

## CATEGORY BUILDING SYSTEMS



### PRODUCT / TECHNOLOGY



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Technology Detail

## ROUND BOULDERS MORTAR (RBM) UNITS

*Alternate to burnt clay bricks for walling.*



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Video

### CONTACT DETAILS

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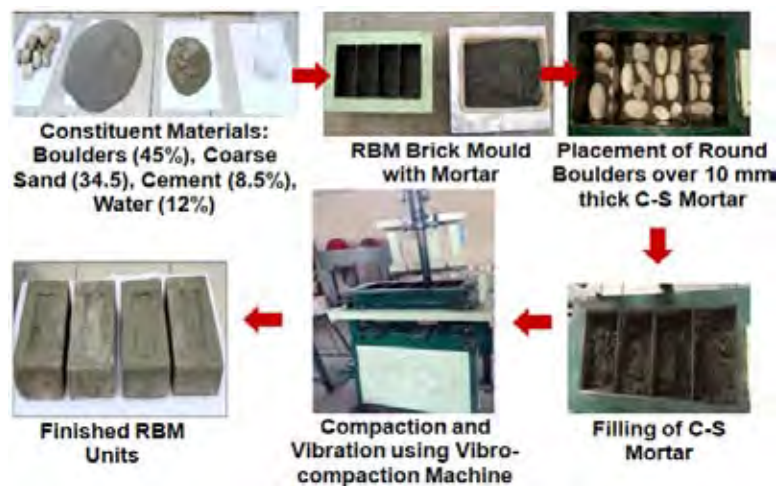
### BRIEF

40-60 mm size round boulders (45% by volume), confined in cement and coarse sand mortar in the ratio of 1:6 (c:s) having cement content of 8.5% and coarse sand content of 34.5%, mixed thoroughly with water (12% by volume) to form a RBM unit. These units can be manufactured on mass-scale using C-brick machine which uses vibro-compaction technique for producing units.

The product is ideally suitable where round boulders are available locally.

### SALIENT FEATURES

- Promotes use of locally available materials (round boulders) hence low transportation cost.
- Eco-friendly manufacturing process (no firing and clay consumption) & Energy efficient.
- Employment generation and no special skills required for manufacturing.
- Less breakage and better shape.
- Low carbon footprint.
- 40% cost reduction as compared to prevalent burnt solid clay units.
- Superior engineering properties as compared to prevalent burnt solid clay and AAC units (100% increase in compressive strength and 30% increase in shear strength).
- Manufacturing rate of 3000 units of size 230x110x80 mm in one shift of 8 hours using C-brick machine.



Manufacturing Process of RBM Units



## ECONOMIC ASPECTS

- 40% cost reduction as compared to prevalent burnt solid clay units.

## SUSTAINABILITY ASPECTS

- India consumes around 250 billion units annually, whose production is being done in rudimentary method with varying soil types across the country. Several million tonnes of coal and several million tonnes of biomass fuel is consumed annually for the manufacturing of burnt solid clay bricks, which results in environmental pollution and depletion of resources. Noteworthy, burnt solid clay brick sector is responsible for 9% of the total black carbon emissions in India. One clay brick consumes 3.2 kg of top soil. Moreover, one square feet of clay bricks exhaust 8 kg of coal and emit 17.6 kg of CO<sub>2</sub>. On the other hand, one square feet of AAC block exhaust 0.9677 kg of coal and emit 2.2 kg of CO<sub>2</sub>. The firing involved in the manufacturing process of burnt solid clay bricks results in environmental pollution. Although, other units, such as AAC units overcome certain issues, but there are issues with physical and engineering properties if proper quality control measures are not taken, which limits their adoption in the construction industry. Alternatively, RBM units are manufactured using locally available round boulders as filler material, which produces units at a relatively lower cost, have minimal environmental hazard and eco-friendly manufacturing process, thus imparting overall sustainability in construction.

## SUITABILITY & AVAILABILITY

- Suitable for all types of climatic conditions.
- Widely applicable in hilly regions and where round boulders are available in abundance.
- Can be used in load bearing as well as infill walls in buildings or in retaining walls.
- Manufactured using CSIR-CBRI developed C-brick machine.

## LIMITATIONS, IF ANY

- Suitable for hilly & other regions where round boulders are available locally

## MARKET LINKAGES

- The research study & technical know-how is available with CBRI, Roorkee.

## MAJOR PROJECTS

- Two-storey masonry building constructed using RBM units at Construction Technology Demo Park of CSIR-CBRI Roorkee.
- Currently being implemented in hilly regions of Uttarakhand and Himachal Pradesh.

## CERTIFICATION/INDIAN STANDARD/ ENDORSEMENT

- Tested at CSIR-CBRI for various material and engineering properties.

