



Projects library of the specialized group for construction

**PUBLIC BUILDINGS**

**Project** **Education (Primary School Reconstruction)**

**Project name** **RECONSTRUCTION AND LIVELIHOOD PROGRAMME (RLP) 2006 -2008**

**Example:** Government Primary School (GPS) Sughdhar  
Government Primary School (GPS) Baffa Kalan  
Government Girls Primary School (GGPS) Hassari

|                               |  |
|-------------------------------|--|
| <b>Country</b>                | <b>Pakistan</b>  |
| <b>Region/town</b>            | <b>Northwest Frontier Province, NWFP<br/>District Mansehra and Battagram</b> |
| <b>Project type</b>           | <b>New reconstruction</b>  |
| <b>Typology</b>               | <b>1 – 4 classroom Primary, Middle and High Schools</b>                      |
| <b>Approach</b>               | <b>Private sector contracted construction</b>                                |
| <b>Beneficiaries</b>          | <b>Affected people in response to the earthquake of Oct. 2005</b>            |
| <b>Climate</b>                | <b>Summer hot and humid, Winter dry, wet and cold</b>                        |
| <b>Special constraint</b>     | <b>Earthquake area, cultural and religious context</b>                       |
| <b>Start / end of project</b> | <b>2006 / 2009</b>   |
| <b>Country GNP</b>            | <b>3'300 USD/cap</b>   |
| <b>Pictures</b>               | <b>GPS Baffa Kalan</b>   |



**Partners**

|                             |  |
|-----------------------------|--|
| <b>Organization (Donor)</b> | SDC-HA, UNICEF, DFID   |
| <b>IO/NGO partners</b>      | UNICEF, DFID   |
| <b>Government partners</b>  | ERRA (Earthquake Reconstruction and Rehabilitation Authority)<br>UET (University of Engineering and Technology, Peshawar)<br>NESPAK (National Engineering Services Pakistan, Consultant to ERRA) |

**Context to project**

|                             |  |
|-----------------------------|--|
| <b>Initial situation</b>    | Following the October 2005 earthquake and the emergency relief phase SDC-HA started in March 2006 the rehabilitation and reconstruction through its <b>Reconstruction and Livelihood Programme (RLP)</b> consisting of three components: the Reconstruction of Schools & Basic Health Units, the Rural Private Housing Reconstruction Programme and Livelihood activities in Mansehra and Battagram Districts.                 |
| <b>Goals, Beneficiaries</b> | Vulnerable communities and families in EQ-affected areas restored their basic livelihood. Private buildings and public infrastructure are reconstructed through coordinated support of SDC-HA, the Earthquake Reconstruction and Rehabilitation Authority (ERRA), the Local Government and Partner Organizations. Through the reconstruction of ca. 70 schools an approximate number of close to 9'000 students shall benefit. |
| <b>Implementations</b>      | SDC-HA pledged to reconstruct on behalf of ERRA and the respective line agencies of the Government of Pakistan totally or partially damaged Schools and Basic Health Units (BHU) in the EQ area of NWFP.   |



|                               |  |
|-------------------------------|--|
| <b>Results by August 2008</b> | 20 schools have been completed, 6 are under construction (status August 2008). In addition, the project is implementing partner to UNICEF funded schools. It is anticipated to construct an additional 40 schools funded by UNICEF and DFID. By the end of 2009 a total of approx. 210 classrooms for mainly Primary Schools and some Middle and High Schools will be built. |
|-------------------------------|--|

## Reference data (comparative samples)

### Example 1: Government Primary School Sughdhar

|                             |                     |                           |  |
|-----------------------------|---------------------|---------------------------|--|
| GIS data (WGS 84)           | N 34.425 E 73.387   | altitude 1054msl          |  |
| Land plot                   | 770 m <sup>2</sup>  | Number of blocks          | 2  |
| Classes/rooms per blocks    | 2 per block         | Number of units           | 4  |
| Beneficiary /classroom      | 43                  | Total beneficiaries       | 170 students   |
| Sanitary facilities         | 3 latrines          | Other infrastructure      | 1 Teacher's office<br>1 Toilet for disabled<br>water tank, boundary wall |
| Ground floor (covered area) | 320 m <sup>2</sup>  | Floor levels              | 1  |
| Total surface               | 320 m <sup>2</sup>  | Surface / beneficiary     | 1.9 m <sup>2</sup> / beneficiary   |
| Volume (outside dim.)       | 1200 m <sup>3</sup> | Volume / beneficiary      | 7 m <sup>3</sup> / beneficiary   |
| Heated surface              | No heating          | Electrification           | yes  |
| Cost per classroom          | 38'500 USD          | cost/beneficiary          | 905 USD/beneficiary  |
| Total cost (1US\$=69PKR)    | 154'000 USD         | Self help (beneficiaries) | 0 USD/beneficiary  |

### Example 2: Government Primary School Baffa Kalan

|                             |                       |                           |  |
|-----------------------------|-----------------------|---------------------------|--|
| GIS data (WGS 84)           | N 34.43851 E 73.21952 | altitude 915 msl          |  |
| Land plot                   | 530 m <sup>2</sup>    | Number of blocks          | 1  |
| Classes/rooms per blocks    | 4 classes, 1 block    | Number of units           | 4  |
| Beneficiary /classroom      | 56                    | Total beneficiaries       | 224 students   |
| Sanitary facilities         | 3 latrines            | Other infrastructure      | 1 Teacher's office<br>1 Toilet for disabled<br>water tank, boundary wall |
| Ground floor (covered area) | 315 m <sup>2</sup>    | Floor levels              | 1  |
| Total surface               | 315 m <sup>2</sup>    | Surface / beneficiary     | 1.4 m <sup>2</sup> / beneficiary   |
| Volume (outside dim.)       | 1180 m <sup>3</sup>   | Volume / beneficiary      | 5.3 m <sup>3</sup> / beneficiary   |
| Heated surface              | No heating            | Electrification           | yes  |
| Cost per classroom          | 32'500 USD            | cost/beneficiary          | 580 USD/beneficiary  |
| Total cost (1US\$=69PKR)    | 130'000 USD           | Self help (beneficiaries) | 0 USD/beneficiary  |

### Example 3: Government Girl Primary School Hassari

|                             |                       |                           |  |
|-----------------------------|-----------------------|---------------------------|--|
| GIS data (WGS 84)           | N 34.41658 E 73.36738 | altitude 827 msl          |  |
| Land plot                   | 730 m <sup>2</sup>    | Number of blocks          | 2  |
| Classes/rooms per blocks    | 2 per block           | Number of units           | 4  |
| Beneficiary /classroom      | 28                    | Total beneficiaries       | 112 students   |
| Sanitary facilities         | 3 latrines            | Other infrastructure      | 1 Teacher's office<br>1 Toilet for disabled<br>water tank, boundary wall |
| Ground floor (covered area) | 246 m <sup>2</sup>    | Floor levels              | 1  |
| Total surface               | 246 m <sup>2</sup>    | Surface / beneficiary     | 2.2 m <sup>2</sup> / beneficiary   |
| Volume (outside dim.)       | 920 m <sup>3</sup>    | Volume / beneficiary      | 8.1 m <sup>3</sup> / beneficiary   |
| Heated surface              | No heating            | Electrification           | yes  |
| Cost per classroom          | 28'250 USD            | cost/beneficiary          | 1000 USD/beneficiary   |
| Total cost (1US\$=69PKR)    | 113'000 USD           | Self help (beneficiaries) | 0 USD/beneficiary  |



| <b>Approach to results</b>                     |   |
|--|---|
| <b>Initial Situation</b>                       | <p>The Government of Pakistan mandating ERRA to implement and coordinate the Reconstruction and Rehabilitation Program and the International and National Donor support initiated following the 2005 earthquake. The purpose of this program was to reconstruct and rehabilitate the livelihoods of the affected communities as well as to rebuild public infrastructures of over 4000 educational (government owned public schools) and almost 800 health facilities (basic health units, hospitals, rural health centers etc.) that were severely damaged or destroyed during the earthquake.</p>   |
| <b>Project concept</b>                         | <p>In order to rely and make use of the available capacity the project concept emphasised to integrate local knowledge as much as possible. For the design of the schools SDC-HA engaged the University of Engineering and Technology, UET in Peshawar through a planning and design consultancy contract. The Civil Engineering Department of UET is leading in the development of EQ-resistant construction methods in Pakistan. Modular drawings for 1 up to 4 classroom single story schools were designed to obtain approval by the Government authorities (Non objection Certificates, NoC) The design was verified by Swiss Engineers and are as well used by CARITAS. Site-specific assessment such as student enrolment, legal issues, topographical survey, soil investigation and other parameters are done to prepare the detailed tender documents.</p> <p>A small team of one to two SHA experts and several national engineers as construction managers and site engineers are managing the above described tasks.</p>   |
| <b>Project procedure</b>                       | <p>The proposed projects for reconstruction were assessed and identified based on the degree of damage and these lists were made available for pledges by NGO's and INGO's.</p> <p>Following a rather bureaucratic identification, selection and approval procedure that involves the local Government as well as ERRA and NESPAK the required technical data is surveyed and the final design and tender documents are prepared. Based on exact bills of quantities and through public bidding procedures, the lump sum contracts are given to the private sector construction contractors. Through a set of specific criteria in terms of price, quality and performance, capable contractors are identified and the contracts awarded. Contract documents are derived and adapted from international FIDIC standards.</p> <p>An average size school of 3 -5 classrooms is completed within 6 to 9 months depending on the contractor's performance, site access and weather conditions. Site supervision is carried out directly by our project site engineers. The finishing standards are of good quality.</p> <p>Legal handing over certificates, as built drawings and maintenance plans are provided upon project completion.</p> |
| <b>Structural concept and finishing design</b> | <p>RCC frame / confined masonry on strip foundation; roof with steel trusses and CGI sheets painted; floor finish in marble tiles; walls cement plastered, both sides reinforced with embedded wire mesh, inside distemper/enamel, outside weather shield painted; aluminium windows with splinter proof glass and safety grill; door frame in steel, blade in Deodar wood; suspended ceiling in Lasani wood; all rooms with electrification, lighting and ceiling fans; ramp for wheelchair access.</p> <p>Double/triple seat benches for 40 students/classroom, black board on two walls, teachers desk and furnished teacher's office, incl. storage</p>   |
| <b>Issues/Constraints</b>                      | <p>Complex bureaucratic approval procedure to obtain all documents to start construction.</p> <p>Marginal community involvement.</p> <p>Difficulties access to sites (occasionally transportation of material with donkeys)</p> <p>Weather conditions - hot and wet monsoon season and sever cold in winters shortens the construction.</p>   |



|                        |   |
|------------------------|---|
| <b>Lessons learned</b> | <p>To work in different stages, e.g. a pilot phase with 5 – 10 schools enables to get first experience of the local context and skills capacity and improve the design as well as adapt the approach.</p> <p>Using the national capacity and know-how in the design and carry out direct supervision by project staff and not the consultant was useful.</p> <p>The concept of modular designs with a well-structured planning process keeps the design and planning costs low. Consistent improvements on the structure and the finishing works of the buildings must be based on the experiences made.</p> <p>High quality of work and timely completion resulted in a good reputation and image of SDC-HA.</p> |
|------------------------|---|

| <b>Legal framework</b>      |   |
|-----------------------------|---|
| <b>Political attachment</b> | Through the bilateral agreement between SDC and the Government of Pakistan followed by an MoU between SDC-HA and ERRA |
| <b>Type of ownership</b>    | District Education Department on behalf of Ministries of Education at Provincial and Federal Level through ERRA       |

### Relevant building construction costs (excl. planning, design and supervision)

| <b>Construction</b> |  | <b>GPS Sughdhar</b> |             | <b>GPS Baffa Kalan</b> |             | <b>GGPS Hassari</b> |             |
|---------------------|--|---------------------|-------------|------------------------|-------------|---------------------|-------------|
| <b>Structure</b>    | Foundations  | 19'060              | <b>11%</b>  | 12'914                 | <b>10%</b>  | 14'736              | <b>13%</b>  |
|                     | Walls or columns   | 25'460              | <b>15%</b>  | 17'617                 | <b>13%</b>  | 18'304              | <b>16%</b>  |
|                     | Fassade (internal + external finishing, grills, sunscreen) | 23'550              | <b>14%</b>  | 11'611                 | <b>9%</b>   | 8'963               | <b>8%</b>   |
|                     | Roof (incl. trusses)                                       | 30'210              | <b>20%</b>  | 28'400                 | <b>21%</b>  | 25'396              | <b>21%</b>  |
|                     | Earthquake protection                                      | inclusive           |             | Inclusive              |             | Inclusive           |             |
| <b>Materials</b>    | Floor surface  | 10'217              | <b>6%</b>   | 9'833                  | <b>7%</b>   | 7'332               | <b>6%</b>   |
|                     | Doors and Windows  | 11'430              | <b>7%</b>   | 12'801                 | <b>9%</b>   | 9'036               | <b>8%</b>   |
|                     | Ceiling (false)  | 4'340               | <b>3%</b>   | 5'182                  | <b>4%</b>   | 2'620               | <b>2%</b>   |
|                     | Thermo insulation  | n.e.                |             | n.e.                   |             | n.e.                |             |
| <b>Watsan</b>       | water  |                     |             |                        |             |                     |             |
|                     | Toilets  | 12'430              | <b>8%</b>   | 11'370                 | <b>8%</b>   | 10'455              | <b>9%</b>   |
|                     | Waste water (septic tank)                                  | inclusive           |             | Inclusive              |             | Inclusive           |             |
|                     | Rain water   | inclusive           |             | Inclusive              |             | Inclusive           |             |
| <b>Equipment</b>    | heating system   | n.e.                |             | n.e.                   |             | n.e.                |             |
|                     | Electricity connection                                     | 3'400               | <b>2%</b>   | 3'456                  | <b>3%</b>   | 2'507               | <b>2%</b>   |
|                     | Telephone connection                                       | n.e.                |             | n.e.                   |             | n.e.                |             |
|                     | Cooking facilities   | n.e.                |             | n.e.                   |             | n.e.                |             |
|                     | School furniture   | 5'060               | <b>4%</b>   | 5'796                  | <b>4%</b>   | 4'348               | <b>4%</b>   |
| <b>Development</b>  | External development works                                 | 18'810              | <b>10%</b>  | 16'446                 | <b>12%</b>  | 13'625              | <b>11%</b>  |
| <b>Total</b>        | <b>In US\$</b>   | <b>153'750</b>      | <b>100%</b> | <b>135'426</b>         | <b>100%</b> | <b>117'322</b>      | <b>100%</b> |



### Urban planning

Example 1: Government Primary School Sughdhar

|              |                  |   |
|--------------|------------------|---|
| Distance to: | villages         | 1.5 km  |
|              | Public transport | Available to the village but not for the students |

Example 2: Government Primary School Baffa Kalan

|              |                  |   |
|--------------|------------------|---|
| Distance to: | villages         | 0 km  |
|              | Public transport | Available to the village but not for the students |

Example 3: Government Girl Primary School Hassari

|              |                  |   |
|--------------|------------------|---|
| Distance to: | villages         | 0 km  |
|              | Public transport | Available to the village but not for the students |

### For further information

|  |   |
|--|---|
| Involved SDC-HA construction group consultants | Thomas Fisler, Peter Brunner  |
| Other involved SDC-HA consultants              | SKAT_Consultants, St. Gallen  |
| Author / Contact:                              | Peter Hilty / Peter Brunner <a href="mailto:peter.brunner@sdc.net">peter.brunner@sdc.net</a> ,<br>Thomas Fisler <a href="mailto:thomas@fisler.ch">thomas@fisler.ch</a>  |
| Recommended Institutions:                      | N / A   |
| Recommended partners:                          | N / A   |
| Recommended books/reports:                     | Further information (drawings, contracts...) on<br>construction group website or email above available  |
| Relevant other projects (links):               | Project Document of the Reconstruction and Livelihood<br>Program (RLP), Pakistan containing the reconstruction<br>of Schools and Basic Health Units.<br>Website: <a href="http://www.sdcpakistan.org">www.sdcpakistan.org</a> |

Relevant illustration

-set of drawings