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## **PROJECT BRIEF: Wagners Earth Friendly Concrete**

### ***Global Change Institute (GCI) Building***

13 September 2012

Wagners are undertaking a supply contract for Earth Friendly Concrete (EFC) for the production of 33 large floor beams that will form 3 suspended floor levels in the new Global Change Institute (GCI) building at the University of QLD's St Lucia Campus. As of 13<sup>th</sup> September 2012, a total of 26 beams have been cast and 11 have been installed in the building to form the first of 3 suspended levels.

The GCI 'Sustainable Building' construction is a showcase of the next generation of environmental building technologies. The design brief was for a sustainable building construction and operation that would serve as an outward reflection of the objectives of the organisation housed within. From the outset of the design process, project architects Hassell Group and project engineers Bligh Tanner were extremely interested in having the most environmental concrete technology available in the world today, geopolymers, included in the building structure.

EFC is the only commercially available geopolymer concrete in QLD, and one of the very few available in the world. This unique project marks a new era of sustainable concrete construction in QLD, and is a world first application of modern geopolymer concrete in the structure of a multi storey building.

EFC contains no cement and its structural performance is superior to normal concrete. Globally, the production of 1 tonne of Portland cement produces around 1 tonne of carbon dioxide emissions and is responsible for 5 – 8 % of total man made greenhouse gas emissions. To produce EFC, Wagners use a geopolymer binder made from the chemical activation of recycled industrial waste products - blast furnace slag and fly ash. This recycled binder reduces the carbon emissions associated with Portland cement by a staggering 80-90 per cent.

Batched at the Toowoomba EFC plant, each beam requires 2 truckloads of EFC to the precast facility at Carole Park, Brisbane. The chemical activation is performed at the precast yard when the trucks arrive, to eliminate the risk of hold ups on the busy Warrego Highway.

The GCI project is not only an important milestone for Wagners EFC development but a giant step forward for creating a truly low carbon concrete construction industry.

## Project Key Facts:

- 33 no. precast EFC floor beams, specified as off white colour class 2 finish.
- Total of 66 truck loads on 33 different casting dates.
- 5 storey building will house the GCI organisation
- By using EFC in the 33 precast concrete floor beams, 69 tonnes of CO<sub>2</sub> emissions will be saved compared to producing them from normal concrete.
- The EFC beams contribute thermal mass to the low energy space heating and cooling design which is undertaken using controlled temperature water flow through pipes contained within the beams.
- Wagners client – McNab Builders
- Precaster – Precast Concrete Pty Ltd
- Project engineers – Bligh Tanner
- Project Architects – Hassell Group
- Principal – University of QLD



Figure 1 – Production at Precast Concrete Products P/L yard, Carole Park Brisbane.



Figure 2 – EFC beams being transported to site and installed.



1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> Floors



**Architectural Rendering GCI Building**  
*courtesy HASSELL Architects*

## **MORE INFORMATION**

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