

Retrofitting of the **HRC Office Battagram**

The building in Battagram that SDC selected as Housing Reconstruction Center (HRC) has been constructed 1950 in colonial style. The house has been partially damaged through the October 05 earthquake. The concrete lintels above windows and doors broke. In addition the center wall cracked seriously.

SDC was looking for a local associate to retrofit this building and found in Dr. Qaisar Ali (University of Engineering and Technology Peshawar) a competent partner. In close cooperation the described retrofitting strategy was developed.

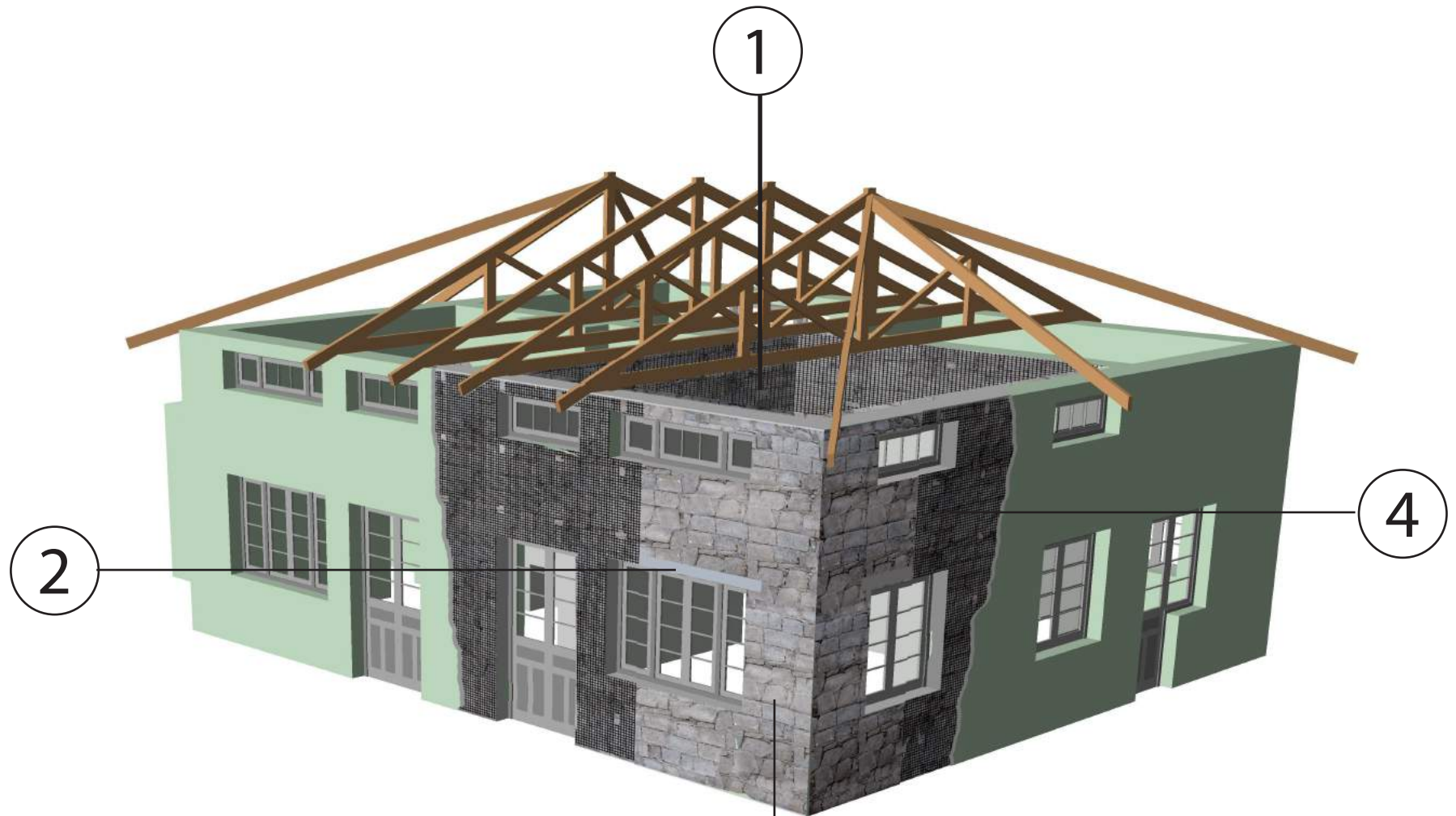
In a first step the damages were restored. The lintels were replaced and the center wall dismantled and rebuilt. Cracks and gaps were filled with cement mortar.

Secondly Iron mesh on both sides of the wall was bolted with steel rods to prevent wall panels and joints from collapsing.

The different steps taken are illustrated in this brochure.



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DEZA DIREKTION FÜR ENTWICKLUNG UND ZUSAMMENARBEIT
DDC DIRECTION DU DÉVELOPPEMENT ET DE LA COOPÉRATION
DSC DIREZIONE DELLO SVILUPPO E DELLA COOPERAZIONE
SDC SWISS AGENCY FOR DEVELOPMENT AND COOPERATION
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Eid. Departement für auswärtige Angelegenheiten
Département fédéral des affaires étrangères
Dipartimento federale degli affari esteri
Swiss Ministry of Foreign Affairs
Ministerio Suizo de Asuntos Exteriores

- 1 Rebuilding of wall
- 2 Replacement of lintels
- 3 Repair of walls
- 4 Fixing of mesh



Major crack in center wall



Cupboard niche in wall



1



New wall with lintel

Reconstruction of center wall

Because of two door openings and two cupboard niches, the center wall was weak in its structure. Consequently the major earthquake damages are in that part of the building.

The whole center wall was built up new with a strengthened lintel and without niches.



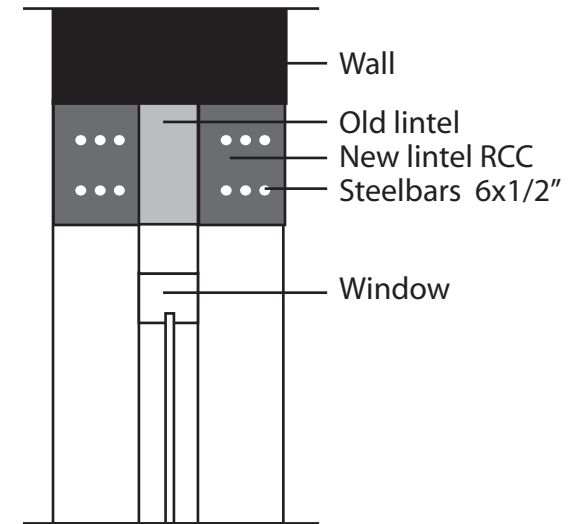
Broken lintel above the door



Broken lintel above the window



Replaced lintels above door and window



Replacement of lintels

Most of the lintels were broken in the earthquake. The lintels have been replaced in two parts, from both side of the wall.

3



Repaired wall

Repair of walls

All the walls have been repaired by filling cracks and bigger holes with cement mortar.

9 water : 9 cement : 1 fine sand



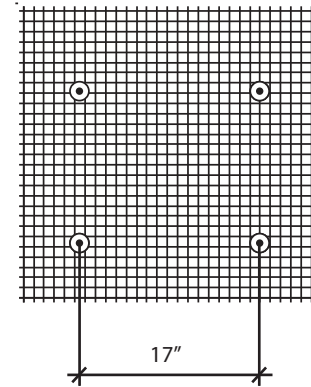
Drilling holes for the bolts



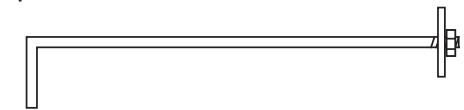
Wire meshes have to overlap 1'



Cover of mesh with plaster



Wire mesh: MS 2mm, 1" Space



Bolt: 1/8" Diameter

Reinforcement of walls

Wire mesh has been fixed on all walls with steel bolts and was covered with cement mortar in ratio 1:4