Attachment A21

Structural Statement - 15-25 Hunter and 105-107 Pitt Street, Sydney

Structural
Civil
Traffic
Façade

18 October 2021 201321 SAAA

Milligan Group
321 Riley St
Surry Hills NSW 2010

(Email: jarrod@milligangroup.com.au)

Attention: Jarrod White

Pitt and Hunter

Structural Innovation

Dear Jarrod,

The proposed tower on Pitt and Hunter St is expected to be the tallest concrete timber hybrid building in the world, consisting of a concrete core and beams with CLT slab infills. It will boast a string of innovations including;

- Design for manufacture and assembly (DFMA). The CLT slabs are expected to be manufactured off site and craned into place with minimal on-site work. Other areas are being investigated along similar lines including precast and structural steel for the main frame.
- Flexible floor plates allowing inter storey connections in most areas of the floor plate with the ability to add and remove these in the future.
- A regular column arrangement with efficient spans
- Repetitious floors that drives efficient design and on site construction.
- A highly buildable solution that keeps the best of existing construction techniques that are efficient and fast such as jump forming the core, but improves in areas where existing methods are cumbersome and time consuming such as the use of prefabricated CLT in lieu of post tensioned slabs, thereby reducing reliance on formwork and temporary propping.
- A highly sustainable design that reduces embodied carbon through design efficiencies and increased timber use. ‘

Sustainability

“To improve the carbon footprint, the proposed scheme replaces concrete PT slabs with timber ribbed decking supported on post tensioned beams. The use of the timber not only avoids the CO2 from the concrete that would have made up the slab, but serves to offset CO2, as the timber is viewed as a carbon sink. Figure 1 shows the carbon emissions per square metre of gross floor area for the structure of a typical concrete building (excluding façade and fitout). Figure 2 shows the same but for a concrete hybrid building, and the reduction in carbon emissions due the timber floors is shown in green. The resulting overall reduction in carbon emissions by adopting this hybrid solution over a traditional concrete building is approximately 30%.”

Total reduction is 6,300 tonnes CO2 (I based the CO2/m^2 on 62,700m^2 total Construction GFA). Assuming the EPA guide of 4.6 tonnes per annum per average Australian car this equates to removing minimum 1370 cars from Sydney's roads.

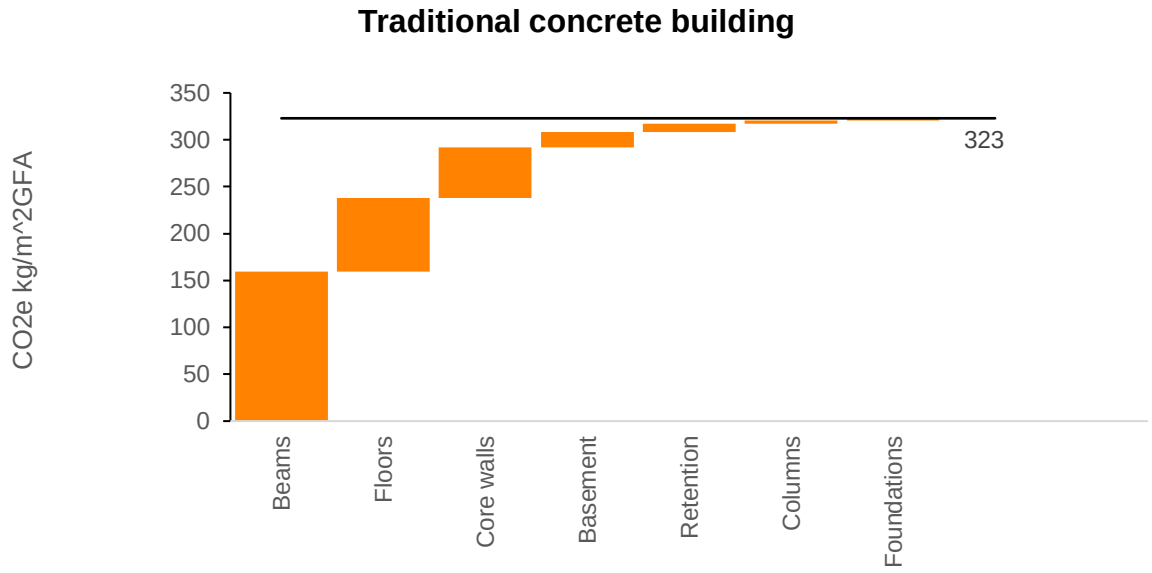

Figure 1: Embodied carbon for the structure a traditional concrete building

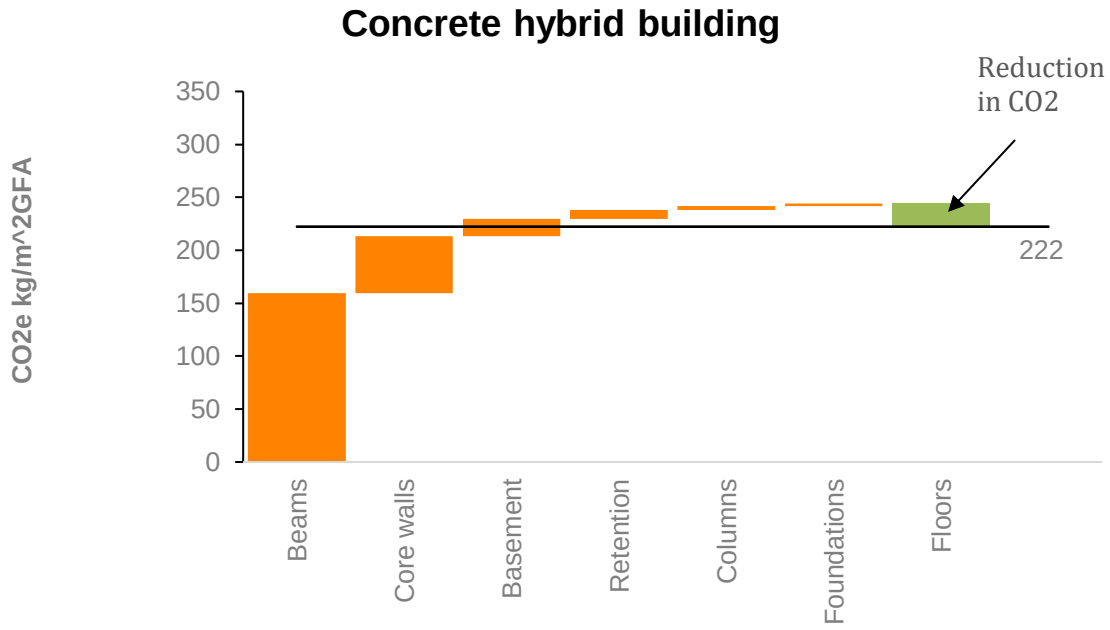

Figure 2: Embodied carbon for the structure of a concrete hybrid building

Structure

The structural concept for Hunter and Pitt St is simple and effective. It seeks to maintain the benefits and efficiencies of traditional tall building construction methods and materials, and supplement these with timber to reduce the building's carbon footprint.

Lateral stability is to be achieved via an offset reinforced concrete core.

Basement slabs will be a combination of reinforced and post tensioned slabs to provide support to retention walls, plant and vehicle loading.

Podium slabs are proposed to be an efficient post tensioned concrete system to create large spans and reduce impact of column in retail and F&B.

Typical commercial floors will be comprised of post tensioned beams with timber rib deck infills. The post tensioned beams will be supported by reinforced columns arranged in an efficient grid to minimise concrete depths.

Fire

To provide fire separation and compartmentalisation, every fourth floor in the tower is proposed to be fully post tensioned concrete with no timber. The approach is based on advice from fire engineers and precedent towers with similar solutions.

Wind

The curved façade will mitigate cross wind effects due to vortex shedding, reducing wind loads and the size of the core to resist these.

Yours faithfully,
TTW (NSW) PTY LTD

BARRY YOUNG
Director

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