



30th April 2021



S|L|B[®]
SOFTWOOD
LUMBER BOARD

**Hybrid Structures &
Low Carbon
Construction**

CIC

Hong Kong

April 2021



Nick Milestone BSc, Bsc (Hons), MSc.

Senior Advisor – US Softwood Lumber Board

Chairman – TRADA (UK) – Timber Research and Development Association

Sigmat UK – Director

Nick has overseen the design and construction of over 550 steel and mass timber structures during his 35+ years in construction.

- Trained as Quantity Surveyor & Project Manager for a General and Structural Steel Contractor (1986 – 2002)
- Created and managed B&K Structures, now the UK's largest Mass Timber & Hybrid Construction business (2002 – 2017)
- Created demand for Mass Timber in Singapore (2017 – 2020)
- Developed a Light Gauge Steel, off-site construction business for Wm Hare Ltd (2018 – 2020) UK, UAE, Singapore

Previous Directorships

- Structural Timber Association (UK)
- Katerra (USA)
- B&K Structures (UK), Managing
- Wm Hare (UK, UAE),
- TiongSeng (Singapore),

Current Directorships

- TRADA (Chairman)
- Timber Development UK (Vice-Chairman)
- Sigmat UK (Senior Director – Engineering)

Integrated Digital Delivery – The Digital Twin (VDC)

+

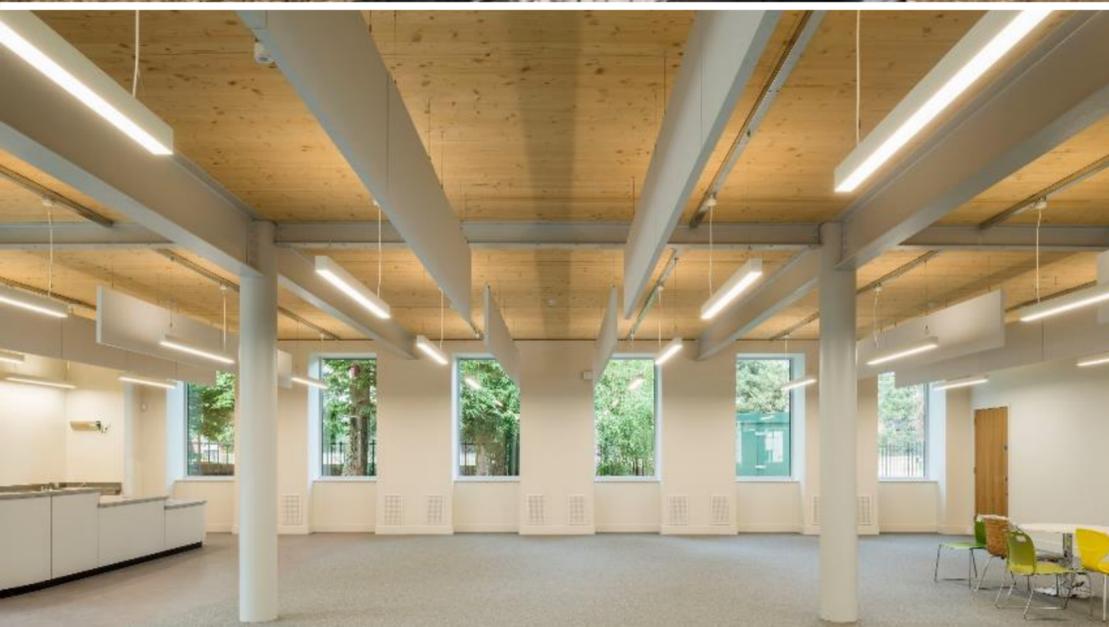
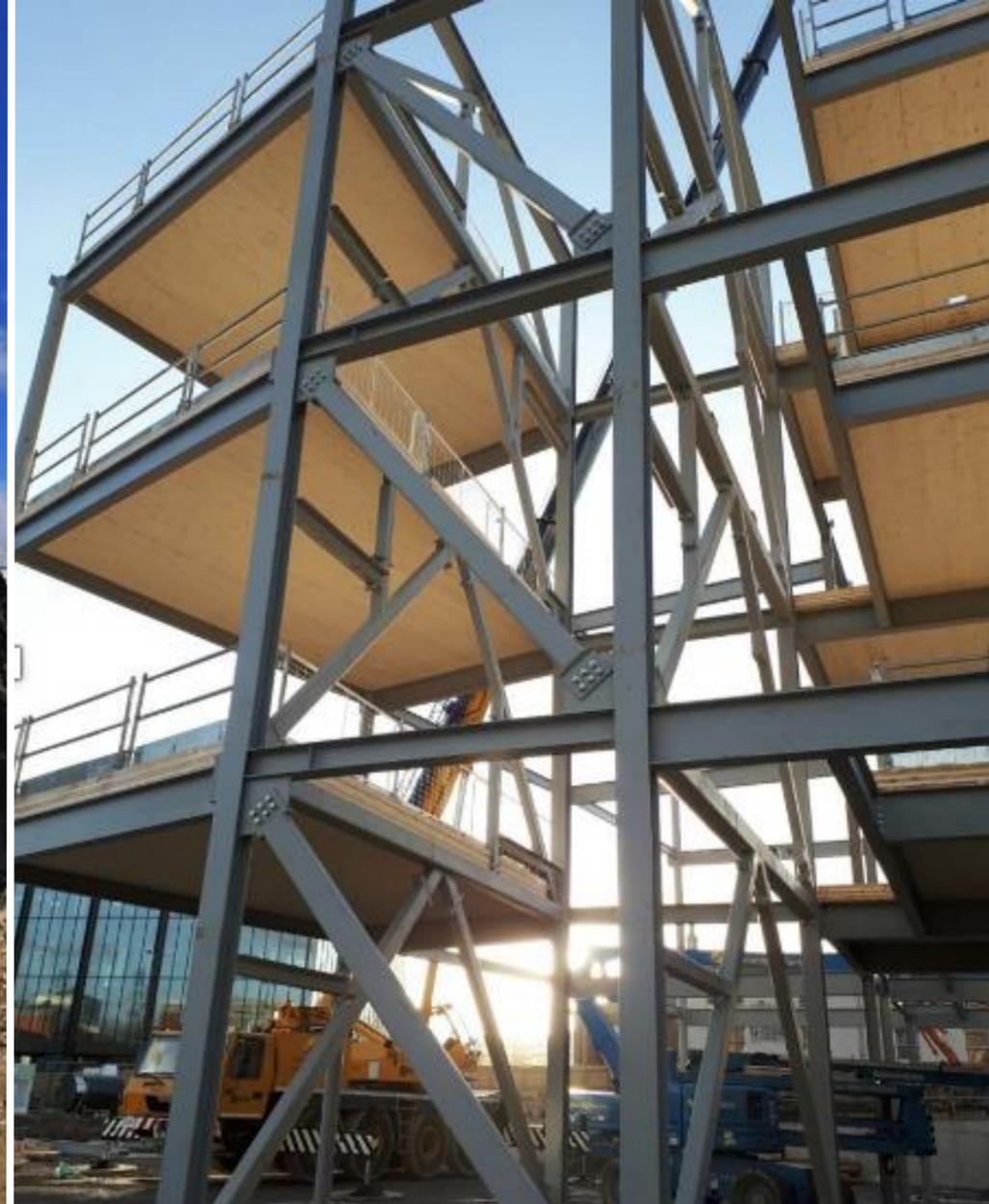
Design for Off-Site Manufacture and Assembly (Off-Site)

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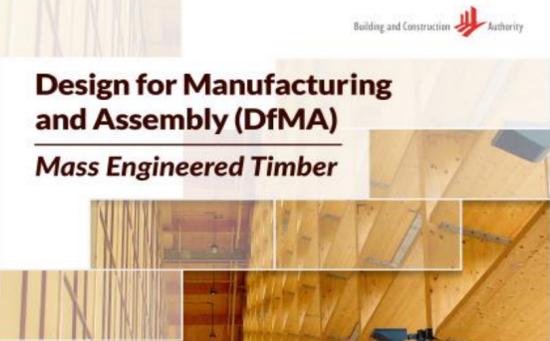
Green and Sustainably Technologies in the Building Physics (Mass Timber & Steel)

+

Construction Disruption – Vertical Integration



SINGAPORE – NANYANG TECHNOLOGY UNIVERSITY



15,000m³ (6.36 mnbf) of Mass Engineered Timber





Iconic Buildings in Mass Timber that have achieved global recognition?

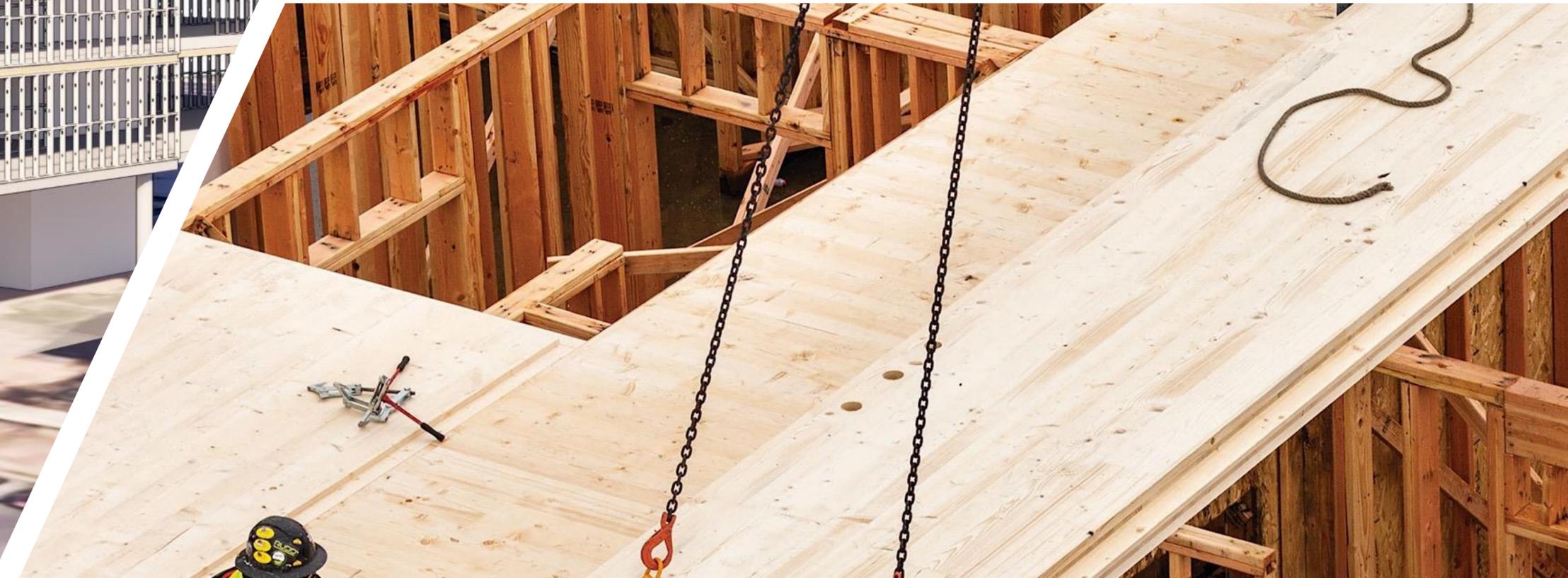




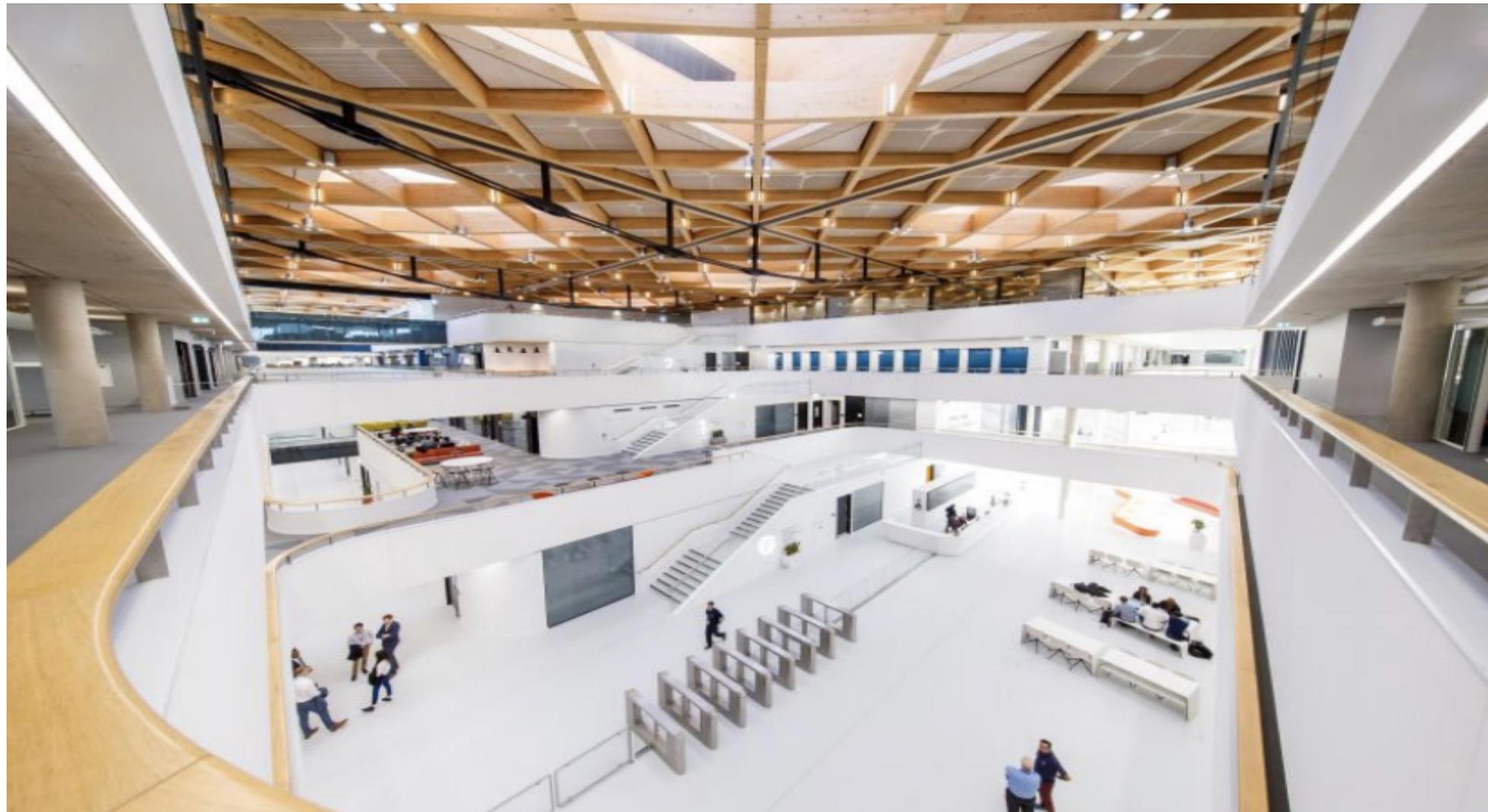




Short Span - Accommodation

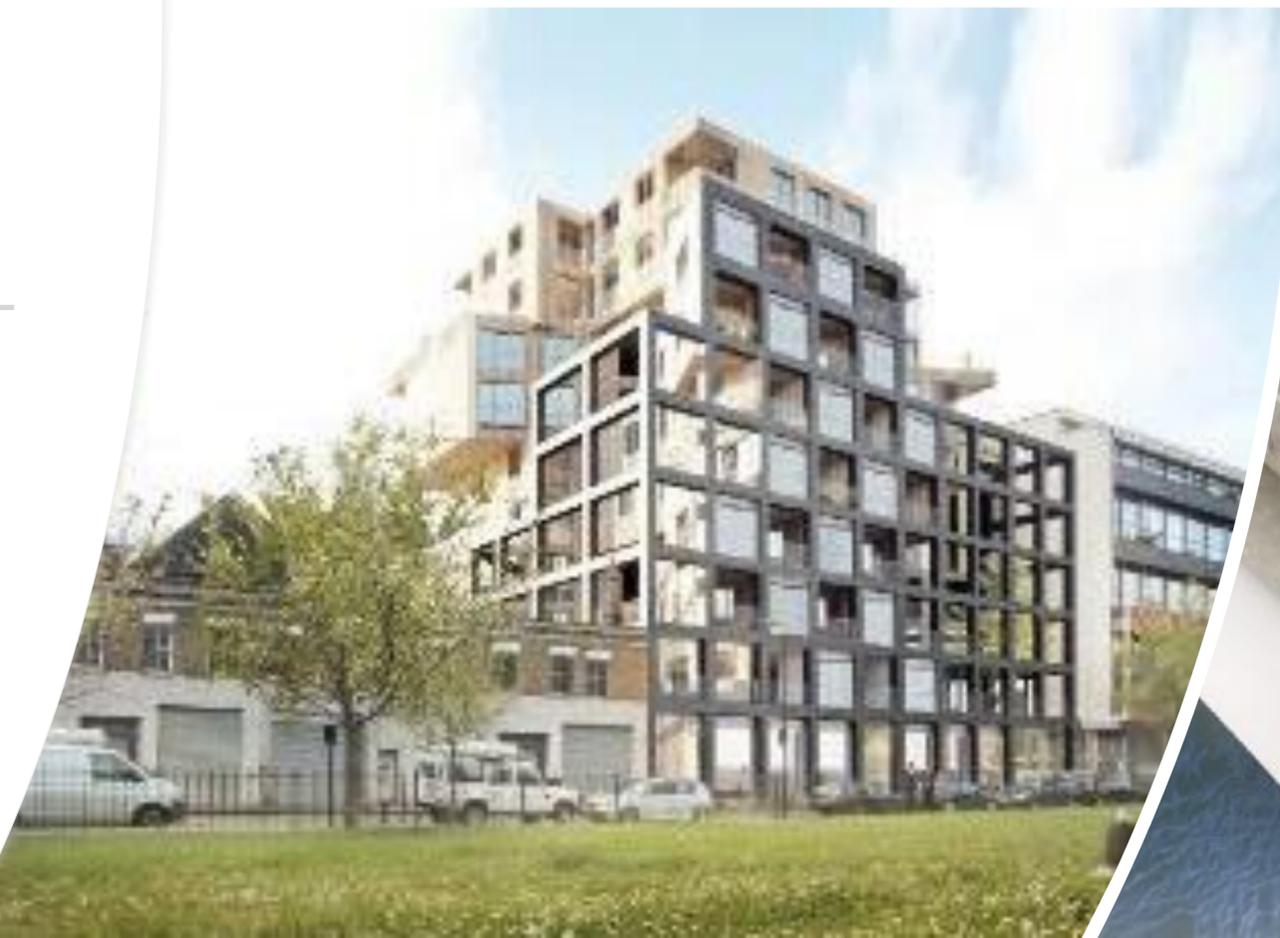


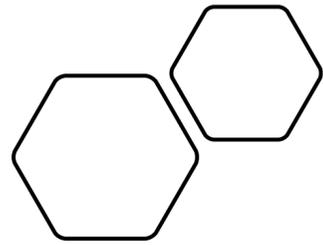
Long Span



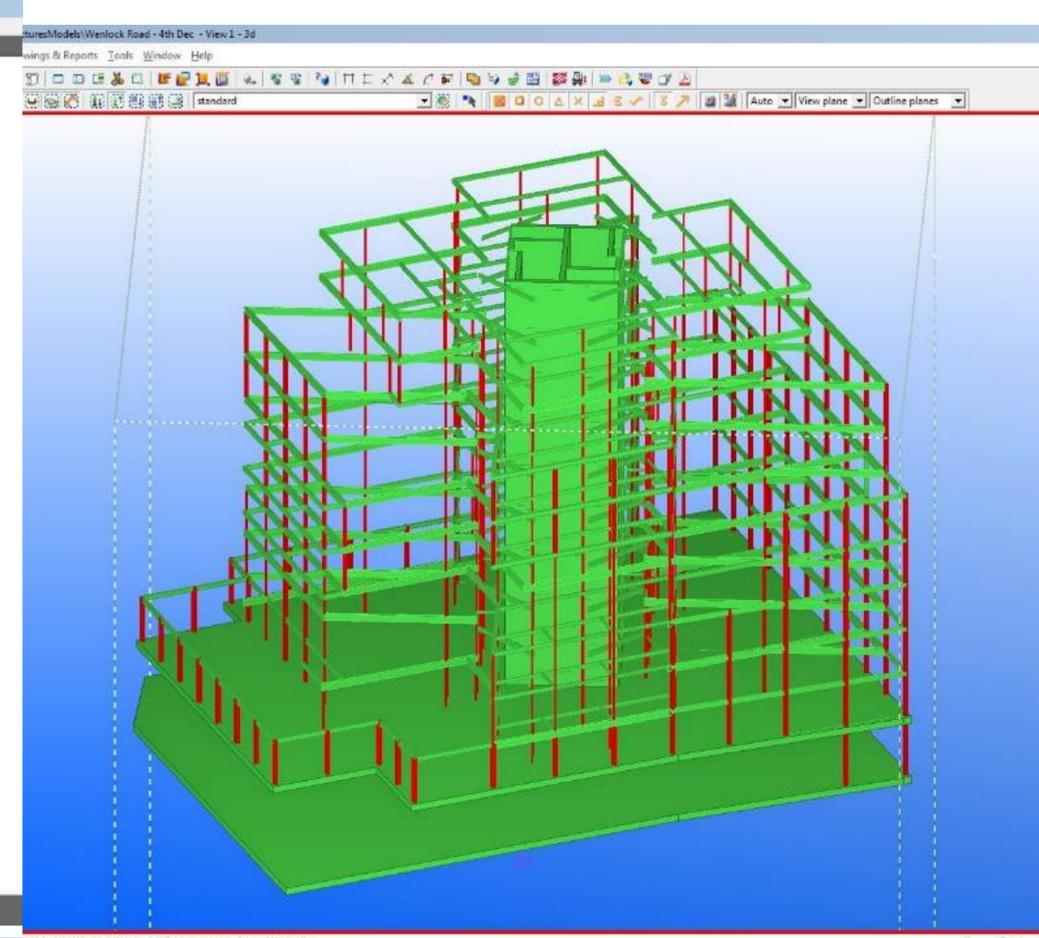
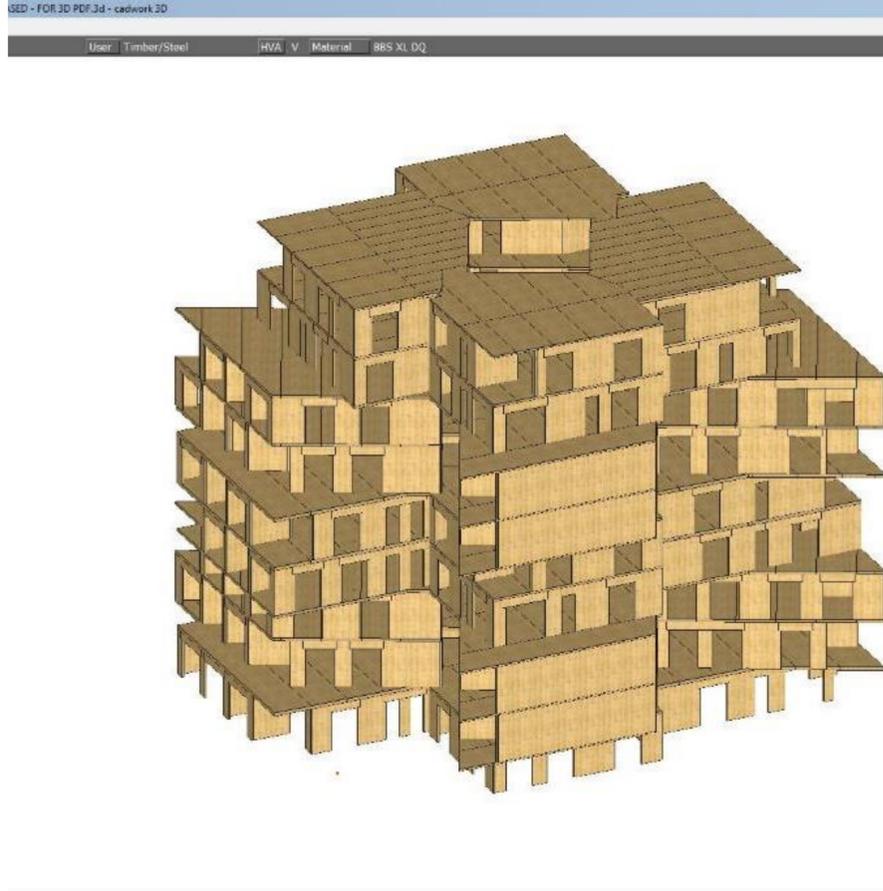
**VIRTUAL
DESIGN AND
CONSTRUCTION**

**Banyan Wharf,
London – ‘The Cube’**



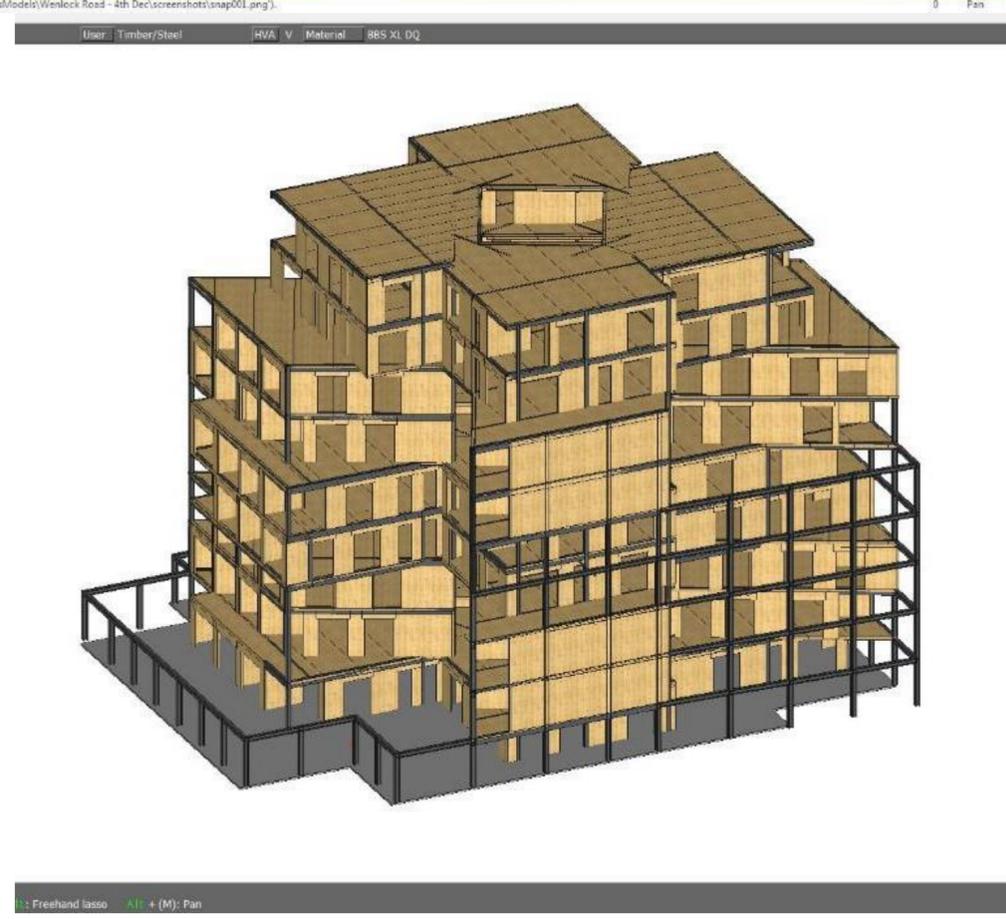
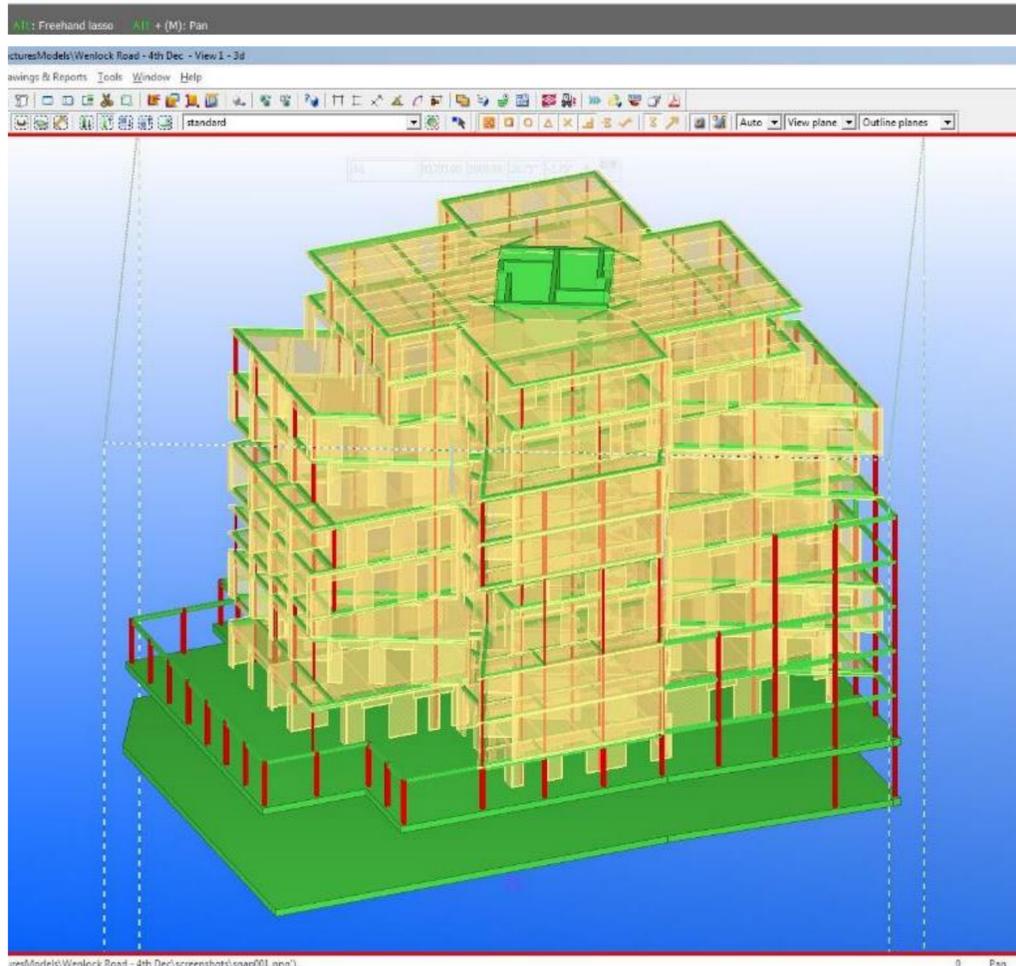


VIRTUAL DESIGN AND CONSTRUCTION



Cadworks – CLT

Trimble - Steelwork



The Cube







The Catalyst Building

Spokane, WA

Building Type: Mid-Rise

Project Status: Spring 2020

Square Footage: 150,000 Square Feet

Services Provided:

- Architecture & Engineering
- Materials
- Construction Management

Net zero target

Assembled from 270+ Katerra CLT Panels

3,700 metric tons of CO₂ stored

The Revit Model



The Catalyst Building



LCA Katerra CLT + Catalyst Building

207 kg CO₂ e/m²

Upfront Embodied Carbon of the Catalyst Building

204 kg CO₂ e/m³

Biogenic Carbon storage of Catalyst Mass Timber



Life Cycle Assessment
of
Katerra Cross-Laminated Timber (CLT)
Supply Chain and Catalyst Building

Final Report
November 2019

Prepared for
Katerra

by the
Carbon Leadership Forum
and the
Center for International Trade in Forest Products
at the

UNIVERSITY of WASHINGTON



Biophilic Design

Intrinsic Benefits of
Wood Environments

Work Productivity

Social Connection

Classroom Learning

Physical Healing

Emotional & Mental
Wellness

Market Application: Retail/Commercial

Sky TV Studios

Osterley, London, UK

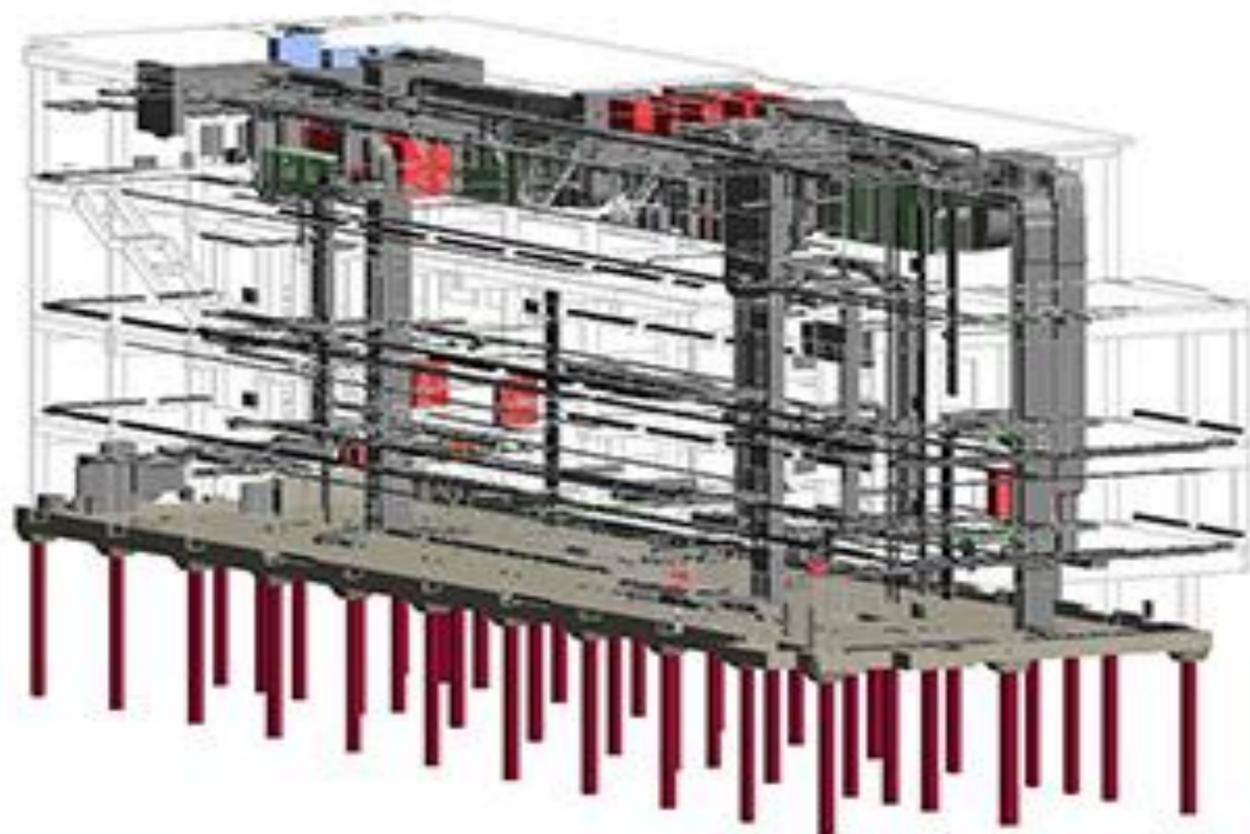


From concept, November 2013.



To hand-over in 11 months, September 2014.







Hybrid Structures

Orsman Road

Shoreditch, London, UK



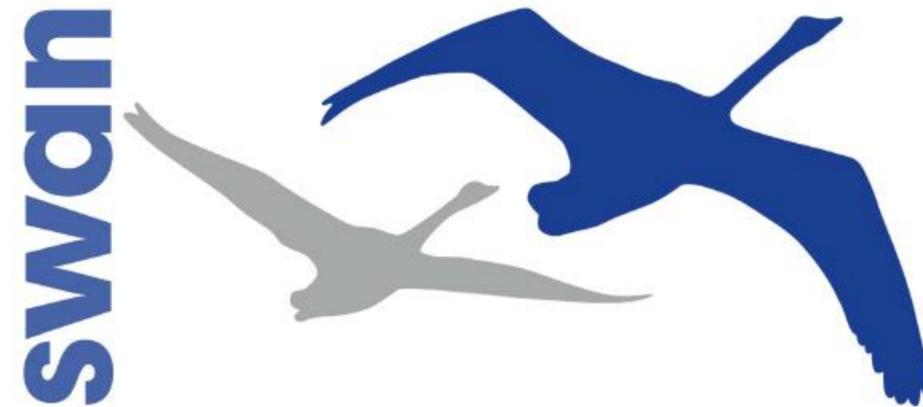


The Future of Mass Timber

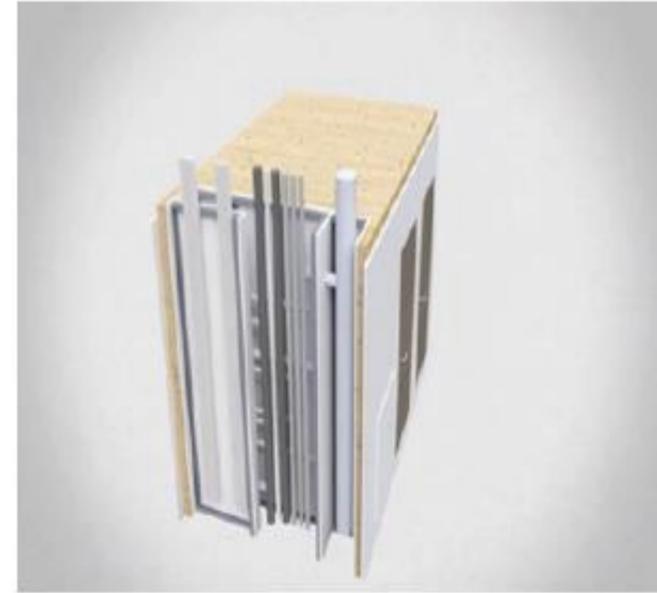
Modular / Volumetric



Modular / Volumetric



Pod & Panel



VASTINT - MOXY HOTEL

A load bearing pod and panel solution.

BINDERHOLZ - BWOOD SOLUTION

A load bearing pod and panel solution.

TIMBER CITIES

Google HQ – London, UK

Side Walk Labs, North America

Altassian – Sydney, Australia



WHAT IS LIGHT GAUGE STEEL FRAMING?

- Similar to timber stud, but replaces timber with light gauge steel cold formed steel sections, to form building systems.
- Light gauge steel members can be combined off-site to create a panelised load-bearing building system.
- Typically between 1-10 storeys, with some suppliers up to 15 (figure #1).
- Non-load bearing thru-wall panels also possible (figure #2)

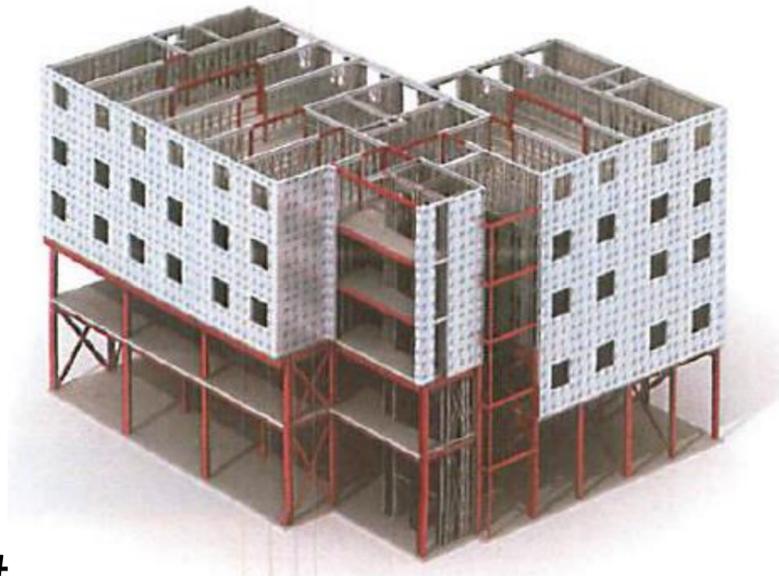


figure #1

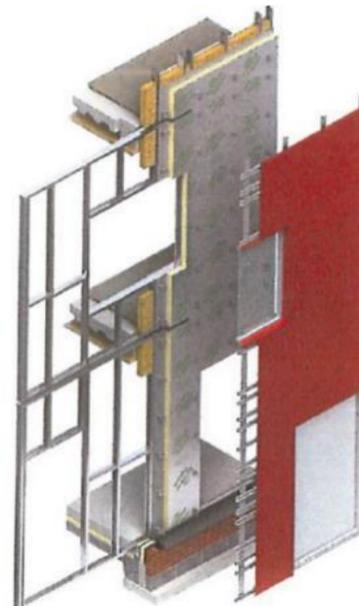
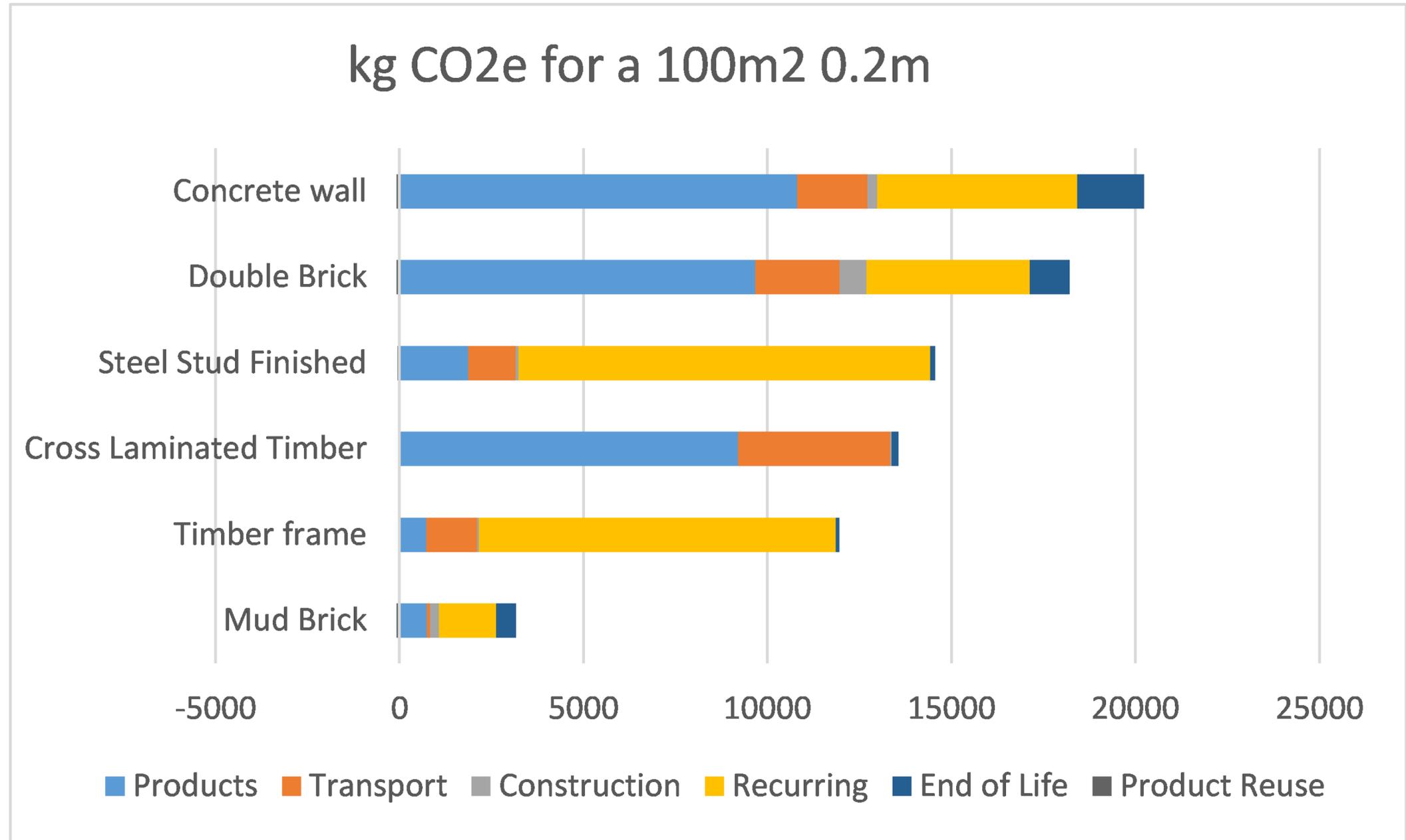


figure #2

SUSTAINABILITY

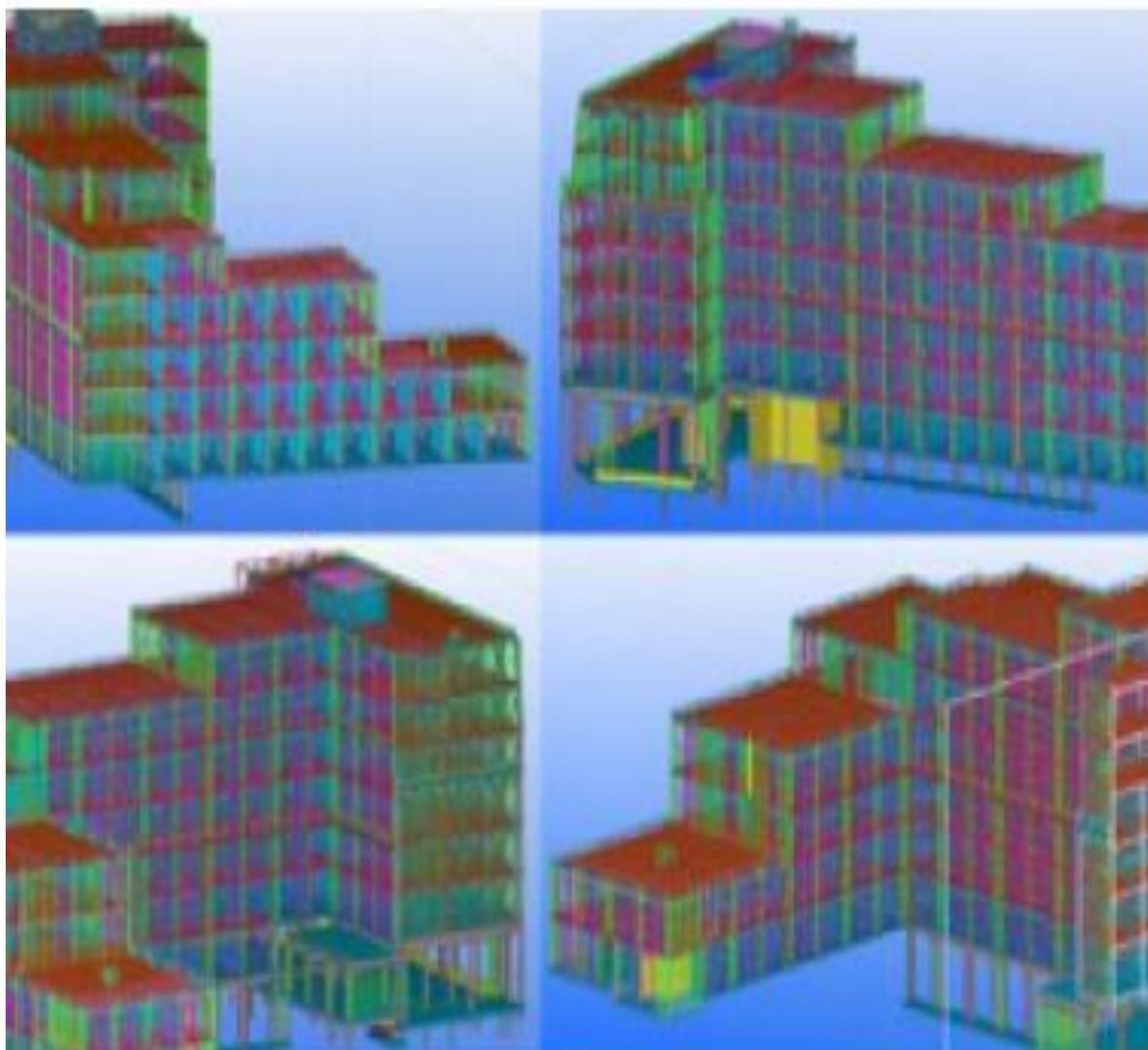


Less embodied carbon than concrete or masonry

Recyclable

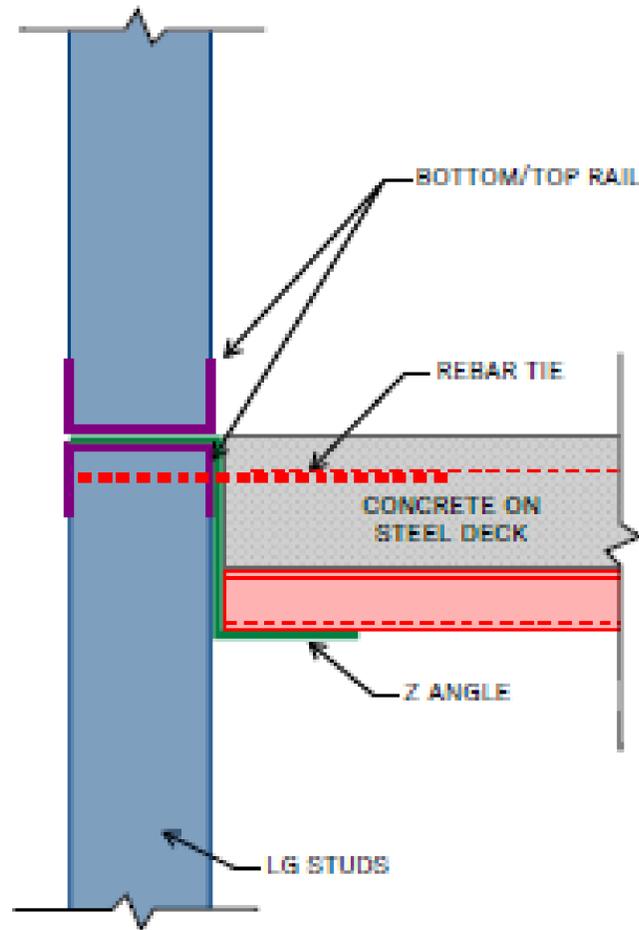
Potential for disassembly

The Off-site Process

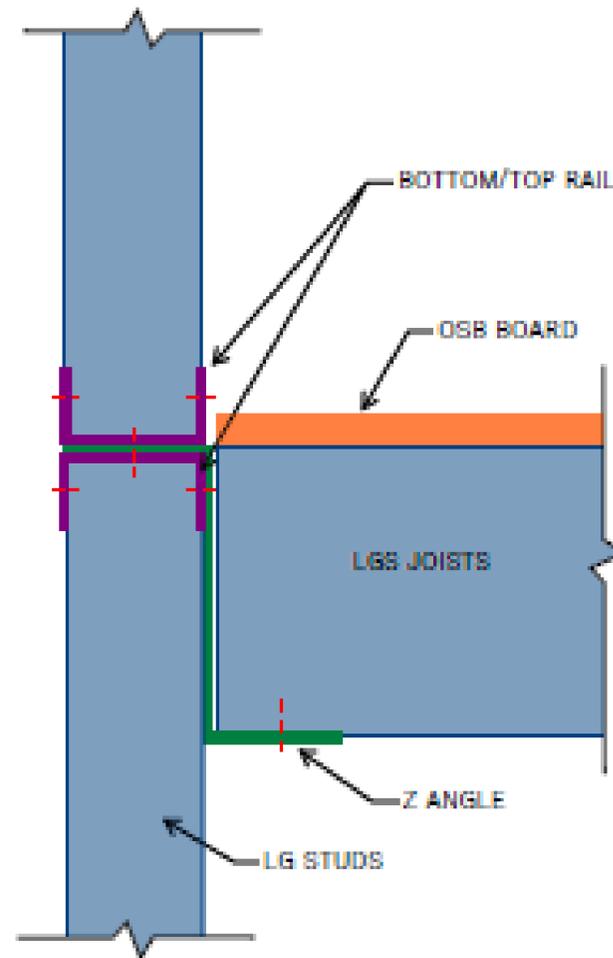


- Modelling of the light gauge structure – Tekla
- Structural analysis

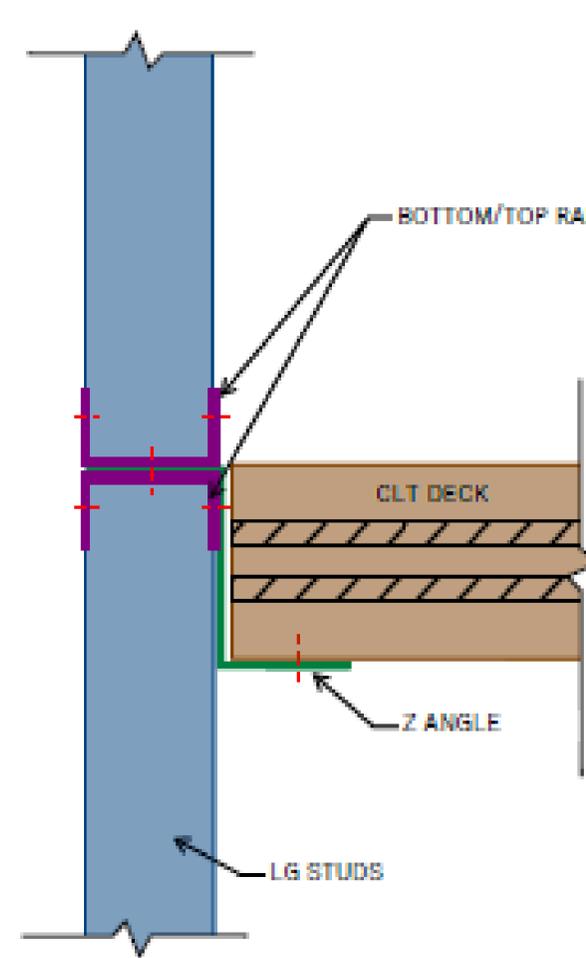
FLOOR CONSTRUCTION (VARIABLE SOLUTIONS)



Metal Deck & Concrete



Light Gauge Steel / OSB



Cross Laminated Timber

UK LEADER IN LOAD-BEARING LGSF

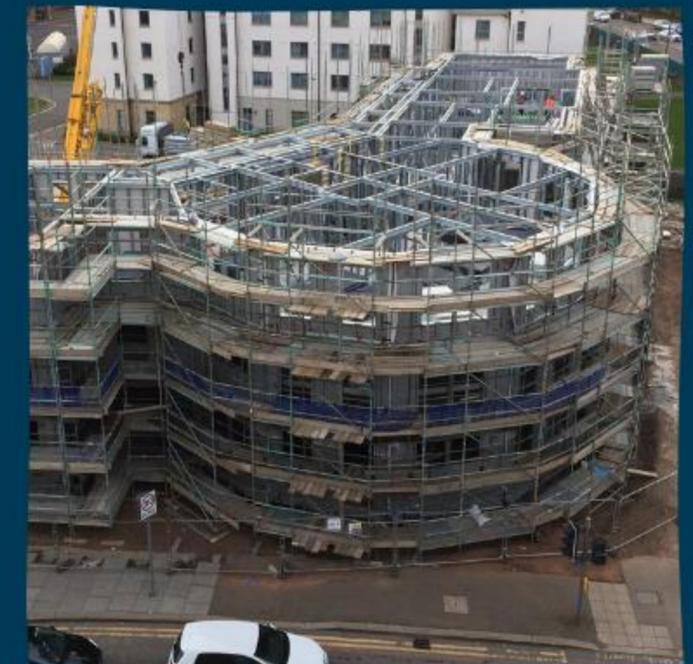
SINCE 2002, SIGMAT HAS MANUFACTURED AND SUPPLIED MORE LOAD BEARING, LIGHT GAUGE STEEL FRAMING FOR **CONSTRUCTION PROJECTS** THAN ANYONE ELSE IN THE UK.

OVER 300 PROJECTS COMPLETED SO FAR.

OUR MARKET LEADERSHIP IS FOUNDED UPON EXPERIENCED PEOPLE WITH **EXTENSIVE CONSTRUCTION KNOWLEDGE** AND THE PROVEN ABILITY TO INNOVATE NEW AND BETTER PATENTED PROFILES WHICH ENHANCED STRUCTURAL CAPABILITY AND ALLEVIATE THE WEAKNESSES OF OTHER LIGHT GAUGE STEEL SYSTEMS.

UNIQUE AND PATENTED STRUCTURAL PROFILES.

END-TO-END SERVICE FROM **DESIGN, MANUFACTURE, PANEL ASSEMBLY, INSTALLATION.**



LGSF DEFINITION

- GALVANISED STEEL PLATE UP TO 4MM GAUGE
- DESIGN DURABILITY UP TO 250 YEARS
- Poured CONCRETE FLOORS UP TO 200MM
- STRUCTURAL CAPABILITY UP TO 20 STOREY
- 30% FASTER BUILD PROGRAMME



SECTORS SUITED TO LGSF



STUDENT
ACCOMMODATION



EDUCATION



RETIREMENT
LIVING / CARE



HOTELS



HOUSES



APARTMENTS

RECENT STUDENT ACCOMMODATION PROJECTS



UNIVERSITY OF HULL
1,462 BEDS



GODIVA PLACE, COVENTRY
770 BEDS



BAILEY STREET, SHEFFIELD
315 BEDS



VINCENT'S WALK, SOUTHAMPTON
283 BEDS



AGARD STREET, DERBY
244 BEDS



TARA HOUSE, LIVERPOOL
769 BEDS



PLUMMER HOUSE, NEWCASTLE
248 BEDS



BYRON HOUSE, NOTTINGHAM
911 BEDS



LONDON ROAD, BRIGHTON
351 BEDS

RECENT APARTMENT PROJECTS



CENTENARY QUAY, SOUTHAMPTON

102 HOMES



THE SANDS, SCARBOROUGH

111 APARTMENTS



CLOCKWORKS, MANCHESTER

105 APARTMENTS



BRANDON YARD, BRISTOL

41 APARTMENTS



MARIONVILLE, EDINBURGH

51 APARTMENTS



CARROW QUARTER, NORWICH

323 APARTMENTS



SALAMANDER PLACE, LEITH

199 HOMES



EASTBANK, MANCHESTER

111 APARTMENTS



GLASSHOUSE STREET, NOTTINGHAM

84 STUDIO APARTMENTS

LIGHTWEIGHT CONSTRUCTION

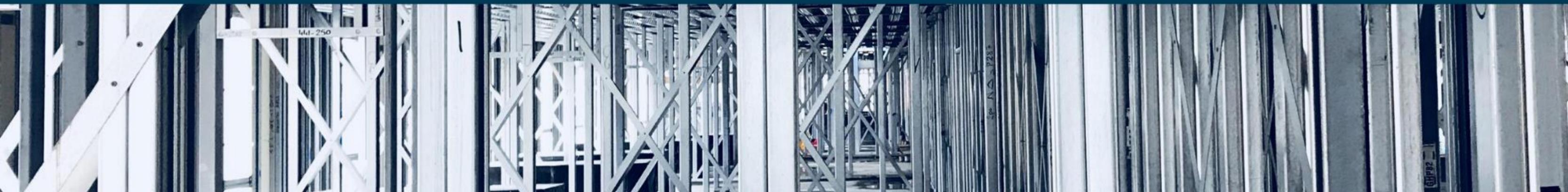
SIGMAT WEIGHT PER M² / DEAD LOAD APPRAISAL

6.6%

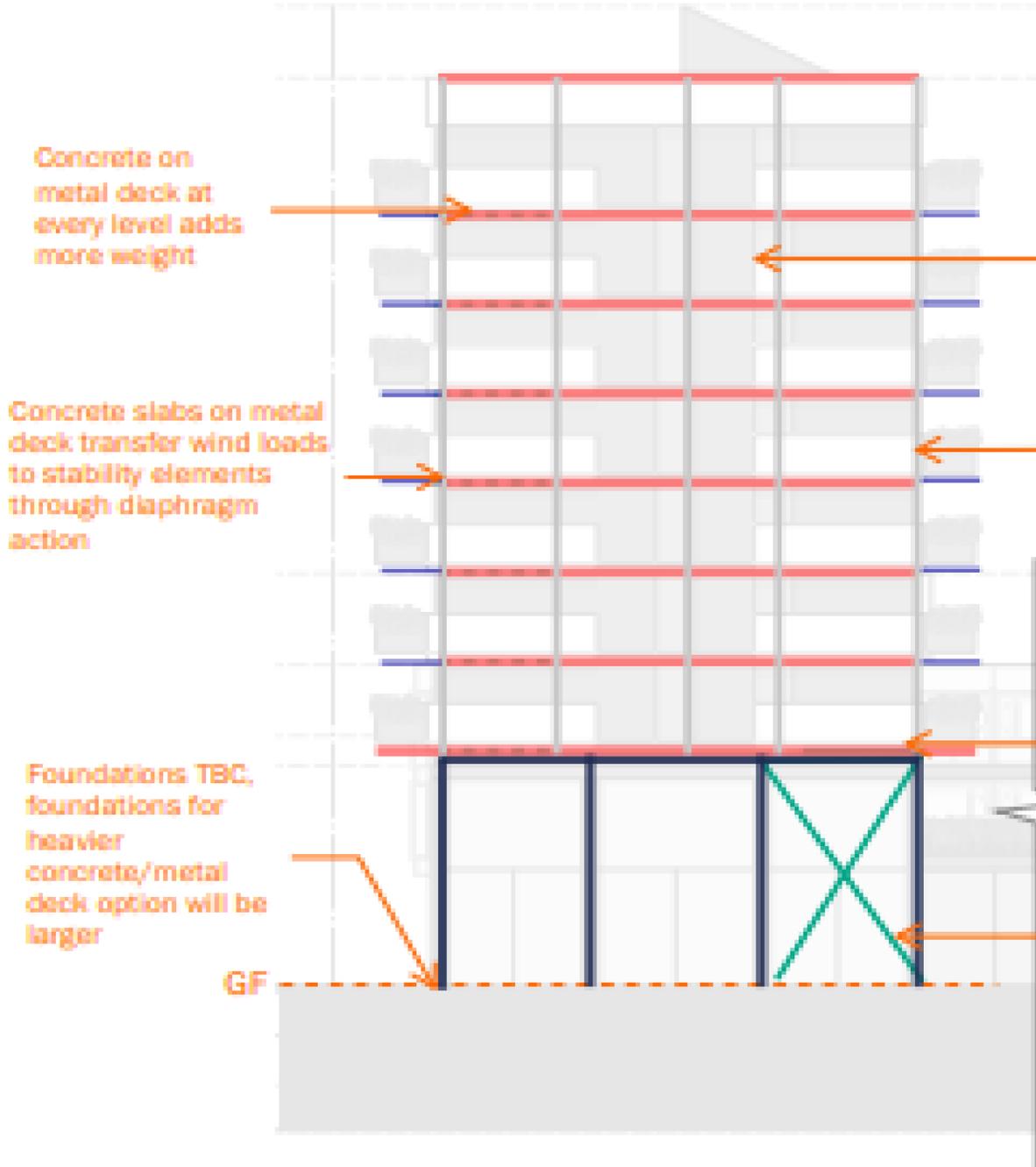
LESS STEEL THAN A HRS FRAME

53%

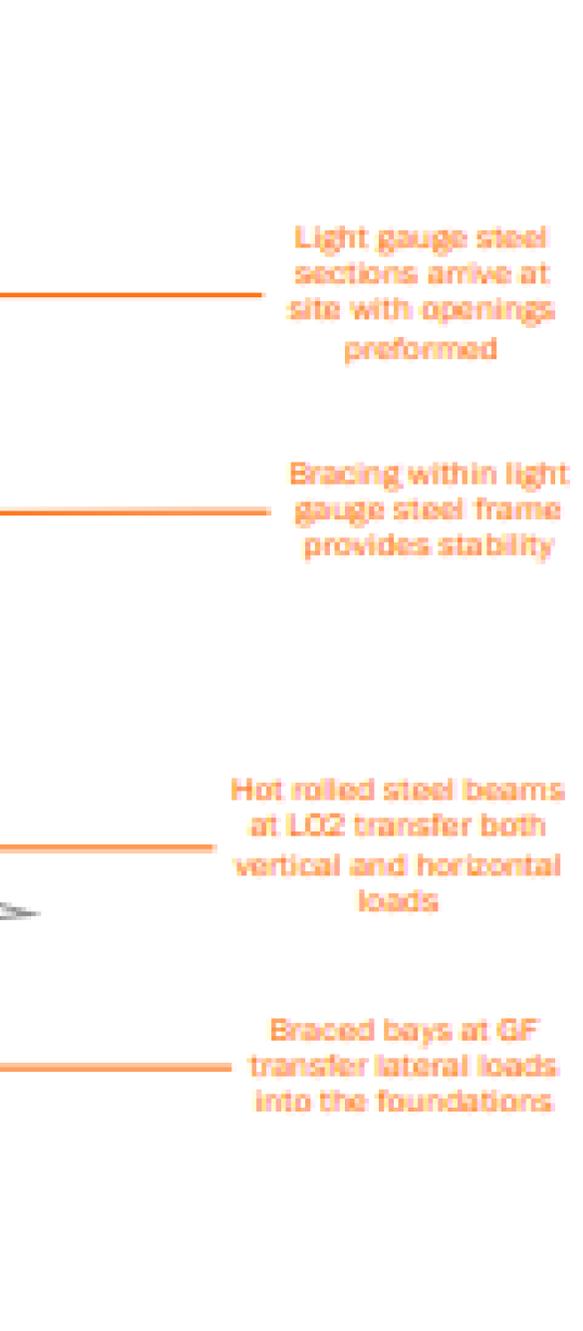
LIGHTER THAN A SIMILAR CONCRETE
FRAME BUILDING



LGSF/& CLT HYBRID ALTERNATIVE



Lightgauge Steel with Concrete Slabs



Lightgauge Steel with CLT



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LUMBER BOARD

Thank You
milestonenj@sky.com

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