An inventive solution

Ancon's lockable dowel eliminates the need for pour strips and thus reduces the trip hazard for workers on site. It's one of the reasons the product has won a prestigious innovation award

CASE STUDY

CONSTRUCT member Ancon Building Products has won a prestigious Queen's Award for Innovation for its lockable dowel system used in post-tensioned concrete construction.

This component accelerates the speed of construction, simplifies concrete design and improves onsite safety. These valuable benefits have led to product sales on four continents – Europe, Australia, Africa and North America – in under six years since its launch.

Post-tensioning is used to create long column-free floor spans which allow flexible internal layout in multi-storey buildings. During construction, 1 m-wide pour strips were traditionally left in the concrete slabs to allow for normal concrete shrinkage.

Once movement in the structure had stabilised, the pour strips would be filled with concrete – sometimes up to 12 weeks after the slabs were first poured. In the meantime, the gaping pour strips would present a trip hazard for workers and the two unconnected slabs had to be supported from below, restricting further work on site.

The invention of the Ancon lockable dowel eliminates the need for pour strips, eradicating sites of all associated delays and obstructions.

A line of dowels transfer load and accommodate movement at a neat temporary joint in the concrete floor. No additional supports for the slab are required, meaning the area is safe, uncluttered and accessible to all construction trades, so work can progress safely to an accelerated schedule.

5k
Number of dowels installed at Royal Children's Hospital in Melbourne

When the concrete movement has stabilised, the dowel bar is mechanically locked in the sleeve with a plate and resin to prevent further movement, providing continuity in the structure without any construction delays.

The lockable dowel was developed in 2007 by Ancon's in-house engineering team and was initially launched in Australia.

Ahead of schedule

The largest project to date was completed in 2010 when 5,000 Ancon dowels were installed by Bovis Lend Lease on the new 240,000 sq m Royal Children's Hospital in Melbourne, Australia (pictured above). Here, the dowels replaced pour strips to enable overhead cabling, fire suppression systems and wastewater pipes to be installed ahead of a traditional site schedule.

The lockable dowel was introduced to the UK market in the same year. Matthew Consultants, a specialist in post-tensioned concrete design, saw the product's potential immediately and detailed it on phase two of University Campus Suffolk (James Hehir Building), a six-storey development in Ipswich.

Matthew Consultants director Ben Ume says: "By using these Ancon dowels we saved at least four weeks per storey. This construction method is just more efficient. Wet trades finish sooner. It is a proven engineered solution that reduces onsite man hours and improves site access".

Matthew Consultants continues to regularly detail the product and pass on the construction benefits to its clients.

The CONSTRUCT concrete structures group has also been quick to recognise the benefits of the lockable dowel. The dowels were supplied and installed by fellow CONSTRUCT members Anchor Bay Construction Products and Foundation Developments respectively on this first UK project – a project which was highly commended in the 2010 CONSTRUCT award for innovation and best practice, for its adoption of lockable dowels.

Ancon dowels were later used by two other CONSTRUCT members in the construction of Aberdeen's New Emergency Care Centre: post-tensioning contractor CCL and concrete frame specialist PJ Carey (Contractors).

Project manager Eamonn O'Donnell says: "PJ Carey chose the lockable dowel system because it offered time and cost savings, which accelerated an already fast build programme".

The dowels are currently being installed at the new Oxford Mathematical Institute, a project where Expanded are constructing the concrete frame.

Other recent UK project references for the lockable dowel include BAM's refurbishment of Stafford College and Morgan Sindall's extension of Manchester Metropolitan University.

The Queen's Awards for Enterprise are presented annually for outstanding achievements in the categories of innovation, international trade and sustainable development. Winning organisations must demonstrate the highest levels of corporate excellence combined with significant advances in commercial success, making a Queen's Award the ultimate business accolade.