


Case Study template

Context

To support the delivery of the Co2nstruct Zero programme, and to highlight the remarkable work of the programmes Business Champions and Partners, the programme is welcoming case studies that can be published on the CLC website. If your case study is readily available online, and you would like to share the URL instead of populating the template then please do so below. LinkedIn provides guidance on [writing case studies](#)

Name of Case Study	Low Carbon Cassette (LCC) System
Organisation	Mace
Are you an SME?	No
Business Logo	
Which Co2nstruct Zero priority the case study supports, please state if this is more than one.	Modern Methods of Construction
Synopsis	<p>Mace has invested heavily in Modern Methods of Construction (MMC) and is leading the way in developing a low carbon floor cassette which reduces the superstructure's embodied carbon by up to 50%. The concept began as a R&D study before being taken to a full-scale factory test in 2021. Working with designers, structural engineers and specialist trade contractors from our supply chain, Mace developed an off-site manufactured low carbon cassette as an alternative methodology for the construction of long span steel frames.</p> <p>Mace tested the first prototype cassettes at its offsite factory in Brandon. During this trial stage, the team fixed sensors within the prototype to find efficiencies in the materials used and further reduce the embodied carbon. Extensive testing was carried out by the Faculty of Engineering Science at University College London. These tests highlighted additional carbon reductions to improve overall embodied carbon efficiency, whilst maintaining structural properties. This method achieves:</p> <ul style="list-style-type: none"> • 55% reduction in carbon footprint. • 40% less deliveries to site.

- Up to 25% reduction in structural frame dead load.

The low carbon cassettes (LCC) are currently being used on two Mace projects, Palmerston Court and Heathrow Tower Transformation Project.

Palmerston Court is a £125m mixed-use development in Battersea comprised of 868 student accommodation rooms across three blocks and a 6,100 sqm commercial building, as well as retail spaces and cafes.

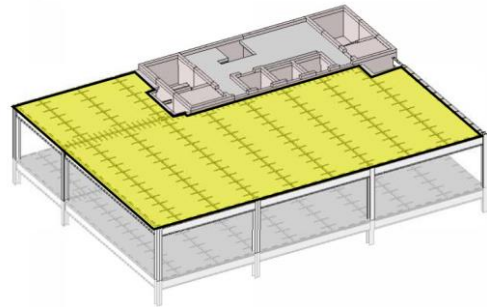
The commercial office element is a long-span, steel-framed building, and the client and architect had an aspiration to minimise embodied carbon and expose the structural elements. Mace managed to achieve this through our LCC prefabricated floorplate solution. Overall, the precast core and LCC methodology reduced carbon by 790tCO₂e, thanks to the 10% reduction in structural steel, the use of low carbon concrete (Cemstone) and the omission of internal cladding. The LCC methodology also reduced the original programme by 10 weeks, reduced the number of HGV site deliveries by 40% and reduced constructure waste generation.

The **Heathrow** Tower Transformation project build strategy and the Mace bespoke C2P approach for the project enabled Mace to introduce the LCC to Heathrow Airport. Mace, working with Jacobs and partners, developed the options agreeing a standard grid on the first floor incorporating the LCCs within the RIBA 2 design. This enabled Mace to propose a new bespoke product of the LCC and more importantly a C2P approach on the project, a new way of implementing projects at Heathrow airport. The use of 75% GGBS concrete mix and lower embodied carbon steel has resulted in the overall saving of 290 tonnesCO₂e, which equates to a 43% saving compared to traditional construction. It also reduced onsite labour and allowed for rapid installation of the building frame.

Our experience at Palmerston Court and Heathrow VCF is a strong example of the benefits of building in MMC solutions from an early design stage.

Word Count: 467

Photo & video



Digital model of the Low Carbon Cassette floor components at Palmerston Court



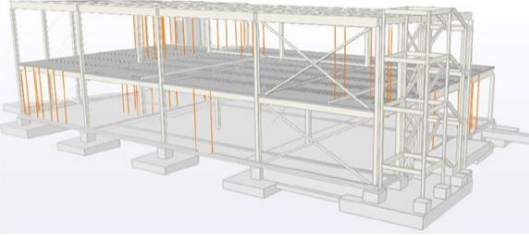

Fully installed LCC in Block A (Office)
Palmerston Court



Artist impression of the installed LCC in Block A
(Office) Palmerston Court



Production of LCCs at Mace's offsite factory in
Brandon

	 <p data-bbox="831 468 1362 499">The finalised building frame at Heathrow VCF</p>  <p data-bbox="951 945 1243 976">Heathrow VCF Mock-Up</p>
<p data-bbox="204 1010 308 1041">Contact</p>	<p data-bbox="807 1010 1246 1041">matthew.brinklow@macegroup.com</p>

*All case studies will be considered for publication, on a case-by-case basis, please note any case study that does not fit within the 500-word limit, may not be considered for publication.

**Please ensure that you have the permission to publish where your case study involves a client/partner.

*** Case Studies may also be published in future [Co2nstruct Zero Performance Framework Reports](#).