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## Low income housing project Peshawar

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The St. Michael's Housing Society was founded in 1980. Its objective is to provide land and housing core units at affordable prices for the Christian community in Peshawar. Although it has received some financial help from outside, its aim has been to be as self-supporting as possible with society members paying the true cost of the facilities provided. This aim has not been met fully but, as we will see, the amount of subsidy to members is not large. After 10 years, the society is expanding and construction work continues apace at the colony. This paper presents a brief account of the history of the colony and gives some information on the ways in which technical and administrative problems have been solved. It is hoped that it will perhaps make a contribution to the solution of housing problems in Pakistan.

The main emphasis in the early days of the society was on collection of funds and the purchase of land for a housing colony. The original membership was limited to about 130 families, each of which was asked to pay a deposit of 3500/Rs. and monthly installments of 200/Rs. The capital generated by members was insufficient to allow the early purchase of land. With this in mind, grants were obtained from various organisations, in particular from the German organisation Misereor. The object of these grants was to provide the basis for a revolving fund for land purchase. Money spent on land would be recouped when members paid for it and would then be available for further land purchases. It is worth making the point that such up-front funding is essential if housing initiatives like St. Michael's are to succeed.

The purchase of land at a location north of Tehkal Bala village began in 1983. The site is about 4km. from the centre of Peshawar Cantonment and about 1km. from Tehkal Payan village. It is adjacent to several brick kilns and much of the land had been dug out to provide material for bricks. The cost of such land tends to be lower than that of agricultural land. On the other hand, land which has been dug deeply will be difficult to service so that construction costs are greatly increased. The depth of excavations on the St. Michael's site was limited and the site could be drained without pumping so the choice of site did not result in major problems. By early 1986, about 670 marlas (1.67 hectares) of land had been purchased at an average of about 2,300/Rs. per marla (one marla is 25.27 square metres). The land formed a rough U shape round three sides of a rectangular depression.

At this stage, the society faced some problems. Members had been promised 5 marla plots and preliminary house designs showed two

rooms and a verandah. They had been told that they would have to pay 11,600/Rs. for their land plus the cost of house construction. No allowance had been made for the land that would be necessary to provide access to the houses and public spaces. Also, the cost of the proposed house design was estimated to be of the order of 40-50,000/Rs. and it was doubted whether most members could afford this amount. Further problems were technical in nature.

It was proving difficult to find someone to design a housing layout to make efficient use of the awkwardly shaped available space. A layout produced by a local engineer fitted only about 80 houses onto the site. It was irregular in form with no definite hierarchy of streets and with many plots having non-standard shapes. Because of these problems, the momentum of the project slowed and many members stopped their regular monthly payments.

A solution to these problems came about in a slightly fortuitous way. The Peshawar Development Authority engaged consultants to produce a "structure plan" to guide the future growth of the city. The consultants were also asked to produce proposals for new sites and services housing to ease the housing problem in Peshawar. One of the consultants team gave some assistance to the St. Michael's Society and there has subsequently been close contact between the society, the PDA and their consultants. This has been beneficial to both sides. The society has benefitted from the technical skills of consultants and PDA officers. At the same time, the St. Michael's scheme has provided an opportunity for the field testing of designs and techniques which may later be incorporated into government schemes.

In accordance with the professional advice now available, two important decisions were made by the society. The first was to reduce the size of plots to just over 4 marlas (98m<sup>2</sup> to be exact). This enabled almost 130 plots to be accommodated on the available land with adequate space for access roads and some public open spaces. The second decision was to provide only a single room and a sanitary core on each plot. This meant that costs could be reduced to a level affordable to the majority of society members. A layout was produced which aligned the majority and 5 meter wide access galls. Space for a 9 meter wide road was existing road from Tehkal Payan. (It is worth noting that some blocks in the southern part of the site were originally planned to be aligned at an angle to the remainder of the plots in order to follow the site boundaries as closely as possible. This layout was subsequently amended as it became clear that additional land would be purchased around that original site. The general point to be made is that layouts should, whenever possible, make allowance for future expansion of schemes.)

The Standard plot size adopted was 46ft. x 23ft. (14m x 7m). The 2:1 ratio between plot depth and plot width reflects in fact that servicing costs tend to reduce as the depth to width ratio increases. The 2:1 ratio makes site planning relatively easy and the plot width is sufficient to allow two rooms to be built across the plot. The core room has internal dimensions of 11.5ft x 11.5ft (3.5 x 3.5m). It was placed at the front of the plot in order to define the street and hence discourage encroachment into the right of way. This arrangement means that one wall is common where plots adjoin one another. The toilet/bathroom block is also placed at the front of the plot, thus minimising the length of water and sewerage connections. The original intention was to provide only the front wall to the plot but society members subsequently requested that a wall should be extended round the plots.

Construction began on site in late 1986. The society was lucky to obtain the services to another government institution, the Gulbahar Technical Training Centre. This institution provides training in building trades including brick laying, plumbing, joinery, carpentry and electricity. These indepth training courses are administered by qualified instructors using proven instructional methods over a six month training period. The site of the colony is an ideal place for practical training for the students. As it was done in the past at the training centre, houses are built and then dismantled for the purpose of practical experience.

Now however, the students can build houses at the colony and allow them to stand giving them the additional satisfaction of seeing their work remain in good condition after years. In this way the housing society members benefit from the students work and the Technical Training Centre benefits through the materials provided by the St. Michael's Housing Society. To date they have completed 135 housing units and 12 more units are in the process of completion, they have income also started a shopping centre. The shopping centre will provide income for later stages. Those who want to take a shop will have to pay rent and that money will go into the society fund for the common good of the colony. Up till now the society has acquired 1482 marlas of land. The training centre is supported by the German technical aid agency G.T.Z.

Several aspects of the core unit design and construction are worthy of note. Mud mortar has been used in all brick walls in order to reduce construction costs. Rooms and sanitation units are pointed externally and rendered internally with cement, sand mortar. Some time into the project, experts advised that cement, sand pointing should not be used with mud mortar joints since the pointing would become loose with time. However, no problems have been experienced over three years after the first units were constructed. Another feature is the use of pre-cast concrete beams and slabs in roof construction. These are produced by a factory at Pabbi, some 20km from Peshawar, and have the advantages of being cheap and easy to use. The total cost of beams and slabs for the core room and sanitation block roofs was about 1530/Rs. per unit in 1986. The concrete roof is surrounded by a brick parapet and covered in a thin layer of concrete and 150mm of mud for insulation purposes.

Another interesting initiative, albeit one which has not been followed up by society members, was an experiment with the use of pressed mud blocks for building walls. A machine for producing pressed cement stabilised blocks was brought from Germany in May 1986. Experiments with cement stabilised blocks led to the conclusion that they were not greatly cheaper than the locally available bricks. Moreover, people expressed a strong preference for brick over what they perceived as "katcha" blocks. However, a large number of mud blocks without any cement stabiliser had been produced while the machine was being tested. These were stacked on the site and were still in good condition a year later, despite being subjected to the ravages of the weather. (The only damage was to those blocks at the top of the stacks which were directly exposed to rainfall).

It was decided to use some of these to build a further two rooms on one plot as a demonstration project. The completed work includes a combination of brick and mud-block construction with a pre-cast concrete roof. The mud-block walls are rendered internally and externally with cement, sand mortar.

The expert advice that this mortar would crack has provided correct but cracking has not been extensive and has been easily repairable. A better alternative would be to use lime mortar but it was not possible to find sources of lime in time for the work. The structure has been standing for over 2 years now without any problems other than the cracks in the render. However, no society members have used the technique, even those who are unable to afford to expand their accommodation using conventional materials.

Water is supplied to a single tap on each plot in the scheme. The source of water is a deep tubewell which was sunk to an artesian aquifer at a depth of about 600ft. This supplies water under pressure so that no pumping is necessary. The tubewell was sunk under contract by WAPDA with funds supplied by the Dutch Government. The yield of the tubewell is estimated to be at least 1.5 cusecs (55 lt/sec.) at a head of about 50ft (15m). Unfortunately, lack of experience with sinking artesian wells resulted in a failure to adequately seal around the tubewell casing. This means that water escapes outside the casing if an attempt is made to restrict the flow inside the casing. It is therefore necessary to let water which is excess to requirements go to waste. While this is wasteful, the experience with the tubewell suggests that the artesian aquifer could be used to supply part of Peshawar's water needs if properly tapped.

Each plot is provided with a connection for the sanitation block to a sewer in the street or gali. Connections are 3.5 ins. pvc inside the plot leading into 4 ins. concrete pipes under the galis. Main sewers are 6 ins. and 9 ins. dia concrete. All concrete pipes are plain ended with joints made using cement mortar over a sacking filter in the joint itself. This is the technique commonly used to make house connections and private sewers in Pakistan. Sewage is treated in two septic tanks, each serving about 80 houses, and is then discharged to the existing drainage system. There is scope for the installation of a small waste stabilisation pond system to provide additional treatment.

This might be combined with ponds for fish farming which could provide income for the community.

Streets and galis are paved with bricks laid on a mortar bed. The bricks are grouted with cement, sand mortar. Most of the site is on ground which has already been excavated and the sub-grade is good and firm. No problems have been experienced with brick-on-edge pavement in 5m. wide galis and bricks laid flat in 3m. wide galis. Surface water drainage is provided by dishing 3m. wide galis and construction shallow channels on either side of 5m. wide galis. The channels were intended to take flows generated by low intensity rainfall with higher flows carried on the gali surface. However WAPDA placed their electricity pylons squarely in the channels, thus blocking them. In future it will be preferable to slope the 5m. galis to a central shallow channel. One covered channel is provided through the site to carry run-off from the higher ground which lies to the west.

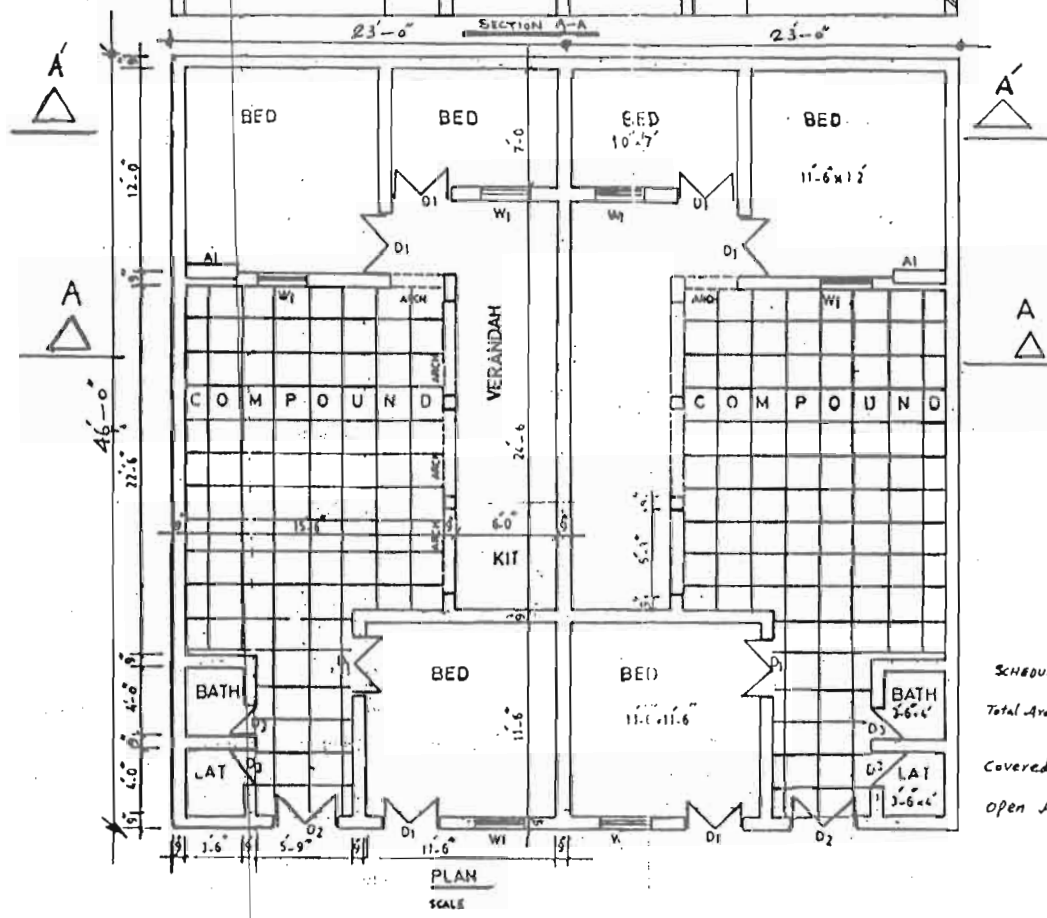
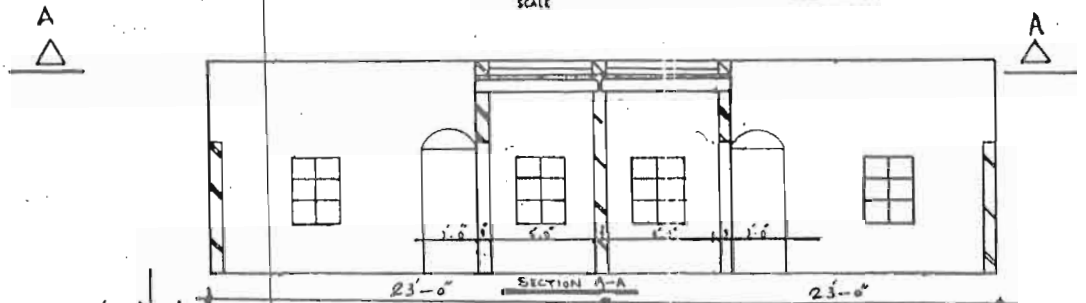
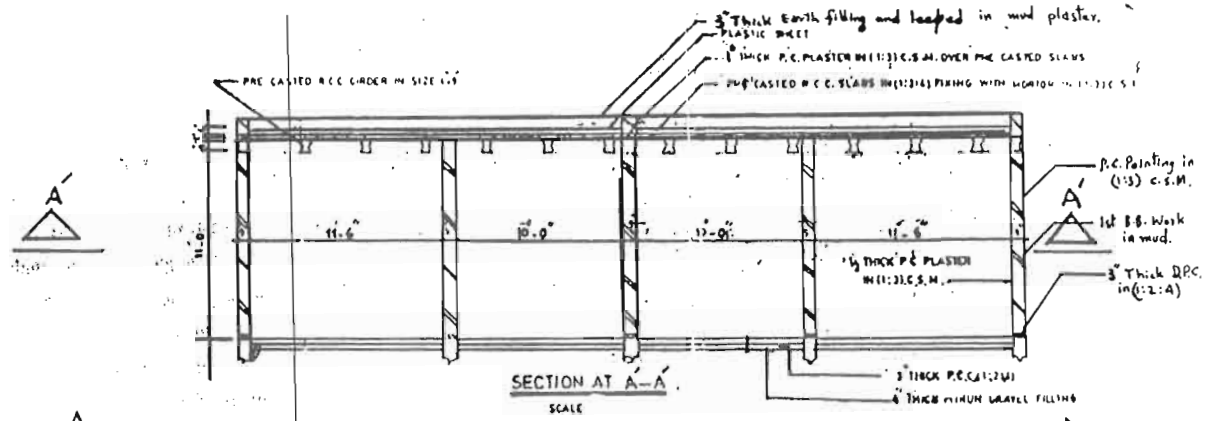
People began to move into the housing colony in mid 1988 and occupation of plots proceeded rapidly once electricity supplies were installed in 1989. The colony is now a thriving community.

Many houses have been extended far beyond the single core room. This suggests that many members have a fairly high level of savings. Other members have occupied the single core room while they save to add additional rooms. Land purchase has continued over the years and at the asking price in the area is now typically of the order of 5-10,000Rs. per marla. The original membership of the society has been expanded and additional funds have been obtained to increase the amount available for the revolving fund. To date the society is 260 members strong and new applicants approach the society regularly. In the first phase, society members could move onto their plot after paying 24,000/Rs. to the society. They then pay a further 6,000/Rs. at a rate of 200/Rs. per month. This was done to lessen the burden on the members of monthly expenses for both their present and future housing, however, the society experienced difficulty in collecting these monthly payments from those who had moved into the community. Therefore in the future phases it is requested that full payment will be made before moving onto the plot. The actual cost of the land, plus core buildings was approximately 36,000/Rs. total is made up of land cost, building cost, and various other expenses including land fill and leveling, road surfacing, sewer system, electrical hook-ups, water supply, etc. Obviously, these costs have risen with time and will continue to do so and thereby some increase in charges will be necessary for those new members included in the later stages of the scheme. Monthly installment rates are presently 300/Rs. over a period of ten years. To stretch these payments over a longer period may discourage the member.

St. Michael's Housing Society has an elected committee consisting of the president, vice president, treasurer, secretary and 5 other members. Once a year the society have an election, as well as giving the statements of accounts and position of the society. Once a month the committee meets and discusses running problems to be dealt with and most decisions concerning the society are made at this time. At

present 47 families are living in the colony, some are busy constructing their own part and others are preparing the difficult task of moving in, but there is great activity throughout the community.

The success of the society is that different groups are working together for the same goal, helping where ever and whenever is necessary so that even the poorest are able to acquire a plot and a house and thereby a position in the community.



SCHEDULE OF AREA.

Total Area of one Unit.	= 1058.0 S.F.T.
Covered Area	= 676.0 S.F.T.
Open Area	= 382.0 S.F.T.

