

Platforms in Practice:

a breakthrough vision for scaling construction

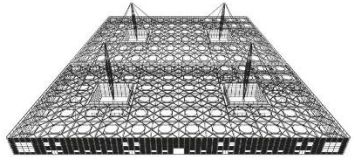
Tom Gregory

Senior Architectural Associate

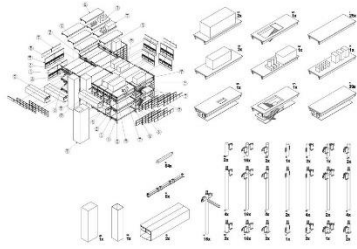
22nd May 2024



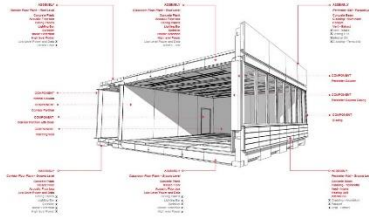
Bryden Wood



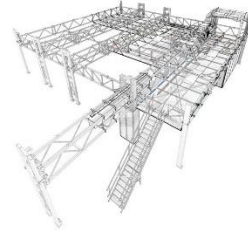
1995 - ongoing
Iigus GmbH



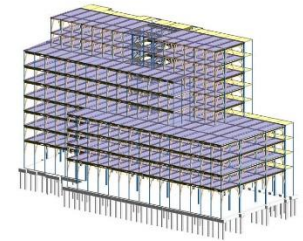
2007 - 2009
GSK 'New Ways'



2009
Herts BSF programme



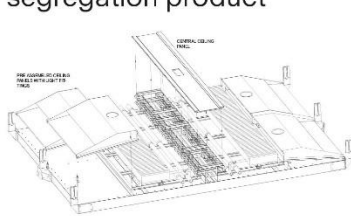
2015 - ongoing
GSK 'Factory in a Box'



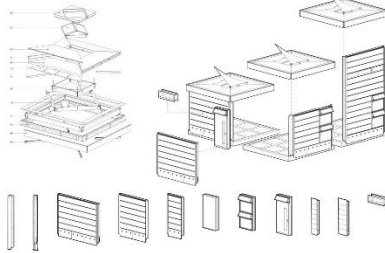
2019 - ongoing
Platform 3 - Landsec 'The Forge'



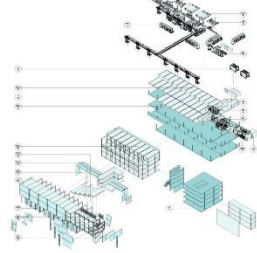
2004
BAA Pier
segregation product



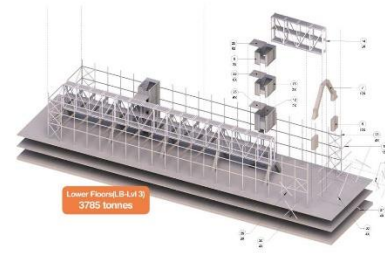
2008 - 2014
EcoCanopy Schools



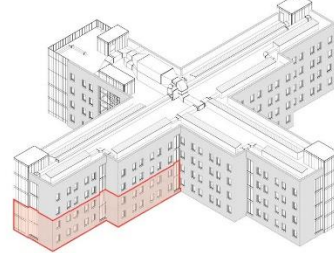
2009 - ongoing
Circle Hospitals



2012 - 2014
Gutenberg, St. Petersburg



2016 - ongoing
Ministry of Justice Platforms 1 + 2



Client value drivers



- Safety (often while delivering assets on complex live sites)



- Sustainability (in the broadest sense – environmental, economic, social...)



- Future flexibility (with fast evolving processes / technology)



- Cost (capex + whole life)



- Speed of delivery (on site)



- Ability to delay capital spend to the ‘last responsible moment’



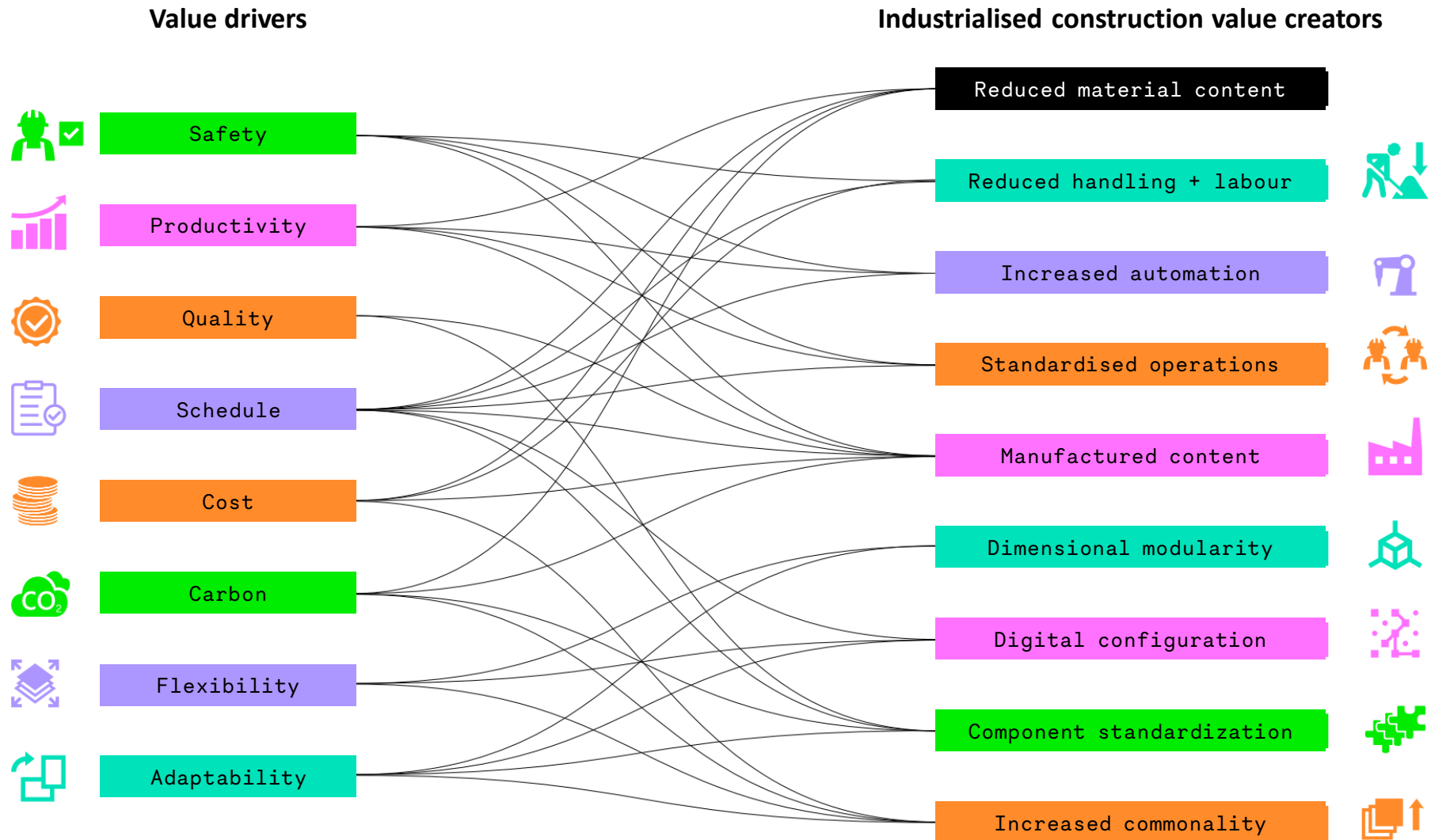
- Innovation in design + delivery (leveraging wider industry shifts)



- What does the world look like post COVID-19?



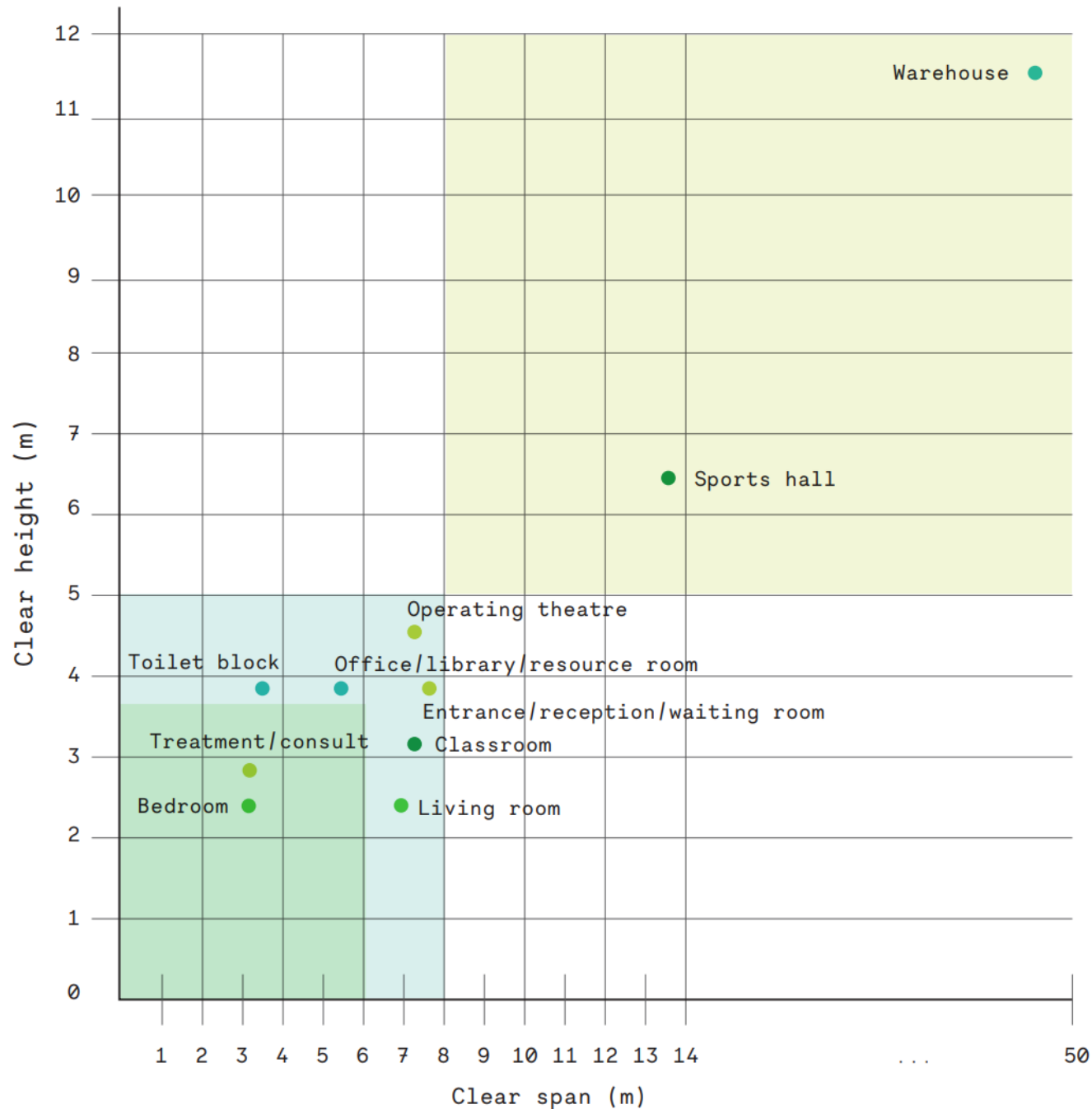
Value drivers + creators



Not projects or programmes, but

Platforms





Key

- Residential
- Offices
- Health
- School
- Platform I
- Platform II
- Platform III


Infrastructure and Projects Authority


Ministry of Justice


Department for Education

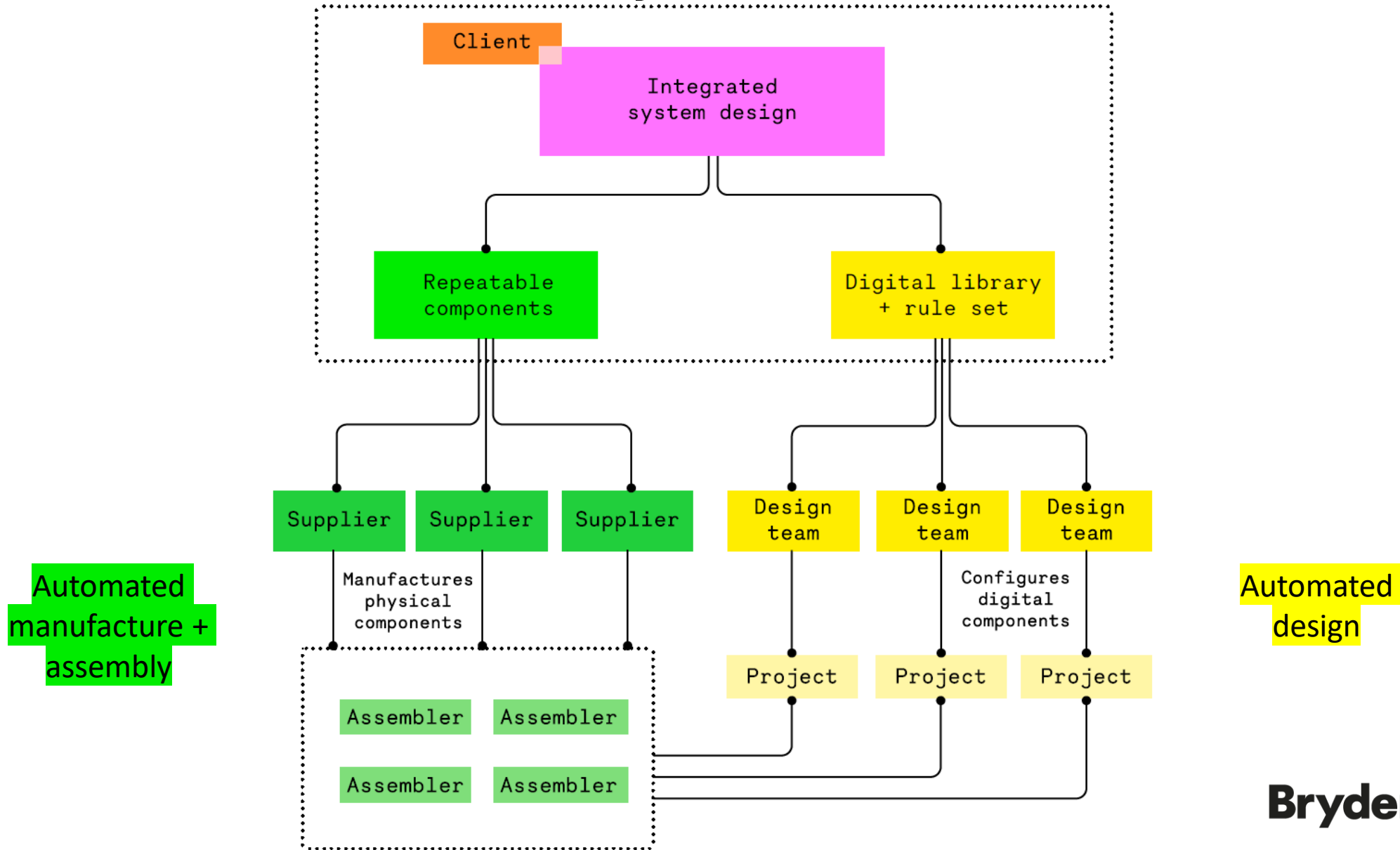

Department of Health


Ministry of Defence


Department for Transport

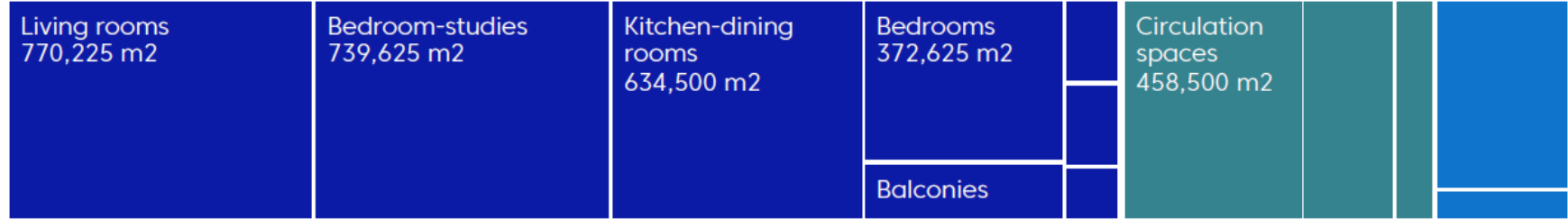


Platform-enabled delivery model





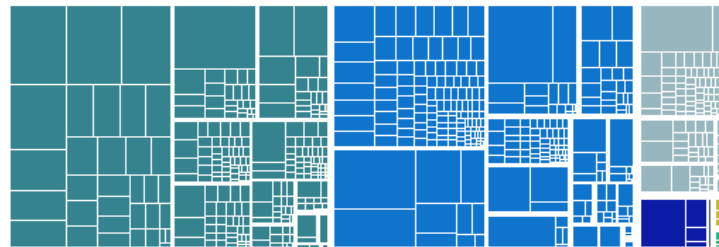
Ministry of Housing,
Communities &
Local Government



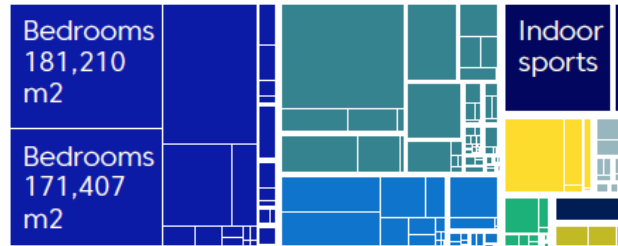
Department
for Education



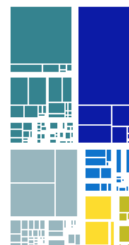
Department
of Health &
Social Care



Ministry
of Defence



Ministry
of Justice



CONSTRUCTION
INNOVATION HUB

- Administrative, commercial and protective service spaces
- Communications, security, safety and protection spaces
- Cultural, education, scientific and information spaces
- General spaces
- Heating, cooling and refrigeration spaces
- Industrial spaces
- Medical, health, welfare and sanitary spaces
- Recreational spaces
- Residential spaces
- Sport and activity spaces
- Waste disposal spaces and locations



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c£35bn

the estimated value of the pipeline that could be delivered with a defined range of mid-span (~8m) platform construction systems, based on geometry alone.

c£13bn

the estimated value of the pipeline that could be delivered with the Hub's Platform Construction System.

104

different names for toilet spaces across the estate. This highlights the need for a common, machine-readable, way of naming spaces to accurately analyse and harmonise future demand.

50%

More than 50 percent of space types across the pipeline are not department specific — hallways, bathrooms and storage areas could be delivered with a standardised platform solution.

38%

of spaces across the new build pipeline will be 'Residential Spaces', presenting a secondary market for the private sector. If the Hub's Platform Construction System demonstrates how it can be used to deliver 'more beautiful, more sustainable, better quality homes in all parts of the country!', it could potentially be used to deliver private sector homes, student accommodation, and hotels domestically and internationally.

?

The majority of departmental specifications are open to interpretation. Units can vary across departments — . dB or NR are both used for acoustic performance. Improved standardisation of requirements — not least nomenclature — is needed to unlock the potential for solutions that deliver pan-government.

Trends

0

The government is committed to bringing all greenhouse gas emissions to net zero by, or ahead of, 2050. Platform construction systems must understand and minimise their GHG emissions footprint throughout their lifecycles.



Buildings need to be highly adaptive so that they can be reconfigured/repurposed across the required 60-year service life.



Platform Design Programme Defining the Need

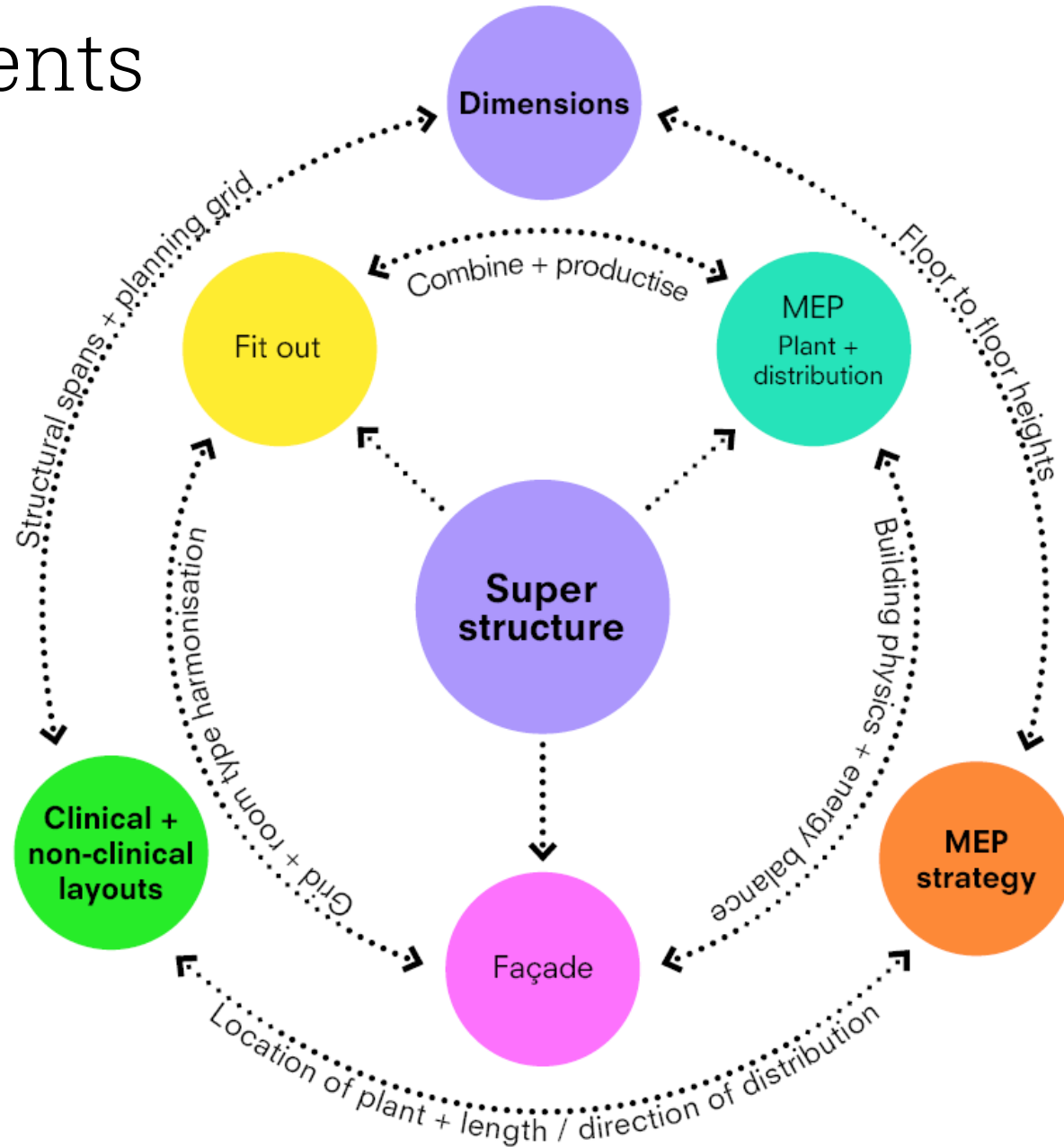
Summary report

December 2020



Bryden Wood

Key components



Common + repeatable elements

Design processes

- Automated configuration of digital components
- Data flow into logistics, manufacturing + assembly processes

Manufacturing processes

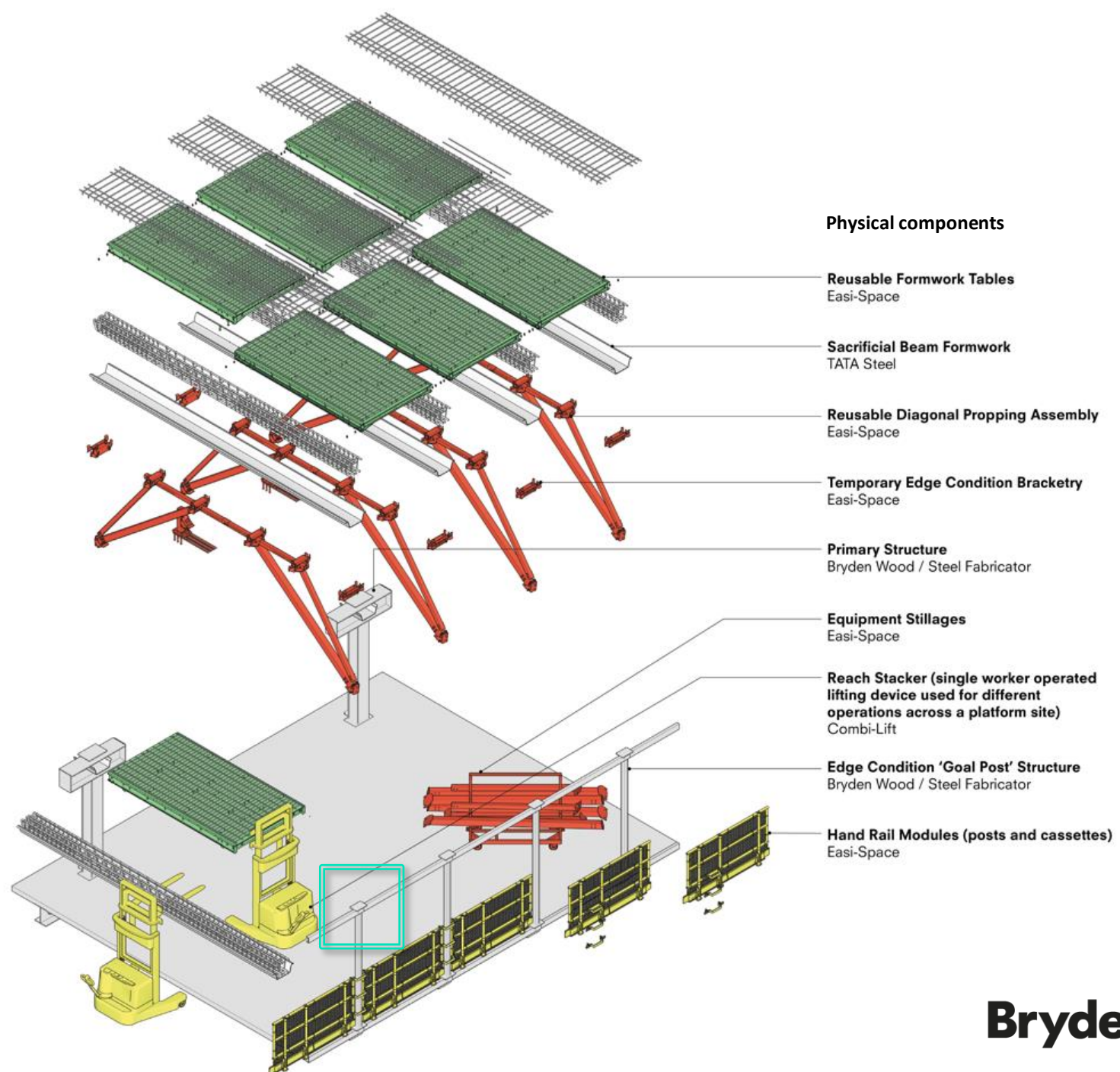
- Robotic cutting and welding of brackets and temporary works
- Jigging and cutting of columns, beams and permanent beam shutters

Assembly processes

- Colour coding for QA
- Micro column pre-assembly including temporary handrails
- Micro column lifting and placement
- Permanent shuttering lifting and placement
- Slab shuttering lifting and placement
- Temporary works lifting, placement and striking
- Temporary works re-use in the next bays / floors

Equipment

- Reach stackers / modified forklifts for lifting permanent shutters, slab shutters and temporary
- Stillages for shutters and temporary works



Partners

easi space
Environmentally And Socially Impacting Spaces

TATA STEEL

easi space
Environmentally And Socially Impacting Spaces

easi space
Environmentally And Socially Impacting Spaces

COMBiLiFT
LiFTING INNOVATION

easi space
Environmentally And Socially Impacting Spaces



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Platforms in
Practice



The Forge, London



Landsec



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Structure



Ministry
of Justice

'...a single component could be used as part of a school, hospital, prison building or station.'



Landsec

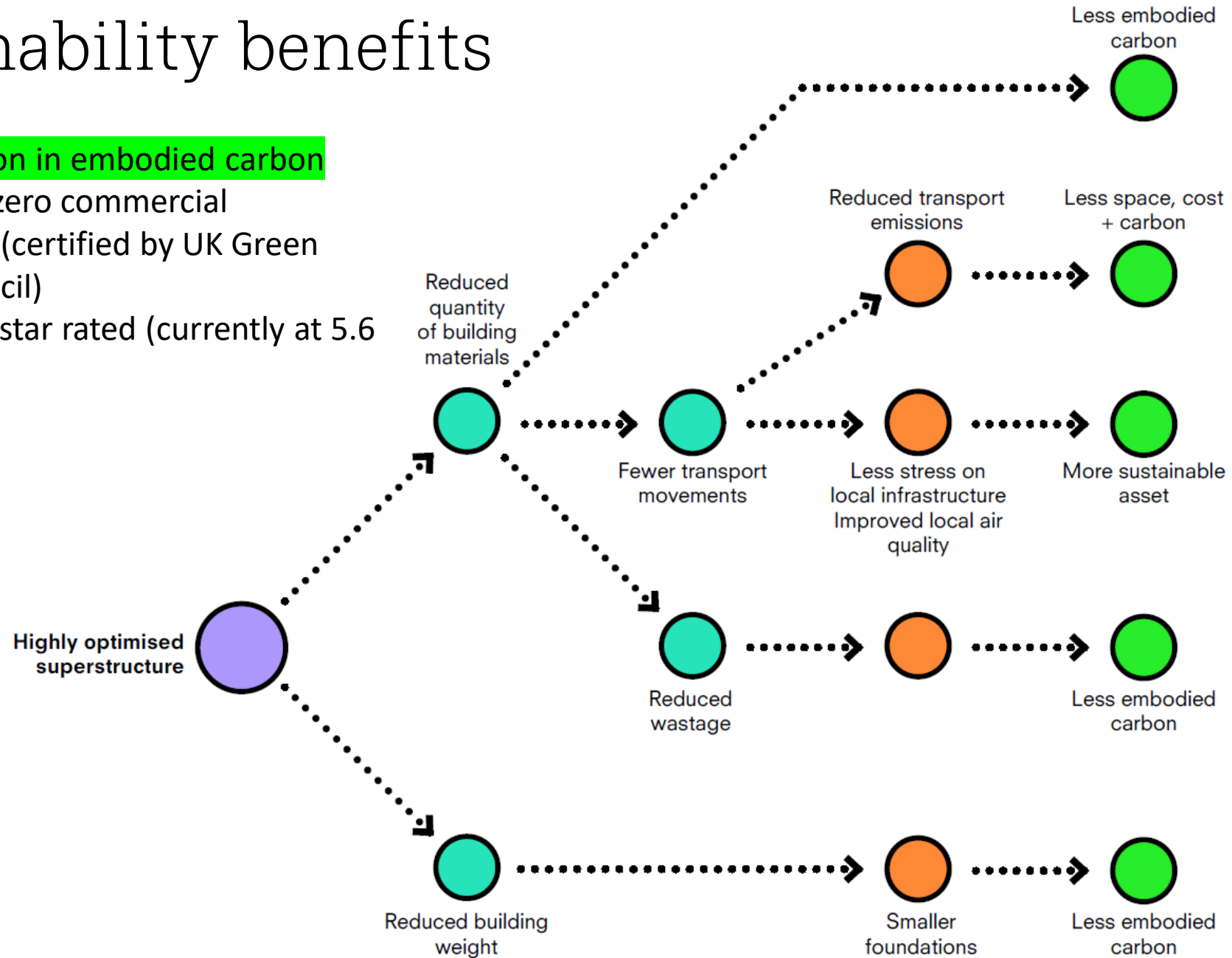


Or commercial office.

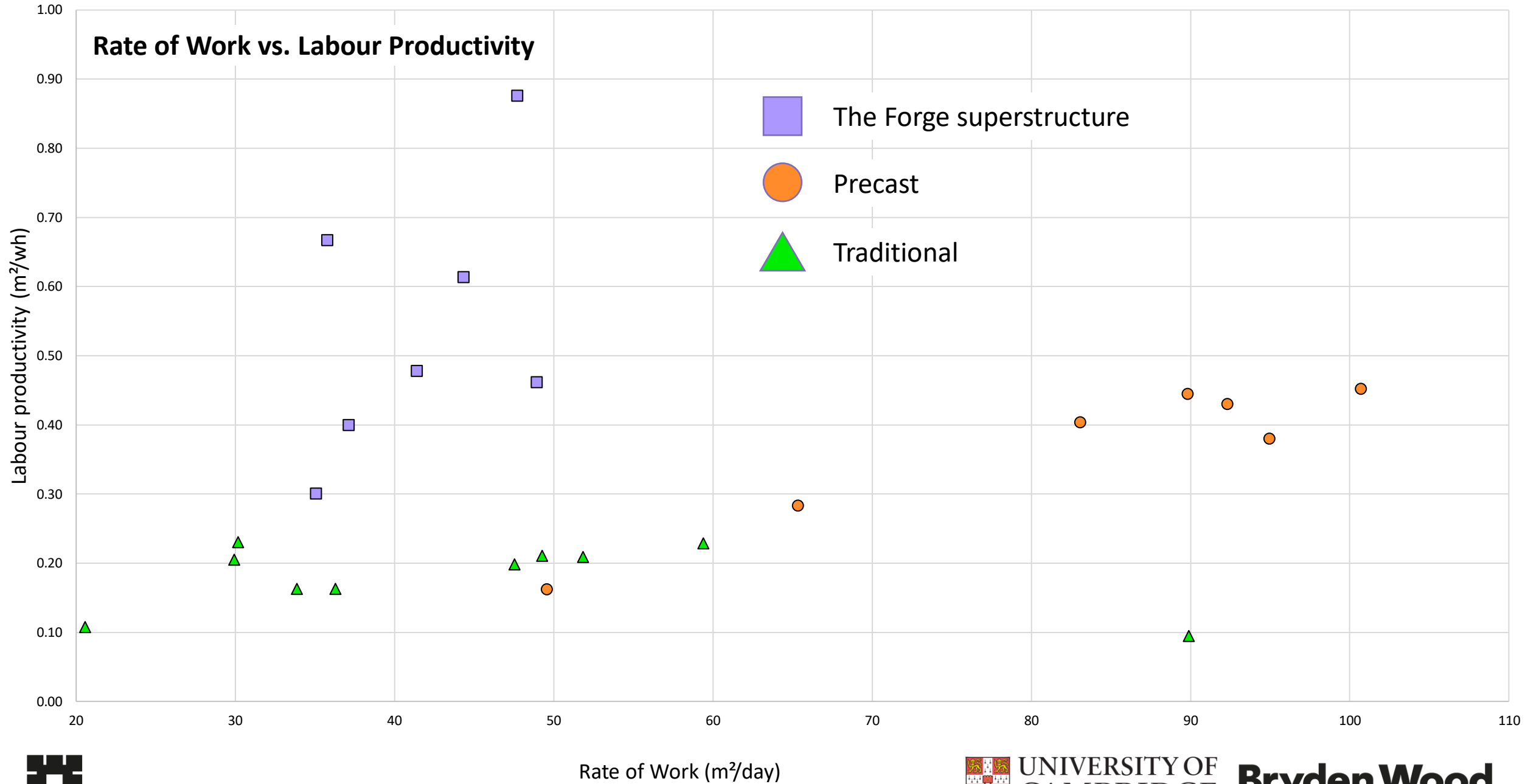
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Sustainability benefits

- ~30% reduction in embodied carbon
- UK's first net zero commercial development (certified by UK Green Building Council)
- NABERS UK 5 star rated (currently at 5.6 stars)



Rate of Work vs. Labour Productivity



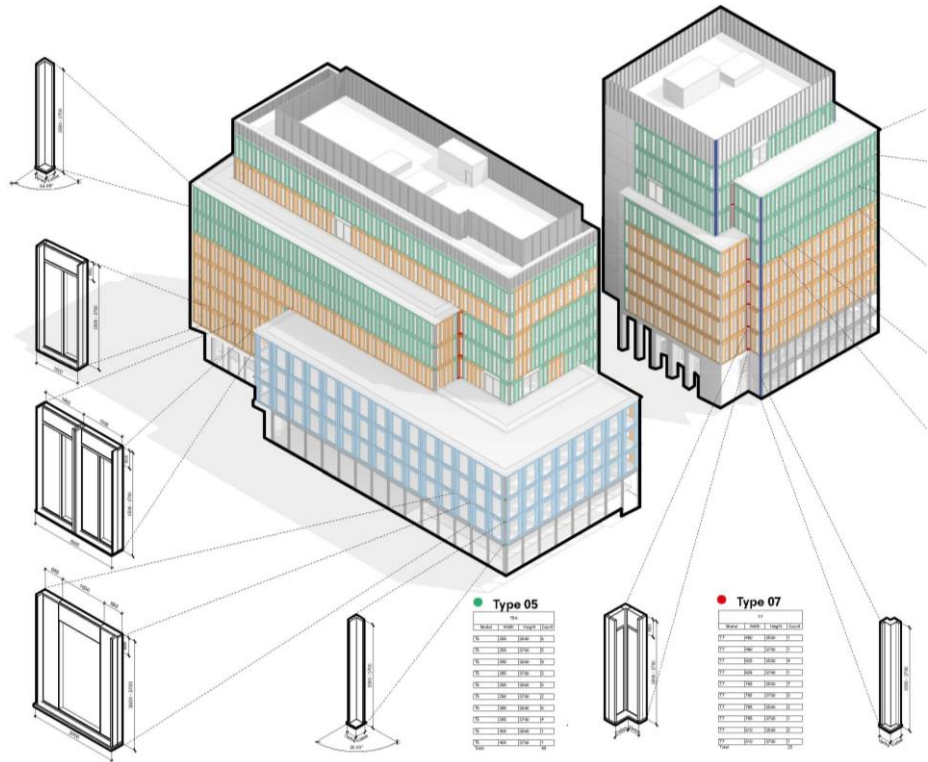
Rate of Work (m²/day)



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Façade



- Planned rate: 7 panels / day
- Peak rate: 6 minutes / panel



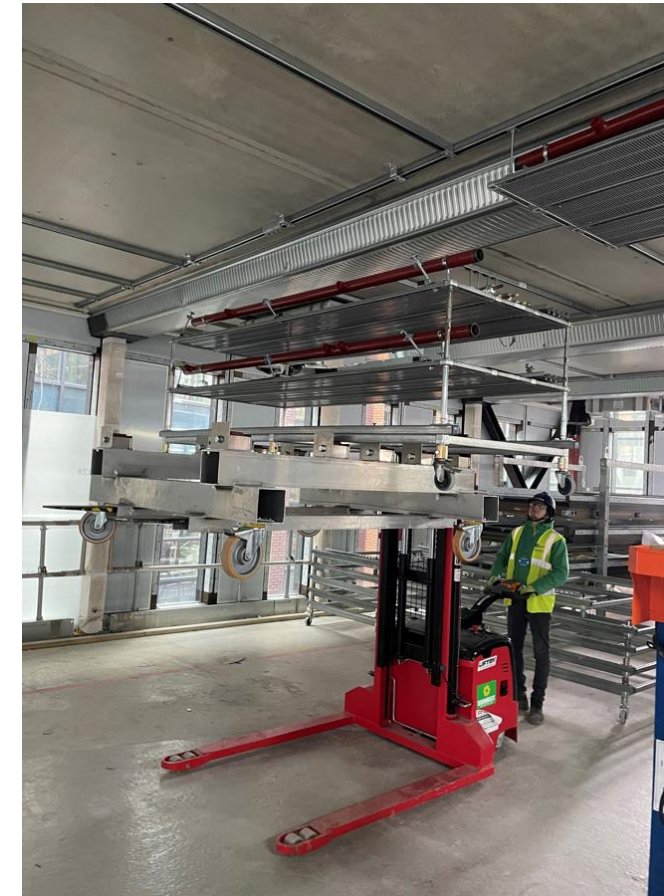
MEP



Courtesy of NG Bailey

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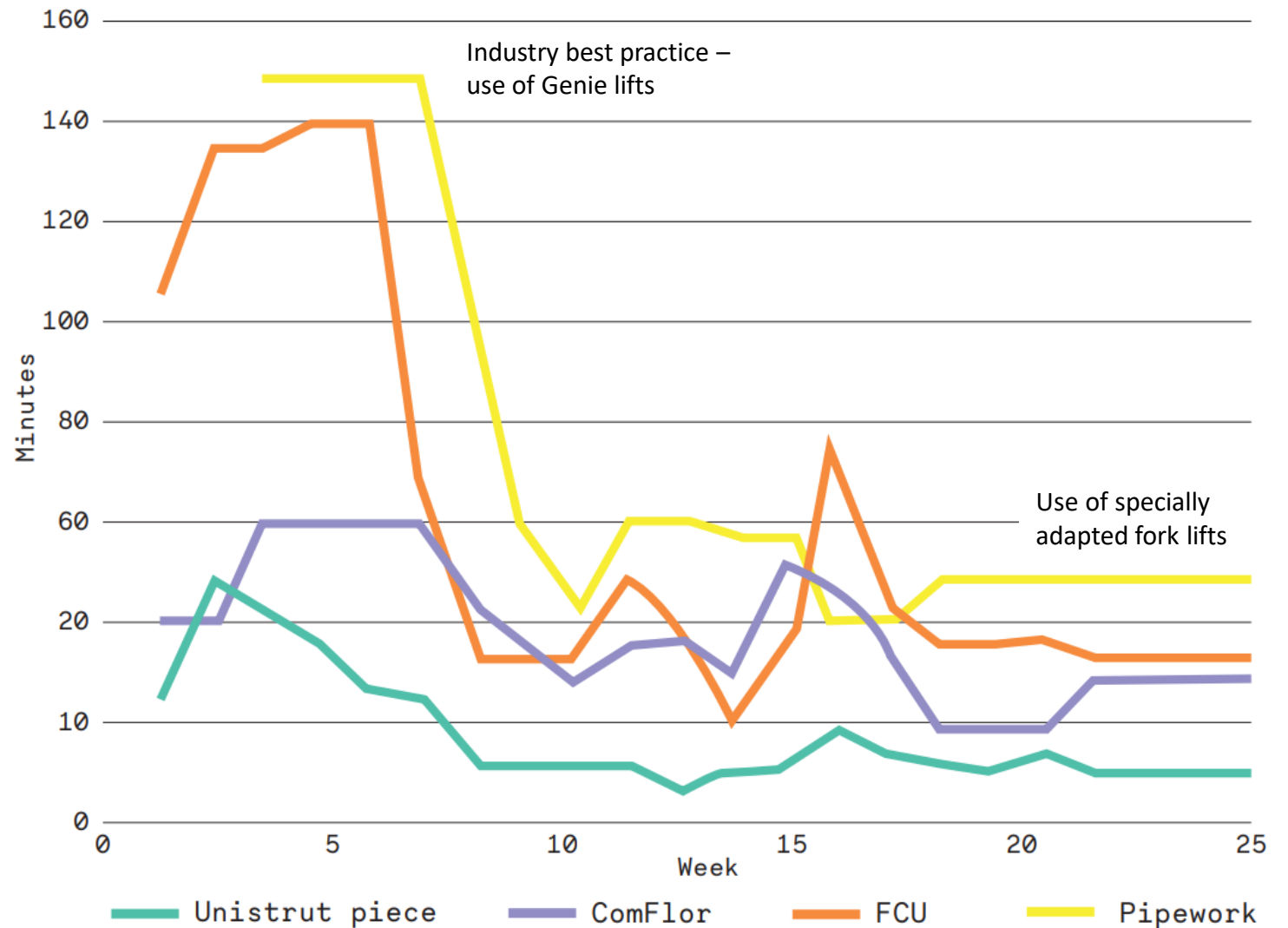
MEP installation





Weekly module install times

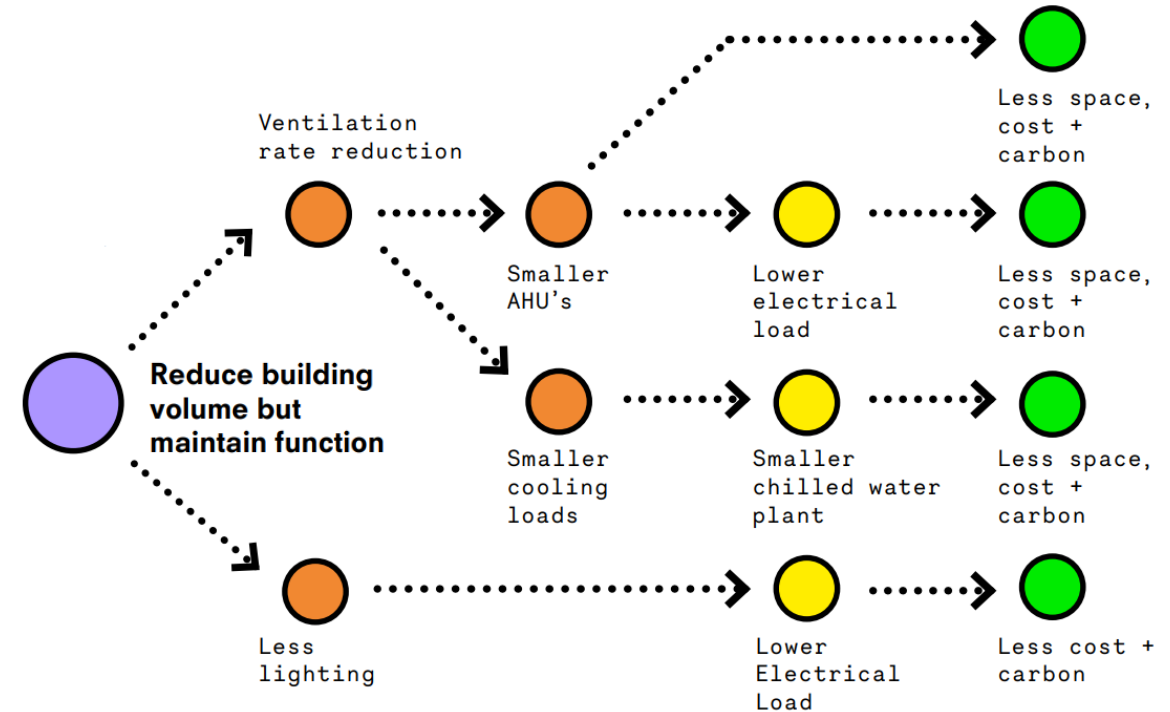
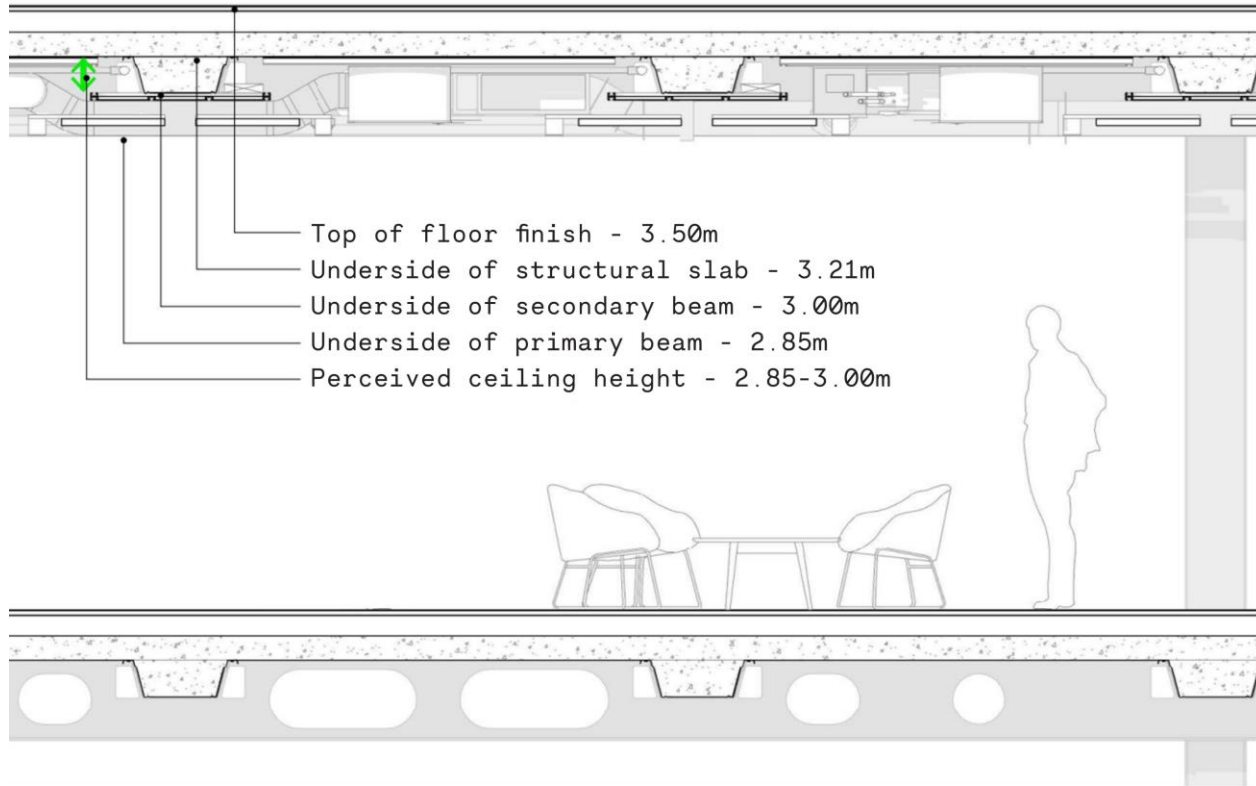
- Install times are shown in the graph on the right
- The dramatic reduction coincides with the introduction of the adapted forklifts in weeks 5 – 6
- **Install times were reduced by 66% - 90%**
- NG Bailey estimate the prefabricated nature of the MEP has resulted in a **reduction of 30,000 hours** of site labour



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Reduced floor to floor heights



- Floor to floor heights are 3.5m, compared to 4.0m for typical London office
- 10 storeys at 4m allows 11 storeys at 3.5m i.e. more floors fit in the same volume
- Volumetric efficiency lowers running costs + carbon

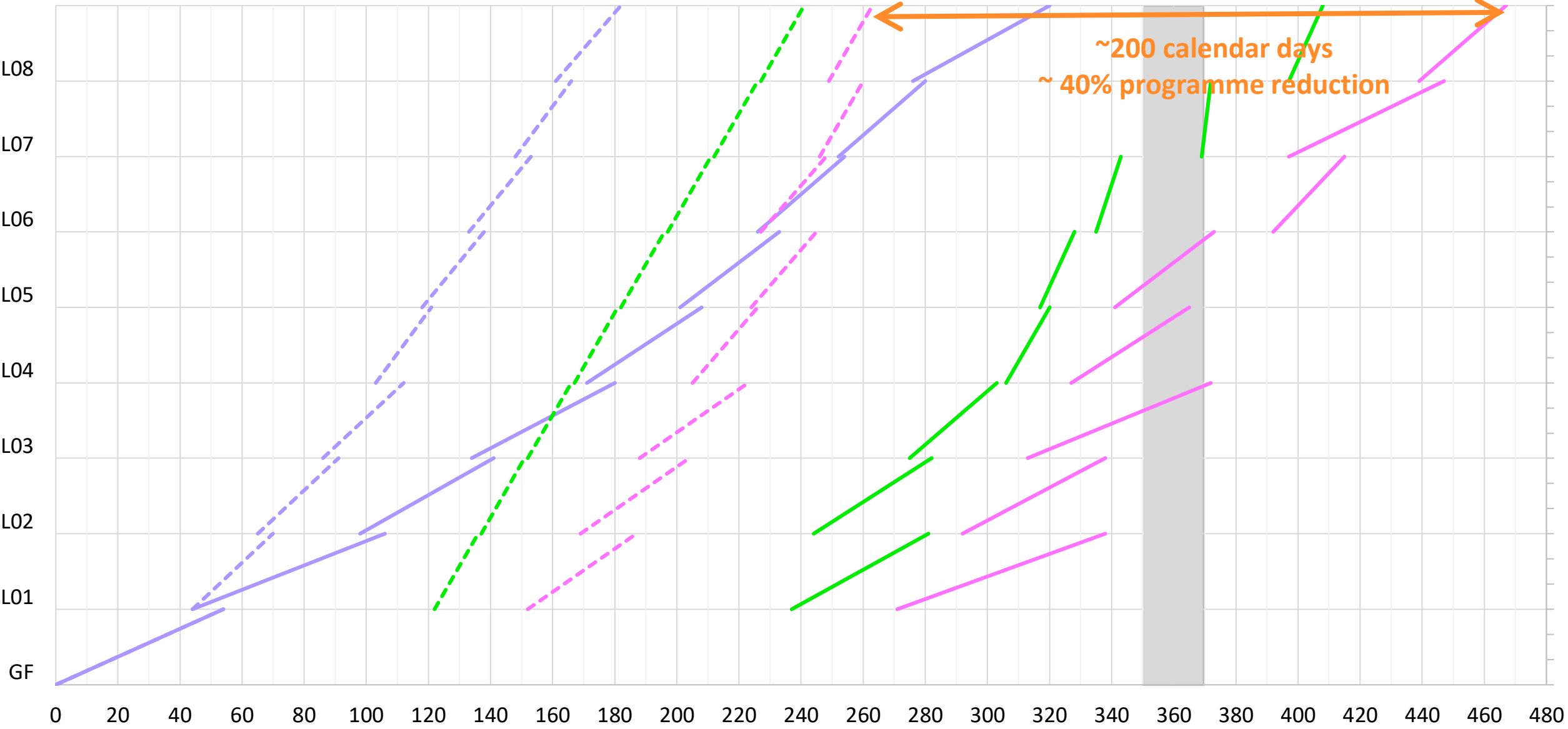


What

next?



Actual vs. 75% rates

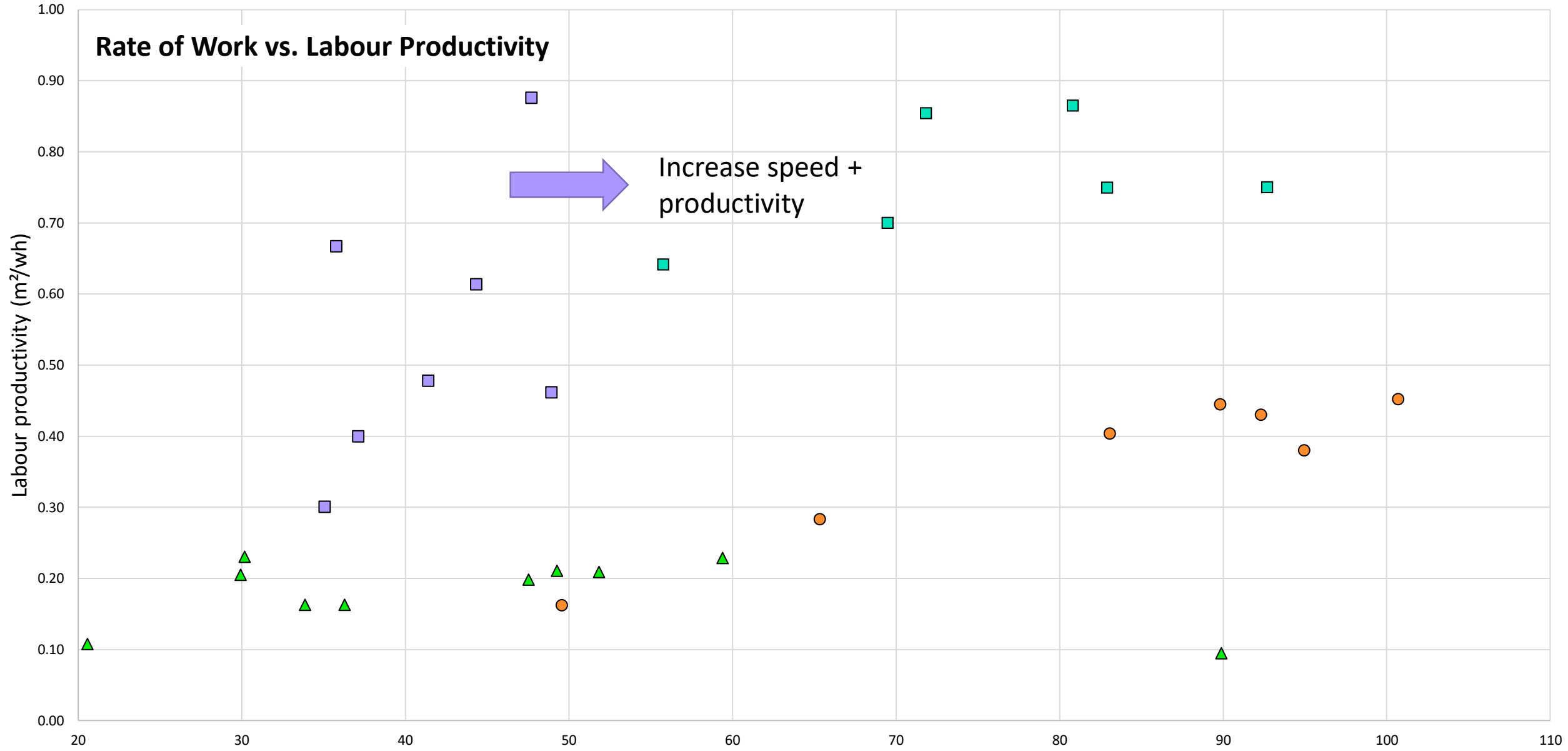



~200 calendar days
~ 40% programme reduction



- Actual Superstructure
- Optimised Superstructure
- Actual Cladding
- Optimised Cladding
- Actual CAT A Modules
- Optimised CAT A Modules

Rate of Work vs. Labour Productivity




 Traditional
  The Forge
  Precast
  The Forge optimised

Rate of Work (m²/day)

Thank you!



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