



PCE Ltd
— Est.1973 —

SYSTEMISED BUILD SOLUTIONS HYBRID

AND
SPECIALISTS FOR
STRUCTURES AND
FAÇADES



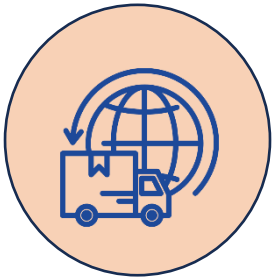
SYSTEMISED BUILD SOLUTIONS SPECIALIST



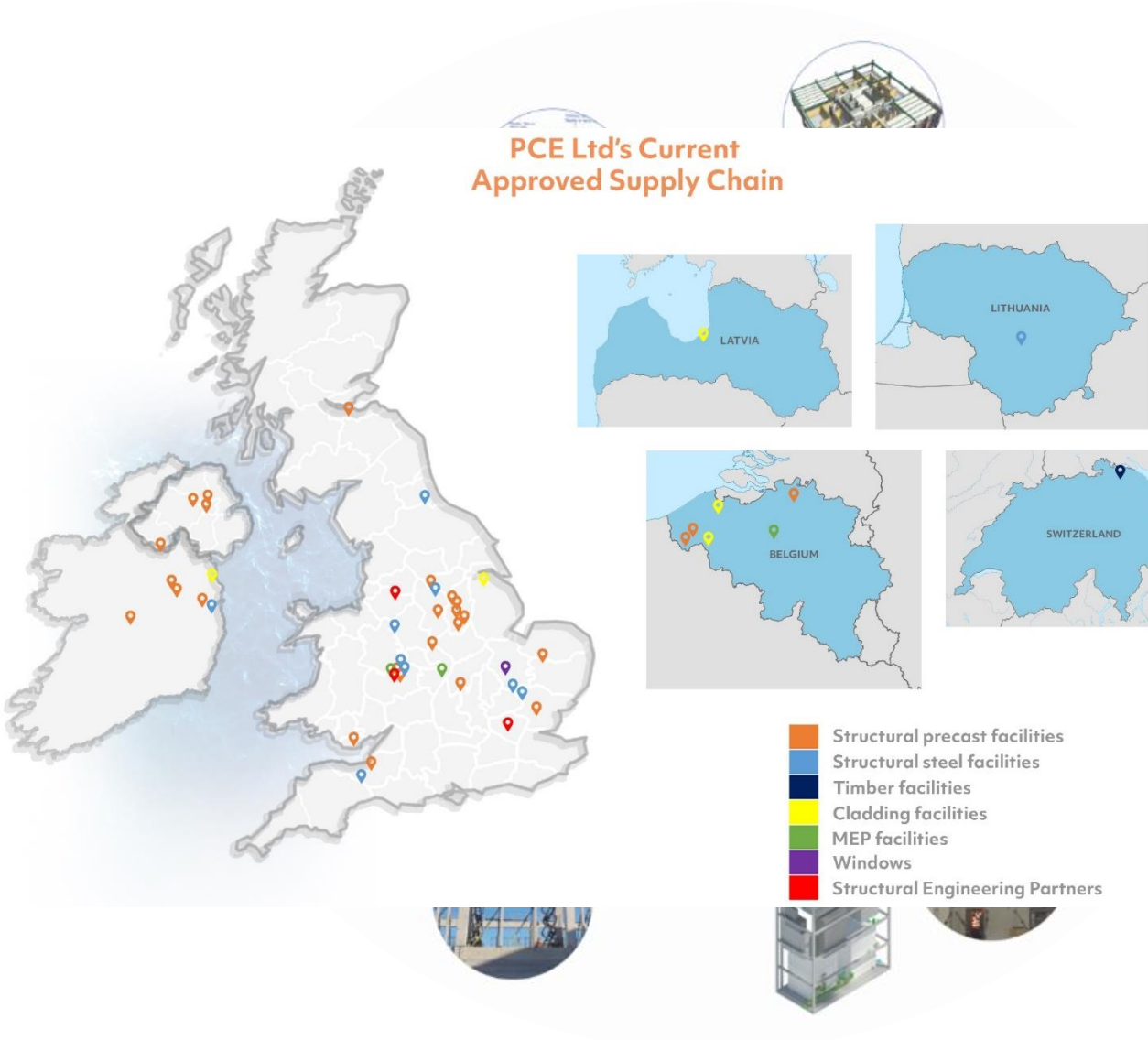
INNOVATIVE BUILD
SYSTEMS



PREENGINEERED
PREDICTABLE
PRECISE



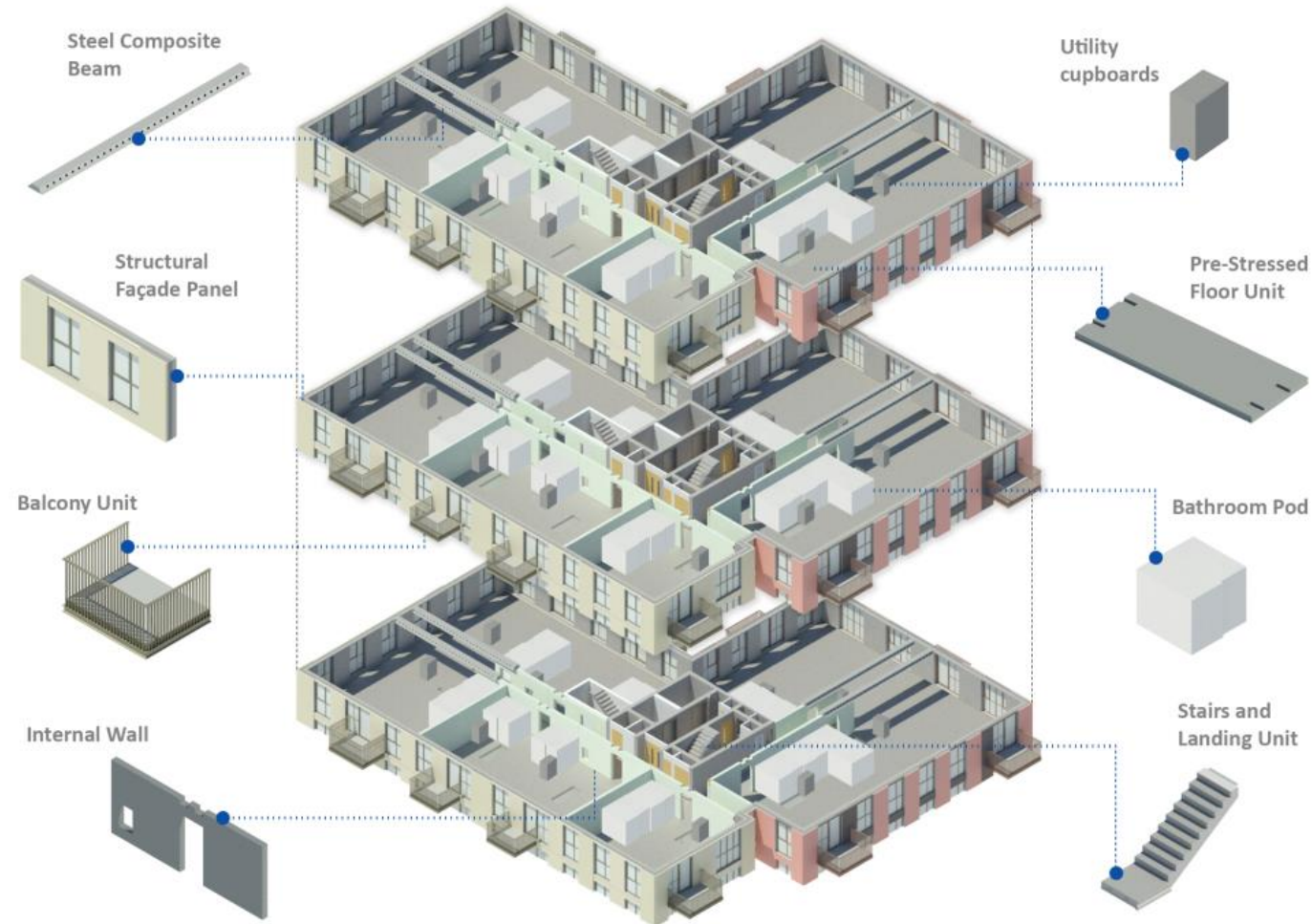
SUPPLY CHAIN
FLEXIBILITY





SYSTEMISED BUILD SOLUTIONS

-  **PREDETERMINED** EFFICIENCIES & PROVEN OPTIMISATION
-  **INHERENT REPEATABILITY**
-  **COST** PREDICTABILITY
-  **OFFSITE PREPARATION RELIEVES SITE PRESSURE AND RISK**
-  **IMPROVED QUALITY** CONTROL
-  **IMPROVED SAFETY** CONTROL
-  **SYSTEMS COORDINATION & INTEGRATION**
-  **EMBODIED CARBON & SUSTAINABLE SOLUTIONS**
-  **PERFORMANCE COMPLIANCE**

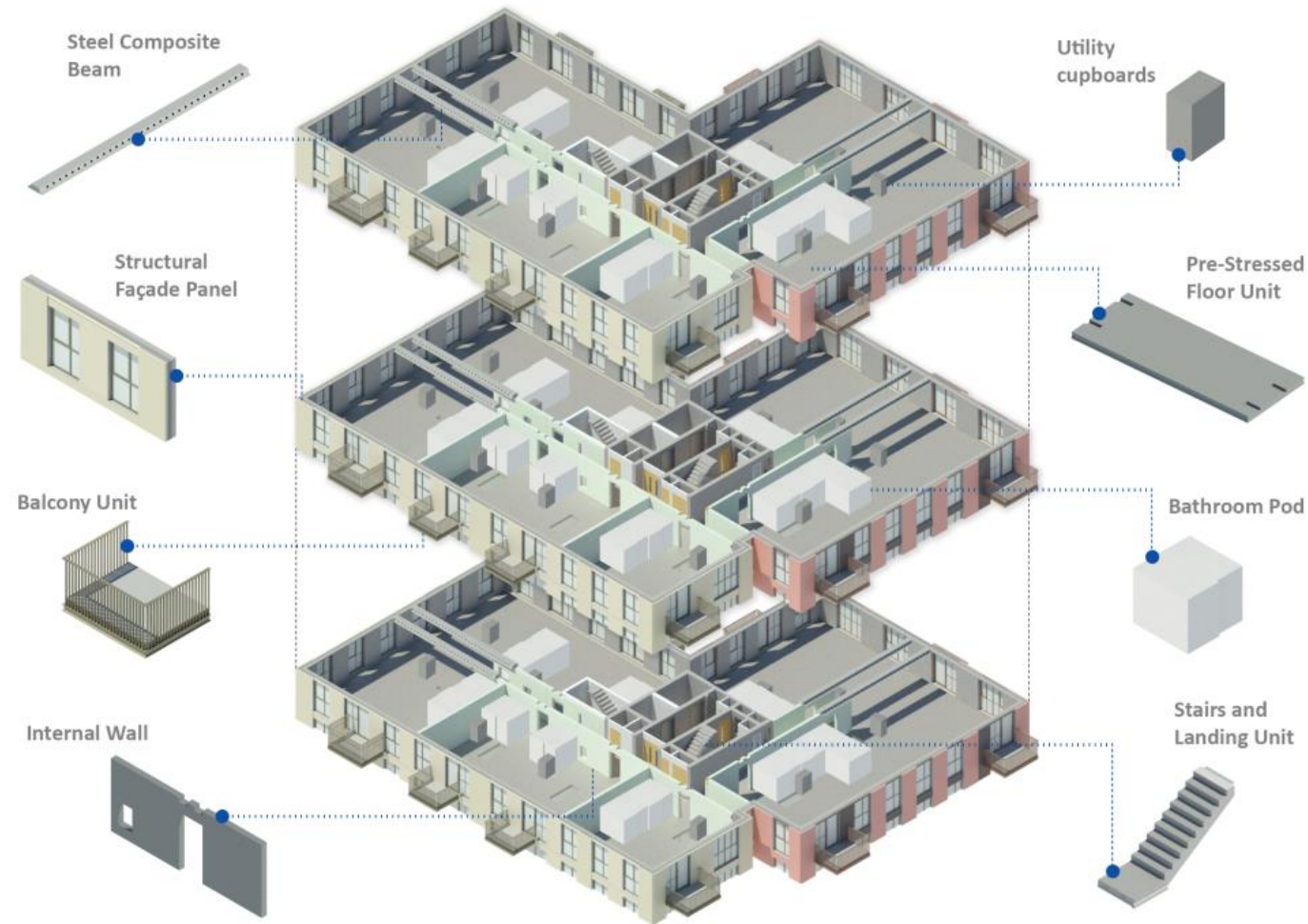




SYSTEMISED BUILD

PCE Approach

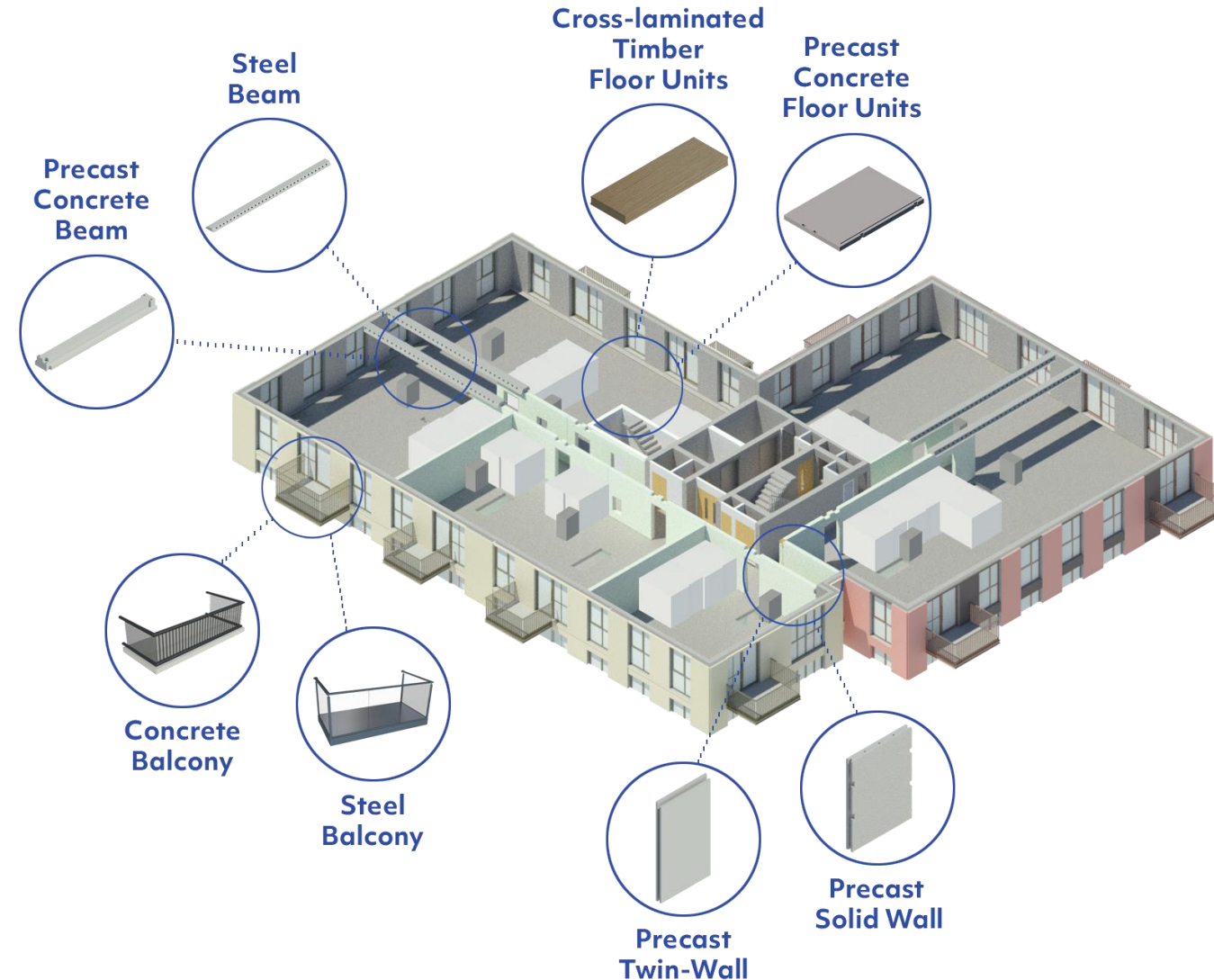
-  SUPPLY CHAIN RESILIENCE
-  MATERIAL FLEXIBILITY
-  PREDETERMINED OPTIMISATION
-  PREDICTABLE SOLUTION
-  COLLABORATIVE INNOVATION
-  INTEGRATED SYSTEMS AND DIGITAL DELIVERY
-  UNLOCKS 'ADDED VALUE'
-  ALIGNS WITH RIBA DFMA OVERLAY





WHY HYBRIDfMA

-  **HYBRIDfMA** & STRUCTURAL OPTIMISATION
-  MATERIAL **FLEXIBILITY**
-  COMMON **CONNECTION** PRINCIPLES
-  EMBODIED CARBON & **SUSTAINABLE** SOLUTIONS
-  GREATER **SUPPLY CHAIN** FLEXIBILITY





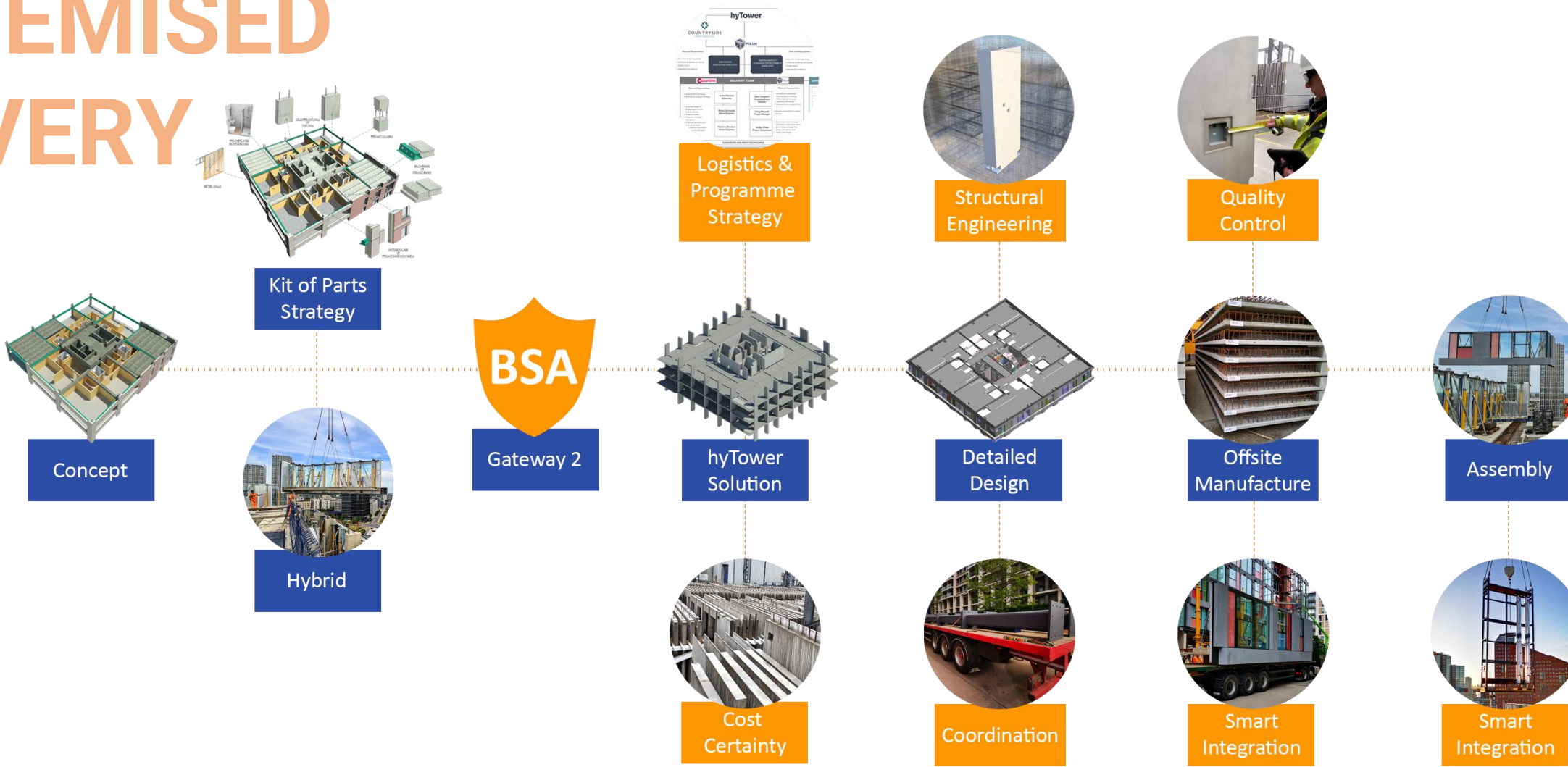
WHY hyTower®

- ❏ OFFSITE **INTEGRATION** – SUB ASSEMBLIES & FAÇADE
- ❏ **WEATHERPROOFED** ASSEMBLY
- ❏ **CONCURRENT** CONSTRUCTION – FASTER FIT OUT & FOLLOW-ON ACCESS
- ❏ NO USE OF **SCAFFOLDING**
- ❏ NO USE OF **BACK-PROPPING**
- ❏ UP TO:
 - ❏ 50% **FASTER**
 - ❏ 80% LESS **DELIVERIES**
 - ❏ 80% LESS REQUIRED **OPERATIVES**
 - ❏ 90% LESS **WASTE**





hyTower® SYSTEMISED DELIVERY





CASE STUDY

FULTON & FIFTH





FULTON & FIFTH PROGRAMME

-  **HYBRIDfMA** hyTower® SYSTEM
-  **10,000+** STRUCTURAL COMPONENTS
-  **5** HIGH-RISE TOWER BLOCKS
-  **15-28** STOREYS
-  **850+** APARTMENTS
-  **65** SITE OPERATIVES
-  **272** WEEKS
-  **INTEGRATED** SUB-ASSEMBLIES

THE HYTOWER® SOLUTION STARTS WITH A **HYBRID TRANSFER STRUCTURE** AT THE GROUND FLOOR WITH A **PRECAST CONCRETE** RESIDENTIAL STRUCTURE FROM LEVEL 1

FAÇADE COMBINES BRICK AND RECONSTRUCTED STONE FINISHES, WITH **INTEGRATED** WINDOWS AND BALCONIES



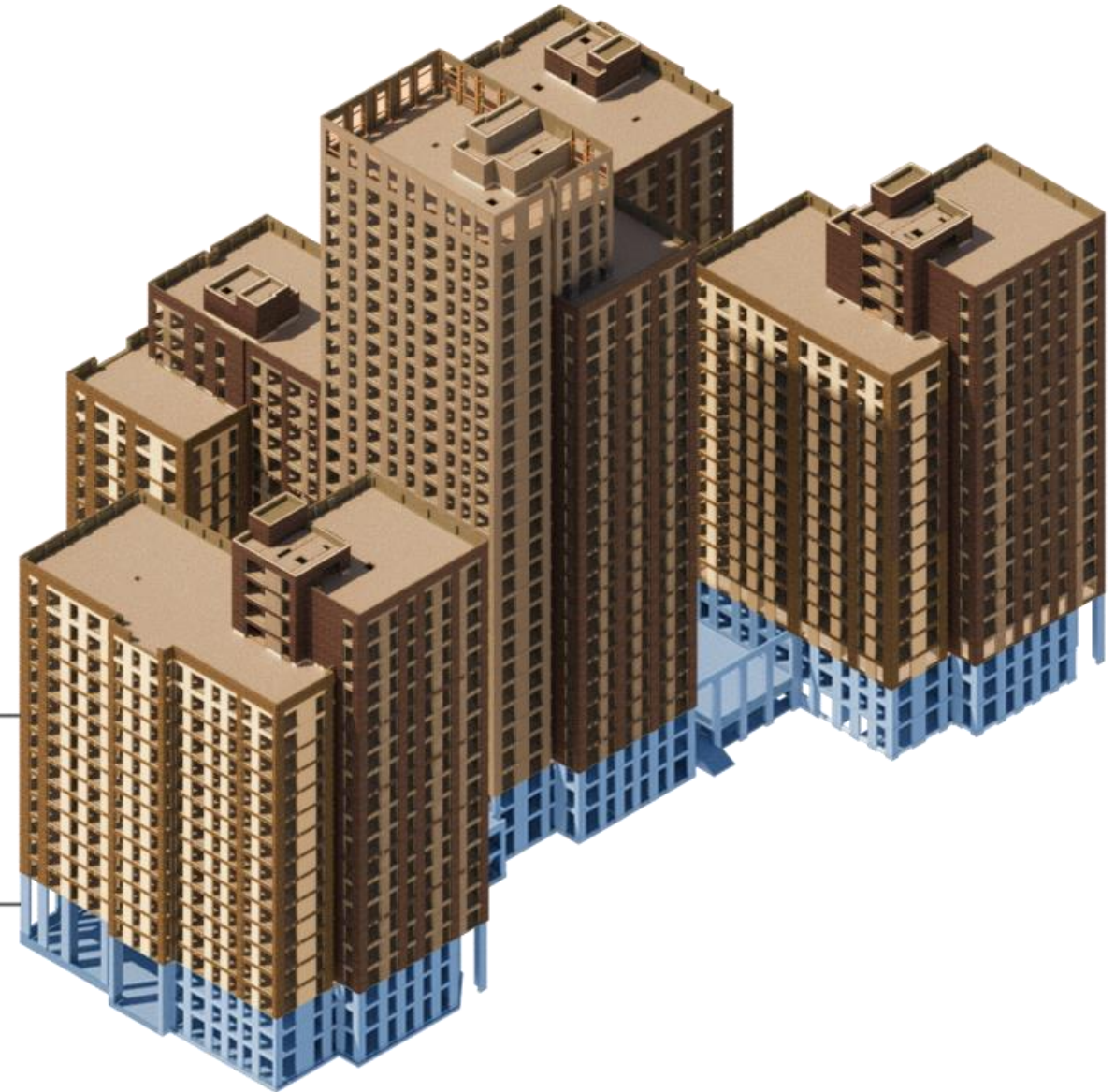


FULTON & FIFTH PODIUM

FULTON & FIFTH'S
STRUCTURAL
SOLUTION SEES **TWO
DIFFERENT PCE
SYSTEMS** COMBINED
WITHIN ONE
STRUCTURE –
HYTOWER® AND
hybridFRAME

hyTower®
System

Frame
System



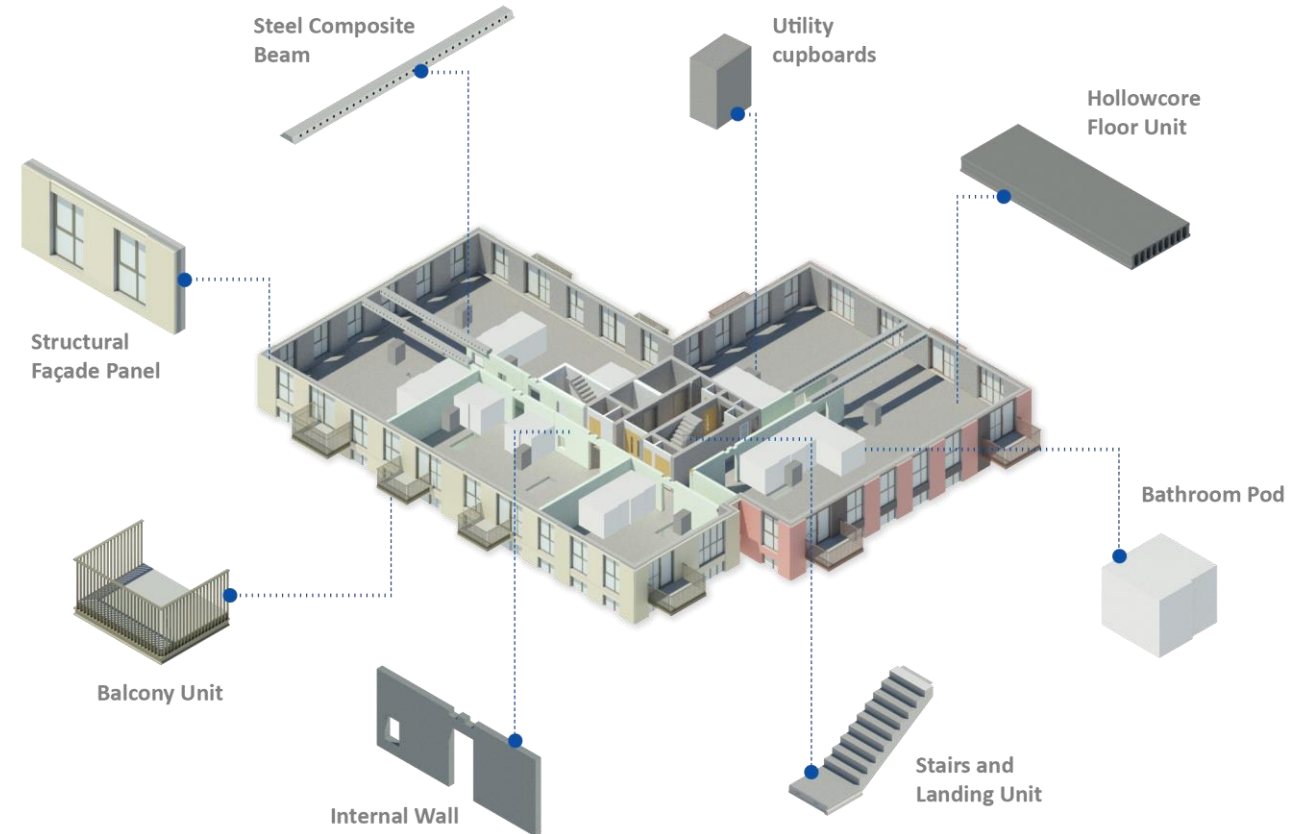


FULTON & FIFTH LAYOUT

THE PROJECT BENEFITS FROM
HYTOWER'S® **REPETITIVE PHILOSOPHY**,
WHICH ENABLES CONSISTENCY,
PREDICTABILITY, AND EFFICIENCY.



LEVEL REPETITION



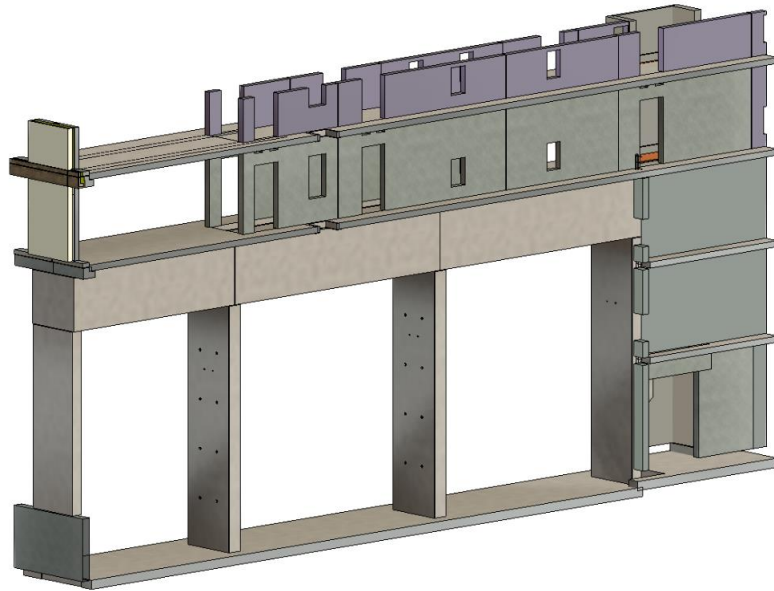
BLOCKS A & E LEVELS 3-17 AND 18-20

BLOCK C LEVELS 3-23 AND 24-28

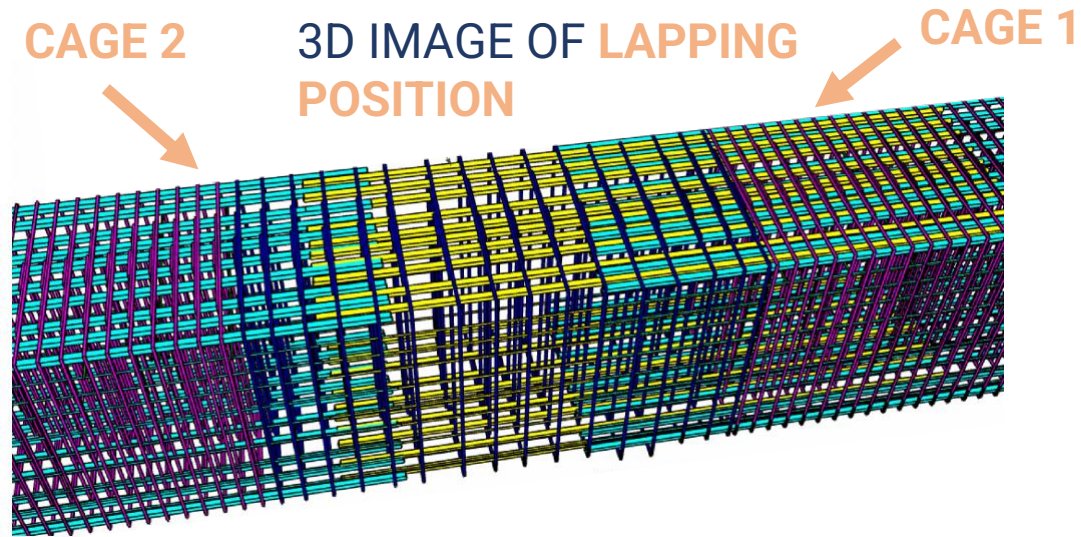
BLOCK D LEVELS 3-14 AND 15-17

BLOCK B LEVELS 3-16 AND 17-19

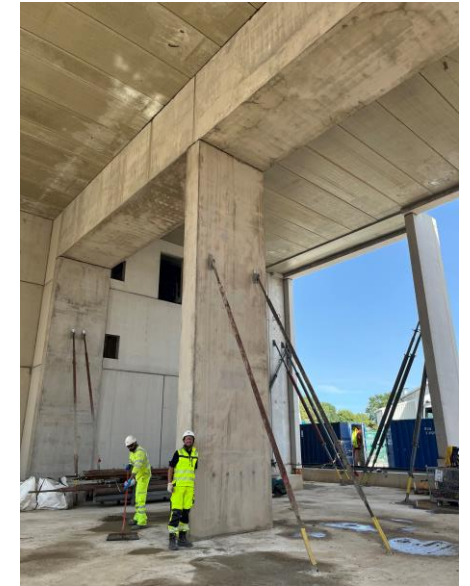
FULTON & FIFTH ENGINEERING



LARGE TRANSFER ELEMENT REQUIRED
TO CARRY 15 STOREYS



REINFORCEMENT SPLICE POSITIONS ALLOW ACCESS TO LAP BOTTOM AND TOP REBAR LAYERS

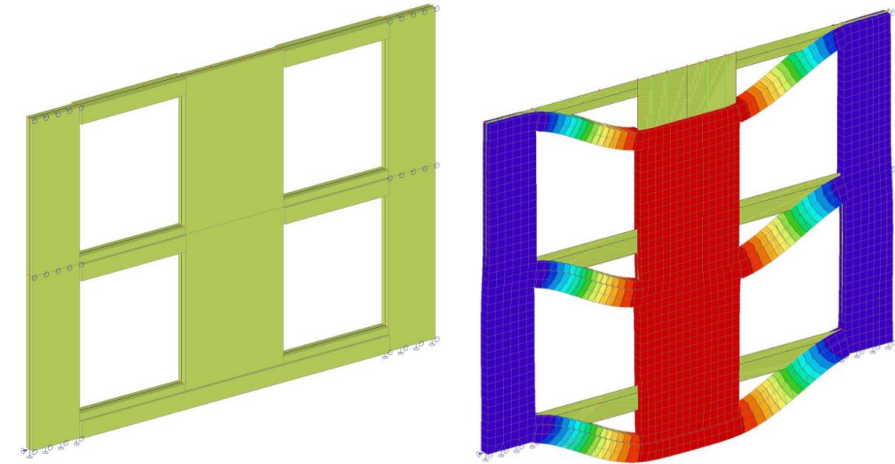




FULTON & FIFTH ENGINEERING



LOAD BEARING SANDWICH PANELS USED TO CREATE FAÇADE. PIERS BETWEEN WINDOWS DO NOT COME TO GROUND IN ALL INSTANCES. TRANSFER ELEMENT REQUIRED



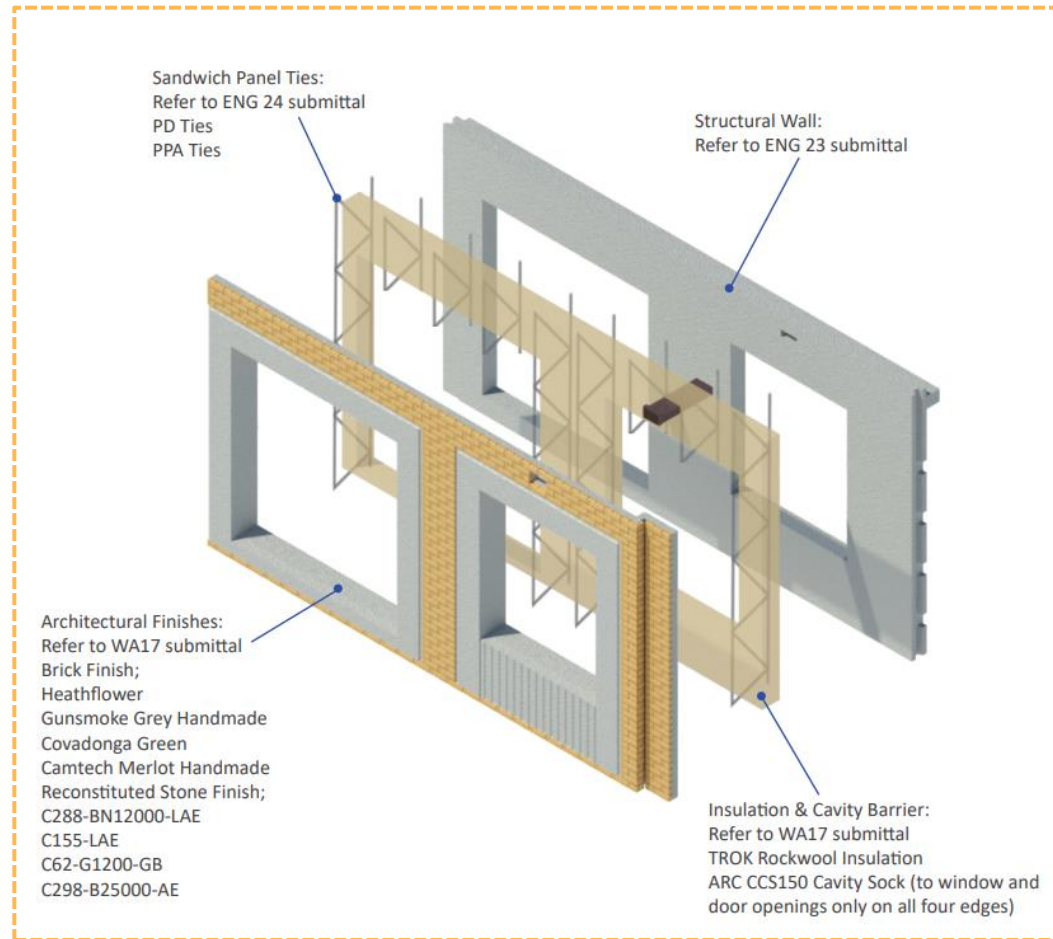
INNER LEAF OF SANDWICH PANEL WAS DESIGNED TO ACT AS A **PUNCHED PANEL** OR **VIERENDEEL TRUSS** ELEMENT

EACH LEVEL IS DESIGNED TO CARRY ITS OWN LOAD RATHER THAN CARRY ALL LOAD TO LOW LEVEL AND PROVIDE LARGE TRANSFER ELEMENT

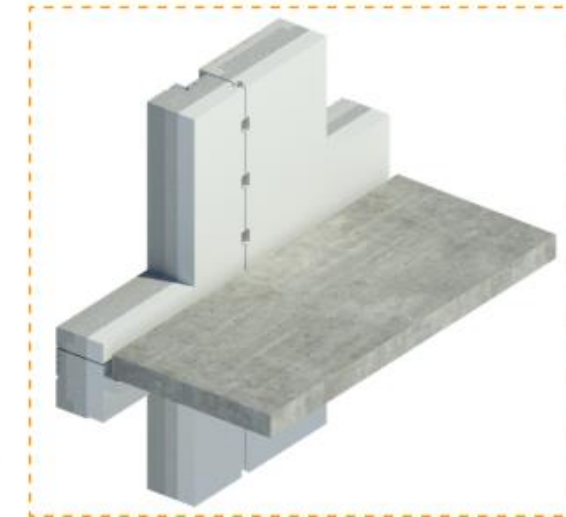
TYING REINFORCEMENT USED TO FURTHER ENHANCE TRUSS ACTION AND DRIVE FURTHER EFFICIENCY. MINIMAL DEFLECTION EXPERIENCED ON SITE

BALCONY CONNECTIONS CAST INTO PANELS ALSO

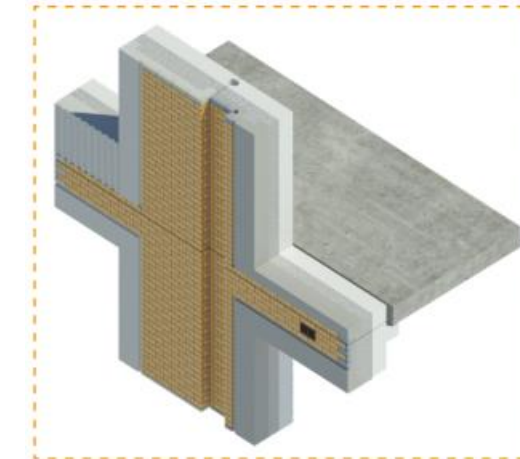
FULTON & FIFTH INTERGRATED FAÇADE



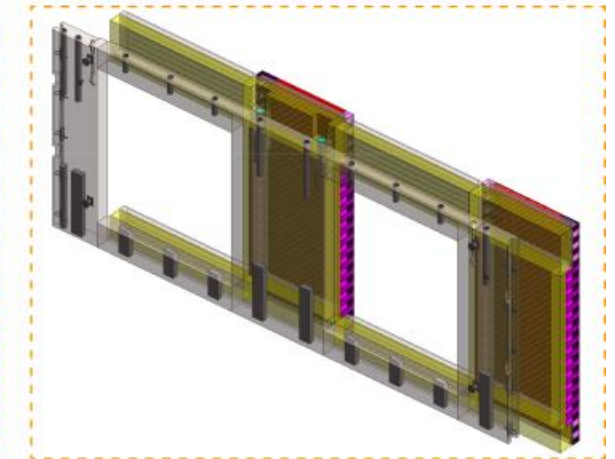
Fulton & Fifth integrated façade.



Façade and floor unit edge interface.



External Joint Considerations.



Façade panel 3D orthographic drawing.



FULTON & FIFTH INTERGRATED FAÇADE

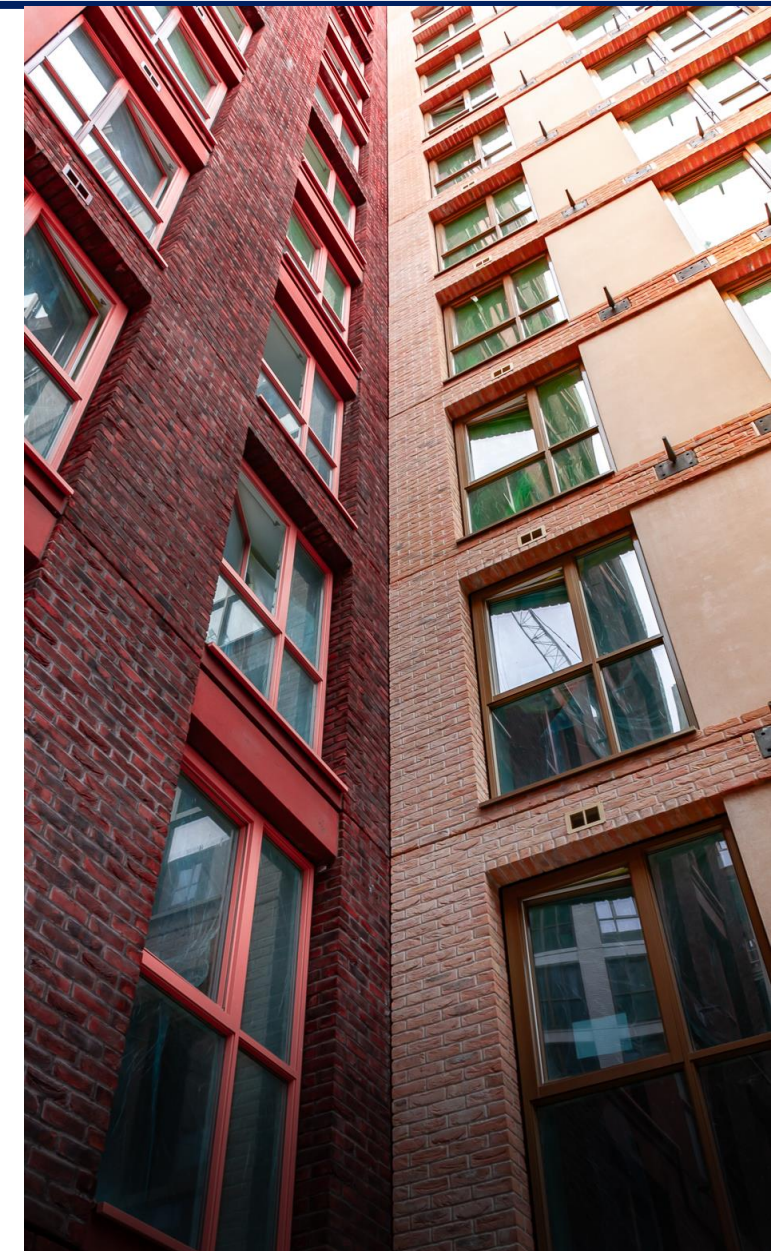
BALCONY
CONNECTIONS

MVHR DUCTS

ENCAST
LIFTER



WINDOWS
PREINSTALLED
OFFSITE





FULTON & FIFTH SUPPLY CHAIN

- 12 OFFSITE FACTORY LOCATIONS
- 5 LOADS DAILY PER CRANE TOTALLING 500t
- ACCREDITED AND AUDITED SUPPLY CHAIN





FULTON & FIFTH OFFSITE

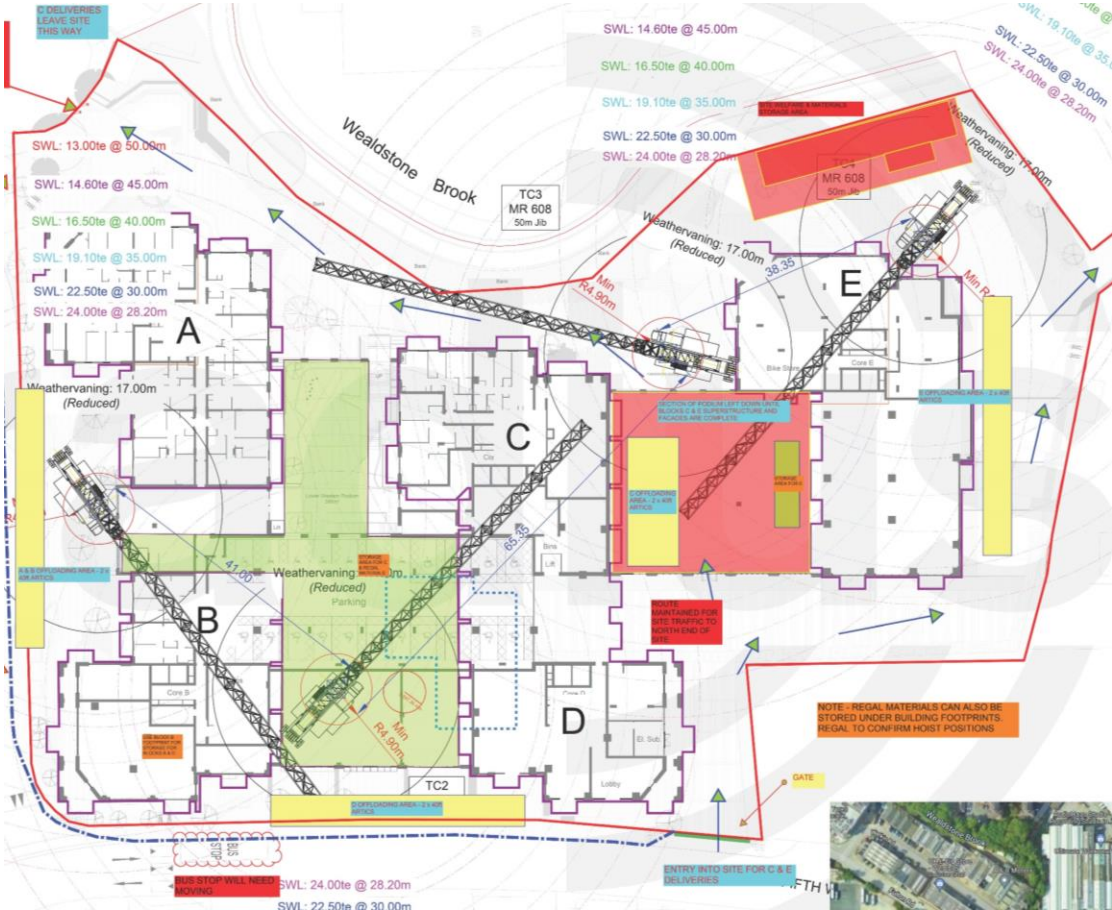
- 📦 HIGHEST STANDARDS OF OFFSITE **QUALITY CONTROL**
- 📦 MANUFACTURING **AUTOMATION** AND **ROBOTICS**
- 📦 BESPOKE **MOULDS** FOR CONSISTENT QUALITY AND PRECISION
- 📦 DIGITALLY INTERGRATED REAL-TIME **TRACKING**
- 📦 SIGNIFICANT REDUCTION IN **WASTE** AND **RISK**





FULTON & FIFTH LOGISTICS

- CENTRAL LONDON LOCATION
- HIGH VOLUME OF COMMUTERS, RESIDENTS, AND TRAFFIC
- DIGITALLY TRACKED IN REAL TIME
- AUTOMATIC DIGITAL TWIN AND INTEGRATED SYSTEM UPDATES
- COORDINATED CASTING, BUILD, LOAD, AND DELIVERY SEQUENCING
- JUST IN TIME DELIVERY





FULTON & FIFTH ASSEMBLY

- STANDARDISED PROCESSES
– REPEATABILITY FOR SPEED
AND SAFETY
- PRECISE TOLERANCES
- SAFE AND ORGANISED
WORKING SPACE
- MINIMAL ONSITE ACTIVITY
- EXPERIENCED,
KNOWLEDGABLE, AND
MULTISKILLED WORKFORCE

PREDICTABLE
PROCEDURES FOR
PREDICTABLE OUTCOMES





FULTON & FIFTH

ADDED VALUE

- ❏ **COMPREHENSIVE SOLUTION**
- ❏ **INTEGRATED FAÇADE**
- ❏ **INCLUDES BATHROOM PODS, UTILITY CUPBOARDS, AND BALCONIES**
- ❏ **UP TO 90% LESS WASTE - NO PLASTERBOARD IN CORRIDORS**
- ❏ **HYTOWER® SAVING 6 MONTHS PROGRAMME TIME**
- ❏ **PRE-DETERMINED AND PRE-ENGINEERED FOR PREDICTABLE OUTCOME**
- ❏ **CREW OF JUST 13 OPERATIVES PER CRANE**
- ❏ **MULTISKILLED TEAM FOR TURNKEY SOLUTION**
- ❏ **SPEED – ALREADY ACHIEVED 30% REDUCTION IN LEVEL CYCLE**
- ❏ **STANDARDISED PROCESSES FOR PREDICTABLE AND SAFE OPERATION**

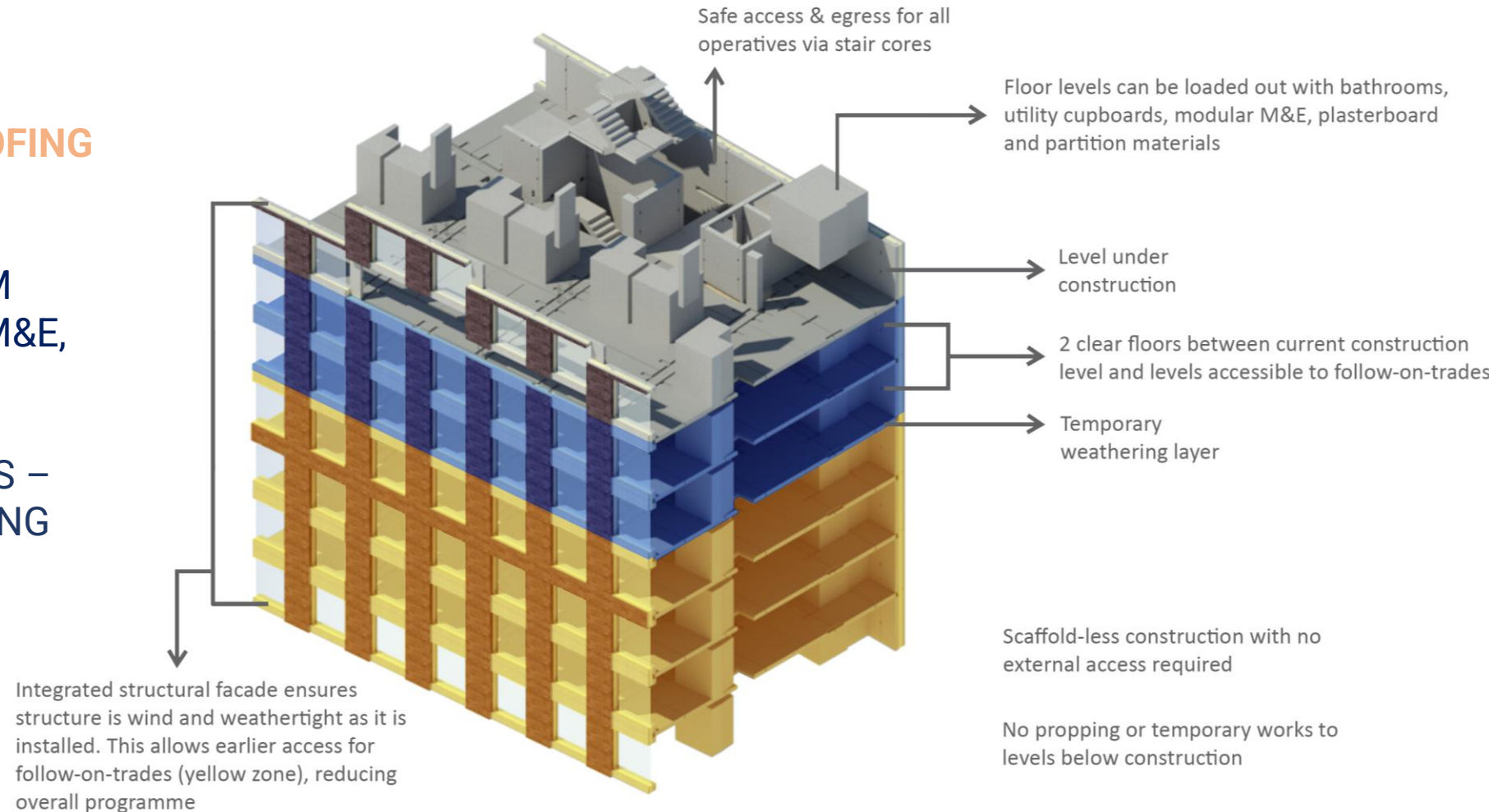




FULTON & FIFTH

CONCURRENT CONSTRUCTION

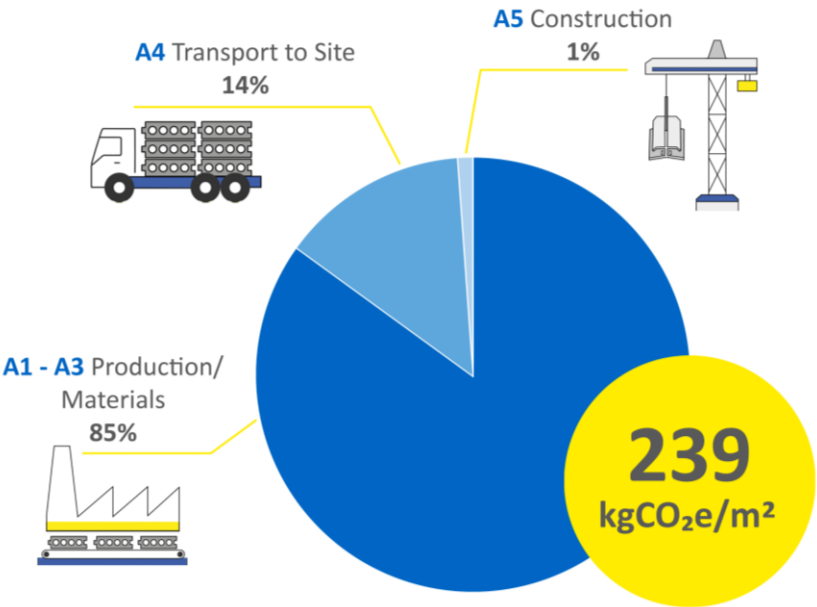
-  STRUCTURAL WEATHERPROOFING
-  NO SCAFFOLDING
-  NO BACKPROPPING
-  FASTER FITOUT – BATHROOM PODS, UTILITY CUPBOARDS, M&E, PARTIONS ETC
-  SAFE ACCESS/EGRESS
-  QUICKER FOLLOW-ON ACCESS – JUST 2 LEVELS BELOW LEADING EDGE





FULTON & FIFTH

CARBON



		Production (A1-A3)	Other Items (A1-A3)	Transport (A4)	Construction (A5)	Total (Stages A1-A5)
Sandwich Panels	Block A	507,466	128,182	63,102	11,309	710,059
Sandwich Panels	Block B	441,428	111,501	55,214	9,837	617,981
Twin Walls	250 avg	2,045,741	404,427	178,645	35,681	2,664,494
Beams	Precast - various	141,663	37,876	17,898	3,342	200,779
Deltabeam	aggregated	2,526,339	34,427	70,194	3,037	2,633,997
Hollowcore	200	3,891,353	769,806	1,569,365	67,918	6,298,442
Stairs		173,819	33,173	35,997	2,927	245,916
Landings		83,296	16,442	17,984	1,451	119,172
RC Slabs	200	221,628	46,197	49,751	4,076	321,652
Hollowcore	250	345,235	68,296	16,445	6,026	436,002
			-		-	
Steelwork	Misc. Framing	155,000	4,006	1,243	353	160,603
Columns	Precast - various	220,974	50,080	23,491	4,207	298,752
Solid Wall	250	350,209	73,157	29,906	6,146	459,418
Hollowcore	300	83,347	16,346	4,016	1,373	105,082
Hollowcore	350	53,113	10,417	2,486	875	66,891
Hollowcore	400	38,201	7,492	1,912	629	48,234
Sandwich Panels	Block C	643,525	162,549	165,925	13,655	985,654
Sandwich Panels	Block D	307,478	77,666	79,284	6,524	470,952
Sandwich Panels	Block E	560,509	141,580	69,806	11,893	783,788
		12,790,324	2,193,620	2,452,664	191,260	17,627,868



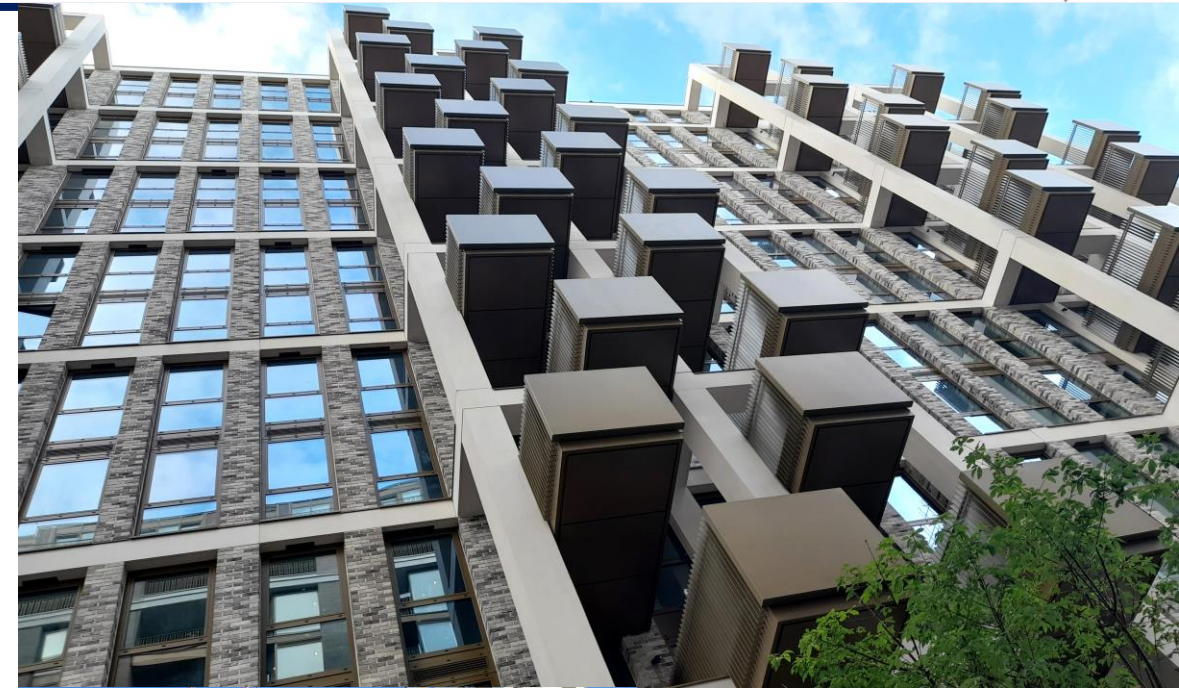
FULTON & FIFTH COLLABORATION

REGAL
CONSTRUCTION



EFFECTIVE COLLABORATION BETWEEN REGAL LONDON AND PCE ENABLES **CONTINUOUS IMPROVEMENT** AS WE COLLABORATIVELY DELIVER INNOVATIVE SYSTEMISED STRUCTURAL SOLUTIONS

EACH PROJECT ALLOWS **REFINEMENT** AND IMPROVEMENT OF THE SOLUTION AS A WHOLE, WITH EARLY ENGAGEMENT ENSURING COMPLIANCE WITH **BSA GATEWAYS** AND ALIGNMENT TO THE **RIBA** DFMA OVERALY





FULTON & FIFTH TIMELAPSE

FROM
JUNE 23 – JUNE 24





RESIDENTIAL PRECEDENTS

-  FULTON & FIFTH – LONDON
-  BRENT CROSS PLOT 14 - LONDON
-  SILVERTOWN PLOT 6 –LONDON
-  N06 EAST VILLAGE - LONDON
-  DAKOTA HOTEL - MANCHESTER
-  CHAPEL WHARF - MANCHESTER



ALL DELIVERED USING PCE'S **SYSTEMISED BUILD SOLUTIONS** - PROJECTS WERE ENGINEERED FOR PREDICTABLE **RESIDENTIAL** STRUCTURAL DEVELOPMENT



HYBRIDfMA



V1_03



V2_03



V3_03



V4_03

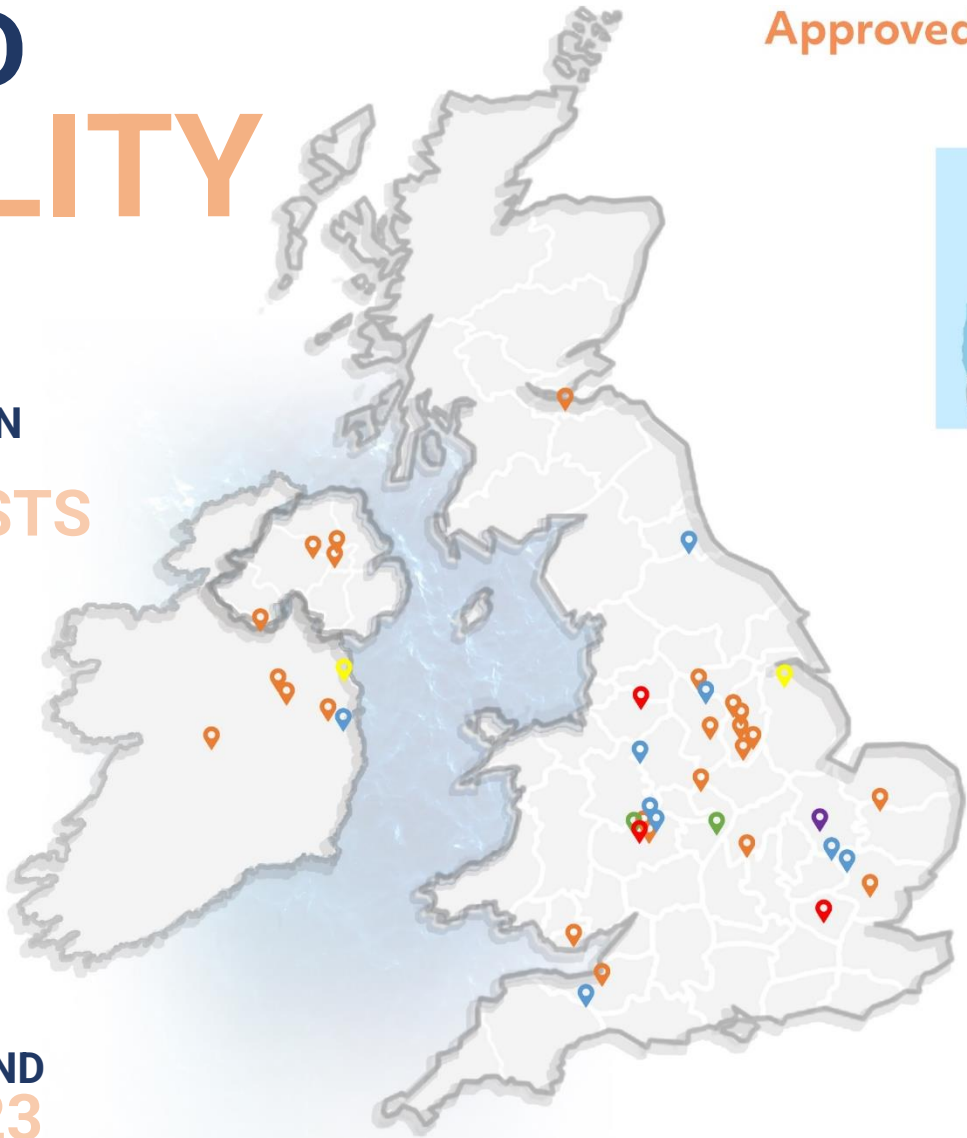


SCALE AND FLEXIBILITY

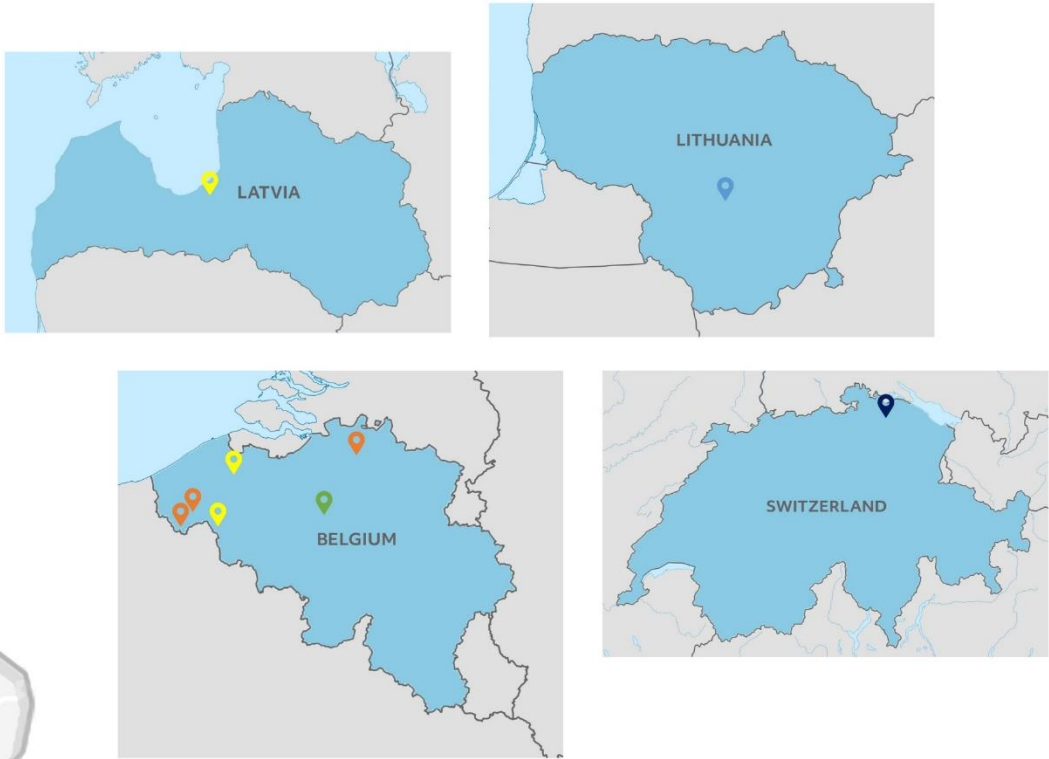
16
UK & EUROPEAN
OFFSITE
SPECIALISTS

500T
MANUFACTURED
AND INSTALLED
DAILY

19,500
COMPONENTS OR
100,000T
MANUFACTURED AND
INSTALLED IN 2023



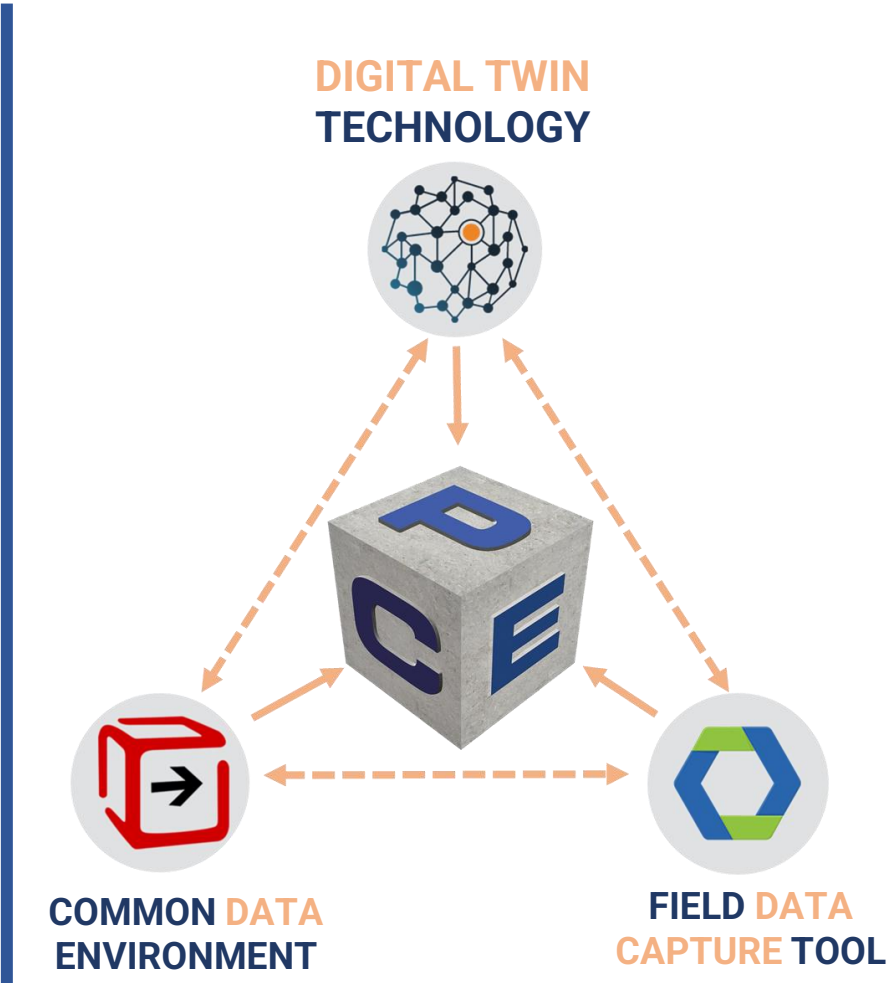
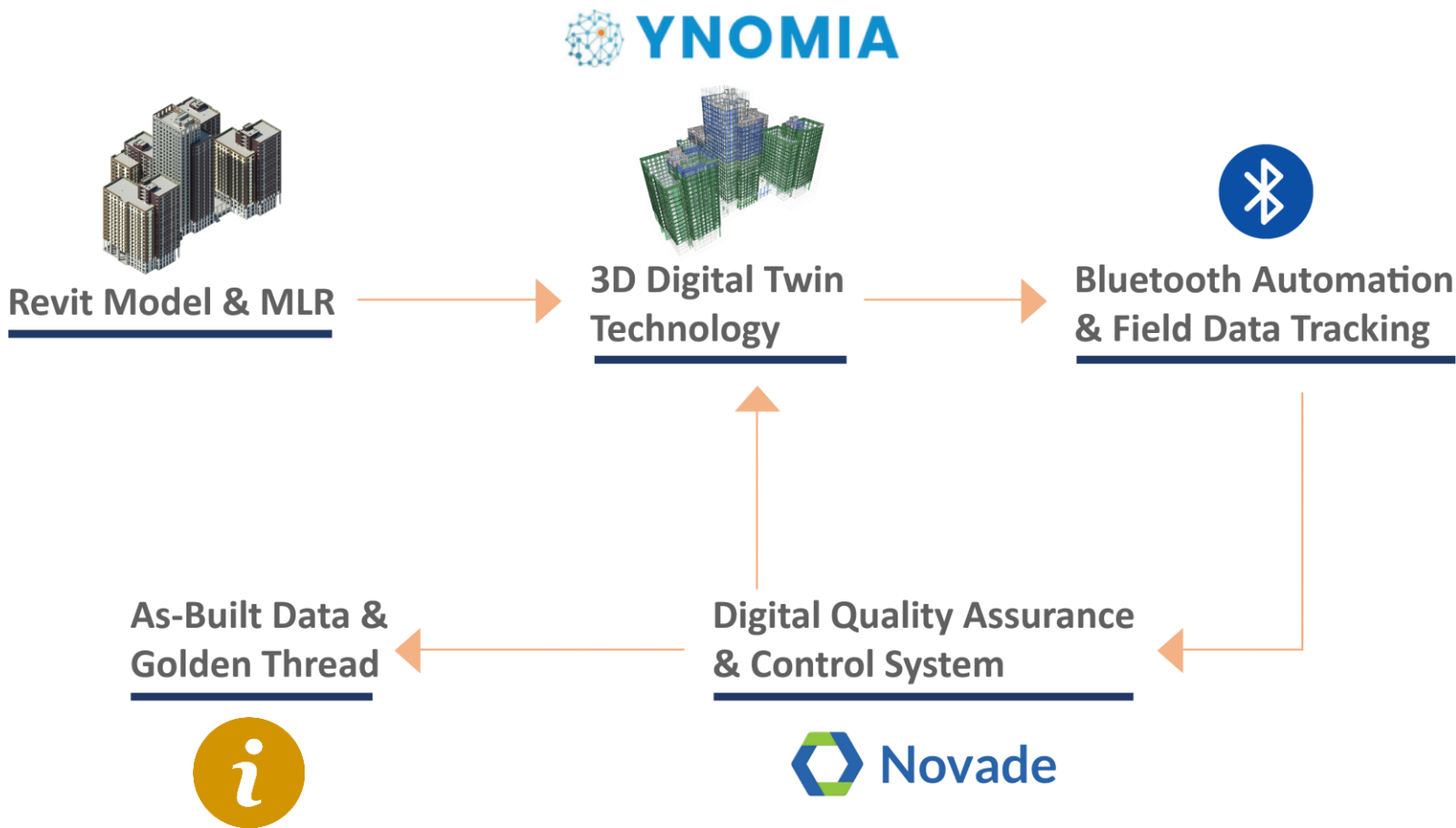
Approved Supply Chain



- Structural precast facilities
- Structural steel facilities
- Timber facilities
- Cladding facilities
- MEP facilities
- Windows
- Structural Engineering Partners



DIGITAL DELIVERY





DIGITAL TWIN TRACK & TRACE

YNOMIA

YNOMIA

LIVE

Project (10753)

Search by Name, Type, Supplier (if applicable) etc.

Start date → End date

Time travel

Selected (1)

History

Jan 17, 2024 at 7:39pm

Tag Unlinked (93.734)

by Richard Carroll

Jan 15, 2024 at 11:24am

Set Tolerances

by foreman11@pceltd.co.uk

Jan 15, 2024 at 11:24am

Installed

Ynomia

Jan 15, 2024 at 11:24am

Location Updated

by foreman11@pceltd.co.uk

Jan 15, 2024 at 7:56am

Received on Site

Ynomia

Jan 14, 2024 at 1:38pm

In Transit

Ynomia

Jan 13, 2024 at 11:39am

Loaded for Delivery

Ynomia

Jan 13, 2024 at 11:39am

Add To "TEC-E-C2-375"

by John Griffin

Jan 05, 2024 at 11:52am

Unit Ready for Delivery

Ynomia

Jan 05, 2024 at 11:52am

Tag Linked (93.734)

by Simon Roucher

Viewing all 10753 Assets

FRONT

3D model of a building structure with various colored units (blue, green, pink, purple) and a 'FRONT' label.

BIS-A00-WE001-001 External Wall BISON Building A L00 BIS-

Properties

Site

Building

Level (Destination)

TwinID/Model location Ref

Supplier

Unit Type

Unit Type Code

Unit Reference

Unit Set Reference

Engineering Package Reference

General Layout Reference

Loading Weight (t)

Unit Weight (t)

Unit Height

Unit Width

Unit Length

Unit Issues

Load Remarks (Supplier)

Pre & Post Pour Checklist Date (Novade)

Top Of Unit Left +/- mm

Top Of Unit Right +/- mm

Door Soffit Height +/- mm

Fulton Road Site

Building A

L00

MLR-1037

BISON

External Wall

WE

WE001

FTRD-PCE-AA-00-DR-X-XX-12001

FTRD-PCE-AA-00-D-S-X-10-0500

5.36

5.36

3530

275

3339

Unknown

Unknown

May 23 2023 at 02:57pm

5

1

0

History

Aug 25, 2023 at 6:31pm

Pre & Post Pour Checklist Completed (Novade)

by Admin

Jun 08, 2023 at 5:54pm

Tag Unlinked (20:E0)

by Trerail Peters

Jun 06, 2023 at 1:24pm

Installed

Ynomia

Jun 06, 2023 at 1:24pm

Location Updated

by foreman10@pceltd.co.uk

Jun 06, 2023 at 1:24pm

Set Tolerances

by foreman10@pceltd.co.uk

STATUS SUMMARY

- NOT YET TRACKED
- ENGINEERING - COMPLETE
- MODEL / LAYOUTS - ISSUED FOR APPROVAL
- MODEL / LAYOUTS - ISSUED FOR CONSTRUCTION
- UNIT SET ISSUED FOR APPROVAL
- UNIT SET ISSUED FOR CONSTRUCTION
- UNIT SET DESIGN HOLD
- UNIT SET ISSUED FOR MANUFACTURE
- UNIT CAST
- UNIT READY FOR DELIVERY
- LOADED FOR DELIVERY
- IN TRANSIT
- RECEIVED ON SITE
- INSTALLED



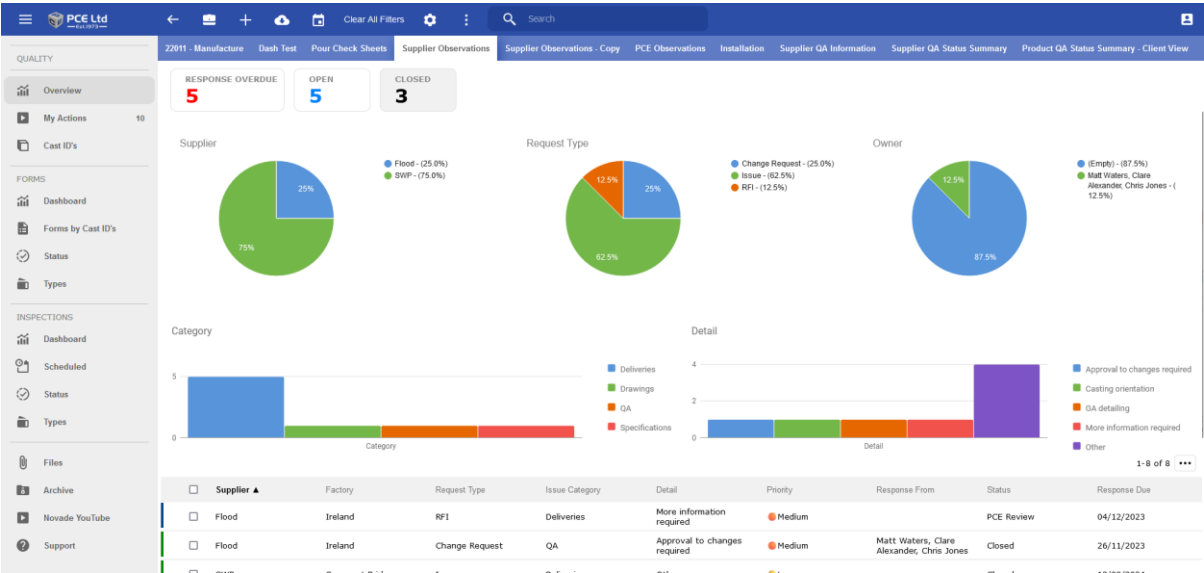
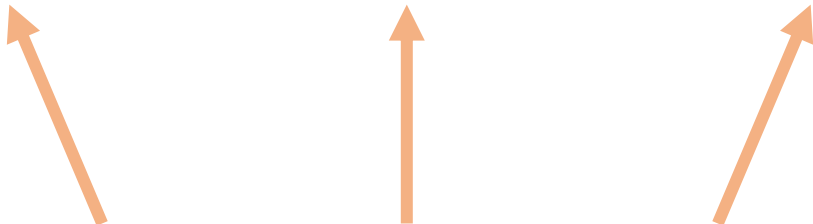
DIGITAL QUALITY

ADVANCED FIELD DATA CAPTURE TOOLS ENSURES KEY **QUALITY** AND **PERFORMANCE METRICS** ARE CAPTURED AND STORED **DIGITALLY**

AUTONOMOUS SYSTEM INTEGRATION ENSURES A SINGLE PLATFROM FOR CLEAR, ACCURATE, AND ACCESIBLE INSIGHT

THIS ENABLES BETTER ACCESS TO AND UNDERSTANDING OF PERFORMANCE METRICS, INFLUENCING PCE'S **QUALITY STRATEGY** THROUGH DIGITAL MECHANISMS

COMPONENT QUALITY PCE QUALITY SUPPLY CHAIN QUALITY



SYSTEM INCLUDES **DATA METRICS, PHOTO EVIDENCE, NCR'S, AND OTHER OBSERVATIONS**



SUSTAINABLE DESIGN

Embodied Carbon Calculator

275mm flat slabs (50% GGBS Replacement)

Notes: EC = Embodied Carbon. Read red triangle cell notes for assistance
Red cells must be entered by engineer
Amber cells are defaults but can be adjusted by engineer to suit
Green cells contain fixed data or outputs - no action required

System	Material	Quantity	Waste	Material Impact		Transport Impact		Total EC
				Concrete	EC / kg	CO ₂	CO ₂	
FOUNDATION	Reinforcement	45.942	5%	(Mpa)	1.550	95.281	5%	35.023
	Piles Concrete	974.589	10%	RC32/40 CEM1 (for all cementitious ex	0.149	199.735	6.379	196.114
	Pilecap Concrete	651.465	10%	RC32/40 50% GGBS	0.089	63.778	4.264	68.042
MAIN FRAME	Formwork (m2)	0	10%		9.870	0	0	0
	Light gauge steel	0	10%		3.030	0	0	0
	Reinforcement	622.835	5%		1.550	1,301.084	7.760	1,308.784
	Concrete	9,776.813	10%	RC32/40 50% GGBS	0.089	967.550	63.989	1,021.139
SUPERSTRUCTURE	Steel structural sections	0	10%		1.550	0	0	0
	Light gauge steel	0	10%		3.030	0	0	0
TOTALS	Steel structural sections	0	10%		1.550	0	0	0
	CLT	0	10%		0.437	2,506.353	82.381	2,689.335

Summary:

Efficiency Rating (kg CO₂e/m²)

B: 200
C: 250
D: 300
E: 350
F: 400
G: 450

EC from material impact: 2,576.953 kg or 2,577 tonnes 97%
EC from transport impact: 82.381 kg or 83 tonnes 3%
Total EC from both impacts: 2,659.335 kg or 2,660 tonnes 100%

Floor area of building: 9,246 m²
Thus, EC per m²: 289 kg CO₂e/m² (= total EC / floor area)
Rating: D

Image: Revit Carbon Calculator Tool

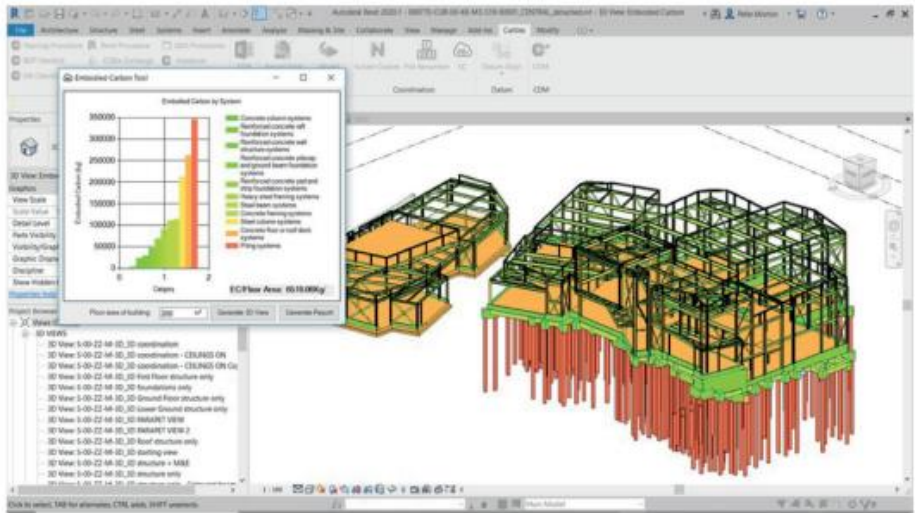


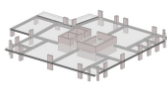
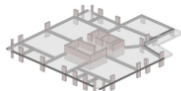
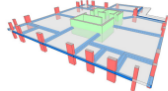
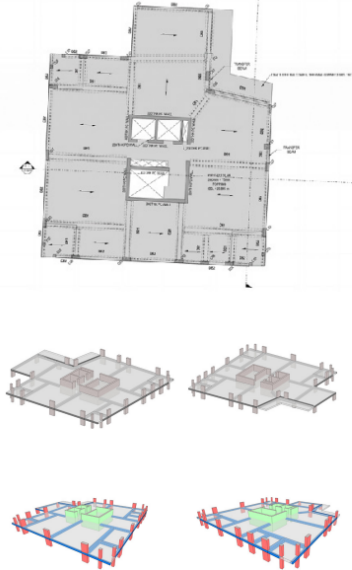
Image: Carbon Assessment Toolkit



ADAPTED FROM THORNTON THOMASETTI

SUSTAINABLE DESIGN INCORPORATING MODERN METHODS OF CONSTRUCTION

Hybrid Frame
200mm thick hollowcore planks



Wembley High Road



Project Number: 77041
Engineer: AP
Project Title: 500 Wilton Highway
Date Created: 09/11/2021
Doc Ref: 6th floor delta beam-hollowcore check
Sheet No: 1 of 1

40 Compton Street, London, EC1V 0ED
020 7304 2249
london@curtins.com
www.curtins.com

Embodied Carbon Calculator

Notes: EC = Embodied Carbon. Read red triangle cell notes for assistance
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System	Material	Quantity	Waste	Material Impact		Transport Impact		Total EC
				Concrete	EC / kg	CO ₂	CO ₂	
FOUNDATION	Reinforcement	0	5%	(Mpa)	1.550	0	0	0
	Formwork (m2)	0	10%		9.870	0	0	0
	Precast columns / beams	0	10%		0.249	81	5	86
MAIN FRAME	Aggregate	0	10%		0.007	0	0	0
	Formwork (m2)	0	10%		9.870	0	0	0
	Precast columns	0	5%		0.138	0	0	0
SUPERSTRUCTURE	Hollowcore (m2)	370	10%		0.200	81	5	86
	Reinforcement	0	5%		1.990	0	0	0
	Concrete	0	5%	RC 35/45 UK Avg mix (small PFA)	0.149	0	0	0
TOTALS	Delta Beam	15,750	5%		2.630	43,507	88	43,606
	CLT	0	0%		0.437	0	0	0

Summary:

Efficiency Rating (kg CO₂e/m²)

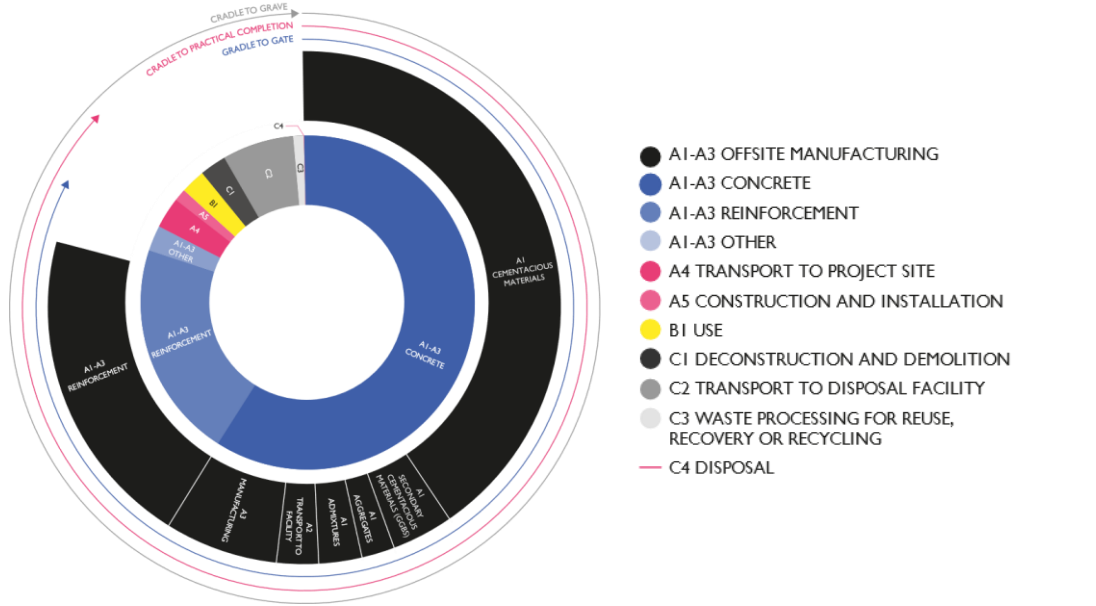
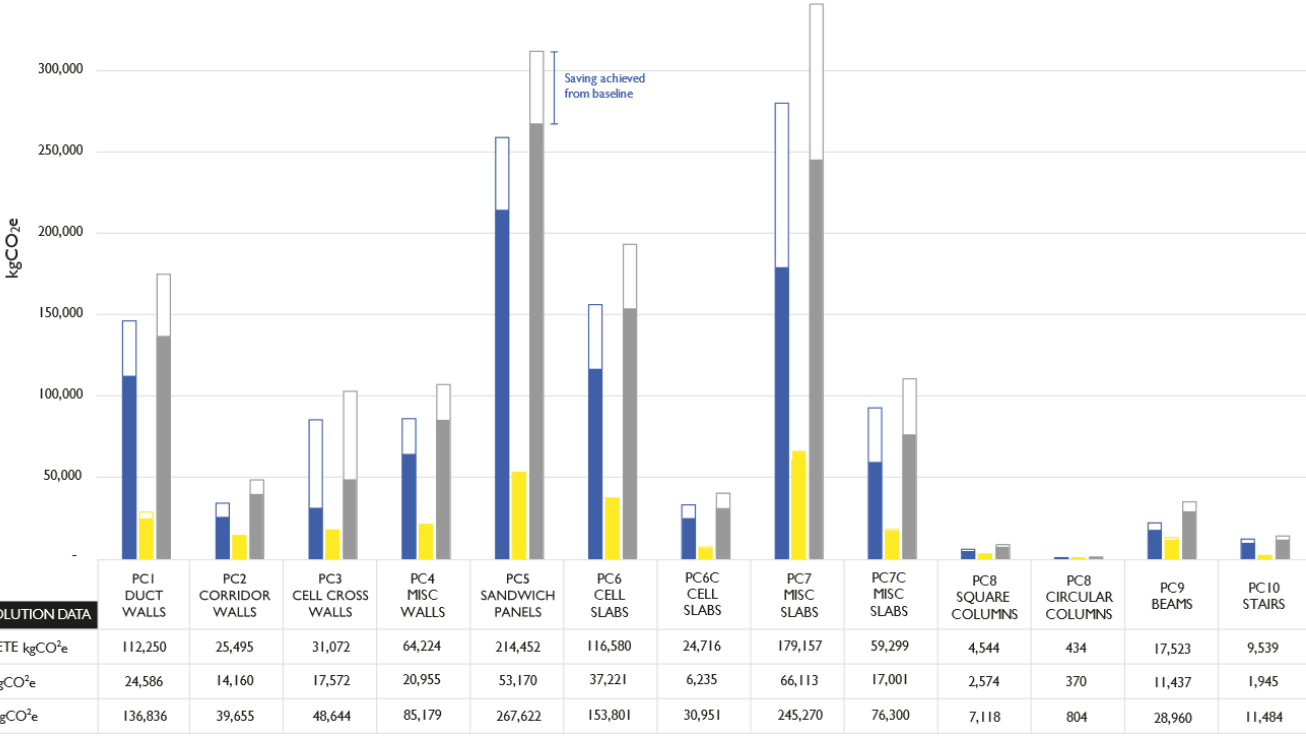
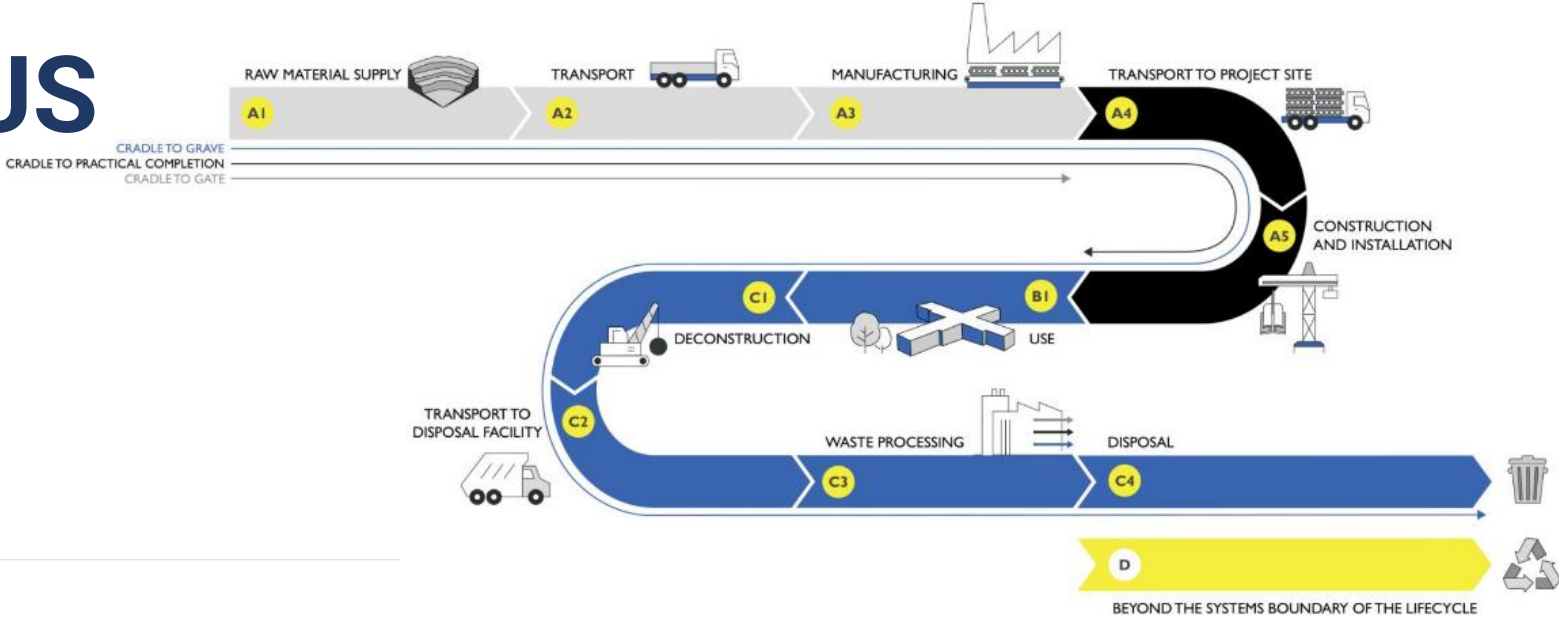
B: 200
C: 250
D: 300
E: 350
F: 400
G: 450

EC from material impact: 43,589 kg or 44 tonnes 100%
EC from transport impact: 103 kg or 0 tonnes 0%
Total EC from both impacts: 43,692 kg or 44 tonnes 100%

Floor area of building: 370 m²
Thus, EC per m²: 118 kg CO₂e/m² (= total EC / floor area)
Rating: A













CARBON CONSCIOUS DELIVERY





PERFORMANCE COMPLIANCE

PCE COMPONENTS ARE MANUFACTURED:

-  COMPLIANT WITH **EUROCODES**, RELEVANT BRITISH **STANDARDS**, BUILDING **REGULATIONS**, AND INDUSTRY **BEST PRACTICE**
-  **FIRE** RESISTANT
-  CWCT **SEQUENCE B** TESTED
-  **THERMALLY** EFFICIENT AND AIRTIGHT
-  **ACOUSTIC** ATTENUATION AND RESISTANCE EXCELLENCE
-  EXCELLENT FOR **VIBRATION**
-  **DESIGN LIFE** OF 60 YEARS
-  ACCEPTED BY ALL MAJOR **INSURERS** AND **WARRANTY** PROVIDERS
-  BIM LEVEL 2 **ACCREDITED**
-  FULL **TRACEABILITY** AND **CHAIN OF CUSTODY**





COLLABORATIVE INNOVATION



WITH
CLIENTS



WITH
SUPPLY
CHAIN



WITH
EXPERTS



WITH
GOVERNMENT



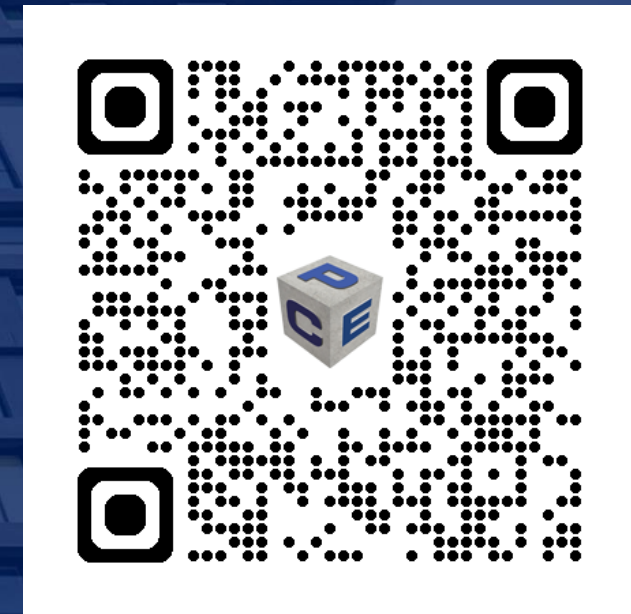
WITH
INDUSTRY

COLLABORATION BRINGS **MEANINGFUL CHANGE**, NEW
PRODUCT INNOVATION, AND MORE **EFFICIENT** &
SUSTAINABLE OPERATIONS FOR INDUSTRY



**SYSTEMISED
BUILD
SOLUTIONS
USING OFFSITE
MANUFACTURED
KITS OF PARTS
FOR ALL BUILD
SECTORS**

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