

THE FUTURE OF **STEEL** CONSTRUCTION

Refurb & Reuse Case Study: 30 Duke Street – London's Largest Steel Reuse Project



Nicholas Bull



Jonathan Davis



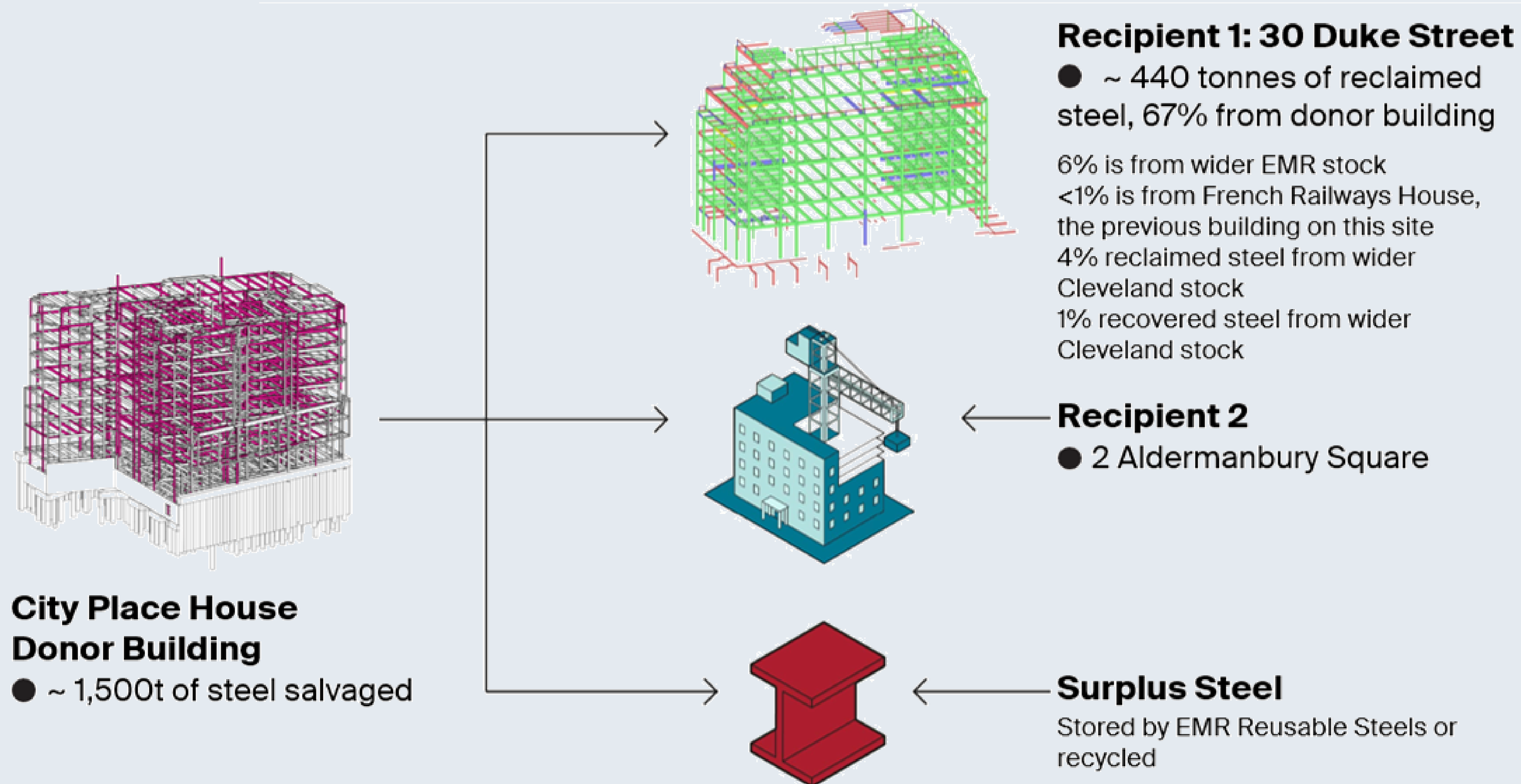
Roy Fishwick



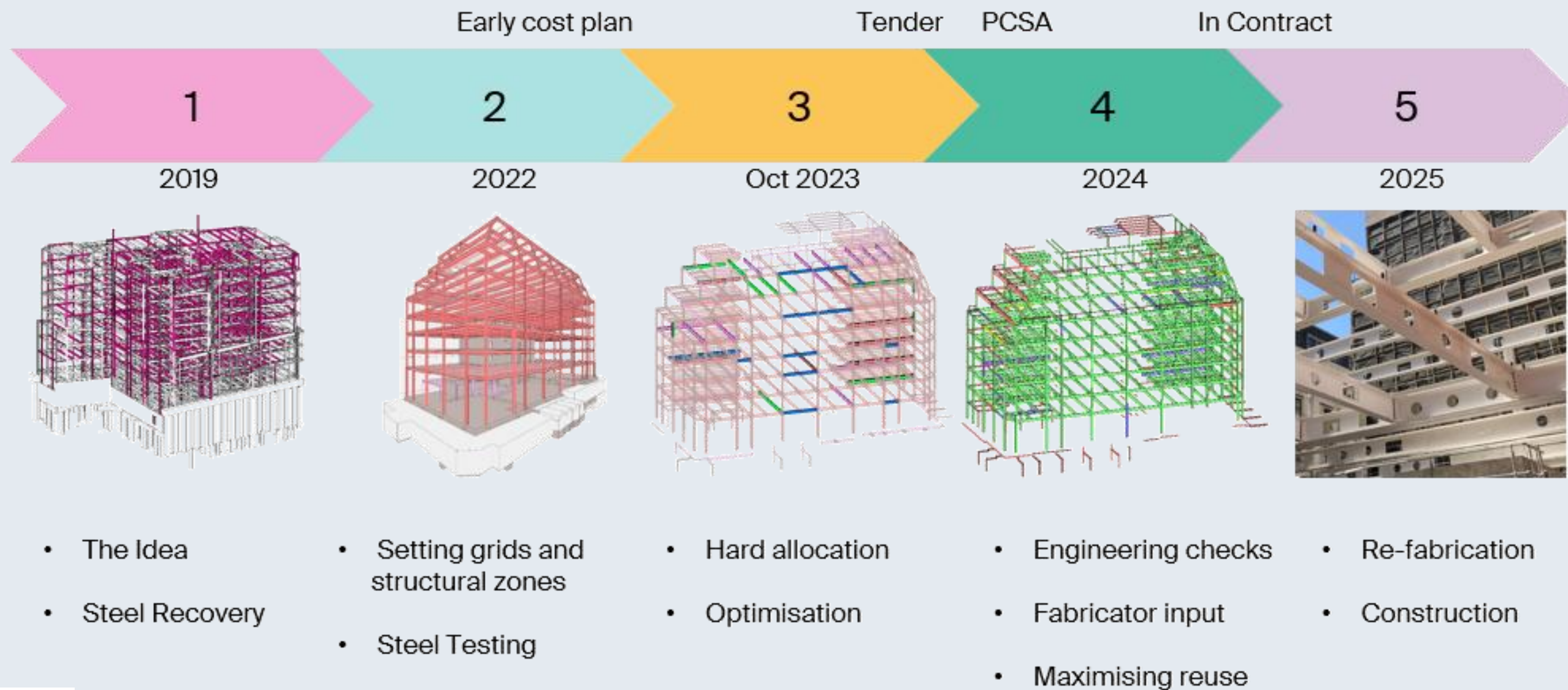
Gemima Walker



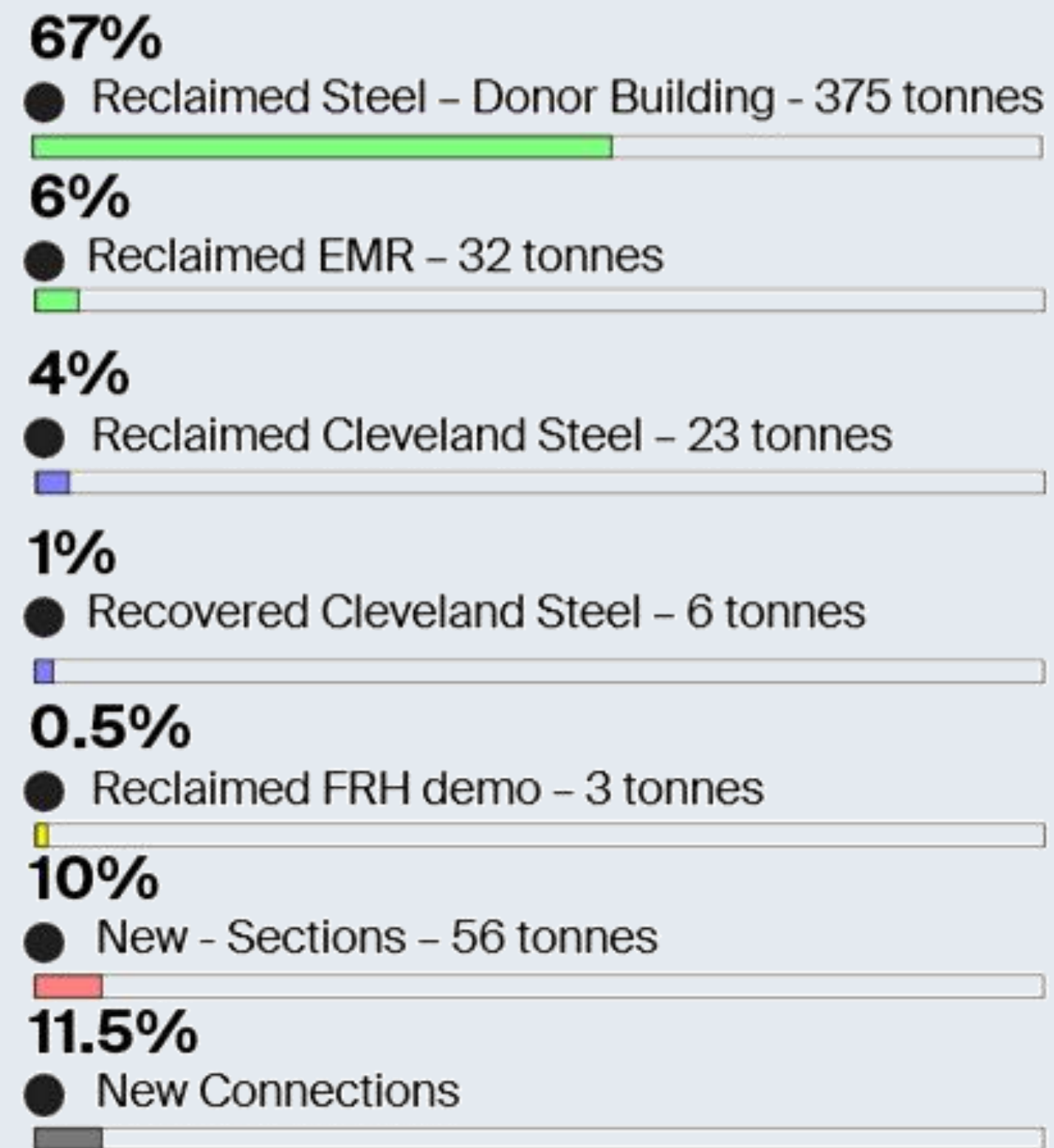
The Client's Vision



6 years in the making

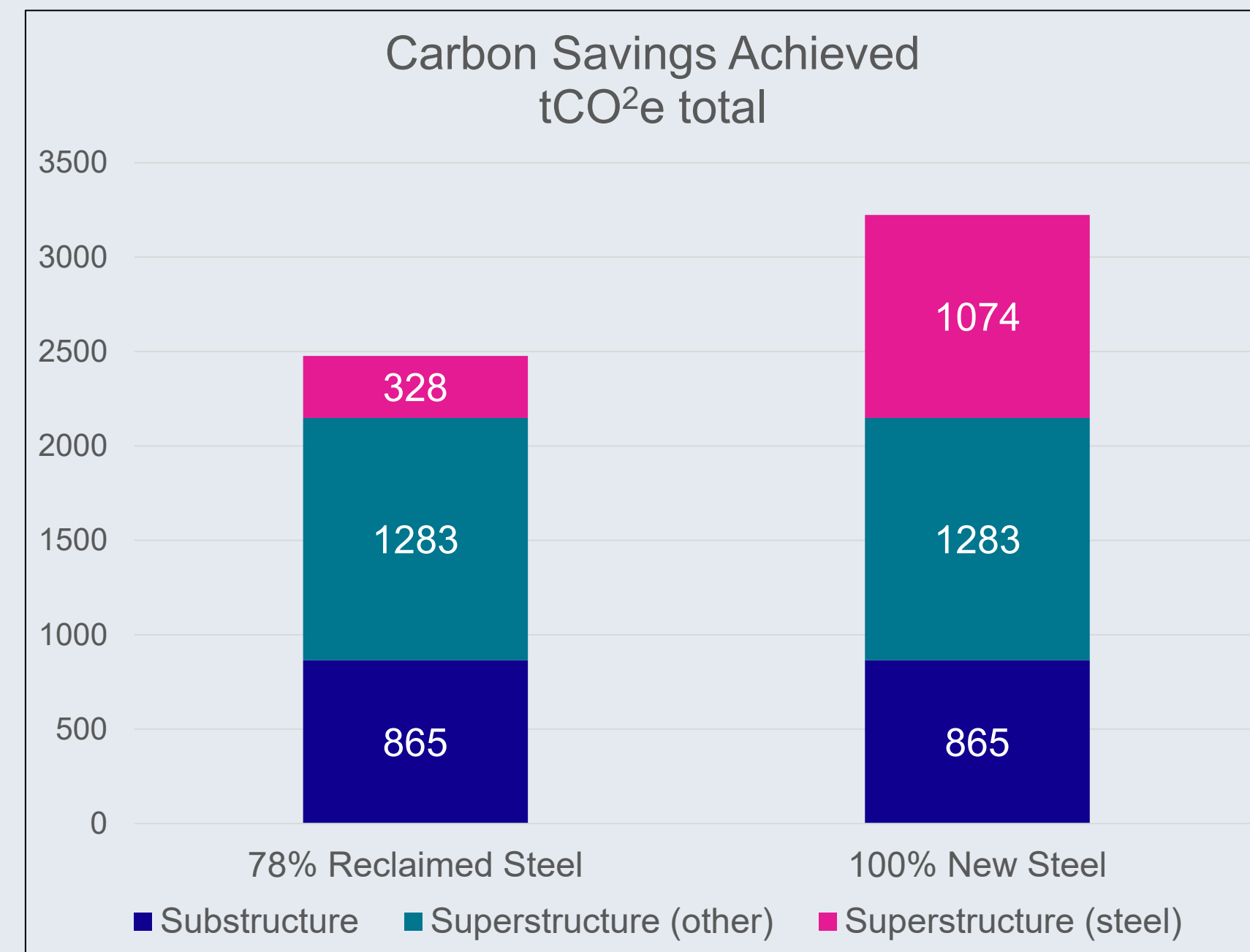
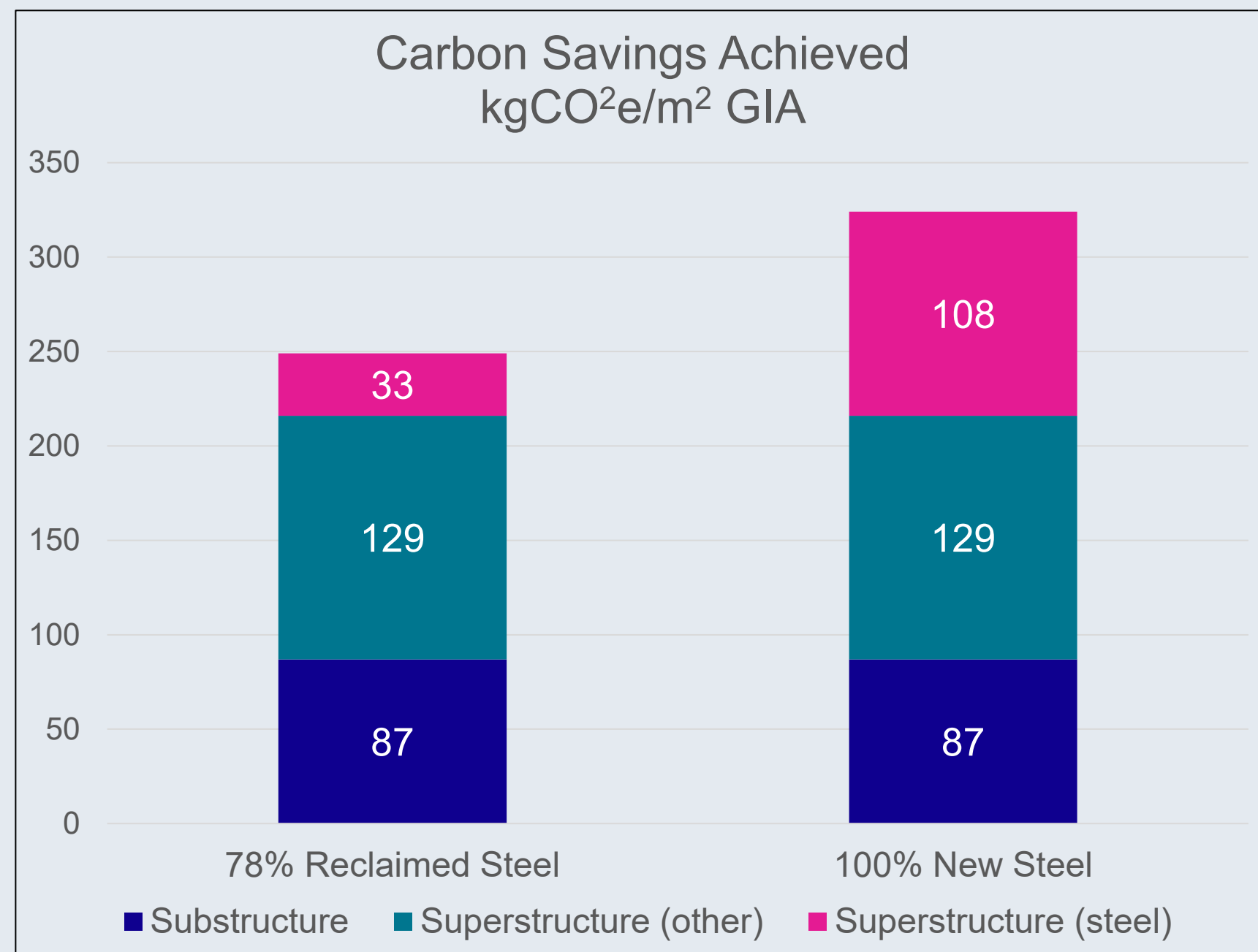


Maximising steel reuse



Carbon Savings Achieved

~70% embodied carbon saving on steel frame



*When using the UK industry average carbon factor of 1.74 for new steel generally and BOF carbon factor of 2.58 for connections and box sections

Deconstruction



Stock & Testing



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SCI P427 & P440
Steel in Reuse
Remain most informative guides

Stock & Testing



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Declaration of Performance

1. Project reference: Broadgate Towers
2. S 055182 / 21961
3. Size(s):
533 210 92
4. Intended use:
Structural steel
5. Manufacturer/supplier:
Name CST
Address Dalton Airfield, THIRSK

6. Declared Performance

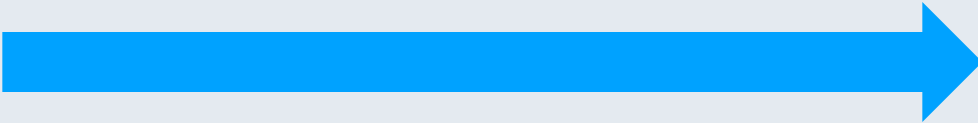
Reference/ Beam number /PO Batch	Essential Characteristics	Performance	Acceptance Criteria/ Certificate number
RU21014 / CSB04996 / 502235	Grade	S275JO	25-06378
RU21025 / CSB04955 / 502235	Yield		349
RU21038 / CSB04960 / 502235	Tensile		481
	Mean Hardness	NA	P427
	CEV		.32
	Geometric tolerances		EN10025-2

7. The performance of the product identified above is in conformity with the declared performance identified in the table and has been determined in accordance with P427 (SCI).
This declaration of performance is issued under the sole responsibility of the manufacturer as identified above.
- Signed for and on behalf of the manufacturer by:
Place and date of issue:
Signature:

CEN/TS 1090-201:2024

Execution of steel structures and aluminium structures - Reuse of structural steel

Complementary provisions to BS EN 1090-2



6. Declared Performance

Reference/ Beam number /PO Batch	Essential Characteristics	Performance	Acceptance Criteria/ Certificate number
RU21014 / CSB04996 / 502235	Grade	S275JO	25-06378
RU21025 / CSB04955 / 502235	Yield		349
RU21038 / CSB04960 / 502235	Tensile		481
	Mean Hardness	NA	P427
	CEV		.32
	Geometric tolerances		EN10025-2



CE Marking / Declaration of Performance

Form No WHL-UK-FM-186



Product ID: (Example - DoP 72300-328)

Execution Class: EXC3 as per EN 1090-2: 2018 + A1: 2024

Last two digits of the year in which the marking is affixed: 24

Intended use: Virgin and Re-Used Structural carbon-steel construction components intended for use in steel structures where the components can be made from;
Hot Rolled Flat Products: EN 10025 - Up to S460 (All delivery conditions)
Channels, Angle, Bars & Rods: EN 10025 - Up to S460 (All delivery conditions)
Hot Rolled Hollow Sections: EN 10210 - Up to S460 (All delivery conditions)
Cold Rolled Hollow Sections: EN 10219 - Up to S460 (All delivery conditions)
All steel materials in accordance with EN 1090-2.

Manufacturer: William Hare Group Limited
Address: Brandlesholme House, Brandlesholme Road, Bury, BL8 1JJ

Systems of AVCP: 2+

Harmonised Standard: EN1090-1:2009+A1:2011

Notified Body: LRQA Nederland B.V, George Hintzenweg 77, 3068 AX Rotterdam, The Netherlands.

EC factory production control certificate No: 0343-CPR-LRQ00004843

Manufacturing: Fabricated in accordance with Execution Class EXC3

Structural Characteristics: Design (Method 3B): Designed using Eurocodes EN1993, Design Calculations Ref (C0064)

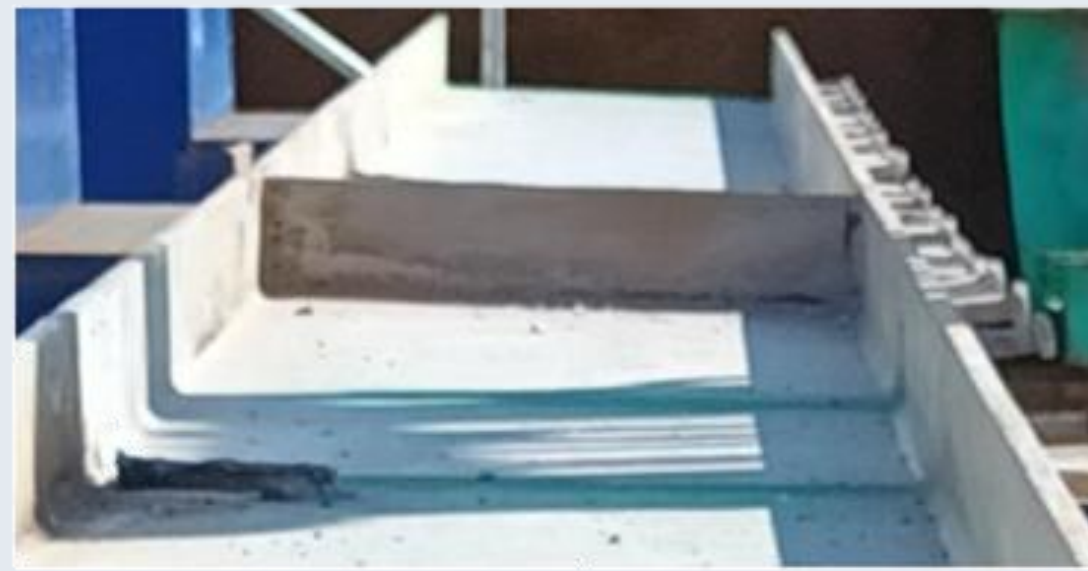
Declared Performances:

Essential Characteristics	Performance	Harmonised Technical Specification
Manufactured Tolerances	BS EN 1090-2 Tolerance class 2	EN 1090-1:2009 + A1:2011
Weldability	EN 10025 - S235, S275, S355, S460 EN 10210 - S235, S275, S355, S460 EN 10219 - S235, S275, S355, S460 EN 10025 / EN 10210-1 / EN10219-1	
Fracture Toughness/Impact resistance	JR (H) = 27J @ 20°C JO (H) = 27J @ 0°C J2 (H) = 27J @ -20°C K2 (H) = 40J @ -20°C NH, NLH, MH, MLH = 40J @ -20°C	
Load Bearing Capacity	NPD	
Fatigue Strength	NPD	
Resistance to Fire	NPD	
Reaction to Fire	Material Classified: Class A1	
Release of Cadmium	NPD	
Emission of Radioactivity	NPD	
Durability	Un-Coated Prepared & painted according to EN ISO 12944 Galvanised according to EN ISO 1461	

The performance of the product identified on page one is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Construction Products Regulation EU No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:
Name: Philip Nicholson (Position: Head of Quality)
Date: 18/03/2024

Fabrication



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Fabrication



Figure 2 - EMR Passport photo

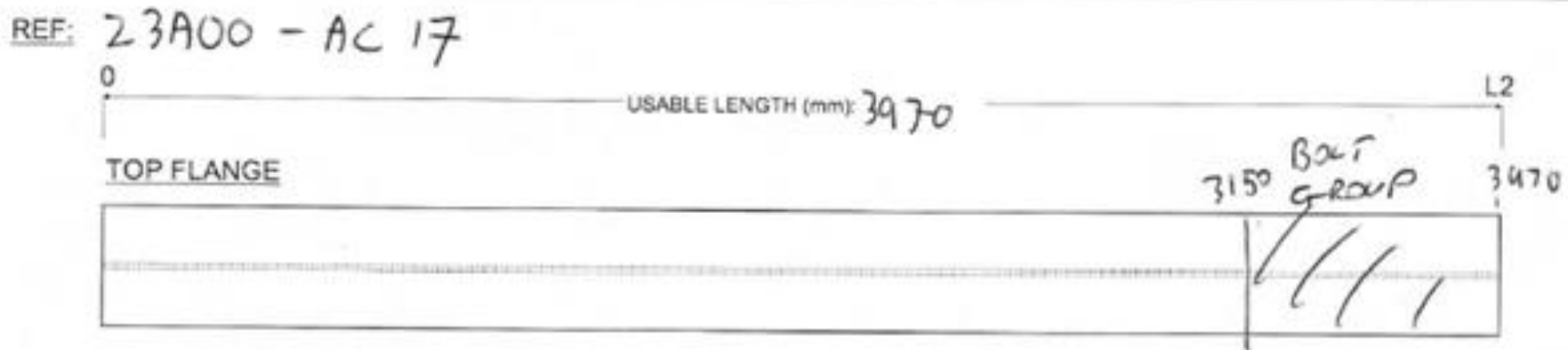


Figure 3 - EMR sample survey

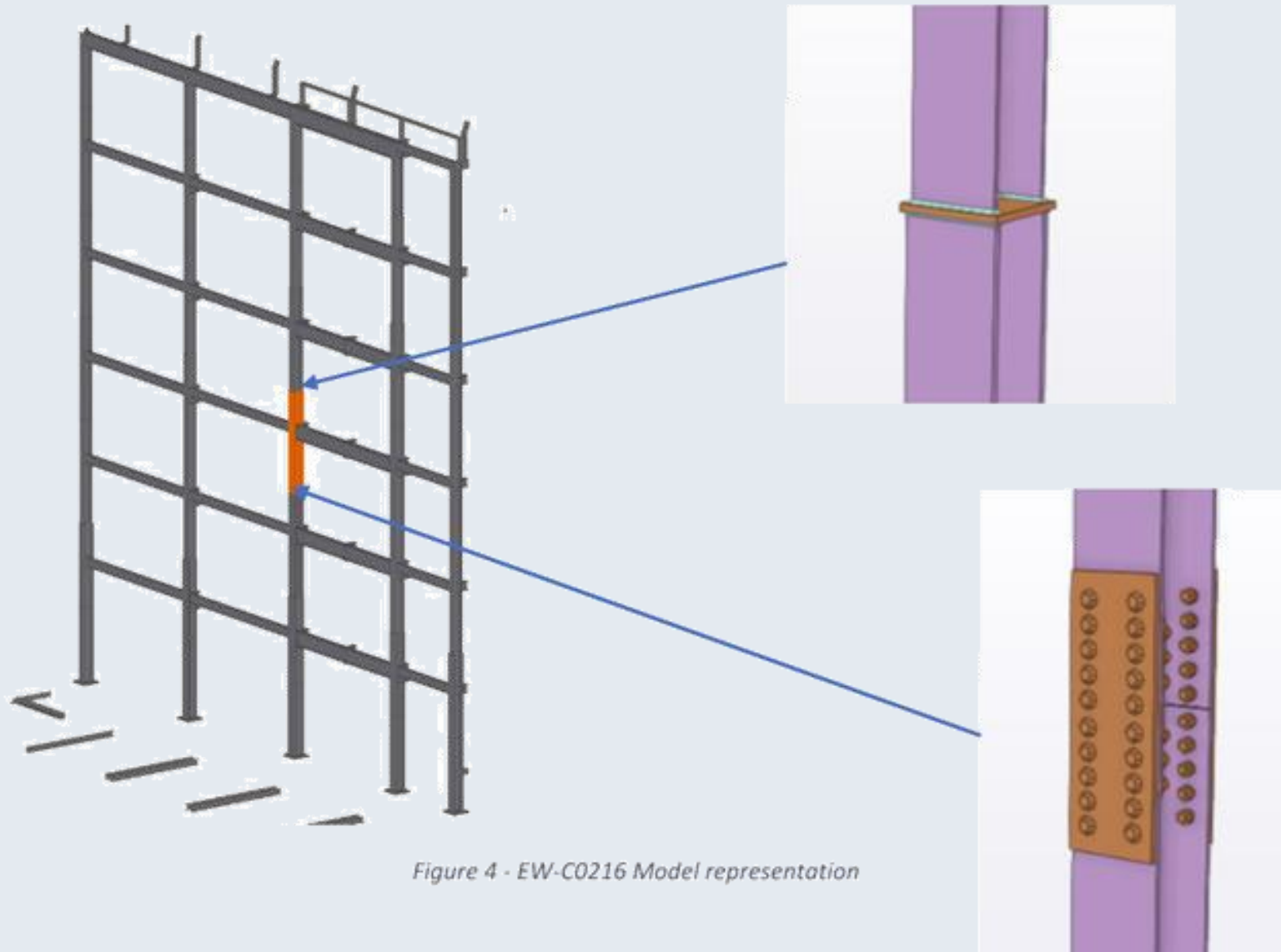
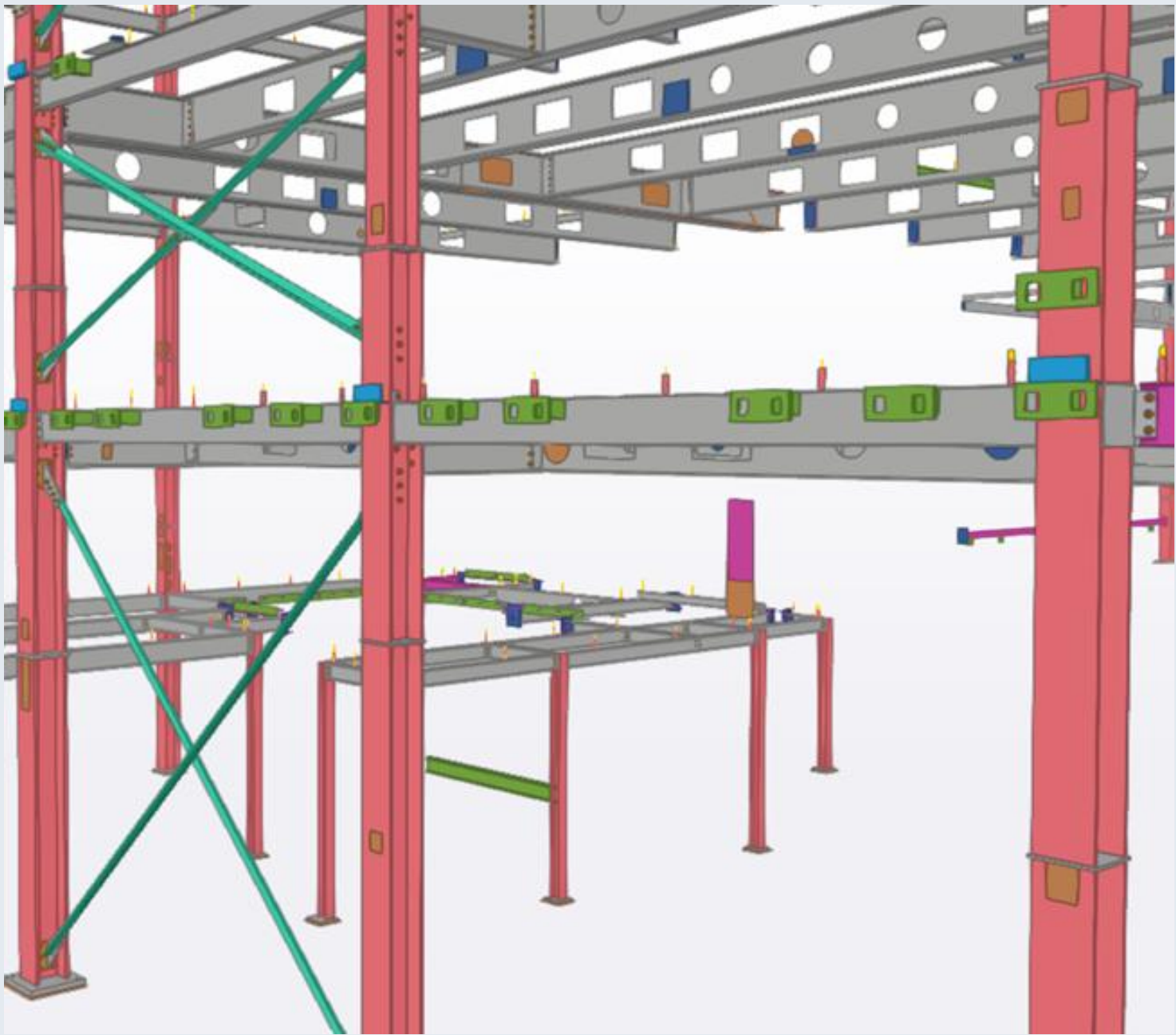


Figure 4 - EW-C0216 Model representation



Reconstruction



Reconstruction



Lessons and the Future



- Re-use at scale is possible
- Client buy-in is key
- Collaboration and flexibility



- Early contractor input
- De-fabrication
- Digital surveys?



- More automation
- Greater supply needed
- Stockholder approach to make more mainstream?

The Team

GPE.

make

**Elliott
Wood**

 **mace**

Turner &
Townsend
alinea

 **keltbray**

John F Hunt

M3
CONSULTING

 **emr**

CST
CLEVELAND STEEL & TUBES LTD

HARE

HOARE LEA 

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HOARE & H.

Image: Boundary