COMPRESSED STABILIZED EARTH BLOCKS

Affordable, eco-friendly and disaster resistant building material for developing countries.
Building Pioneers tackles 4 pressing issues in Bangladesh…

Solid building material is unaffordable for millions of Bangladeshis.

Most structures are not built earthquake resistant. Just like in Nepal.

Unskilled labourers often endure slavery like working conditions.

8000 brick kilns cause 9 Mio tonnes of $\text{CO}_2$ and severe deforestation.
… with one proven technology and an innovative approach to make it big.

Dear “competitors”, copy us!

Building Pioneers will set-up CSEB production facilities in various regions of Bangladesh to showcase their technical feasibility and economical viability. This will convince other commercial companies to produce CSEB on a large scale.
Compressed stabilized earth blocks (CSEB) is a proven technology and an eco-friendly alternative to fired clay bricks.

**CSEB technology is proven for decades in various countries**

The first CSEB press was developed in the 1950’s. Today CSEB technology has been used in more than 30 countries around the world, among them Mexico, USA, South Africa, India, Thailand. CSEB production is suitable for unskilled labourers.

**The production of CSEB dispends firing in kilns**

CSEB consist of soil, sand water and a low percentage of cement. The soil mix is compressed in a block press and cured during 28 days. For the curing, the CSEB are daily sprinkled with water and air-dry. Afterwards they are ready for construction. The cement makes the blocks strong and water resistant. The production of CSEB is much more eco-friendly than that of fired clay bricks (75% less CO$_2$ – emissions).

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<tr>
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<th>Embodied Energy [MJ / m$^3$ wall]</th>
<th>CO$_2$- Emissions [Kg / m$^3$ wall]</th>
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</thead>
<tbody>
<tr>
<td>Compressed stabilized earth blocks (CSEB)</td>
<td>631</td>
<td>57</td>
</tr>
<tr>
<td>Kiln fired clay bricks (FCB)</td>
<td>2,356</td>
<td>230</td>
</tr>
<tr>
<td><strong>Savings of CSEB over FCB</strong></td>
<td>73%</td>
<td>75%</td>
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CSEB offer compelling technical properties reduce the building cost of walls compared to conventional bricks.

Best equipment for high quality and productivity

The *Auram 3000* is one of the best manual CSEB presses available on the market today. The high compression ratio produces exceptionally strong blocks for the construction of load bearing walls for multi-storey buildings. The dimensional accuracy of less than 1 mm variation (compared to 1 cm with FCB) saves mortar and plaster. CSEB walls are approx. **25% cheaper** than FCB walls.

**Auram 3000’s outstanding technical specifications**

- Available force: 150 KN (15 tonnes)
- Compression ratio: 1.60 to 1.83
- Block height [mm]: 25, 50, then up to 100 in 1 mm increments
- Practical output: 100 strokes per hour
- Daily output: 1,600 plain blocks
- Manpower: 3 men on the press

**Different CSEB types to meet various requirements**

More than 70 different types can be produced with moulds and inlays to meet different demands such as hollow interlocking\(^1\) for *disaster resistant building* (earthquake, cyclone), U-shaped\(^2\) for horizontal RCC ring beams, recesses\(^3\) for water or electrical pipes, floor tiles\(^4\) or simply plain\(^5\) CSEB with the same dimensions as FCB.
Impressions from Building Pioneers’ CSEB test production in Bangladesh

1. Drying the soil
2. Crushing the soil
3. Mixing soil, sand, 5% cement and water
4. Initial curing for 2 days
5. Compressing the mix
6. Final curing for 26 days: daily watering and air-drying
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