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BubbleDeck

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BUBBLEDECK

THE NEED

Conventional horizontal concrete slabs are heavy that limit their spans. Enhancement of span results in addition of beams that increases the cost of the structure. Thus, there is a need for a technology that will help in increasing the span by reducing weight of the span.

FIGURE 1 BUBBLEDECK

THE TECHNOLOGY

BubbleDeck is a revolutionary construction method that virtually eliminates concrete from the middle of a floor slab between columns that does not perform any structural function, thereby dramatically reducing structural dead weight. BubbleDeck is based on a patented technique - the direct way of linking air and steel. Void forms in the middle of a flat slab eliminates typically 35% of a slab's self-weight by removing constraints of high dead load and short spans. The incorporation of recycled plastic bubbles as void forms permits longer spans between columns. Combining this with a flat slab construction approach that spans in two directions then connects the slab directly to insitu concrete columns without any beams.

The overall floor area is divided down into a series of planned individual elements (panels), typically 8ft to 10ft wide dependent upon trucking, weight restrictions of the crane at site and other site conditions, Panels are manufactured off-site using local precast facilities. The panels comprise both the top and bottom reinforcement mesh, sized to suit the specific project, joined together with vertical lattice girders with the

bubble void forms trapped between the top and bottom mesh reinforcement to fix their optimum position. This is termed a “BubbleCage” sandwich which is then cast into a bottom layer of 2 ½ inch pre-cast concrete, encasing the bottom mesh reinforcement, to provide permanent formwork within part of the overall finished slab depth. On site, the individual elementpanels are then placed on shoring and ‘stitched’ together with loose reinforcement (splice bars) simply laid centrally across the joints between elementpanels. The splice bars are inserted loose on top of the pre-cast concrete layer between the bubbles and the welded wire mesh sheets and also tied across the top reinforcement mesh sheets to connect the elementpanels together into a monolithic structure. After the site finishing concrete is poured and cured this technique provides structural continuity across the whole floor slab.

THE BENEFITS

Reduced Overall Cost

BubbleDeck eliminates up to 35% of the structural concrete. When coupled with the reduced floor thickness and facade, smaller foundations and columns, direct material construction costs can be reduced by as much as 10%.

Faster Construction

With virtually no formwork, no downturn beams or drop heads, and fast coverage using panels typically 350ft² each, means BubbleDeck floor cycles time is up to 20% faster than traditional construction methods. Regardless of project size, architectural shape or complexity; simply shore, place, and pour to quickly install concrete decks.

Lower Risk

Off-site manufacturing, fewer vehicle trips and crane lifts as well as simple installation all combine to minimize operating risks as well as lower health & safety risks. As a result, major projects around the world have chosen the BubbleDeck technology as the low-risk way to build large and complex projects.

LEED Compatible

The BubbleDeck system offers a wide range of advantages in building design and during construction. There are a number of green attributes including: reduction in total construction materials, use of recycled materials, lower energy consumption, reduced CO₂ emissions, less transportation and crane lifts make BubbleDeck more environmentally friendly than other concrete construction techniques.

Other Benefits

BubbleDeck provides greater noise isolation, thermal and vibration resistance. The precast panels that act as a stay-in-place formwork have a high quality finish for exposed concrete requirements. Mechanical, electrical and plumbing (MEP) can be integrated within the BubbleDeck system.

STATUS

BubbleDeck technology has been widely used in slab construction in both residential and commercial buildings. The technology is highly successful in wide span flooring.

POINTS OF CONTACT

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REFERENCES

1. <http://www.bbdna.com/index.php>

REVIEWERS

Peer reviewed as an emerging construction technology

DISCLAIMER

Purdue University does not endorse this technology or represents that the information presented can be relied upon without further investigation.

PUBLISHER

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