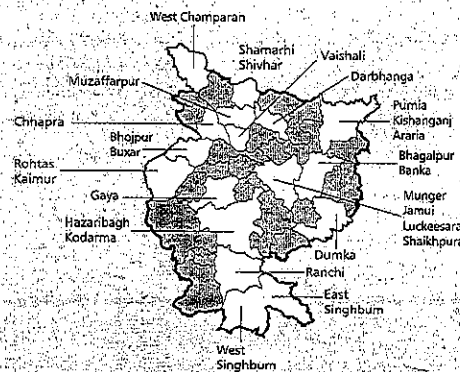
CONSTRUCTION AGENCY

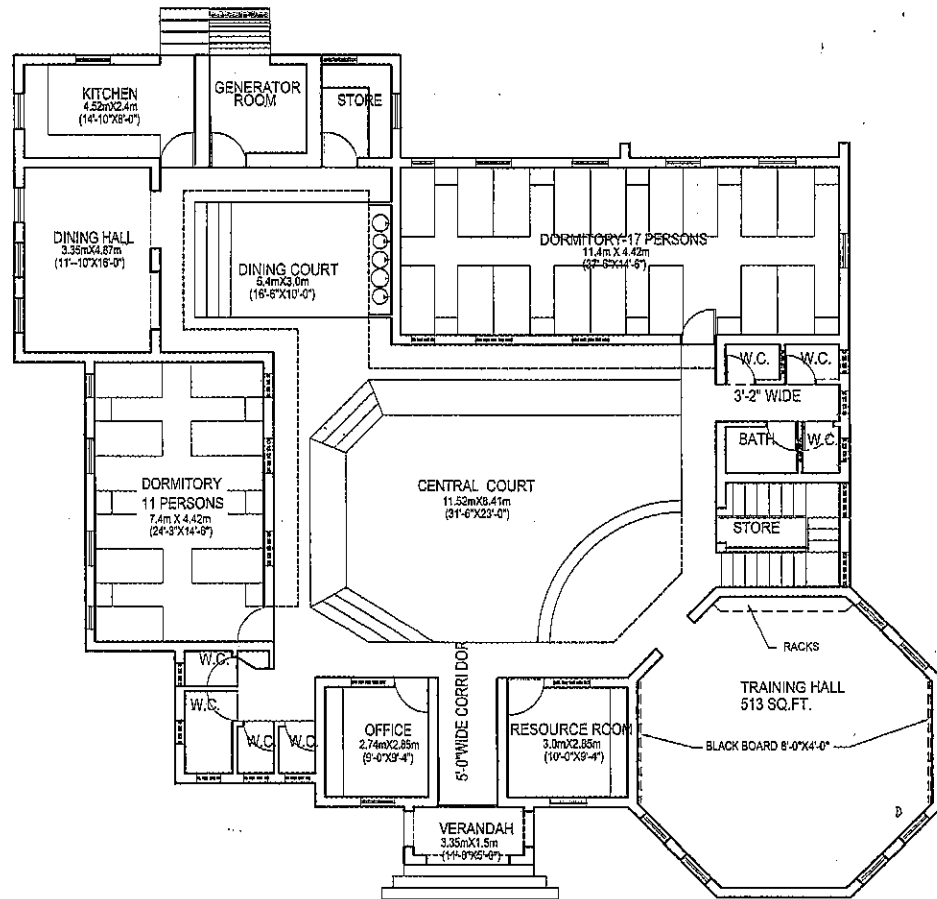
All works are undertaken through the community. Due to the successful experience with community construction in BEP, even BRC buildings (which would normally have to be contracted) would normally have to be contracted) are undertaken through the same system.

The supervision for the works is provided by inhouse engineers of contract.

UNIT COSTS

The cost of the BRC is approximately Rs. 10.5 lakhs while the cost of the two room school and CRC are Rs. 2.0 lakhs and Rs. 1.5 lakhs respectively.

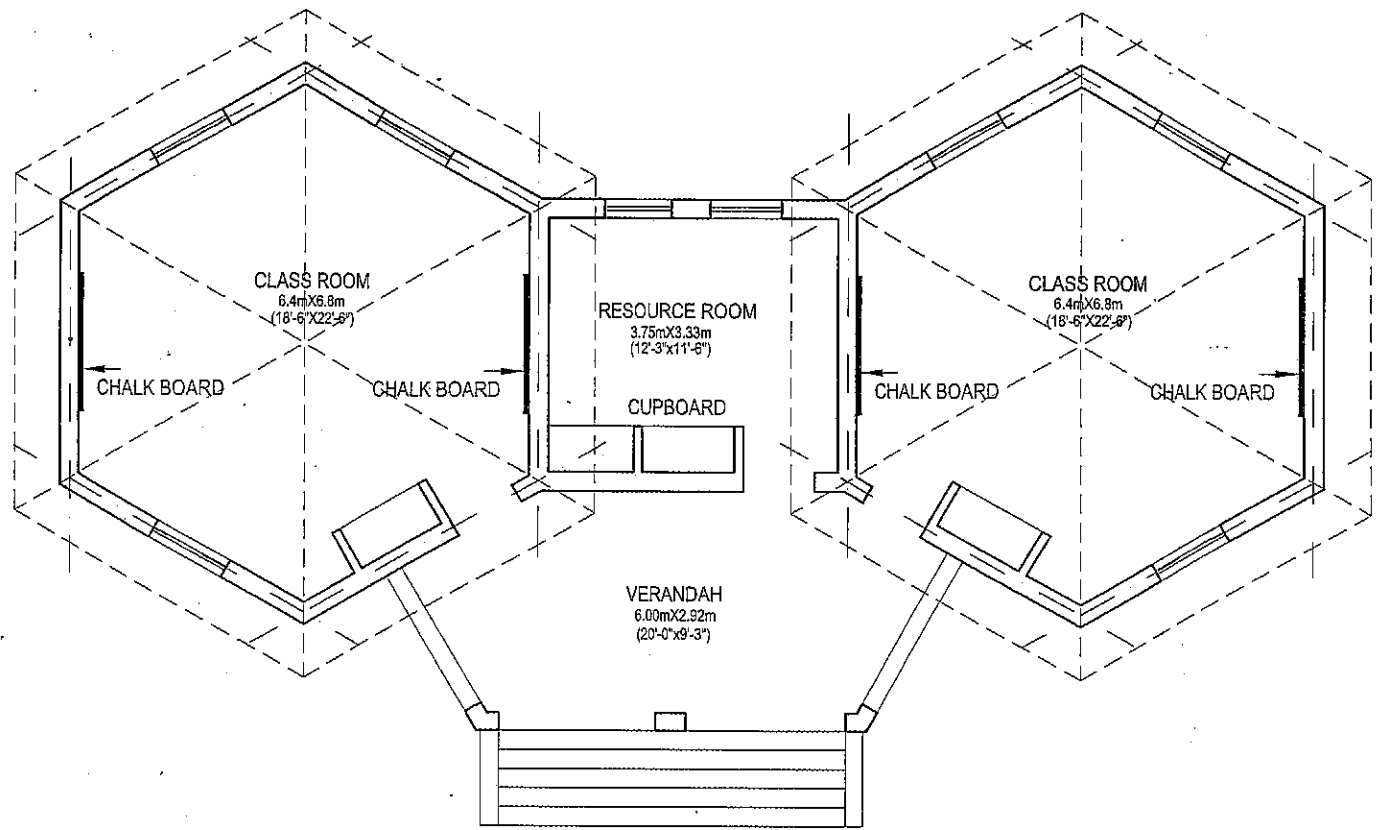




0 0.75M 2.25M 4.5M
 Plinth area. 3907 SqFL
 Cost Rs. 950,000
 Cost per sqft. Rs. 243
 Architects
 SPACE DESIGN CONSULTANTS
 PATNA

Block Resource Centre

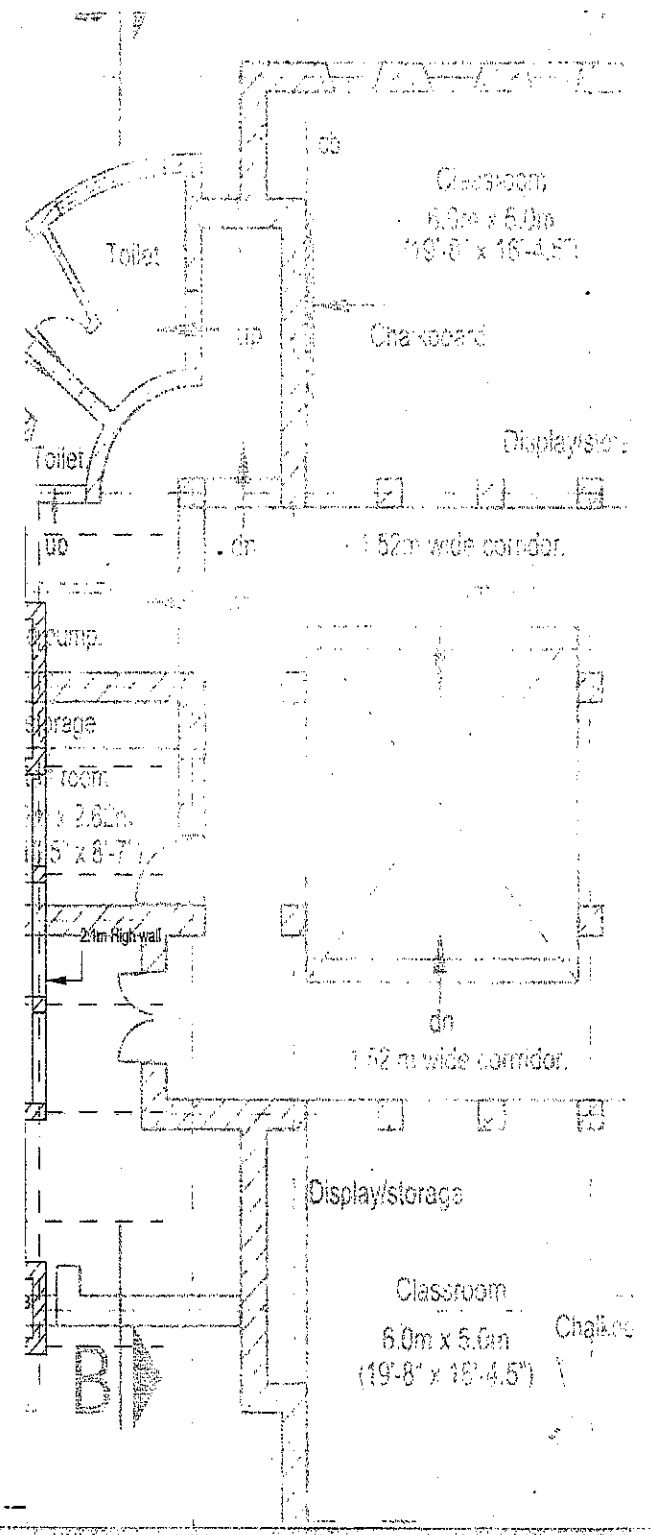
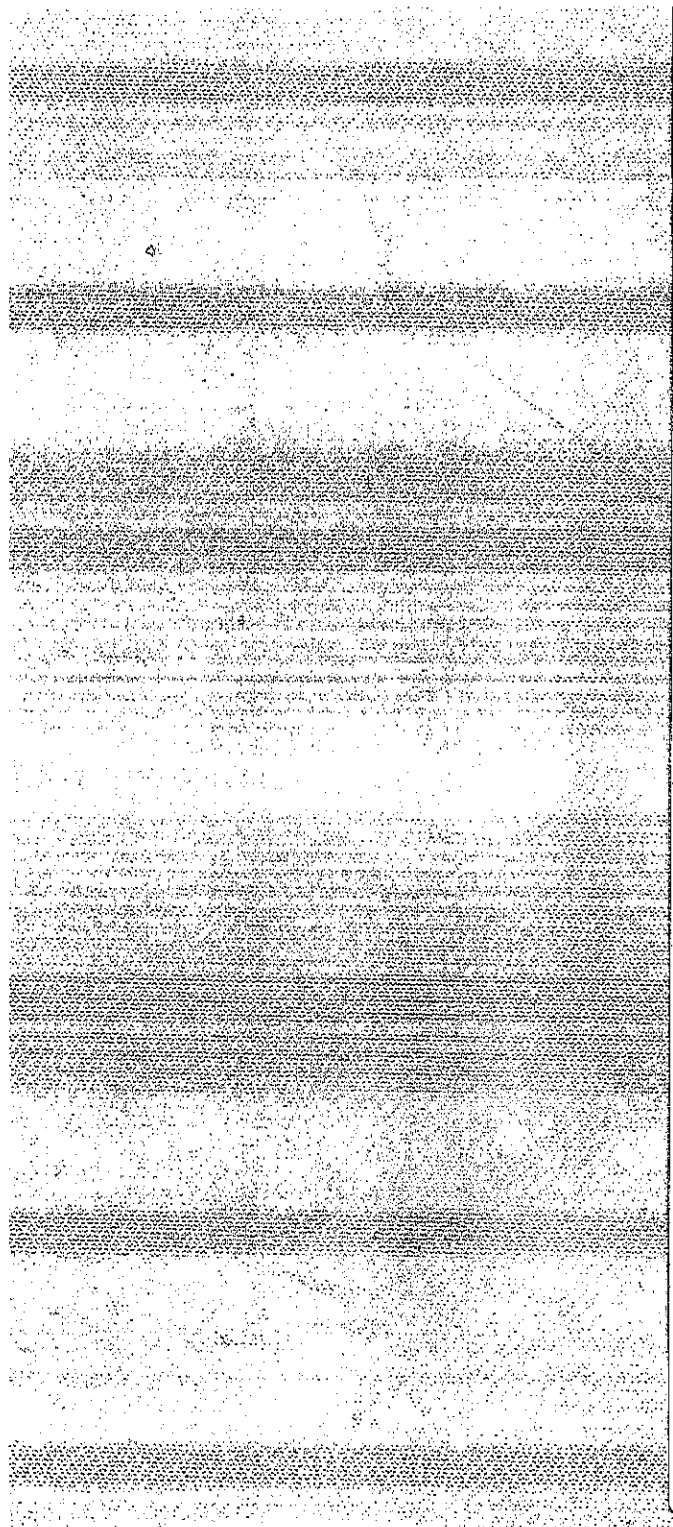
BIHAR



0 0.75M 2.25M	
Plinth area.	1116 SqFt.
Estimated cost	Rs. 200,000
Cost per sq. ft.	Rs. 179
Architects	
SPACE DESIGN CONSULTANTS PATNA	

BIHAR

Activity Based Primary School



Conventional belief has it that schools are prevented from being more 'sensitive' due to financial constraints. There is definitely some truth in this. Yet, what is more restrictive is the fact that school buildings are seldom expected to be more than buildings that just happen to be schools. How and why should a classroom be different from any other room? And what prevents it from being so - is it a financial constraint or is it a limitation of our understanding of what a school building can be?



MINISTRY OF HUMAN RESOURCE DEVELOPMENT
DEPARTMENT OF EDUCATION
GOVERNMENT OF INDIA