Structural Timber Conference

# ARU-P THE LAB

7th October 2026



# The headlines

- 40 year + journey for Peterborough
- Part of wider regeneration activity
- Education and research – an innovation eco system
- Three headed client – CPCA, PCC and ARU
- Phase 1 (2022): 5,000m2 teaching building
- Phase 2 (2023): 3,000m2 innovation hub
- Phase 3 (2024): 2,500m2 teaching and community

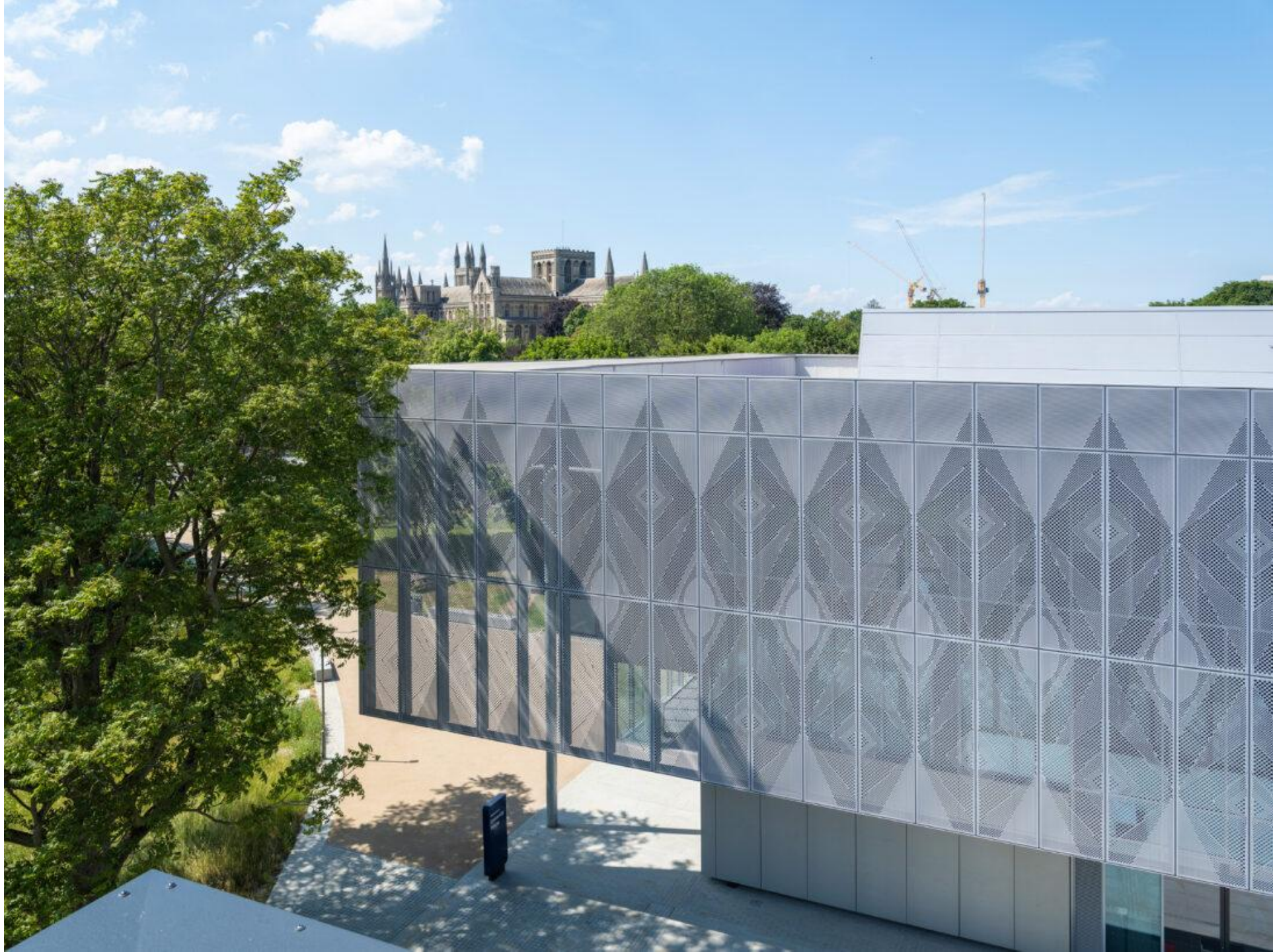



Phase 2
Phase 1
THE LAB

40% of students wouldn’t have gone to university if it wouldn’t be for ARU-Peterborough

## Phase 1

5,000m2
Teaching building
2022
Post tensioned RC frame






## Phase 2

3,000m2
Innovation hub
2023
Steel/CLT hybrid




## Phase 3

2,500m2
Teaching
and community
2024
CLT and Glulam




a.r.u.

PETERBOROUGH
CITY COUNCIL

CAMBRIDGESHIRE
& PETERBOROUGH
COMBINED AUTHORITY

# Phase 1, 2 and 3: Structural frame materials




**Insitu/post-tensioned RC frame**
999kg/m2 frame material




**Steel/CLT hybrid**
177kg/m2 frame material




**CLT and glulam**
204kg/m2 frame material

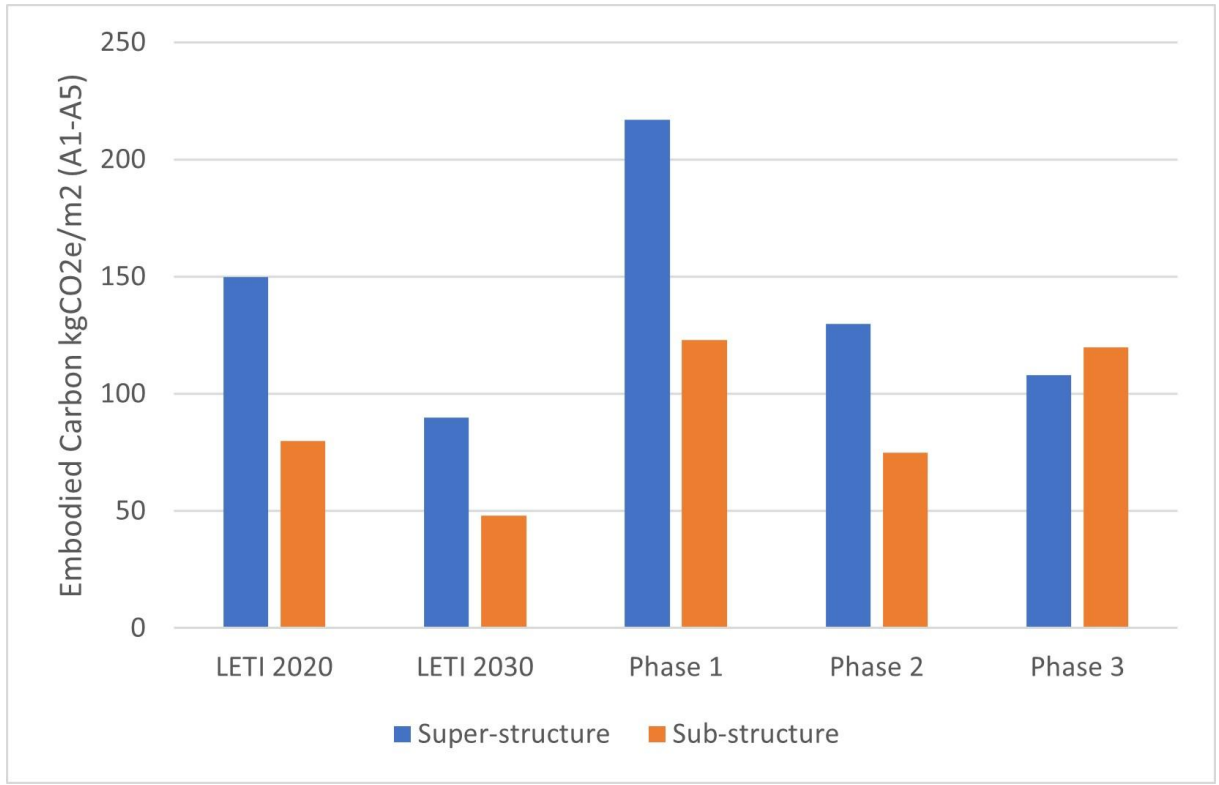
# Phase 1, 2 and 3: Embodied carbon



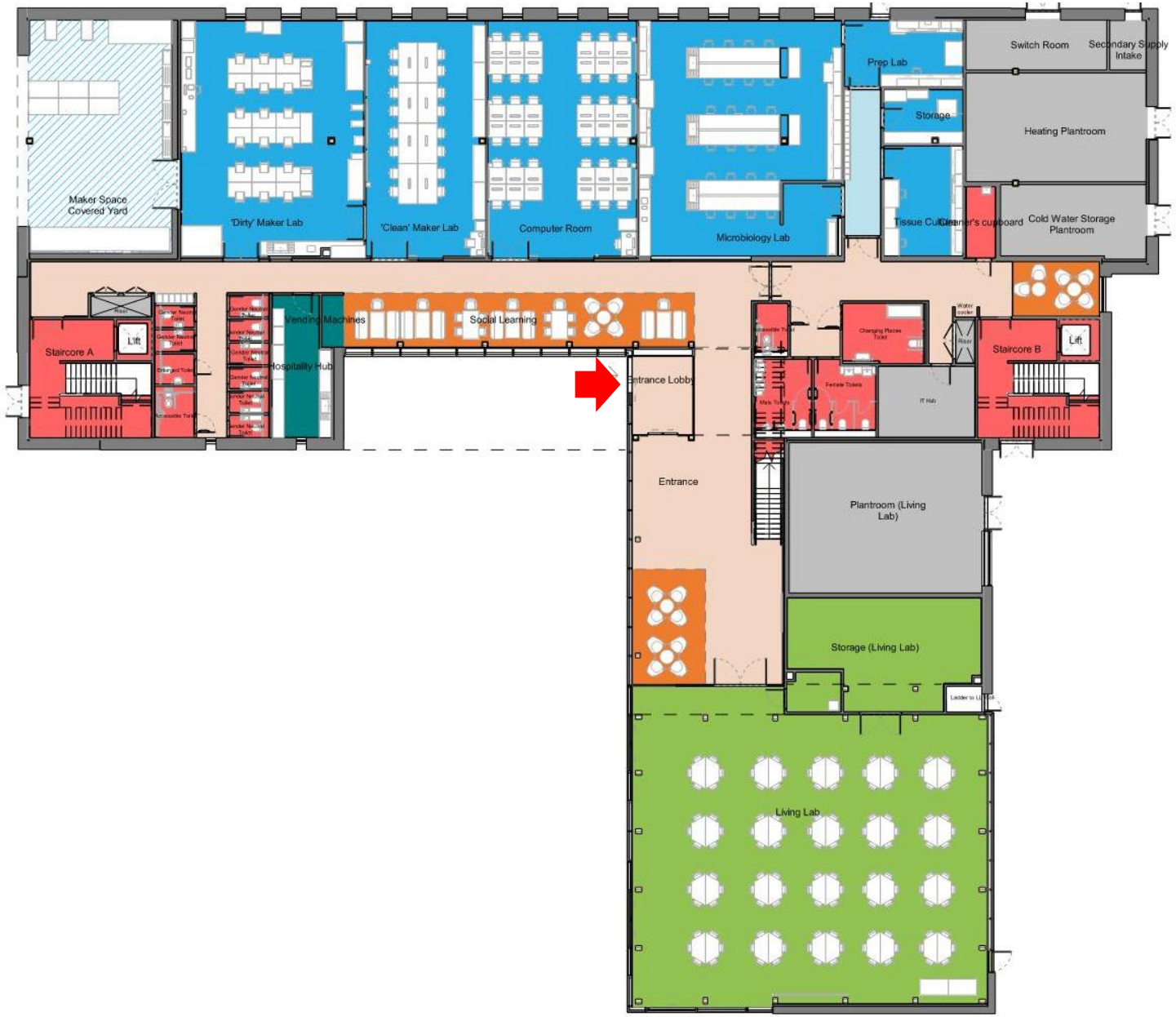







Structural embodied carbon (A1-A5) vs. LETI



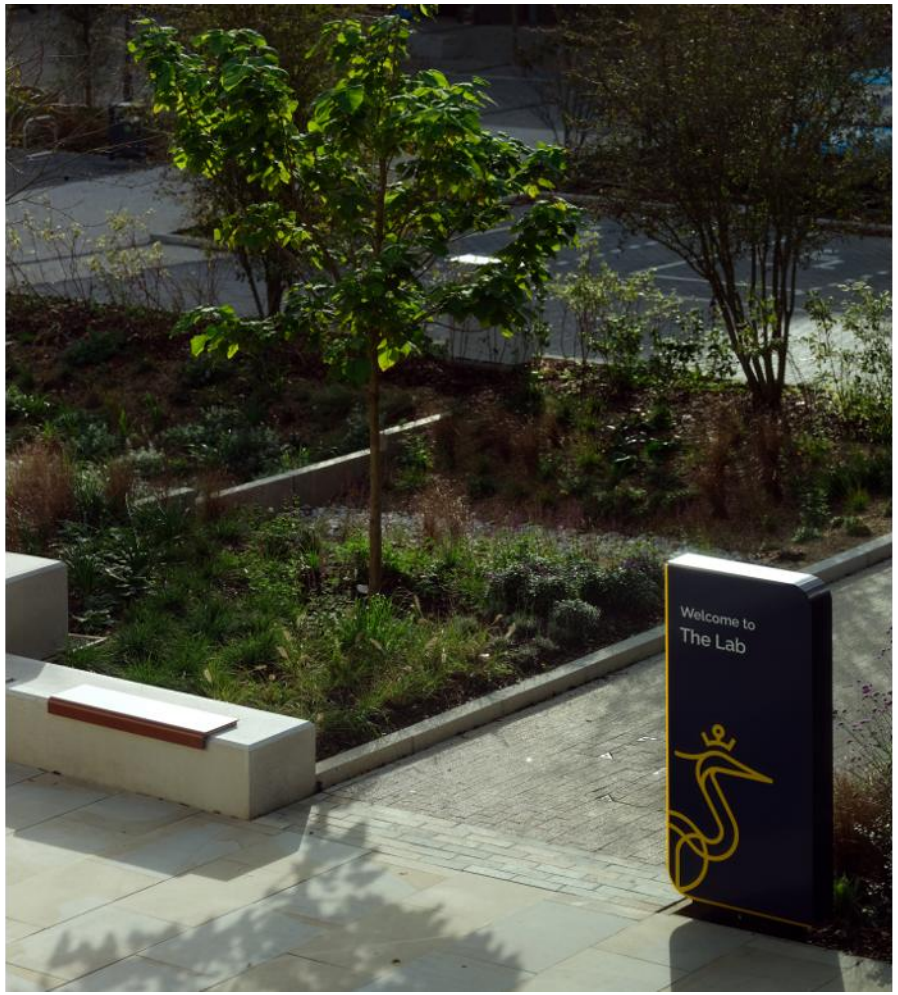

Ground Floor


Workspace
Teaching Room 1
Teaching Room 2
Teaching Room 3
Teaching Room 4
AHU
Social Learning
Void
The Hub
Lift
Meeting room
Green Roof
Riser
Void above Living Lab

First Floor


Welcome to
The Lab



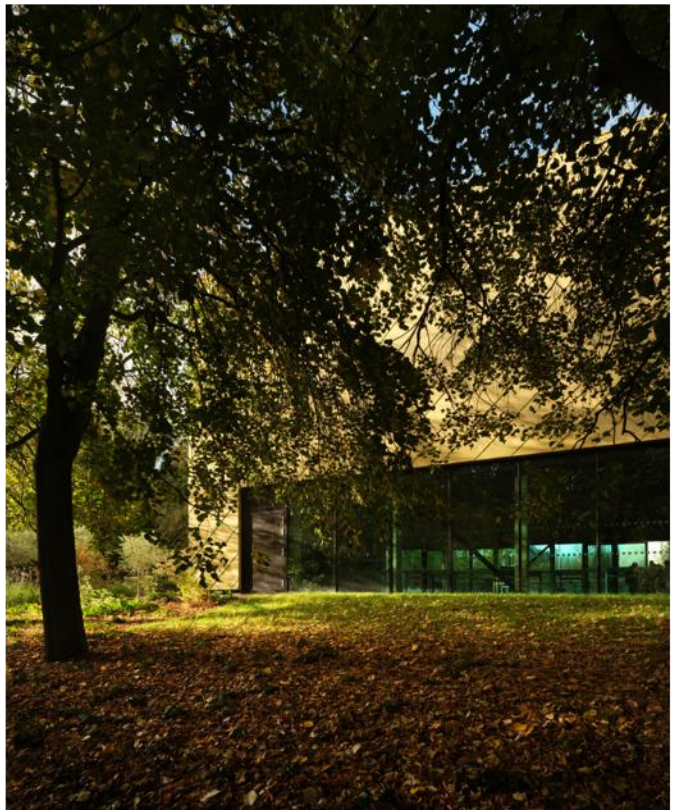

Welcome to
The Lab









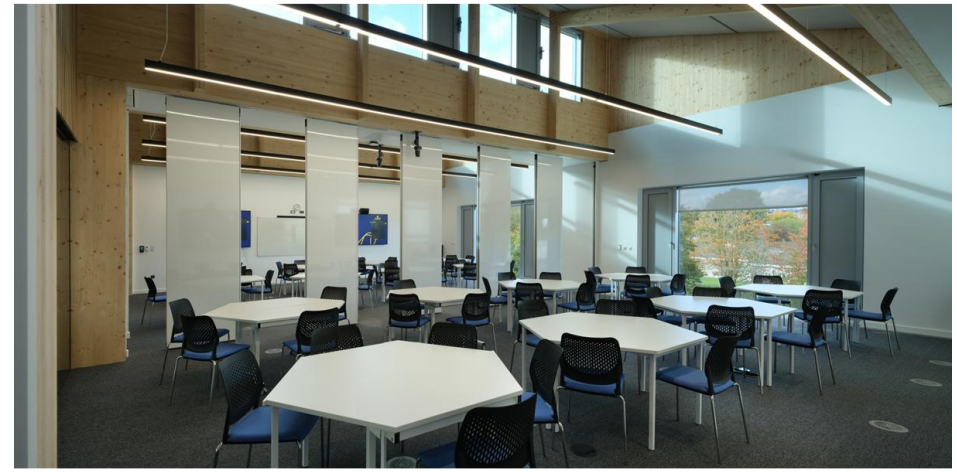






















# Phase 3:  Structural scheme





**Substructure:**

- ø600 CFA piles supporting 250mm RC raft slab

**Superstructure:**

- 120mm thk. CLT walls with glulam posts and beams
- 180/260mm thk. CLT floor slabs
- 180mm thk. CLT ‘flat’ roof (1:40)
- 12m span glulam/CLT sawtooth roof
- CLT stair flights and balustrades



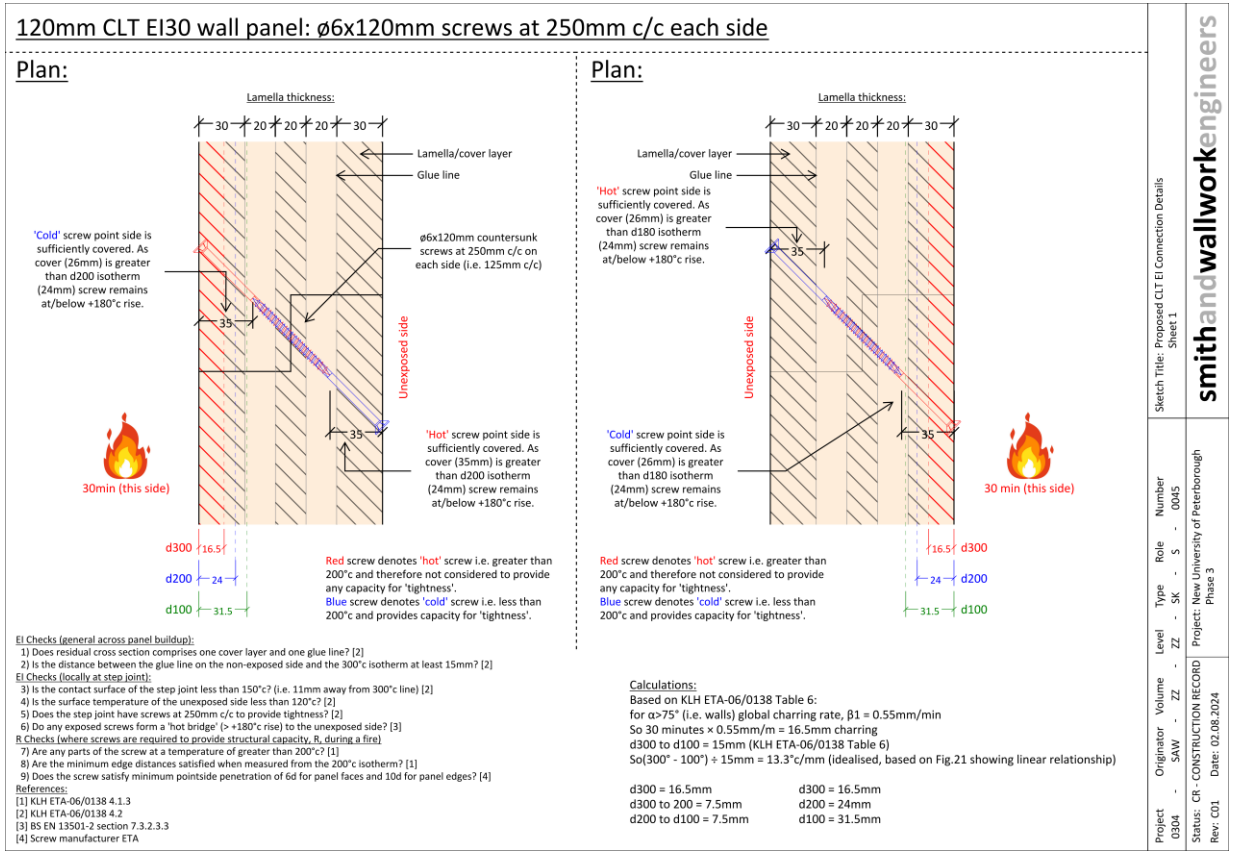
# Fire engineering compliance

**Fire engineered mass timber frame provides REI30.**

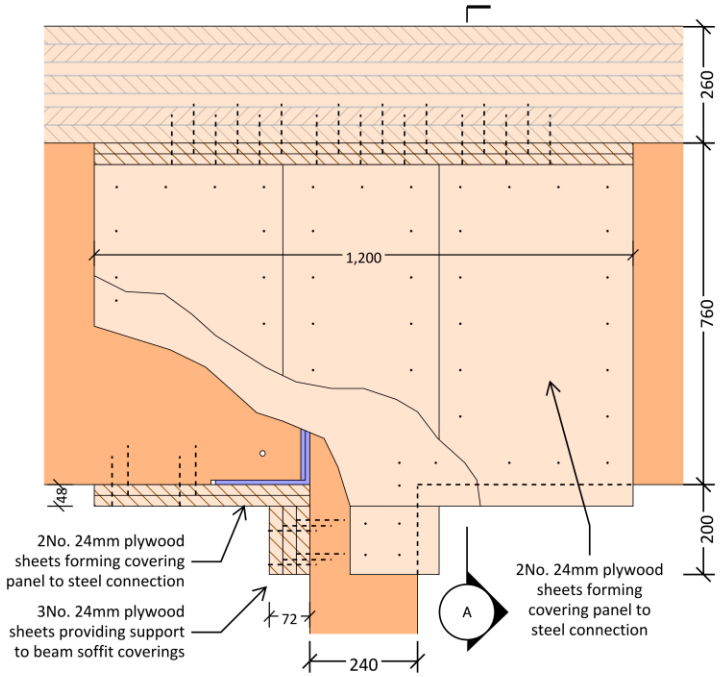
- CLT and glulam designed for loadbearing capacity (R) through charring design
- CLT walls and slabs provide Integrity (E) and insulation (I) using manufacturer ETA and engineering judgement without reliance on protective linings.
- Design and detailing (elements and connections) by structural engineer.
- Peer reviewed by fire consultant and specialist fire engineer.

**Challenges**

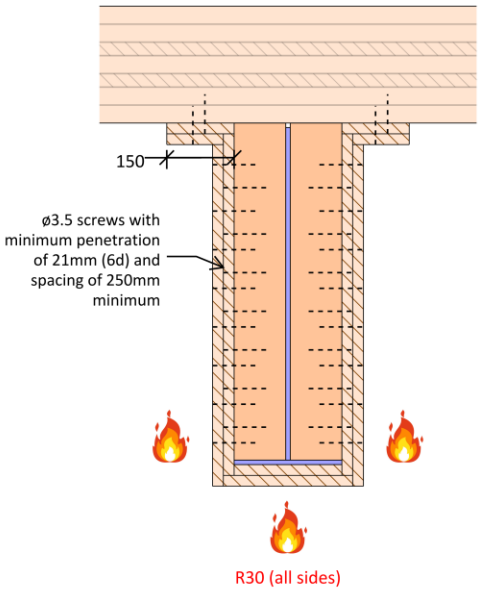
- Lack of industry tested data around protective linings with CLT
- Required a shift from a ‘compliance-based’ approach to a ‘fire-engineered’ approach
- Timing was a potential ‘show stopper’ – alternative frame options considered.
- Buy in from insurers and other key stakeholders. Early involvement and ongoing dialogue required.



# Sacrificial timber protecting steel connectors: Post and beam hanger




**Elevation 2**

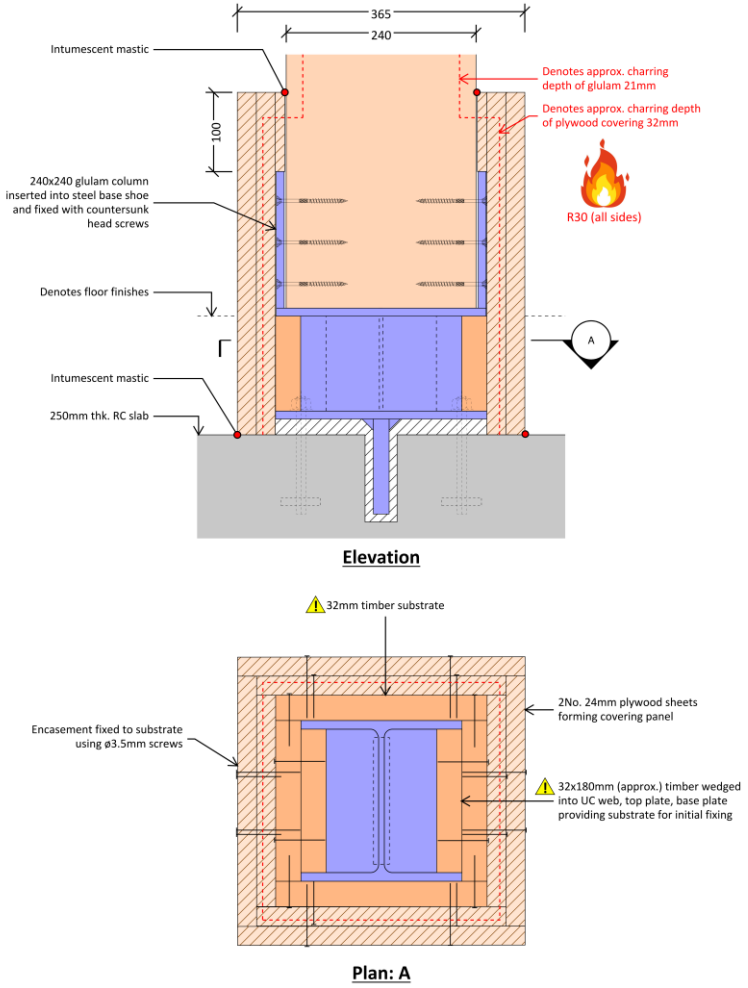



**Section: A**





# Sacrificial timber protecting steel connectors: Key element column shoe







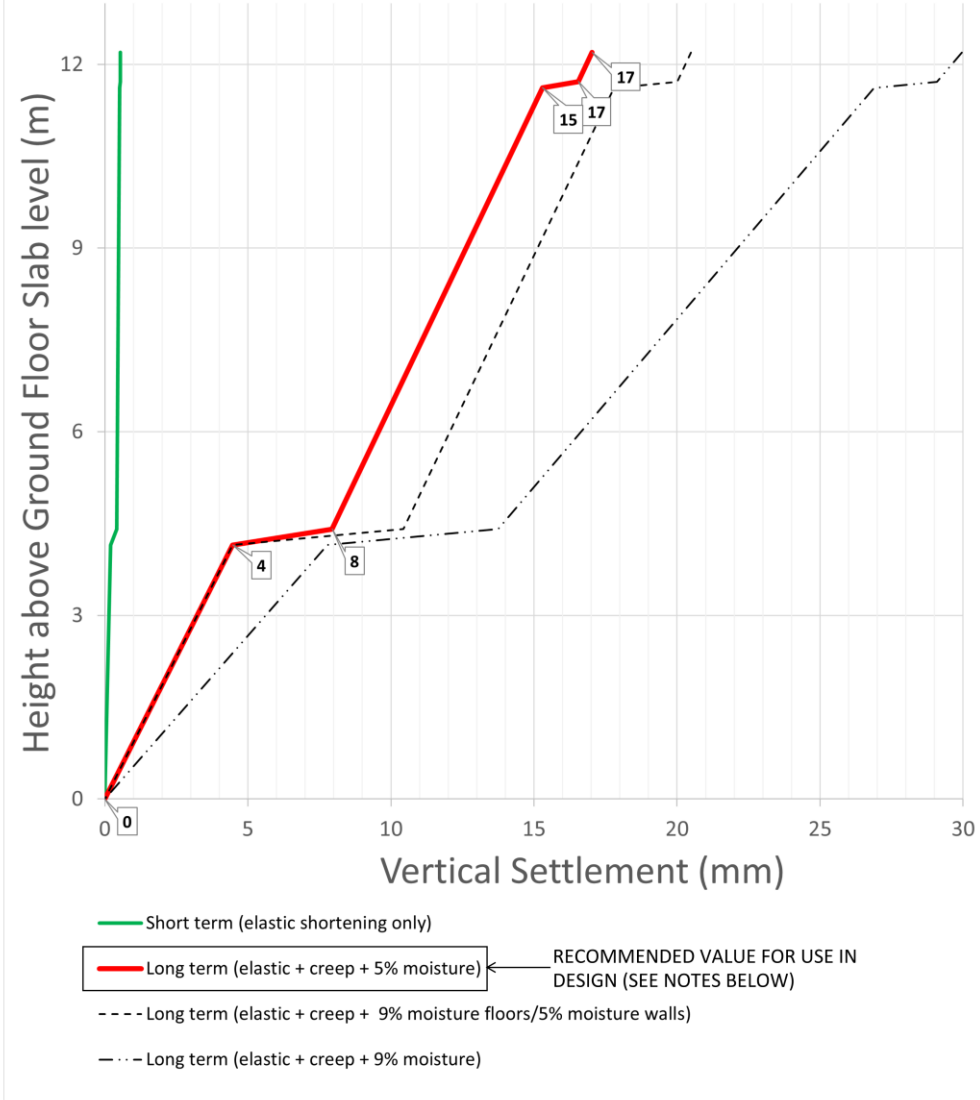

# External envelope: Strategy

- CLT external envelope provides airtight line with Passivhaus details
- Glazing and façade directly supported from CLT frame - no secondary support structure required
- Requires understanding and communication of moisture movement of CLT envelope

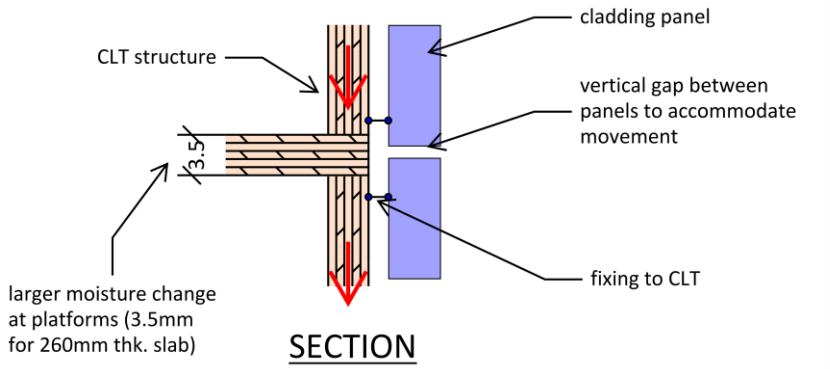




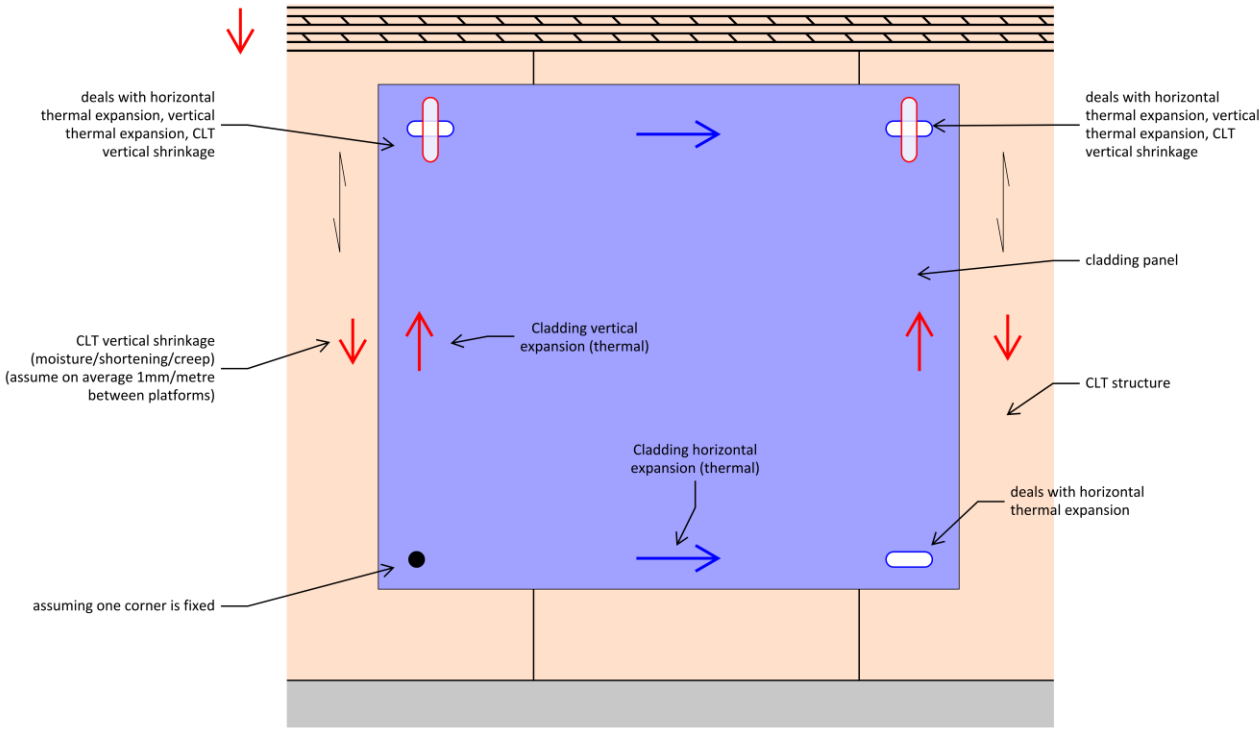
# External envelope: Moisture movement




**NORTH ELEVATION SHRINKAGE**

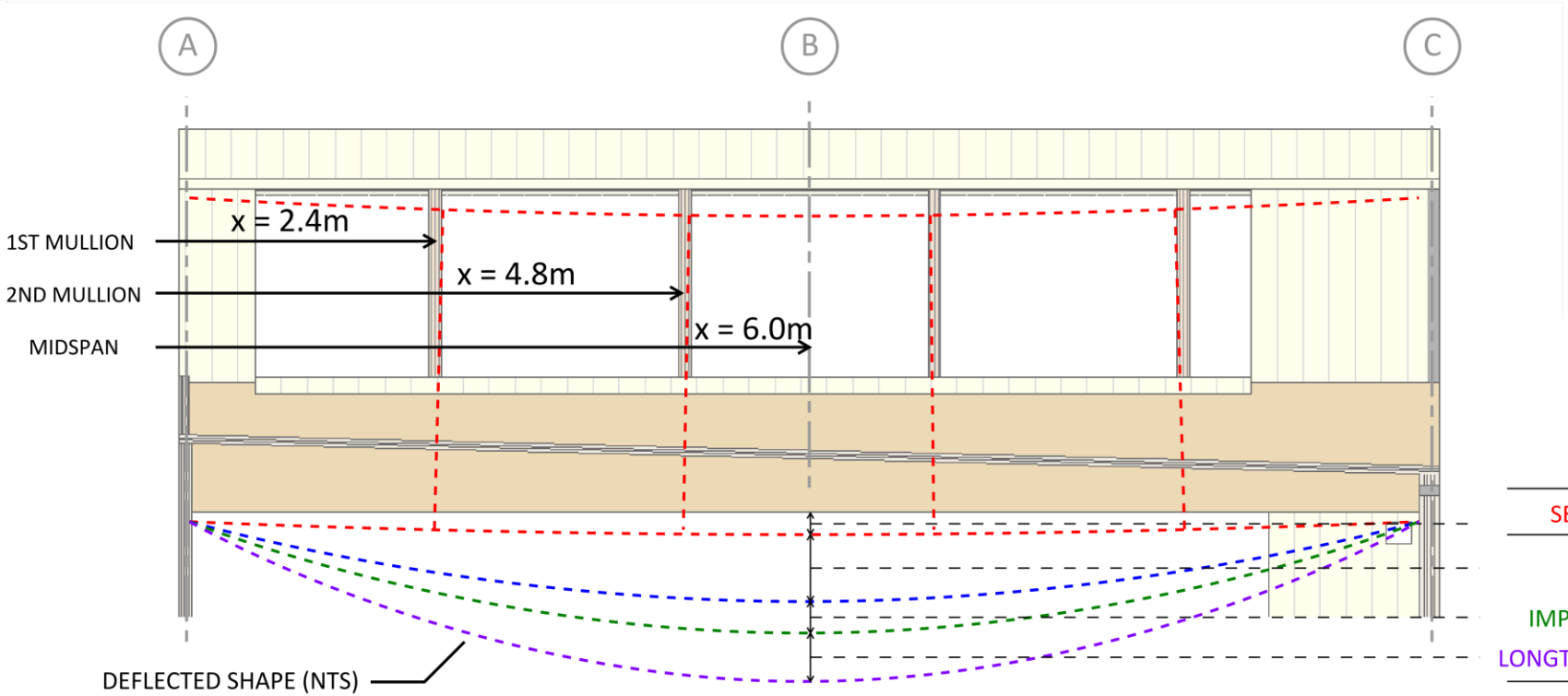



SECTION




ELEVATION

# External envelope: Longterm deflection

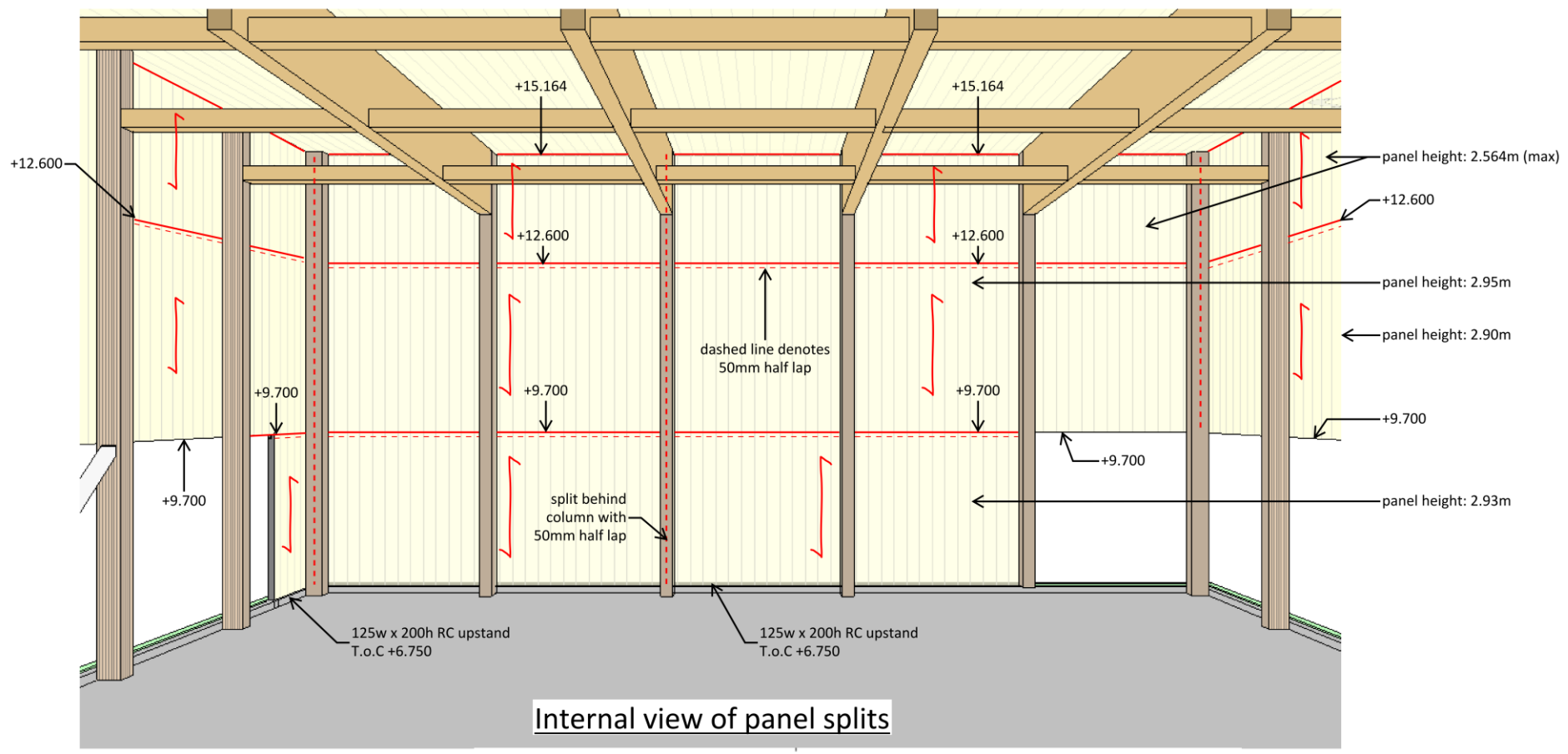



2 SECTION: TYPICAL SAWTOOTH BEAM DEFLECTION

| | DISTANCE (x) 2.4m (1st MULLION) | 4.8m (2nd MULLION) | 6.0m (MIDSPAN) |
|---|---|---|---|
| SELF-WEIGHT | 0.5mm | 0.8mm | 1mm |
| DEAD LOAD | 3mm | 4.5mm | 4.7mm |
| IMPOSED LOAD | 1.5mm | 2.3mm | 2.4mm |
| LONGTERM CREEP | 2.0mm | 3.2mm | 3.4mm |
| FINAL DEFLECTION | 7.0mm | 11mm | 11.5mm |
| LESS S.W. DEFLECTION | **6.5mm** | **10mm** | **10.5mm** |

# Visual timber

- Coordination of panel arrangements to balance
  - internal visual appearance
  - wastage/delivery/buildability,
  - structural capacity




Internal view of panel splits

# Timber is a natural product

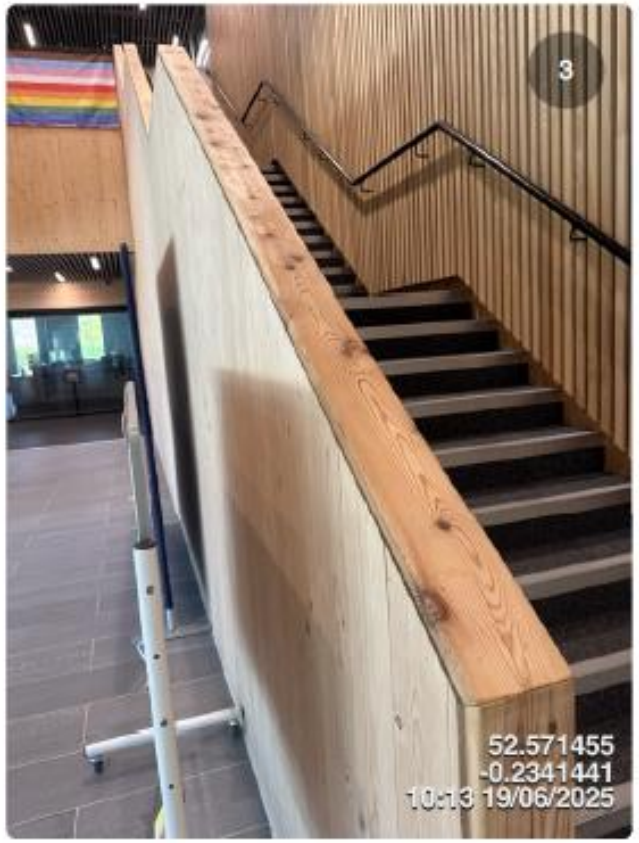
With as much of the CLT on show it was important to protect it once installed.

There a was learning curve when it came to some of the finishes.
As some of the exposed timber sections dried there was some shrinkage and cracking.
We monitored the staircase with the customers facilities team before closing it out within expected tolerances.





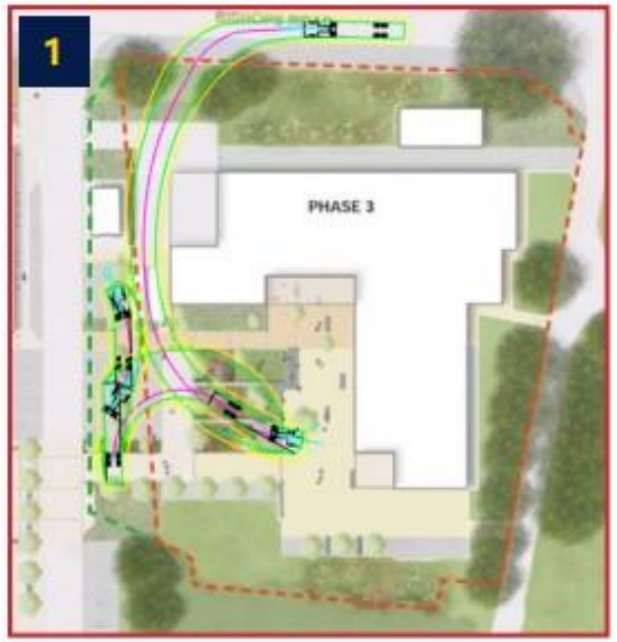




# Logistics on a live campus






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CONSTRUCTION
Intelligent
Solutions.
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Anglia Ruskin
University
CAMBRIDGESHIRE
& PETERBOROUGH
COMBINED AUTHORITY
PETERBOROUGH
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# Water Management



There were plentiful conversations early doors to ensure we had a good plan in place to deal with the moisture. This required three types of plans:

1. Surface Management Water Plan
2. Moisture Control Plan and how we are going to protect the building during construction
3. Water management plan for the M&E systems (CIREG)

The project team had a robust plan in place to mitigate the risks...



Ground Drainage → Downpipes ASAP → Sweeping regime

# Roofing and Lessons Learned

- Roofing contractor as early as possible.
- Sequencing the programme in a way whereby we could get watertight as soon as possible.

**However…**

- Challenge on if SIGA Wet guard was necessary everywhere
- Lost time due to moisture content





THANK YOU!