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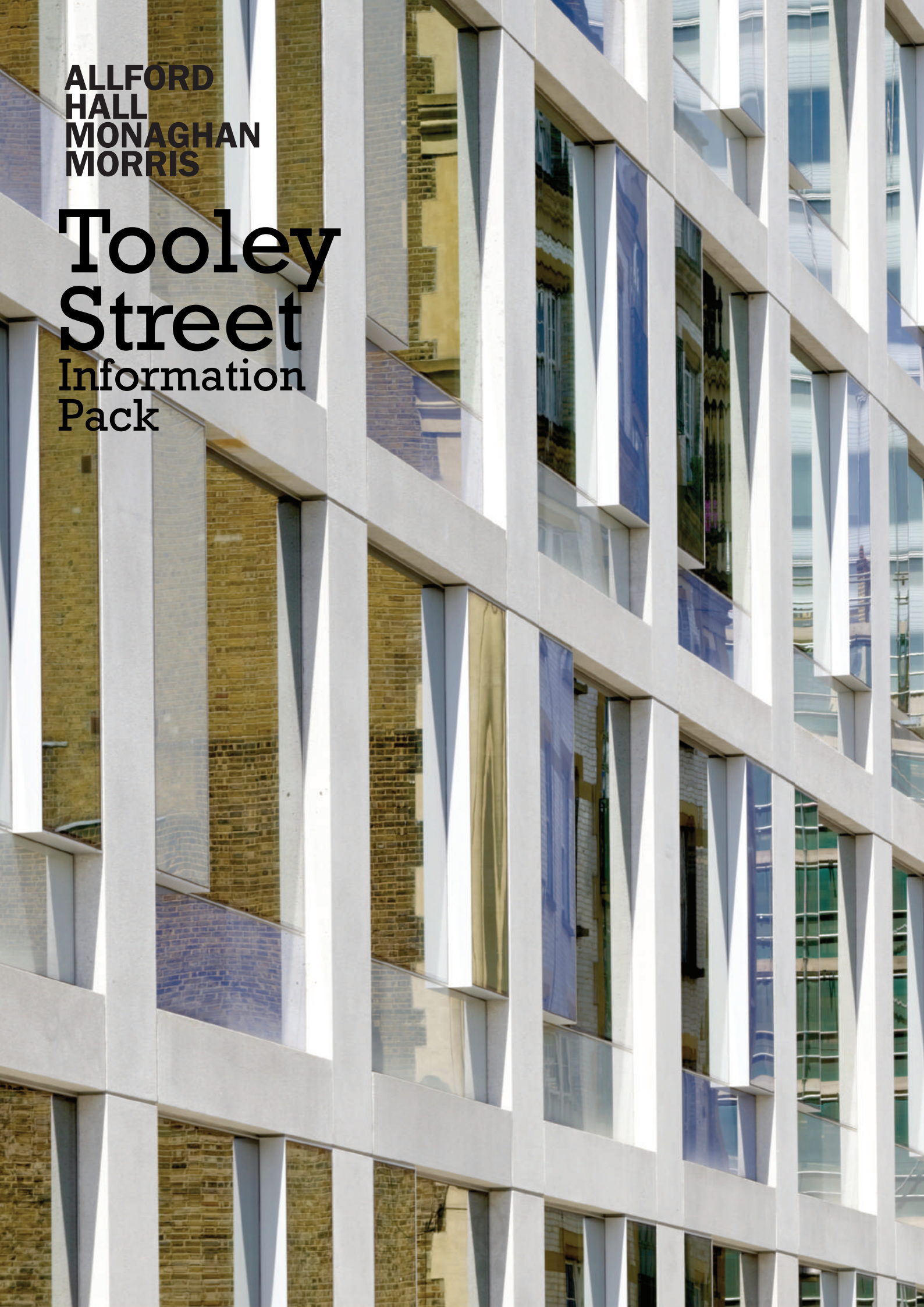
Tooley Street

Information Pack



Tooley Street

Tooley Street is an 18,600 m^2 mixed use development for Great Portland Estates. Embodying ideals of sustainability, prefabrication and flexibility, the project represents a significant step forward in the evolution of speculative office design. Part refurbishment and part new build, the scheme offers five floors of office space, a variety of retail units on the ground floor and five residential units.

An innovative approach to 'lean office design' has been adopted for all aspects of the building's design, procurement and construction. The building uses only 62% of the energy of a typical speculative office building, equating to a carbon saving of 600 tonnes per year.

Sector :	Office
Location :	London, UK
Address :	Southwark, SE1. London
Client :	Great Portland Estates
Value :	£41.6m
Start :	May 2004
Completion :	June 2008
Contract Type :	Two stage Design and Build

Key Dates

May 2004 :	Project initiated
June 2005 :	Initial multi-let scheme was amended into an 'atrium' scheme
January 2006 :	Appointment of the Contractor at the end of Stage C
January 2006 :	Planning consent was obtained
September 2006 :	Works on site commenced
June 2008 :	Works on site completed
March 2009 :	First occupants move in

Areas

Gross Internal :	200,000 ft^2 | 18,600 m^2
Office	146,765 ft^2 | 13,635 m^2
A1/A3 space	12,000 ft^2 | 1,115 m^2
Residential	4,150 ft^2 | 3,850 m^2

Brief Planning History

The project evolved from a thorough design development and consultation process with the Planning Authority, conservation officers, the client, the client's letting agent, local interest groups and residents. From the beginning, studies focused on massing, materiality and connection in relation to the mixed urban context, daylighting and rights of lights considerations.

Planning approval for the scheme was received in January 2006.

Project Team

Client :	Great Portland Estates Plc
Architect :	Allford Hall Monaghan Morris
Structural Engineer :	ARUP
Building Services Engineers :	ARUP
Project Manager :	Jackson Coles
Main Contractor :	Laing O'Rourke
Quantity Surveyor:	Gardiner and Theobald LLP
Planning Consultant:	Montagu Evans LLP
Rights of Light Surveyor:	Anstey Horne
Fire Consultant:	Bodycote Warringtonfire
Approved Inspector:	Butler and Young Group
Planning Supervisor:	Gardiner and Theobald LLP
Party Wall Surveyor:	Jackson Coles
Acoustic Consultant:	Alan Saunders Associates
Letting Agents:	DTZ Holdings Plc

Allford Hall Monaghan Morris Team Members

Simon Allford, Sarah Baccarini, Alberto Barba Guerrero, Andreia Castanheira, Ming Chung, Nic Crawley, Patricia Ferreira de Sousa, Jonathan Hall, Gareth Jones, Dan Marshall, Ian McArdle, Yuk Ming Lam, Paul Monaghan, Peter Morris, Andy Jones, Gareth Lord, Goh Ong, Geoff Poon, Ana Sa, Maria Antonia Ripoll, Jonathan Rixon, Morna Robertson, Robert Romanis, Philip Turner, Ignacio Vidal Traver, Artur Viveiros, and James White.

For further information and images please contact

Allford Hall Monaghan Morris
Morelands
5-23 Old Street, London
EC1V 9HL

T: +44 (0)20 7251 5261

E: press@ahmm.co.uk

Project Description

160 Tooley Street is an 18,600m^2 mixed use speculative development. It represents a significant step forward in the evolution of office design. The building embodies current thinking about how commercial buildings can respond intelligently to the need for sustainable architecture, in its broadest sense. Part refurbishment and part new build, the scheme offers five floors of flexible office space, a variety of retail units on the ground floor and five residential units.

Client's Brief
The brief to the Design Team was to deliver a scheme which was to embrace sustainability, enhance the character of the existing Tooley Street buildings and maximise net lettable area. Particular focus was to be given to utilising modern methods of construction where high levels of prefabrication would lead to cost efficiencies and waste reduction.

Planning opportunities and constraints
The project evolved from a thorough design development and consultation process with the Planning Authority, conservation officers, the client, the client's letting agent, local interest groups and residents. From the beginning, studies focused on massing, materiality and connection in relation to the mixed urban context, daylighting and rights of lights considerations.

Materials
The existing buildings have been retained and refurbished, maintaining the urban grain of the street. The materiality of the new facades responds to the urban context, being robust in nature, but with detailed consideration given to contrasting finishes as well as articulation of the façade in terms of depths of reveals. The materials are hard, in response to the urban surroundings. Internally, the exposed precast concrete soffit, a vital feature of the building's energy strategy, generates a new kind of architecture. A bespoke direct/indirect lighting system was developed as part of the total solution.

Procurement and Construction
Early discussions with contractors enabled the best resolution of technical issues. Many elements were manufactured off-site, in the form of precast soffits and columns, prefabricated service looms and a unitised façade to the new build. This resulted in higher quality finishes, easily and quickly installed on site with greatly reduced waste. Mock-ups and trials were used extensively to explore and refine new ideas.

Summary of Timetable
The project was initiated in May 2004. The initial multi-let scheme was amended into an 'atrium' scheme in mid 2005, following interest from tenants in taking the whole building. A two stage tender using a design and build contract was used with the appointment of the Contractor at the end of the Stage C in January 2006. Planning consent was obtained in January 2006. Work on site commenced in September 2006 and was completed in June 2008. A fitout was undertaken following handover, and was ready for occupation in sprint 2009.

Programme and Budget Constraints and Opportunities
The scheme was procured at a relatively low capital cost. Subcontractors and suppliers were able to plan early, avoid delays and any unnecessary costs. Early consideration of design responsibility led to economy of working. Lean construction methods with minimal wet trades, no external scaffold and extensive use of self finished materials kept the contractors on site costs down. Modular methods and prefabrication were used extensively on the services installations to avoid site problems and minimise installation work on site. Extensive modelling and large scale mock-ups were utilised to reassure the client and agents that such approaches were both suitable and effective.

The use of recycled water, solar heating, low maintenance finishes, intelligent lighting systems as well as the cooling benefits of the exposed concrete structure has resulted in a pleasurable working environment that is both energy and cost efficient. In addition, the plan - designed to be capable of being split into multiple separate tenancies - is future-proofed for a range of different potential users of various sizes.

Conclusion
The completed 160 Tooley Street project represents a significant step forward in the evolution of office design and serves as a new model for large scale commercial office developments. It is a successful speculative commercial office building: it was forward-sold twice and then pre-let before completion. But, more importantly, it is built research into how the office can be artistically and technically reconsidered.

On the urban level, the three existing buildings have been retained, refurbished and then cut away: creating a link between old and new, generic and specific, and building and city.

On a technological level, the new building tests construction skill. Its concrete materiality, expressed through innovative prefabrication of structure, wall and soffit, defines an architecture of the purposeful eradication of superfluous detail. The engineering is integrated into the fabric of the architecture: nothing can be taken away and nothing need be added.

On the organisational level, 160 Tooley Street pursues the idea of big flexible volumes. This is not radical but it reflects a commitment to the philosophy of long-life-loose-fit architecture: dimensions in plan and section are generous and the focus on light creates two generous city rooms, one open, one enclosed.

Ultimately, 160 Tooley Street succeeds because the new model it defines offers delight. Delight in the remaking of the old; the richness, depth and materiality of the new and the engagement of the two. 160 Tooley Street defies the norm and the call for monotonous sameness by offering difference, delight and incidence: the future of the office, and the office of the future is lighter, larger, specific and dynamic.

Client Summary

The site was assembled by Great Portland Estates in four separate transactions through the summer of 2004. The three buildings fronting Tooley Street were tired in appearance and inefficient internally, whilst the land to the rear accommodated a collection of one and two storey warehouses.

The brief to the Design Team was to deliver a scheme which was to embrace sustainability, enhance the character of the existing Tooley Street buildings and maximise net lettable area. Particular focus was to be given to utilising modern methods of construction where high levels of prefabrication would lead to cost savings and waste reduction. In addition, the London Mayor's renewable energy target of 10% was to be delivered through the incorporation of a biomass boiler and solar thermal water heating.

The team delivered – 160 Tooley Street represents a significant step forward in the evolution of office design, procurement and thoroughly embraces sustainability. As a direct result, keen interest was shown by potential tenants including City & Guilds, TfL as well as Southwark Borough Council who eventually took a pre-let of the building in July 2007. All were eager to occupy a building whose green credentials were not merely regarded as being token.

Contractor Summary

The Laing O'Rourke Group joined the Tooley Street project team in January 2006 following a successful 1st stage tender. At this point the scheme design had been recently revised and was at Stage C.

The involvement of a main contractor at this early stage not only brings initial benefits with buildability advice but also longer term benefits from having a contractor that is full briefed and integrated into the team prior to starting on site. By forming these relationships early in the process the transition to a Design and Build contract was made with greater confidence and less risk to all parties.

The Laing O'Rourke Group understood the aspirations behind the project and was able to input into its development by drawing on the specialist knowledge of its in house companies:

- Expanded Piling - Worked with Arup Structures to design the most appropriate foundation solution.
- Malling - Worked with the design team to develop the external pre cast cladding solution. Malling was also able to demonstrate what was achievable with pre cast concrete for the exposed structural frame and soffit panels. This work contributed to the success of the finished product.
- Expanded structures – Worked alongside Arup, Mallings and the other designers to devise a method of construction that enabled the programme to be met, while achieving a high standard to the concrete finish.
- Strongforce – Designed the post tensioned slabs in conjunction with Arup and Expanded structures.
- Crown House Technologies – Collaborated with Arup services and other design team members to develop the design of the services installations, utilising their 3D modelling capabilities.

The integration of the various parts of the group at all stages of the design process was fundamental to the success of the project. This success however, was as much due to the keenness of the client and the designers to join forces with the wider team, as the contributions themselves. When challenges presented themselves they have been resolved collectively. Every member of the team contributed to the genuine desire to deliver an outstanding and innovative building.

Design Ambitions

Overview

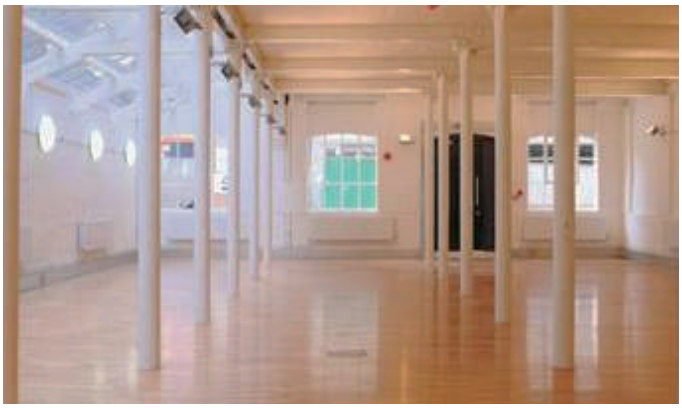
From inception, the ambition of the client and project team was to create a building that would offer a critique of recent speculative office developments. In doing so, the building would serve as a new model for large scale commercial office developments.

An innovative approach has been adopted for all aspects of the building's design, procurement and construction. This is based on a clear attitude to holistic, integrated design, involving a high degree of coordination between disciplines and with the main contractor and key subcontractors.

Whilst few of the technologies applied are in themselves ground-breaking, it is the way in which these have been successfully brought together, coupled with the scale of application, that is visionary.

The stated ambitions were:

- High quality, flexible product
- Low energy building
- Prefabrication
- Intelligent design, procurement and construction



Project aspirations

Design Ambitions

Flexibility

High quality, flexible product:

- Excellent internal environment
- Achieve good natural daylighting levels
- Provide good artificial lighting conditions
- Access to views out from all parts of each floor plate
- Generous floor to ceiling height
- Challenge preconceived notions about planning grids
- Flexible tenancy and cellularisation strategies
- Optimised structure relative to depth of floor plate
- Robust architectural language, responsive to its context

Self finished prefabricated components for repetition, integrated structure and services

Design Ambitions

Low energy

Low energy building:

- Achieve BREEAM Very Good rating
- Reduce energy consumption
- Exposed thermal mass
- Displacement air conditioning system
- Consider alternative strategies for sustainable design
- Minimise solar gain

Structural duct

Solar thermal tubes

Design Ambitions

Prefabrication

Use of prefabricated components:

- Greater guarantee of quality and finish
- Reduce the duration of on-site work
- Limit the need for site storage – important on a tight urban site
- Minimise reliance on finishing trades
- Minimise waste
- Minimise use of wet trades
- Minimise requirement for scaffolding

Assembly of pre-fabricated components

Pre-cast soffit

Design Ambitions

Procurement and construction

Intelligent design, procurement and construction:

- Embrace a collaborative approach between all stakeholders on the project
- Close coordination of architecture, structure and building services
- Obtain early input of specialist knowledge - external envelope, exposed superstructure, buildability
- 2-stage tender and incentivised pre-construction services agreements with key sub-contractors

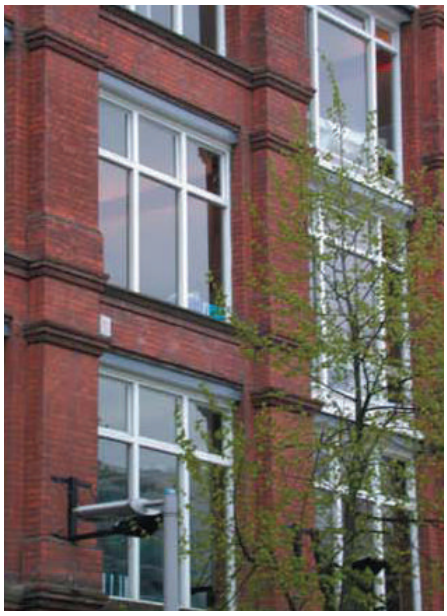
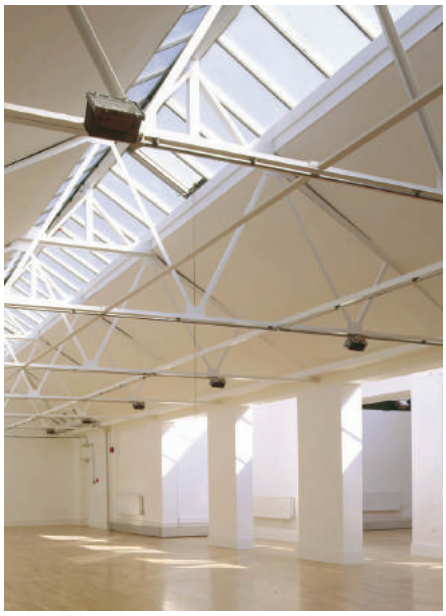
Site progress photographs

Design Ambitions

Materiality

The term ‘new warehouse aesthetic’ was coined in the early stages of the project to describe an attitude towards materiality and the internal aesthetic of the new buildings.

The buildings were conceived as a contemporary reinterpretation of nineteenth century warehouse buildings. These offer robust, light, big volume, flexible space that provide high quality, desirable space even today.




Precedent AHMM buildings: New warehouse aesthetic

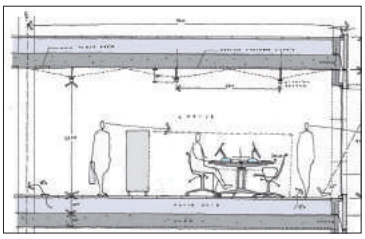
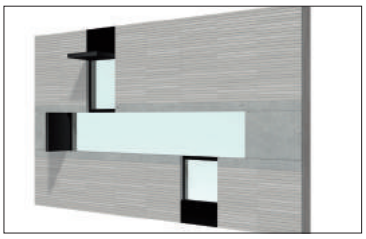
Design Development

Timeline Overview

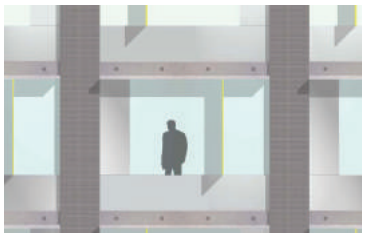
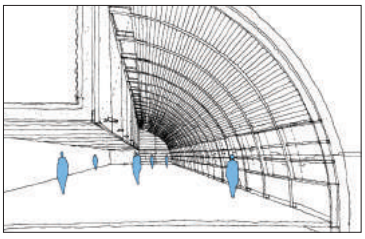
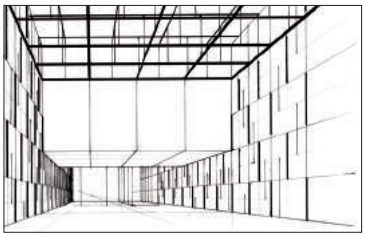
Achieving the project aims demanded close integration of architecture, structure and building services. This has been attained through the collaborative approach adopted by the wider team throughout the duration of the project.

The strong backing of a forward looking client was pivotal to the outcome of the process. 160 Tooley Street represents the continuation in a thread of research in to lean building methods that includes The Johnson Building, Yellow Building and has been followed by Angel and City Road. These projects are linked by a concept which has been termed 'White Collar Factory'.

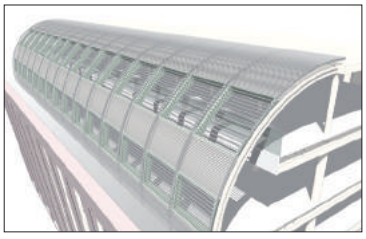
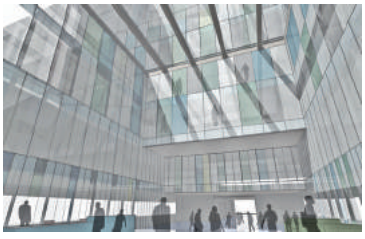
2004

2005

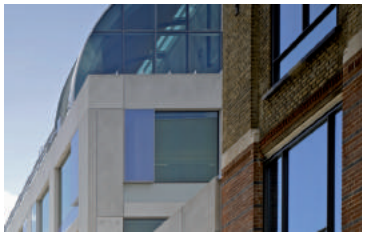
2006

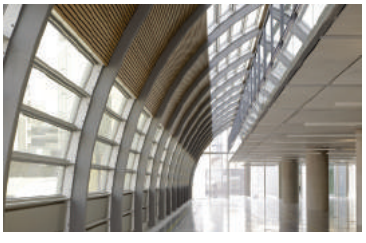




2007



June 2008





Design Development

Urban Context

The new buildings are conceived as a remaking of the existing warehouse buildings on the site. As such, they reflect their clear structural language, and employ robust materials, appropriate to the urban context.

Existing Tooley Street elevation

Cleared site looking south

Typical floor of existing building

View north from roof of existing buildings

3rd floor 166 Tooley Street

Barnham Street looking south

View south over site before demolition

Design Development

Site connections

The site fills an urban block between Tooley Street and the mainline railway viaduct connecting London with the south coast. The scale of the project is such that it is conceived as a piece of masterplanning.

As such, it strives to reinstate connections between More London and the river Thames to the north, and peripheral areas south of the railway. Improvements have been carried out to the side streets to enhance connections. This theme is reinforced by the idea of the internal street, linking a series of 'public rooms'.

KEY

A	Access from City Hall
B	Access from Tower Bridge
C	Access from Shad Thames
D	Access through railway tunnels
E	Access from London Bridge Stations
F	Access from Thames riverside walk

01	River Thames
02	City of London
03	Central London
04	Hay Gallery
05	More London
06	Potters Fields
07	Primary office and retail entrances on Tooley Street
08	Primary residential entrance on Shand Street
09	Railway viaduct to London Bridge & Charing Cross Stations

Computer generated photomontage

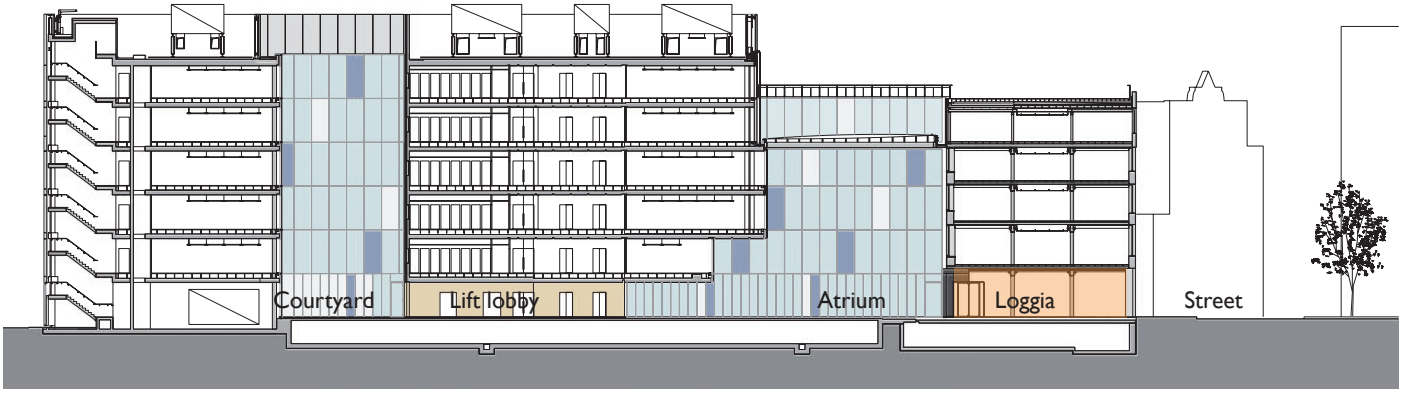
Design Development

Entrance and street

The principle organising device in the scheme is an internal street that accommodates the public areas of the building as well as the principle vertical circulation and services zones. The idea of a street manifests itself as a succession of linked spaces or rooms, each having its own spatial quality.

The rooms are visually unified by means of a continuous stone floor surface. The office floorplates are arranged as two wings to each side of the street, connected at upper floors to create donuts of open plan space.

Early sketch proposal of Tooley Street office entrance



Section through street - Tooley Street Entrance loggia, atrium, lift lobby, courtyard

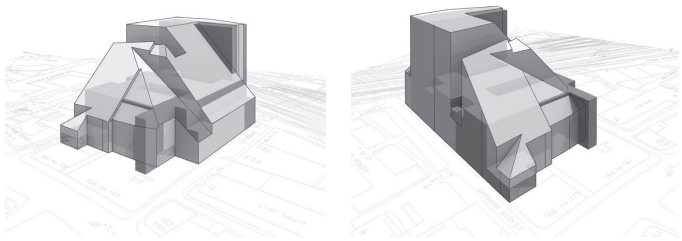
Views of completed loggia and atrium spaces

Design Development

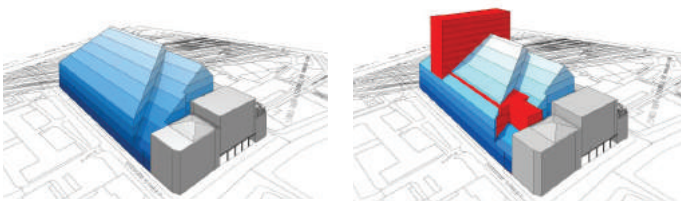
Rights of light

The building occupies a dense urban site on the south side of Tooley Street in Southwark.

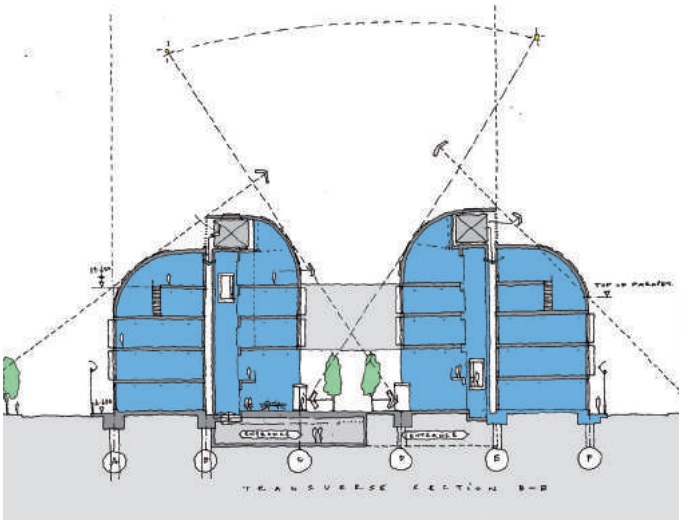
The form and mass of the building have been derived from analysis of daylighting and rights of light as well as a consideration of the characteristics and scale of surrounding buildings.



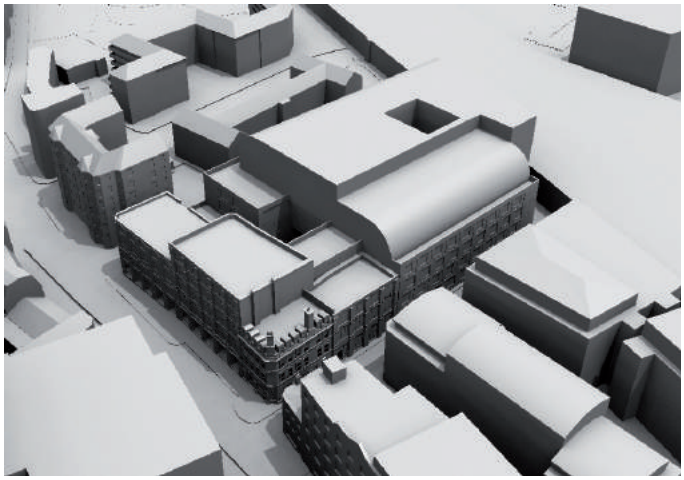
Rights of light analysis model



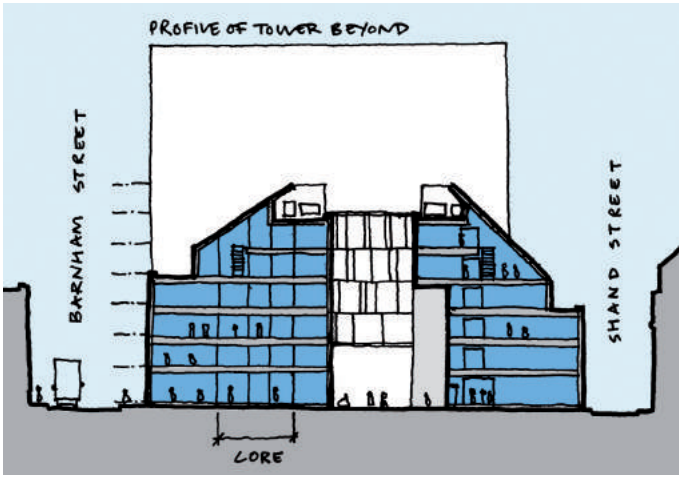
Early scheme within rights of light envelope



Design development sketches with rights of light considerations



Massing study



Design Development

Sustainability

A driving ambition of the project was to achieve a BREEAM (2006) Very Good rating. This was easily achieved, along with a strong B rating APC certificate. Throughout the design development, alternative strategies for sustainable design were considered and solar gain was addressed through the form and façade design. Significant use of prefabricated components delivered a number of advantages including; a greater guarantee of quality and finish: the reduction of on-site work and the need for site storage; reduced reliance on wet and finishing trades; reduced waste. In addition to this, rainwater harvesting was incorporated into the scheme.

After planning permission was granted in 2005, the GLA's requirement for 10% of the building's energy consumption to be provided from on-site renewable sources became mandatory. The inclusion of a biomass boiler as well as solar thermal preheating of hot water, using evacuated tubes on the west facing roof were able to provide a total of 10% of the building's energy use.

- Reduced waste through prefabrication
- Biomass boiler
- Rainwater harvesting for grey water building use

Solar thermal tubes for pre-heating of hot water

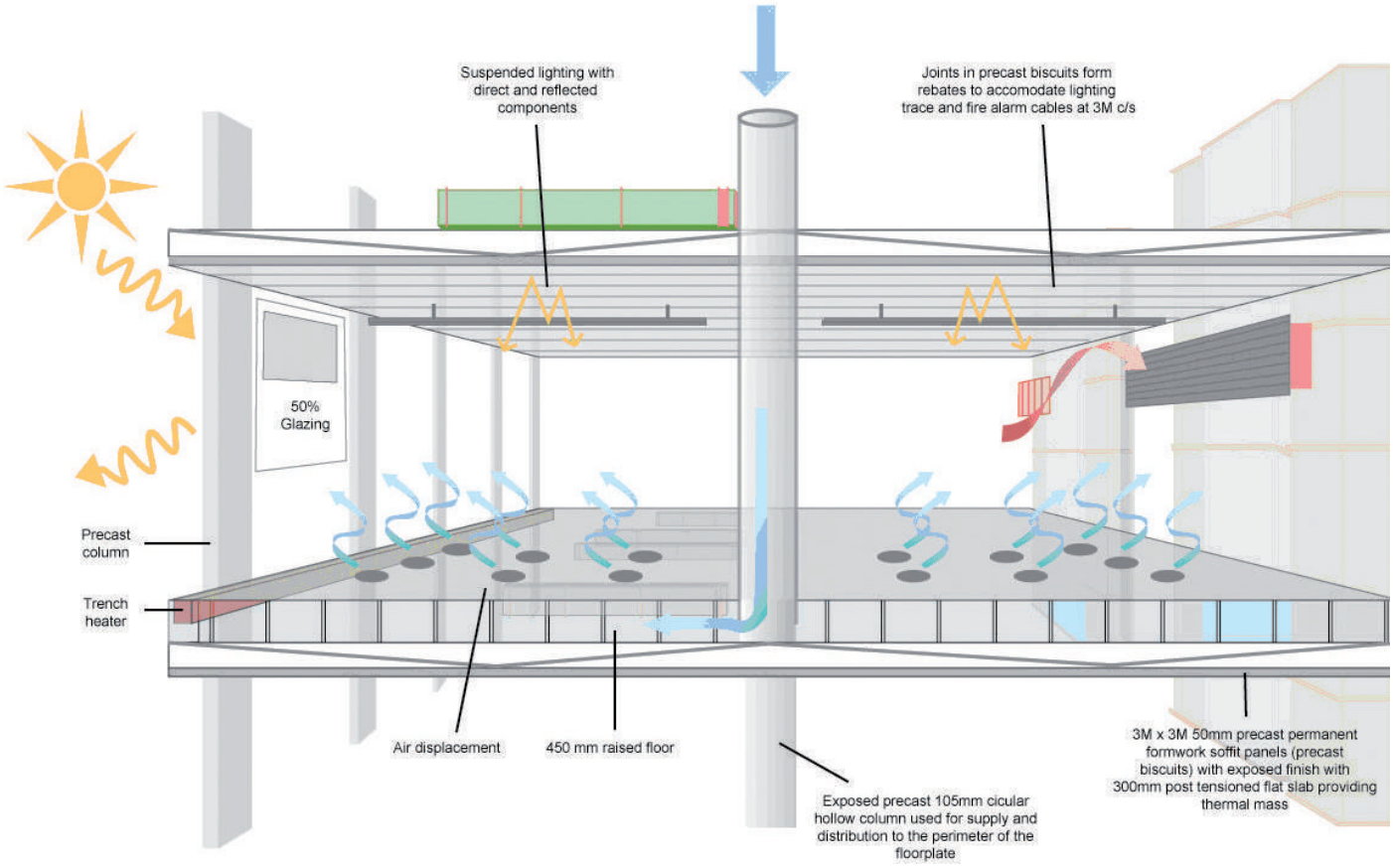
Biomass boiler

Design Development

Structural ducts

Air is routed through the hollow centres of columns from roof mounted plant. This dispersed delivery limits the length of ducting required, and simplifies the service layout.

The central columns act as structural ducts delivering cooled air from the rooftop plant, directly to the perimeter zone of each floor plate, where the solar gain load is highest. The development of techniques for pre-casting these components involved a high degree of coordination between design team and the precast concrete sub-contractor.



Sustainability diagram

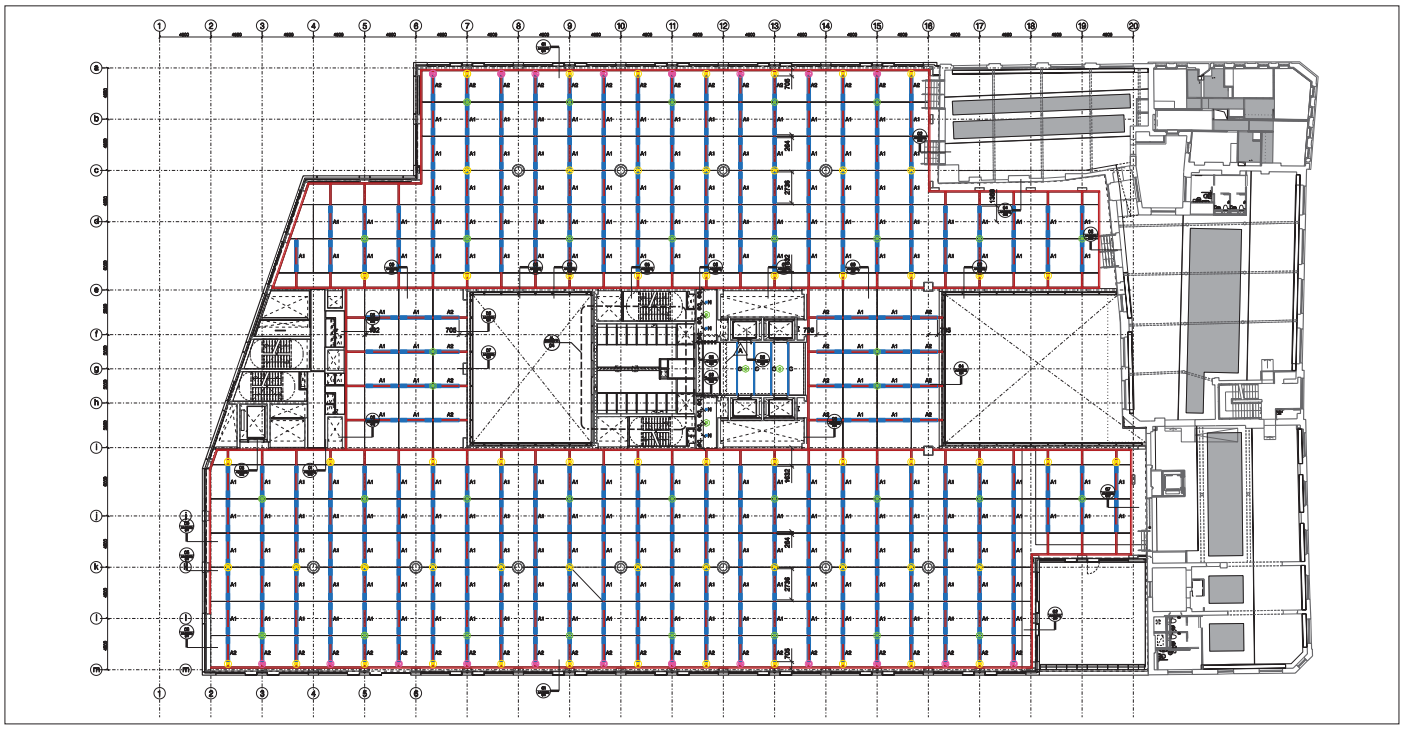
Integration of elements in finished building

Design Development

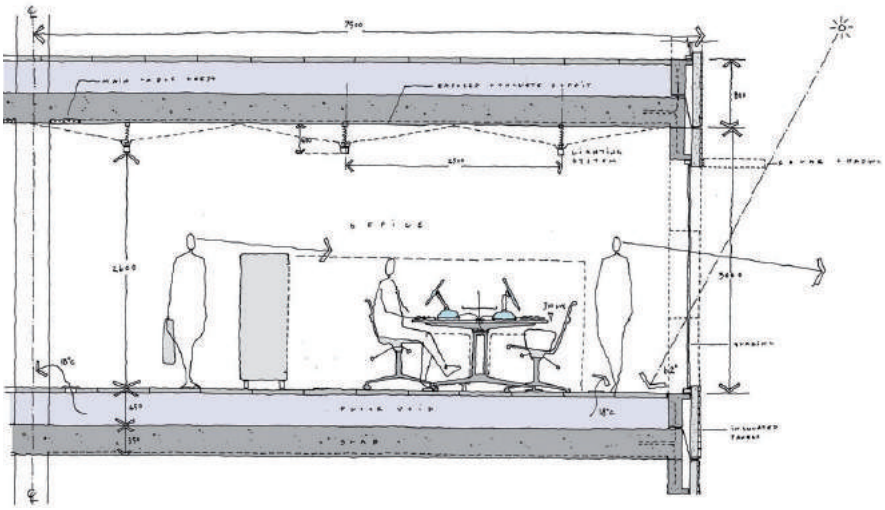
Soffits - biscuits

To be most effective, the displacement air conditioning system needs a generous floor to ceiling height and exposed thermal mass. By revealing the soffit, control of the finish and coordination of building services installations becomes crucial.

The precast concrete soffit panels, or 'biscuits', were formed in steel moulds using self-compacting concrete, with an as-struck finish. These are used as permanent formwork to a post-tensioned in-situ slab and have steel lattices cast into the top surface to tie the construction together. Recesses between these biscuits take the primary and secondary distribution trunking for the lighting and fire detection systems.



Pre cast 'biscuit' setting out plan

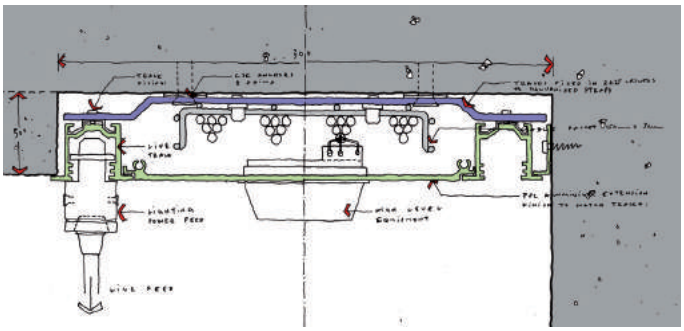


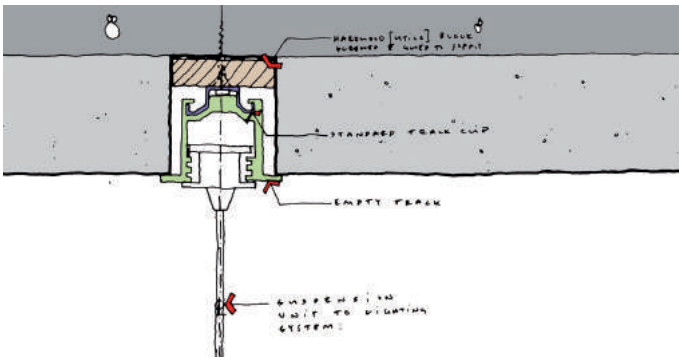
Office plate schematic

Design Development

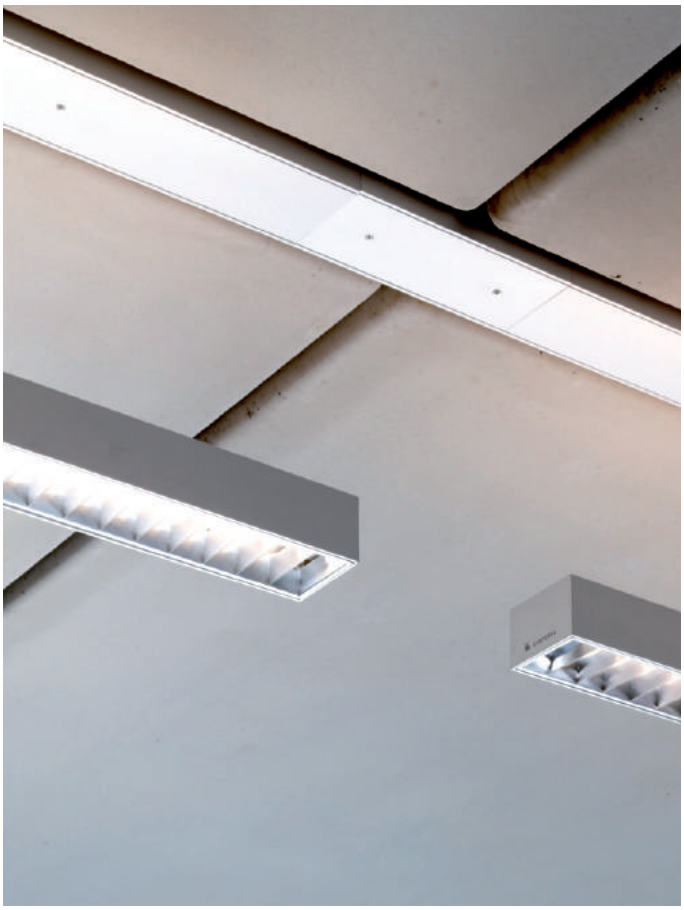
Soffits - lighting

The absence of lightweight finishes to ceilings and walls meant that there was no opportunity to conceal building services. This led to the development of a bespoke lighting system in conjunction with Zumtobel, with integrated fire protection, whilst the floor void acts as a plenum for the displacement system and also contains distribution for small power and data.

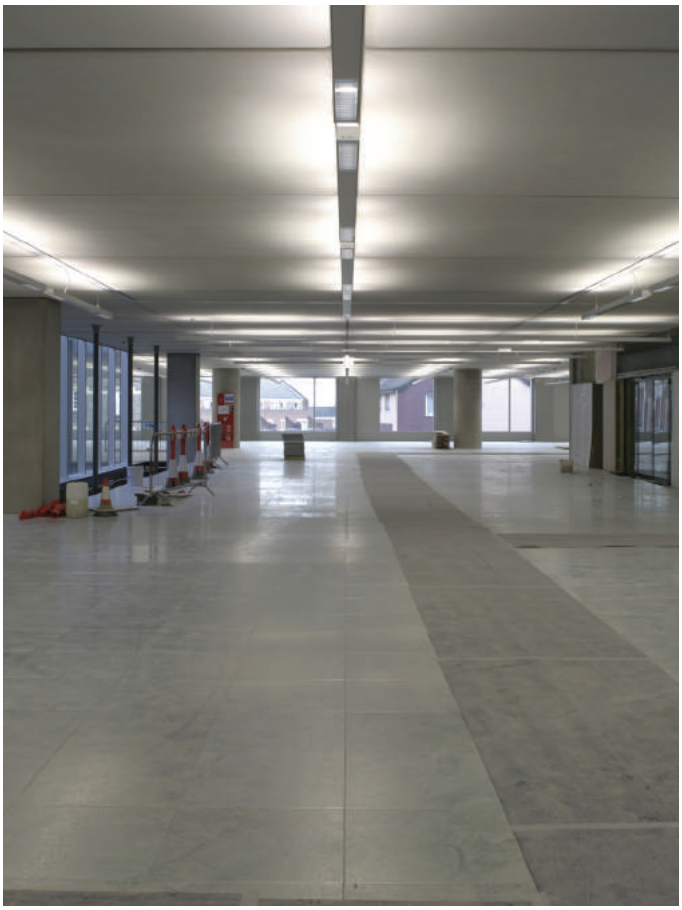




Development sketches - Primary and secondary services distribution route



Soffit panels with integrated services and bespoke lighting



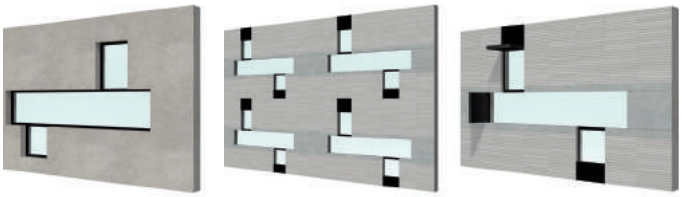
Soffit panels

Design Development

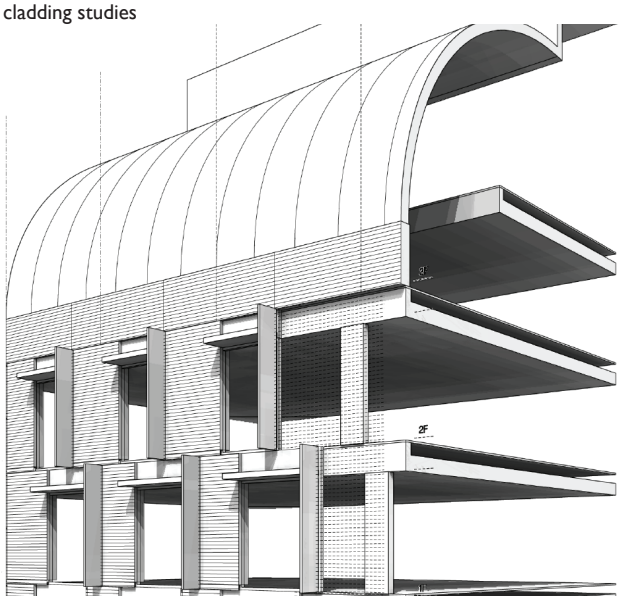
Cladding

The façade is derived from a consideration of the elevations of the existing buildings. It is comprised of a frame of precast concrete that mirrors the superstructure. As with most other elements, the elevations are composed of prefabricated, self-finished components, assembled on site on a just-in-time basis. Large unitised glazed units are inserted into the frame with the pattern offset on successive floors to create a staggered rhythm on the elevation.

The use of coloured opaque spandrel panels and vertical units, minimises solar gain by employing a high level of insulation to the solid parts. The area of clear vision glazing is limited to around 48%, thus moderating the energy load on the building.



Early cladding studies



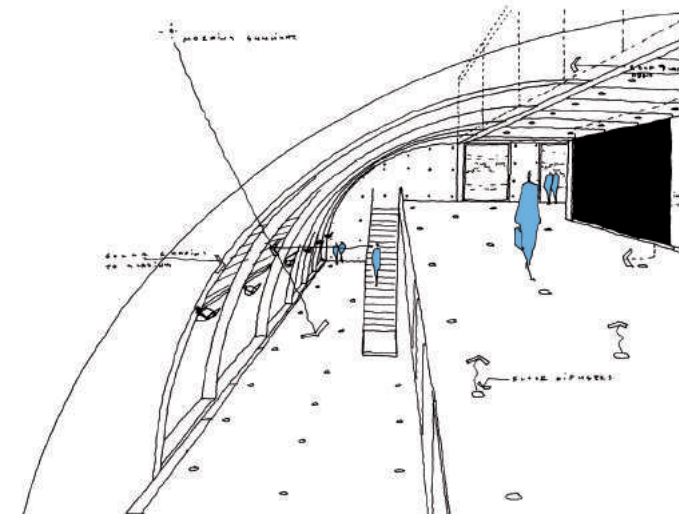
Completed Building

Design Development

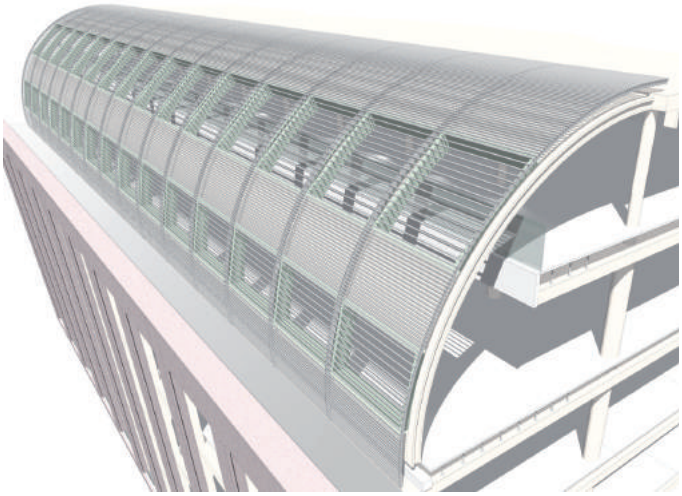
Barrel vault

The barrel vaulted roofs are a direct response to the rights of light envelope. The idea was to maximise the internal volume, minimise the area of the cladding, whilst creating a special space and giving an identifiable external form.

The design and construction of the barrel vault roof adheres to the stated aims of producing prefabricated, repetitive components in controlled off-site conditions, which are then brought to site for assembly. Structural aluminium ribs are infilled with identically sized solid and glazed overlapping units which were pre-finished internally and externally. A timber lining system adds warmth to the appearance of the anodised aluminium panels and acoustic absorbency.



Early sketch proposal of barrel vault



Proposed barrel vault

Design Development

Construction Process

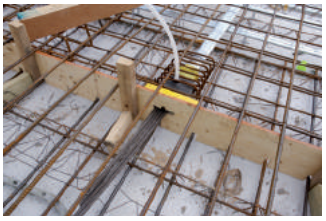
The following sequence of images describes the construction process. Around 80% (by volume) of the building was pre-fabricated offsite and assembled as a kit of parts following delivery.

Table being lifted to next storey

Formwork table to support precast soffit

Crane lowering precast biscuit

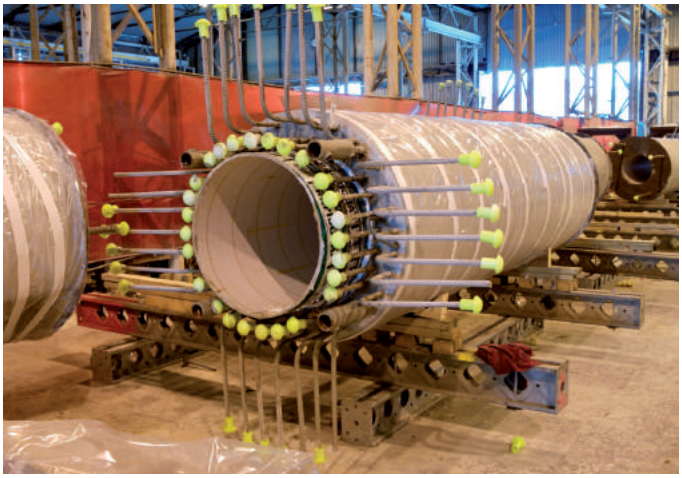
Precast biscuits being set out for pouring of slab



Preparation of reinforcing rods and post tension bars

Post tensioning of slab

Structural ducts



Structural ducts

Site Photos

Key construction technologies:

Pre-fabricated pre-cast concrete soffit installation sequence

Table being lifted to next storey

Formwork table to support precast soffit

Crane lowering precast biscuit

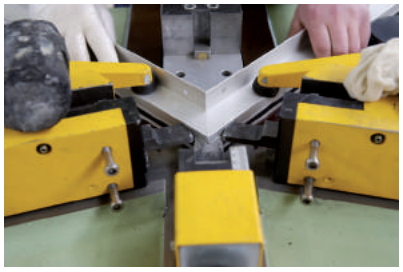
Precast biscuits being set out for pouring of slab

Preparation of reinforcing rods and post tension bars

Post tensioning of slab

Site Photos

Key construction technologies:
Pre-fabricated unitised cladding

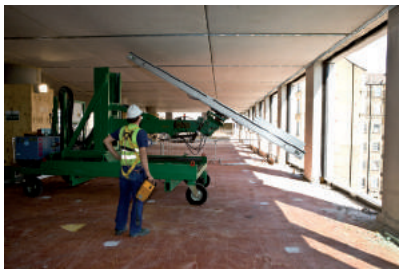



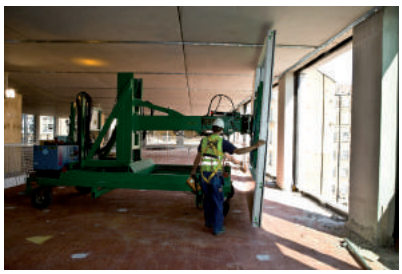


4.05 Unitised cladding in construction







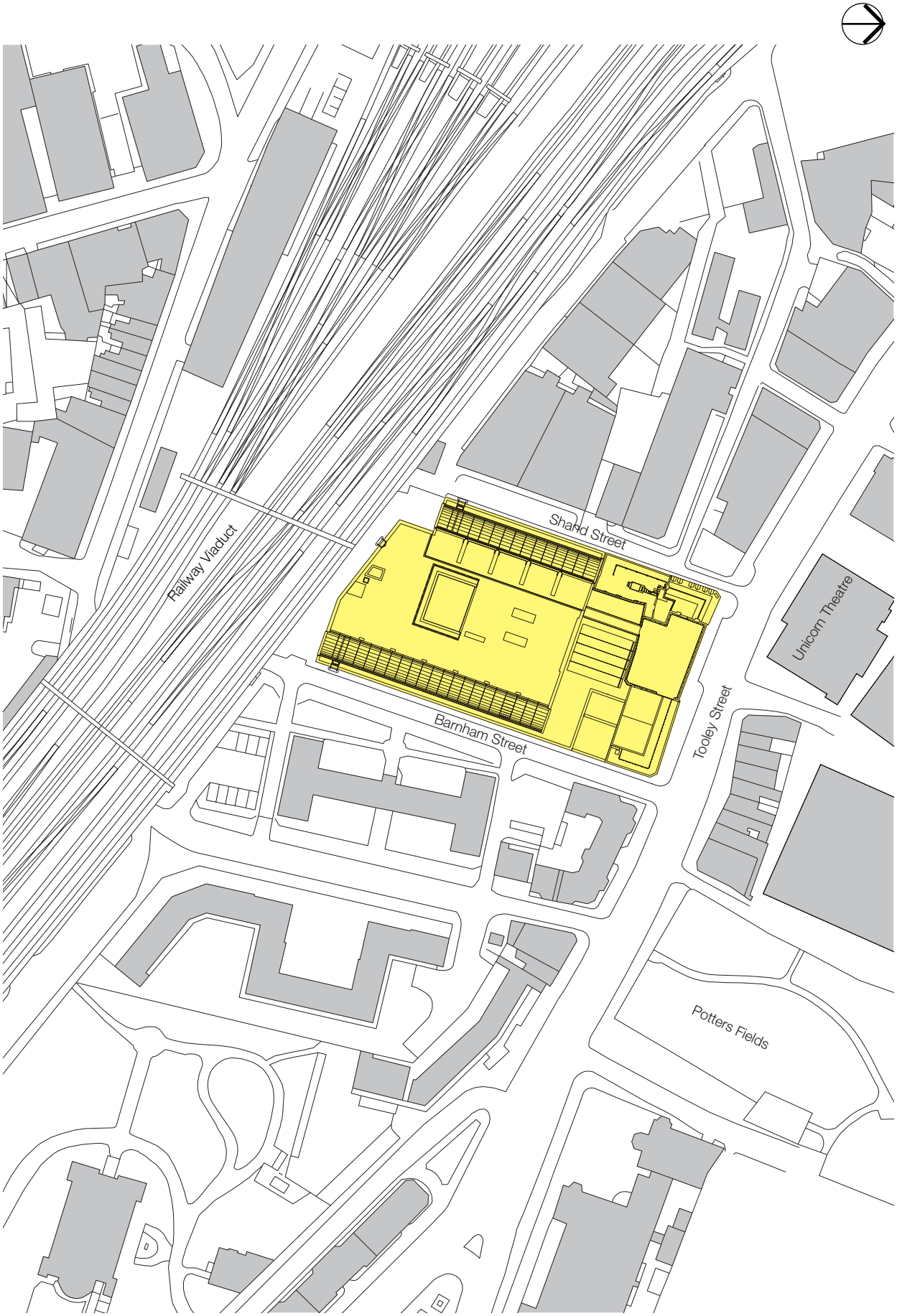





Installation of unitised cladding

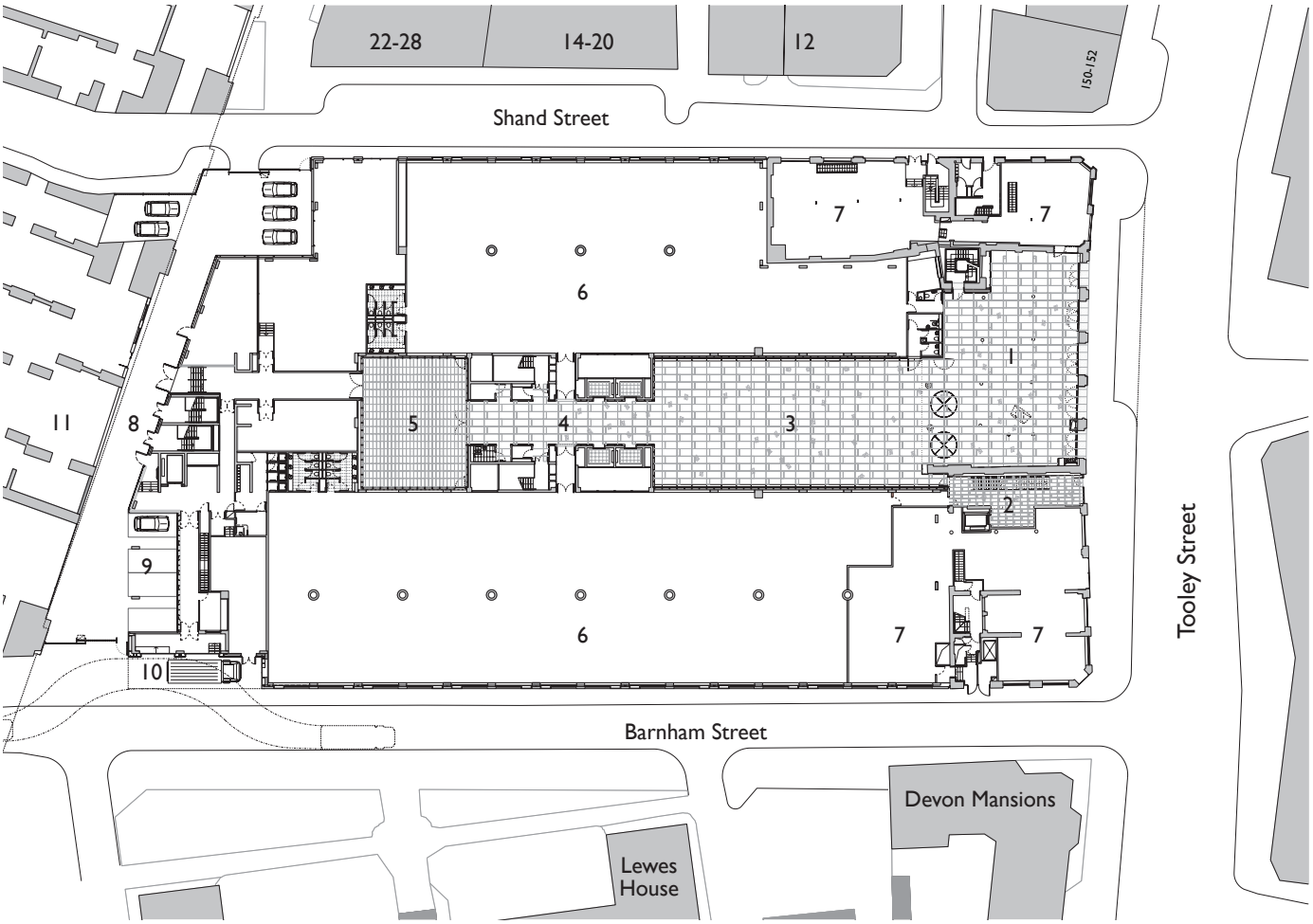
Drawings

Site Location Plan



Site plan

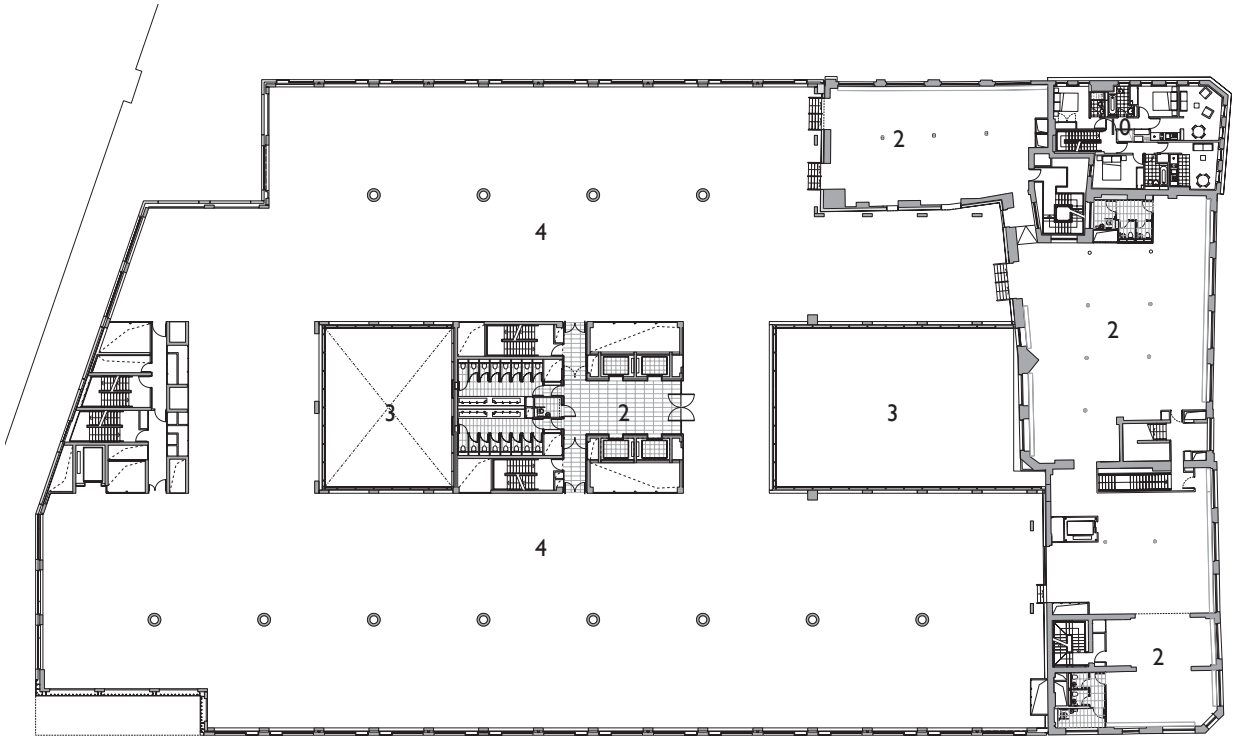
1:1000



Ground floor plan with context

KEY

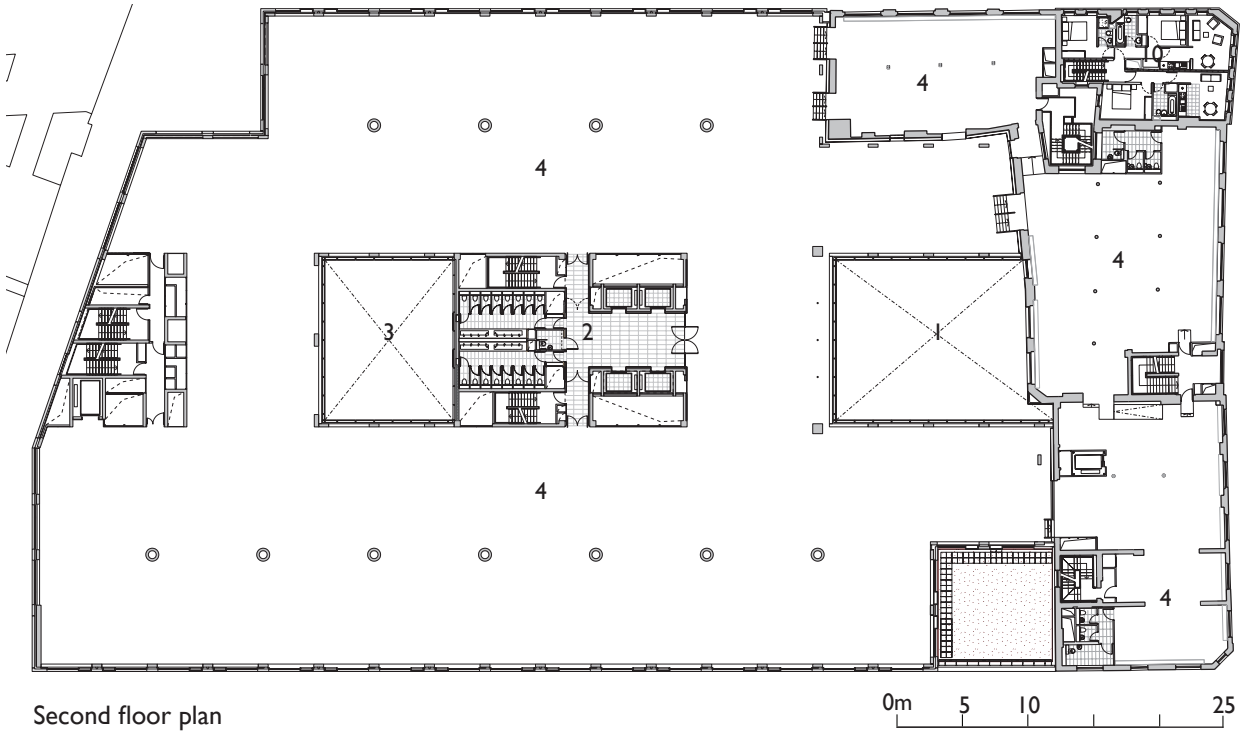
1 Main entrance loggia
2 Secondary entrance
3 Atrium
4 Central core
5 External courtyard
6 Office space
7 Retail
8 Rear service yard
9 Disabled parking
10 Loading bay
11 Railway viaduct



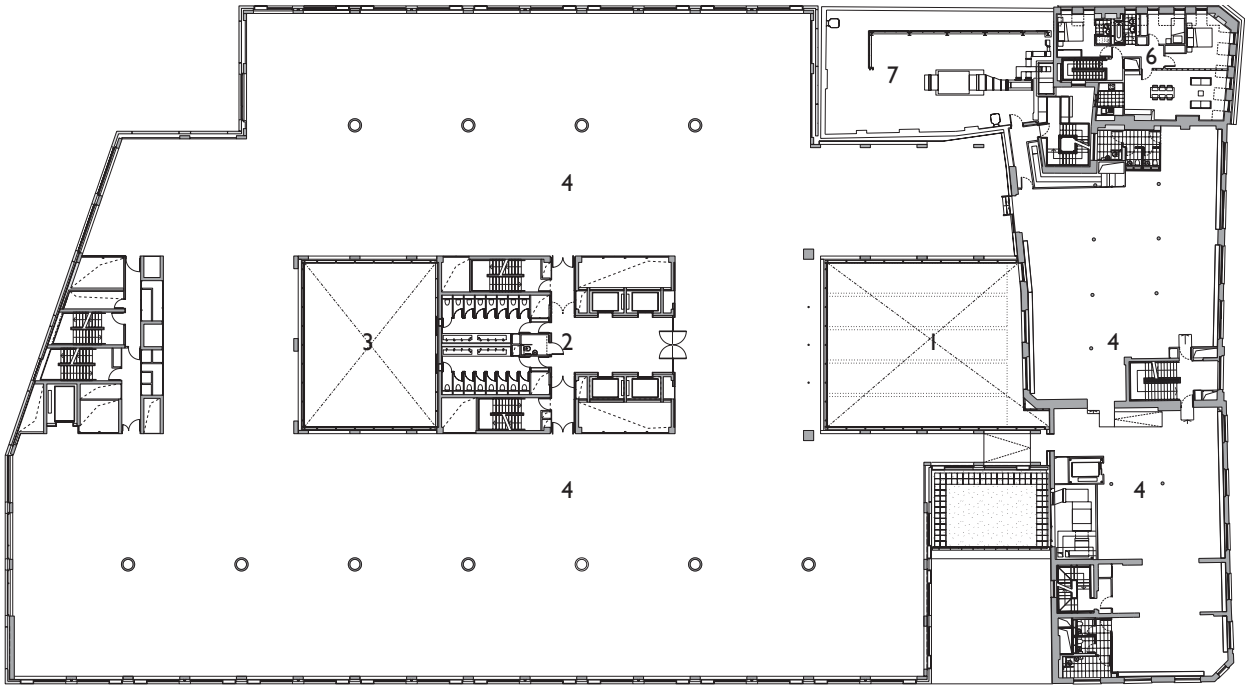
First floor plan

KEY

1 Atrium
2 Central core
3 External courtyard
4 Office
5 Retail
6 Rear service yard
7 Disabled parking
8 Loading bay
9 Railway viaduct
10 Residential
11 Plant



Second floor plan

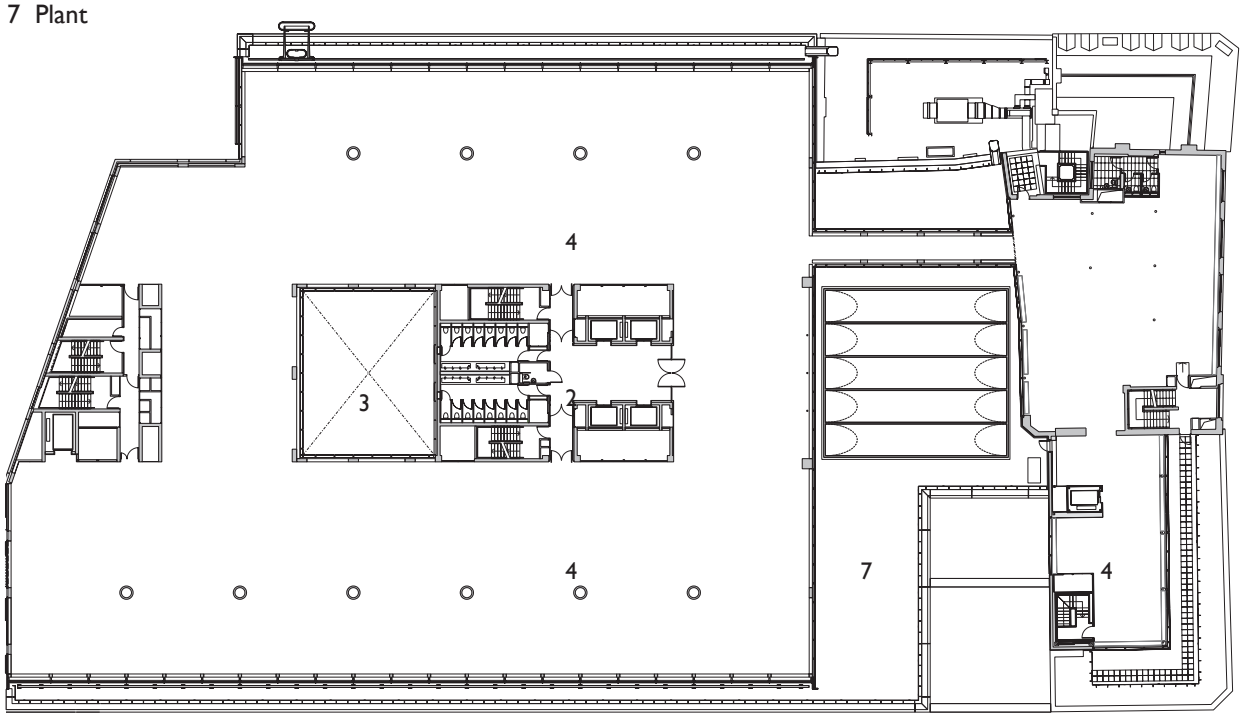


Third floor plan

0m 5 10 25

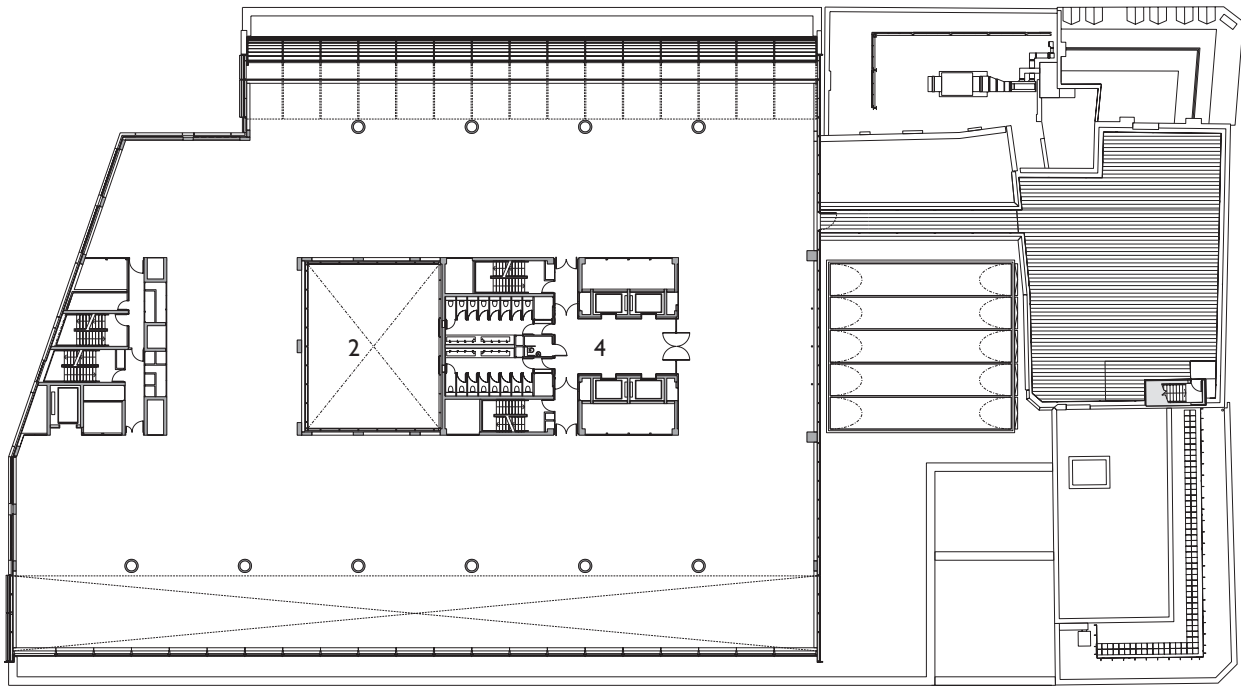
KEY

1 Atrium
2 Central core
3 External courtyard
4 Office
5 Rear service yard
6 Residential
7 Plant



0m 5 10 25

Fourth floor plan

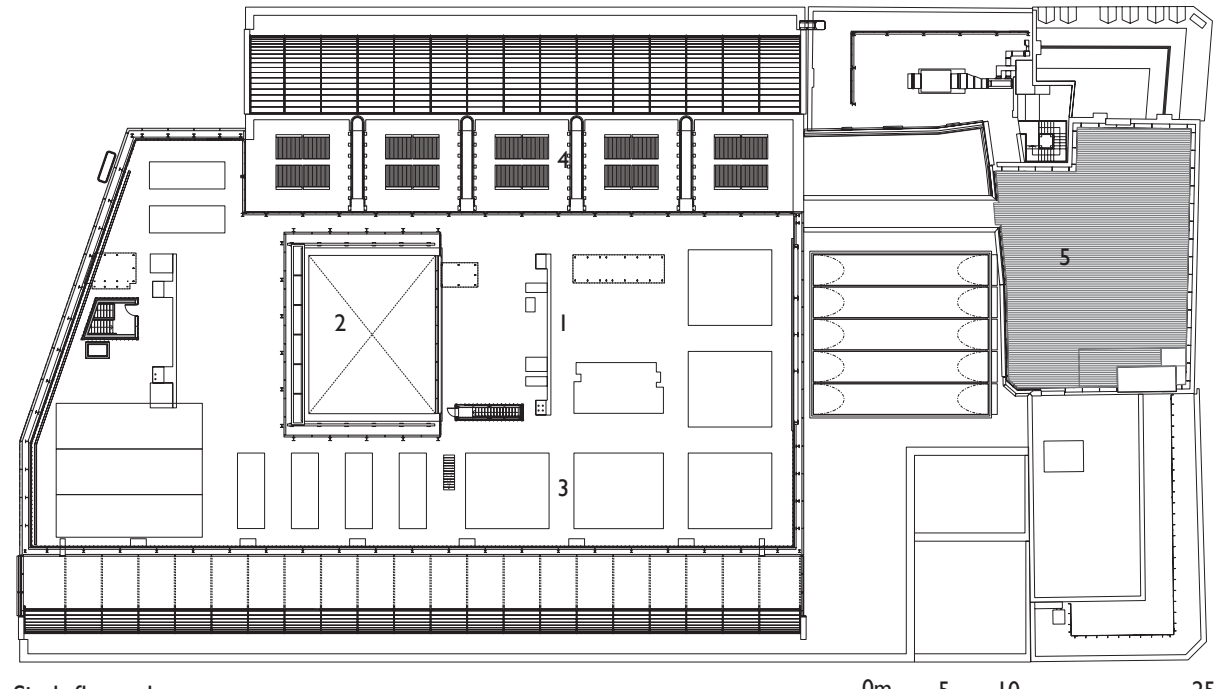


Fifth floor plan

0m 5 10 25

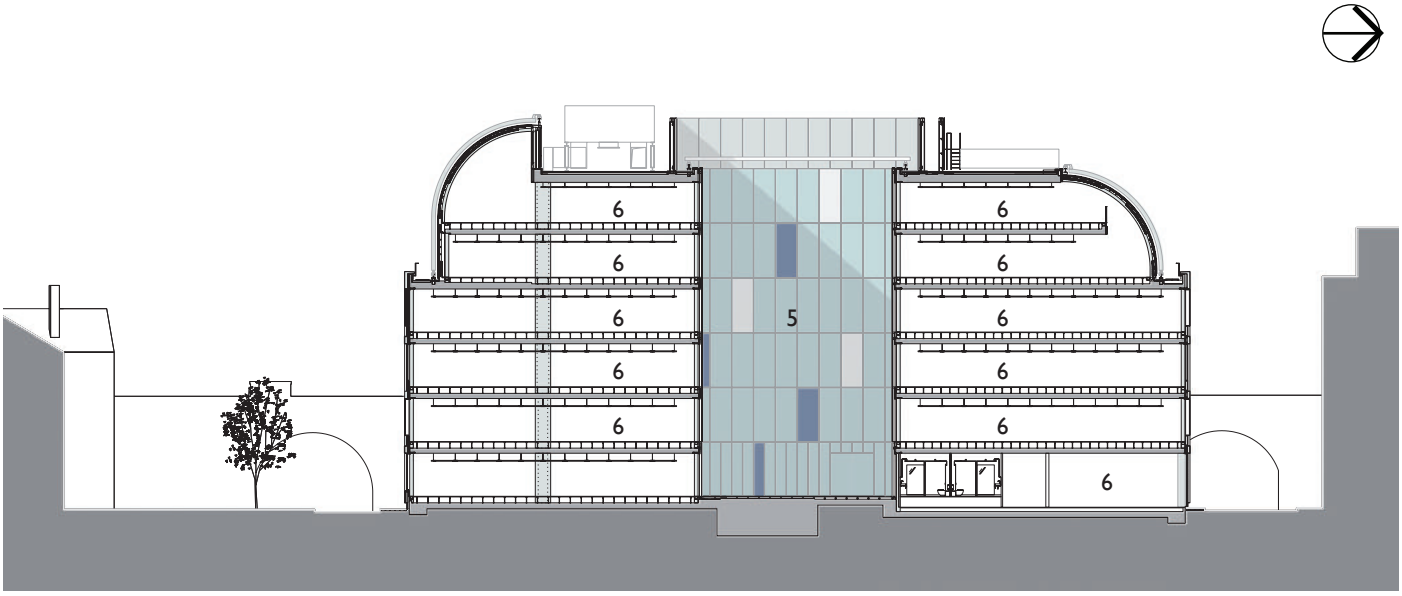
KEY

1 Central core
2 External Courtyard
3 Office Space
4 Plan
5 Roof Deck



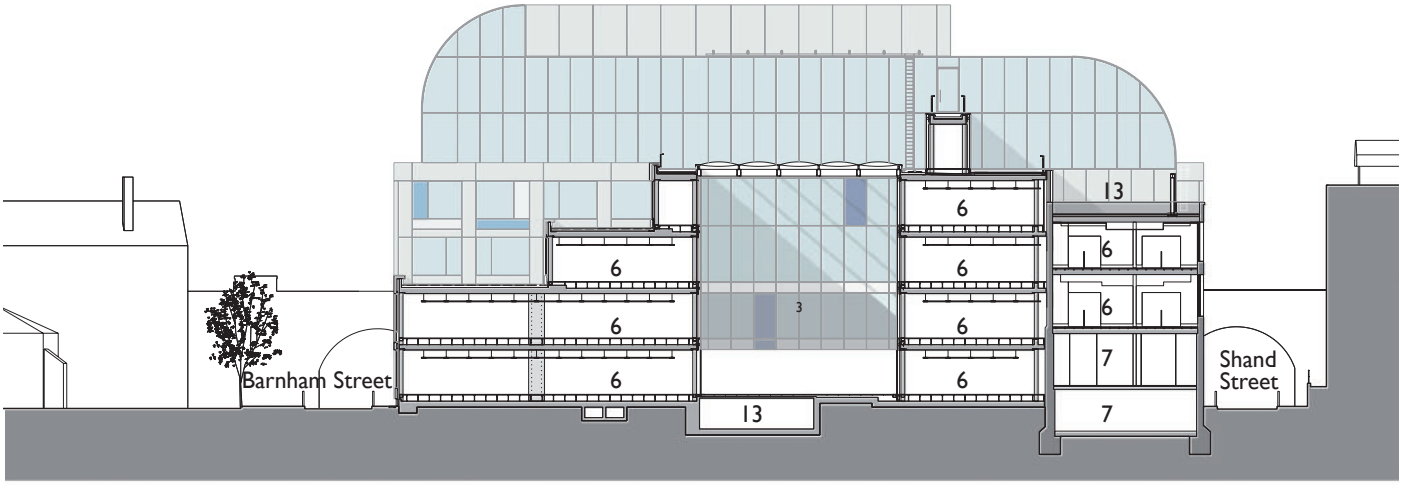
Sixth floor plan

0m 5 10 25



AA Cross section through external courtyard looking South

0m 5 10 15

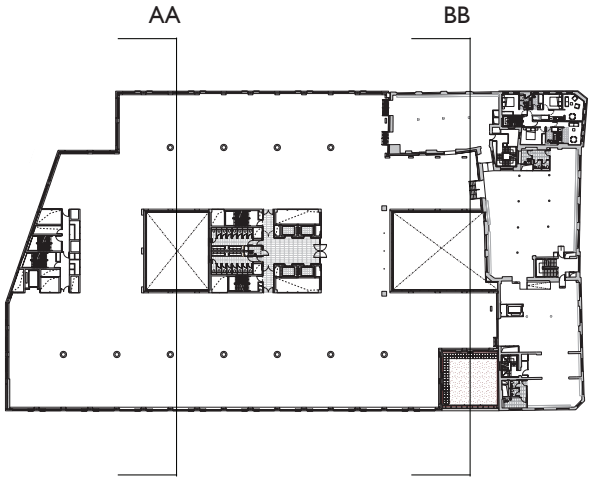


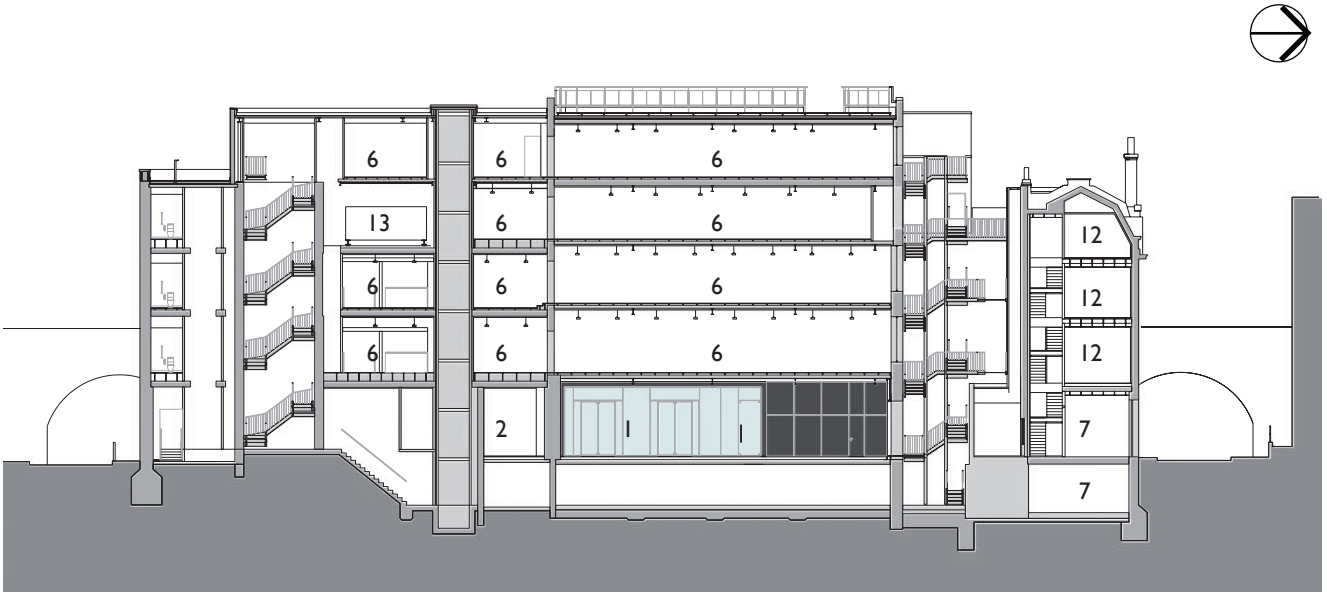
BB Cross Section through Atrium looking South

0m 5 10 15

KEY

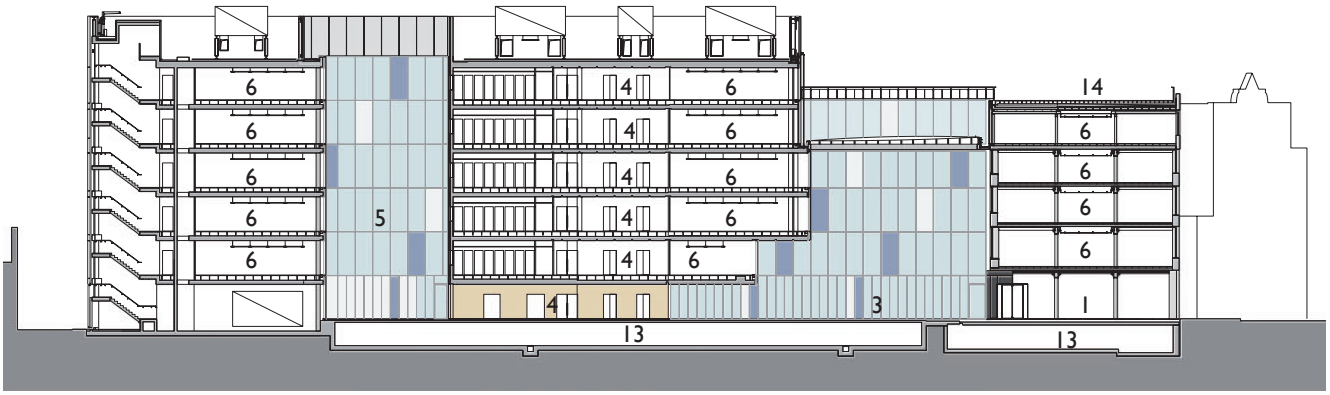
1 Main entrance loggia
2 Secondary entrance
3 Atrium
4 Central core
5 External courtyard
6 Office
7 Retail
8 Rear service yard
9 Disabled parking
10 Loading bay
11 Railway viaduct
12 Residential
13 Plant
14 Light roof deck





CC Cross Section through existing buildings

0m 5 10

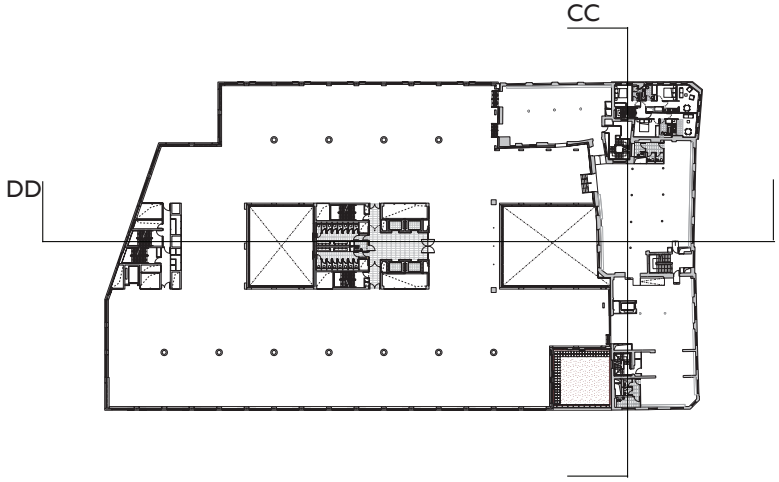


DD South-North Section through new & existing buildings

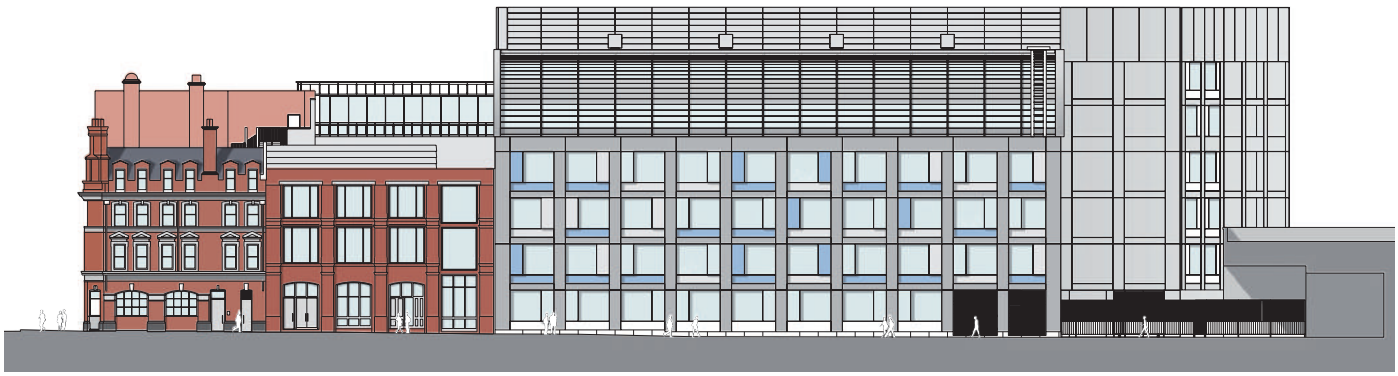
0m 5 10

KEY

1 Main entrance loggia
2 Secondary entrance
3 Atrium
4 Central core
5 External courtyard
6 Office
7 Retail
8 Rear service yard
9 Disabled parking
10 Loading bay
11 Railway viaduct
12 Residential
13 Plant
14 Light roof deck



East Elevation along Barnham Street



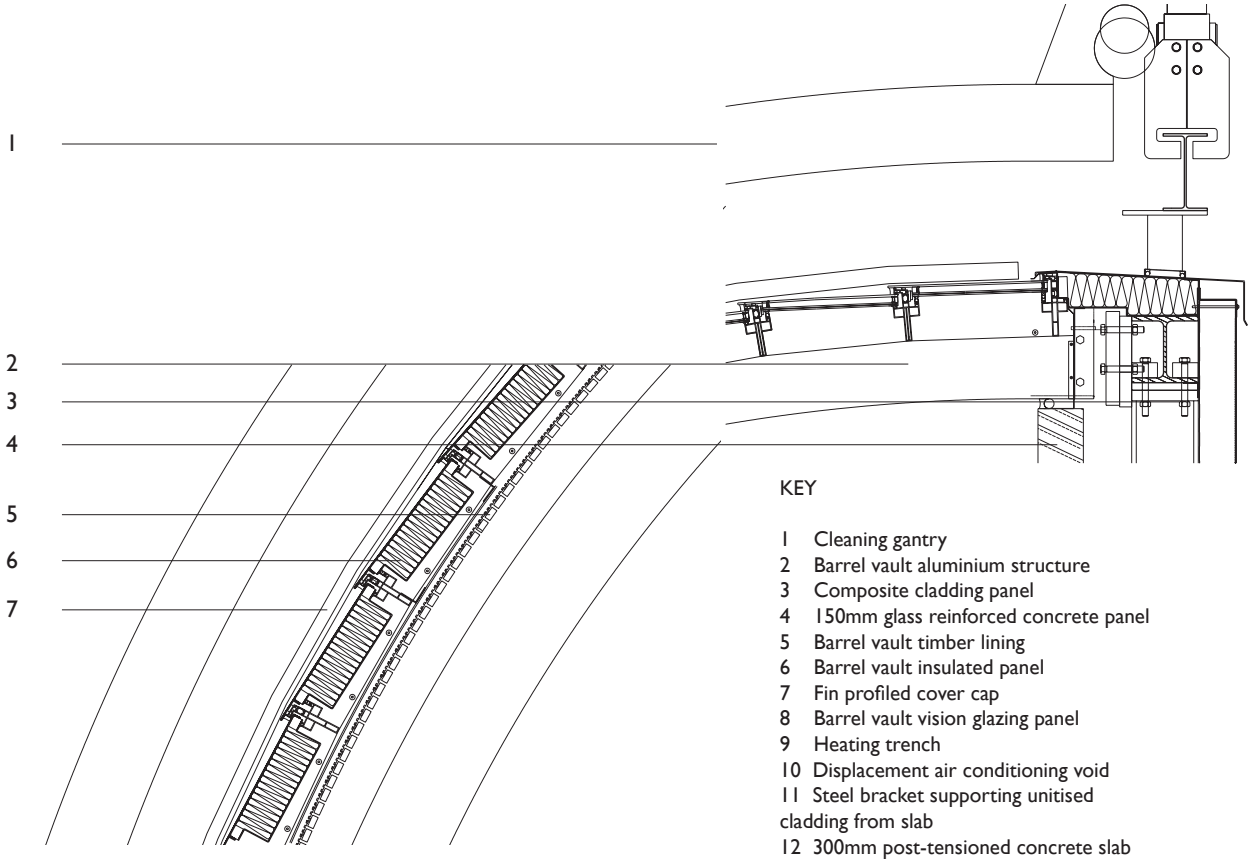
West Elevation along Shand Street

0m 5 10

South Elevation along Rear Service Yard

North Elevation along Tooley Street

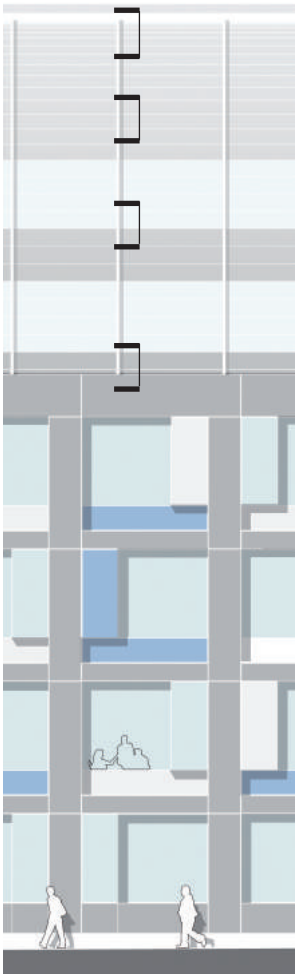
0m 5 10



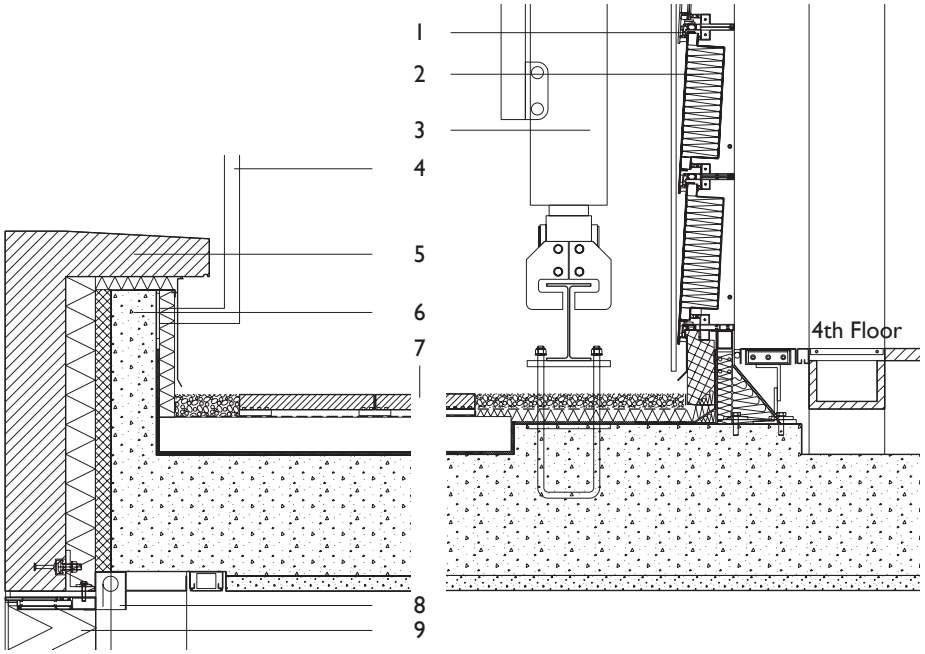
External cladding detail

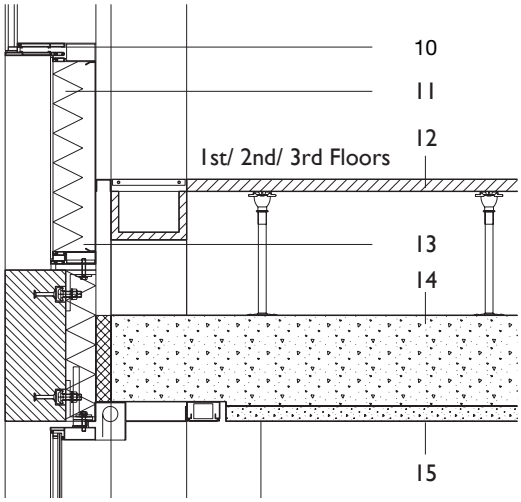
KEY

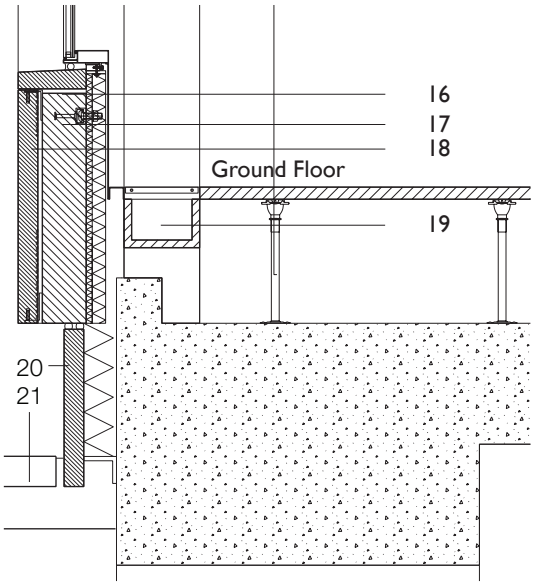
1 Cleaning gantry
2 Barrel vault aluminium structure
3 Composite cladding panel
4 150mm glass reinforced concrete panel
5 Barrel vault timber lining
6 Barrel vault insulated panel
7 Fin profiled cover cap
8 Barrel vault vision glazing panel
9 Heating trench
10 Displacement air conditioning void
11 Steel bracket supporting unitised cladding from slab
12 300mm post-tensioned concrete slab
13 Integral roller blind box
14 Barrel vault vision glazing
15 Cleaning gantry



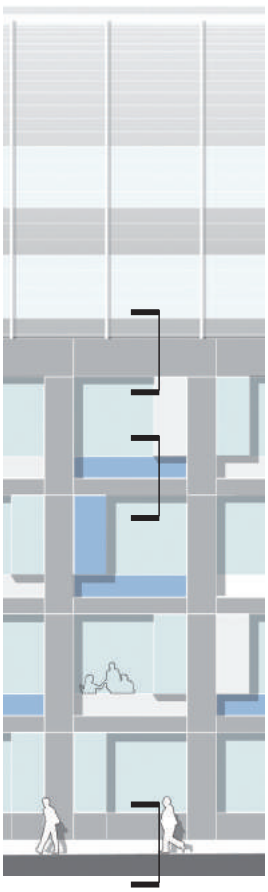
Part elevation







External cladding detail



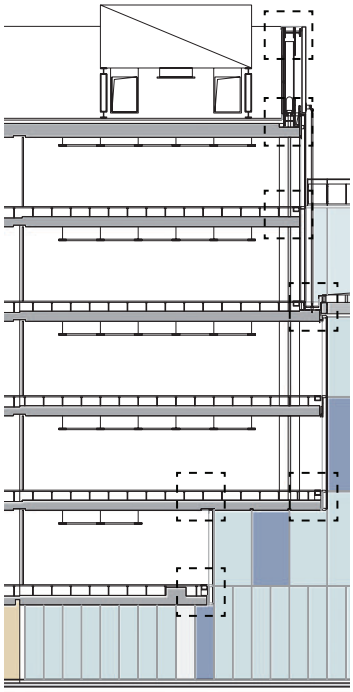
Part elevation

KEY

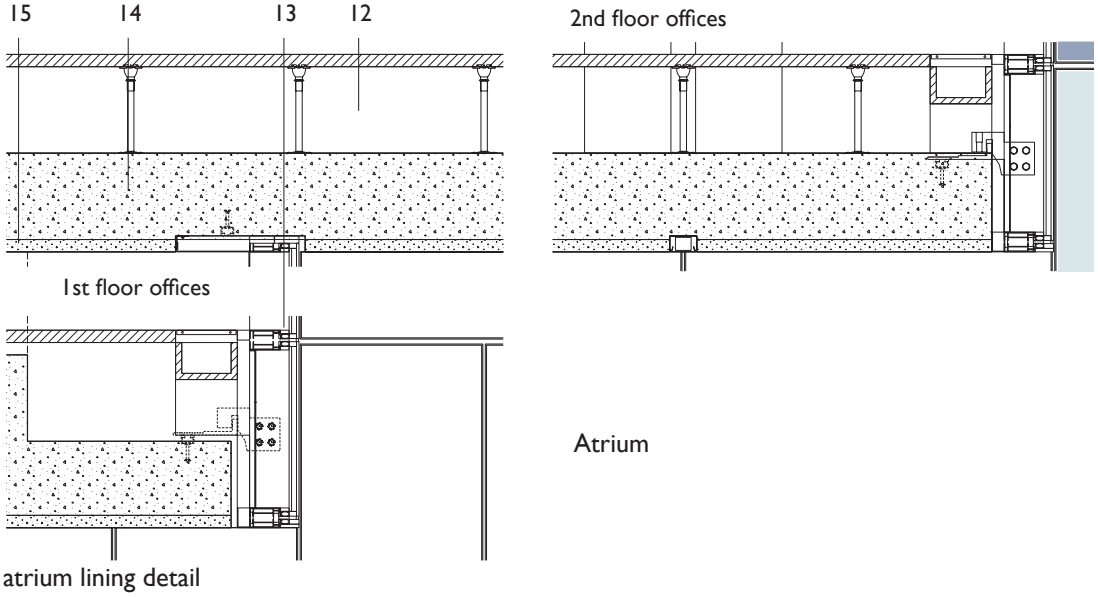
1 Barrel vault vision glazing
2 Barrel vault insulated panel
3 Cleaning gantry
4 Galvanised steel balustrade
5 Precast concrete parapet
6 150mm in-situ concrete upstand
7 Paving slabs
8 Integral roller blind box
9 Unitised insulated panel
10 Unitised vision glazing panel
11 Unitised insulated panel set back
12 Raised access floor
13 Precast concrete spandrel panel
14 300mm post tensioned concrete slab
15 50mm precast concrete formwork soffit
16 150mm stone faced cill
17 Low-level precast concrete spandrel
18 Stone face to precast concrete spandrel
19 Heating trench
20 Stone face
21 Concrete paving slabs

KEY

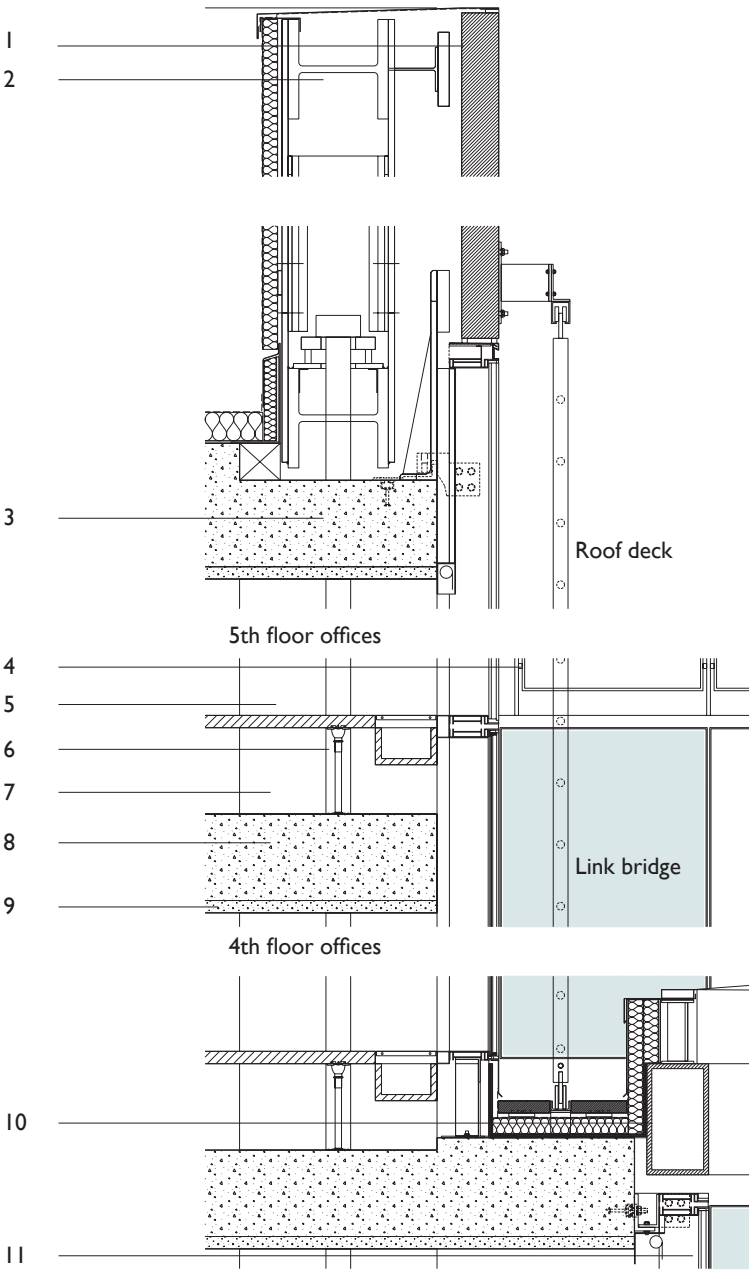
1 150mm precast concrete panel
2 Steel truss supporting lower floors
3 350mm insitu concrete floor slab
4 Galvanised steel balustrade
5 Precast concrete column
6 Macalloy rod
7 Diffuse ventilation under raised floor
8 350mm insitu concrete floor slab
9 50mm precast concrete biscuit soffit
10 ETFE roof structure
11 Unitised vision glazing onto Atrium
12 Displacement air conditioning void
13 Unitised vision glazing onto Atrium
14 300mm Insitu concrete floor slab
15 50mm precast concrete biscuit soffit



Section through atrium



Cladding and atrium lining detail



Final Photos

Aerial view

A588_721 © Tim Soar

South façade overlooking train viaduct

A588_734_© Tim Soar

Barnham Street railway arch

A588_735 © Tim Soar

South façade overlooking railway viaduct

A588_687 © Tim Soar

Barnham Street elevation

A588_688 © Tim Soar

Barnham Street façade - Punched windows with articulated projecting bays, in precast frame

A588_707 © Tim Soar

Detail view in Barnham Street - new façades reinterprets existing; barrel vault to top floors

A588_708 © Tim Soar

View from Shand Street showing junction of old and new (More London in the background)

A588_726 © Tim Soar

Barnham Street elevation

A588_689 © Tim Soar

Site progress new build typical façade

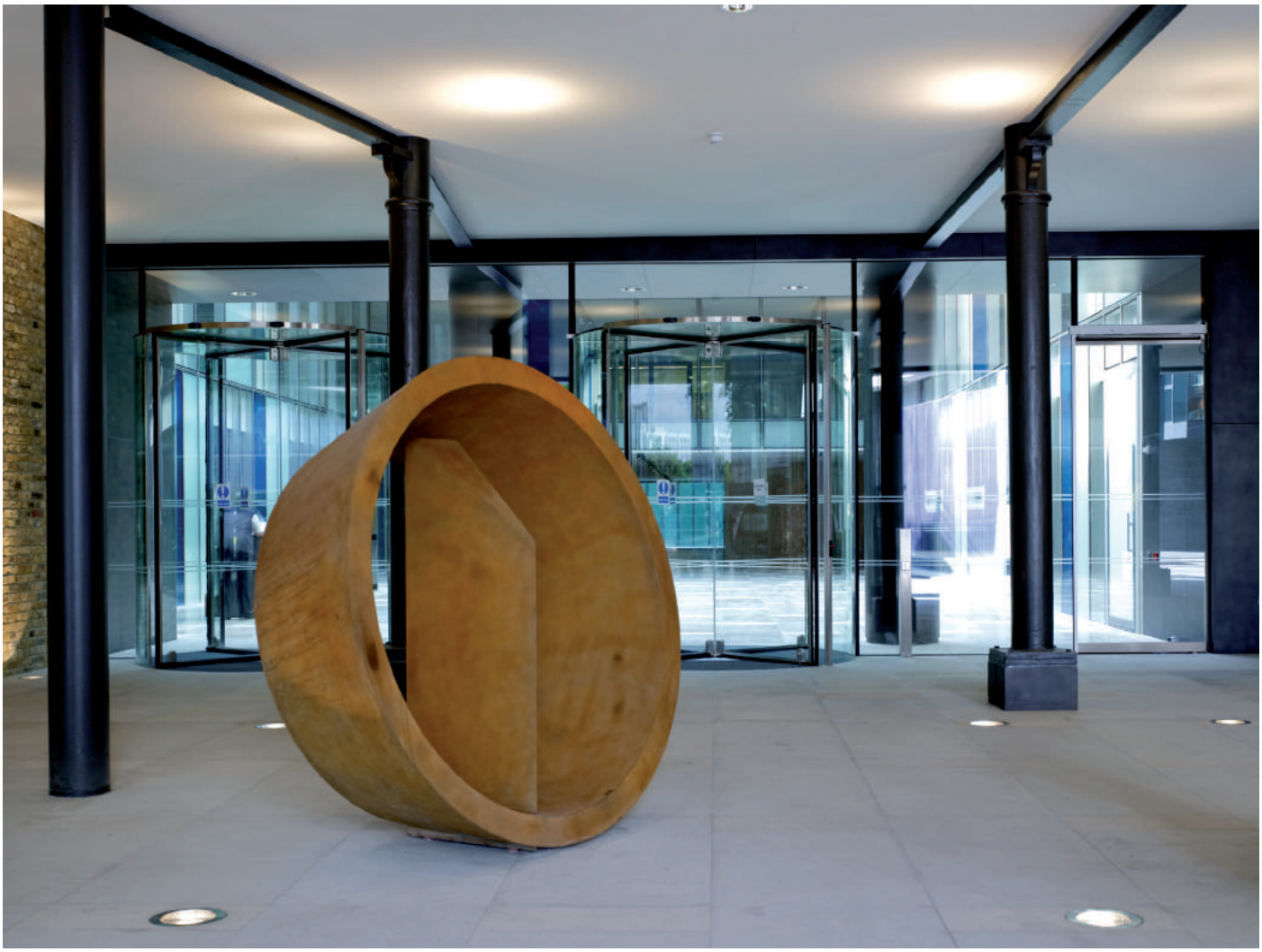
A588_426_© Rob Parrish

View from Tooley Street showing entrance loggia cut through retained buildings

A588_713 © Tim Soar

Entrance Loggia with artwork, with atrium space beyond

A588_719 © Tim Soar



Entrance loggia

A588_717 © Tim Soar

Entrance loggia looking into atrium

A588_698 © Tim Soar

Atrium space with ETFE roof

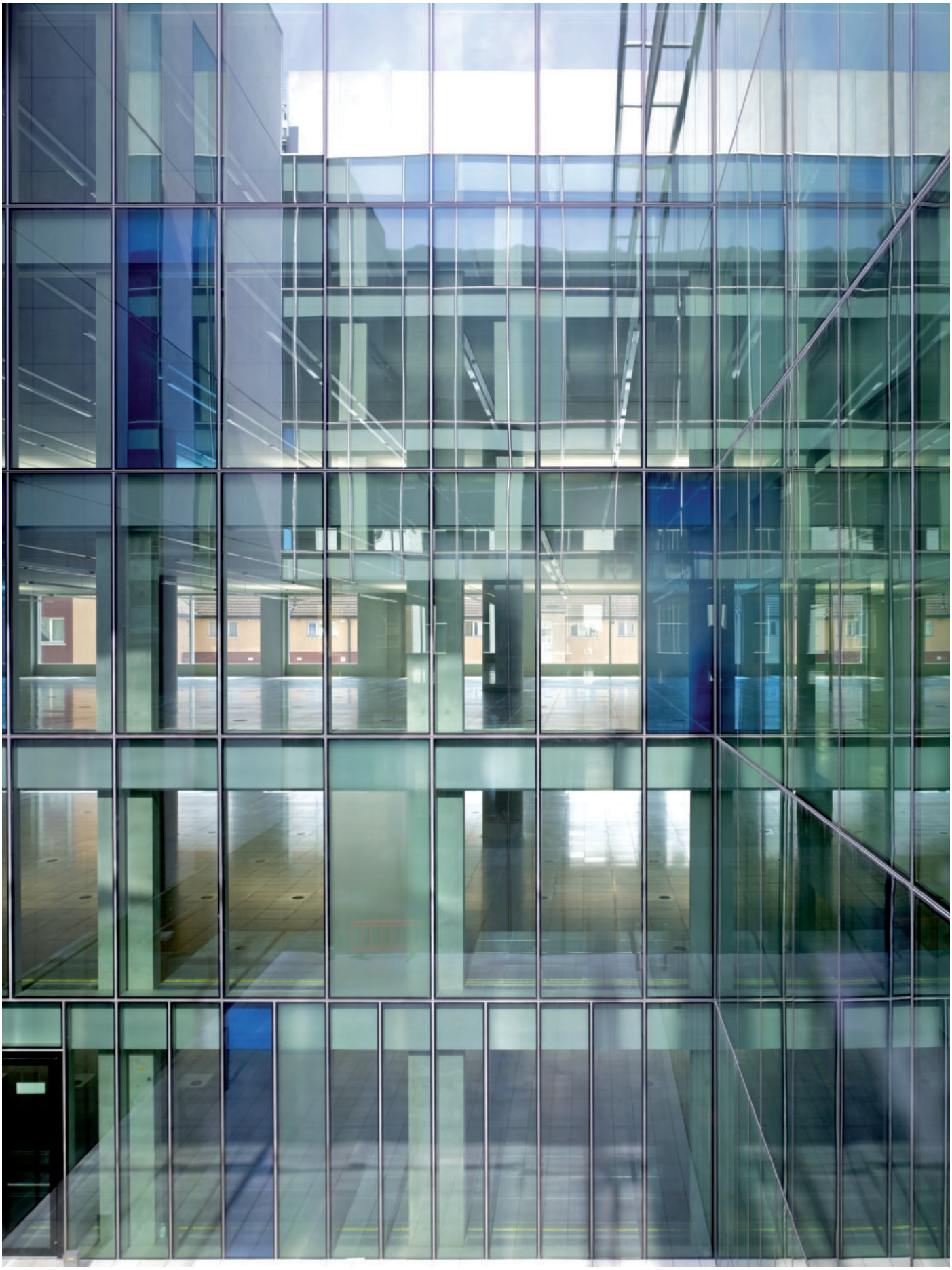
A588_680 © Tim Soar

Atrium cladding

A588_683 © Tim Soar

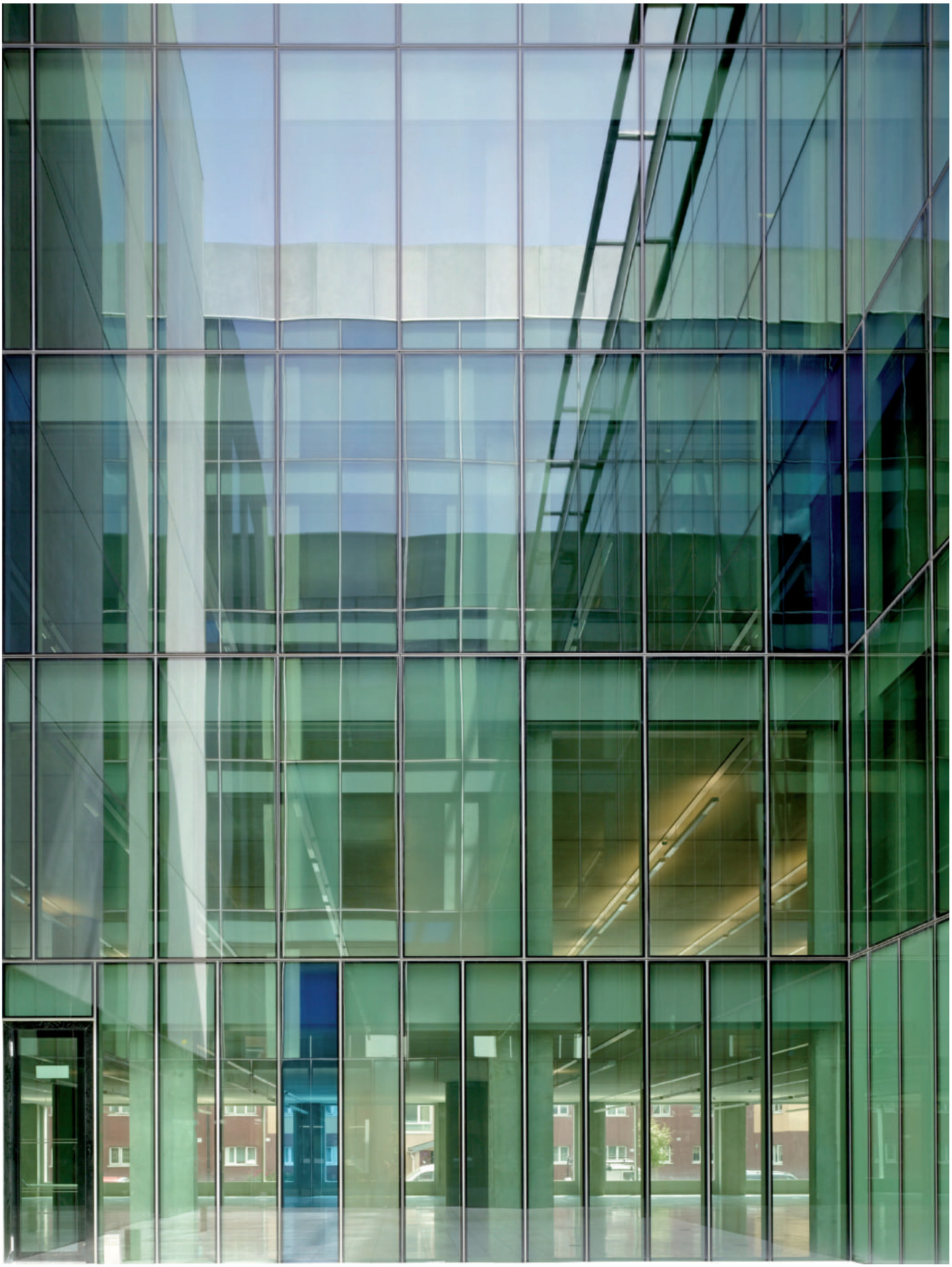
North wall of atrium

A588_704 © Tim Soar



Courtyard cladding

A588_701 © Tim Soar



Courtyard cladding

A588_705 © Tim Soar

Typical office floor

A588_685 © Tim Soar

Typical office floor

A588_686 © Tim Soar

Upper storey overlooking atrium

A588_684 © Tim Soar

Opening between Victorian and new build

A588_670 © Tim Soar

Pre-cast concrete soffit with atrium cladding behind

A588_729© Tim Soar

Precast concrete column with atrium behind

A588_730 © Tim Soar

Structural duct with barrel vault behind

A588_728 © Tim Soar

New build from Victorian building roof extension

A588_681 © Tim Soar

Barnham Street barrel vault

A588_676© Tim Soar

Barnham Street barrel vault

A588_673 © Tim Soar

Shand Street barrel vault

A588_700 © Tim Soar

Shand Street barrel vault

A588_699 © Tim Soar

Typical office floor

A588_728 © Tim Soar

Barnham Street barrel vault space post-fitout

A588_729 © Tim Soar

View looking down at the atrium

A588_735 © Tim Soar

View from the atrium into office floors

A588_736 © Tim Soar