

**LOW COST DEMONSTRATION MODEL
HOUSES AND ROOMS CONSTRUCTED
BY CWHR**

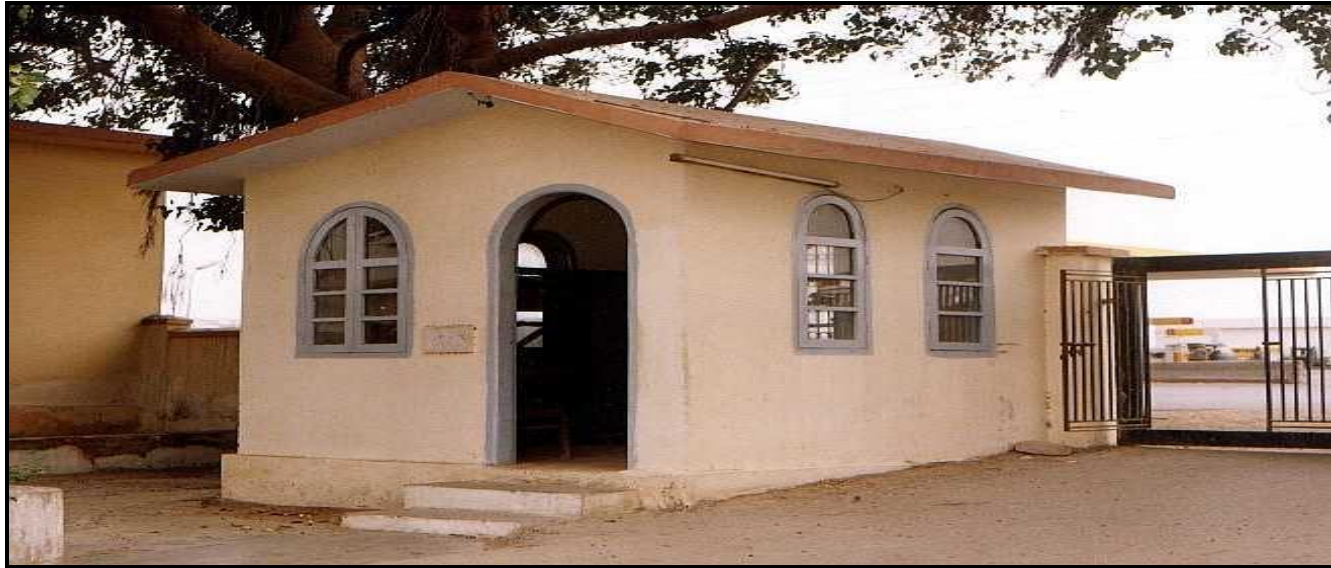
CONSTRUCTION OF A LOW COST HOUSE USING RICE HUSK ASH AND LIME AS PARTIAL REPLACEMENT OF CEMENT



For utilization of agro-wastes a house was constructed for the first time, using rice husk ash and lime as partial replacement of cement in construction.

Location	: CWHR Premises
Covered Area	: 678SFT
Year of Construction	: 1882
Overall Saving	: 37%

CONSTRUCTION OF A ROOM USING GROUND GRANULATED BLAST FURNANCE SLAG AS PARTIAL REPLACEMENT OF CEMENT



For utilization of industrial waste material, a room was constructed, using ground granulated blast furnace slag, (a waste product of Pakistan Steel Mills,) as partial replacement of cement in construction.

Location	:CWHR Premises
Year of Construction	:1982
Covered Area	: 132 SFT
Overall Savings	: 43%

CONSTRUCTION OF A LOW COST SCHOOL USING SOIL CEMENT STABILIZED BLOCKS FOR MASONRY WALLS AND PRE-FABRICATED ROOF WITH SLAG CEMENT



For utilization of industrial wastes, a five room school was constructed using Soil-Cement Stabilized blocks for masonry walls and pre-fabricated roof using slag (a waste product of Pakistan Steel Mills,) as partial replacement of cement in construction.

Location	: Hub, Balochistan
Year of Construction	: 1984
Covered Area	:1,433 SFT
Overall Saving	: 37%

CONSTRUCTION OF THREE ADDITIONAL ROOMS IN AN EXISTING SCHOOL BUILDING USING LOAD BEARING HOLLOW CONCRETE BLOCKS



For utilization of industrial wastes, three additional class rooms were constructed, using air cooled slag as coarse aggregate and ground granulated blast furnace slag, (both waste products of Pakistan Steel Mills,) as substitute of conventional coarse aggregate and partial replacement of cement in construction.

Location	: Gharo, Sindh
Year of Construction:	1985
Covered Area	:1,780 SFT
Overall Saving	: 43 %

TWO EXPERIMENTAL MODEL ROOMS USING SOIL STABILIZED FOUNDATION / BLOCKS FOR MASONRY WALLS AND PRE-FABRICATED ROOFING ELEMENTS



Location	: CWHR Premises
Year of Construction	:1980
Covered Area	: 387SFT
Overall Savings	: 30%

LOW COST HOUSING UNIT AT OLD THANO VILLAGE, MALIR, KARACHI



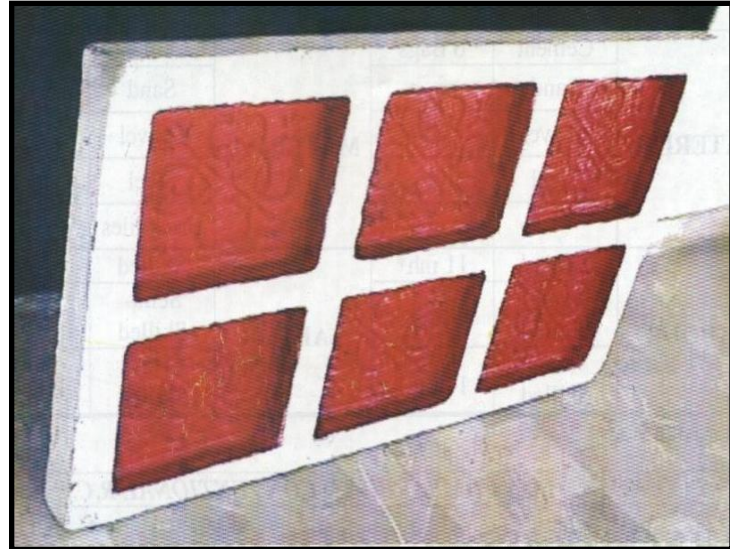
A demonstration and experimental low cost housing unit was constructed by utilization of alternative low cost construction materials and techniques including wastes. The house has two rooms with kitchen and bathroom.

Location	: Old Thano Village,Malir,Karachi
Year of Construction	:1993
Covered Area	: 466 SFT
Overall Savings	: 24%

**Some building components used in the construction
Low Cost Housing Unit At Old Thano Village, Malir, Karachi**



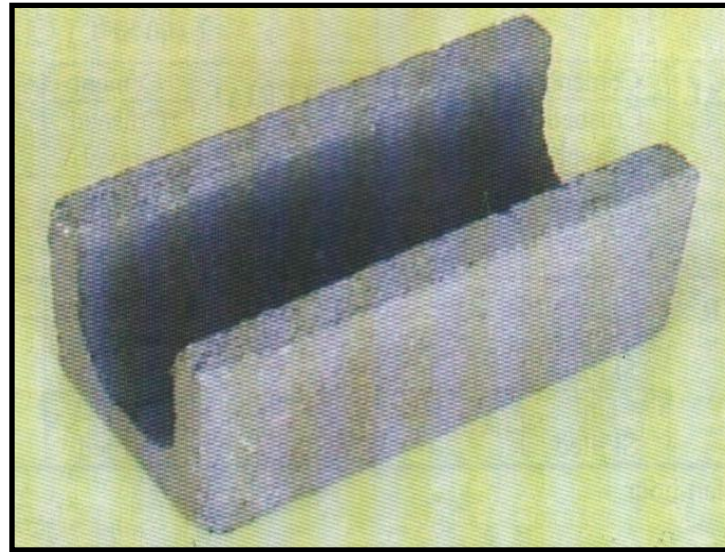
**FERROCEMENT BARREL
SHELL ROOFING SYSTEM**



**PRE-CAST REINFORCEMENT BURNT CLAY
BRICK WAFFLE SLAB TILES FOR ROOFING**



PRE-CAST CONCRETE STONE MASONRY BLOCKS



U-SHAPED CHANNEL BLOCKS FOR LINTELS

A Model Room Built With Wheat Straw Concrete Block Masonry Walls And Precast RCC Batten Tile Roof(2001)



A model room is constructed by using wheat straw concrete block masonry for load bearing walls with lightweight R.C.C. Tile Batten-Roofing system. This type of construction is economical and thermally comfortable for rural houses. The construction is simple, low cost and can be constructed on self-help basis.

Model Room Built With Cement Surkhi Brick Masonry Walls & Ferrocement Clay Tiles (FTC) Hollow Roof Deck Slab (2001)



A model room is constructed by using masonry made with Surkhi Lime and Portland Cement. Surkhi- Cement has been used as a binding material and as replacement of Portland Cement in load bearing masonry walls. The roof of this room is constructed with Ferrocement Clay Tile Roofing System. This type of construction is economical for areas where cement is costly. The construction techniques are simple and can be constructed on self-help basis.

Model Room Built With Soil Stabilized Block Masonry Walls and Pre-Cast RCC Hollow Roof (2001)



A model room is constructed using stabilized soil in foundations, base of floor and in load bearing masonry wall. The roof of this room is constructed with Precast RCC hollow roofing system. This type of construction is economical for construction of thermally comfortable housing in tropical climates.

Model Room Built With Soil-Sandwiched Block Masonry Walls And Precast RCC T-beam & Tile Roof (2001)



A model room is constructed by using soil stabilized sandwiched blocks for load bearing masonry wall with precast T-Beam and tile roofing system. The T-Beam is placed inverted to obtain a leveled ceiling. This type of construction is economical for rural housing.

Model Room Built With Stone-concrete Block Masonry Walls And Ferrocement Barrel Shell Roof (2001)



A model room has been designed and constructed by using stone concrete masonry both in foundation and for load bearing walls with ferrocement barrel shell roofing system. This type of construction is economical for rural housing and where low-grade stones are available in abundance. The construction techniques are simple and can be constructed on self-help basis.

Thermally Comfortable Model Room Built With Hollow Cavity Walls (2001)



A model room is constructed with hollow cavity walls and roof to save energy for cooling and heating the house in extreme climates. The thickness of load bearing wall varies from 13 ½” to 18” This type of construction is economical and improves the thermal performance of the indoor conditions.