

I was recently able to inform a Consultant, who had decided he could not build his scheme with traditional methods, that he could achieve his project with the patented BubbleDeck™ system !



BubbleDeck™ – Advanced Structure Engineering

By Paul Harding, Managing Director BubbleDeck C.I. Ltd

He was designing a rather unusual house extension comprising a large rectangular sun room & lounge, 12.3 metres long by 5.2 metres deep, elevated over a car parking area below without any columns or other supporting structure in the middle of the space. The two long walls were to be fully glazed and the only supports were the two flank walls. He told me that after investigating methods of providing a structure to meet this brief he had realised he could not build the design using traditional methods and wanted to know if the BubbleDeck system could achieve a span of over 12 metres. We were able to advise him a BubbleDeck solution could achieve this span and he can realise his project!

This illustrates BubbleDeck is much more than a revolutionary flat slab floor and deck system but is a whole structure solution that releases building designs from the limitations of short spans, rectilinear layouts, load-bearing walls or beams and restricted column positions. The system has proved to be highly successful in Europe since its invention ten years ago.

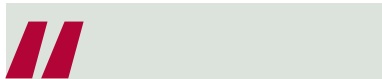
Advanced engineering of the system comprises a hollow flat slab, into which recycled plastic ball 'void formers' are incorporated to eliminate concrete that does not contribute to the structural performance of a slab. This results in a dramatic reduction of dead weight by as much as 50% allowing much longer spans and less supporting structure than traditional solutions.

Sections, or 2.4 metre wide elements, forming part of the overall slab are delivered partly pre-cast with a bottom layer of 70mm concrete providing permanent formwork into which is bedded the bottom layer of mesh reinforcement. Light reinforcement girders hold the top mesh in place and trap into the sandwich the plastic ball void formers.

Reinforcing mesh, top

Recycled plastic hollow 'Bubble' void former

Reinforcing mesh, bottom



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After the 'sandwich' elements are placed in position, temporarily supported on props, the joints between the pieces are stitched together with splice reinforcement loose laid between the plastic balls directly on top of the pre-cast concrete and also tied across the top mesh reinforcement. This has the effect, following placing & curing of the in-situ concrete, of making the joints between the elements structurally 'disappear' – the whole slab becomes monolithic spanning in two directions onto reinforced concrete columns.

When the BubbleDeck slabs are completed, it is a strange experience to walk below the floor, with the joints between the elements now redundant and of no structural effect, seeming to 'hang' in free air without any nearby support. My instinct, with 25 years' experience as an Architect, still suggests to

me there is a lack of support although, after three years' researching the system, my knowledge tells me it does work. I have even had a structural engineer amazed to see the elements seeming to be suspended in free air. Once the system is explained, they understand it really does work.

This technique is totally unfamiliar to the British tradition of creating structures with one way spanning slabs supported on load bearing beams or walls, but is a technique that has been widely used in European buildings for the last 40 years - known as 'filigree' slabs. Extensive testing has proved the splice reinforcement laid across the semi pre-cast element joints acts in concert with the top and bottom mesh reinforcement to form a

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seamless mesh reinforcement across the whole floor plate, rendering the joints irrelevant to the completed structural performance.

This combination of techniques brings a lot of other benefits and efficiencies to the construction process:-

- It allows freedom of design with non-rectilinear plan forms.
- Construction is less weather dependant as there is no need to erect load-bearing blockwork to support floor slabs, which is taken off the critical path.
- Elimination of down-stand beams means the problems and the costs of routing services around, or through, structure, are avoided.
- Reduced foundation sizes because there is up to 50 % less structural dead-weight.
- Cross-bracing and intermediate supports are eliminated.
- Concrete usage is significantly reduced; 1kg of recycled plastic replaces 100kg of concrete. It is, therefore, environmentally friendly.
- It uses fewer building elements compared to steel frame and metal decking systems and so reduces erection time.
- There is no need for additional fire protection – the completed BubbleDeck structure provides 1 to 2 hours protection dependant upon concrete cover specified.
- Soffits can be left exposed, facilitating low/passive energy design methods.
- Conduits and cooled slab systems can be incorporated into the elements in the factory.

The overall result is a significant cost saving of between 2.5 % to 10 % of total construction costs.

BubbleDeck Channel Islands has been established to market, distribute and supply the BubbleDeck system to the Channel Islands and United Kingdom. We provide a complete service, including the design of the floors and columns – the complete building structure above ground floor slab level. We look after manufacturing of the BubbleDeck elements and then deliver the system as a complete set



of components to the building site ready for construction by either the Main Contractor or our own

specialists. During construction we provide technical and construction advice on the system, undertake Quality Assurance inspections and on completion provide our Professional Indemnity Insurance and Product Liability protection. A major BubbleDeck project is now under construction in Jersey and we can arrange to give you a tour of the project to explain the system and show you it in action.

For further information about BubbleDeck®, please contact the exclusive licensed distributors for the Channel Islands and United Kingdom:-

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BubbleDeck behaves, in all respects, as a solid deck!