CATEGORY

BUILDING SYSTEMS

PRODUCT / TECHNOLOGY

LIGHT WEIGHT CELLULAR (LWC) PANELS

Alternate to conventional walling system.

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CONTACT DETAILS

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BRIEF

Light Weight Cellular (LWC) panels consist of fly ash (580 kg), cement (140 kg), water (80 kg) per cubic meter, along with foaming agent. It has protruded trough shaped, 20 mm deep and 72 mm wide notch, which forms a male-female type joint connection at the top and bottom edge of panel, with an intent to achieve vertical interlocking between the upper and lower panels, thus improving the integral action between the panels. LWC panels measures 590 x 270 x 140 mm, having four vertical holes of 60 mm diameter, spaced at 157 mm c/c (Fig. 1). Two holes may be casted with rebar and concrete if implemented in high seismic regions.

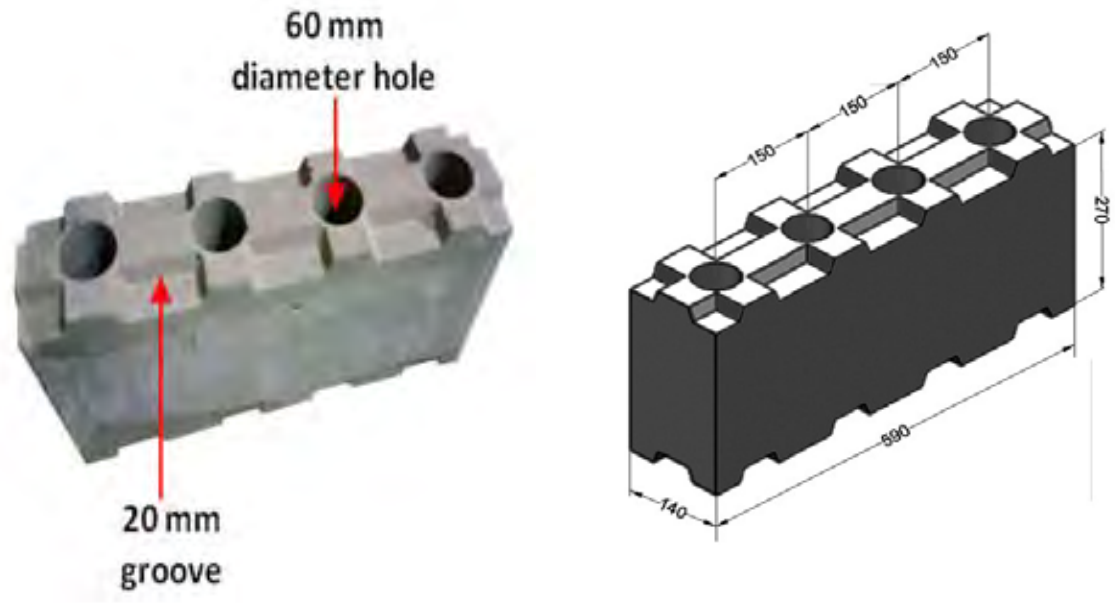


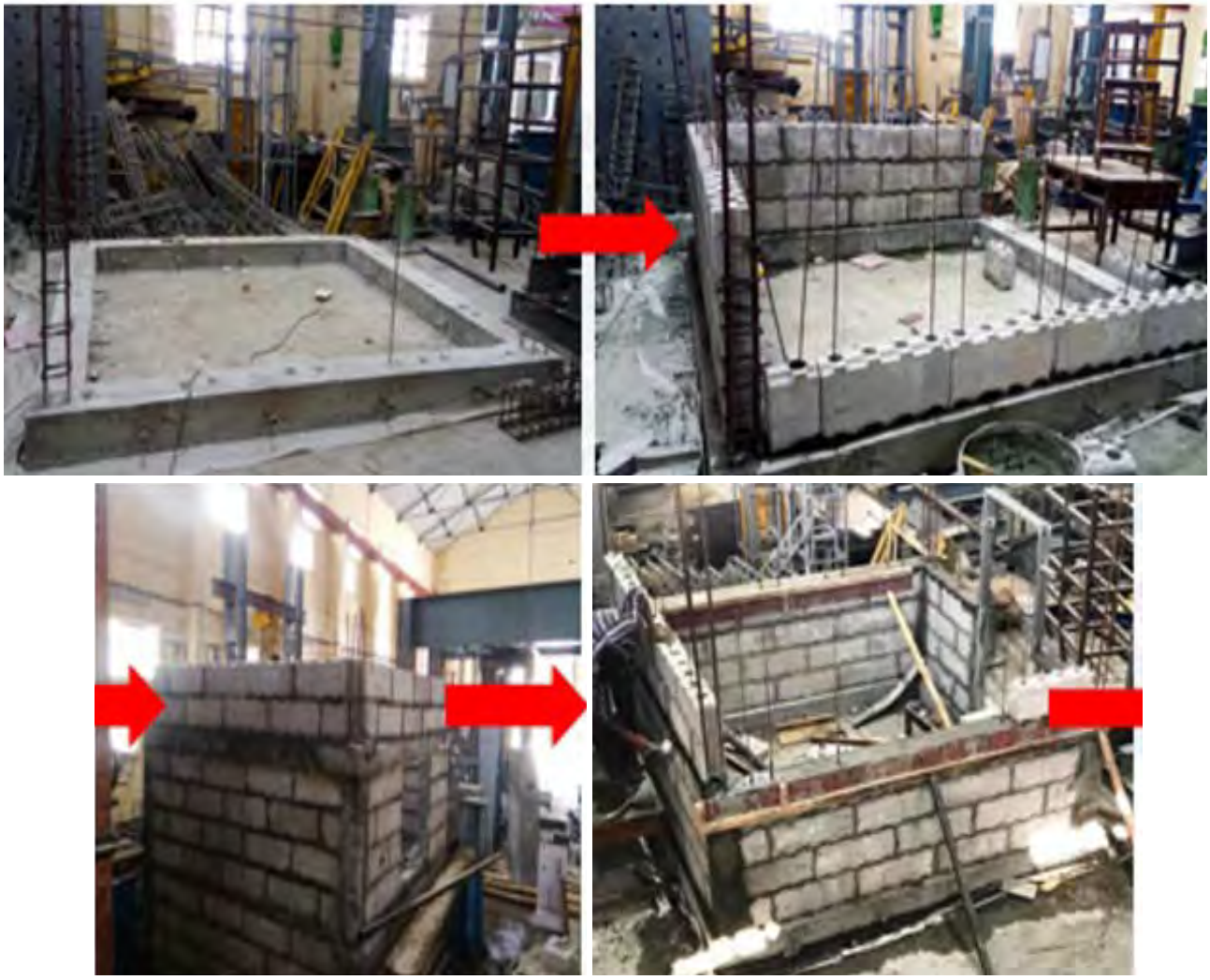
Fig. 1. LWC panel

SALIENT FEATURES

- Light weight, thus easy handling.
- Provide benefit of extra floor space due to reduced thickness.
- Easy and eco-friendly manufacturing process as compared to burnt solid clay units.
- Minimal constructions skills requirement
- Facilitate interlocking mechanism with vertical panels, thus minimal damage and prevents panel-to-panel separation at the interface.
- Facilitate rapid construction and easy to construct methodology without using heavy equipments.
- Utilize waste material (fly ash) as major ingredient
- Satisfactory performance in axial and lateral loads (earthquake, wind force etc.)
- Aesthetically compliant to social and cultural environment.
- Suitable & economically viable for low-to-medium rise construction

ECONOMIC ASPECTS

- Large quantity of fly ash as raw material, light in weight & fast construction with these panels, makes it economically viable for low-to-medium rise construction with about 30% cost reduction.



SUSTAINABILITY ASPECTS

- Prevalent burnt solid clay units utilizes natural resources such as clay/soil and coal. Moreover, their manufacturing process involves consumption of coal and requires firing thus creating environmental pollution. Alternatively, LWC panels are manufactured using waste material such as fly ash as one of the component thus eliminating the need of soil or clay. Further to this, they have eco-friendly manufacturing process, which do not require firing and reduces the depletion of natural resources, thus imparting overall sustainability in construction.

SUITABILITY & AVAILABILITY

- Suitable for all types of climatic conditions.
- Can be used in load bearing walls in masonry buildings, as well as in infill walls in RC frame buildings.

LIMITATIONS, IF ANY

- Suitability for individual /scattered and low to medium height (G+3) houses and not in load bearing walls of high-rise buildings.
- Single storey and two storey confined masonry buildings with the proposed LWC panels are favourable for all the seismic zones, while three storey buildings can be adopted up to zone IV.

MARKET LINKAGES

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

MAJOR PROJECTS

- Currently being implemented in various masonry load bearing and RC frame buildings in Uttarakhand and Uttar Pradesh.

CERTIFICATION/INDIAN STANDARD/ ENDORSEMENT

- Tested at CSIR-CBRI for various material and engineering properties; along with full-scale confined masonry building using LWC panels tested under lateral load.

Full-scale CM Building

Damage Pattern from Lateral Load Test