

Designing for Offsite

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Partners, HTA Design LLP

hta.co.uk | [@HTADesignLLP](https://twitter.com/HTADesignLLP) |   [in](https://www.linkedin.com/company/hta-design-llp)



hta



HTA@50 Subheader one



Our housing

Rural/Masterplan



Suburban



Urban



High Rise



Build to Rent



Estate Regeneration



Sustainable/Zero Carbon



Multi-generational Living

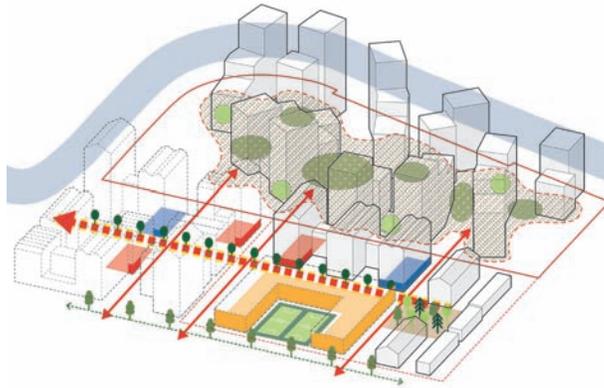


Our services

Architects & Designers



Masterplanners & Urban Designers



Landscape Architects



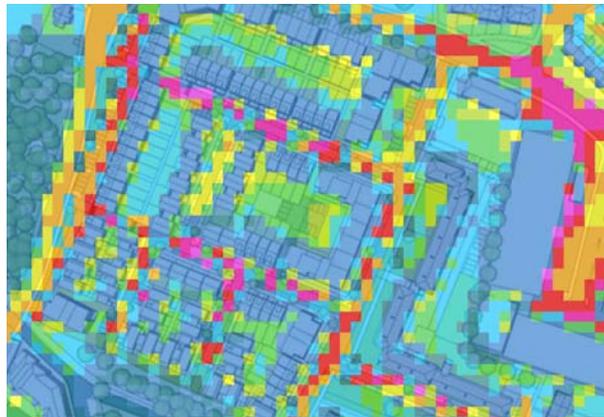
Planners & Researchers



Graphic Designers & Visualisers



Sustainability Consultants



Engagement Specialists



Interior Designers



Our awards



BD AYA

Public Realm Architects of the Year
(2019)



Offsite Awards

Architect of the Year
(2019)



Sunday Times

British Homes Reader's Choice
(2018)



AJ Architecture Award

Architecture Awards - Masterplanning
(2018)



Housebuilder

Best Regeneration Initiative
(2018)



AJ100

Client's Choice
(2019)



AJ100

Employer of the Year
(2018)



Offsite Awards

Best use of Volumetric
(2018)



Building Awards

Offsite of the Year
(2018)



Housing Design

Housing Design Award
(2018)

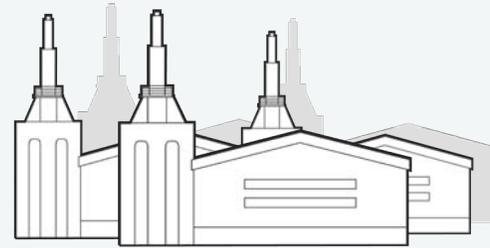
Our Offsite Experience

HTA's unique modular record

6,000
modular dwellings
built to date



and counting...

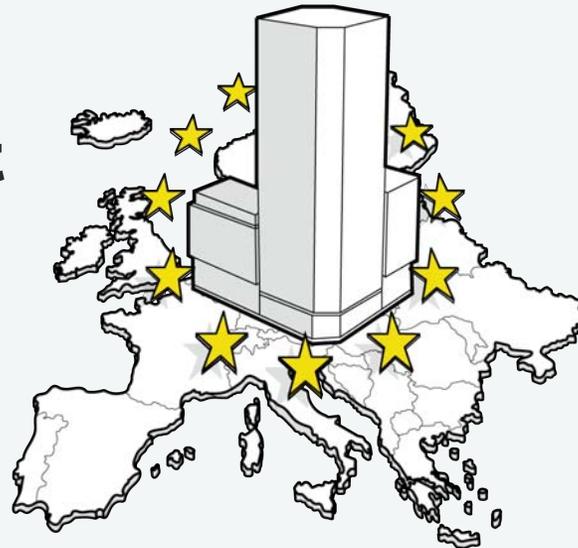


Only UK Architectural practice to have worked with **multiple modular manufacturers**

Designers
of...

**the tallest
modular
building
in Europe**

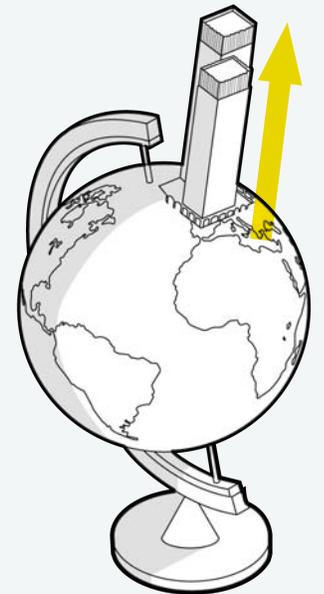
(Complete 2017)



Designers
of...

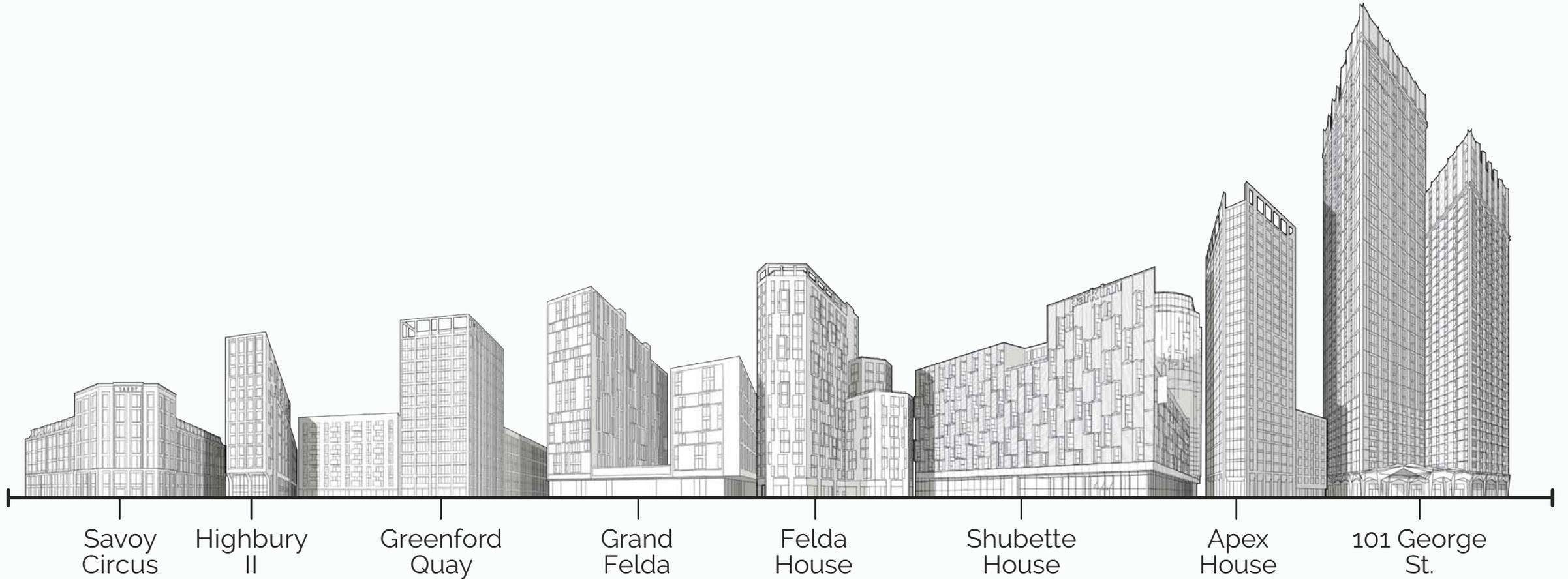
**the tallest
modular
building in
the World**

(on site, anticipated
completion 2020)



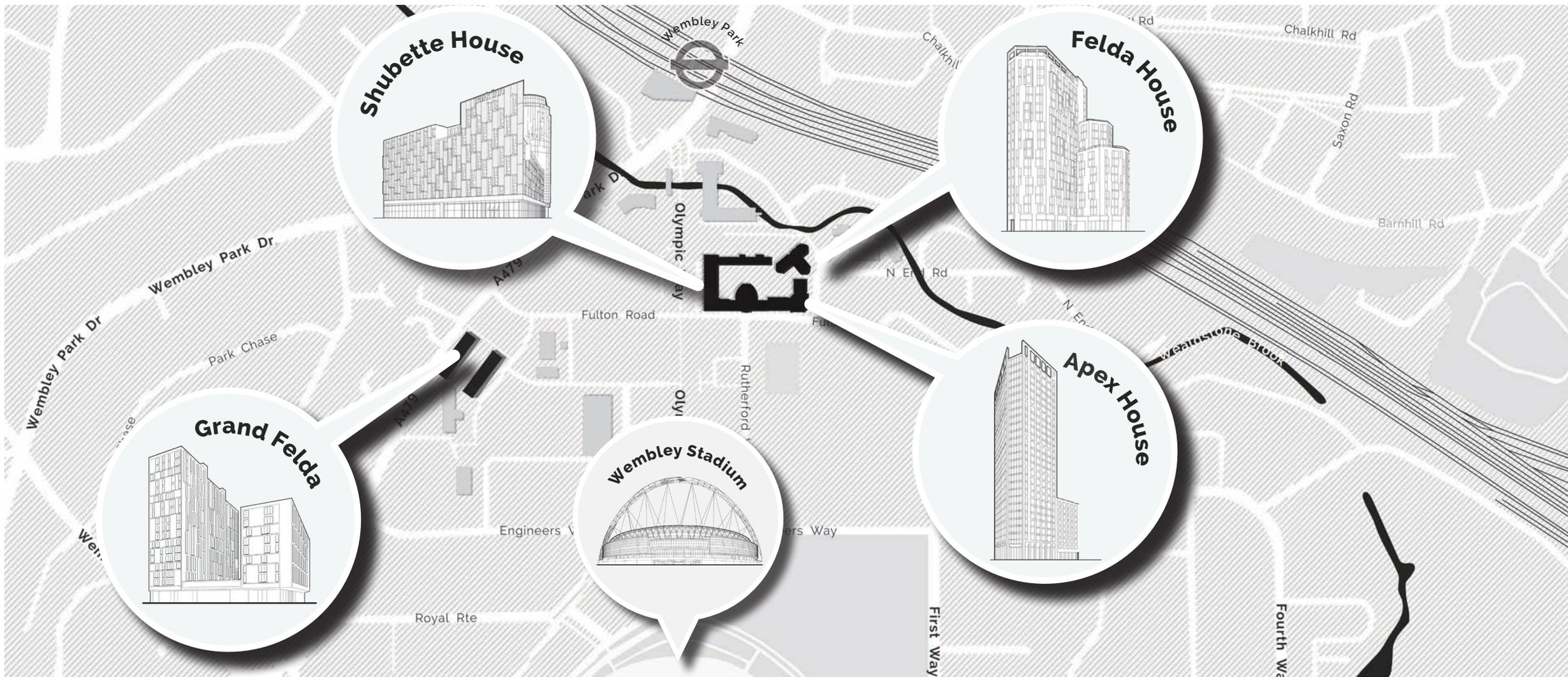
Offsite Experience

HTA's Urban Modular projects



Wembley Suite

Offsite projects in Wembley



Shubette House

Wembley

Off site
Hotel

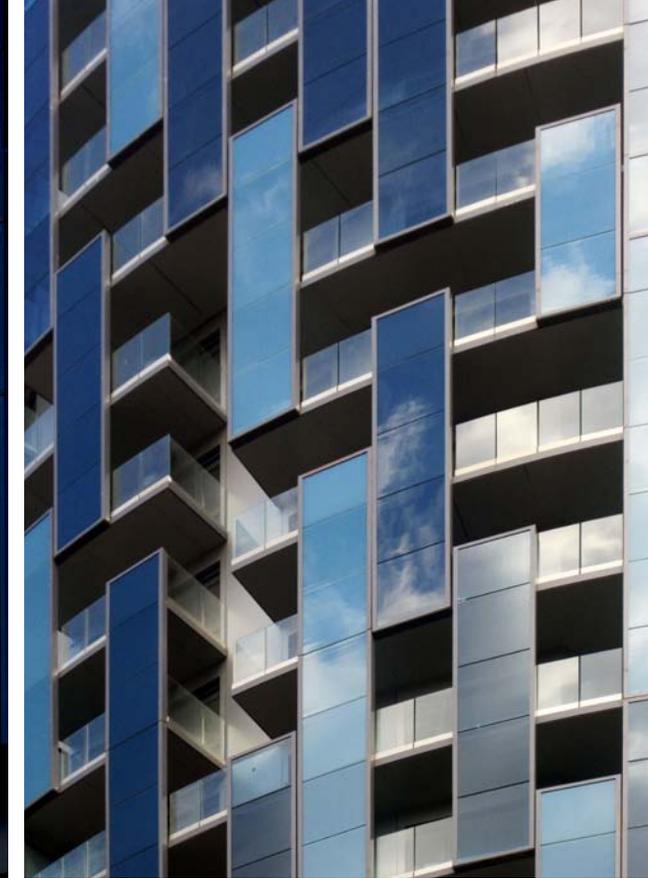
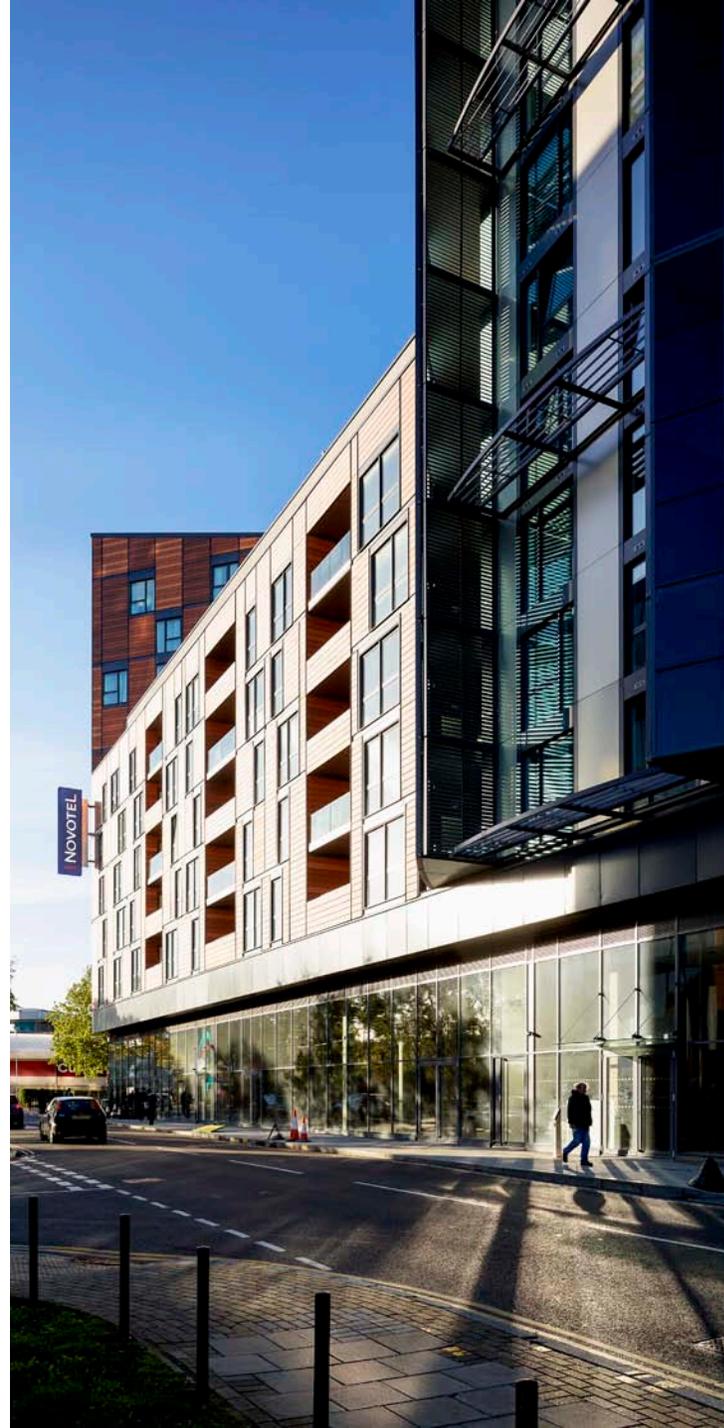
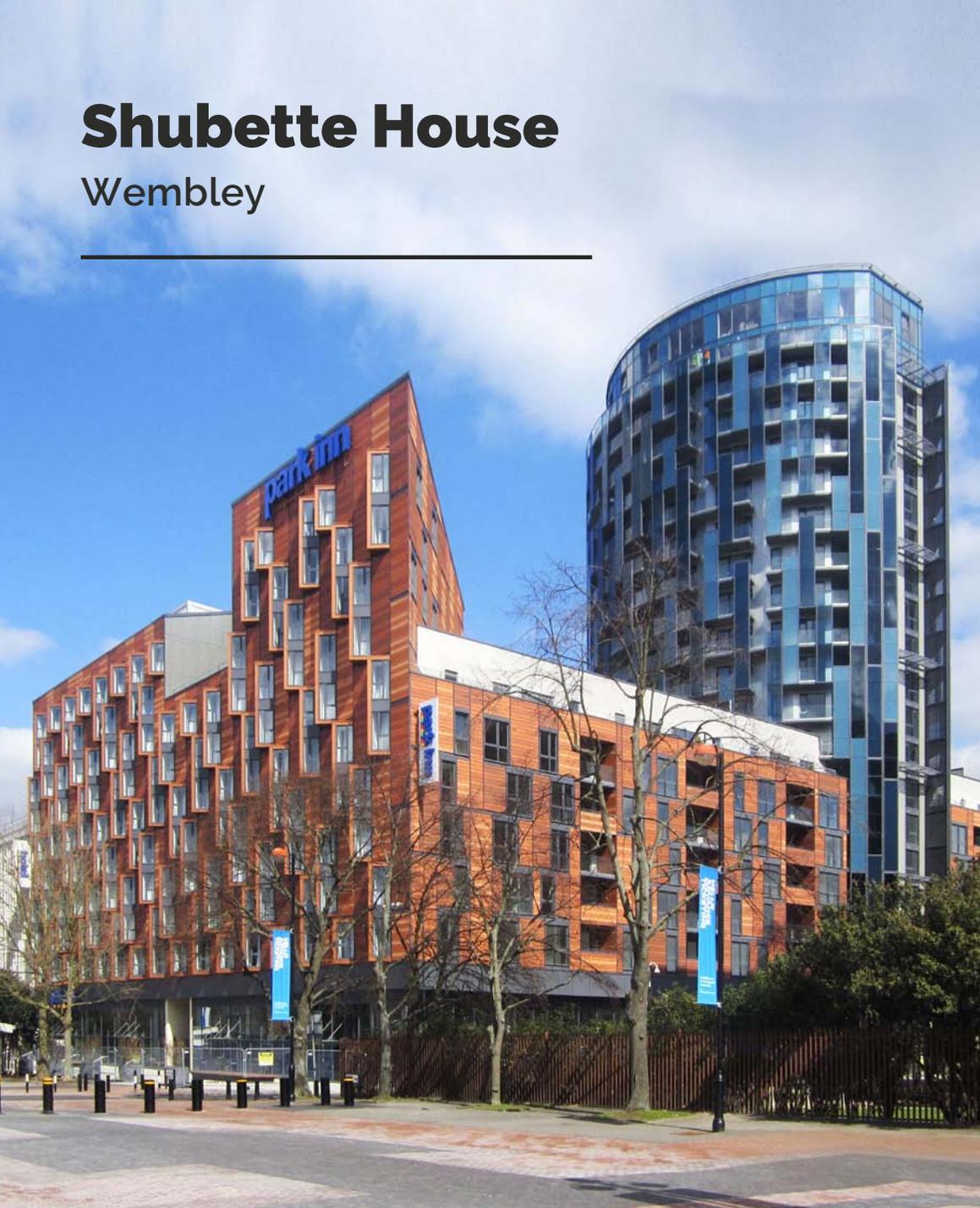
158 homes
0.54 ha
293 dw/ha

Donban
Contracting



Shubette House

Wembley



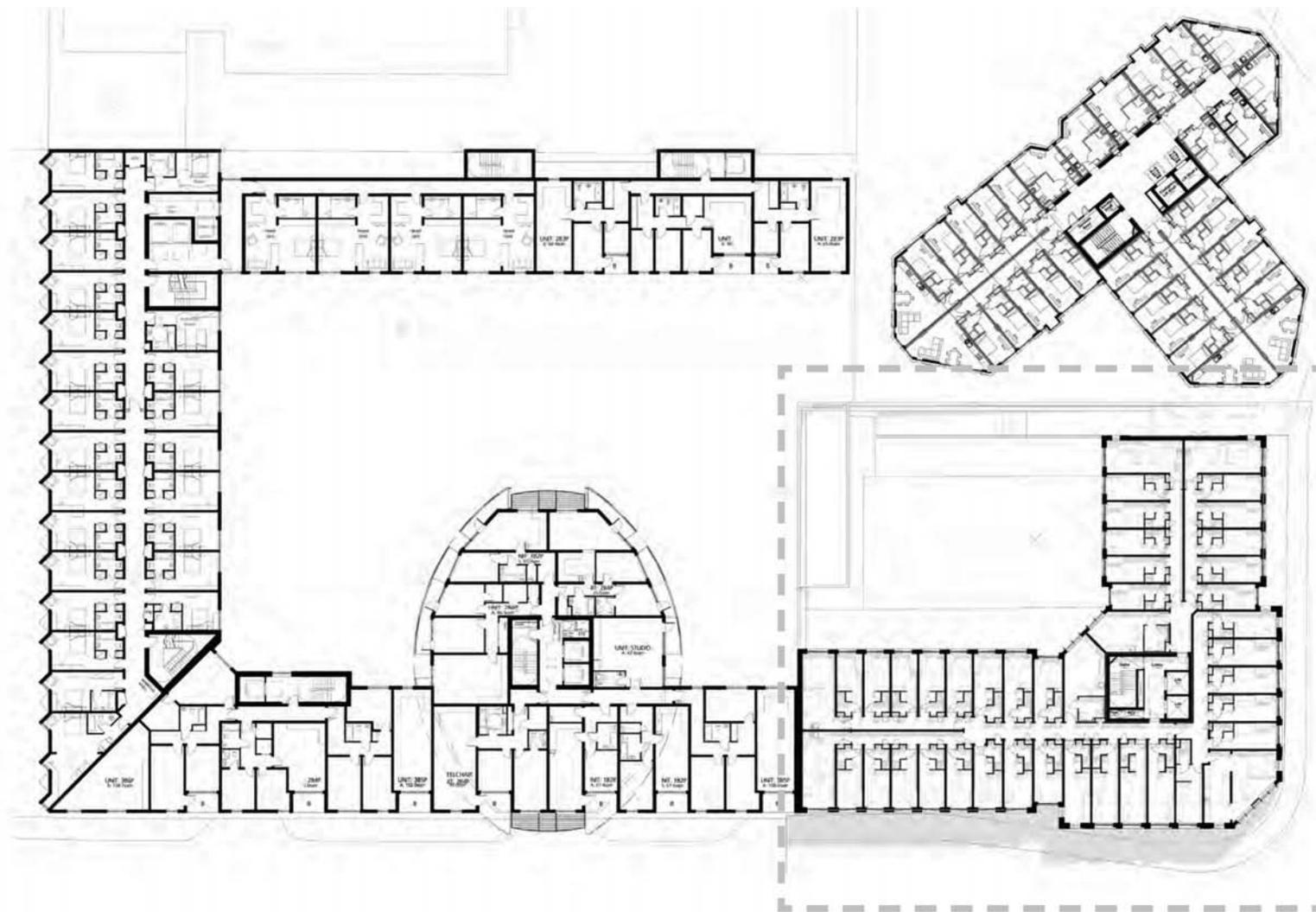
Grand Felda

Wembley



Modular Variety

Wembley suite



Apex House

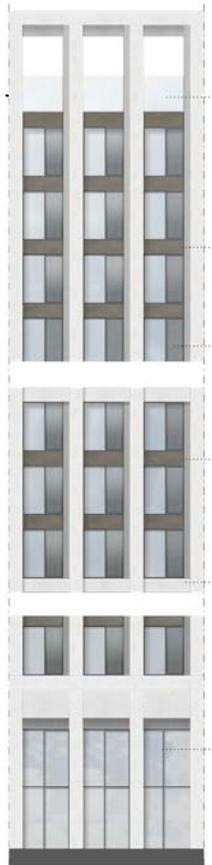
Wembley



Apex House

Stages timeline

Concept
April
2015



Design
June
2015



Planning
August
2015



Consented
March
2016



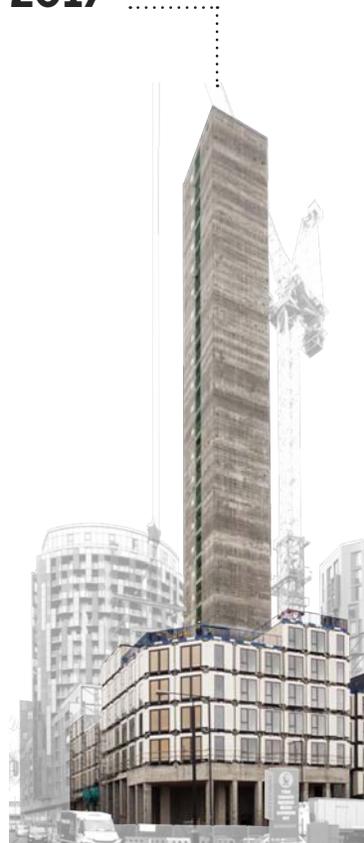
Apex House

Modules over 5 months

2nd
February
2017



21st
February
2017



2nd
March
2017



6th
April
2017



6th
August
2017



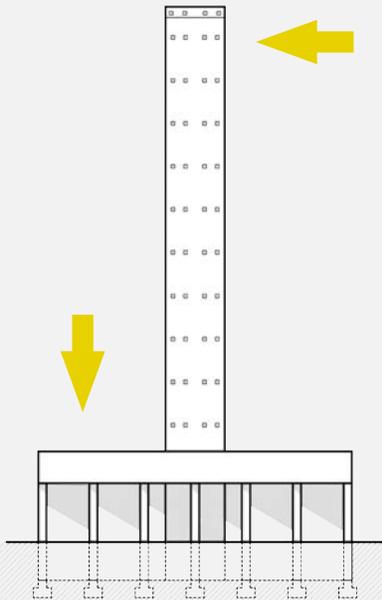
Example Process

Modular construction

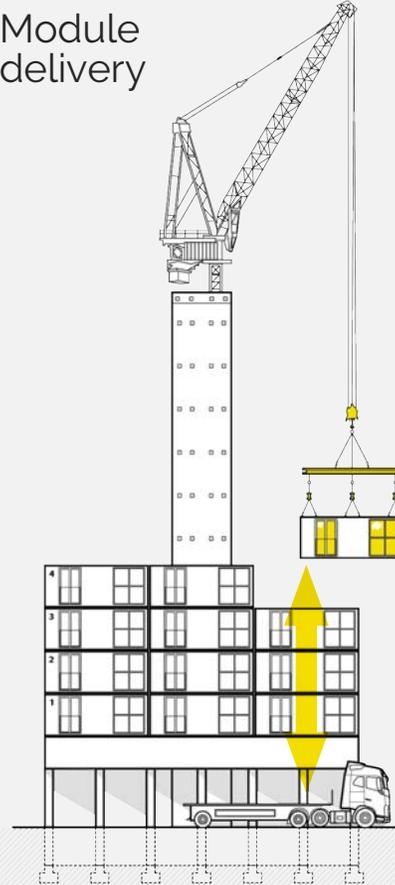
1.
Factory
manufacture



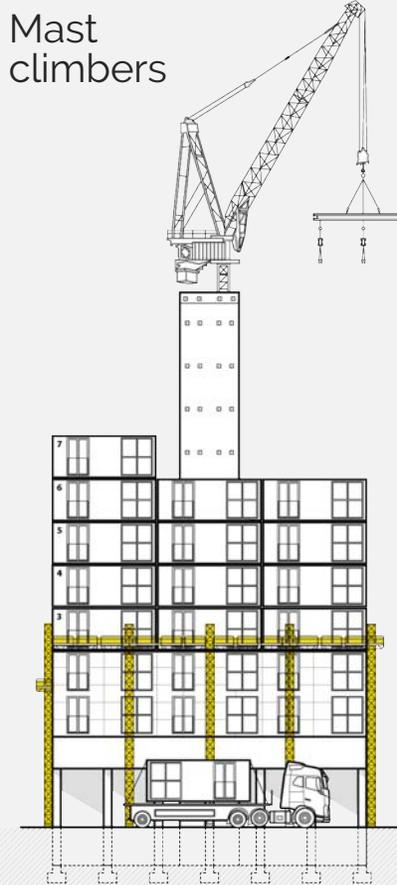
2.
Slipform core &
Podium structure



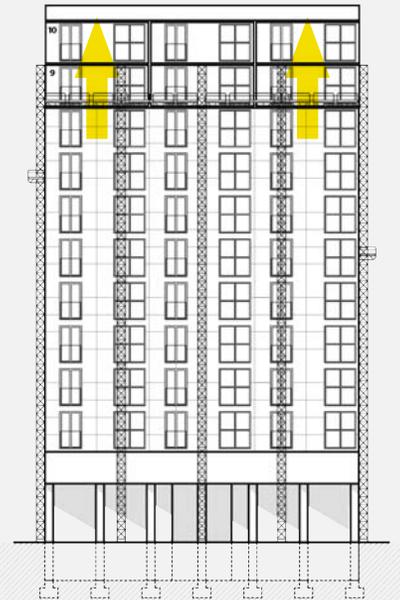
3.
Module
delivery



4.
Mast
climbers



5.
Facade
completion



Apex House

Wembley

679
Indv. Modules

558 homes
0.18 ha
3100 dw/ha

Tide Construction
& Vision Modular



Apex House

Wembley



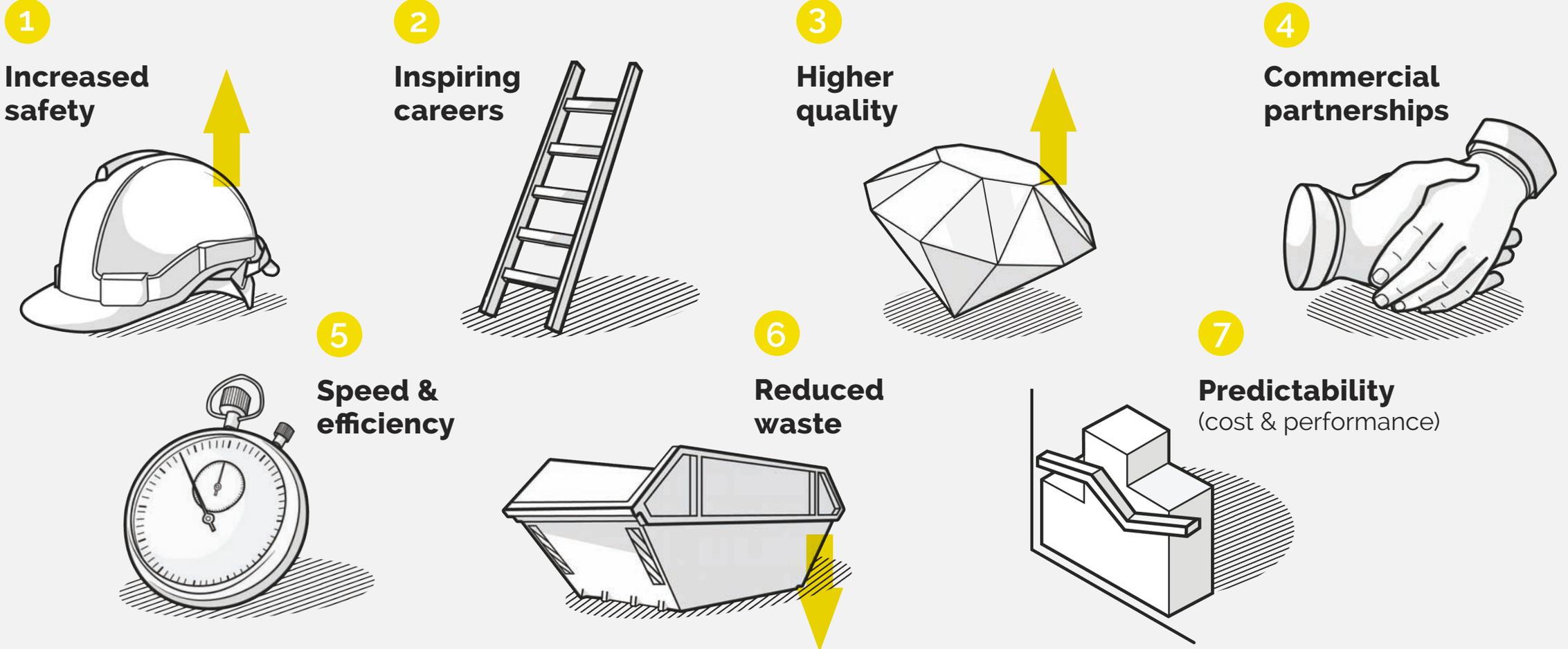
Apex House

Wembley



Understanding the Benefits

Traditional vs offsite design



Assembling the Right Team

1



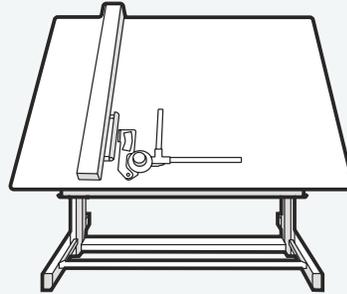
Category:

**Client
Body**

Role:

- Public body
(Government-backed)
- Private developer
(investor-backed)
- Independent sector
(charitable constitution)

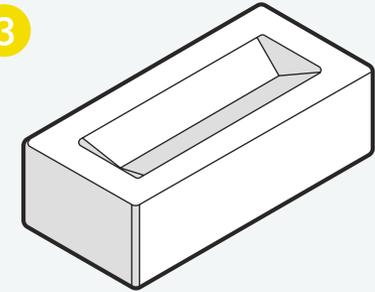
2



**Consultant
Team**

- Masterplanner
- Design Lead (resi)
- Design Lead (non-resi)
- Delivery Architect
- Structural Engineer
- MEP Engineer
- Landscape Architect
- Specialist Consultants

3



**Fabrication &
Construction**

- Main Contractor
- MiC Manufacturer
- RC Frame Contractor
- MEP Contractor
- Facade Contractor
- Other Trade Contractors
- Suppliers

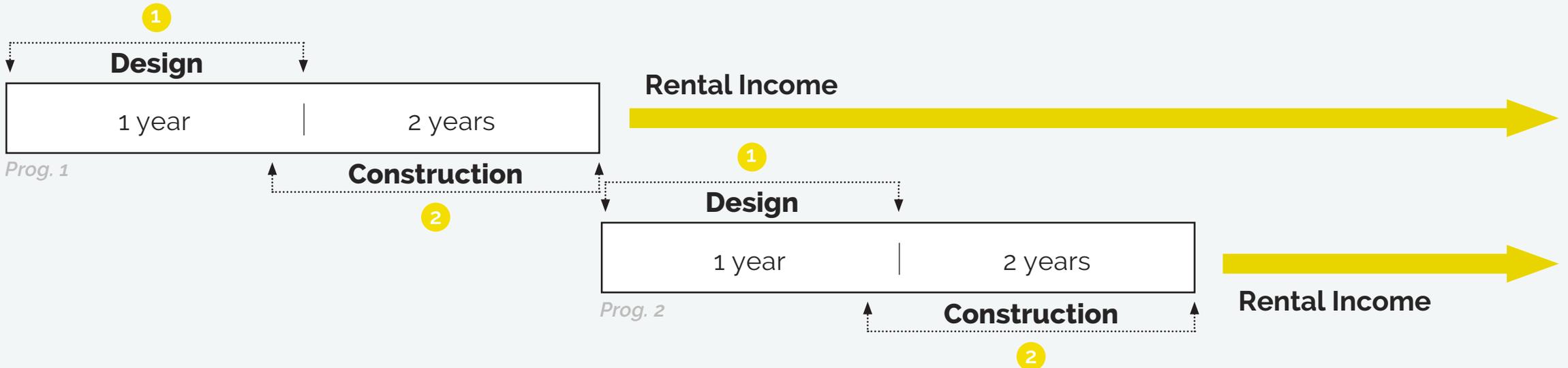
Business Strategy

Procurement comparison

Typical Traditional Project

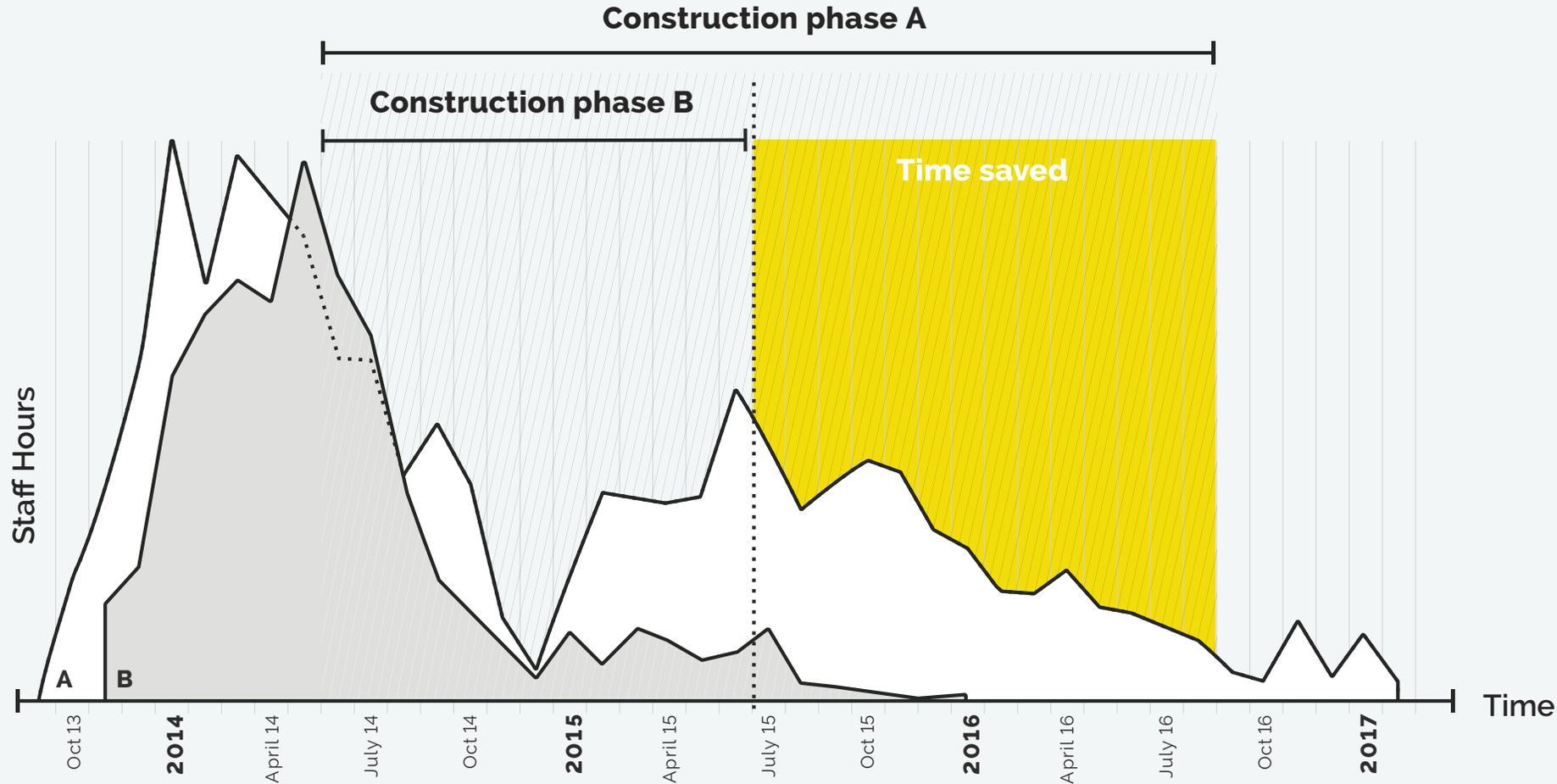


Typical Offsite Project



Measurable Benefits

Traditional vs offsite design



A	B
Traditional project	Felda House Wembley

	A	B
Hours	14,187	6,903
Homes	188	450
M ²	20,282	14,678
M ² /Hours Ratio	0.97	1.66

Savoy Circus

Hammersmith

Largest BTR
Scheme in UK

1,965 homes
8.64 ha
227 dw/ha

Tide Construction
/Vision Modular



Savoy Circus

Hammersmith



Savoy Circus

Hammersmith



Highbury II

Islington



Highbury II

Islington



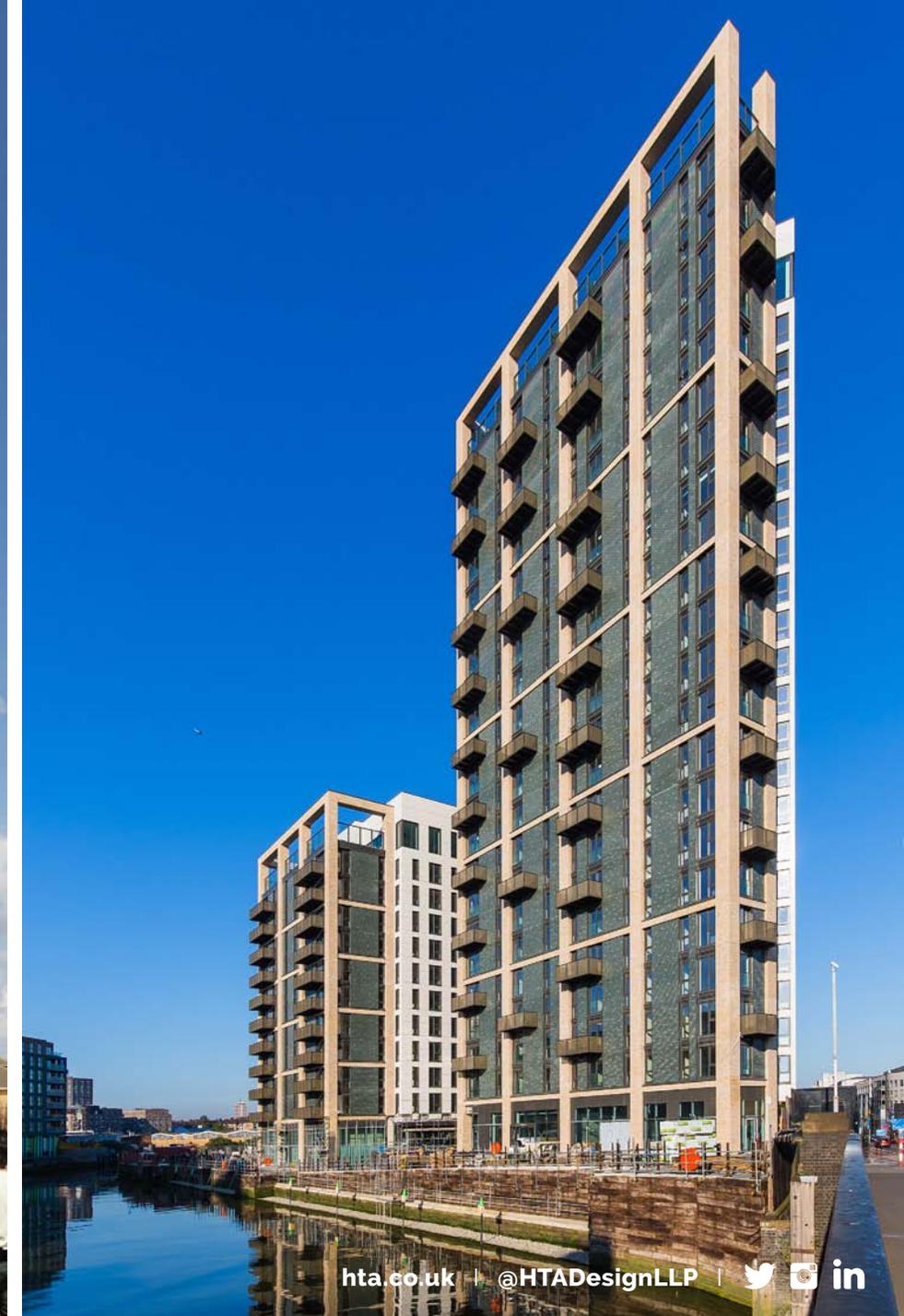
Union Wharf

Greenwich

249
Indv. Modules

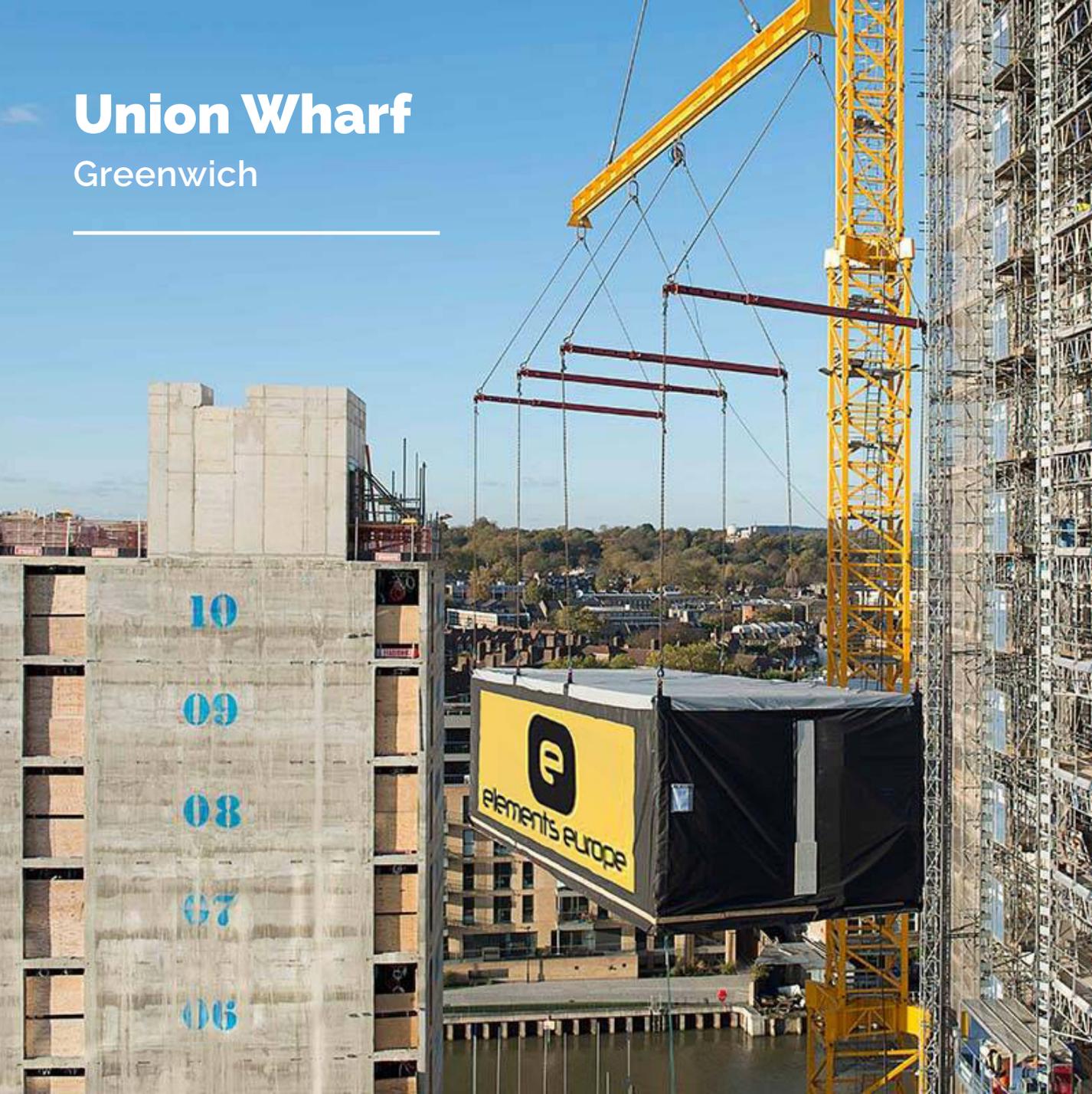
249 homes
0.47 ha
530 dw/ha

Essential Living
Design: Assael



Union Wharf

Greenwich



Greenford Quay

Ealing

Largest BTR
Scheme in UK

1,965 homes
8.64 ha
227 dw/ha

Greystar



Greenford Quay

Ealing

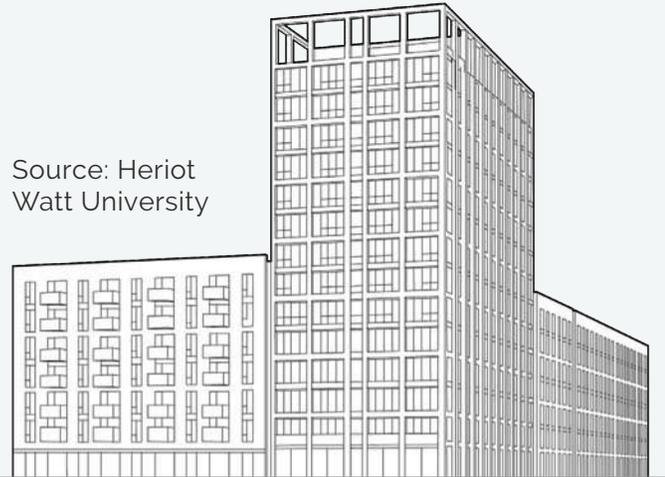
THE MOORING



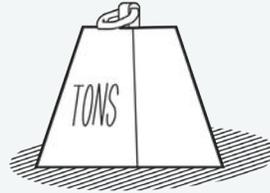
Embodied CO²

Greenford Quay study

The embodied CO² savings that were made through the use of modular construction at Greenford Quay would be equivalent to the following.

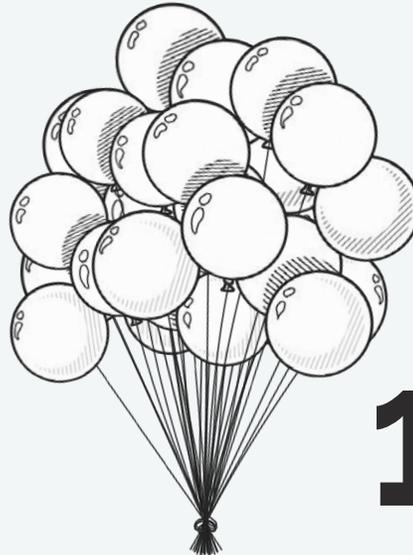


26,000
tonnes of
CO² - the
same as...



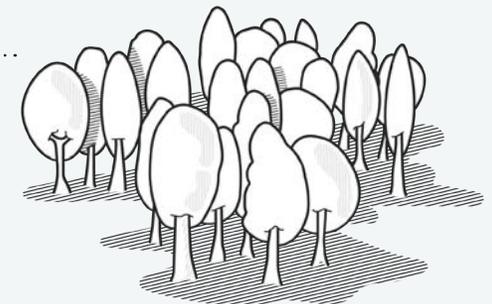
3,562
Zero-energy homes
being run for a year

7,030
Vehicles taken off the
road for a whole year



810,000,000
Balloons of CO² gas being removed from the atmosphere

160,287 Trees
being
planted



Embodied CO²

Greenford Quay Study

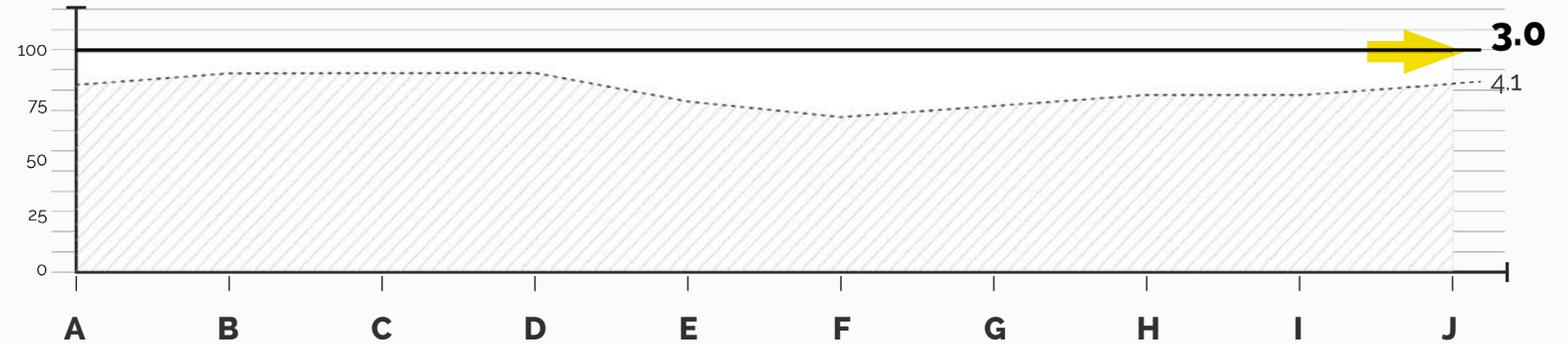
- A.** Global Warming Potential (GWP)
- B.** Embodied Energy
- C.** Water Footprint
- D.** Land Use
- E.** Ozone Depletion Potential (ODP)
- F.** Acidification Potential for Soil & Water (AP)
- G.** Eutrophication Potential (EP)
- H.** Photochemical Ozone Creation Potential (POCP)
- I.** Abiotic Depletion Potential - Elements (ADPE)
- J.** Abiotic Depletion Potential - Fossil Fuels (ADPF)

Sustainability Summary Chart

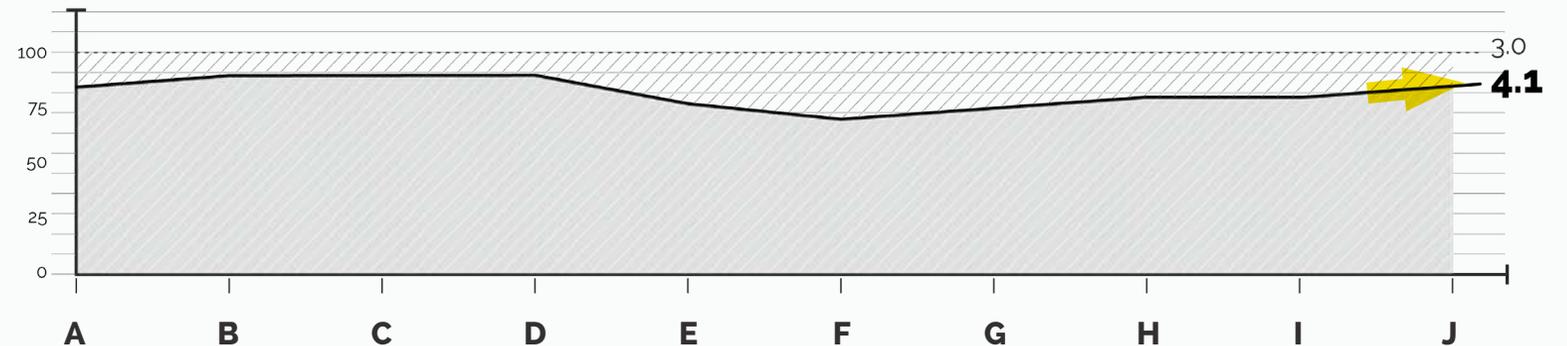
Greenford Quay Block 5

Source: Heriot Watt University

Stage 3.0



Stage 4.1



Greenford Quay

Ealing



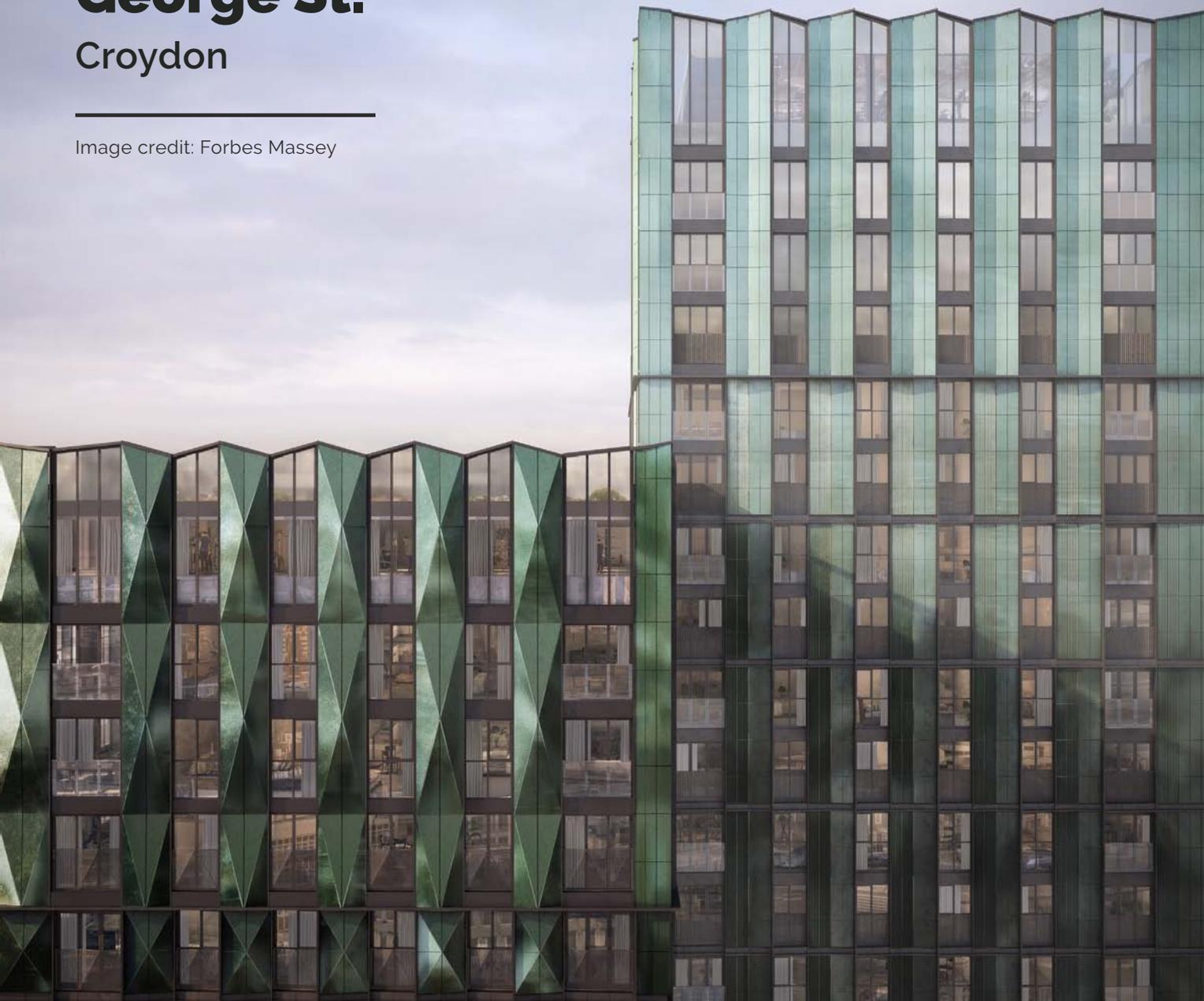
George St. Croydon

Image credit: Forbes Massey



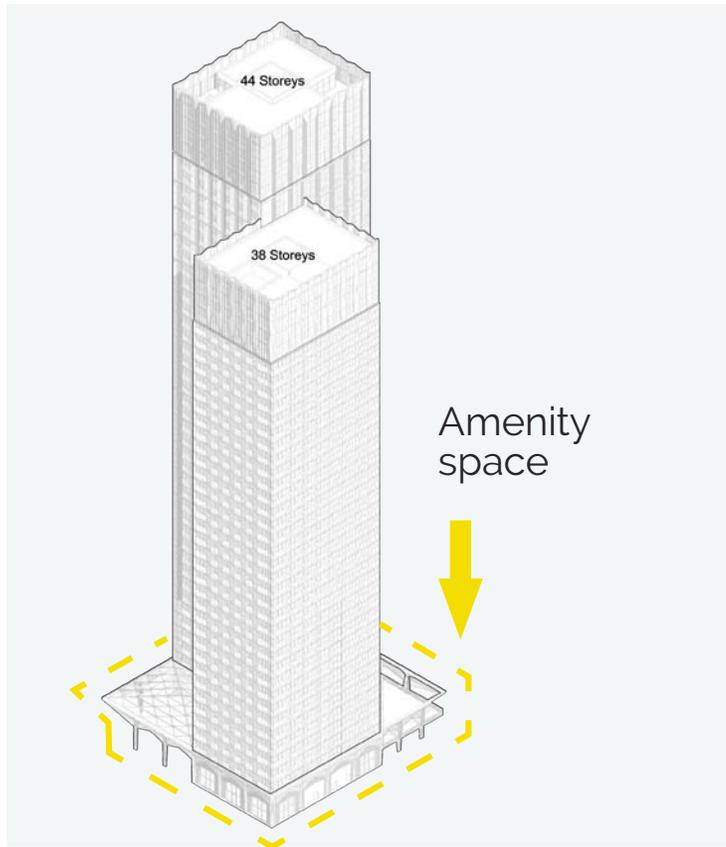
George St. Croydon

Image credit: Forbes Massey



Amenity Space Winter Gardens

Public realm



George St.

Amenity space



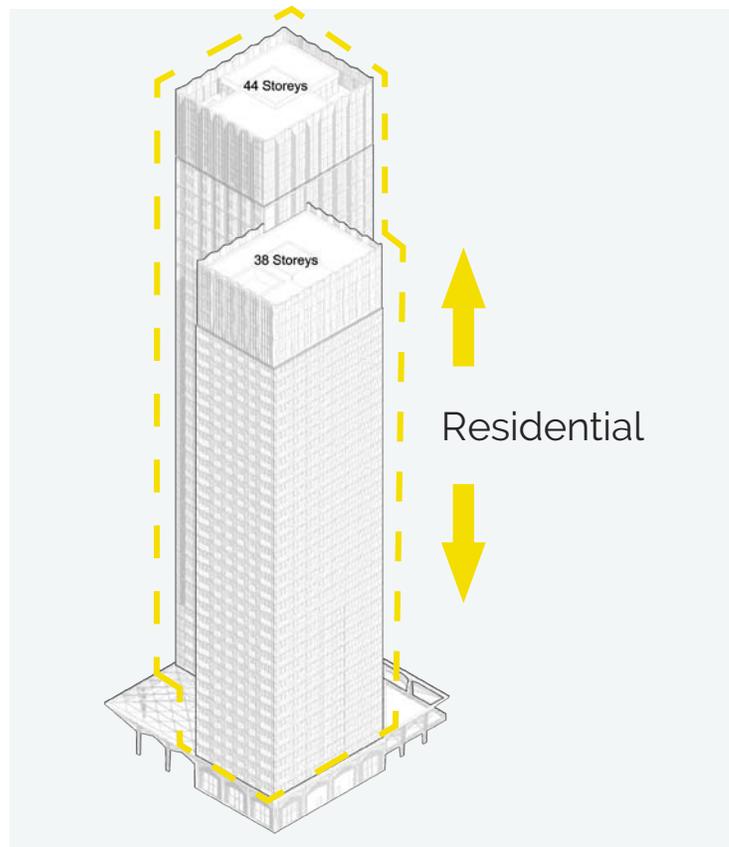
George St.

Amenity space



Residential Interior views

Private residential



George St.

Tower A interior



George St.

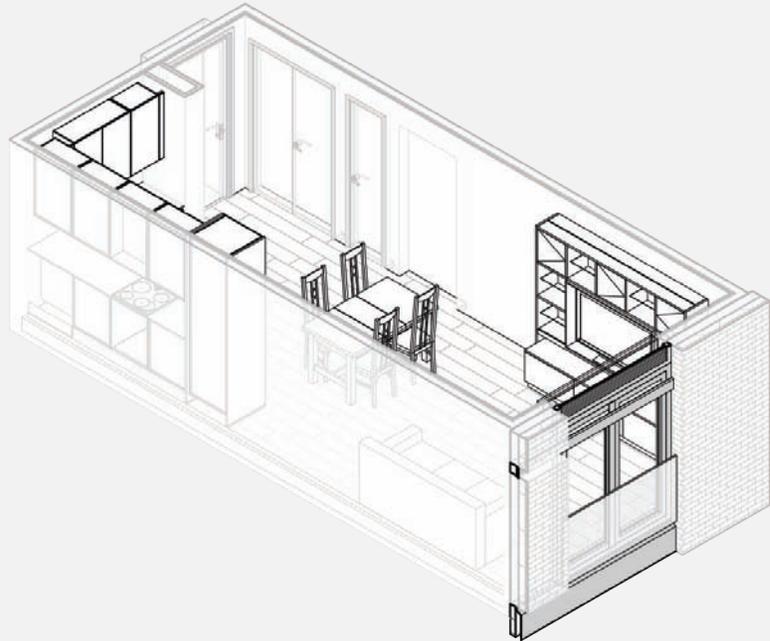
Tower B interior



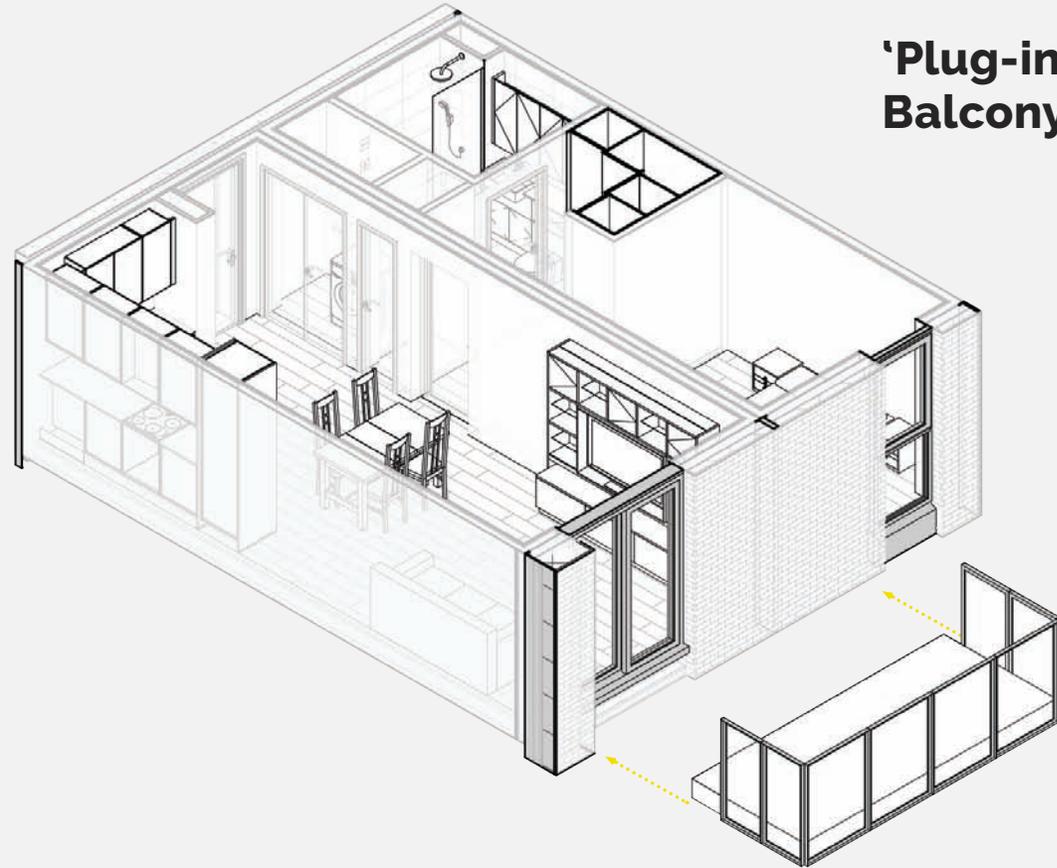
Modules with Balconies

Facade, Balconies & Cladding

**Juliet
Balcony**



**'Plug-in'
Balcony**



George St.

Typical Floor Plan

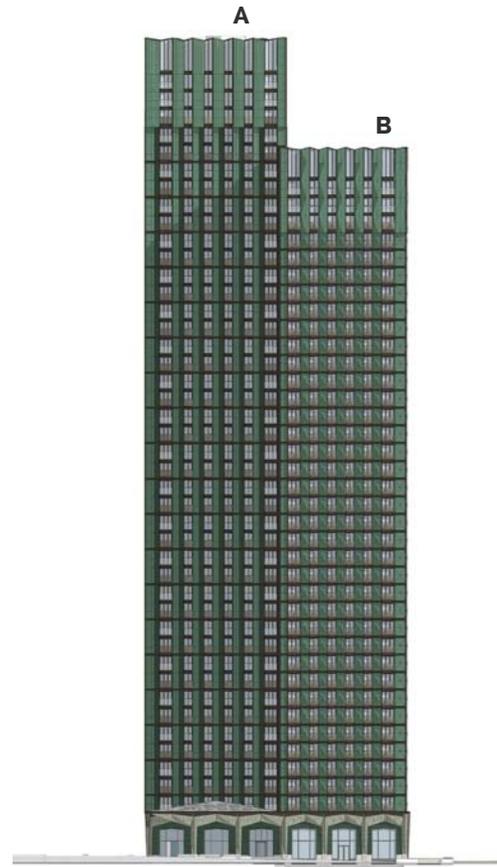


George St.

Elevation views

South & North

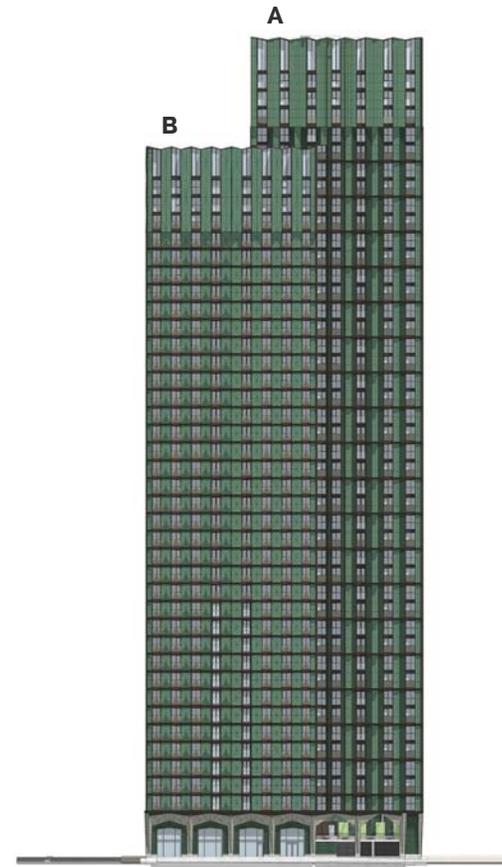
East & West



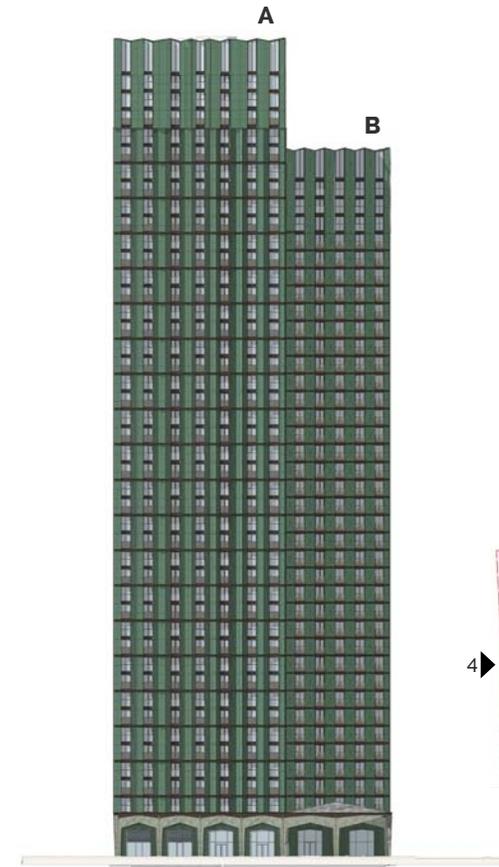
1. George St. elevation



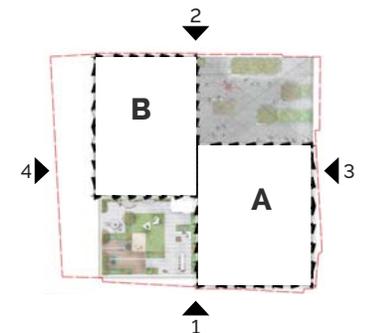
2. College Rd. elevation



3. East elevation



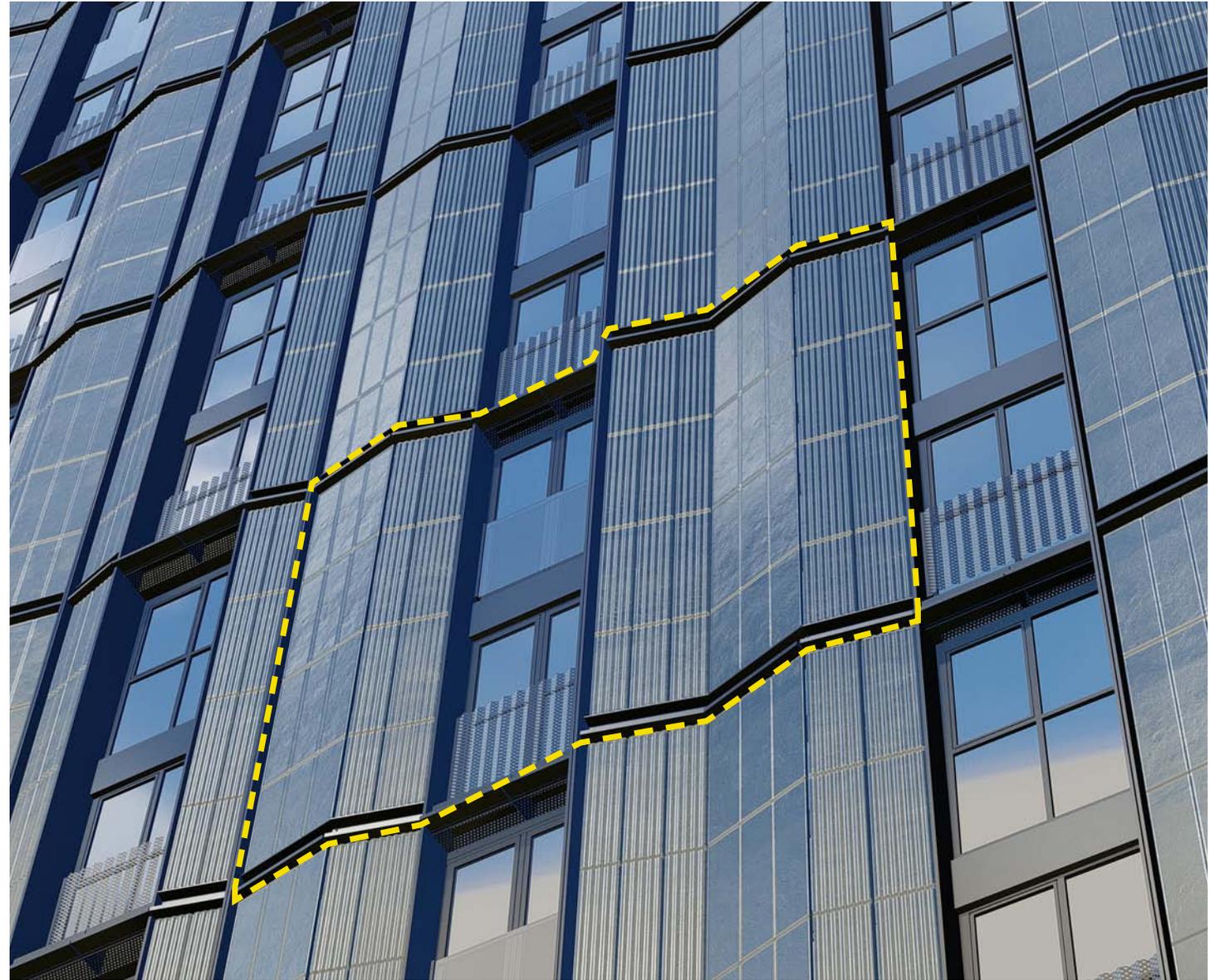
4. West elevation



Typical Bay 04

Side Mid Elevation - A East

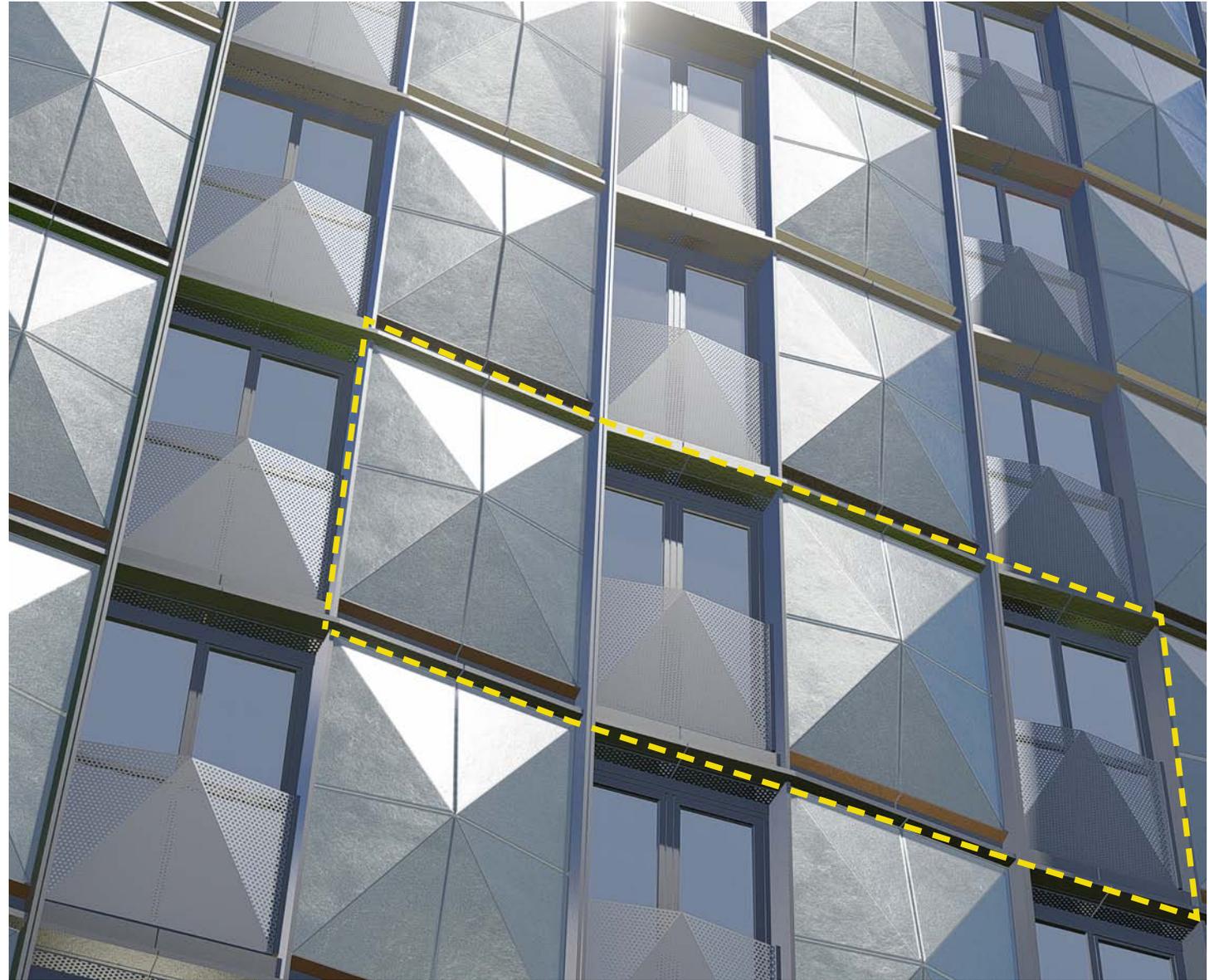
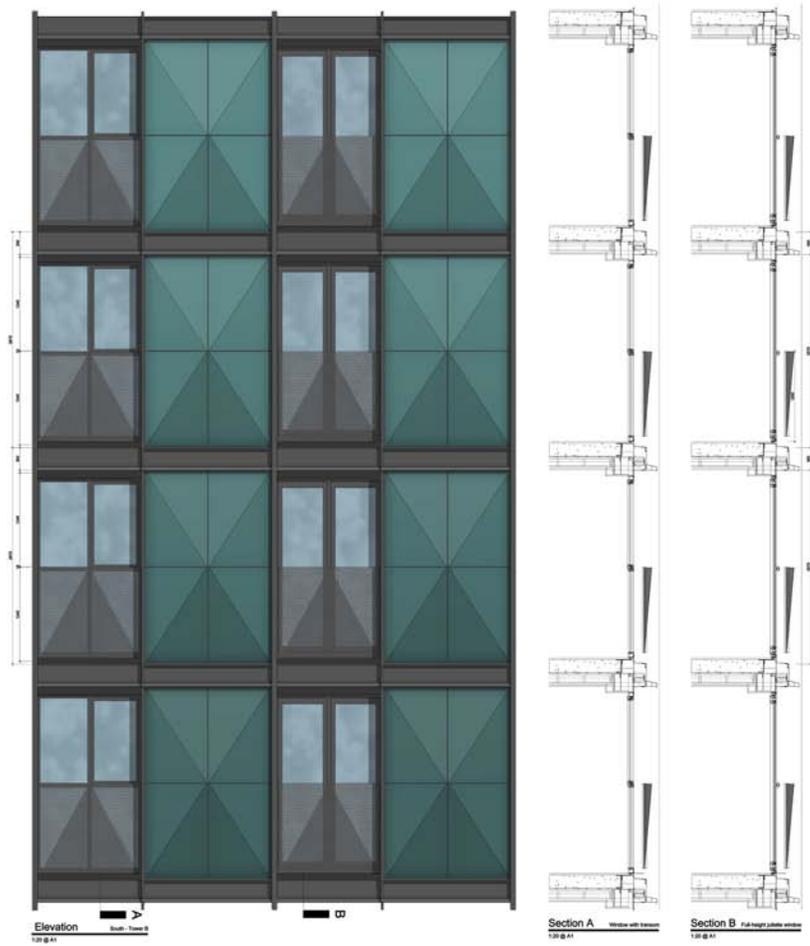
Levels 1-12



Typical Bay 02

Mid Elevation - B South

Levels 1-33



Typical Bay
Tower A



Typical Bay
Tower B



George Street

Offsite process: ground works



George Street

Offsite process: core erection



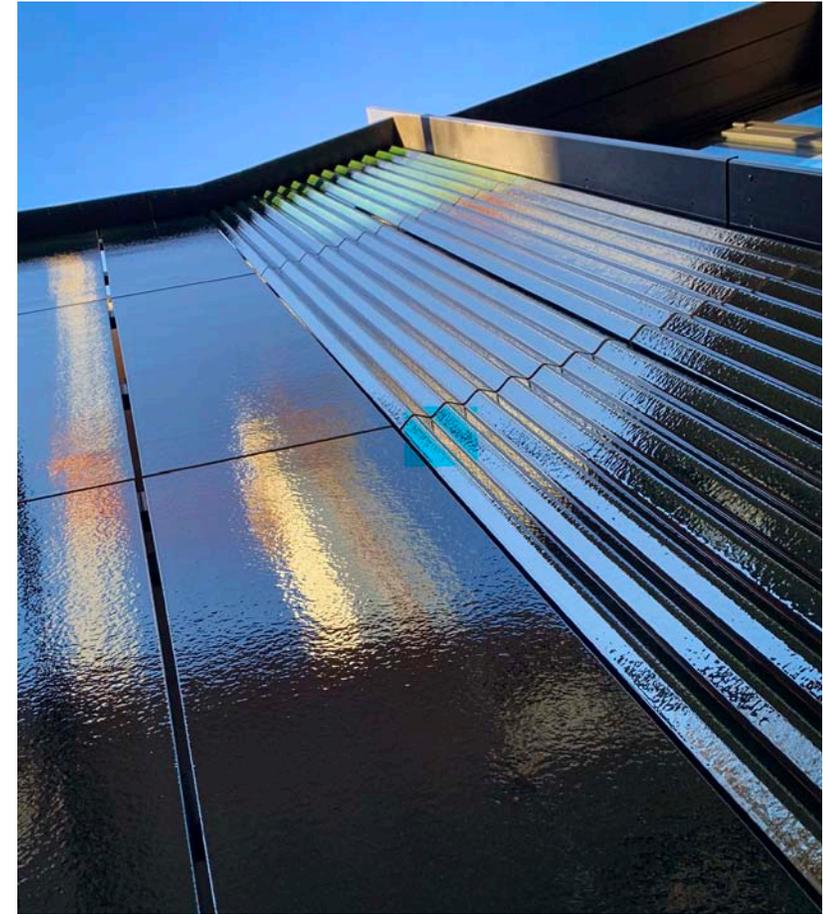
George St.

Low level elevational views

Tower A



Mock Up



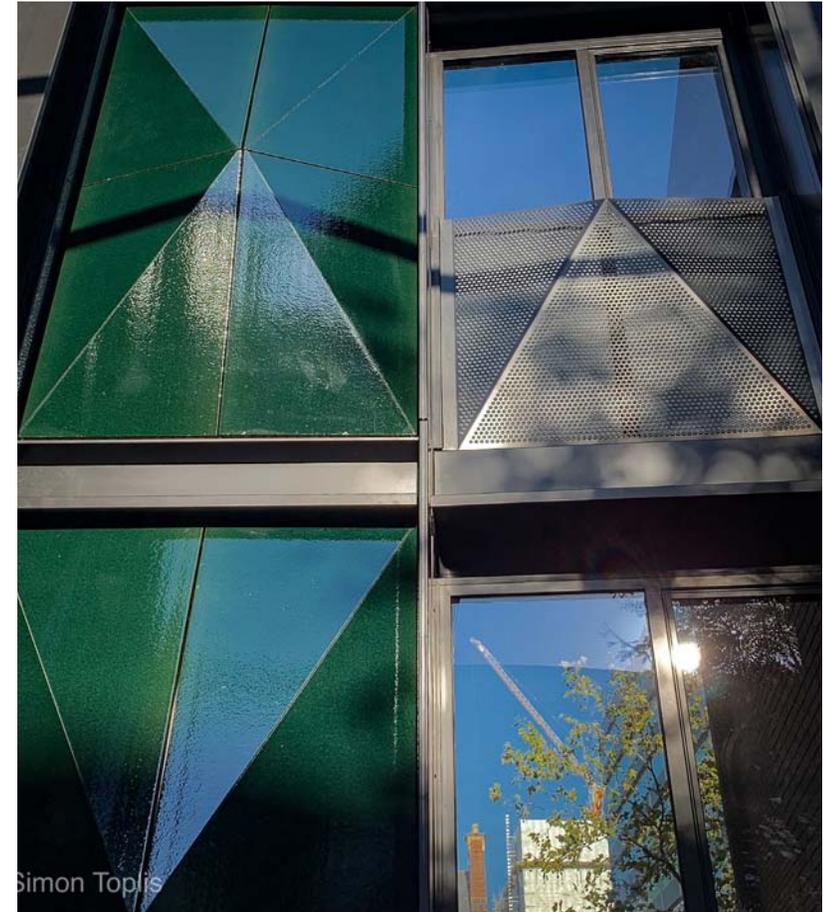
George St.

Low level elevational views

Tower B



Mock Up



George Street

Offsite process: module delivery



George Street

Offsite process: module installation



George St.

Site photos



George Street

Construction over 9 months

October
2018



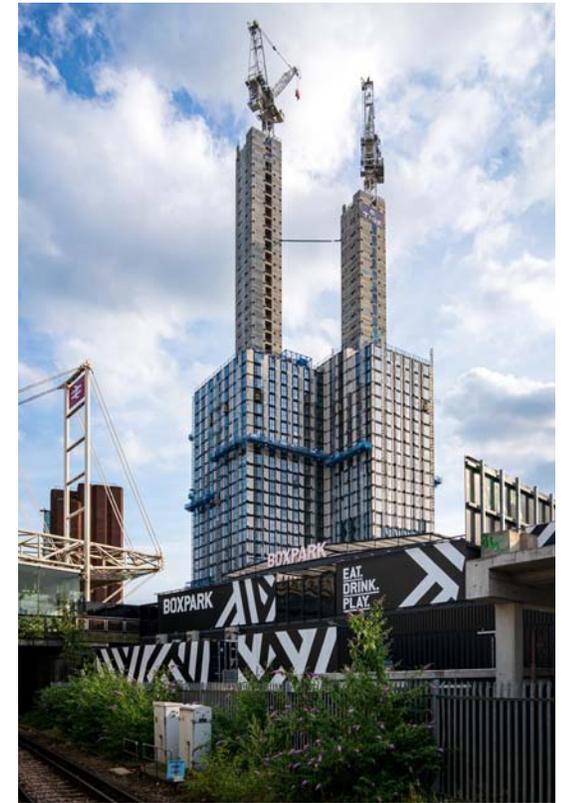
May
2019



June
2019



July
2019



George Street

Offsite process: facade installation



George St.

Tower A interior



George St. Tower A interior



George St.

Site photos



Why Hong Kong? Why HTA?

Why Hong Kong?

Opportunity to make a difference



- Genuine demand for high quality housing at super-density
- Existing resi sector is unproductive & failing to meet demand
- Acknowledgement that innovative design, procurement & construction methods are needed

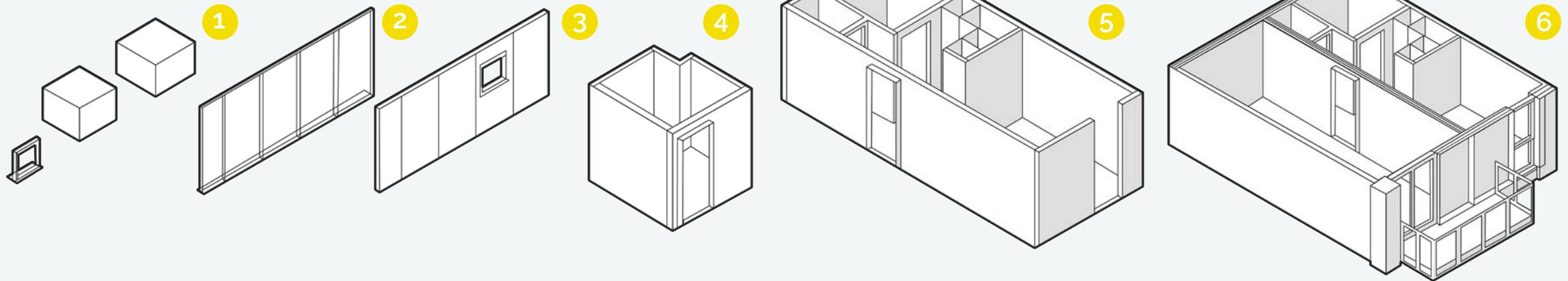
Why HTA?

Reasons for our interest in Hong Kong scene



- HTA's MiC experience highly relevant to HK market
- HTA are housing people (50 years in residential place-making & creating successful neighbourhoods)
- HTA enthusiastic to promote cross fertilisation between UK & HK MiC markets

Defining the System



Manufactured Components

Frame Systems

Panel Systems

Pods

~ Bathroom
~ Kitchen

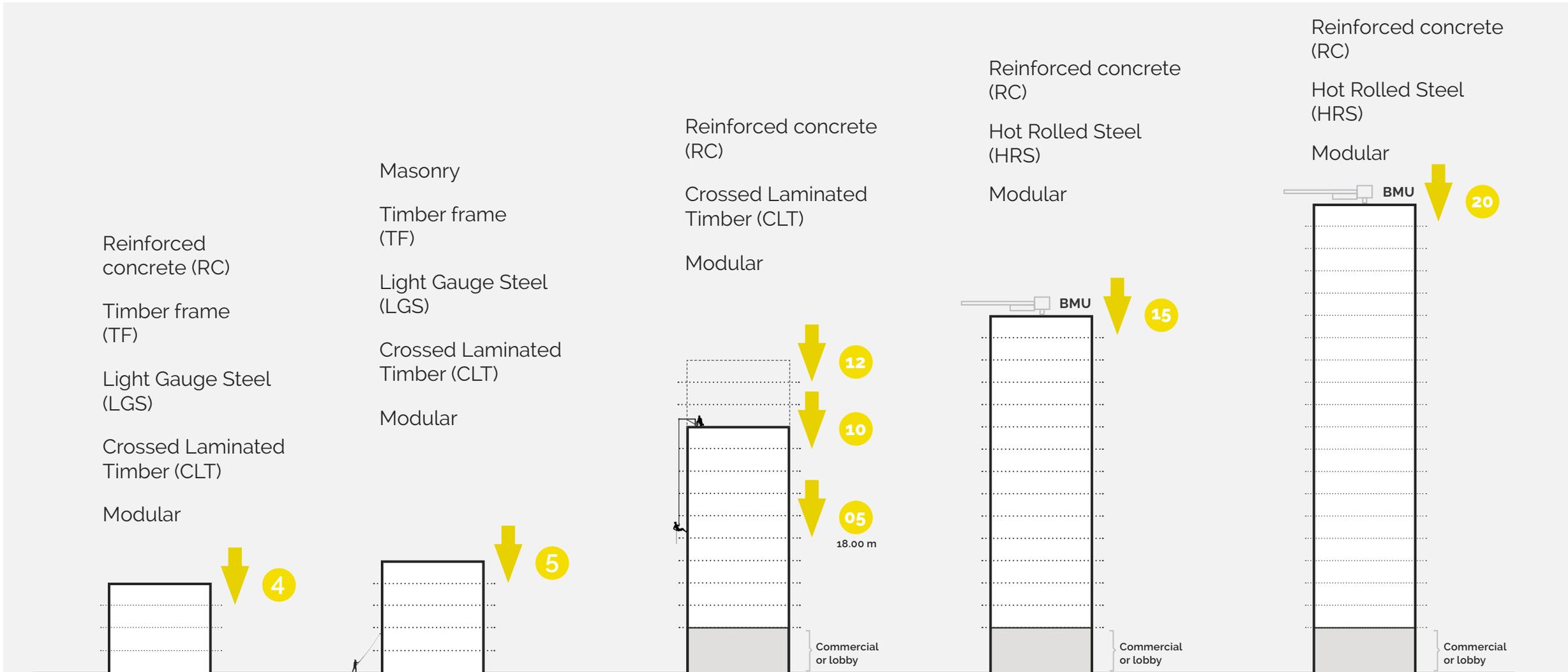
Volumetric Modular

Volumetric Modular + Prefab Facade, Foundations & Roof

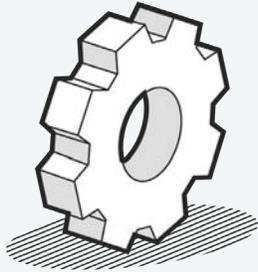
40% ————— Pre-manufactured Value (PMV) ————— 75-80%

Selecting a System

Systems by storey height



Process:

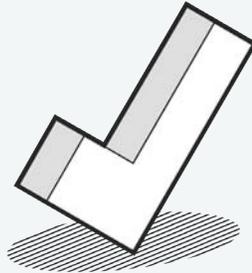


Employer appoints Contractor



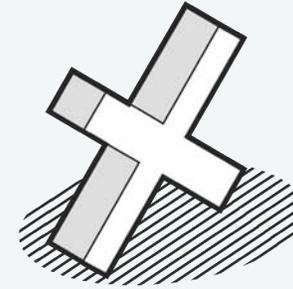
Contractor appoints MiC manufacturer (and all other subcontractors)

Pros:



- Employer has relatively hands-free role
- Risk transferred to contractor (theoretically)
- Enables competitive tendering

Cons:

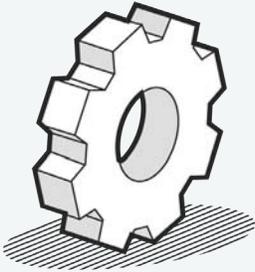


- Design reaches mature stage before MiC manufacturer is known. Design won't be optimised for chosen MiC system. Either MiC system has to be adapted, or design has to change
- Contractor unlikely to understand MiC well enough to be able to offer requisite savings on prelims and programme
- Take it or leave it commercial arrangements. Little visibility to Employer where real costs lie

MiC Procurement Routes

Construction Management

Process:

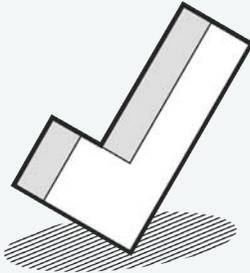


Employer appoints MiC manufacturer (and all other subcontractors)



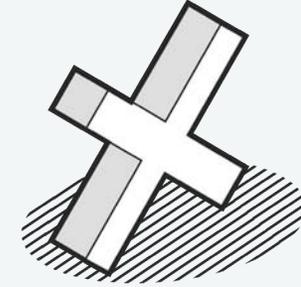
CM manages MiC manufacturer (and all other subcontractors)

Pros:



- Opportunity to engage MiC manufacturer early in design process (via PCSA) to optimise design for MiC system
- Risk is apportioned by CM (but Employer retains a share as appropriate)
- Good visibility of commercial aspects

Cons:

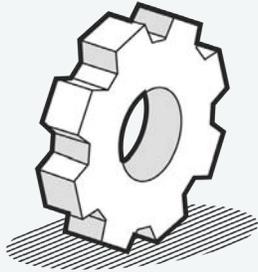


- Total cost and programme remain partially fluid throughout contract
- Requires specialist CM to manage interfaces between adjacent trade contractors
- Employer retains some of the risk normally covered in Contractor's prelims

MiC Procurement Routes

Turnkey (Vertically Integrated)

Process:

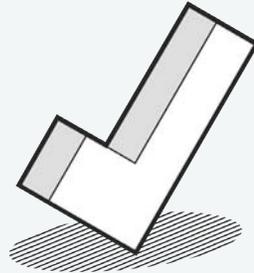


Developer has in-house MiC manufacturing and construction divisions



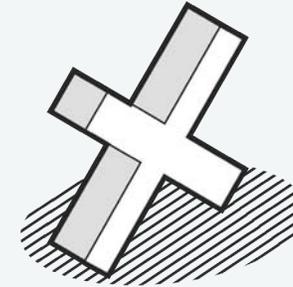
Developer manages entire process to maximise efficiency gains through MiC

Pros:



- Developer can optimise entire end-to-end process to leverage efficiencies through MiC
- Risk and profits shared equitably (disputes less likely)
- Opportunity to build on lessons learnt through repeat business

Cons:



- Requires significant capital investment to maintain viable manufacturing & contracting divisions (only suitable for large corporations)
- Requires constant pipeline of new developments to feed factory at optimal efficiency
- MiC system tends to be highly bespoke (less interchangeable with competitors)

Apex House

Wembley



1969 - 2019 50 years of innovation



Thank you

hta.co.uk | [@HTADesignLLP](https://twitter.com/HTADesignLLP) | [!\[\]\(8387fd45d40c9c68c440292d5a0a3deb_img.jpg\)](#) [!\[\]\(67c58ee7c1ba38088e812c24ca2b8f81_img.jpg\)](#) [!\[\]\(18777d9659680d74e4eca81a8dfe1933_img.jpg\)](#)