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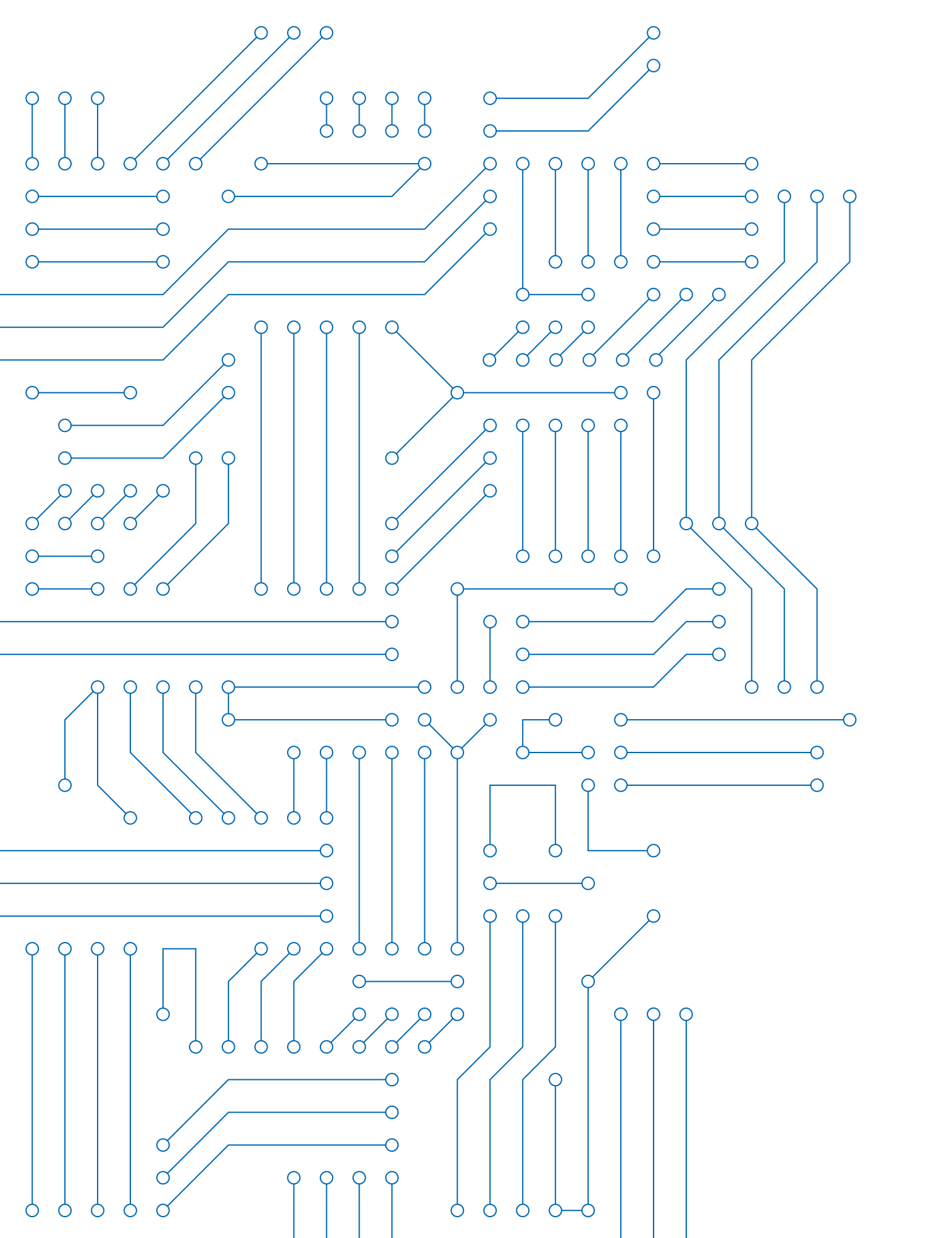
**Making places for
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This NLA Research was published by New London Architecture (NLA) in May 2018. It accompanies the NLA exhibition and events programme *Knowledge Capital: making places for education, innovation and health* taking place from May-July 2018 and is part of NLA's year-round Education and Health programme, exploring the changes and developments in London's education, health, research and innovation sectors.

New London Architecture (NLA)
The Building Centre
26 Store Street
London
WC1E 7BT

www.newlondonarchitecture.org
[#knowledgecapital](https://twitter.com/newlondonarch)

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FOREWORD

A few years ago I visited Pittsburgh, not quite sure what sort of place I would find. 'Steel City' had born the brunt of the United States' deindustrialisation of the 70s and 80s with the loss of hundreds of thousands of jobs. The resulting northern rustbelt is a key driver of President Trump's current economic policies.

But instead of the down-at-heel city that one might have expected, I found a thriving economy – the regeneration of which observers ascribed to its burgeoning 'eds and meds' sector. Over the previous thirty years, education and health had grown to be major contributors to the city's wealth creation. Today Pittsburgh has among the highest rates of employment in education and health care in the US.

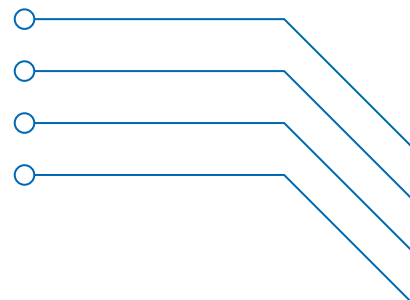
The partnering of 'eds and meds' was first identified as a key economic driver of cities by the Brookings Institution's metropolitan think tank some twenty years ago and since that time, with the growth of wider knowledge-based industries, universities are increasingly viewed not only as institutions of higher learning but as engines of economic growth and innovation.

Listed as the world's top university city, with 14 in the world's top 500 list, London is in prime position to benefit from the strength of the knowledge economy – an asset which is further reinforced by the London/Oxford/Cambridge 'Golden Triangle' in the wider metropolitan region. The strength of the sector will be of increasing importance in a post-Brexit economy, especially since – unlike banks and financiers – these institutions are wedded to the city and will not move away.

This NLA Research paper looks at how London must plan for the needs of this fast-changing economy. NLA itself sits in the shadow of the University of London's Senate House and we see around us the impact of the clustering of knowledge-based institutions – from the Francis Crick Institute, the Sainsbury Wellcome Centre for Neural Circuits and Behaviour, and the UCL Cancer Institute, to the construction of the new Google and Deep Mind HQs at King's Cross. The quality of the built environment, infrastructure, clustering and the location of amenities are essential if the knowledge economy in London is to thrive. We hope this paper will assist in the informed shaping of the city in response to its requirements.

Peter Murray

Chairman, New London Architecture



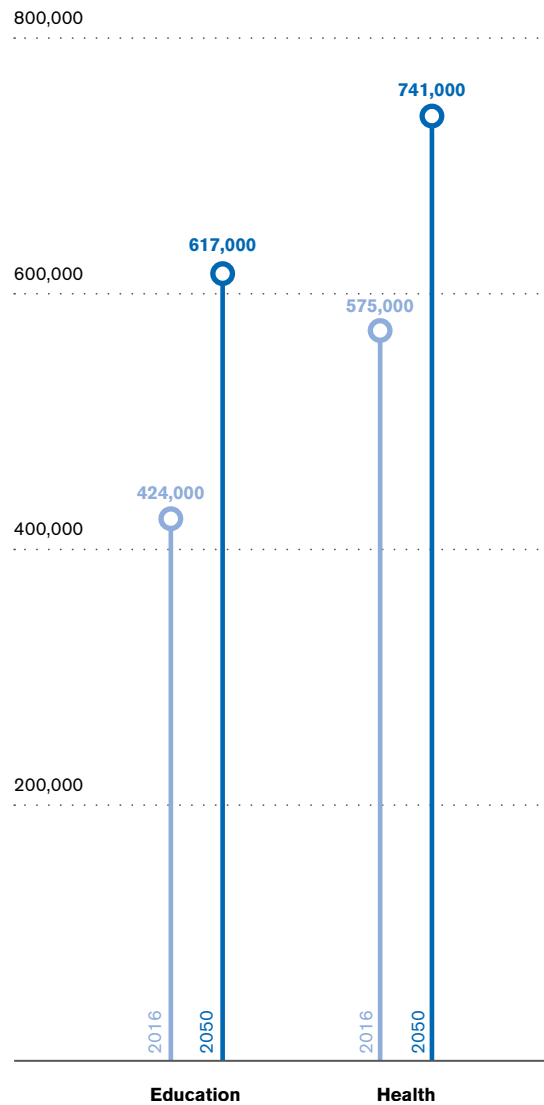
EXECUTIVE SUMMARY

In the 21st century, knowledge and innovation are among the key drivers of urban prosperity in the age of greater automation, disruptive technologies and global communication. However, greater mobility and digitisation mean that **physical location and proximity to other like-minded people have become ever more important** in order to support the spontaneous personal interactions, sharing of ideas and inspiration that lead to innovation and advances in research to flourish.

The importance of collaboration as the prerequisite for innovation, and the need to accommodate 'translational research', i.e. the use of research to inform the development of commercial uses and applications, mean that buildings and spaces have to become more flexible and work ever harder to allow both for continuity and changing multiple uses over time. **Universities, medical centres and research institutions are adjusting and adapting** to new technologies, changing trends in working and methods of learning, and, most importantly, the increasing need for co-location of functions and people.

London has long been internationally recognised as a foremost global centre for higher and further education, a pioneering research hub for science and technology, and a home to some of the world's leading medical centres, institutes and hospitals. Contributing to its advantageous position is its status as one of the world's leading financial centres, giving businesses access to venture capital, specialist services and investment, and legal expertise – and its wealth of cultural and leisure amenities. **Research and Development (R&D) expenditure in London has previously been estimated at £3.7 billion**, accounting for 1.2% of London's Gross Value Added (GVA). These sectors also play a major role in employment in the capital, with an overall total of **424,000 education sector and 575,000 health sector employees in 2016** – numbers expected to grow to 617,000 and 741,000 by 2050. It also forms one part of the 'Golden Triangle' alongside Oxford and Cambridge, a term referring to the area's world-leading research institutions but also high growth in the technology, medicine, ICT and life sciences sectors.

However, in an age of rapid social and technological change, buildings and places for education and health will need to not only be digitally networked, but also even more **highly adaptable, responsive, well-connected and even demountable – as well as affordable**. They will need to continue to facilitate collaboration and personal interaction to drive forward innovation in research and personalisation of services and treatment.



Employment figures in the education and health sectors 2016 vs 2050

The key priorities for future-proofing the education and health estate will be:

A) GREATER FLEXIBILITY AND INTEGRATION ACROSS SERVICES, FACILITIES AND POLICY

To create the truly 'long life, loose fit' city that will meet the changing demands of the health and education sectors, we will need different building typologies and approaches to planning – including transitional health facilities such as 'patient hotels' built adjacent to hospitals. At a citywide level, as noted in a 2018 NLA forum, policy frameworks need to be looser and more flexible to support closer collaboration, complementarity and connectivity across London and the South East.

B) A WIDER RANGE OF LABS FOR START-UPS AND MORE SPACE IN WHICH TO SCALE UP

The co-working model has already been adopted in London and the South East to meet demand among start-ups in tech and the commercial sector for offices with integrated business support and flexible leasing terms. Incubators and accelerators often linked to universities and institutes also provide valuable space for development of spin-off enterprises emerging from research. There is still, however, a significant lack not only of start-up but especially of grow-on space for companies that want to scale up but that need laboratory facilities alongside offices. A more nuanced understanding is required of market demand, especially in relation to relative price points.

C) MORE QUALITATIVE AND CREATIVE APPROACHES TO UNDERSTANDING COLLABORATION OUTPUTS

The success of collaboration is conventionally measured quantitatively, for example in scientific achievement and citations, number of businesses established, economic outputs and so on. However, there is still a gap in in-depth qualitative research into how collaboration leads on a practical level to innovation and how workspaces in education and health can foster this. In this area, built environment research itself can provide a way forward through interdisciplinary projects.

D) BETTER AND MORE COHERENT TRANSPORT AND DIGITAL INFRASTRUCTURE

London's lack of effective digital infrastructure still poses a major potential barrier to growth for the city's tech and science industries, including those in the fields of digital health and other emerging sectors. Digital infrastructure standards could be improved if developers and London's great estates, both new and old, present a coordinated approach. In terms of physical infrastructure, there could be potential

to further explore the use of drones in fast, targeted delivery of blood and medical products, for example. However, continued emphasis must also be placed on improving rail and transport connections in the Golden Triangle, especially between Oxford and Cambridge.

E) AFFORDABLE HOUSING IN A MIX OF TYPES AND TENURES

Across London and the South East, huge increase in demand as the population grows, combined with a lack of supply and new build, has made housing a critical issue in every city. While micro-homes might be a solution for undergraduate and postgraduate students, affordable housing for sale and rent for postdoctoral researchers, junior doctors and other early career professionals – as well as support staff who may not always qualify as 'keyworkers' – is especially scarce. Modular family housing and mixed-use schemes that integrate living with other functions may therefore be part of the way forward for future development, alongside the building of affordable homes within NHS estates that are looking to restructure and rationalise assets and land ownership.

F) KEEPING CITIES 'MESSY'

Collaboration – especially between divergent disciplines – is rarely a simple, linear process in reality: it involves communication, deliberation and discussion, often at length. Cities such as London, with intricate economic ecosystems and networks built up over centuries of agglomeration, are also 'messy' and 'unprogrammed' in places, and it is this indefinable quality that is often most valued in the search for unforeseen breakthroughs. Ambitions to create world-class places for education, health and research, dedicated to the pursuit and applications of knowledge, must be integrated with the wider city economically, socially and culturally, but not at the expense of distinctive, layered urban character and quality that allow those unexpected encounters and revelatory discoveries to take place.



CHAPTER ONE

THE SHAPE OF LONDON'S KNOWLEDGE ECONOMY: HIGHER EDUCATION, SCIENTIFIC RESEARCH AND HEALTH

"Cities have been engines of innovation since Plato and Socrates bickered in an Athenian marketplace ... The great prosperity of contemporary London, Bangalore and Tokyo comes from their ability to produce new thinking."
Edward Glaeser, *The Triumph of the City* (2012)

1.1 WHAT IS THE KNOWLEDGE ECONOMY?

While cities have always been centres of knowledge – as places where like-minded people come together to discuss ideas – in the 21st century it is knowledge and innovation that are among the key drivers of urban prosperity. With the decline of economies based on natural resources, physical labour and manufacturing, the production of new knowledge – that is, innovation – can provide a city with competitive advantage in the age of greater automation, disruptive technologies and global communication.

Definitions of the knowledge economy or knowledge-based capital are still widely debated, but generally knowledge-based industries are those that relate to 'a broad range of intangible assets, like research, data, software and design skills, which capture or express human ingenuity' and that create high-wage employment¹. In practical terms, this relates to industries and economic sectors broadly encompassing higher-level education and graduate research: science and technology; medicine, life sciences and healthcare; and advanced manufacturing. Some definitions also incorporate the wider creative and cultural industries; these will be referred to here briefly in relation to placemaking but are otherwise beyond the scope of this paper, which focuses principally on higher education, medicine, healthcare and scientific research. As an influential report on 'defining the knowledge economy' by the Work Foundation observes, 'Put more prosaically, we can say the knowledge economy is what you get when firms bring together powerful computers and well-educated minds to create wealth.'²

1.2 HOW DOES THE KNOWLEDGE ECONOMY SHAPE A CITY?

With the rise of the knowledge economy, a city's economic growth and competitiveness in an age of globalisation has come to depend on its social

and intellectual capital – the results of uniquely human qualities of creative analysis, critical thinking, sophisticated judgement and invention. Machines and technology can supply the data – and with the advance of artificial intelligence (AI) can also take on production, analytics and services: the burger-flipping robot being one of the latest publicised inventions³ – but it is human minds, working together, that still spark previously hidden connections, and challenge established modes of thought or approaches to products and services.

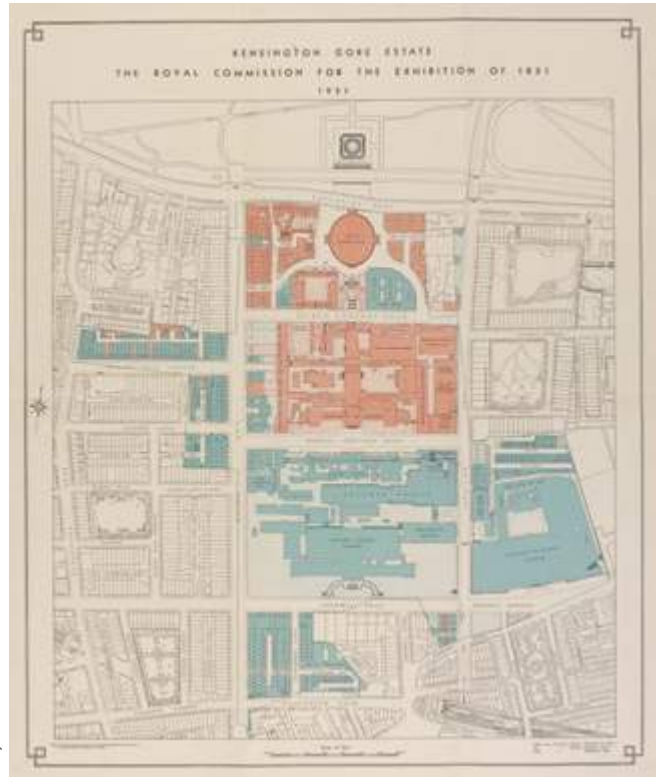
Businesses have always sought well-connected locations in order to reach markets and customers, but in the globalised economy a distinctive high-quality urban environment is vital to attract talented staff and entrepreneurs. Technological advances including Skype and virtual reality (VR) have made it possible to work in almost any place at any time, and to collaborate in real time, but conversely, greater mobility and digitisation mean that physical location and proximity to other like-minded people have become ever more important in order to support the spontaneous personal interactions, sharing of ideas and inspiration that lead innovation and advances in research to flourish. At the same time, these fundamental transformations in the way that we work, live and learn have started to break down barriers between established sectors, leading to a greater interest in interdisciplinary collaboration, for example between science and art, to generate new ways of thinking and practice. In academic discourse, knowledge itself is no longer seen as a fixed 'truth', but a fluid, non-hierarchical and changing set of concepts.

This emphasis on greater integration is being reflected in the urban environment. 'Places for knowledge' are not new – indeed, one of the best-known examples is 'Albertopolis', the South Kensington estate developed with the profits from the 1851 Great Exhibition in order to 'increase the means of industrial education and extend the influence of science and art upon productive industry', through the foundation of

¹ Andrew Wyckoff, 'Knowledge is growth', *OECD Yearbook* (2013).

² Ian Brinkley, *Defining the Knowledge Economy*, Work Foundation (July 2006), p. 3.

³ 'Burger-flipping robot begins first shift', BBC News website (5 March 2018), <http://www.bbc.co.uk/news/av/technology-43292047/burger-flipping-robot-begins-first-shift>



Top: Napp Pharmaceutical, the first of the iconic buildings on the Cambridge Science Park, completed in 1981

Above: Laser-Scan, the first company to move onto the Cambridge Science Park in 1973

Right: Map of Albertopolis area 1951, an early example 'Place for knowledge'

institutions including the Victoria and Albert Museum, the Science Museum, the Natural History Museum, Imperial College, the Royal College of Art (RCA) and the Royal College of Music. From the mid to late 20th century the dominant model for the idea of the 'knowledge city' was Silicon Valley in California, home to the world's leading high-tech institutions and thousands of start-ups in a 'supercluster' spread across a vast, state-wide area, generating a unique culture supported by copious levels of venture capital, tax incentives, talented entrepreneurs and inventors, and a large, competitive and sophisticated market. Alongside this, especially in Europe, was the intensive growth of the science and technology park, from the 1960s, located in suburban districts or in out-of-town locations, where land costs were lower and where space was more abundant for buildings with larger floorplates. Such locations were dedicated to the development and commercialisation of research through the provision of laboratories and offices, yet they were often isolated, could only be reached by car (having been located next to a motorway or major road) and did not incorporate amenities for leisure or housing. Science parks still provide a valuable environment for research today, but many are being expanded and upgraded in line with contemporary demands for social infrastructure; at the oldest in the UK, at Cambridge, founded in the 1970s, there are plans to add a hotel, conference and leisure facilities, and pubs and shops. Its director explains, 'at the moment the place lacks soul, so we want to inject a bit of soul to the Park by creating this social hub'.⁴

1.3 THE 'URBAN PLACE FOR KNOWLEDGE' – THE INNOVATION DISTRICT

Since the 1970s another major shift has occurred with the emergence of the 'innovation district', as entrepreneurs and workers began to seek central urban locations that are compact, integrated with the wider city with a mix of amenities, accessible through public transport, pleasant to work in and, especially, cheaper to rent. Most importantly, they were positioned close to research organisations and institutes, universities, start-up companies and business incubators that enable the sharing of ideas and resultant innovation. The idea of the innovation district was first posited by the Brookings Institution, a public policy and research organisation based in Washington, DC. Its highly influential report in 2014, *The Rise of Innovation Districts: A New Geography of*

Innovation in America, explored how innovation districts enable the development and commercialisation of new ideas and support urban economies by creating jobs in ways that 'build on and revalue the intrinsic qualities of cities: proximity, density, authenticity, and vibrant places'.⁵ An 'innovation ecosystem', it noted, could be created through the overlap of innovation-led (and often tech-led) business and research, physical environments stimulating a higher level of collaboration and connectivity, and networks that actively build new relationships. Innovation districts 'focus extensively on creating a dynamic physical realm that strengthens proximity and knowledge spillovers ... an intentional effort to create new products, technologies and market solutions through the convergence of disparate sectors and specialisations'.⁶ The Centre for London's *Spaces to Think* initiative has explored in depth how this concept can be applied to understanding and mapping the geography of innovation in London.⁷

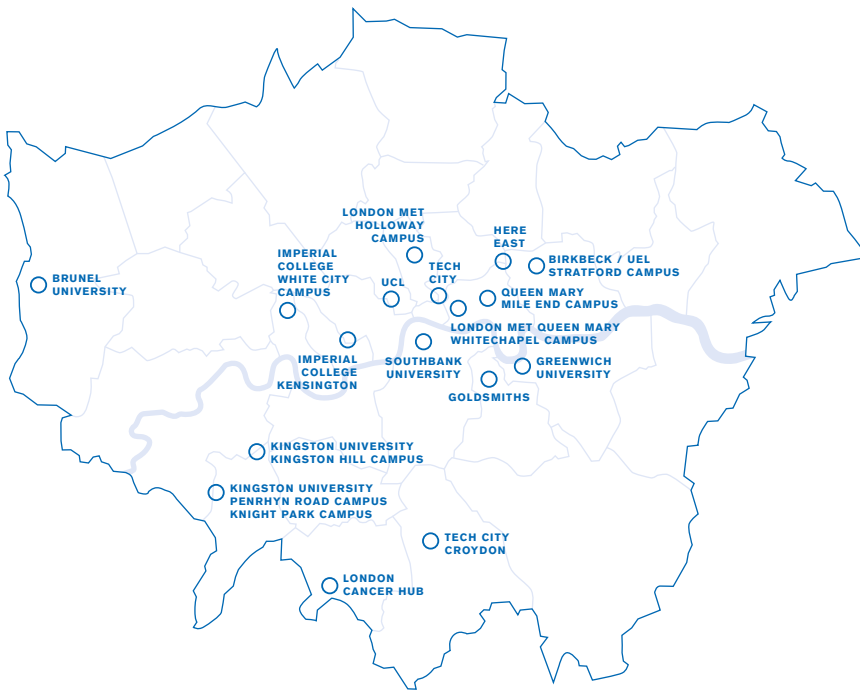
Innovation districts or knowledge quarters do not fit a standard template like the science parks of the Modern era but develop according to an area's existing economic strengths, urban form and density, and populations. Some emerge organically – for example the original informal agglomeration of tech companies around the 'Silicon Roundabout' on the City Fringe – while others are the result of targeted policies or initiatives that aim to stimulate economic growth through support in such areas as skills development, networking and knowledge-sharing, often through partnerships between private, public and third sectors. (The influence of policy drivers that seek to catalyse activity might be negative, however: rents began to rise significantly when the UK government started to get involved in promoting Tech City as a location.) However, these new districts are generally centred on one or more 'anchor' institutions – generally a university or hospital – which act as magnets for a varied ecosystem of businesses that seek to benefit from close access to the institutional research outputs. This is the model that has begun to emerge in London in the Knowledge Quarter – a knowledge-sharing network centred on King's Cross of more than 85 organisations principally including the British Library, Central Saint Martins and The Francis Crick Institute – in the east with the Cultural and Education District in the former Olympic Park and the west at the new Imperial College campus at White City.

4 Mike Scialom, "'We want to inject more soul into the Science Park", says inaugural director', *Cambridge Independent* (3 September 2017), <http://www.cambridgeindependent.co.uk/business/business-news/we-want-to-inject-more-soul-into-the-science-park-says-inaugural-director-1-5173003>

5 'Innovation districts', Brookings Institution website, <https://www.brookings.edu/innovation-districts/>

6 Bruce Katz and Julie Wagner, *The Rise of Innovation Districts: A New Geography of Innovation in America*, Brookings Institution (2014), p. 2

7 Kat Hanna, *Spaces to Think: Innovation Districts and the Changing Geography of London's Knowledge Economy*, Centre for London (2016)



Above: The Imperial West masterplan by Aukett Swanke creates a new campus for Imperial College within the wider White City Opportunity Area

Left: The development of a 2.8 acre site to the north of the British Library's existing Grade I listed building will create an additional 100,000 sq ft of new space

The recipe for making or evolving an urban campus or district centred on the knowledge economy is a complex one, but a number of key factors can be identified, including:

- **a knowledge ecosystem** – the established presence of one or more respected institutions capable of attracting talented staff, students and a network of large and smaller businesses to sustain a robust local (and citywide) economy
- **flexibility** – buildings and public spaces that are adaptable enough to respond to changing research and business needs
- **permeability and accessibility** – the integration of facilities into the existing urban fabric through opening up new routes for walking, cycling and public transport that allows public access while also recognising the need for security of people and data
- **connectivity and communication** – a fully integrated digital, physical and organisational infrastructure
- **clear vision and dynamic governance** – a policy framework and management structure that provides leadership but is also flexible enough to facilitate collaboration and interaction
- **a balanced mix of uses** – retail, leisure, restaurants, hotels and conference facilities, alongside spaces for working, studying and learning, as well as affordable housing to attract staff, researchers and students
- **variety** – buildings in an assortment of types and scales to accommodate large businesses, start-ups and growing enterprises, with spaces for private work and study as well as communal spaces for meetings and coworking
- **diverse high-quality public spaces** – quiet, reflective and beautiful spaces alongside larger places for bringing people together

1.4 WHAT IS THE WIDER REGIONAL PICTURE IN THE UK FOR THE KNOWLEDGE ECONOMY?

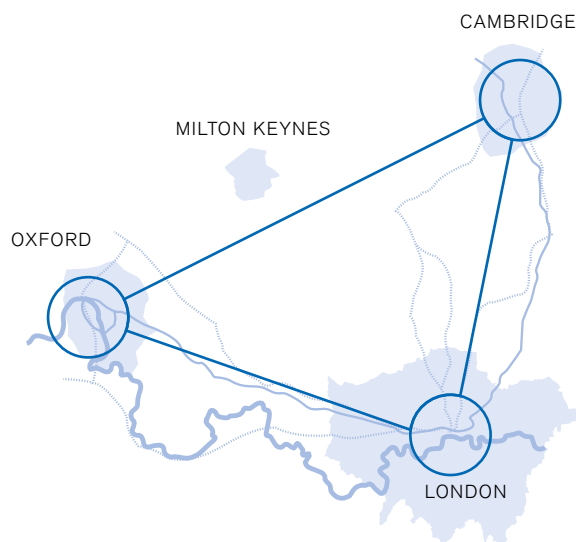
While London is the engine of the UK economy, for the knowledge economy especially it is also one part of the Golden Triangle along with Oxford and Cambridge. This is traditionally the name used to describe the broad group of elite and world-leading universities based in southern England: the University of Oxford, University of Cambridge, Imperial College London, King's College London (KCL), London School of Economics (LSE) and University College London (UCL). Increasingly, this geographical relationship has also come to define an area of high growth in the technology, medicine,

ICT and life sciences sectors in particular. The Government's Industrial Strategy, published in 2017, recognises that value to the economy and outlines plans to invest in high-quality infrastructure, homes and workspace along the Cambridge-Milton Keynes-Oxford Corridor, which currently suffers from a lack of coherent transport connections.

The combination of some of the world's most prestigious higher education institutions, a large number of skilled and talented graduates, and good quality of life has attracted hundreds of digital and tech companies. The 'global brand' of the Golden Triangle may still present an attractive proposition in the face of Brexit given the continuing growth of the digital economy there and the creation of overarching initiatives to position the South East as a world-leading, interconnected region for research and its commercialisation. Such initiatives include MedCity – a collaboration between the Mayor of London, Imperial College Academic Health Science Centre, King's Health Partners, UCL Partners, Cambridge Health Partners and Oxford Academic Health Science Centre. It aims to attract coordinated investment and entrepreneurship by, among other work, providing a single point of contact and 'concierge service' for industries and investors and facilitating collaboration by introducing new companies to partners and business expertise.

Nevertheless, London also faces competition from Oxford and Cambridge university colleges to bring in and retain the best academic minds, as well as students and research funding. Oxford and Cambridge colleges have the advantage of being major historic landowners (not just in their respective cities, but also in London and elsewhere) with more scope for new buildings compared with the severe pressures on land use and high costs in the capital. Also, their endowments collectively dwarf those of some elite London universities: £3.78 billion for Cambridge and £5.07 billion for Oxford compared to £119.2 million for LSE and £126.2 million for Imperial, for example (note, however, this is still a fraction of the value of Harvard University's endowment of \$37 billion in 2017). Lower rents – £30 per square foot in Oxford for prime office and laboratory space, less than half that in parts of London – means that digital tech firms increasingly are considering relocation out of the capital, and Cambridge now reportedly has the highest concentration of such expertise outside London.⁸ Disadvantages remain, however, currently in the lack of an integrated transport infrastructure in the third

8 Praseeda Nair, 'Can we count on Cambridge-London-Oxford Golden Triangle to boost the UK economy?', [growthbusiness.co.uk](http://www.growthbusiness.co.uk/can-we-count-on-cambridge-london-oxford-golden-triangle-to-boost-the-uk-economy-2552632/) (17 October 2017), <http://www.growthbusiness.co.uk/can-we-count-on-cambridge-london-oxford-golden-triangle-to-boost-the-uk-economy-2552632/>



line of the triangle, between Oxford and Cambridge. All these factors create a complex dynamic picture of collaboration in conjunction with competition that takes place simultaneously at different levels – as Stephen Wells, Deputy Director of Estates and Director of Major Projects at UCL, suggests ‘institutions compete but disciplines collaborate’ – but London remains the gateway to the wider world in the globalised disciplines of academic research and medicine.

1.5 WHAT ARE LONDON'S KEY STRENGTHS IN RELATION TO THE KNOWLEDGE ECONOMY?

London is internationally recognised as a foremost global centre for higher and further education, a pioneering research hub for science and technology, and home to some of the world's leading medical centres, institutes and hospitals. Education, research and health are, as the London Plan notes, ‘important economic sectors in their own right with a key part to play in developing London's world city offer’, and Research and Development (R&D) expenditure in London has previously been estimated at £3.7 billion, accounting for 1.2 per cent of London's Gross Value Added (GVA).

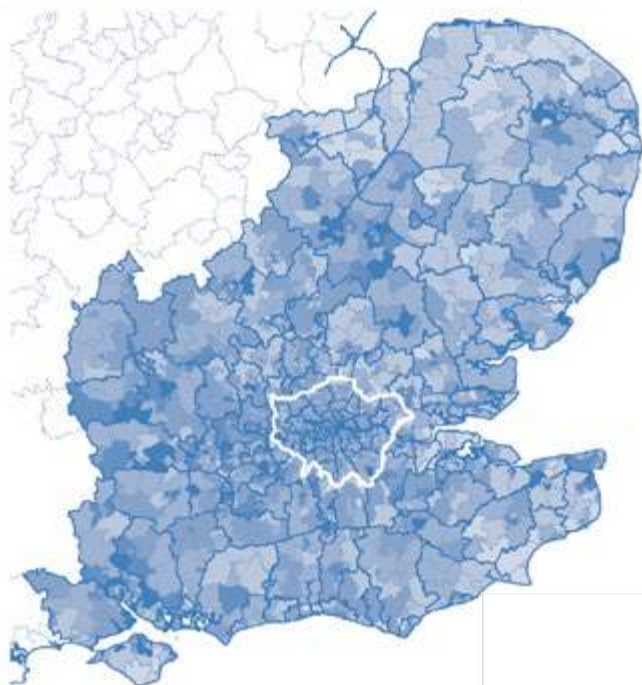
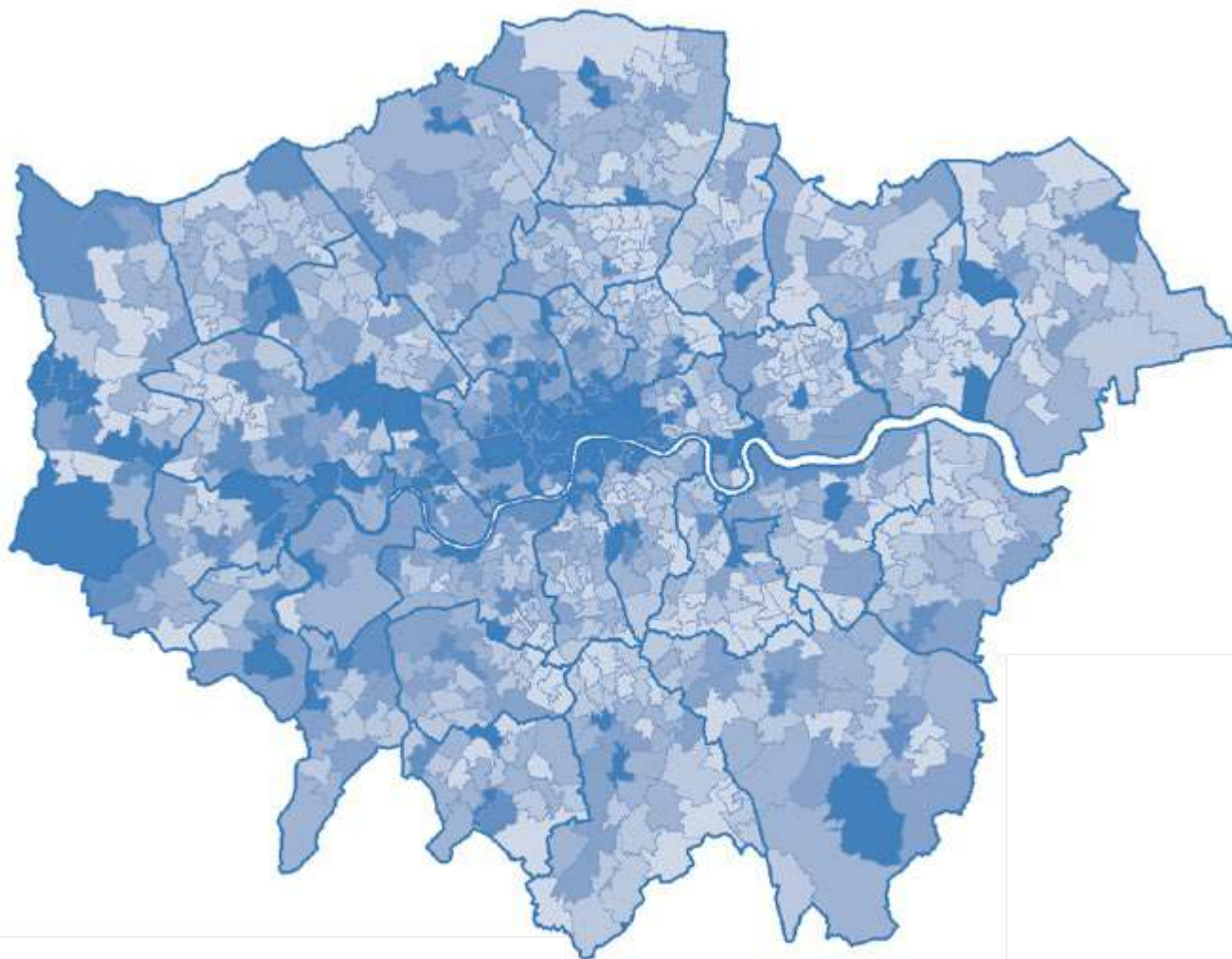
These sectors also play a major role in employment in the capital, with an overall total of 424,000 education sector and 575,000 health sector

employees in 2016 – numbers expected to grow to 617,000 and 741,000 by 2050. The area of science and technology has seen a near tripling of employee jobs in recent decades, and in particular forms an important part of London's highly skilled labour market, with over half holding a degree-level qualification. The fastest growth has been in central and east London: in both cases, employee jobs in digital technologies have grown by 50 per cent or more over the past decade.⁹ GVA's analysis of the knowledge economy in London in 2015 showed that the number of people employed by small- to medium-sized enterprises (SMEs) or who are self-employed is equal to 39 per cent of all employment but constitutes 47 per cent in the information and communications sector and 54 per cent in professional, science and technical services.¹⁰ It is these businesses, therefore, ‘that provide the most potential for new growth, creating new technologies and opening up further opportunities in new markets’. Alongside this, a critical factor in London's advantageous position is its status as one of the world's leading financial centres, giving businesses access to venture capital, specialist services and investment, and legal expertise – and its wealth of cultural and leisure amenities.

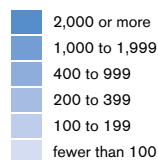
Over many decades, London has become one of the world's outstanding hubs for higher education and research, with – more than any other world city – four

9 SQW and Trampoline Systems, *Mapping London's Science and Technology Sector: Final Report to the Greater London Authority* (2015), p. 33

10 Bilfinger GVA, *London and the Knowledge Economy* (2015), p. 7



Employee jobs in the Science and Technology category (STC) in the Greater South East and in London, 2013.



Source: Inter-Departmental Business Register, Office for National Statistics. Contains National Statistics data ©Crown copyright and database right 2014. Contains Ordnance Survey data ©Crown copyright and database right 2014

universities in the world's top 40, and six of the UK's top 10 research institutions as rated by research excellence. These facilities have been extended with key projects such as The Francis Crick Institute – Europe's largest centre of biomedical research – which aim to bring together different organisations and disciplines under one roof. This project in particular (see Chapter 2) has been regarded as the prime example of a major shift in thinking which promotes multidisciplinary collaboration and co-location of research and development to boost new thinking and innovation, and to bring forward practical applications via incubators and accelerators that support the emergence of new start-up enterprises.

1.6 WHAT ARE LONDON'S KEY CHALLENGES IN RELATION TO THE KNOWLEDGE ECONOMY?

The latest (2017) survey of London business CEOs by the CBI showed that 65 per cent of businesses in capital believe that the 'tech and creative' sector will be the key element for London's economic growth over the next five years.¹¹ Nevertheless, London faces many major challenges, not least from the growth of innovation districts and the knowledge economy in many other global cities, especially in the USA, Australia and Europe, as policymakers seek to capitalise on the perceived growth that the knowledge economy can bring. In geographical terms, London has an uneven pattern of innovation-led growth, creating clusters that may in fact compete with one another for similar areas of research expertise and business innovation; one of the challenges for policymakers is therefore how to ensure growth is more even and that areas of innovation – and their resultant expected positive effect on growth of jobs, for example – complement one another. Among the principal threats to London maintaining status as a world-leading hub for advanced research, education and health is its digital and physical infrastructure. Slow broadband speeds – owing to the lack of fibreoptic upgrades – are widely quoted as a barrier, especially for small and micro businesses, with even central London boroughs such as Southwark and Westminster reported to have speeds of 10.4 and 12.9 megabits per second (mbps), both well below the nationwide average of 17 mbps.¹² As Jennifer DiMambro, Director at Arup, explains, 'the data system might work in a building but plug it into the street and it often falls over'. One inherent advantage that emerging innovation hubs may have is their potential capacity to integrate much more

sophisticated and efficient data systems. At Here East, a new tech hub in the Queen Elizabeth Olympic Park, a new data centre is housed in the redeveloped Olympic Broadcast Centre and is fed by multiple power grids and fibre capacity through several different routes.

Alongside this, London's expanding population puts additional pressure on an already strained transport infrastructure – even with the advent of the Elizabeth Line, businesses are pressing for progress on construction of Crossrail 2 and High Speed 2 rail links and the expansion of Heathrow airport. Increased demand for housing and lack of supply has made affordability a critical issue – especially for younger workers such as early career researchers, who have graduated from student accommodation but do not necessarily qualify as 'keyworkers' in order to gain access to the subsidised housing open to certain health and education professions. Alongside this are the rising costs of business premises and the loss of industrial and commercial space owing to conversion into housing under Permitted Development Rights, which represent further challenges especially for start-ups across all sectors. The challenge of Brexit presents another complication as many top research teams are not only heavily staffed by EU nationals but also gain funding from the same source. In March 2018 the Russell Group of elite research UK universities reported a 9 per cent fall in non-British EU students starting postgraduate research courses in 2017-18, compared with the previous year leading to concerns about a possible 'brain drain' of the most talented PhD and postdoctoral researchers.¹³

¹¹ CBI *London Business Survey* (September 2017), p. 2

¹² James Titcomb, 'Broadband speeds in central London worse than national average, Which? claims', *The Telegraph* (27 June 2017), <https://www.telegraph.co.uk/technology/2017/06/26/broadband-speeds-central-london-worse-national-average-claims/>

¹³ Anna Fazackerley, 'Brexit brain drain: elite universities say they are losing future research stars', *The Guardian* (6 March 2018), <https://www.theguardian.com/education/2018/mar/06/brexit-brain-drain-russell-group-universities-research>



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CHAPTER TWO

THE CHANGING FORMS OF SPACES FOR EDUCATION, SCIENCE AND HEALTH

*“... It’s all about open-plan, collaborative working and direct sightlines,
in an environment that I hope will encourage a sort of gentle anarchy.”*

Sir Paul Nurse, Nobel Prize-winning scientist and Director of The Francis Crick Institute

With the overarching focus on crossdisciplinary thinking and practice, the requirements of spaces for education, healthcare and research have been changing radically in recent decades. The importance of collaboration as the prerequisite for innovation, and the need to accommodate ‘translational research’, i.e. work that can be applied to develop commercial uses and applications, mean that buildings and spaces have to become more flexible, and work ever harder to allow both for continuity and changing multiple uses over time. Universities, medical centres and research institutions are adjusting and adapting to new technologies, changing trends in working and methods of learning, and, most importantly, the increasing need for co-location of functions and people.

While highly technical spaces are needed for scientific research, especially in life science and biotech, for example, increasingly, with advances in technology, research is ‘dry’ – often a huge amount of data analysis taking place at desks and in generic spaces – rather than ‘wet’. Such evolutions open up a wider potential for accommodating education and research uses in other types of buildings, for example repurposing obsolete office stock, alongside the emergence of the flexible ‘coworking’ space model, seen in commercial workspace, for scientific and lab applications. Similarly, the interface between patients, clinicians and researchers required for advanced healthcare research has seen a renewed focus on public areas of buildings and on improving the patient experience through better design.

2.1 THE ‘SCIENTIFIC HOTHOUSE’: RESEARCH INSTITUTES, LABORATORIES AND THE COLLABORATIVE MODEL

Bringing people together and giving them a place to discuss ideas informally has long been seen as the main way to generate new thinking: from the agora or central public space in ancient Greek cities, to the coffeehouses and cafés from the 17th century to the

present day. The concept of fostering new breakthrough ideas in science through personal interaction really started to come to the fore in the mid 20th century. One of the most famed precedents for today’s collaborative laboratory spaces was the ‘magical incubator’ of Building 20 – an anonymous, temporary, shed-like structure at the Massachusetts Institute of Technology. This building was originally used for military research in World War II but later as overflow space into which a diverse set of academics ranging from linguists to electronic engineers and particle physicists were crammed owing to a lack of space in the main university buildings. In time the building became known as home of groundbreaking ingenuity in research areas such as video games, scientific photography and microwave physics, all as a result of forcing people in different disciplines to interact in unplanned ways – mainly through the long hallways – in a confined space.¹⁴ Louis Kahn’s Salk Institute, built in California in 1965, was equally influential by having laboratory spaces that were shared, open and spacious, promoting spontaneous encounters.

Personal interaction has now become the prerequisite to invention. Facilitating chance meetings through corridors and other circulation areas, making scientific research visible both internally and externally, and providing the all-important ‘third spaces’ – cafés, foyers, atria, for example – to support frequent, spontaneous interactions have become established objectives in the design, planning and management of scientific research institutes and laboratories in recent years. Nowhere is this more apparent in London than in The Francis Crick Institute (‘The Crick’) at King’s Cross, named after the Nobel Prize-winning scientist who co-discovered the structure of DNA, and opened in 2016 as one of the world’s biggest and most sophisticated biomedical research facilities on a single site. Founded by a unique partnership between the Medical Research Council (MRC), Cancer Research UK, the Wellcome Trust, UCL, Imperial College London and KCL, the

14 Jonathan C. Molloy, ‘Can architecture make us more creative?’, *ArchDaily* (3 April 2013), <https://www.archdaily.com/353496/can-architecture-make-us-more-creative>. Thanks to Rupert Cook, Director, ArchitecturePLB, for this reference



Flow from street to building at St Mary's
Hospital Outpatients Building, Paddington
by Feilden Clegg Bradley Studios

£650 million building brings together more than 1,500 scientists and support staff across disease research areas including cancer, viral infections and neurodegenerative diseases.

The requirement for all research findings to be open source is reflected in the intention of the design to encourage informal exchanges, for example through circulation areas meeting at the centre of the building in the atrium, and through shared workspaces. Similarly, the large glass walls and partitions are designed to make science visible and encourage curiosity and collaboration – as well as to generate interactions with the wider district and reinforce the building's role as a flagship of scientific innovation that will attract medtech and other start-ups to locate in the area. Among other influential examples of this trend towards using high-quality design to create iconic landmarks as a setting for world-leading research and collaboration is Stanton Williams' Stirling Prize-winning Sainsbury Laboratory, a plant science research centre in the University of Cambridge's Botanic Garden. The building comprises meeting spaces, the University's Herbarium, and a new public café alongside laboratories, with the spaces linked by a circulation route around the garden conceived as a 'thinking path' for reflection and discussion.

However, one important question that emerges from such approaches is how we measure the success of these buildings in facilitating interaction, collaboration and the all-important innovation that supposedly results. Some measures can be quantitative – the number of Nobel Prize-winning discoveries or laureates, new patents, academic research papers and citations in respected journals, for example, as well as more prosaic evidence-based studies that count the number of staff meetings and walking distances – though qualitative measures are somewhat less clearly identified. The Crick has reported positive outputs from collaboration across disciplines in terms of medical breakthroughs, such as experts in cell biology and paediatric surgery who are working on building artificial replacement intestines for children whose guts are irreparably damaged and whose quality of life has been severely impaired.¹⁵

This important area for investigation was explored by a working group in a 2018 NLA discussion forum. As Rob Partridge, Design Director of AKT II, explained: 'You can't force people to collaborate... Working out why some collaboration spaces work better than others is really very difficult', a point reiterated by Carol Lelliott, Partner of Nicholas Hare Architects, who observed

15 'Collaboration in action', Crick News, <https://www.crick.ac.uk/news/cricknews/issue-16/collaboration-in-action/>

that while ‘people from industry are sometimes used to working closely together’, this may be more of a cultural challenge to established academics with their own offices, but that ‘through the design process you can kick-start collaboration’ by bringing people together to develop the brief. Understanding the psychology of how people interact is especially important: as Richard Walder, Associate Director of BuroHappold Engineering, noted, answering this question is dependent on understanding that it is ‘not just about the design of the space but how it is used’, on how the building is managed, and on the provision of flexible elements that allow people to adapt spaces to their needs. ‘People need to feel that the design is not so perfect that they cannot interfere with it’, commented Carol Lelliott, ‘... that they can take it over and feel it’s theirs’.

Some of these points are borne out by anecdotal evidence reported in late 2017 that a small number of occupants of The Crick found that the open-plan design meant that some areas set aside for thinking and writing up research were too noisy.¹⁶ The solution, as Professor Alan Penn, Dean of The Bartlett, has explained,¹⁷ is to ensure that thought is given to how spaces for ‘creative conversation’ – people bumping into one another in the corridors and sparking discussion – can be distinguished from quieter, contemplative spaces needed for writing or reading. At the Laboratory of Molecular Biology in Cambridge – which has produced more Nobel Prize-winners in chemistry or medicine from a single building than all of France – areas between the laboratory bays adjacent to a corridor had been knocked through, so that people walking around would stop and join a conversation in a door of a laboratory, separate from write-up areas. Laboratory designs, while promoting collaboration, still need, therefore, to provide a variety of flexible spaces for different functions.

2.2 FROM RESEARCH TO APPLICATION: SPACES FOR TRANSLATIONAL RESEARCH, PRACTICE AND COWORKING

In 2018 the global healthcare industries, including pharmaceuticals, bio-technologies, medical technologies, medical imaging and digital health, are estimated to grow in value by nearly 5 per cent¹⁸ – faster than many national economies – with combined

worldwide spending on healthcare in major regions expected to reach US\$8.7 trillion by 2020, a rapid increase from US\$7 trillion in 2015.¹⁹ And, as a 2018 report by Deloitte described, with ‘quality’, ‘outcomes’, and ‘value’ the bywords for healthcare in the 21st century, providers around the globe ‘are looking for innovative, cost-effective ways to deliver patient-centred, technology-enabled “smart” healthcare, both inside and outside hospital walls’.²⁰ Healthcare and associated life sciences research are therefore understandably widely regarded in many countries, including the UK, as priorities for investment to support national and local economic growth.

The key to success, as Professor Sir Robert Lechler, Vice-Principal of Health and Executive Director of King’s Health Partners Academic Health Sciences Centre, explains, is ‘the intimate integration of research and clinical care’. In recent decades, he remarks, London had ‘a history of being less than the sum of its parts’, with major organisations and institutions competing at the expense of collaboration. Part of the potential solution, following a national UK healthcare review by Lord Darzi in 2007 (*A Framework for Action*), was the creation across the country of Academic Health Science Centres (AHSCs), partnerships between hospitals, universities and other, often third-sector, organisations that align education, clinical research and innovation, training and education, and healthcare delivery. The stated aim is to ‘improve patient and population health outcomes by translating research into practice, ... developing and implementing integrated health care services [and to] support knowledge exchange networks to ... actively share best practice and provide for rapid evaluation and early adoption of new innovations’.²¹ There are three AHSCs in London, incorporating three of the best-known higher education institutions: Imperial College, KCL (King’s Health Partners) and UCL (UCL Partners). Through consolidating, rationalising and co-locating functions and specialisms, the intention is to harness world-class academic and clinical expertise to accelerate diagnosis, treatment and prevention strategies. Bringing clinicians, researchers and patients closer together, it is hoped, will start to make inroads in lowering the estimated average 17-year time lag from the conversion of scientific research into clinical practice: what is

16 Robert Booth, ‘Francis Crick Institute’s £700m building “too noisy to concentrate”’, *The Guardian* (21 November 2017), <https://www.theguardian.com/science/2017/nov/21/francis-crick-institutes-700m-building-too-noisy-to-concentrate>

17 ‘The secrets of the “ideal” open plan office revealed’, UCL News (22 November 2017), <http://www.ucl.ac.uk/news/news-articles/1117/the-secrets-of-the-ideal-open-plan-office-revealed>

18 *Global Healthcare Industry Outlook* (2018), https://www.researchandmarkets.com/research/cn2fvm/global_healthcare?w=4

19 *World Industry Outlook, Healthcare and Pharmaceuticals*, The Economist Intelligence Unit (June 2017)

20 Deloitte, *2018 Global Health Care Outlook: The Evolution of Smart Health Care* (2018)

<https://www2.deloitte.com/global/en/pages/life-sciences-and-healthcare/articles/global-health-care-sector-outlook.html>

21 ‘Academic Health Science Networks’, NHS England, <https://www.england.nhs.uk/ourwork/part-rel/ahsn/>

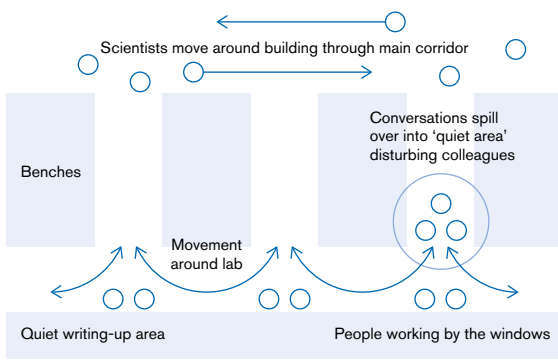


Left: Spaces for collaboration at The Francis Crick Institute by HOK with PLP Architecture

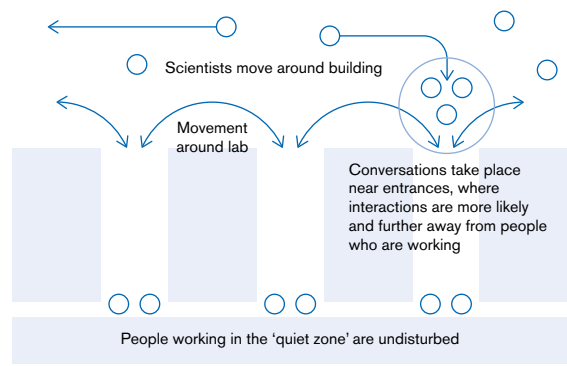
Below: Use of glass walls in Bush House, King's College London by John Robertson Architects



Poor lab layout:



Improved lab layout:



Guardian graphic showing poor lab layout vs improved lab layout (see footnote 16)

often described as 'translational research'.²² This 'bed to bench' approach enables researchers to work on new treatments on site, to directly monitor patients' responses, refine the results, and ultimately to develop new drugs and applications that can be commercially produced at scale.

As Professor Lechler explains, the driver behind AHSCs especially in London and the South East has been the concentration of research spend in major centres, and a place-based strategy that also aims to draw in commercial partners and thus inward investment, as well as world-leading specialists and researchers. The UK already attracts some of the world's top practitioners, especially as the National Health Service (NHS) uniquely provides a vast set of 'big data': more than 50 million patient records, as Christopher Shaw, Director of Medical Architecture and Chair of Architects for Health, remarks. On the other hand, he says, 'medical practice has globalised hugely over the past 30 years [especially in] the sharing of knowledge and translation of papers' so we need to create 'the best place in the world' to retain skills and talents.

The response has been a series of new buildings and spaces creating centres of excellence for advanced medical and biotech research, patient treatment or clinical trials, especially those co-located in hospitals and clinics. Among the many recent and proposed examples in the capital are: UCL Hospitals Biomedical Research Centre – a partnership between UCL and University College London Hospitals (UCLH) NHS Foundation Trust; the new first major proton beam therapy unit in the UK at UCLH, designed by Edward Williams Architects in association with Scott Tallon Walker Architects; the Phase 5 Outpatient Building integrating all outpatient services from the Royal National Throat Nose and Ear Hospital and the Eastman Dental Hospital, forming part of the new UCLH medical campus; and Sheppard Robson's Imperial Centre for Translational and Experimental Medicine, part of the facilities of Hammersmith Hospital and providing lab space with a facility for evaluating and developing new medical treatments through clinical trials. Like The Crick, many of these spaces – with avowed aims to improve patient outcomes and/or facilitate close collaboration – feature full-height atria to bring daylight into the centre of the buildings and to improve wayfinding. The heavy equipment – including proton beam units and MRI (magnetic resonance imaging) scanners, which also

© Ron Bambridge courtesy of Futurecity and the artist



Angela Bulloch's 'Radiance' as part of Guy's Cancer Centre's art programme



Maggie's Barts by Steven Holl Architects creates improved therapeutic environments that can help strengthen and improve patients' physical and psychological wellbeing

need protective room lining – is accommodated in deep basement levels.

One exception to this is at the Guy's Cancer Centre by Rogers Stirk Harbour + Partners, where a combination of buried archaeological remains (a scheduled ancient monument) and patient feedback placed the radiotherapy room at a higher level. The building also demonstrates the trend towards demands for a greater 'patient-focused' approach through its organisation into a series of so-called 'villages': colour-themed clinical and complementary care spaces with a distinctive public art programme of specially commissioned furniture, sculpture, film, lighting and graphics. This scheme is one of the leading examples of the move towards a greater focus on 'wellness' in terms of improved therapeutic environments that can help strengthen and improve patients' physical and psychological wellbeing – something pioneered in the UK by Maggie's Centres. Founded by and named

22 Zoë Slote Morris, Steven Wooding and Jonathan Grant, 'The answer is 17 years, what is the question: understanding time lags in translational research', *Journal of the Royal Society of Medicine* (December 2011), 104 (12), pp. 510–520, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3241518/>



Queen Mary BioEnterprises Innovation Centre offers 39,000 square feet of commercial wet laboratory and office space – the largest of its kind in London

after Maggie Keswick Jencks, and designed by world-leading architects, this network of drop-in centres – built in hospital grounds but quite unlike conventional hospital environments in terms of their design and layout – offer support to people with cancer, and their family and friends.

The nature of scientific research and practice is increasingly converging with the changing form of the wider world of work, through a much more mobile workforce, flexible working, and radical advances in technology enabling faster processing and smaller equipment and the ability to work almost anywhere, with the right digital infrastructure. Similarly, the use of open source data has become more widespread – though significant concerns about privacy remain – and the cross-fertilisation of ideas has been seen to lead to significant new scientific discoveries and innovation. It is therefore not surprising that we have started to see coworking spaces for science, healthcare and tech start-ups and sole practitioners, which offer flexible access to labs and offices with business support and shared facilities, often as incubators or accelerators co-located on a campus with a major institution or research body. Among the earliest examples in London was the London BioScience Innovation Centre (LBIC), created in 2000 with funding from the London Development Agency, part of the Royal Veterinary College in Camden (and therefore also close to The Crick), and housing about 60 life science enterprises. The first completely

new build facility for science start-ups – a ‘WeWork for science’ as David Lewis, Partner at NBBJ, describes it – is the Queen Mary BioEnterprises (QMB) Innovation Centre. It offers 39,000 square feet of commercial wet laboratory and office space – the largest of its kind in London – and is owned by Queen Mary Innovation, the technology transfer company of Queen Mary University of London. Both start-up and grow-on space for scientific and tech enterprises such as this is in very high demand. The issue often lies in the fact that such companies ‘are still small enough that they need access to often very expensive specialist equipment but do not have the covenant strength to afford it’, observes Charles Walford, Director at Stanhope. There is therefore potentially a gap in the market for speculative lab development of the kind seen in the USA and elsewhere (see Chapter 4).

2.3 THE CHANGING SHAPE OF LEARNING – NEW HIGHER EDUCATION ACADEMIC AND LIBRARY BUILDINGS

Higher education institutions have experienced a building boom over the past few years, with campuses being transformed by some of the best-known names in design and engineering. This spate of new buildings is a result of several factors. First is capacity: an increase in student numbers that will continue to grow, with a rise in the number of 18-year-olds and more participation in higher education leading to a demand

for an extra 300,000 places at UK universities by 2030, according to one recent estimate.²³ Most significant, however, has been the impact of the tripling in 2012 of tuition fees to up to £9,250 per year for university students in England. This was designed partly to meet the shortfall that universities would experience with the phased reduction of direct government grants via the Higher Education Funding Council in England (HEFCE) to support teaching and building maintenance and improvement – but, according to some estimates, actually resulted in a surplus of nearly £3 billion more of combined grant and fee income in 2014-15 than in 2010-11.²⁴ With so much heavy long-term financial commitment needed for their education, students are becoming much more discriminating about the quality of the buildings and facilities on offer on campus, as much as the level of the teaching. Similarly, there is much rivalry – an ‘arms race’ – between institutions for the best teaching staff in order to maintain their national and international reputations in a highly competitive market.

According to HEFCE, capital spending on higher education facilities between 2014-15 and 2017-18 was expected to be more than £17 billion, a remarkable 60 per cent higher than in the 4-year period before. Such heavy investment is transforming campuses as a whole (see Chapter 3) but also – because of 21st century teaching and learning methods – individual buildings. The impact of new technology and online learning – especially via MOOCs, or massive free open online courses provided by open web access – have not fundamentally changed the university experience. It is still, as Rachel Shaw, Director at ArchitecturePLB, observes, about ‘the university of life ... meeting people you don’t know’ and expanding horizons and aspirations. What technology has transformed is the academic learning process. For many subjects, this is now geared to personalised tuition, self-directed study and learning in small groups rather than the one-way transmission of knowledge from lecturer to student – the ‘guide on the side’ rather than the ‘sage on the stage’, to quote a well-known pedagogical saying. Higher education buildings now need to accommodate a range of different learning spaces, from pods, desks and offices for private work to open spaces for collaborative and group work. Stephen Wells, Deputy Director of Estates and Director of Major Projects at UCL, explains that primary considerations in new and refurbished buildings on the university estate are ‘contact time between student and lecturer, bookable spaces and flexible spaces’.

This need for flexibility, responsiveness and variety are apparent in many new flagship projects, especially in libraries, faculty buildings and study centres, which have become the focus of not only study but also interaction between students and academic staff. Among the latest, due to be completed in late 2018, is the new UCL Student Centre designed by Nicholas Hare Architects, which will combine 1,000 study spaces for students, student enquiry services and social learning spaces, as well as a café and roof terrace, allowing the building to be adapted for use for events. Its exemplary sustainability targets – with the ambition to be certified at the BREEAM ‘Outstanding’, the highest level of environmental performance – is a key part of its credentials. Heneghan Peng’s Stirling Prize-shortlisted University of Greenwich Stockwell Street building housing the architecture school, a campus library and teaching facilities for a new creative and digital faculty also features a variety of spaces: teaching and learning areas are divided up by service spaces and circulation routes, with a central atrium and, by the windows, quiet reading spaces. Like most new university academic buildings, it also features public facilities at ground floor level including exhibition spaces, shops and a café along Stockwell Street in the middle of Greenwich. As Rachel Shaw explains, in relation to ArchitecturePLB’s phased £12 million redevelopment of the LSE Library, the university library is in many ways ‘the key – the identifiable heart owned by all faculties’, where students cannot only study on their own but also benefit from informal learning support sessions, perhaps led by postgraduates, organised by library staff and advertised on intranet systems. Acoustic panels separating book stacks from the main study space, and flexible modular seating for group discussions, accommodate these varying requirements. Circulation spaces promoting ‘bumpability’ and unallocated spaces allowing flexible uses are also seen in Hawkins\Brown’s 22 Gordon Street for The Bartlett, UCL, at the heart of which is a distinctive angular black steel staircase with open landings.

2.4 REPURPOSING SPACES FOR HIGHER EDUCATION AND HEALTHCARE

With widespread general concerns about sustainability, many healthcare, education and research bodies have begun to look at how they can optimise existing buildings. This is most apparent in organisational headquarters, most akin to commercial buildings as most space is taken up by offices. Examples in central London have included Bennetts Associates’

23 Hannah Richardson, ‘University place demand to grow by 300,000 by 2030’, BBC News (15 March 2018), <http://www.bbc.co.uk/news/education-43399089>

24 Steven Morris, Richard Adams and Rebecca Ratcliffe, ‘How universities went on a building spree as tuition fees pour in’, *The Guardian* (22 September 2016), <https://www.theguardian.com/education/2016/sep/22/uk-universities-building-schemes-tuition-fees-new-students>



Top: City, University of London main entrance and pavilion project by NBBJ

Above: UCL New Student Centre by Nicholas Hare Architects



Circulation spaces promoting 'bumpability' at The Bartlett by Hawkins\Brown

refurbishment of a Victorian headquarters into a five-storey headquarters – including fully fitted training laboratories and technical facilities – for the Royal College of Ophthalmologists at Euston, and ArchitecturePLB's creation of the Lightwell Café, a central social learning space with a striking 'pod' maximising the use of a previously underused courtyard at the centre of the Royal Veterinary College's 1930s headquarters in Camden.

In order to maintain their world-class status in a highly competitive higher education market, some of London's leading universities are investing in remodelling existing facilities alongside commissioning new build faculties and centres. At City University, the main entrance on Northampton Square, built in the 1960s, NBBJ's adaptation to improve access and increase capacity involved measures such as linking the different campus levels and adding a new glazed pavilion with multipurpose space. In addition, universities are looking beyond their own established

boundaries, taking over neighbouring buildings originally designed for other uses as part of their long-term expansion strategy and development. Among the most notable examples is the lease to King's College London of the refurbished Bush House, the Grade II listed former headquarters of the BBC World Service, along with other associated buildings, to create a new centrally located KCL campus between Aldwych and the Strand. The buildings have been fitted out by John Robertson Architects originally as offices but reworked to provide a 400-seat auditorium, lecture theatres, teaching spaces and an interlinked courtyard. The aim, explain architects Nathalie Bergvall and Angela St Clair-Ford, was to 'push these buildings to the limit, to double the occupancy', improving the student experience, and to maximise use throughout the day and evening.

One relatively recent trend is the 'colonisation' of office and commercial space in central London by universities based in the rest of the UK. The latest estimates available indicate that there are at least 13 such campuses with more than 8,000 students.²⁵ In most cases, as a 2014 report by the Quality Assurance Agency for Higher Education found, the main rationale behind setting up these campuses is to attract international postgraduate students, taking advantage of the 'status of London as a financial centre, making it an appropriate location to deliver business, management and accountancy programmes'.²⁶ Such campuses are therefore often located in and around the City of London, with at least three – the universities of Northumbria, Newcastle and Coventry – in one street (Middlesex Street). The University of Liverpool in London now occupies a former commercial building at 33 Finsbury Square, and the 2013 planning application for conversion of use from office to non-residential institutional (education) use there provides an insight into how and why office stock can be repurposed: 'In this case the applicant is seeking to change the use ... due to a lack of identifiable market demand ... and a supply side which has meant a large quantity of new higher specification office space coming forward that [is] better placed to attract potential tenants.'²⁷ On the other side of the river, Warwick Business School's executive programme occupies two floors of The Shard, chosen for its transport links and landmark status.

Alongside this, some London universities are also creating satellite hubs outside their main campus to co-locate research, faculty and teaching alongside practice, especially in business and management

25 *London Campuses of UK Universities: Overview report of a thematic enquiry by the Quality Assurance Agency for Higher Education* (December 2014), p. 4, <http://www.qaa.ac.uk/en/Publications/Documents/London-campuses-of-UK-universities.pdf>

26 *ibid.*, p. 5

27 Planning Report for 33 Finsbury Square, EC2 (PDU/2452a/02), planning application no. P2012/0624/FUL, https://www.london.gov.uk/sites/default/files/PAWS/media_id_155214/33_finsbury_square_report.pdf



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Space Allocation

- Formal teaching + break out
- Student hub / study
- Research / office and ancillary
- Landlord area

Above: UCL School of Management by Levitt Bernstein occupies the 38th floor of One Canada Square in Canary Wharf

Left: Refurbished Bush House, King's College London by John Robertson Architects

courses. Since 2016 UCL's School of Management has occupied the 38th floor of One Canada Square in Canary Wharf, immediately below Level 39, one of the world's top fintech accelerators. Designed by Levitt Bernstein, the facility features a series of 'villages', or interconnected zones differentiated by colour and texture. This layout and fit-out – almost identical to a corporate space – has been developed 'to encourage active collaboration and communication' in 'taking its cues from start-up workspaces, academic workspaces and corporate environments ...'.²⁸ At the same time, being located at the centre of one of the world's main financial districts directly adjacent to innovative start-ups surely seeks to give students a distinctive advantage in the world of business and enterprise.

When it comes to converting buildings for life sciences or healthcare, certain building typologies such as warehouses or factories lend themselves to flexibility and retrofitting more than others. One major project planned for completion in 2020 is the first facility in London of the Cleveland Clinic, the world-renowned global healthcare provider based in Ohio. In 2017 the Clinic gained planning permission for the conversion of 33 Grosvenor Place, a historic six-storey building converted into speculative office space in the 1990s, into a 200-bed private hospital. Parts of the existing structure and the neoclassical façades of the building will be retained, with the rest extensively remodelled or rebuilt.

28 'Level 38, One Canada Square: Project Overview', Transforming UCL Estates, <http://www.ucl.ac.uk/transforming-ucl/completed-projects/canary-wharf>



Cleveland Clinic London, 33 Grosvenor
Place by PLP Architecture and HKS with
Cleveland Clinic Design Studio

The real challenge comes in accommodating specialist scientific and medical equipment. As noted above, diagnostics and radiotherapy treatment for cancer, for example, can require MRI scanners and proton beam therapy cyclotrons. Owing to their weight – the cyclotron at The Christie NHS centre in Manchester weighs 90 tons (actually a quarter of the average weight) – and use of high-energy rays or radioactive material, floors need to be specially reinforced and rooms lined to seal the magnetic or radiation field. As Graham McClements, Principal and Head of London Studio, BDP, points out, ‘vibration is an issue ... you can’t do imaging or microscopic research’ as equipment is so sensitive to movement. The usual solution, as in most new builds,

is to put such advanced equipment in the basement. Sonnemann Toon’s proton beam therapy centre for the Harley Street Medical Area will house a proton accelerator in a new 15-metre-deep basement, below mews houses and a road that will be removed and then reinstated to accommodate its construction and retain visual character respectively. Above ground, two Grade II listed Georgian buildings will be refurbished to house clinical and consultation rooms. Such a project is costly and difficult logistically in an urban conservation area, explains Simon Baynham, Property Director at The Howard de Walden Estate, but providing such advanced treatment, he says, is all part of ‘making Harley Street competitive on the international stage and supporting the London economy’.



CHAPTER THREE

CHAPTER THREE

KNOWLEDGE, PLACEMAKING AND THE CITY

“The old divisions between town and gown are disappearing.”

Julian Robinson, Director of Estates, LSE

Traditionally colleges, universities, clinics and hospitals were found in well-defined clusters, now centrally located but often once on the edges of the city. More recently universities and medical institutes are undertaking major expansion and relocation plans further afield, in a more holistic approach that places ‘anchor’ institutions at the heart of placemaking in emerging districts beyond central London and around Cambridge and Oxford. With the focus on supporting innovation as the key driver of a robust economy, these estates – as major landowners and employers – can also play a vital role in shaping a sustainable, resilient city. Consideration also needs to be given to the provision of student, keyworker and affordable housing, as well as a variety of workspace types, in order to support local communities.

Among established central estates there has also been a shift to establish wider engagement with neighbouring institutions of all types, businesses and BIDs, seen for example in the Aldwych Quarter which encompasses LSE, King’s College London, the Royal Courts of Justice, Somerset House and the Northbank BID, among others. Increasingly, all types of knowledge-led organisations are being guided to think about what they create as public ‘outputs’, leading to a much greater focus on public engagement such as lectures and exhibitions, and indeed public realm improvement, as well as branding and identity.

3.1 RESHAPING AND UPDATING EXISTING DISTRICTS AND CAMPUSES

In terms of higher education estates, London occupies a unique position among major UK cities as it has several traditional ‘education quarters’ that have been dispersed across the city: principally Imperial College and the Royal College of Art (RCA) at South Kensington; King’s College London and the LSE historically at the Strand and Aldwych; and University College London in Bloomsbury; as well as institutions further from the centre such as Goldsmiths, Queen Mary and Royal Holloway. This is partly owing to the fact that while the University of London has existed since 1836, it is in fact a federal body composed of these and other colleges

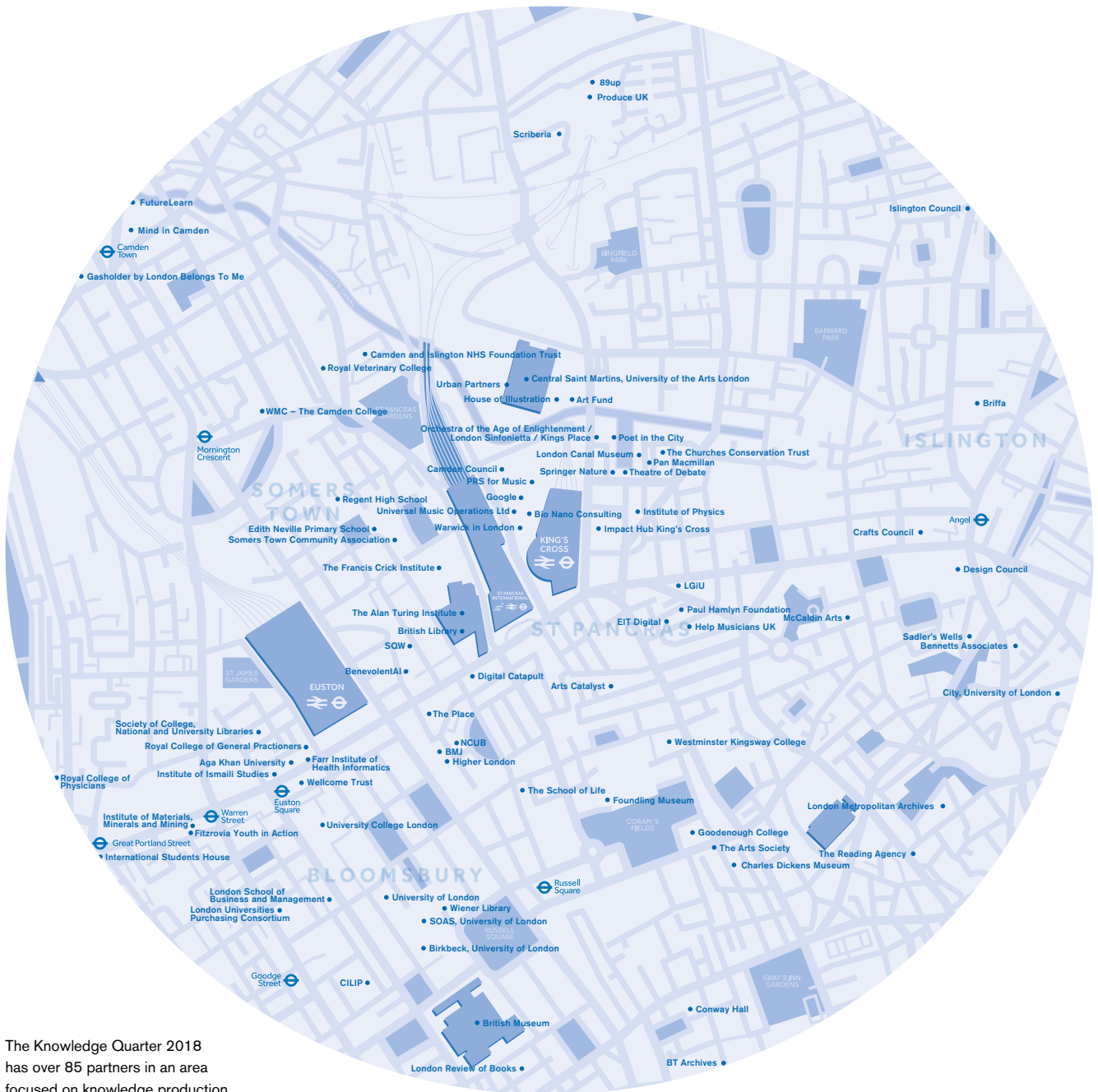
that operate independently. London’s education estate is therefore largely woven into the rest of the city. Julian Robinson, Director of Estates at LSE, commented at a 2018 NLA workshop that London ‘has world class facilities and critical mass, and people come to the city because they can meet their intellectual peers from all around the world. Connections can be made here in this intellectual powerhouse, but the knowledge economy must fight for attention with so much going on; although happily this sector has been recognised in the new draft London Plan.’

For this reason, many established urban knowledge districts and institutions are now investing heavily in new world-class buildings and refurbishments, with long-term masterplans to ensure continued viability, visibility and reputation for excellence – especially when, as Stephen Wells at UCL remarked, for universities ‘students are more like customers’. The Transforming UCL project is a 10-year programme with over £1.2 billion of funding, while among others the London Metropolitan University’s One Campus, One Community project is investing £125 million in creating a single unified campus in Holloway. Through this, universities (and indeed many NHS trusts, using a similar approach) are seeking to make the most efficient use of land, public spaces and buildings by rationalisation and consolidation, to not only reduce costs but to create a more coherent and integrated estate accessible to the wider city (see 3.3 below), to improve environmental performance, and to enhance the experience of students, staff and other employees. As David Lewis, Partner at NBBJ, notes, clients now expect that ‘buildings have to work harder these days ... the question is, how do people get longevity, continuous and multiple uses?’

The move to reinforce the power of London’s ‘brand’ of excellence in higher education and healthcare is perhaps the most striking common feature of the ways in which existing estates are being repositioned, updated and managed. As Julian Robinson explains, in relation to LSE’s award-winning Saw Swee Hock Centre by O’Donnell + Tuomey Architects, ‘We want our buildings to project our values and how we see



Saw Swee Hock Student Centre at the LSE by O'Donnell + Tuomey Architects, stitching into the existing urban fabric.



The Knowledge Quarter 2018
has over 85 partners in an area
focused on knowledge production

ourselves ... A challenging and forward-thinking architect is the outward expression of that.¹²⁹ In a similar way, Herzog and de Meuron's new flagship building for the RCA's Battersea campus, due for completion in 2020/21, is intended to provide a striking focus for the expansion of the campus as well as state-of-the-art workshops, studios, incubator spaces and research centres for disciplines such as materials

science, advanced manufacturing and intelligent mobility – identified as priorities for the UK's economic development. However, while iconic structures are designed to act as visible magnets to attract students and staff, many estates can often still look on the face of it like a disparate collection of buildings.

One common challenge reported by interviewees for this paper is that kickstarting collaboration often

29 David Rogers, 'Client interview: How to impress Julian Robinson', *bdonline.co.uk* (3 May 2016)

requires a lot of effort to encourage people to move beyond thinking in silos. This is where the creation or consolidation of networks so vital as a precursor to innovation comes in: 'just because things are adjacent does not mean that there is collaboration going on – there is the physical design, and then there is the cultural embedding', explained Juliette Morgan, Head of Campus – Regent's Place, British Land, summarising the findings of her group at an NLA workshop. Two examples stand out here: the Knowledge Quarter and the Harley Street Medical Area. The Knowledge Quarter (KQ) is a consortium of large and small cultural, research, scientific and media partner organisations all located within a 1 mile radius of King's Cross 'with one thing in common – we are all actively engaged in advancing and disseminating knowledge'.³⁰ Since its foundation in 2014, it has grown to include over 85 partners in an area focused on knowledge production, with the British Library, Central St Martins University of the Arts London and The Crick – soon to be joined by the new UK Google headquarters. As Jodie Eastwood, CEO, says, the KQ is a 'convening of minds – not a large capital project, but a convenor or broker', with networking, research and other opportunities that are helping to establish a recognisable brand while also enabling like-minded organisations to 'speak with one voice'.

Harley Street in Marylebone, part of The Howard de Walden Estate, has long had a worldwide reputation for outstanding private medical practice and expertise. But now that medicine is much more globalised, 'branding is much more important', Simon Baynham remarks, and the presence of world-renowned clinics such as The Priory 'will provide the patient with the assurance that is required' in the highest standards of medical care. As well as a proactive policy of identifying key specialisms that add value to the area's offer, and working with leading practitioners to provide world-class facilities, the Estate has also undertaken to promote collaboration between occupiers by hosting networking and knowledge-sharing events, trade fair delegations, and a medical concierge service that creates a comprehensive service to the various specialisms for patients, for example. In addition, it has responded to the needs of emerging practitioners in the development of 'sessional houses' in which consulting rooms can be hired on variable terms.

One critically important element in making these estates sustainable for the future is the successful integration of housing and workspace. In central London availability of land is extremely scarce. Universities including King's College London have sought to

respond to the increase in student numbers by entering into development partnerships with companies such as Urbanest in areas beyond its traditional campus. Hopkins Architects' £200 million mixed-use scheme in the City of London, which received planning consent in 2017, will include 640 student flats, alongside 10,000 sq ft of innovation space for KCL's London Entrepreneurship Institute, and 75,000 sq ft of commercial office space for SMEs. The university will lease the flats on a long-term basis. There remain so far, however, very few examples where affordable housing is being built on existing campuses, not just for students, academics and early career researchers, but also often low-paid support staff such as cleaners, receptionists, porters, security officers and catering teams. This is not just the case in London but also in Oxford, where the gap between house prices and average incomes has been said to be even bigger than in the capital.³¹ Integration of such schemes in emerging districts and campuses through early engagement with local authorities, for example, may be one part of the possible solution, as also may be modular micro-homes that may suit recent graduates as starter housing.

3.2 EMERGING DISTRICTS AND CAMPUSES

With innovation regarded as the critical factor for the UK's and London's economic growth, the Mayor's Economic Development Strategy, published as a draft for consultation in December 2017, understandably highlights tech and digital and life sciences as among the key sectors in which London needs to reinforce its expertise. This requires not only investment in skills and employment, but also the right environment and location in which businesses, institutions and organisations can develop and commercialise new ideas, products and services. However, as Stewart Murray, Head of Development Group at GL Hearn, explains, 'with London's strength of critical mass and talent you can completely avoid clustering and opportunities if they are not put into spatial context'. Strategic planning, and public-sector investment, often as seed funding, are therefore required not only to balance complementary clusters across the city but also to support the growth of individual clusters through incremental change, regeneration or other interventions. The question remains as to how far the Government is responsible for stimulating innovation through targeted measures, and how far this should emerge organically; in other words, how far is this 'innovation-led policy and development' or 'policy- and development-led innovation'?

³⁰ Knowledge Quarter website, <https://www.knowledgequarter.london/>

³¹ David Matthews, 'Priced out: housing cost headaches for universities and staff', *Times Higher Education* (28 January 2016), <https://www.timeshighereducation.com/features/priced-out-housing-cost-headaches-for-universities-and-staff>



Top: Harley Street Medical Area, Howard de Walden Estate

Above left: UCL East, Marshgate by Stanton Williams

Above right: London Cancer Hub, Sutton by Haptic Architects

The best-known example of this to date is East London Tech City – in and around Old Street, Hoxton and Shoreditch – also known as ‘Silicon Roundabout’. It developed organically in the 1990s as tech start-ups were drawn in by then relatively inexpensive rents and plentiful space in former industrial buildings and warehouses, and the proximity to sources of finance in the City and a dynamic creative and arts scene, which soon caught the attention of policymakers. In 2010 the then Prime Minister David Cameron unveiled major plans to expand facilities, provide business advice and support infrastructure for emerging tech enterprise, and attract tech giants, with £15 million of Government funding. In just one year the number of tech firms in the area was reported to have tripled.³² However, even in 2015 it was reported that rents in the area had doubled in just a few years, with some tech firms looking to other locations such as Aldgate, Canary Wharf, King’s Cross and the Southbank.³³

With the growing pressures on, and the cost of, space in the centre, new well-connected locations were sought to meet demand for the creation of new clusters, with major universities, hospitals and research centres seen as the catalyst – the ‘centre of gravity’ around which, using a scientific analogy, ‘component molecules can form into a compound leading to unforeseen opportunities’, according to David Height, Director of Planning and Engineering at Mitsui Fudosan UK. Large strategic clusters are now being developed beyond Zone 2 to the south, east and west. One of the main life science and tech districts is centred on Imperial West at White City, a multidisciplinary research space for Imperial College London’s scientists and engineers, together with state-of-the-art space for translating research ideas into direct applications and spin-out companies. This includes the I-Hub incubator providing flexible workspace and support for start-ups. Among the companies based here in 2018 is one that has developed a fully biodegradable plastic. The second major emerging cluster is situated in the east, at the Queen Elizabeth Olympic Park innovation district, with the new UCL East campus acting as a driving force for cross-disciplinary innovation and enterprise in research, design, development and manufacture in construction, automotive, digital technology, robotics and other sectors. To the south is the London Cancer Hub, a partnership between The Institute of Cancer Research, LB Sutton and The Royal Marsden NHS Foundation Trust (with the GLA) to transform 26-hectares just south of Sutton town centre into the world’s second largest cancer research facility, estimated to create

13,000 new jobs and contribute £1.1 billion to the UK economy through groundbreaking life science and pharmaceutical research and development.

In these emerging districts, one of the major considerations – as with existing clusters – is to create a distinctive place that is knitted physically and socially with the wider city. Embedding new institutions and associated businesses is a long-term strategy, and therefore the approach taken in the clusters mentioned above is generally one of phased development over many years in areas where good transport infrastructure (especially the Elizabeth Line) will be a critical factor in connectivity. Scale is a factor shaping a strong identity, as is the ability for people to appropriate space for their own, unexpected uses – but even more important is the quality of the public realm and an understanding of the needs of workers, visitors, students and local communities in terms of adequate provision of jobs, schools, skills development opportunities, housing and other facilities (see 3.3 below).

The North West Cambridge Development, masterplanned by AECOM, has been hailed by some as a potential model for such new sustainable urban quarters. On a 150-hectare site just outside Cambridge, this new mixed community is designed to offer not just 100,000 sqm of research space but also 1,500 keyworker homes and accommodation for 2,000 postgraduate students, along with facilities such as a primary school, health centre and shops, set in parkland with an extensive cycle network. It is important to bear in mind two factors that make it unusual, however: the planning process was especially lengthy – the original development proposal was submitted in 2003 – largely owing to the fact that the land was originally designated as green belt; and the site is owned entirely by the University of Cambridge, probably in collective terms the UK’s richest university in terms of building assets and land ownership acquired by its constituent colleges over its 800-year history, and therefore able to take a much longer-term view of strategic investment than can be done in areas of multiple ownership. Another advantage that established and central urban clusters have over emerging ones is a well-ingrained ecosystem of cultural and creative businesses and facilities, both large and small, that can prove the testing ground for new collaborative concepts.

3.3 SCIENCE, MEDICINE, TECHNOLOGY, EDUCATION AND THE WIDER CITY

Building design, management and placemaking strategies are now focusing on making previously

32 Heather McKay, ‘A Short History of Tech City’, Tech London (17 October 2017), <https://www.tech.london/news/a-short-history-of-tech-city>

33 Lynsey Barber, ‘Bye-bye Tech City? Spiralling office rents in Shoreditch’s Silicon Roundabout will push tech startups out of London’, *City A.M.* (17 April 2015)

'closed' institutions more open, aiming to making science and tech more accessible to the wider community in a variety of ways. As Jodie Eastwood, CEO of the Knowledge Quarter, points out, institutions are not only looking for 'space to bring the best and brightest together but are thinking about how to share and how to engage with new audiences'. A number of factors are at work here: cross-disciplinary working is now seen as a precursor to innovation; the concept of sharing data via open source technology is well established; and, more prosaically, drastic reductions in central and local government funding are driving institutions of all kinds to find new ways to generate income through facilities and activities open to new visitors and participants. There is much greater demand for spaces to be permeable and accessible, and for 'border projects', i.e. those with a primary health or education function but with community facilities around the edges. While spaces for knowledge are intended to bring the most inventive minds together, they also now need to be designed to share the results much further.

This aim to extend openness manifests in two main ways: physically and culturally/socially. In terms of the former, cafés, roof terraces, exhibitions and other spaces are opening up ground-floor (and top-floor) levels to public access and use, with the aim of making science and tech literally more visible. Over the past decade these have begun to appear in a multitude of locations across the city, from the Wellcome Collection on Euston Road to the Saw Swee Hock Building at LSE and the Sainsbury Wellcome Centre at UCL. Projects in the pipeline or on site also have these features fully integrated: the Institute of Physics headquarters at King's Cross, for example, will incorporate education and exhibition facilities for the local community and schools, alongside function and start-up incubator space. The Marshgate I building in the first phase of UCL East will include shops, exhibition and other public uses within 'fluid zones' at ground and first floors to draw people into the building, with the floors linked by escalators, much in the manner of a traditional shopping centre. Notably, many of these spaces are managed directly by the institutions, so that they can not only retain income but also control of public-facing operations.

Equally, if not more, important is the emphasis on public realm improvements and strategic approaches to improve cross-campus connections, wayfinding and links with the wider city, walking and cycling access, and places where students, staff and workers can sit and meet. Higher education institutions in particular are recognising that high-quality public realm can

also support ambitions to create and sustain world-class estates through enhancing the visual integrity, character and identity of a campus. LSE, for example, has put in place a comprehensive public realm strategy which aims to 'signal both our place in the city and our openness to the city'.³⁴ Although much further afield, NBBJ's new campus for the Royal Liverpool University Hospital shows how the same principles can be applied to health campuses. Adjacent to Liverpool's own Knowledge Quarter, the development centred on the largest medical facility in northern England is designed with a series of public terraces at the centre, overlaying a car park, not only defining the main hospital entrances but also connecting back directly to the rest of the city.

Activating public spaces through events and education programmes is also a key feature of how science, tech and health are extending their reach. Some organisations, such as the Wellcome Collection, the Francis Crick Institute and the new Science Gallery London that will open in 2018 at London Bridge are actively encouraging collaborations between art and science as a means to support collaboration between different disciplines and promote innovative thinking and practice. Almost all academic institutions have wide-ranging programmes of talks, lectures, exhibitions, conferences and seminars open to the public, and either initiate or participate in festivals that showcase academic discoveries and research alongside the work of businesses and cultural organisations – the annual Bloomsbury Festival being just one example.

Closing the UK's skills gap in STEM (science, technology, engineering and mathematics) is an urgent priority for government in order for the UK to maintain economic performance and growth in the future. Skills in these subjects are not only important for science and innovation; as the UK Industrial Strategy notes, the country's 'world-class creative industries, which cover film, TV and video games, are growing at twice the rate of the economy as a whole and are heavily reliant on STEM skills'. Encouraging greater and more diverse take up of STEM subjects at school and university is a critical objective of policy initiatives and national campaigns such as the 2018 Year of Engineering, aiming to inspire younger generations to consider careers in this field, where there is currently an estimated shortfall of 20,000 graduates per year. In addition, a new movement originating from the USA is now championing STEAM, or the inclusion of Arts within this grouping, and an emphasis in the curriculum on creative thinking, observation and critical analysis that both arts and sciences share. A large part of public programmes led by science and research bodies is

34 LSE *Public Realm Strategy* (November 2013), http://www.lse.ac.uk/intranet/LSEServices/estatesDivision/pdf/14_0047-LSE-Public-Realm-Strategy-high-res.pdf

Left: Sainsbury Wellcome Centre for Neural Circuits and Behaviour at UCL by Ian Ritchie Architects

Below: Science Gallery London at King's College London by LTS Architects

Bottom: Royal Liverpool University Hospital by NBBJ in collaboration with HKS

©Grant Smith



therefore directed towards schools. The Centre of the Cell, within the Will Alsop-designed Blizard Institute at Queen Mary, University of London, and opened in 2009, was the first science education centre in the world to be located within working biomedical research laboratories, offering direct views of scientists at work and interactive activities for schools and families.

Institutions are also taking greater steps to ensure they are open and accessible to their own local community; this is particularly a challenge where areas with considerable economic disadvantage border on to areas of regeneration and high growth. At the annual Knowledge Quarter conference in February 2018, Amber Perrier, Community Engagement Officer at the British Library, highlighted the fact that the residents of Somers Town to the north of King's Cross know of the Library 'but don't think it's for them – they feel nervous [about it] and think it is for a certain type of person'.³⁵ One of the principal objectives of the major extension scheme to the north of the British Library will therefore be not only to provide a new headquarters for the Alan Turing Institute for data science research, but also a new north 'front door' that will be designed to make the building more attractive and welcoming to all in the immediate neighbourhood. In Kingston, the new Town House building designed by Grafton Architects is intended not only to provide new facilities for Kingston University but also to act as a new civic landmark, with a library, dance performance area and covered courtyard for public events that seek to encourage the wider community to come into the campus.

3.4 DEVELOPING PLACES FOR KNOWLEDGE – PARTNERSHIPS, FUNDING AND THE ROLE OF BOROUGHES

One of the key challenges of higher education and healthcare institutions is how to expand and update their estates to keep up with demand not only for increased capacity but also factors such as rapid advances in technology, changing demographics, and, especially, the need to generate long-term income streams in an age of austerity. With the great squeeze on public sector funding, universities and hospitals are focusing on strategies for consolidation, rationalisation and improvement to ensure continued resilience and adaptability for the changing needs of the knowledge economy. In its latest report on the financial health of the higher education sector, the Higher Education

Funding Council for England (HEFCE) reported that since 2006 the sector has spent £27.9 billion on improving its physical infrastructure but that it 'still needed to invest £3.6 billion to bring its non-residential estate up to a sound and operationally safe condition', which, it pointed out, was not 'the same as the investment required to bring the estate up to the standard required to satisfy rising student expectations'.³⁶ The same report shows that the higher education sector in England planned to use £11.3 billion from its own cash reserves and to borrow an additional £4.3 billion to help fund its capital investment plans until 2019/20.

As noted above, therefore, universities are seeking new ways to optimise their estates not only through maximising value through additional uses such as venue hire for conferences, retail and hospitality throughout the academic year, but also through development partnerships with the private sector to create student accommodation, and also even with other universities in order to share costs – with the further cross-fertilisation of ideas generated by co-location a potential additional benefit – while creating new high-quality facilities. University Square Stratford, designed by Make Architects and opened in 2013, was a joint venture between the University of East London (UEL) and Birkbeck, University of London. Including a variety of spaces for education and the arts, the building was designed for extended daily use – by UEL during the day and Birkbeck during the evening.

Major philanthropic trusts and charities are also now becoming more prominent as funding partners in the development of new campuses, especially for medicine, life sciences and health. Like several Oxbridge colleges, some trusts are themselves major historic London landowners – the Wellcome Trust, founded from the profits of Henry Wellcome's pharmaceutical company in the 1930s, has significant holdings in South Kensington and Knightsbridge among its total global investment portfolio of £23.2 billion.³⁷ The Guy's and St Thomas' Charity, whose history dates back to the 16th century, reported funds of £39 million generated by its investment properties in 2014/15.³⁸ Medical, pharmaceutical and life science research are areas in which support from private donors is especially significant: a single gift of £10 million by a supporter of Cancer Research UK in 2012 contributed to the funding of The Crick.³⁹ While

35 Panel discussion on 'The Role of the Knowledge Consumer', The Future of Knowledge: Knowledge Quarter Conference 2018 (12 February 2018)

36 HEFCE, *Financial Health of the Higher Education Sector: 2016–17 to 2019–20 Forecasts* (October 2017/2018), p. 28, http://www.hefce.ac.uk/media/HEFCE,2014/Content/Pubs/2017/201728/HEFCE2017_28_corrected.pdf

37 'Investments', <https://wellcome.ac.uk/about-us/investments>

38 Guy's and St Thomas' Charity, *The Story of Our Year: Annual Report and Accounts 2014/15*, p. 15, https://www.gsttcharity.org.uk/AnnualReport1415/assets/report_hyperlinks.pdf

39 'Cancer Research UK receives largest ever donation', The Crick website news (18 July 2012), <https://www.crick.ac.uk/news/news-archive/2012/07/18/cancer-research-uk-receives-largest-ever-donation/>

University Square
Stratford by Make
Architects, a unique
joint venture between
University of East
London and Birkbeck
University of London



finance on this scale can help to unlock development, academics and research leaders are continuously bidding for grants from major donors and foundations, which can create some major challenges for the built environment industries. As Patricia Martin del Guayo, Architect at Shepherd Epstein Hunter, explains, sometimes 'you don't always know when the funding is coming ... but you need the masterplan to be able to build it immediately'.

New mixed and long-term sources of funding are now identified as a priority for healthcare estates. In March 2017, Sir Robert Naylor published his major independent review of the NHS estate for the Department of Health. Naylor estimated that at least £10 billion of additional capital funding was required to meet ambitions to make the estate sustainable in the face of demand, of which at least £1.5 billion was needed in London. Among his recommendations were that this sum could be found from a combination of private and public sources and monies released from the current estate – the incentives for which included match funding and the reinvestment locally of income from sales of assets. This review is now

seen as an important milestone in identifying how to make best use of the buildings and land owned by the NHS, and how to free up land to generate income while consolidating hospital facilities and retaining long-term control. This also opens up potential for integrating housing – perhaps through partnerships with housing associations – and services, such as schools and nurseries, within NHS estates; although, as many interviewed for this paper have pointed out, this has to be carefully managed in terms of public perceptions, as the NHS is considered the 'jewel in the crown' of the welfare state founded in 1948, and a fundamental part of the fabric of British life. In March 2018, NHS Property Services sold the former St George's Hospital site in Hornchurch to national housebuilder Bellway, for the then record amount of approximately £40 million, with the aim of reinvesting the receipts in 290 homes, a mixture of houses and flats, and a new health facility.⁴⁰ Shepherd Epstein Hunter's masterplan for the future of the Warneford Hospital site, a partnership between Oxford Health NHS Foundation Trust and the University of Oxford, proposes a mixture of new clinical facilities, keyworker

40 Alex Cameron, 'Sale of surplus London hospital site yields new homes and funds for reinvestment in the NHS', NHS Property Services news (8 March 2018), <https://www.property.nhs.uk/sale-of-surplus-london-hospital-site-yields-new-homes-and-funds-for-reinvestment-in-the-nhs/>



Left: Herzog & de Meuron vision for AstraZeneca, delivered by BDP

Below: Warneford Hospital Masterplan by Shepherd Epstein Hunter



© ArchitectureFab

housing and research space with potential for an atrium linking the restored existing hospital buildings to house training and social spaces at the heart of a major new centre for mental health research and practice. Major private sector investment and strategic partnerships have come to the fore in other large-scale projects such as the new Cambridge Biomedical Campus, funded by Liberty Property Trust and Countryside Properties with Cambridge University Hospitals NHS Foundation Trust, the Wellcome Trust, Cancer Research UK and the Medical Research Council. The campus will also be home to pharmaceutical company AstraZeneca's new global research and development centre and corporate headquarters, which will be integrated with biomedical research, healthcare and education on a single site. Through such multiple partnerships, the NHS can benefit from new facilities at zero cost and direct access to cutting-edge research.

All such developments need to be considered within the wider policy framework of borough strategies – somewhat simpler in Oxford and Cambridge than in London, where the knowledge economy ecosystem is made more complex by having 33 different local authorities. GVA's report on London and the knowledge economy in 2015 pointed out that in some London boroughs, 'there is a lack of clear policy and intervention to shape growth within the sector', whereas in others, the rapid pace of market development 'means that local policy or public sector investment is one or two steps behind what is happening on the ground' despite an authority's willingness to diversify into new economic sectors. Some boroughs less known for having traditional

knowledge economy clusters are seeking to build on local strengths: Lewisham's business growth strategy, for example, has identified the borough as having the largest percentage of micro businesses (employing less than 5 people) in the UK, many of which are connected to technology and media sectors. In response the borough strategy seeks to exploit this advantage and attract new business by strengthening links between local knowledge businesses and Goldsmiths as a hub of creativity and innovation.⁴¹

Of particular concern to many boroughs where the knowledge economy already has strong visibility and presence is the importance of ensuring that all local residents benefit from the perceived uplift that these industries can bring, especially where clusters sit side by side with areas of deprivation and low skills. Quoted in the Centre for London report on innovation districts, Jo Negrini, now Chief Executive of LB Croydon, points out, as well as competitively priced office space, the borough also has 'a large population of young people ... producing digital content as well as consuming it. By harnessing and developing this talent, we can create a tech ecosystem that not only attracts businesses to Croydon but will see Croydon residents fully participate in all that the tech sector and its incumbent jobs have to offer'.⁴² Boroughs can therefore play a vital role through coordinating skills and training. The Camden Apprenticeships team, for example, works in partnership with local employers and training providers and offers tailored support throughout the process alongside training in key business skills such as minute-taking and presentations.

41 *Lewisham Business Growth Strategy 2013–2023*,

<https://www.lewisham.gov.uk/mayorandcouncil/aboutthecouncil/strategies/Documents/LewishamBusinessGrowthStrategy2013-2023.pdf>

42 Kat Hanna, *Spaces to Think: Innovation Districts and the Changing Geography of London's Knowledge Economy*, Centre for London (2016), pp. 60–61



CHAPTER FOUR

FUTURE-PROOFING PLACES FOR EDUCATION, SCIENCE AND HEALTH

“Could we think differently of what’s required of the built environment in terms of ‘faster, quicker, cheaper, lighter’?”

Juliette Morgan, Head of Campus – Regent’s Place, British Land

Technology is changing so fast it is difficult for those who commission, plan, design and manage buildings for education and health to think even 10 years ahead: digital learning has completely transformed the way in which colleges and universities can operate – with a ‘campus’ anywhere in the world – and similarly healthcare technology (medtech) has radically advanced the trend towards virtual consultations. There is much greater demand therefore for flexible, ‘looser fit’ buildings that can be repurposed, and integrated with wider services. Despite some well-publicised progress in UK/EU negotiations, continued relative uncertainty around Brexit has emphasised the importance of creating high-quality, affordable, adaptable and attractive spaces in order to retain highly skilled workers.

There is still much debate about the potential impacts of artificial intelligence (AI) and robotics, as technological advances accelerate to the extent that some predict that middle-income roles such as paralegals and journalists will be replaced by automation and smart software. Education and healthcare as major industries have not yet undergone comprehensive transformation, but most forecast that this is just over the horizon. The British Library, for example, completed its massive newspaper archive storage building in Yorkshire in 2012, maintained by machines and robots, rather than humans, and to that end supplied with low levels of oxygen to reduce fire risk and humidity and temperature controls. In healthcare, revolutionised technology in the design and manufacture of precision instruments has allowed less invasive types of surgery, but the shifts taking place will have a more substantial social impact: improved interfaces, new materials, automated controls, high-definition visualisation and wearable devices, for example, are helping to enable patients, especially in the private sector, to monitor their own care at home and consult with specialists via online platforms.

With these changes, what is the role for humans especially in the health and education sectors? As technology becomes more powerful and capable, it is likely that there will be much greater demand for uniquely human qualities such as empathy and emotional

intelligence, negotiation, persuasion and coordination: ‘workers whose core purposes are critical and creative thinking and making human connections will thrive’.⁴³ More emphasis will be placed on personalised, targeted and highly specialist services and interactions – in university libraries, for example, a librarian will not only be an expert on resources, but much more defined primarily as ‘a person who helps people to learn how to study’ through a personalised approach, says Rachel Shaw. In medicine, Simon Baynham suggests online consultations will be the norm as medtech becomes fully integrated into healthcare provision. Patients will be able to search specifically for the right consultant online, and one-to-one consultations will take place only alongside treatment rather than GP visits, with ‘greater clusters of excellence’ that concentrate specialist medical expertise even more tightly in one area. Alongside this are long-term social and demographic changes – an ageing population, for which preventative medicine is a priority to keep people healthy and active in older life – and moves towards ‘whole-life’ learning as multiple jobs and flexible working become the norm.

In response, buildings and places for education and health will need to not only be digitally networked, but also highly adaptable, responsive, well-connected and even demountable – as well as affordable. They will need to continue to facilitate collaboration and personal interaction to drive forward innovation in research and personalisation of services and treatment.

In conclusion, these will be the key priorities for future-proofing:

A) GREATER FLEXIBILITY AND INTEGRATION ACROSS SERVICES, FACILITIES AND POLICY

To create the truly ‘long life, loose fit’ city that will meet the changing demands of the health and education sectors, we will need different building typologies and approaches to planning. New building types seen elsewhere around the world are starting to appear in the UK. Among these will be ‘step up/step down’ healthcare facilities – already known in the USA – that provide patients with a space where they can undertake

43 Oxford Economics and Cisco, *The AI Paradox: How Robots Will Make Work More Human* (2017), p. 2



Grand Valley State University Pew Library
automated book retrieval system

normal daily activities (making rehabilitation more rapid) under medical supervision – a transition point between hospital and home often with single-person rooms (which have been proven to reduce infection rates and improve recovery times).⁴⁴ Similarly, 'patient hotels' – built adjacent to hospitals in Nordic countries and elsewhere – are short-term facilities with hotel service for patients who are able take care of themselves, and where they can stay with friends, families and other guests. Hopkins Architects' Institute of Immunity and Transplantation Pears Building, with a planned opening in 2019, is designed to include such a facility alongside office and lab space on the Royal Free Hospital's campus in north

London. At a citywide level, as noted in a 2018 NLA forum, policy frameworks need to be looser and more flexible to support closer 'collaboration, complementarity, and toolkits; connectivity and identifying key strengths of partnership', said Stewart Murray. 'London and the South East are best positioned internationally to exploit that opportunity if we get our act together.'

B) A WIDER RANGE OF LABS FOR START-UPS AND MORE SPACE IN WHICH TO SCALE UP

Over the past few years, the co-working model has been adopted in London and the South East to meet demand among start-ups in tech and the commercial

44 Rob Wilson, 'How hospital design is being shaped by the trend for single-person rooms', *The Architects' Journal* (2 May 2017), <https://www.architectsjournal.co.uk/buildings/how-hospital-design-is-being-shaped-by-the-trend-for-single-person-rooms/10019396.article>



sector for offices with integrated business support and on flexible leasing terms. Incubators and accelerators often linked to universities and institutes also provide valuable space for development of spin-off enterprises to commercialise research. There is still, however, a significant lack not only of start-up but especially of grow-on space for companies that want to scale up but that need laboratory facilities alongside offices. A more nuanced understanding is required of market demand, especially in relation to relative price points. The type of speculative lab development seen in the USA by companies such as Bio-Med and Alexandria Real Estate Equities may be part of the answer. The latter has developed spaces in urban campuses in cities including Boston, San Francisco and New York, and also provides strategic financing to life science and technology companies through its venture capital arm.

C) MORE QUALITATIVE AND CREATIVE APPROACHES TO UNDERSTANDING COLLABORATION OUTPUTS

The success of collaboration is conventionally measured quantitatively, for example in scientific achievement (the number of Nobel Prizes, academic citations, etc.), number of businesses established, economic outputs and so on. These measurements are undoubtedly important: for example, the MedCity

initiative, founded only in 2014, brought in about £6 million of investment directly and through building a network that has enabled firms to benefit from another £18.6 million.⁴⁵ However, there is still a gap in in-depth qualitative research into how collaboration leads on a practical level to innovation and how workspaces in education and health can foster this. In this area, built environment research itself can provide a way forward through interdisciplinary projects. These include UCL's Centric Lab, which draws on expertise in neuroscience to explore further how people use space, and, on a larger scale, how this might influence initiatives to improve health, wellbeing, and productivity.

D) BETTER AND MORE COHERENT TRANSPORT AND DIGITAL INFRASTRUCTURE

London's lack of effective digital infrastructure still poses a major barrier to development for the city's estimated 40,000 digital tech companies, including those in the fields of digital health and other emerging sectors. In 2017 the Mayor announced new plans including identifying the most problematic connectivity spots and initiating measures to work with local authorities and providers to improve connectivity; a 2017 NLA forum also recommended, for example, that digital infrastructure standards could be improved if developers and London's great estates, both new

45 Mayor of London, *The Mayor's Economic Development Strategy for London: Draft for Consultation* (December 2017), p. 161

Left: Pears Building – Institute of Immunity and Transplantation, Royal Free Hospital by Hopkins Architects

Right: Flexible office and laboratory space at Milton Park, Building 141 by SRA Architects



and old, present a coordinated approach. In terms of physical infrastructure, drones have become less expensive and technologically advanced; Network Rail already uses them to monitor track maintenance, for example⁴⁶ – they also have potential for applications in fast, targeted delivery of blood and medical products. The need to improve the connections between one side of the 'Golden Triangle' between Oxford and Cambridge (as well as Milton Keynes) was recognised by the National Infrastructure Commission in 2017 through its design competition, alongside government plans to invest heavily in housebuilding and transport links across this 'arc'. The winning entry by the VeloCity team centres on the development of six new villages with mixed tenures and shared public spaces, linked by cycling routes.

E) AFFORDABLE HOUSING IN A MIX OF TYPES AND TENURES

Across London and the South East, the huge increase in demand as the population grows, combined with a lack of supply and new build, has made housing a critical issue in every city. People need to be able to live near where they work and study if the knowledge economy is to thrive. While micro-homes might be a solution for undergraduate and even postgraduate students – who are often looking for a centrally located, affordable place to rent for a few years while they experience university life – affordable housing for sale and rent for postdoctoral researchers, junior doctors and other early career professionals, as well as support staff who may not always qualify as 'keyworkers',

sometimes with families, is especially scarce. Modular family housing and mixed-use schemes that integrate living with other functions may therefore be part of the way forward for future development, alongside the building of affordable homes within NHS estates that are looking to restructure and rationalise assets and land ownership.

F) KEEPING CITIES 'MESSY'

Collaboration – especially between divergent disciplines – is rarely a simple, linear process in reality: it involves communication, deliberation and discussion, often at length. Speakers from the 'Reading Well' campaign promoting the benefits of reading for mental health and wellbeing, for example, explained at the 2018 Knowledge Quarter conference that even what might seem as straightforward as collaborating on recommended reading lists strongly challenged professionals including librarians and NHS staff to upend their existing perspectives. Cities such as London especially, with intricate economic ecosystems and networks built up over centuries of agglomeration, are also 'messy' and 'unprogrammed' in places, and it is this indefinable quality that is often most valued in the search for unforeseen breakthroughs. Ambitions to create world-class campuses in education, health and research, dedicated to the pursuit and applications of knowledge, must be integrated with the wider city economically, socially and culturally, but not at the expense of distinctive, layered urban character and quality that allow those unexpected encounters and revelatory discoveries to take place.

⁴⁶ 'Drones or Unmanned Aircraft Systems (UAS)', Network Rail, <https://www.networkrail.co.uk/running-the-railway/looking-after-the-railway/fleet-machines-vehicles/air-operations/drones-unmanned-aircraft-systems-uas/>

‘LONG LIFE, LOOSE FIT, AND SMART’

Juliette Morgan, Head of Campus – Regent’s Place, British Land

It is clear there is demand from the education sector to locate in commercial space in London. Warwick University are in the Shard, UCL at Here East and Canary Wharf and University of East Anglia are in a commercial office in Shoreditch. It’s no surprise: students are now customers and demand an amenity-rich environment that is also work-ready, now that they are under pressure to pay back student debt. Academics are similarly under increasing pressure to commercialise their research and collaborate with industry partners. Proximity to corporates achieves all of these objectives for faculty and student body.

Academic institutions are using brands of locations to reinforce their own identities of innovation, and corporates are keen to demonstrate that they can attract talent. One of the most successful examples of

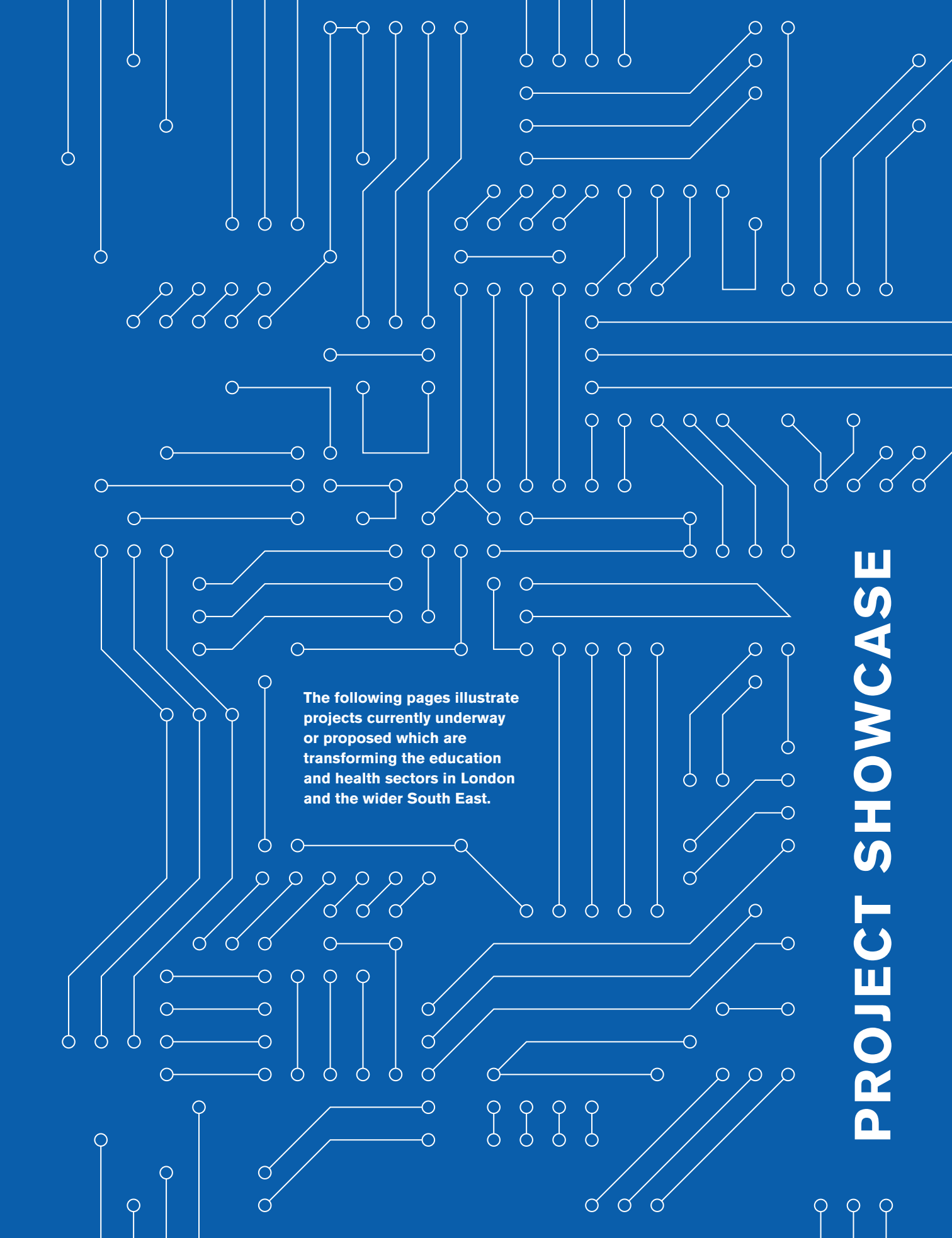
which is how Central St Martin’s animates Kings Cross, and Ravensbourne does the same for Greenwich. This collaboration makes for cosmopolitan, animated environments that attract corporates, students and institutions alike.

As a consequence, commercial space providers need to find flexibility in use class and usage of their spaces. In future, learning environments will be tech-enabled (filled with sensors) but also highly collaborative and physically adaptable. UCL’s adaptation of an office building into a robotics lab is a clear indicator of this enlightened perception of what a space is for. We’ll all have to be open-minded about occupancy and adaptability of space, and find new ways to enable places to respond to the changing shape and needs of London’s knowledge communities over time.



Regent's Place Pop-Up Garden

© British Land

The background of the entire page is a dark blue color. Overlaid on this background is a complex, white, abstract pattern that resembles a circuit board or a network diagram. This pattern consists of numerous small white circles, which act as nodes, connected by thin white lines. The lines and nodes are distributed across the entire page, creating a sense of connectivity and flow. The pattern is more dense in some areas and more sparse in others, with lines often branching out or converging at the nodes.

The following pages illustrate projects currently underway or proposed which are transforming the education and health sectors in London and the wider South East.

PROJECT SHOWCASE





LONDON CENTRAL

INSTITUTE OF PHYSICS

Balfe Street, King's Cross, London N1

Completion: August 2018

Relocating from Portland Place, this new building for the Institute of Physics (IOP) will be the society's first publicly accessible home, providing education and exhibition facilities for the public, local community and schools alongside a start-up incubator space, café, members' room and staff offices. The new headquarters will link to the Knowledge Quarter, connecting with eight higher education institutions, 22 museums and galleries, 34 libraries and archives, 580 research centres, 3,000 scientists, 13,700 academics, 57,000 staff and 98,500 students within a one-mile radius.

The design seeks to engage these different communities and make physics more accessible to a wider audience, within a highly sustainable and innovative structure. Large windows along Caledonian Road are designed to give a glimpse of the institute's activities, with visitors and staff able to enjoy views to the atrium and Balfe Street from the ground floor entrance. Straddling Balfe Street and Caledonian Road, the tight central London site is located within a Conservation Area and has been built behind a retained brick façade with a new frame.

The north-facing atrium extends five storeys, providing space to host exhibitions and events as well as linking to all other facilities – including a 160-seat auditorium at basement level, open plan offices to mid-floors, and teaching spaces on the upper floor. All are designed to be flexible and can be reconfigured according to changing needs.

Sustainable interventions include the use of bore hole cooling piles, natural and mixed mode ventilation systems, and blue and green roofs. A key part of the energy strategy has been the installation of GeoKOAX geo-thermal heat pumps – used here for the first time in the UK, within a central London site at less than half the depth of conventional systems.

One of the key aims was to create a building as 'scientific apparatus', to progress understanding of building performance. A Building Management System has been developed, involving a complex and comprehensive integration of different systems, services and sensors which are constantly recorded. The system will process the building's environment, allowing the IOP to continually monitor and manage the building's performance and its impact on the environment.

VIEWPOINT

"The new headquarters for the IOP signals an open and community-driven direction for the organisation. The move to welcoming and public-facing premises in the heart of London's Knowledge Quarter in King's Cross is a key part of our strategy to reach beyond our traditional networks and encourage the general public's interest in physics. Emerging behind a retained façade, a five-storey building has been designed to meet the needs of an evolving IOP. Incorporating the latest green technologies, the building will be a showcase for sustainable innovation and raise aspirations of what is possible."

Kate Meehan, Managing Director, IOP Enterprises

Client: Institute of Physics **Architect:**
TateHindle **Structural and Services**
Engineer: AECOM **Planning**
Consultant: Daniel Watney **Main**
Contractor: Murphy **Project**
Manager: Colliers International
Quantity Surveyor: Core Five





©Keyframe visuals



©Simon Kennedy



GREAT ORMOND STREET HOSPITAL

Great Ormond Street, London WC1

Completion: 2023

This new clinical building on Great Ormond Street will become the hospital's new front door, replacing outdated facilities with a high quality environment consistent with the hospital's world-renowned paediatric care and research activities. The design brief for the competition was created in partnership with staff, patients and families and articulated their shared aspiration for a building to express the GOSH guiding principle: The Child First and Always.

Client: Great Ormond Street Hospital
Architect, Engineer, Landscape Architect, Interior Designer, Lighting and Graphic Design: BDP **Contractor:** John Sisk & Son

LEARNING LIBRARIES

London School of Economics and Political Science (LSE) have undertaken a rolling programme of investment to provide flexible spaces alongside traditional book stacks, as well as a special collections exhibition space to engage students and the public. Reaffirming the focus of the library is not for the book, but rather the learning, the briefing study for LSBU includes an automated storage and retrieval system, releasing 80 per cent of the floor area for study, teaching and learning space.

LSE Library

Portugal Street, Holborn, London WC2

Completion: August 2017

Client: LSE **Architect:** ArchitecturePLB **Structural Engineer:** Wilde Carter Clack **M&E Consultant:** CBG **Project Manager:** LSE Estates team

LSBU Library

London Road, Elephant & Castle, London SE1

Client: LSBU **Architect:** ArchitecturePLB **M&E and Environmental Consultant:** Elementa

ST. MARTINS LE GRAND, UNIVERSITY COLLEGE LONDON (UCL)

St Paul's, London EC1

Completion: May 2017

Adapting an existing office to enable new working trends, this project has centralised UCL's Information Services Division's disparate accommodation into a single space, allowing agile working throughout. A careful approach achieved two key targets of highly functional space and staff wellbeing, with the latest technology embedded.

Client: University College London **Architect:** Paul Murphy Architects **Services Engineer:** AECOM



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CITY, UNIVERSITY OF LONDON – MAIN ENTRANCE AND PAVILION

Northampton Square, Clerkenwell, London EC1

Completion: November 2016

Originally built in the 1960s, the main university building's elevated ground floor and concourse was altered in the 1980s with ill-considered extensions and infills that made the building appear fortress-like and without its original sculptural quality. This project transforms the main entrance to the campus, paying tribute to the original concept by adapting the structure rather than adding to it. Creating a transparent and interactive new hub, the ground floor opens new views through the building to create an active and welcoming entrance. Stepped frameless glazing on Northampton Square blurs the threshold between inside and outside, and puts the original concrete columns on display.

Client: City, University London **Architect and Lead Consultant:** NBBJ **Lead Designer (Lecture Theatre):** Architecture PLB **Contractor:** Morgan Sindall **Landscape Architect:** East **Structural Engineer:** Curtins **Services Engineer:** BDP **Consulting Services Engineer:** Avoca **Approved Inspector:** Butler and Young

FORTIUS DIAGNOSTICS CLINIC

King William Street, Monument, London EC4

Completion: May 2016

Transforming a dingy basement into a state-of-the-art medical facility, this orthopedic and sports injury clinic has been designed to calm the anxious patient and provide a healing and reassuring environment. Combining a luxury spa feel with clinical functions, the design optimises flows to create light and spacious spaces. As patients enter the main body of the clinic at lower ground floor, its soft organic forms, green wall and ambient lighting provide a welcome retreat from the noisy urban environment above.

Client: Fortius Clinic **Architect:** tp bennett **Structural Engineer:** Conisbee **Services Engineer:** Hoare Lea **Main Contractor:** Paragon **Specialist Contractor:** Apollo Building Services

THE BRITISH LIBRARY

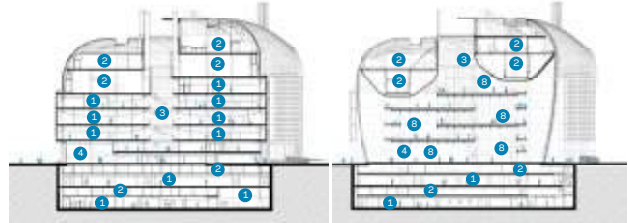
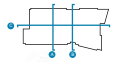
King's Cross, London NW1

Developing a 2.8 acre site to the north of the British Library's existing Grade I listed building, this scheme will create an additional 100,000 sq ft of new space for learning, exhibitions and public use; including a new northern entrance and a bespoke headquarters for the Alan Turing Institute, the national centre for data science research. The development will also include new commercial space for organisations that wish to be located within the heart of the Knowledge Quarter.

Client: The British Library **Architect:** Rogers Stirk Harbour + Partners **Development Manager:** Stanhope Plc **Structural Engineer and Building Services:** Arup **Cost Consultant:** Alinea

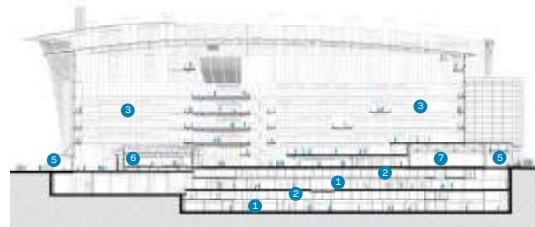


Sections + Plans



section a

section b



section c

- 1 Labs
- 2 Mechanical
- 3 Atrium
- 4 Dining
- 5 Entrance
- 6 Auditorium
- 7 Receiving
- 8 Break/ Informal Meeting

THE FRANCIS CRICK INSTITUTE

King's Cross, London NW1

Completion: August 2016

Forming one of the largest, most sophisticated research facilities of its kind, The Crick seeks to improve scientific advancement via collaboration – a vision which is embedded not only in the ethos of the organisation but in the aesthetics and structure of the building itself. Housing more than 1,700 occupants and 1,250 scientists undertaking ground-breaking research from cancer research to neuroscience and viruses, the building's architecture, floor layout, and design orientation all lead to promoting encounters between the scientists and new research collaborations. Allowing researchers and scientists from different institutions and organisations around the world to work together collaboratively rather than in silos or isolation is transformational for most scientists.

Circulation paths across the atria meet at the centre of the building where the stairs and elevators are located so that occupant's paths criss-cross, encouraging informal and serendipitous exchanges. The shared workplace areas are designed to further encourage collaboration and knowledge sharing whilst the building's navigation, directional flow and signposting further encourages these informal and unanticipated encounters.

The entire building has been designed to be visually permeable with large glass walls and partitions making the building not just light and airy, but reflective of the design philosophy to promote collaboration and ensure that science is always on display both within and from outside the building. The building fits its urban context with a third of the floor area below ground to reduce its visible mass. Its form and exterior responds to the architectural heritage and historic context of the area whilst creating a new civic landmark in King's Cross.

Both the masonry and the distinctive vaulted roof recall features of the adjacent King's Cross St Pancras International Station. The toroidal roof was conceived to contain and conceal the vast amount of plant space in a form that minimises the building's visual impact on the sensitive surrounding streets, whilst allowing it equal standing to the adjacent British Library and Station. It also incorporates a large array of solar panels as part of the building's BREEAM Excellent-rated sustainable design.

VIEWPOINT

"Discovery without boundaries' is our tagline, so we didn't want any physical barriers between our 120 labs. It's all about open-plan, collaborative working and direct sightlines, in an environment that I hope will encourage a sort of gentle anarchy."

Sir Paul Nurse, Director, Francis Crick Institute

Client: The Francis Crick Institute **Architect:** HOK with PLP Architecture **Structural Engineer:** AKT II **M&E Engineer and Project Manager:** Arup **Planning Consultant:** CBRE **Contractor:** Laing O'Rourke **Cost Consultant:** Turner & Townsend **Environmental, Sustainability and Transport Consultant:** AECOM



ST THOMAS EDUCATION CENTRE

Westminster Bridge Road, London SE1

Seeking to create a world-class education centre, including the leading Simulation and Interactive Learning centre (Sall) in Europe, this project partners King's College London (KCL) and Guy's and St Thomas' Hospital Trust (GSTT) to create a centre that integrates facilities for medical training and ongoing professional development.

Utilising the latest teaching technologies, the centre will create simulated ward and surgical environment to develop practical skills – including robotic dummies to simulate an emergency scenario, allowing participants to respond and learn in a safe environment. Comprehensive IT infrastructure is proposed to enable wider learning opportunities, such as video links from live surgery to classrooms, or critiquing a recorded simulated scenario. The co-location of student and staff training facilities will foster this interdisciplinary approach whilst enabling both space, staffing and equipment efficiencies to be gained.

Thorough stakeholder consultation workshops have developed the user and design brief, identifying a shift in teaching towards a focus on smaller group teaching, with an increasing emphasis on highly realistic simulation, benchtop practical skills and enacting group scenarios. The design response is to provide highly flexible, adaptable space, with generous floor to ceiling heights, raised access floors for servicing, good daylighting and an efficient structural grid.

Located on a complex and sensitive site, surrounded by the Palace of Westminster, listed hospital buildings and Lambeth Palace, the structure also has to work within key view corridors and covenants restricting development above ground. To optimise the value of the site, basement excavations have been maximised, providing top-lit purpose-built space.

The refurbished and extended Grade II listed Block 9 building includes a new double-storey mansard which provides highly serviced flexible space to balance the more constrained refurbished spaces. The new Prideaux building is proposed with a two-storey basement, which provides a 500-person lecture theatre, to host academic medical conferences, along with multi-purpose function to benefit the local community. All new interventions are proposed in Portland Stone, referencing the heritage assets, whilst creating a legible contemporary layer to the site's history. A new landscaped terrace is created overlooking the river, providing wellbeing and amenity space.

VIEWPOINT

"Initially, the massing of the new Prideaux building was particularly challenging, due to the proximity of neighbouring listed buildings and protected views. However, we used these constraints to shape the building and create amenity spaces between; stepping back from the River to create a terrace, enclosing a courtyard with Block 9 and pushing forward to have an active frontage onto Lambeth Palace Road. The proposals aim to enhance the setting, through the creation of spaces and frontages which had previously been neglected."

Danusia Lewis, Architect, MICA Architects

Client: King's College London

Architect: MICA Architects

Structural and Building Services

Engineer: Mott MacDonald

Planning Consultant: Quod

Heritage Consultant: Alan

Baxter Associates **Landscape**

Architect: Townshend Associates



ROYAL COLLEGE OF OPHTHALMOLOGISTS

King's Cross, London NW1

Completion: November 2014

Providing new offices, this project has opened up the façade and interior to create a triple height entrance space, bringing light into the building. A feature staircase leads to the public areas, with bespoke display cases throughout housing the College's collection of scientific artefacts. Where possible, the interior refurbishment has exposed the brickwork, cast iron columns and timber floor structure of the original Victorian warehouse building.

Client: Royal College of Ophthalmologists
Architect: Bennetts Associates **Structural Engineer:** Alan Baxter Associates **Cost Consultant and Project Manager:** Jackson Coles **Services Engineer:** E3 **Contractor:** Knight Harwood

THE SAMMY OFER CENTRE, LONDON BUSINESS SCHOOL

Marylebone Road, Marylebone, London NW1

Completion: July 2017

Transforming the iconic Old Marylebone Town Hall into a major new facility for the London Business School, with six lecture theatres, 32 seminar spaces, a library, offices and a student lounge, alongside civic and political uses. Creating a strong urban presence along Marylebone Road, the project has refurbished the Hall's Council House and annex buildings, using the excavated space between these to create a new glass and steel entrance and link structure.

Client: London Business School **Architect:** Sheppard Robson **Structural Engineer:** Ramboll **Main Contractor:** Wates Construction **MEP Consultant:** Long & Partners **Quantity Surveyor and Cost Consultant:** Wheelers **Project Manager:** Colliers

SCIENCE GALLERY LONDON

Great Maze Pond, London SE1

Completion: Autumn 2018

Renovating the Grade II* listed old Guy's hospital, this project aims to make research carried out at King's College London accessible to a wide public audience – creating an exhibition space, café and 150-seat auditorium within this prominent building. Forming a key redevelopment in the vibrant and rapidly changing London Bridge area, it will also provide a major new addition to the cultural landscape of the city; bridging the gap between the general public, student community, and an academic institution.

Client: King's College London **Architect:** LTS Architects **Structural Engineer and Services Engineer:** WSP **Landscape Architect:** LDA Design **Heritage Consultant:** Alan Baxter Associates **Cost Consultant:** Turner & Townsend **Lighting Designer:** Arup Lighting **Fire Engineer:** Astute Fire **Planning Consultant:** Deloitte



©Janie Airey



©Alan Williams



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ST THOMAS' HOSPITAL EAST WING CLADDING PROJECT

Westminster Bridge Road, Lambeth North, London SE1

Completion: November 2015

Built in 1966, this thirteen-storey tower at the heart of St Thomas' Hospital suffered from water ingress problems and excessive solar gain. This retrofit scheme ensured the existing hospital could continue to function without disruption to patient care occurring inside. It clads the outdated structure with a new high performance skin, creating two art-filled atria and transforming a tired building at the end of its life into a rejuvenated facility with a 50-year life span – achieved at a fraction of the cost of a new building.

Client: Guy's and St Thomas' NHS Foundation Trust **Architect:** Hopkins Architects **Structural and MEP Engineer, Fire and Acoustics:** Arup **Quantity Surveyor:** Davis Langdon

LESOCO – LEWISHAM SOUTHWARK COLLEGE: WATERLOO CAMPUS

The Cut, Waterloo, London SE1

Completion: July 2016

Transforming the existing campus, this modernised teaching facility has helped shape a professional environment for students. With flexibility at its core, the design of this BREEAM-excellent multi-functional teaching space promotes a communal learning approach for the students. With a vibrant atrium and transparent study spaces, alongside a music rehearsal room, dance and recording studios, large breakout areas, a public exhibition space and Learning Resource Centre, the design has created a true student hub within the campus.

Client: Lewisham Southwark College **Architect:** Richard Hopkinson and Platform 5 Architects **Contractor:** Balfour Beatty **Structural Engineer:** Price & Myers **Project Manager:** Deloitte **Services Engineer:** Elementa and Hoare Lea **Quantity Surveyor:** AECOM **Acoustic Engineers:** Ion Acoustics

MACINTOSH HOUSE

Beaumont Street, Marylebone, London W1

Completion: March 2020

Replacing an existing building, this project will create a four- and five-storey building, with the basement and lower ground floors accommodating a new purpose built hospital, including scanning suites providing over 21,900 sq ft of open plan modern medical facilities.

Client: The Howard de Walden Estate **Architect:** Dixon Jones **Structural Engineer:** AKT II **Quantity Surveyor:** Quantem **Project Manager:** Platform

HARLEY STREET MEDICAL AREA

Marylebone, London W1

The Harley Street Medical Area (HSMA) is a collective of hospitals, clinics and specialists renowned for delivering outstanding patient care through pioneering treatments and cutting edge technologies. Based in Marylebone, HSMA brings together a community of medical professionals who provide access to some of the best medical treatments and services in the world and are at the forefront of advancing medical practices – seeking not just to practice medicine but advance it. HSMA members regularly attend international medical conferences and exhibitions, informing a designated website and printed periodical, Prognosis.

The Howard de Walden Estate is the guardian of the Harley Street Medical Area and has been supporting and nurturing medical excellence in this historic part of London for years. The Estate has developed a thorough procedure for selecting tenants: after carefully identifying credible medical experts and specialisms, it provides them with world-class facilities and encourages collaboration between clinics.

As part of a long-term strategy for developing and promoting its medical sector, it seeks to enhance the tenant mix, market the area to an international audience, and improve the patient experience.

To attract the necessary calibre of medical tenants, the Estate continues to invest heavily in facilities. The result is a large portfolio of sophisticated medical facilities contained within attractive, heritage-rich buildings. The Estate provides significant investment to create brand new or substantially redeveloped medical buildings in partnership with tenants.

To improve the patient experience, the Estate is keen to support medical concierge services, which help patients identify the institutions and clinicians suited to their individual needs, as well as providing assistance with travel, accommodation and post-treatment services. The Estate is keen to see the development of a specialist hotel for patients who have been discharged from hospital but require further outpatient medical care.

VIEWPOINT

“Harley Street has a centuries’ old association with medicine, but we felt that what had always been a loose cluster of institutions and individuals lacked the clear identity and coherent direction needed to compete in a global marketplace. Through a programme of construction and modernisation and a focus on identifying and attracting clinics at the forefront of their fields, coupled with the building of the Harley Street Medical Area brand and a forum through which medical tenants could meet and collaborate, we hope to have both reinforced the historic reputation of the area and created something truly modern.”

Simon Baynham, Property Director, The Howard de Walden Estate

Client: The Howard de Walden Estate





SAINSBURY WELLCOME CENTRE FOR NEURAL CIRCUITS AND BEHAVIOUR, UCL

Howland Street, Fitzrovia, London W1
Completion: July 2015

Delivering a new generation of adaptable laboratories for long-term theoretical and experimental neuroscience research, this project seeks to enhance UCL's reputation. It is one of the first buildings to have neuroscientific knowledge incorporated into its spatial configuration and fabric, and was co-designed 'from inside to out' with its prospective users. The street façade is made of light transmitting white cast glass, and below it is a public colonnade incorporating art, and a public landscape.

Client: University College London **Funders:** Gatsby Charitable Foundation and Wellcome Trust **Project Sponsor and Funders' Representative:** Stuart A Johnson Consulting **Architect, Landscape Architect and BREEAM Assessor:** Ian Ritchie Architects **Structural, Civil, Building Services, Fire, Acoustic and Vibration Engineer:** Arup **Contractor:** Kier **Project and Contract Administrator, and Planning Supervisor (CDM):** Peter Brett Associates **Cost Consultant:** Arcadis **Lighting Design:** EQ2 Light **Access Consultant:** Centre for Accessible Environments **Planning Consultant:** DP9 **Heritage Consultant:** Peter Stewart Consultancy



66 WIGMORE STREET

Marylebone, London W1
Completion: January 2017

Located within a restricted site behind retained residential and retail properties and above an Underground tube line, the project's completed shell and core building has been let by the Howard de Walden Estate to Schoen Clinic for their first London-based specialist hospital for spine and orthopaedics. With onsite diagnostics and a unique consultant model, patients will receive their diagnosis and therapeutic or surgical treatment from a multi-disciplinary team working together under one roof to provide the best patient pathway.

Client: The Howard de Walden Estate
Architect: ESA Architecture | Design
Structural Engineer: WSP



110 MARYLEBONE HIGH STREET

Marylebone, London W1
Completion: August 2019

Creating an unusual mixed-use development, this project includes part demolition of existing structures and construction of a new rear addition and entrances via St. Vincent Street. The proposals provide open plan offices at first to fourth floors, a retail space off Marylebone High Street offering flexible trading at ground and first floors, and a new basement area proposed as restaurant or café. At the rear of the development via Cramer Street, a pre-school educational facility is proposed at ground and first floors.

Client: The Howard de Walden Estate **Architect:** CSK Architects **Structural Engineer:** Fairhurst **Quantity Surveyor:** Leslie Clark



THE ROYAL ACADEMY OF MUSIC THEATRE AND NEW RECITAL HALL

Marylebone Road, Marylebone, London NW1
Completion: January 2018

This project has delivered two new outstanding performance spaces for Britain's oldest conservatoire. The concept seamlessly integrates quite different practice and performance spaces within the historic site. The 309-seat Theatre is designed for both opera and musical theatre, and the public 100-seat Recital Hall is located above the theatre – the last area into which the Academy could expand.

Client: Royal Academy of Music **Architect** and **Principal Designer:** Ian Ritchie Architects Ltd **Structural Engineer:** WSP **Cost Consultant:** Equals Consulting **Building Services:** Atelier Ten and King Shaw Architects **Acoustics Consultant:** Arup **Stage Theatre Consultant:** Fisher Dachs Associates



ST MARY'S HOSPITAL OUTPATIENTS BUILDING

Praed Street, Paddington, London W2

Replacing aging buildings on the eastern side of the hospital estate, this new eight-storey outpatient building will serve around half a million patients each year, bringing together the majority of outpatient services and supporting diagnostics currently spread across the site. Allowing the hospital – which is the major acute hospital and trauma centre for north-west London – to meet the demands of a diverse and growing environment, the development will improve patient and staff experience and offer flexibility for future changes in service provisions.

Client: Imperial College Healthcare NHS Trust **Masterplanner and Architect:** Feilden Clegg Bradley Studios **Planning Consultant:** DP9 **Civil/Structural, Building Services, Transport, Sustainability and Acoustics Engineer and Cost Consultant:** AECOM **Landscape Design:** Grants Associates **Townscape Consultant:** Tavernor Consultancy **Community Consultant:** Lexington **Healthcare Planner:** Essentia



HELIX CENTRE

Praed Street, Paddington, London W2
Completion: December 2014

Providing dedicated space for HELIX (Healthcare Innovation Exchange) – a research group formed between Royal College of Art (RCA) and the Imperial College NHS Trust – the project was designed by students on the RCA's Architecture course, with a team of three undergraduates selected as winners. Their pavilion, located outside St Mary's Hospital, is based around the concept of simple, IKEA-style furniture: low-tech and simple to assemble, but clean-cut and aesthetically pleasing, utilising timber beams in combination with glazed panels.

Client: Royal College of Art and Imperial College London **Architect:** RCA Architecture Students **Structural and Civil Engineer:** AKT II



BRITISH MUSEUM WORLD CONSERVATION AND EXHIBITIONS CENTRE

Great Russell Street, Bloomsbury, London WC1

Completion: March 2014

Located at the north-west corner of the British Museum's Bloomsbury estate, the World Conservation and Exhibitions Centre (WCEC) is one of the largest redevelopment projects in the museum's 265-year history. Situated in the heart of the Bloomsbury Conservation Area, the structure is respectful of the historic architecture, with massing and height designed to create an understated transition from the grand scale of the museum to the more domestic proportions of the predominantly 18th century properties found in the neighbouring streets.

The use of Portland stone references the existing materiality's colouration, scale and structural rhythm, however the new structure is read as a separate entity – heightened by the opaque, kiln-fired glass façade which creates a privacy screen between the public world of the street and the private world of the Museum, but which also offers subtle indications of the important work going on within its walls.

The nine-storey WCEC is composed of five pavilions which provide the British Museum with an exhibition gallery, state-of-the-art laboratories and studios, world-class collections' storage, and logistics and handling facilities to support its extensive UK and international loan programme.

The five linked pavilions are served by four external towers or 'cores' which provide stairs, lifts and mechanical and electrical risers which enable the pavilions to remain open and flexible.

Whilst the conservation studios are housed at the top of the pavilions to provide good quality light for detailed conservation work, almost 70 per cent of the building is subterranean, including the 5,000 sqm storage facility – where heavy loads can be accommodated and where the most stable environmental conditions are found. The logistics hub and collections handling facility is located six metres below Montague Place and can be accessed by a bespoke 42-tonne truck lift, or via the existing North and West Roads. The Science Facility is also located below ground, adjacent to the Duveen Gallery, and is arranged around a central atrium which allows daylight to penetrate to the lowest level. A heavily-serviced network of air distribution and fume extraction ensures a safe and efficient working environment for staff.

The 1,100 sqm flexible Special Exhibitions Gallery is located at the same level as the Great Court and can be accessed from the Court's north-west corner. This space allows more people to see temporary exhibitions, and improves visitor circulation by easing congestion in other areas of the Museum.

VIEWPOINT

"Our major challenge was to attain planning permission for a contemporary building in the Grade I listed environment of Bloomsbury. The consultees had widely varied aspirations for the site so identifying an approach that could even attempt to deal with all the conflicting requirements was very difficult. The Museum had put together a very aspirational brief to meet the specific demands of the five departments and the requirements of the individual users who would ultimately work in the building. It was our key role to combine these conflicting requirements into a cohesive piece of architecture and integrate it with the historic museum estate."

John McElgunn, Partner,
Rogers Stirk Harbour + Partners

Client: British Museum **Architect:**
Rogers Stirk Harbour + Partners
Conservation Architect: Purcell
Architects **Structural Engineer:**
Ramboll **Services Engineer:**
Arup **Construction Manager:**
Mace **Landscape Architect:**
Gillespies **Quantity Surveyor:**
AECOM **Project Manager:** Savant
Planning Consultant: Montagu
Evans **Townscape Consultant:**
Francis Golding **Strategic
Planning and Consultation
Strategy:** The Green Brain

UCLH PHASE 5

Huntley Street, Bloomsbury, London wc1

Completion: August 2019

University College London Hospitals (UCLH) Phase 5 marks the latest phase of the hospital's main campus regeneration, providing a specialist facility for Ear Nose and Throat (ENT) and Dental services. Located within the Bloomsbury Conservation Area and adjacent to listed residential neighbours, the design seeks to develop a building that draws precedent from the surrounding townscape and addresses the transition between the institutional scale of hospital buildings to the north and the domestic scale of apartment's blocks to the south.

Accommodating a new state of the art clinical facility, the building will house medical facilities in six storeys above ground and three storeys below ground. Traditionally, such buildings are planned with clinical spaces at the façade and waiting areas at the core, however the design inverts this, with waiting areas on the street façade set in a range of bay windows. The form and detail of these bays offer a contemporary reinterpretation of the bays of the adjacent 19th century mansion blocks. Perforated brick screens to the south of each bay address considerations of heritage, environment and privacy.

The building benefits from a legible central public entrance placed on Huntley Street with back of house service areas accessed from an enhanced Shropshire Place. Café and break out spaces are set adjacent to the foyer with glazed ground floor frontages serving to animate the surrounding public realm. The façade reflects the building's internal planning with a generous 'base' denoting arrival and reception areas, the main 'body' with clinical areas and a recessed 'roof' which provides a landscaped garden for both staff and patients.

Vertical circulation is arranged on the northern apex of the site. Here, the architectural language of perforated brick screens is reinterpreted to provide shading to more generously scaled communal waiting areas. The elements of the core – lifts, stairs and risers – are each reflected in the external massing, creating an articulated silhouette that serves to denote the hospital's entrance for patients approaching from the north and west.

The external shading and exploitation of thermal mass contribute to the building's environmental performance – designed to achieve a BREEAM Excellent accreditation.

VIEWPOINT

“Clinical services currently delivered at the Royal National Throat, Nose and Ear Hospital and Eastman Dental Hospital sites are world-leading and deliver innovative and complex clinical pathways to improve the quality of life for patients in London. This is all currently undertaken in buildings that are out of date and lengthen the time needed to treat patients. We are excited to see the new UCLH Phase 5 building being delivered as it will provide an environment which reduces stress and anxiety for the patients by providing clustered treatment zones. This will shorten patient pathways, providing open waiting areas with access to natural light together with a stimulating art strategy, which will improve the outcomes for all patients being treated.”

Donna Fitzpatrick, University College London Hospitals NHS Foundation Trust

Client: University College London Hospitals (UCLH) **Architect:**

Pilbrow & Partners **Structural**

Engineer: Clarke Nicholls Marcel

Services Engineer, Energy

and Sustainability: Arup **Cost**

Consultant: Sweet Group **Project**

Manager: Henry Ruby Consulting

Planning Consultant: JLL





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LONDON SCHOOL OF HYGIENE & TROPICAL MEDICINE TP2

Tavistock Place, Bloomsbury, London WC1
Completion: February 2020

Providing airy dry-laboratory research space, arranged around a daylight-filled atrium to promote innovation through collaboration between users, this new building will provide accommodation to assist the London School of Hygiene & Tropical Medicine in addressing some of the greatest public health problems throughout London, the UK and worldwide by expanding the limits of research in epidemiology and public health. Situated close to current and future Knowledge Quarter research centres, the building will be contextually inserted into a pocket of mews space in Bloomsbury's Conservation Area.

Client: London School of Hygiene & Tropical Medicine **Architect and Lead Designer:** BMJ Architects **Structural Engineer and Transport:** Carter Clack Wilde **M&E Engineer and Sustainability:** BDP **Planning Consultant:** Montagu Evans **Project Manager and Quantity Surveyor:** Greenwoods **Contractor:** Keir

TORRINGTON PLACE, UCL

Bloomsbury, London WC1
Completion: January 2018

Forming part of UCL's Bloomsbury campus, this refurbishment and interior fit-out of an 1950s building improves the entrance, reception and a number of teaching and learning spaces as part of the Transforming UCL Programme. The works have allowed for increased student occupancy, greater accessibility and provided contemporary spaces whilst reusing the University's existing building stock. The result is a range of flexible room configurations, furniture and integrated technology to support UCL's Education Strategy, with its emphasis on student-led research, collaboration and skills development.

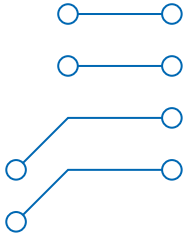
Client: University College London **Architect:** John Robertson Architects **Contractor:** Structuretone **M&E Services Engineer:** Thornton Reynolds **Fire Consultant:** Buro Happold **Accessibility Consultant:** LB Camden **Project Manager:** Mace

WILKINS TERRACE

Gower Street, Bloomsbury, London WC1
Completion: August 2017

Updating an amenity space at the heart of UCL's Bloomsbury campus for students and staff, this project enclosed the existing service yard so the space above could be transformed into a courtyard terrace; improving access across campus, creating new public realm, and providing flexible amenity that doubles as a facility for formal events, film screenings and exhibitions. A new 'fourth façade' – constructed using Portland stone and designed to Georgian proportions – completes the courtyard whilst concealing the plethora of services required for the existing buildings.

Client: University College London **Architect and Landscape Architect:** Levitt Bernstein **Structural Engineer:** Curtins **M&E Consultant:** BDP **Main Contractor:** Balfour Beatty **Landscape Contractor:** idverde **Project Manager:** WSP **Quantity Surveyor/Cost Consultant:** Potter Raper Partnership **Stonework:** Szerelmei **Planning Consultant:** Deloitte



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UCL FACULTY OF LAWS

Endsleigh Gardens, Bloomsbury, London WC1
Completion: September 2018

Refurbishing two adjacent buildings to provide improved facilities for UCL's Faculty of Laws, the design integrates Bentham House – a Grade II listed former Union Headquarters – and the adjacent mid-20th century Gideon Schreier Wing. A new atrium between the buildings provides access to all levels and a legible heart to the faculty. Multi-purpose teaching and seminar spaces have been integrated on the lower floors, with new offices and support spaces above. Portland stone unites the street elevation, whilst also upgrading the walls to create a highly insulated envelope.

Client: University College London **Architect:** Levitt Bernstein **Structural Engineer:** Curtins **Services Engineer:** Buro Happold **Project Manager and Energy Consultant:** Parsons Brinckerhoff **Cost Consultant:** AECOM **Planning Consultant:** Deloitte **Inclusive Design:** Arup

GARDEN HALLS

Cartwright Gardens, Bloomsbury, London WC1
Completion: September 2016

Redesigning the existing student accommodation at Cartwright Gardens, this project helps to accommodate the university's growth and create a flagship development befitting its location within the Bloomsbury Conservation Area. It is now one of the largest student residential developments in London, providing 1,200 rooms that cater for all living requirements such as townhouses, cluster flats, apartment bedrooms and accessible accommodation sitting behind a highly crafted façade.

Client: University Partnership Programme; University of London **Executive Architect:** tp bennett **Principle Façade Architect:** Maccleanor Lavington **Structural and Services Engineer:** Cundalls **Energy and Sustainability:** Mecserve **Contractor:** Brookfield Multiplex **Landscape Design:** Macfarlane Wilder **Planning Consultant:** CBRE **Cost Consultant:** McBains Cooper **Townscape and Heritage Assessment:** Peter Stewart Consultancy **CDM Co-ordinator:** Faithful and Gould **Approved Inspector:** Assent Building Control **Acoustic Consultant:** SRL **Fire Consultant:** Tenos **Public Consultation:** Lodestone **Specialist Precast Sub-Contractor:** Thorp Precast **Employers Agent:** McBains Cooper



UCL NEW STUDENT CENTRE

Gordon Street, Bloomsbury, London WC1

Completion: December 2018

In the heart of the Bloomsbury Conservation Area, this flagship project seeks to provide a progressive, flexible and memorable environment that supports students' needs and learning – that is responsive to change, inspirational and enabling, and capable of re-inventing itself as trends in education develop. Key components of the brief include 1,000 study spaces for students, a Student Enquiries Centre, a café and space for exhibitions.

The New Student Centre will act as a portal to UCL's Bloomsbury Campus. A fluid and generous route through the publicly accessible ground floors of the building will mediate between Gordon Street and the higher level of the Japanese Garden, whilst controlling access to the quieter upper floor study areas. These levels are brought together with wide central steps – the beginning of a circulation route that spirals up through the building, whilst a lift ensures these levels are easily accessible to all visitors.

A two-storey glazed façade and entrance at street level will enhance the feeling of welcome, with high levels of transparency giving views through the building. The building's learning spaces are designed to vary in character and size, with floor layouts providing different types of individual study and group environments. Spaces and furniture solutions are intended to be flexible and adaptable, with integrated IT and power provision. The building will be topped with a roof terrace overlooking the dome of the adjacent Wilkins Building.

The Japanese Garden – a key space in the transitional route from Gordon Street to the Grade I listed Wilkins building – will provide a place for exhibitions and events, but will also be a place of peace and tranquility at the heart of a busy university campus.

The project is on track to achieve BREEAM Outstanding and incorporates a Soft Landings process. Sustainability features include embedded cooling pipes set within the exposed concrete frame and connected to boreholes beneath the basement. These will provide free cooling as part of a low-energy, low-carbon mixed-mode strategy that supports the building's 24-hour occupation.

VIEWPOINT

"This flagship development within our Transforming UCL programme has required a genuinely collaborative team approach. The site is one of our main gateways in to campus, and is surrounded by listed buildings, sensitive laboratories, and the Bloomsbury Theatre – part of which the project has had to rebuild. The exceptional team has taken these challenges in their stride, and is on track to deliver a ground-breaking facility dedicated to our students, providing inclusive and inspirational learning spaces with outstanding sustainability credentials, whilst framing an accessible courtyard garden for London."

David Young, Project Manager, Capital Projects, UCL Estates

Client: University College London
Architect: Nicholas Hare Architects
M&E Engineer: BDP **Energy & Sustainability Consultant:** Expedition
Structural Engineer: Curtins
Contractor: Mace
Landscape Architect: Colour
UDL Cost Consultant: AECOM
Health & Safety: Faithful & Gould
Fire Consultant: Arup
Project Manager: Arcadis
Planning Consultant: Deloitte Real Estate

ZAYED CENTRE FOR RESEARCH INTO RARE DISEASE IN CHILDREN

Guilford Street, Russell Square, London WC1

The Zayed Centre for Research into Rare Disease in Children (Zayed Centre for Research) will be the first purpose built centre of its kind in the world. The aspirations of Great Ormond Street Hospital and University College London for the building are to be embodied in both design and operational terms, with an emphasis on the creation of a world class and high quality building with outstanding research and clinical facilities.

The Zayed Centre for Research will enable clinicians and researchers to work side-by-side, share thinking and collaborate in advancing the understanding of rare diseases. This will help to improve diagnosis, develop treatments and the manufacture of innovative medical devices, whilst providing direct links to patient care.

The new building will incorporate an outpatient department hosting paediatric clinics for children with a range of rare and complex conditions, and also house a variety of specialist and generic laboratories, shared platform technologies and associated write-up areas to be used by hundreds of researchers.

Central to the building design is the desire to give expression to the client's vision for the promotion of 'bench to bedside' translational research by encouraging interaction between multi-disciplinary research staff and patients within a single building, while providing public expression to the important work being carried out.

Within the write-up areas, the interior is designed to provide a high-quality working environment by maximising access to daylight and views to the exterior from both open plan work stations and cellular rooms. As well as the generic laboratories, tissue culture suites and associated support rooms, a high level containment laboratory forming a Good Manufacturing Practice (GMP) suite is also located in the building. This will undertake specialist clinical grade gene, cell and tissue manipulation.

At street level, the building is animated by views directly into the principal research laboratories. Research staff, patients and other visitors will share a common entrance which will pass above the main open plan laboratories. Internally, strong links between research and outpatient areas are created to promote the unified vision for the building, stimulating new thinking between different institutions. Designed to promote interaction through visual and physical connections, the design includes key routes converging on the centrally located staff café and south-facing external terrace on the second floor.

VIEWPOINT

"The really exciting thing about the new building is the possibility of creating a working environment that brings everyone together. As a clinician, I need to explore my options for treating a patient with experts who can help me develop them. A variety of different professionals under one roof will allow us to turn innovative thinking into practical solutions. The centre will also give us a manufacturing capacity to develop these solutions at scale so we can help more and more patients."

Professor Andrew Taylor, Divisional Director of the Cardio-Respiratory service at Great Ormond Street Hospital and Professor of Cardiovascular Imaging at the UCL Institute of Cardiovascular Sciences

Client: Great Ormond Street Hospital Children's Charity (on behalf of Great Ormond Street NHS Foundation Trust and University College London) **Architect:** Stanton Williams **Structural Engineer:** Pell Frischmann **Services, Environmental and BREEAM Engineer:** Hoare Lea **Landscape Architect:** BHSLA **Cost Consultant and Project Manager:** Gardiner & Theobald **CDM Coordinator:** Turner & Townsend **Planning Consultant:** DP9 **Façade Consultant:** Eckersley O'Callaghan





CENTRE BUILDINGS REDEVELOPMENT AT LSE

Houghton Street, Aldwych, London WC2

Completion: April 2019

Inspired by the university's core values of 'collaboration, excellence and innovation', this design includes the demolition and redevelopment of three existing buildings on the Aldwych campus to create a new 10-storey building, and new public square to create a focal point for the school and improve connectivity and wayfinding throughout the campus. The gross internal floor area of the existing sites has been increased by nearly 6,000 sqm, allowing for future growth in the school.

The public square has been created through committing a large part of the development site to open space and by maximising the potential of the remaining site to deliver the brief's requirements. In order to create the public square, the design has maximised the site's potential through creating a 13-storey tower which exploits the massing potential offered by a cluster of nearby tall buildings, and a lower six-storey building that responds to the scale of Houghton Street. Roof terraces have been created for the use of students and staff where the building steps down to mediate the two building scales.

The building combines the best elements of passive design with innovative MEP plant and controls; making it easy for users to adapt their individual environment, but also easy for maintenance staff to operate. Passive features have been achieved by means of solar protection of the façade, narrow floorplates for daylight and ventilation, and an atrium with roof vents to enhance air movement. The result is that more than 60 per cent of the total building area is entirely naturally ventilated, with only the enclosed teaching spaces being mechanically ventilated. The remaining spaces are designed for mixed-mode ventilation, and can operate in either natural or mechanical mode, depending on the occupancy and comfort requirements.

The design has been zoned vertically, with the most public and highly-serviced facilities located on the lower levels – helping to animate the newly-created LSE Square and Houghton Street – and the more private academic departments located on the upper levels. Simple, flexible floor plans provide a mixture of cellular and open plan offices, teaching spaces and student study areas. Public and student facilities are accommodated between the lower ground and second floor, connected by a single sculptural staircase which rises within a three-storey atrium lined with informal break-out spaces.

VIEWPOINT

"One of the many challenges we faced was to design an educational building that could provide facilities that reflected the changing methods of teaching, and that would still be state-of-the-art when the building opened. Extensive consultation was done across many LSE departments to develop an approach to the provision of physical teaching space and the supporting technology. A new-style lecture theatre evolved, which could facilitate both lectures and group-working without reconfiguring the room. The LSE aspiration to move towards more open-plan accommodation, allowing better collaboration and dialogue between academic staff, was met with strong resistance, and consequently we embraced a system that could be flexible and evolve with the school."

Tracy Meller, Partner, Rogers Stirk Harbour + Partners

Client: LSE **Architect:** Rogers
Stirk Harbour + Partners **Structural**
Engineer: AKT II **Services**
Engineer: Chapman BDSP
Landscape Architect: Gillespies
Fire Strategy and Acoustic
Consultant: Hoare Lea

KING'S COLLEGE LONDON, STRAND CAMPUS

Aldwych, London WC2

Completion: April 2018

Transforming the former home of the BBC World Service into a world class university campus at the heart of the Strand, this project houses a 400-seat auditorium, lecture theatres, seminar rooms, offices, trading labs, a GP health centre, the Student Union and two restaurants, across a campus spanning 30,000 sqm. At the centre, the courtyard will be transformed into the hub of the campus via a new central pavilion that will act as a flagship entrance, providing level access to every area of the university.

Innovative designs that balance the benefits of traditional cellular offices with the occupational densities required for a thriving central London university have enabled the creation of 266 academic offices. These semi-shared spaces provide customisable furniture, meeting spaces and storage whilst saving an estimated 3,700 sqm versus cellular offices. Building upon the BREEAM Excellent standard which was reached on the initial refurbishment, the project exclusively uses sustainable furniture and materials, as well as integrated technology such as closed control systems and presence detectors.

The best of the original neo-classical architecture has been preserved and enhanced with high quality, modern materials that reflect the KCL brand, achieved through stakeholder engagement with union staff, academics, students and estates staff. The result is a university campus that has been shaped by the end users, with student and staff experience at the centre of the designs.

Interface areas that welcome the public have been created across the five buildings using flexible partitions and modular furniture. They provide space dedicated to cultural engagement, events and exhibitions that can expand and contract according to occasion. In addition, the café, retail spaces and public realm can be accessed via the semi-public courtyard and pavilion.

VIEWPOINT

“One of the key challenges of the project was formulating the brief with the various stakeholders including five separate departments, Estates, Venues, and Student Union. Our goal was to break away from the traditional footprint of private offices which take up 70 per cent of the previous Strand Campus to make spaces that would improve the student experience including informal learning spaces, more teaching spaces and student commons. Once the space utilisation study revealed that the offices were only occupied 30 per cent of the time, a shift in the space allocation was deemed necessary for this central London location. JRA, together with the Project Management Office, conducted over 60 workshops with the various departments to help fine tune their spaces and promote shared offices. This allowed us to free up around 3,700 sqm which allowed for more student spaces.”

Angela St Clair-Ford, Head of Workplace Interiors,
John Robertson Architects

Client: King's College London

Architect: John Robertson Architects

Structural Consultant: AKT II M&E

Engineer: Hilson Moran **Landlord's**

Agent: JLL **Project Manager:**

Lendlease & KCL Estates **Fire**

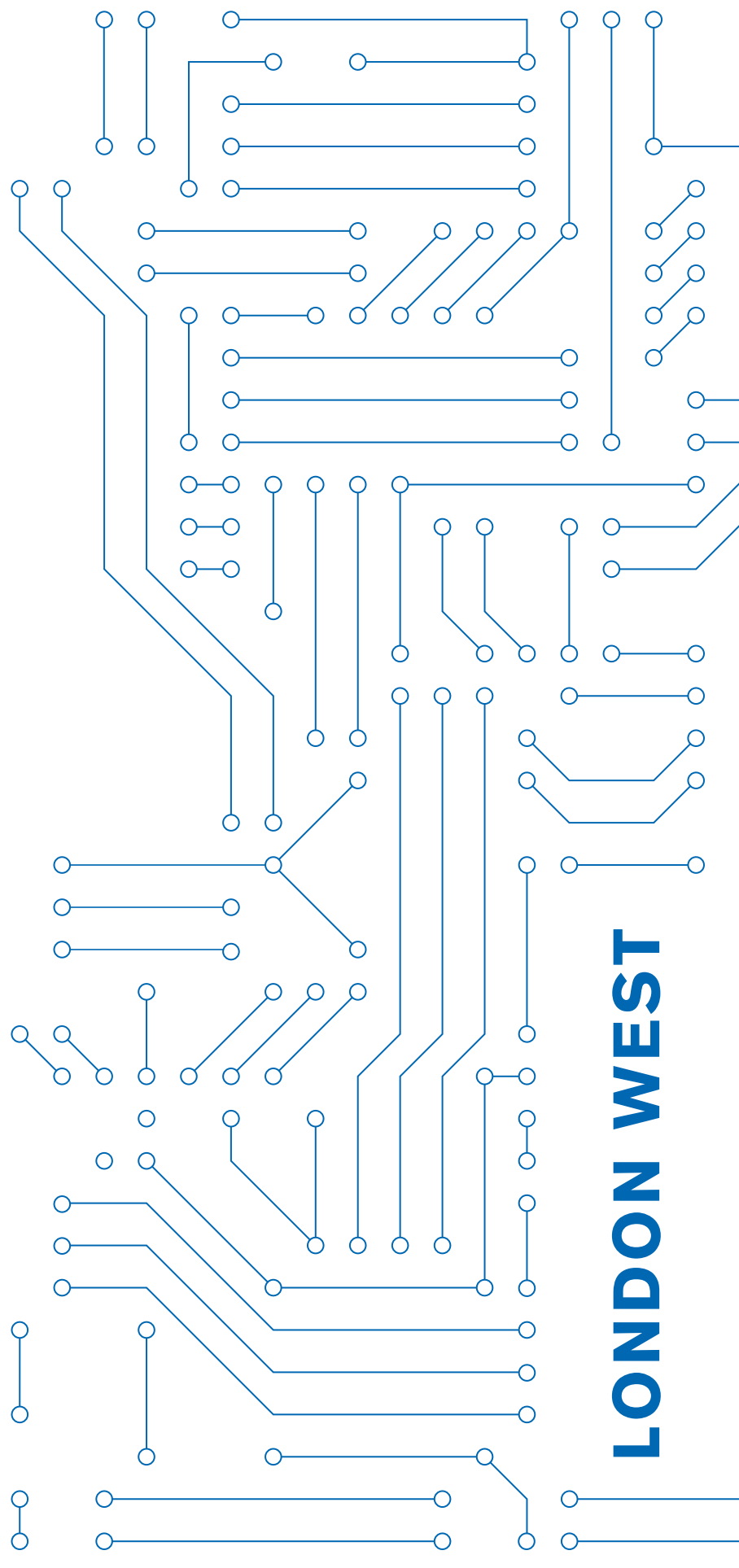
Consultant: Hoare Lea Engineering

Consultants **Space Management**

Consultant: 360 Consulting







LONDON WEST



AVANTON: BATTERSEA

York Road, Battersea, London SW11

Completion: 2020

Combining residential with cultural and educational uses, this project gives a new home to the Royal Academy of Dance (RAD), while providing 299 homes and new public realm. Three new housing buildings, ranging in size from six to 24 storeys, will sit on a plinth featuring studios, flexible performance space, cafés and a new archive library. The RAD will be located at the ground floor and part of the first floor, representing a major new destination and animating the public realm.

Client: Avanton, RAD and A2 Dominion

Masterplanner and Executive Architect:

Patel Taylor **MEP Engineer:** Hoare Lea

Structural, Civil and Traffic Engineer:

Waterman **Health and Safety:** Orsa **Planning**

Consultant: RPS **Project Manager:** Arcadis



ELM GROVE STUDENT RESIDENCES AND CONFERENCE CENTRE

University of Roehampton, London SW15

Completion: September 2016

Providing affordable campus-based residential courtyards with high quality landscapes, these student residences create an attractive and unique setting for Roehampton University. A civic-scale building creates circulation spaces that encourage chance meetings, establish communities and exploits views across the campus. Extensive use of pre-fabrication is made, notably in the high quality brick and cast stone external walls, precast structural elements and bathroom pods.

Client: University of Roehampton **Architect:**

MJP Architects **Structural, M&E, Acoustics**

Engineer and BREEAM: BDP **Landscape**

Architect: GROSS MAX **Fire Engineer:** JGA

Approved Inspector: MLM **Access Consultant:**

David Bonnet Associates **Contractor:** Osborne



UNIVERSITY OF ROEHAMPTON LIBRARY

University of Roehampton, London SW15

Completion: September 2017

The new Library at the University of Roehampton is the centerpiece of an ambitious campus masterplan and characterised by a generous park and garden landscape that makes it unique among London's universities. It delivers over 1,000 study spaces, staff support and work areas, specialist digitisation and collection management over five floors and 7,840 sqm. It fulfils a number of specialist functions focused around education and teaching, and celebrates the rich history of the University's four Colleges through fixed exhibition spaces. The Library's study spaces are intended to support a variety of group sizes and work intensities, from individual silent study to group collaboration.

Client: University of Roehampton **Architect:**

Feilden Clegg Bradley Studios **Cost Consultant**

and Project Manager: Gardiner & Theobald

Structural, Acoustic and Services Engineers:

BDP **BREEAM Assessor:** BDP **Fire Engineer:**

Jeremy Gardner Associates **Access Consultant:**

David Bonnett Associates **Landscape Architect:**

Gross Max **Main Contractor:** Osborne



MICHAEL UREN BIOMEDICAL ENGINEERING RESEARCH HUB

**Imperial College White City Campus,
London W10**

Completion: June 2019

This new triangular-shaped 13-storey facility for Imperial College London will provide flexible accommodation for translational research initiatives at the interface of biomedical sciences and engineering. It will include research laboratories, an outpatient clinic, a 150-seat auditorium and social spaces to encourage informal exchange. Laboratory and clinic spaces are served by interconnected plant on each floor. A field of vertical fins in front of the glazed façades provide solar shading and internal privacy while lending the building a dynamic and distinctive image.

Client: Imperial College London **Architect:** Allies and Morrison **Structural Engineer:** Curtins **Services Engineer:** Buro Happold **Quantity Surveyor:** Faithful & Gould



TRANSLATION & INNOVATION HUB

**Imperial College White City Campus,
London W12**

Completion: January 2016

Situated at the southeast edge of a new common, The Translation & Innovation Hub for Imperial College London brings together leading experts from both education and business to the area. The building provides accommodation for ThinkSpace – the commercial development and research endeavour of the university. The campus consolidates multidisciplinary innovation with cutting edge facilities, enabling world-class biotechnology and scientific researchers, small and large businesses and start-up companies to work and learn together.

Client: Imperial College London & Voreda
Architect: PLP Architecture **Building Services Engineer:** Hoare Lea **Structural Engineer:** WSP
Project Manager: Meedhurst Project Management
Planning Consultant: JLL **Façade Consultant:** Thornton Tomasetti **Access Consultant:** Access=Design **Wind Engineering:** Adams Kara Taylor **Hand Drawn Visualizer:** Alan Marten
Heritage Consultant: GgMS **Landscape:** Ian Turkington **Main Contractor:** Laing O'Rourke



RICHMOND ADULT COMMUNITY COLLEGE

Parkshot, Richmond, London TW9

Completion: January 2015

Richmond Adult Community College (RACC) provides a welcoming centre of learning where students can extend existing skills and acquire new ones, particularly for learners with learning difficulties or disabilities.

The College originally functioned from two sites, Richmond and Twickenham. The brief sought a consolidation into one campus, with funds gained from the sale of Twickenham financing the design and reformation of the Richmond site. The project encouraged greater access, inclusivity and flexibility, upgrades to site quality and improved the street relationship. The scope consisted of new build and refurbishment including a new theatre, art and ceramics department, a reception area and a new central cloister, alongside general teaching spaces.

In order to achieve this vision, within an already heavily developed site, it was imperative to make the college more efficient in terms of spatial use, identifying unused areas and landlocked spaces, and unlocking them. Where necessary areas were reconfigured or demolished to create better efficiencies within the site.

The process of unlocking and stripping served a dual purpose – to improve the setting of the original Edwardian building and unify the site with new buildings, extensions and link blocks. This allowed for the reorganisation of curriculum hubs bringing compatible uses together, such as dance and theatre, with shared facilities providing greater spatial efficiency for its users.

Designed with adult learning for the older generation in mind, the Community College is equipped with a range of adaptive and inclusive features, including induction loops and high levels of light.

The client wanted a place where there was something for everyone, where everyone felt at home, and no one would be turned away. There would be a broad range of learning activities available, from exhibitions, lectures, talks, concerts, plays, conferences and markets to the more formal courses and qualifications. It was important that the building was welcoming and that everyone was free to enter and stay all day.

A courtyard sits at the centre of the site – this green space is intended to provide a heart to the scheme and provides a transparent connection for several of the key site activities, including a café and exhibition space along with reception, foyer, artists' shop and theatre bar, all accessed from a new clear entrance for staff, learners and the public.

The college actively promotes sustainability and has worked with the Carbon Trust to reduce its carbon footprint. Heating systems have been updated at the Parkshot site and the new build has achieved a BREEAM Excellent rating and incorporates recycling and sustainable energy strategies. There is also a Building Management System control to allow facilities managers to optimise the services according to changing patterns of use and the different seasons.

VIEWPOINT

"When we were inspected in May 2015 Ofsted praised the new facilities as 'excellent' as it helped to raise the standard of student work. Ofsted saw us being used for meetings and events of the local LGBT community, a Dementia support group, the carers association, MIND, many learners with disabilities and learning difficulties, local businesses and people of all ages and backgrounds. They praised our inclusivity and ambition for our learners. This is a new beginning for us. Our new environment has helped us to offer more to the community and refresh our mission and identity."

Gabrielle Flint, Principal, Richmond Adult Community College

Client: Richmond Adult Community College **Architect:** Duggan Morris Architects **Associate Architect:** APLB architects **Contractor:** Leadbitter/Bouygues **Structural Engineer:** Elliott Wood Partnership **Services/Environmental Engineer:** Skelly & Couch **Cost Consultant and Project Manager:** Turner and Townsend **CDM Coordinator and Approved Building Control Inspector:** Richard Wragg **CDMC:** Appleyard & Trew **FF&E Consultant:** FFE Consulting **Theatre Consultant:** Theatertech **Planning Consultant:** GKA Limited **Client Advisor:** Cavendish Berkeley Consulting Ltd



IMPERIAL WEST MASTERPLAN

Imperial College White City Campus, London W12

Creating a new campus for Imperial College London as part of a new mixed-use urban quarter within the wider White City Opportunity Area, this 8-acre campus builds a new ecosystem for research – a place for science and business coming together in an innovative and creative environment. A total area of 1.2 million sq ft ranging from academic facilities to commercial uses are arranged around a new square, becoming a catalyst to wider urban renewal and regeneration of the local environment.

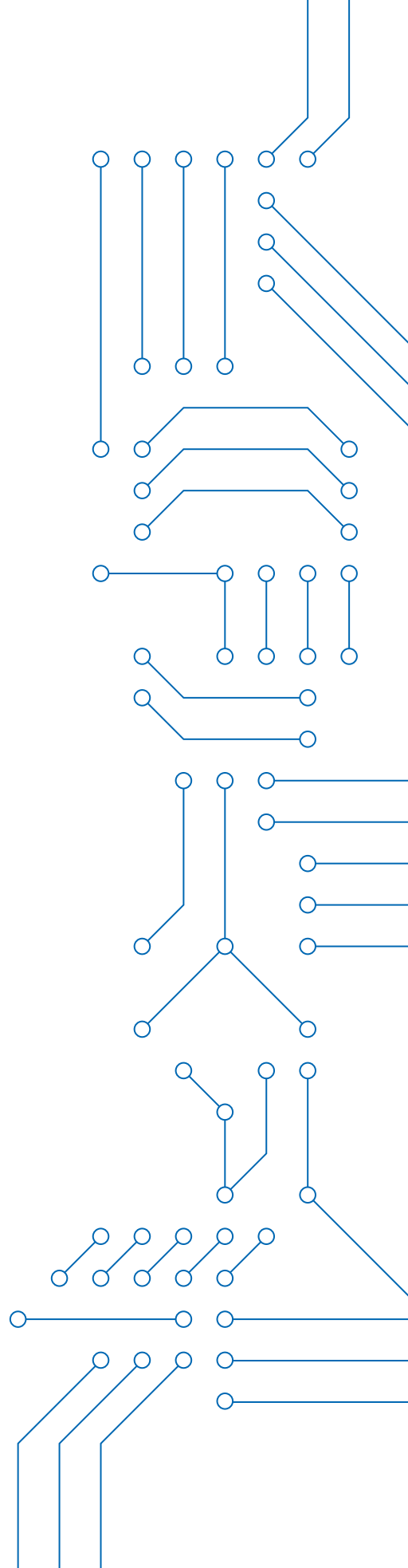
Client: Imperial College London and Voreda Capital **Architect:** Aukett Swanke
Landscape Architect: Turkington Martin
Transport Consultant: Pell Frishmann

IMPERIAL COLLEGE WHITE CITY – SOUTH CAMPUS

Imperial College White City Campus, London W12

Commissioned in 2017, a masterplan is currently being drawn up which will guide the expansion of the White City campus south of the Westway. It will add 5.7 ha to the Imperial College White City estate, bringing together researchers, industry partners and residential uses with a new common space at its heart.

Client: Imperial College London
Architect: Allies and Morrison





MOLECULAR SCIENCE RESEARCH HUB

Imperial College White City Campus, London W12

Completion: June 2018

Forming the centrepiece of the Imperial West campus, this hub has evolved from an academic building to include high specification technical and laboratory areas clustered around a full-height atrium. The building reveals its inner workings and encourages physical and visual connectivity, fundamental to innovative research. The interior spaces facilitate interaction between the diverse and specialised research activities, which include flexible wet laboratories, centralised analytical facilities and a specialist low vibration facility.

Client: Imperial College London and Voreda Capital **Architect:** Aukett Swanke **Fit out Architect:** Sheppard Robson **Façade:** Thornton Tomasetti **Landscape Architect:** Turkington Martin **Lighting & Services Engineer:** Hoare Lea **Structure Engineer:** Curtins and WSP

IMPERIAL CENTRE FOR TRANSLATIONAL AND EXPERIMENTAL MEDICINE (ICTEM)

Hammersmith Hospital, London W12

Completion: March 2013

As a world-class medical research facility at the Hammersmith Hospital, this centre combines laboratory space for up to 450 scientists with a dedicated facility for evaluating and developing new medical treatments through clinical trials. Laboratories and office spaces are set either side of an atrium which encourages communication and spontaneous interaction – essential to the promotion of cutting edge scientific research.

Client: Imperial College London **Architect:** Sheppard Robson **Structural Engineer:** Curtins Consulting Engineers **Contractor:** Lendlease **M&E/ Sustainable Engineer:** Hoare Lea **Quantity Surveyor:** Turner & Townsend **Project Manager:** EC Harris **Landscape Architect:** Nicholas Pearson Associates

WHITE CITY PLACE

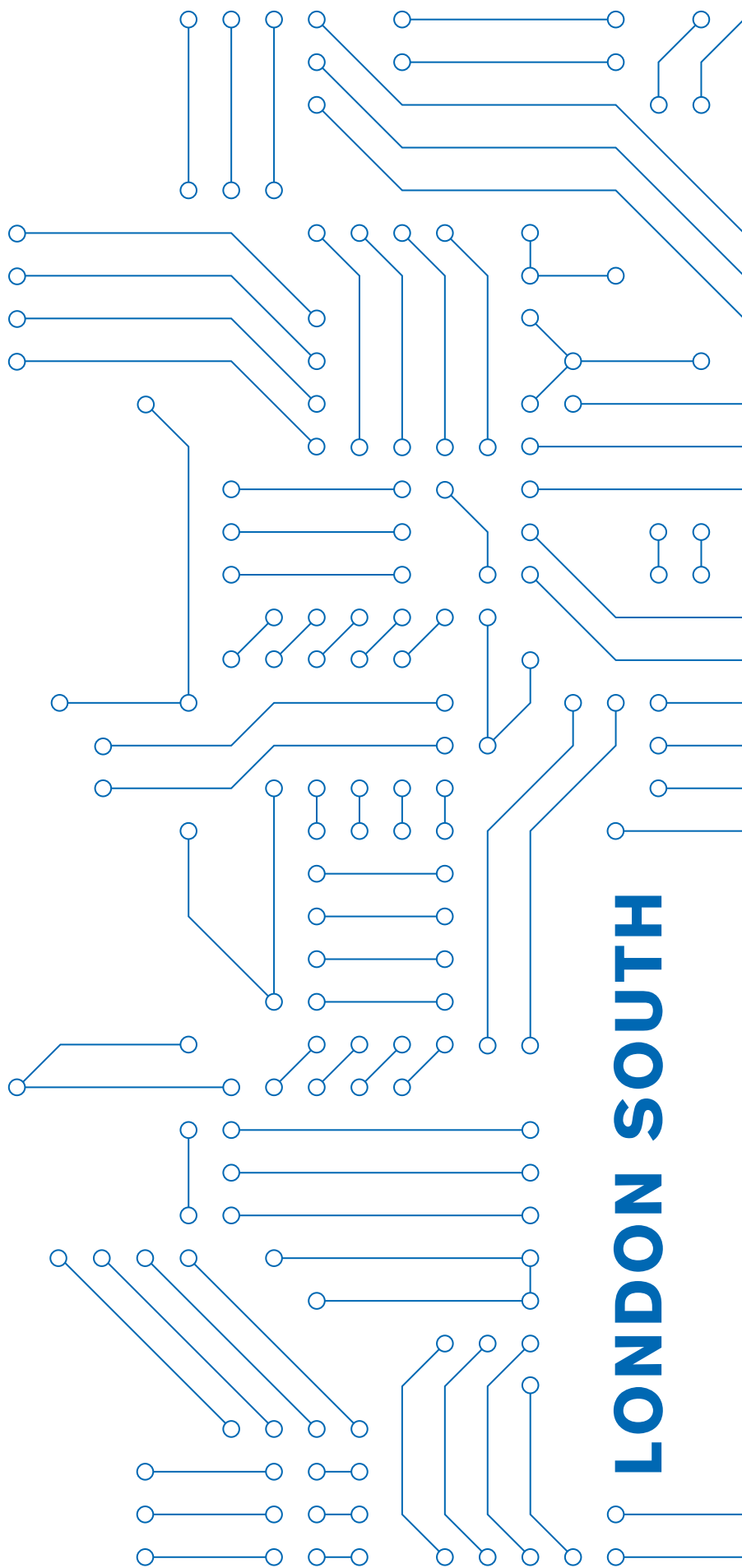
White City, London W12

Completion: September 2017

Forming part of a wider investment in the White City area and Imperial College campus, this project creates a collection of refurbished and new buildings set around re-imaged public realm. A Creative Hub for the Royal College of Art has also opened as its new centre for communication, architecture and humanities.

Client: Mitsui Fudosan, AIMCo and Stanhope **Architect:** Allies and Morrison **Structural Engineer:** AKT II **Building Services Engineer:** Sweco **Construction Manager:** Lendlease **Cost Consultant:** Deloitte **Development Manager:** Stanhope





LONDON SOUTH

BETHLEM, MUSEUM OF THE MIND

Monks Orchard Road, West Wickham, London BR3

Completion: January 2015

This museum is the only building dedicated to the history of mental health treatment in the UK, containing the archive of the hospital which was once known as Bedlam, aiming to promote wider knowledge of the history of mental health care and treatment.

Bethlem Museum of the Mind and Bethlem Gallery are two organisations based within the building who work collaboratively to shape a creative and cultural landscape with the aim of encouraging better understanding of mental health and to challenge stigma. The design provides space for a diverse range of activities; not only specialist facilities for archivists, conservators and academics but also visitors of all ages. In addition, the Bethlem Gallery, which offers art therapy and an exhibition venue for patients of the South London and Maudsley NHS Trust, combines patient care with academic research and art.

The museum and gallery are closed to the public for two days a week to be used as a venue for art therapy while enabling wards or community groups to book private visits if preferred. To encourage social inclusion the museum offers a wide range of opportunities, such as expenses paid volunteering for people with experience of mental health problems, a range of informal learning opportunities and regular infant-friendly mornings for mothers with children in the mother and baby unit to enable them to meet other local parents.

The museum has also been host to collaborative projects, such as a month of informal learning opportunities connected with the 'Big Draw' festival through the National Lottery fund, and a project funded by the Wellcome Trust called 'Exceptional and Extraordinary: Unruly bodies and minds in the medical museum' aiming to stimulate public and professional debate around the attitudes towards disability, led by the Research Centre for Museums and Galleries, University of Leicester.

Key to the design was ensuring the building played a significant role in shaping visitor experience and to emphasise its unique position as part of the working hospital. The symmetrical arrangement of the existing building inspired a 'winged' layout maintaining the dramatic central circulation space, Art Deco reception area and staircase. The journey through the museum commences in the foyer where visitors are greeted by life-size statues depicting 'Raving' and 'Melancholy Madness,' which stood at the gates of the 17th century

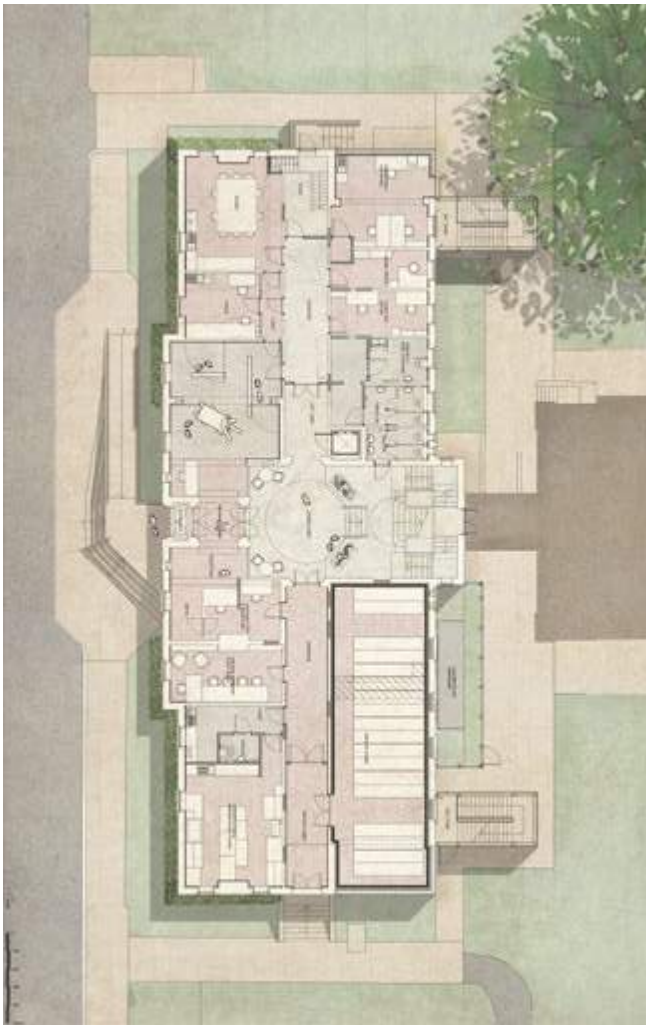
hospital, commonly known as Bedlam. Upstairs, the South Wing extension is envisaged as a darker space, inspired by Hogarth's etchings of Bedlam. The North Wing extension is a lighter space, where full-height glazing directs views across the landscaped grounds beyond – a respite for visitors after engaging with potentially confronting exhibits. Outwardly, the building retains its attractive façade, enhanced by contemporary extensions that complement the existing scale and proportion with an elegant material palette – including brick, limestone, marble, perforated aluminium, bronze and copper.

VIEWPOINT

"The partnership with Bethlem Museum of the Mind has enabled the college to utilise a high quality training venue which is easily accessible to students based on the hospital site or in the local community. SLaM Recovery College has been able to support the provision of mental health focused education to complement the range of activities within the museum, whilst providing our students with the opportunity to learn within an environment which encourages them to explore the history of mental healthcare and treatment."

Kirsty Giles, Manager, SLaM Recovery College

Client: Bethlem Arts & Heritage Collections Trust **Architect:** Fraser Brown Mackenna Architects
Main Contractor: Keir Southern
Consultant and Interior Designer: REAL Studio





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AYLESBURY HEALTH CENTRE & EARLY YEARS

Thurlow Street, Elephant & Castle, London SE17

Completion: September 2020

Creating a mixed-use public building, this project comprises a GP and primary community healthcare centre, supporting staff facilities and an early years nursery, layered across three and four storeys, located at heart of the Aylesbury regeneration area. The scheme has been developed alongside the Plot 18 North Building – containing a library, play-and-stay and café – and a new public space. These new additions will bring a synergy of public functions to the surrounding area.

The design process focused on a series of foundational principles for the future of healthcare and early years design in London – from the integration of compatible services to the promotion of a sense of community and wellbeing, from flexibility and future adaptability to cross-cultural legibility, from developing strong relationship with urban context to designing for dignity, privacy, comfort and accessibility.

The design seeks to enhance the patient experience through barrier free access, combining a welcome sense of arrival with generous floor-to-ceiling and mini-atrium and providing a clear wayfinding strategy throughout. The ambition is to create a calm and healing environment by providing widespread natural daylight, regular views out and by adopting a durable palette of warm natural materials. The Early Years facility on the upper level will deliver flexible large open-plan learning spaces connecting with a large external play space and full catering kitchen.

The complex and overlapping uses housed within the building meant that it was essential for stakeholders to play an active and collaborative role in the development of the final design, which will bring together several organisations under one roof. An extensive briefing process focused on the specific everyday needs of each user group was fed directly into the arrangements and detailed placement of equipment and furniture.

As well as being visitor focused, the design team also considered the day to day staff experience, focusing in detail on the operational aspects of the building and essential adjacencies between clinical and supporting spaces. A flexible working environment is intended for staff, providing a choice of opportunities during the working day, allowing for social interactions, collaboration between the departments and spaces for individual focused work.

The site is envisaged as a new civic landmark for the area bringing together new and existing communities and so the proposal will be a standalone sculptural building that mediates between the new masterplan and the smaller grain of the existing Conservation Area.

VIEWPOINT

“Duggan Morris Architects has been instrumental to the design success of the South Building, delivering a design that acts as a catalyst for positive change in the urban environment of the Aylesbury regeneration area. As project lead, client and funder representative for the Council, I have been involved in this project at all stages through to the current detailed design stage. From the start, design quality and originality has been key in the design of this building. Meeting all the requirements of a complex and technical brief on a tight site has been a huge challenge for the architects, but the result is a design of beauty and poise that meets all the operational needs of its stakeholders and exceeds the expectations of its client.”

Catherine Bates, Principal Design and Technical Officer
– Regeneration South, LB Southwark

Client: Aylesbury Health Centre
Architect: Duggan Morris Architects
Project Manager and Quantity
Surveyor: Arcadis **Structure,**
MEP Engineer and BREEAM:
AECOM Fire Engineer: WSP

THE LEARNING HUB AT ST CHRISTOPHER'S HOSPICE

Lawrie Park Road, Sydenham, London SE26

Completion: August 2019

Funded by Dame Cecily Saunders 1967, St. Christopher's Hospice is an independent charity that has developed a formidable reputation as a champion of excellence, and a leader, innovator and disseminator of best practice in palliative and end of life care.

St. Christopher's Hospice's humane mission to the dying extends to their families, friends and carers. This new building addresses the Hospice's need for new accommodation to educate, teach, inform and train those who care for the dying, whether highly skilled professionals or a relative, friend or carer. This is as much a psychological and emotional endeavour as it is a clinical and practical one, requiring a suitably inclusive environment.

The large campus accommodates its new learning hub, distinct from but nevertheless closely linked to the hospice building itself. The campus lies on the slopes of Sydenham Hill, once associated with medicinal springs or 'wells' accessible to the general London populace, and latterly the site of Crystal Palace, which during the late 19th and 20th Centuries was a hub of scientific and cultural knowledge.

The new building is imagined as part of this landscape, an educational grove, at whose heart is a welcoming foyer, shared by the whole hospice community – carers, volunteers, professional staff, patients and loved ones – which is seen and experienced in continuity with the gardens which surround it. A good place to 'shelter in time' during one of the most poignant human experiences.

The materials chosen for the building reflect its local context. The housing which transformed countryside into urban London was built out of bricks from local brickfields, and bricks have been chosen as the main facing for the building. The translucent polycarbonate enclosure of the Skills Lab strikes a more futuristic note and reflects the sunset.

The accommodation is divided into two blocks. One houses the main teaching spaces: a sub-divisible double-height Lecture Room with a practical Skills Lab above, that gives onto a roof terrace. The other houses the library, meeting rooms, staff offices and boardroom. The two blocks are connected at ground level by the foyer and linked by bridges at first and second floors carrying e-learning galleries with work stations accessible to both professional staff and visitors, across the 'ravine' between them. Here a tall window, rising through three storeys, overlooks the gardens. Seen from the main hospice, this window gives transparency

to the activities of the learning hub and allows light flooding through the building from the south to draw visitors to the hospitality of the foyer.

The Learning Hub at St. Christopher's crystallises a pivotal moment in the evolution of hospice education, when the balance has shifted towards more innovative, more inclusive teaching methods. This recognises that most people want to die at home amidst friends and family, who likewise want their loved ones to be with them in familiar surroundings when this happens. This insight has informed the character of the architecture, its materials and the domestic feel of the settings created.

VIEWPOINT

"The new Learning Hub will enable St Christopher's to fulfil its founding mission to empower those who care for dying people – whoever they are and wherever they are based. Our vision for the future calls for a space that will offer a wide range of individuals access to education and training, that will provide learning for people working locally, across the UK and in other parts of the Globe, and which will support personal growth alongside skills development and new qualifications. We want to train lay carers, patients and the public alongside professionals engaged in end of life care. Working with Mills Power in a creative process to design inclusive spaces, we know the new building will draw in a whole variety of learners, and surprise them in its offerings of new opportunities to learn about an issue that affects us all".

Heather Richardson, Joint Chief Executive, St Christopher's Hospice and Liz Bryan, Director of Education and Training, St Christopher's Hospice

Client: St Christopher's Hospice

Architect: Mills Power **Structural**

Engineer: Price & Myers

Environmental Consultant: P3r

Project Manager: Developing

Projects **Quantity Surveyor:** Castle

Hayes Pursey **Landscape Architect:**

LDA **Planning Consultant:** Quod





ORTUS – THE HOME OF MAUDSLEY LEARNING

Grove Lane, Camberwell, London SE5

Completion: June 2014

ORTUS, home of Maudsley Learning is a 1,550 sqm pavilion housing learning and event facilities, café and exhibition spaces. The central focus of this unique project, initially coined 'Project Learning Potential', was to create a totally immersive learning environment generating a series of inter-connecting spaces to encourage intuitive learning activities, either in groups or individually.

The building stimulates community-wide engagement by being a welcoming, friendly and accessible building, helping to remove barriers to learning and to create a good first impression of an organisation promoting equality and diversity.

The building is now home to Maudsley Learning, a Community Interest Company that has been set up to run the building. Its vision was to raise knowledge and awareness of mental health and wellbeing which it intends to achieve through the development of a virtual learning environment and the creation of learning events focusing on mental health and wellbeing across a broad audience.

The building promotes interaction between users by providing flexible, informal spaces where people can enjoy respite and interact, creating closer proximity between learners and tutors and encouraging greater communication between staff, as well as being welcoming, friendly and accessible to all.

A noteworthy art-collection is used as stimulus for engaging with the community, aided by the ground floor café, welcoming the public into the heart of the building.

On this project, the challenge was to create a building type and facility for an institution, without a specific precedent. In order to solve this open-ended question, an extensive 'immersion programme' was set up to bring all end users together to converse primarily about education in a qualitative way and to attempt to forecast the future of learning, spatial typologies, teaching methodologies and the influence of digital technology. This process was ultimately captured through a series of 'Vision Statements', which guided the wider team through the project providing a constant reference point during the design development stages.

The interior spaces are planned around a central multifunctional space, navigated by a grand 'open' staircase. This central space is key for the environmental performance of the building, by introducing abundant natural light from a glazed roof into the heart of the plan. An intelligent system controls the internal CO2 and temperature, with the option for manual over-ride by the users, introducing cooling air as required at each level throughout day and night, feeding the central heart space.

VIEWPOINT

"Even today, almost four years after the opening of the building, we get people from the architectural world coming in to admire the building. Our guests often comment on how they enjoy the feeling they get from the building, which again is testament to the planning that went in to the project and shows that Duggan Morris Architects really understood what the building would be used for and the importance of Mental Health and Wellbeing."

Joanne Cripp, Services Manager, Ortus Learning and Events Centre

Client: Maudsley Charity **Client Representative:** Articulate
Architect: Duggan Morris Architects **Construction Manager:** Cavendish Berkeley **Structural Engineer:** Elliott Wood Partnership
Environmental Engineer: Skelly and Couch **Cost Consultant:** Measur **Planning Consultant:** Signet Planning **CDM Coordinator:** Andrew Goddard Associates
Stakeholder Communication: Local Dialogue **Approved Building Control Inspector, BREEAM and Ecology Consultant:** MLM
Fire Strategy: Trenton Fire



MOUNTVIEW ACADEMY

**Peckham Hill Street, Peckham,
London SE15**

Completion: August 2018

Conceived as a 'warehouse for the arts', this project will provide 21 specially designed acting and dance studios, 16 music studios, rehearsal spaces, set building workshops, facilities for 100 staff and 400 students, a TV studio, radio broadcast, two black box studios and a training theatre. The inclusion of revenue earning spaces, such as a 200-seat theatre, restaurant, café and rooftop bar alongside lettable workspace, will help to fund the teaching activities of the School, presenting a sustainable model for delivering educational facilities.

Client: Mountview Academy of Theatre Arts

Architect: Carl Turner Architects **Project**

Manager: Baqus **Structural Engineer:** Eckersley O'Callaghan **M&E Engineer:** Skelly and Couch

Contractor: Gilbert Ash **Fire Engineer:** Astute

Fire Theatre Consultant: Charcoal Blue

INSTITUTE OF HEPATOLOGY – KING'S COLLEGE LONDON

**Coldharbour Lane, Camberwell,
London SE5**

Completion: November 2016

The Foundation for Liver Research, whose pioneering work includes research on liver transplantation alongside liver disease and acute liver failure, has commissioned a new Institute of Hepatology building on a site adjacent to the existing medical research facilities at King's College Hospital's Denmark Hill campus. The new 1,000 sqm facility, entirely funded through charitable donations, provides laboratory space, write up areas, seminar rooms and offices, with a flexible layout and open plan breakout spaces that promote interaction and engagement between research groups.

Client: Foundation for Liver Research

Architect: Avanti Architects **M&E Engineer:** TP Engineering **C&S Engineer:** Ross & Partners

Quantity Surveyor: Currie & Brown



KING'S COLLEGE HOSPITAL LONDON, CRITICAL CARE UNIT

Denmark Hill, London SE5

Completion: September 2019

The new critical care unit consolidates King's College Hospital's status as one of London's major trauma centres, giving access to immediate specialist care for the city's most urgent, life threatening cases. Literally bridging the hospital's main operating theatre block, it will be one of the largest units of its kind in the UK. Focusing on quality of recovery, with emphasis on patient environment, the design takes into account natural daylight, flexible bedrooms, interactive technology and stimulating artwork to enrich patient surroundings.

Client: King's College Hospital NHS Trust

Architecture: BMJ Architects **Structural:**

Ross and Partners **Engineer:** WSP

Contractor: McLaughlin and Harvey



THE LONDON CANCER HUB

Cotswold Road, Sutton, London SM2

Completion: January 2038

The London Cancer Hub will be one of the world's leading life sciences districts specialising in cancer research and treatment, attracting researchers, clinicians, pharmaceutical companies and related innovative enterprises. The design will deliver modern facilities in beautiful green space, making the most of the development's unique location within London.

Client: LB Sutton and The Institute of Cancer Research **Architect:** Haptic Architects

Supported by: The Royal Marsden NHS Foundation Trust, Epsom and St Helier NHS Universities Trust and Greater London Authority **Commercial Adviser:** JLL

ESTATE MODERNISATION PROGRAMME

Glenburnie Road, Tooting, London SW17
Completion: 2024

South West London and St George's Mental Health Trust (SWLSTG) have developed a programme, named the Estate Modernisation Programme (EMP), which will transform the estate to deliver two new hospitals in a community setting by 2024. Currently at Full Business Case (FBC) stage and subject to government approval, this entirely self-funded and innovative programme will use surplus land, no longer required for mental health services, to fund the building of two new state-of-the-art campuses at the Springfield site, in Tooting, and Tolworth site, in Kingston.

The hospitals have been developed and designed alongside clinicians and once built, are expected to be some of the best mental health facilities in the UK.

The Trust currently operates out of a primarily Victorian Estate and the new hospitals will improve the privacy and dignity of mental health patients in south-west London.

The EMP will transform the way mental health services are delivered for patients, alongside reducing the overall cost of running the hospital estate to redirect funds back into frontline services. At the Springfield site, a new community will be developed around the hospital, opening up the estate to the public and helping reduce the stigma associated with mental health.

The programme will deliver two hospital campuses at Springfield and Tolworth, 839 residential units in Tooting – including 20 per cent affordable homes – new 32 acre park for the Tooting community, £5 million investment in local transport and infrastructure and extensive community healthcare, delivering care closer to home.

The planning and design of mental healthcare buildings has been informed by nearly 400 meetings, seminars and workshops with patients, their carers, nurses, doctors and other clinical experts. Some of the agreed guiding principles for the new hospitals include daylight and fresh air; access to gardens; improved sightlines and co-production.

In addition, the bedrooms in each ward have been designed to provide high levels of natural light and views, whilst ensuring privacy and comfort. The window in each room features a bay seating area which projects outwards at a 45-degree angle, offering external views but ensuring privacy for both service users and nearby buildings or public areas.

The internal layout of the buildings seeks to increase efficiency and improve the experience for patients, staff and carers by reducing the number of passages

and walkways. This helps with wayfinding whilst also encouraging safety and security on site.

This clinically-led architecture will ensure patients in south-west London benefit from facilities whilst supporting staff to deliver high quality mental health care in a secure and supportive environment. In a large and growing city such as London, being able to deliver innovative healthcare facilities will ensure the city can be at the forefront of pioneering treatment and research for mental healthcare for generations to come.

VIEWPOINT

“The EMP is unique as clinicians have been at the forefront of developing the design approach and the guiding principles will create the best possible facilities and ensure we can deliver the highest level of care to our patients. The new wards feature large communal spaces with dining and day areas which aim to promote a therapeutic, light and airy environment. Each ward has been reduced in size to increase staff to patient ratio and also features space for a range of support and activities. Many mental health facilities have a monotonous environment, with the same fixtures, materials and fittings throughout and the new hospitals will break this mould.”

Dr Mark Potter, Medical Director, South West London and St George's Mental Health NHS Trust

Client: South West London and St George's Mental Health NHS Trust
Architect: C.F. Møller
Planning Consultant: Montagu Evans
Commercial Consultant: PWC and Savills
Legal Consultant: Mills and Reeve





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©David Kohn Architects



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NEW STUDIOS, WIMBLEDON COLLEGE OF ARTS

Merton Hall Road, Wimbledon, London SW19

Completion: January 2015

A deceptively simple structure in a Conservation Area, designed as versatile, adaptable creative spaces and a BREEAM Outstanding exemplar for the University of the Arts, these studios provide new spaces for students of these college. Indicative of the craftsmanship within, the two-storey studios are a simple but distinctive zinc-clad enclosure at the campus' southern end, with a canopy connecting the new studios with the existing, providing semi-outdoor workspace and storage.

Client: University of the Arts London **Architect:** Penoyre & Prasad **Structural Engineer:** Webb Yates **Environmental and M&E Engineer:** Clearsprings Energy Solutions **Contractor:** R Durnell & Sons **Quantity Surveyor:** Chinmans **BREEAM Consultant:** CarbonPlan

SAYES COURT

Sayes Court Street, Deptford, London SE8

Completion: Summer 2020

Embedded in the forthcoming Convoys Wharf development, the new garden and landscape research and education centre at Sayes Court will be a place where everyone can explore, educate and advocate the transformative relationship between people, the living world and the city. Since 1652 when John Evelyn established his garden alongside the world's leading Naval Dockyard, Sayes Court has provided an alternative argument.

Client: Sayes Court Garden C.I.C.

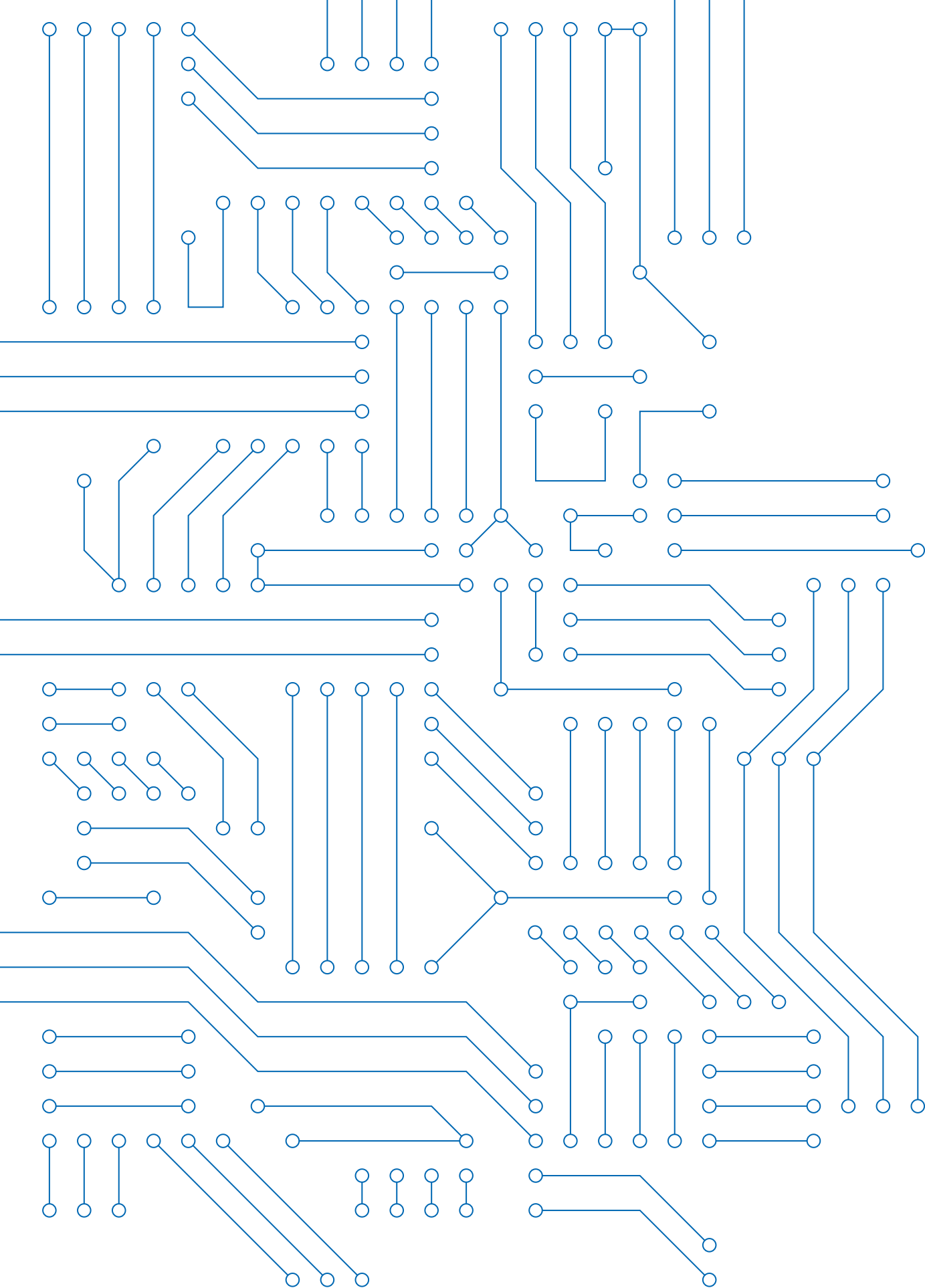
EUROCENTRES ELTHAM

Court Road, Eltham, London SE9

Completion: March 2013

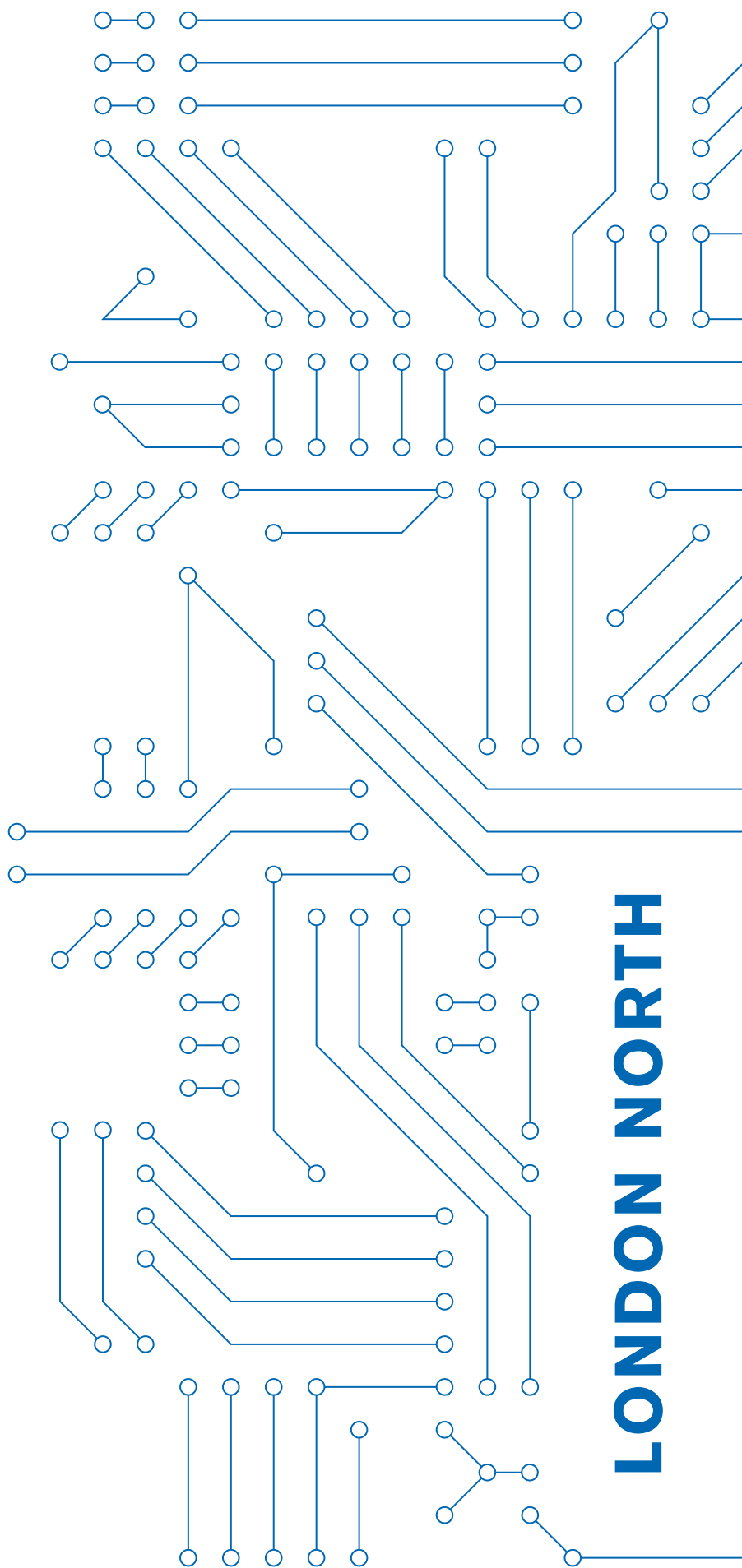
Set in the beautiful Eltham Palace Gardens, this conversion of former offices to school of languages brings the building up to contemporary standards without changing its envelope. A new relationship between the interior and its surroundings is established by inserting a glass partition separating the classrooms from circulation space, bringing natural light as far as possible into the building. A bespoke typographic glass was developed with quotes from classic literature submitted by teachers, creating a sense of participation and ownership of the space.

Client: Eurocentres **Architect:** Guarnieri Architects **Project Manager and Quantity Surveyor:** Equitas Partnership **Structural Engineer:** Hemsley Consulting **MEP Engineer:** TEP





Noah's Ark Children's Centre



LONDON NORTH



NOAH'S ARK CHILDREN'S HOSPICE

Byng Road, Barnet, London EN5

Completion: March 2019

Creating a new on-site care facility for children with life-limiting or life-threatening conditions, this children's hospice is designed to create an inspiring space for palliative care, relaxation and adventure – allowing young people to connect with other families facing similar challenges, and be given time and space to be children, rather than just patients. A central vaulted hall is flanked by two protective wings for therapy and play, with bedrooms and family rooms, all with garden views.

Client: Noah's Ark Hospice **Architect:** Squire and Partners **Landscape Architect:** Gensler
Contractor: Build 8 **Project Manager and Planning Consultant:** JLL **Services:** KUT
Structure: Ramboll **Cost Management:** DBK



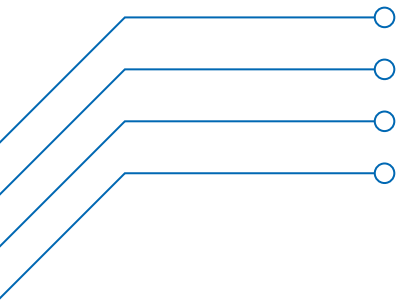
CPOTENTIAL – LONDON CENTRE FOR CHILDREN WITH CEREBRAL PALSY

Coppetts Road, Muswell Hill, London N10

Completion: September 2020 (subject to funding)

Incorporating inclusive design principles, this centre for children with cerebral palsy is designed to stimulate the senses through a series of environments that create immersive learning. When completed, it will include hydrotherapy and physiotherapy facilities, a community hall and teaching space. An external 'treetop' walkway wraps around the building, offering views out to the surrounding woodland. This walkway is enclosed by a timber screen which itself becomes a giant xylophone for children to play with.

Client: CPotential **Architect:** pH+ **Contractor:** City Sq. Solutions **Landscape Design:** BJD Landscape Architects **QS:** Morgan Carr **Structural Engineer:** Price & Myers **M&E:** Medland Metropolis



RITTERMAN BUILDING

The Burroughs, Hendon, London NW4

Completion: January 2017

Part of Middlesex University's strategy to consolidate 17 London-wide sites onto one campus at Hendon, this building offers new innovative teaching space for the two faculties of Science & Technology and Arts & Creative Industries. Providing world-class facilities for a diverse student population representative of London's rich cultures, this project has been built to high sustainability standards, with a 'Living Wall' that helps to reduce air pollution.

Client: Middlesex University **Architect:** bpr architects **Contractor:** Interserve **Structural Engineer:** Curtins **Quantity Surveyor:** Currie & Brown **M&E:** Mott Macdonald / Anderson Green **Planning Consultant:** Tibbalds Planning and Urban Design



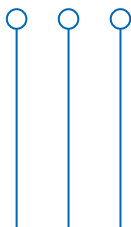
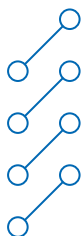
PEARS BUILDING: INSTITUTE OF IMMUNITY AND TRANSPLANTATION, ROYAL FREE HOSPITAL

Pond Street, Hampstead, London NW3

Completion: June 2020

This BREEAM Excellent-rated medical research building for UCL and the Royal Free Charity at the Royal Free Hospital will create a centre of research excellence, incorporating world-class laboratory research and write-up space for the Institute of Immunity and Transplantation, a patient hotel, and offices. The cost-effective and adaptable facility will improve care provision for patients, public outreach and engagement, with a light-filled interior to foster enhanced interaction amongst researchers, with research facilities and supporting space making the heart of the Institute a vibrant international hub for clinical research.

Client: Royal Free Charity, University College London and the Royal Free London NHS Foundation Trust **Architect:** Hopkins Architects **Structural and MEP Engineer, Landscape and Acoustics:** BDP **Lab Consultant:** Abell Nepp Architects **Fire:** RPS **Quantity Surveyor:** AECOM **Planning:** Savills





ALEXANDRA CENTRE

Ainsworth Way, Hampstead, London NW8

Completion: February 2017

The Alexandra Centre was developed as one of the first hubs in the UK for learning, multi-agency health, therapy provision and short break accommodation. The Centre is focused on supporting learners aged 16-25 years with severe and complex needs and autism, preparing those young people for a more independent life. This unique approach had no specific precedent at the outset, and so developing a robust brief alongside the three clients was a critical part of this work.

The brief called for a project that ensures young people within Camden with special education needs and disabilities have access to a local, dynamic and integrated model of further education and care, to enable each young person to flourish and maximise their potential. Based in the Grade II listed former Jack Taylor School on the Alexandra Estate, the refurbished building and new accommodation provides Camden with a facility for up to 50 learners.

The existing building was in a poor state of repair and had suffered from several poorly conceived additions. The project sought to adapt the existing building for modern flexible teaching methods, with a greater emphasis on technology.

Through extensive consultation with stakeholders, building users, health professionals, planning and conservation officers, the original architect Neave Brown, the 20th Century Society and Historic England, the proposal was able to meet the high standards set by the original modernist design whilst also fulfilling the ambitious brief.

A single storey, prefabricated timber 'Passivhaus' has been introduced to the site to provide the living accommodation. The frame was delivered to the site and constructed quickly, reducing impact to neighbours and learners. The building promotes 'fabric first' design and is heavily insulated to reduce energy demands. Windows and doors are all triple glazed to allow good levels of daylight but control solar gain. The building's roof is designed to attenuate rainwater, managing its flow rates into the original drainage system. Photovoltaic cells are installed on all roofs to contribute to the energy supplied by the district plant room.

The college have engaged with their neighbours and local community by offering vocational training for their learners in the form of a café within the main entrance foyer of the college. Sandwiches, cakes, coffees and teas are prepared and sold by the learners to members of the public. The building design responds by being open with large areas of glazing for visibility

and open spaces that can be separated when required, yet providing exceptional levels of security to ensure the safety of the buildings users and guests.

VIEWPOINT

"Haverstock showed great determination and dedication in helping us to deliver a complex project that was one of the more challenging schemes we have undertaken in some time. Considerable care and understanding was shown in consulting with the college and the wider community, and in transforming the existing listed building into a facility that meets the needs of our young people in the 21st century. Their passion and commitment was remarkable given the many challenges faced in restoring and adapting the building and providing the new Passivhaus short breaks units on the site."

Fiona Dixon, Senior Projects Manager, LB Camden

Client and Project Manager: LB

Camden **Architect:** Haverstock

Structural & Civil Engineer:

Ramboll **Mechanical & Electrical**

Engineer: WSP **Quantity**

Surveyor: Baqus **Conservation**

Architect: Robert Loader

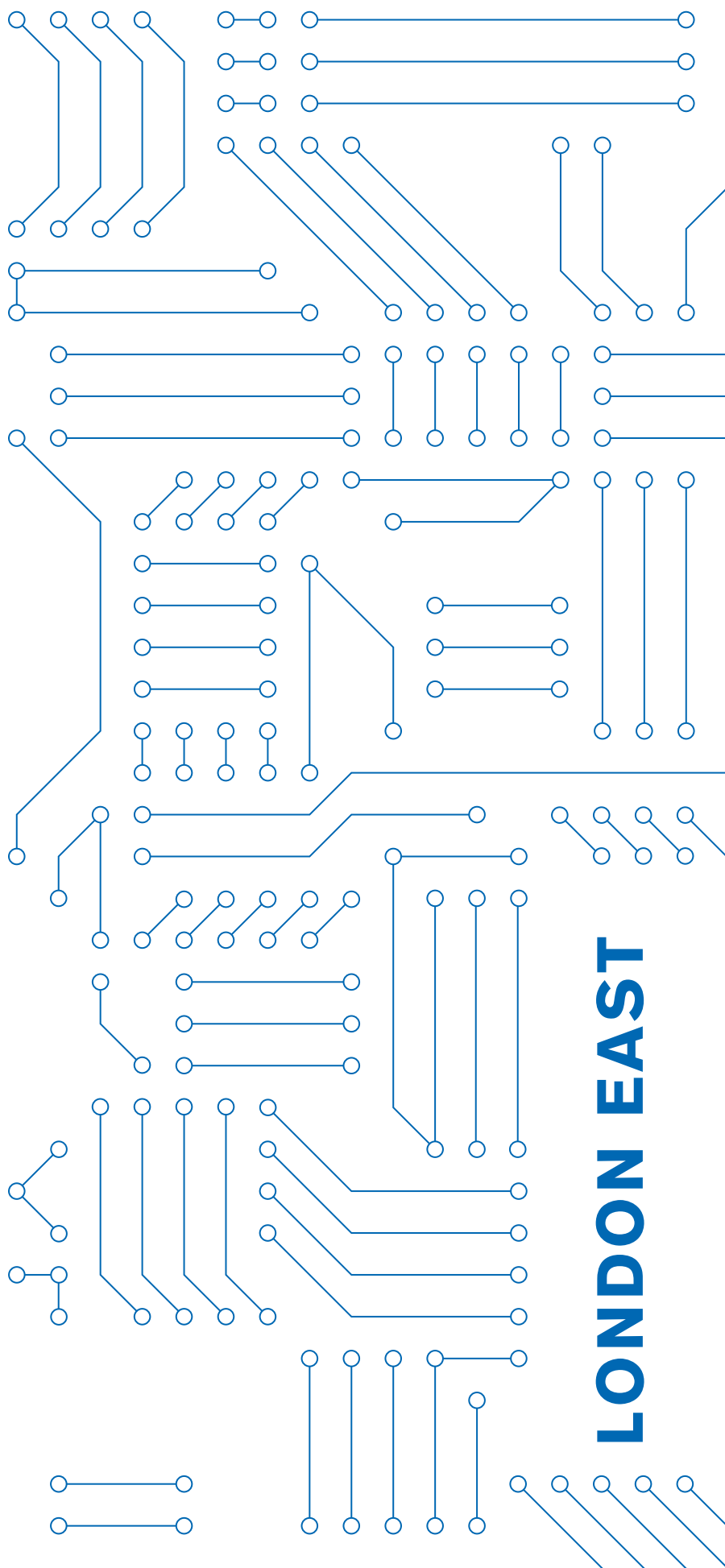
CDM Coordinator: Goddard

Consulting **Main Contractor:**

Rooff **Acoustic Consultant:** WSP

Landscape Architect: Plincke





LONDON EAST



SIR LUDWIG GUTTMANN HEALTH & WELLBEING CENTRE

East Village, Stratford, London E20

Completion: January 2014

Visited by 16,000 Olympians and Paralympians during five weeks of 2012, the Sir Ludwig Guttman Health & Wellbeing Centre was re-opened a year later by the NHS to serve the local community. This landmark civic building provides state-of-the-art accommodation for NHS primary care needs along with additional community spaces for the London Borough of Newham. It represents a true and rapid test of the oft-cited principles of flexibility and adaptability in healthcare design.

Client: Olympic Delivery Authority and NHS Newham CCG **Architect:** Penoyre & Prasad
Structural & Civil Engineer: WSP **Services Engineer:** Wallace Whittle **Contractor:** Willmott Dixon **Quantity Surveyor:** Gardiner & Theobald
Landscape Architect: Applied Landscape Design **Project Manager:** Lendlease



WHITECHAPEL LIFE SCIENCES MASTERPLAN

Whitechapel, London E1

Completion: December 2023

The result of mutual commitments from the London Borough of Tower Hamlets, Barts Health NHS Trust and its partner organisations, this project aims to have a positive local, regional and national impact whilst meeting the objectives of both the Whitechapel Vision Masterplan SPD and the City Fringe Opportunity Area Planning Framework. The sites around the Royal London Hospital have been identified as having the capacity to support the expansion of the health, bio-tech and Life Sciences research activities to create the new Med-City Campus.

Client: Barts Health NHS Trust **Architect:** Sheppard Robson **Planning and Heritage Consultant:** Montagu Evans **Property Advisor:** JLL **Infrastructure Engineer:** WSP



©Jack Hobhouse



©Flash forward



©Ben Blossom

GRADUATE CENTRE, QUEEN MARY, UNIVERSITY OF LONDON

Bancroft Road, Whitechapel, London E1
Completion: October 2016

Over ten years, WilkinsonEyre has designed four buildings at the Queen Mary University Mile End Campus, each one stitched into the urban fabric to prioritise outdoor amenity space between buildings. The new Graduate Centre has been designed to create a light, open and inviting atmosphere with a strong identity through the juxtaposition of cantilevering brickwork volumes. It provides a home for the School of Economics and Finance, the counselling centre and public adult education services, and contributes to significant campus improvements.

Client: Queen Mary, University of London
Architect: WilkinsonEyre **Structural and Services Engineer:** Buro Happold **Landscape Architect:** COE Design **Executive Architect:** ECE Architects

ROYAL COLLEGE OF PATHOLOGISTS HEADQUARTERS

Whitechapel, London E1
Completion: September 2018

Relocating the Royal College of Pathologists from rented accommodation, this new long-term flexible home will enable the College to continue growing international membership, advance its valuable research and provide public education services. The internal spaces of the seven-storey building are unified by exposed concrete coffers with integrated lighting and services which give a distinctive visual atmosphere to the column-free floors and form a key part of the building's passive cooling strategy.

Client: The Royal College of Pathologists
Architect: Bennetts Associates **Structural Engineer:** Waterman Group **Services Engineer:** Troup, Bywaters & Anders **Cost Consultant:** Equals Consulting **Project Manager:** CBRE **Acoustic Consultant:** Sandy Brown Associates **Lighting Consultant (concept):** Pritchard Themis

UCL SCHOOL OF MANAGEMENT

Canary Wharf, London E14
Completion: April 2016

This SKA Gold fit out is a result of relocating UCL's School of Management from Bloomsbury to Canary Wharf – creating a complete university satellite, covering academic, administrative and social spaces on the 38th floor of One Canada Square. The space is designed to encourage the cross-fertilisation of ideas by blurring the areas between formal and informal research, and teaching 'anything anywhere'. To achieve this, broken geometries create informal spaces and shared breakout areas, whilst open thresholds foster a culture of openness.

Client: University College London **Architect:** Levitt Bernstein **Project Manager:** MACE **Brand Consultant:** Studio Blackburn **Quantity Surveyor:** AECOM **M&E Engineer:** Buro Happold **Contractor:** Canary Wharf Contractors

NEURON POD

Whitechapel, London E1

Completion: Summer 2018

The 'Neuron Pod' is an extension to Will Alsop's award-winning Blizard Institute and informal science learning centre, 'Centre of the Cell', in the Whitechapel medical and dental campus of Queen Mary University of London. The purpose of both Centre of the Cell and the new Neuron Pod is to provide an exemplary programme of public engagement with science to children, young people and adults.

Since opening in 2009, Centre of the Cell has had over 155,000 participants in its innovative activities based on cell biology and biomedical science. The presence of a science learning centre within a laboratory allows wide-ranging public engagement with scientific research.

Neuron Pod was borne of the public's enthusiasm for Centre of the Cell's scientific education offer. Centre of the Cell has attracted large numbers of visitors, both to the existing interactive Pod, to workshops and science shows on site and to the website. It is arguably the world's first major informal science learning centre to be situated within a research laboratory.

The addition of Neuron Pod has potential to double visitor numbers and increase visitors' time on site, providing a dedicated space for Centre of the Cell's science shows, workshops, youth activities and opportunities for adults.

The Pod will be a three-legged, Corten steel monocoque structure that has been designed to 'mimic' a neuron using fibre optic 'hairs' or dendrites fitted with LEDs that are illuminated at night. A neuron is a nerve cell that processes and transmits information by electrical and chemical signalling. Typically, it has many dendrites, which appear as branches or hairs growing out of the main cell.

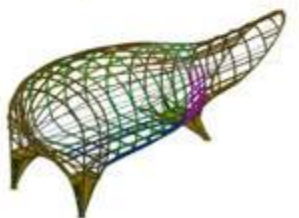
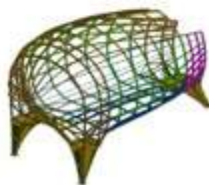
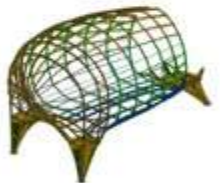
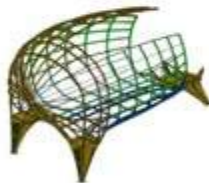
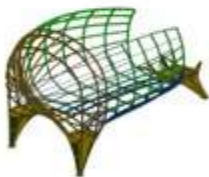
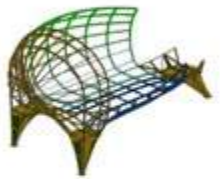
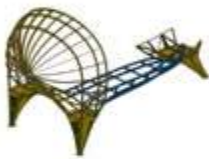
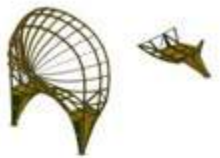
The three 'legs' raise it above ground level and this preserves pedestrian routes through the Mews and views across it from the ground floor of the Blizard Building. The pod is positioned such that its 'nose' is just visible from the surrounding routes, hinting at activity inside the building, and enhancing street presence for the Centre of the Cell.

VIEWPOINT

"The existing Queen Mary University of London Blizard Building incorporates architectural 'cells' – pod-like rooms and structures – the forms of which are based on parts of the body; for example Centre of the Cell's exterior is likened to a 16-cell embryo. This reflects some of the work done in the laboratories below. When asked to extend the education outreach space (to complement the use of Centre of the Cell) into the courtyard, it seemed sensible to base the new design on a neuron, continuing the theme of form reflecting the scientific work going on in the laboratories."

Prof. Will Alsop OBE RA, Director, aLL Design

Client: Centre of the Cell and Queen Mary, University of London **Architect:** aLL Design **Structural Engineer:** AKT II **Services Engineer:** Watermans **Quantity Surveyor:** Turner & Townsend **Fire Engineer:** The Fire Surgery **Lighting Designer:** Sutton Vane Associates **Main Contractor:** Total Construction **Sub-Contractor:** Little Hampton Welding





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HERE EAST

Queen Elizabeth Olympic Park, London E20

Completion: July 2016

Formerly the Press and Broadcast Centres in the Queen Elizabeth Olympic Park, Here East continues the legacy of the 2012 Olympic Games, providing a new innovation campus that builds on the flourishing East London tech scene and rich mix of creative industries that have thrived for years in nearby Hackney Wick.

The approach to workplace at Here East has been to provide diversity in terms of its character and scale. This has allowed for an eco-system of small and large businesses to develop, encouraging collaboration and engagement.

A key ingredient in developing any cluster is the inclusion of academia. Loughborough University's first ever London campus (LUL), will focus on seven postgraduate areas: digital technology, innovation and entrepreneurship, design innovation, media and creative industries, diplomacy and international governance, international business and sport business.

In conjunction with the London Legacy Development Corporation (LLDC), LUL has established a fund to provide up to 100 per cent scholarships for students having taken GCSEs or A-levels in one of four growth boroughs. To date, 28 young people from the local community have been able to study for a master's level degree for free.

UCL's new cross-disciplinary research and teaching centre is exploring everything from architecture and transport to manufacturing and robotics. Shared between the Bartlett School of Architecture and Civil, Environmental and Geomatic Engineering departments, their innovative approach brings creative design and advanced technological research under the same roof.

Both on-site universities work with third party providers to run education streams into local schools and host future opportunity programmes on campus. Here East hosts numerous education events from code clubs, science summer schools and introduction events for young people.

Plexal is the latest addition to the campus. This 68,000 sq ft start-up hub delivers a beautiful, flexible and functional office with prototyping space for start-ups and scale-ups using urban design principles and insights from the world's best incubator spaces to provide an inspirational space dedicated to the entrepreneurial process.

VIEWPOINT

"Our ambition was to create a new technology campus where we could gather large and small companies in an environment that would encourage innovation. Key to establishing a strong cluster is the co-location of academic teaching and research and the inclusion of two universities anchored this to the scheme. Careful curation of the innovation centre, Plexal, and tenants is essential to ensure the true benefits of clustering are achieved; not in a single sector but across many cross-cutting themes. Six years on from the original vision, we have numerous examples of collaborative innovation between many organisations now at Here East."

Gavin Poole, CEO, Here East

Client: Innovation City (London)

Architect and Interior Designer:

Hawkins\Brown **Developer:**

Delancey **Contractor:** Laing

O'Rourke **Structural Engineer:**

Buro Happold **M&E Engineer:**

Cundall **Quantity Surveyor and**

Cost Consultant: Gardiner &

Theobald **Project Management:**

Colliers International **Property**

Company: DV4 **Agent:** Knight Frank



PLEXAL INNOVATION CENTRE AT HERE EAST

East Bay Lane, Hackney Wick, London E15

Completion: June 2017

Located in the heart of the Here East campus, Plexal is one of the largest innovation centres in Europe and facilitates technological innovation, business ideation, product development and entrepreneurship training. The space adopts principles of urban planning, with a main 'high street' which links offices and civic spaces. It is designed with flexibility in mind, with a modular partition system and highly customisable workspaces to cater for businesses at varying scales.

Client: Plexal **Architect and Interior Designer:** Grimshaw Architects **Developer:** Delancey **Project Manager:** Colliers International **Quantity Surveyor:** Gardiner & Theobald **Mechanical/Electrical Engineer:** Cundall **Structural Engineer:** Buro Happold **Contractor:** Paragon Interiors Group

MILDMAY

Shoreditch, London E2

Completion: February 2017

Mildmay combines a specialist hospital, residential units, a church, and commercial space in the heart of Shoreditch. Anchored around the listed Tab Centre community building, the masterplan re-establishes the tight urban grain and restores the permeability of historic links across the site through new pedestrian-oriented public realm and outdoor amenity space. The new Mildmay Mission Hospital provided much-needed upgraded facilities, enabling the Charity to continue to play an important community role in its provision of specialised care.

Client: Genesis Housing Group **Architect:** Feilden Clegg Bradley Studios and Matthew Lloyd Architects **Services and Structural Engineer:** MLM and AECOM **Stakeholders:** Mildmay Mission Hospital Shoreditch, Tabernacle Baptist Church **Project Manager & Cost Consultant:** Philip Pank Partnership and Capita **Landscape Architect:** Ireland Albrecht **Quantity Surveyor:** Philip Pank Partnership **EIA and Sustainability Consultant:** URS Corporation and Richard Coleman CityDesign **Planning:** DP9





UCL EAST MARSHGATE

**Queen Elizabeth Olympic Park,
London E20**

Completion: 2022

Marshgate Phase 1, together with Pool Street West, will form the first phase of development within the UCL East Masterplan in the Queen Elizabeth Olympic Park. The project aims to create a vibrant new university quarter, which is engaged with the culture of its east London context and the landscape setting of the Queen Elizabeth Olympic Park. The 33,500 sqm academic research and teaching facility includes a range of workshop, laboratory and exhibition spaces.

Client: University College London **Architect:** Stanton Williams **Structural Engineer:** AKT II **MEP Engineer:** Arup **Landscape Architect:** VOGT **Public Consultation:** Soundings **Design Manager:** Plan A



EDUDROME: NEW CREATIVE UNIVERSITY BUILDING

Greenwich Peninsula, London SE10

Completion: 2020

Creating a new anchor building within an open campus, the scheme creates zoned areas that can spatially flex in tune with users needs, creating an open interchange between learners and researchers. The lower floors are shared by learners and the community with 24-hour access, invited in by access to the cafés and restaurants. The front of the building is animated by a super sized screen, which at night reveals aspects of the day's activities within.

Client: Ravensbourne **Architect:** Desitecture **Structural Engineer:** Atelier One

PEMBURY COMMUNITY CENTRE

Dalston Lane, London E8

Completion: September 2016

The Pembury Community Centre, part of the regeneration of Pembury Circus, provides a multi-purpose space for youth and community activities including adult education, IT training, parent support programmes, and homework clubs. In addition to providing a venue for community skills training, the flexible space is used as a hub for neighbourhood art, drama and dance groups, including a performance space with studio, as well as a purpose-built café run by a local social enterprise scheme. The centre aims to be accessible and inclusive by appealing to all ages – a move away from separate spaces for ‘toddler,’ ‘youth clubs’ or a ‘day centre’ for older people – providing a single, coherent, welcoming space that can comfortably accommodate a range of activities.

Brook Children’s Centre relocated their family services into the Pembury Community Centre, offering sessions four days a week. The Pembury Children’s Community is an ambitious 10-year programme led by Peabody and the London Borough of Hackney that aims to significantly improve the life chances of children and young people living on and around the Pembury estate in Hackney. According to Peabody’s recent Impact Report, 96 families with children under five have attended Early Years sessions run by the Children’s Centre and from April 2015 to March 2017 the Children’s Community has supported more than 200 local parents. Using the new community space and working closely with the council, employers, businesses, schools and others, the Children’s Community Centre so far includes adult education for parents, childcare, reading groups for young children and homework clubs, as well as apprenticeships and work experience for young people.

Clad in eye-catching terracotta tiles, the curved form of the community centre helps to re-activate routes through the site which were lost during the building of the estate in the 1970s. A key design requirement was a sustainable, flexible open space that could be easily adapted and screened for both quiet and learning activities. The shared environment invites local residents to come together both formally and informally.

VIEWPOINT

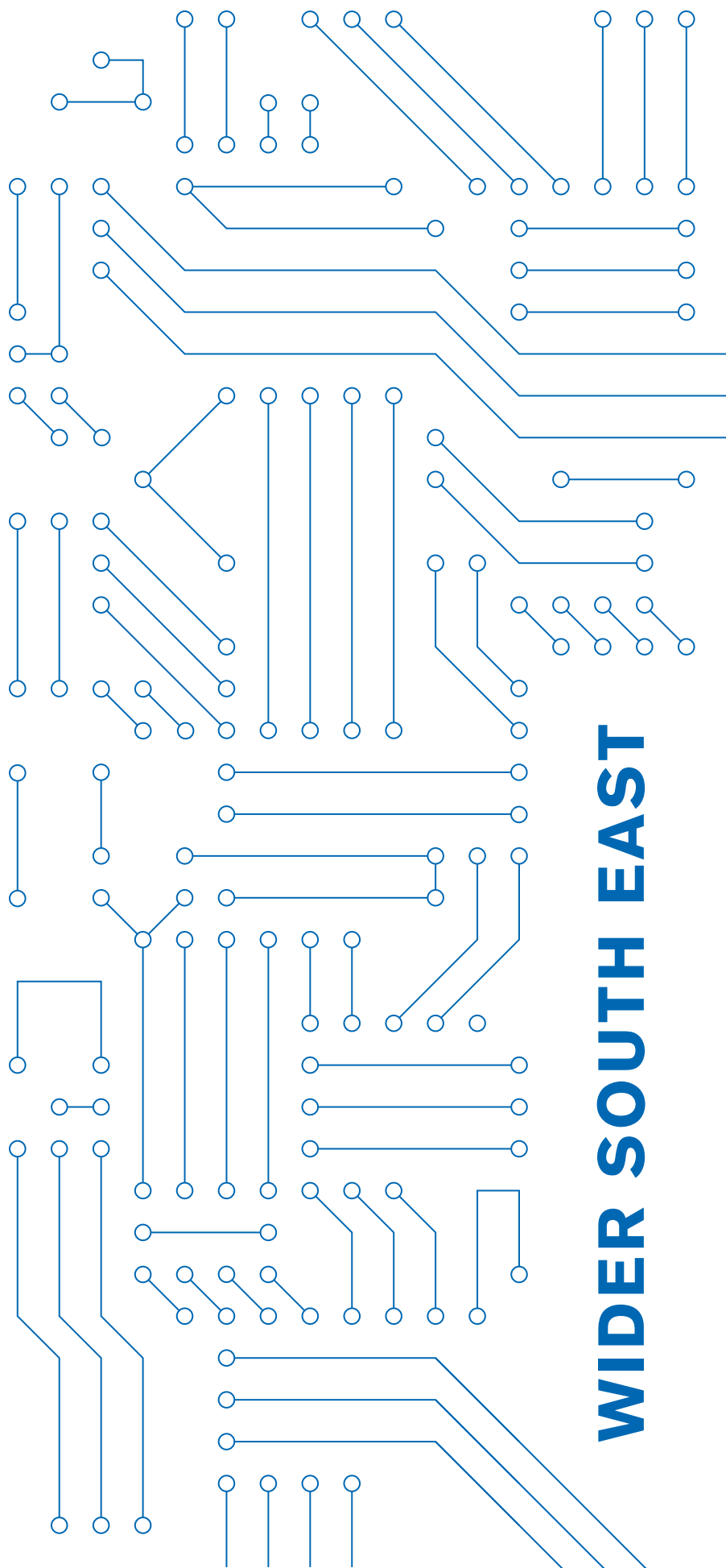
“I love the community centre, it’s a vibrant place where you can feel free, and you can gain something rather than being stuck at home... You get all the resources, information, support, encouragement, it’s all there, you just have to push yourself out of your shell to go and get it”

Local parent

Client: Peabody & Bellway
Homes **Main Contractor:**
Ardmore Group **Structural**
Engineer: MLM Consulting
Engineers **Environmental/M&E**
Engineer: Hodkinsons **Landscape**
Architect: Murdoch Wickham







WIDER SOUTH EAST



NEW QEII

**Howlands, Welwyn Garden City,
Hertfordshire AL7**

Completion: May 2015

The New QEII Hospital is a radical patient-centred environment – amongst the first of a new generation of NHS local hospitals – integrating primary, acute and social care. Three interlocking 'L' shapes create a central courtyard garden. The dissolution of inside and outside brings the therapeutic benefits of nature to the building, with circulation and waiting spaces adjacent to the garden. The hospital is designed around the wellbeing of patients, and artwork has been integrated to enrich the narrative and celebrate the health service.

Client: Assemble Community Partnership Limited

Architect: Penoyre & Prasad **Structural and**

Civil Engineer: AECOM and URS Corporation

Environmental and M&E Engineer: Building Services Design **Contractor:** Balfour Beatty

Landscape Architect: Macfarlane Associates

QS: Tropius Spicer **Art Consultant:** Art in Site



INSPIRING FUTURE RESEARCHERS: ROYAL VETERINARY COLLEGE

**Hawkshead Lane, Hatfield, Hertfordshire AL9
Royal College Street, London NW1**

Completion: May 2011

The Teaching and Research Centre showcases the everyday work of scientists and inspires the next generation of researchers. Circulation spaces have views into research laboratories and write up areas, and exhibits from the Museum of Veterinary College's collections are on display. On the college's London campus, the new Lightwell Café has specimens on display in bright cases. The space has opened up the campus physically and socially by connecting the surrounding facilities, improving way-finding and encouraging interaction between academic groups.

Client: Royal Veterinary College **Architect:**

ArchitecturePLB **Main Contractor:** Faircloth Ltd

Structural Engineer: Elliott Wood Partnership

M&E Consultant: Mott MacDonald Fulcrum

Project Manager: Gardiner & Theobald



VETERINARY VACCINOLOGY AND CELL THERAPY HUB

Hawkshead Lane, Hatfield, Hertfordshire AL9

Completion: June 2020

The Hub will provide state-of-the-art equipment, laboratories, animal facilities, business incubator and expert staff to support discovery science and innovation in veterinary vaccine development and stem cell therapies. The Hub – 20 minutes from King's Cross – is easily accessible for London-based scientists. It will adopt a One Health (comparative) approach, promoting collaboration between veterinary and medical researchers, with close ties to industry, to ensure that important concepts and principles in a veterinary species can be rapidly translated to similar infections in humans, and vice versa.

Client: The Royal Veterinary College

Architect: NORR



TEACHING, TRAUMA AND TERTIARY CARE CENTRE, BRIGHTON

Eastern Road, Brighton BN2

Completion: December 2019

The Teaching, Trauma and Tertiary Centre (3Ts) is being developed for the Brighton and Sussex University Hospital NHS Trust, as part of a major £486 million redevelopment of their main hospital campus. Two new state-of-the-art hospital buildings will bring elderly care, general medicine, HIV and clinical infection wards up to modern standards, establishing the hospital as the major trauma centre for the region. The building will include 361 beds – 65 per cent of which are single en-suite rooms – a helipad and additional parking spaces underground.

Client: Sussex University Hospitals NHS Trust and Laing O'Rourke **Architect, Environmental Engineer, Interior Designer, Landscape Architect and Planner:** BDP **Contractor:** Laing O'Rourke

UNIVERSITY OF ESSEX BUSINESS SCHOOL

Wivenhoe Park, Colchester CO4

Completion: March 2015

This centre has an emphasis on postgraduate learning and research, with flexible group learning and media facilities to promote extended community and international links. It provides students, staff and business partners with stimulating spaces and a collaborative environment, centred around a winter garden. The site, in parkland on a hillside overlooking an estuary, forms an important link between the existing 1960s campus and the new knowledge gateway research park. The business school building reflects the university's vision for growth, excellence and sustainability.

Client: University of Essex **Architect, Civil, Structural and Environmental Engineer, Landscape Architect, Interior Designer, Acoustics, Lighting and Sustainability:** BDP



CANTERBURY UNIVERSITY MASTERPLAN AND PRISON REFURBISHMENT

North Holmes Road, Canterbury CT1

Completion: 2019

Canterbury Christ Church University's purchase of the Grade II HMP Canterbury, presented an opportunity to extend their campus and consolidate their estate. Located within a World Heritage Site, the scheme links St Augustine's Abbey and the Grade I St Martin's Church and Canterbury Cathedral with a new university square and public route. BDP designed the Prison Quarter Development, creating a new campus heart with the construction of a £60 million teaching building and adaption of the HMP Canterbury to a collaborative hub.

Client: University of Canterbury **Architect,**
Masterplanner, Planner, Building Services,
Civil and Structural Engineer: BDP



THE ARTS BUILDING, CANTERBURY CHRIST CHURCH UNIVERSITY

North Holmes Road, Canterbury CT1

Completion: September 2018

On the edge of a World Heritage Site, within sight of Canterbury Cathedral, this new Arts Building brings together the Schools of Media, Art & Design and Music & Performing Arts – enhancing cross-disciplinary collaboration. Outstanding facilities for the University will contribute to the social and economic growth of the region through development of skills needed in the creative industries. The café and exhibition space will form a lively hub for student learning and performance – where the University and community come together.

Client: Canterbury Christ Church University
Architect: Nicholas Hare Architects **M&E:**
Max Fordham **Structural Engineer:** Integral
Engineering Design **Planning:** BDP **Project**
Management: Pellings **Fire Engineer:**
The Fire Surgery **Archaeology:** Canterbury
Archaeological Trust **Cost Consultant:**
Currie & Brown **Acoustics:** Sandy Brown



SIBSON BUILDING, UNIVERSITY OF KENT

Park Wood Road, Canterbury CT2

Completion: January 2017

Celebrating its natural setting, the Sibson Building is set within woodland on the edge of the University of Kent's campus. This flagship academic hub brings together the Schools of Business and Maths, comprising interactive social learning, innovative teaching, academic and open plan research spaces. The University had envisaged linked but separate buildings, but the design is an interconnected hub, with shared learning and teaching at its heart, fostering interaction and collaboration. The spatial arrangement creates degrees of separation for civic, public and private spaces to coexist.

Client: University of Kent **Architect:** Penoyre
& Prasad **Structural Engineer:** Price & Myers
Environmental and M&E Engineer: Max Fordham
Contractor: Willmott Dixon **Landscape Architect:**
Fabrik **Quantity Surveyor:** Betteridge & Milsom
Art Consultant: Art in Site **BREEAM Consultant:**
Southfacing **Project Manager:** BNP Paribas Real
Estate **Planning Consultant:** Porta Planning



©Tim Crocker

THE LEIGH UNIVERSITY TECHNICAL COLLEGE

Oakfield Lane, Dartford, Kent DA1

Completion: September 2014

The Leigh University Technical College specialises in engineering and computer science, with a vision to be a distinctive education provider for Science, Technology, Engineering, Mathematics (STEM) learning. Students and apprentices learn from a personalised curriculum emphasising practical application of academic and vocational learning. The team worked closely with the College and industry sponsors to develop the design – a unique fusion of educators and industry. The building is a cost-effective composition of two elements: the 'office' (teaching space, labs, IT workshops) and 'workshop' (a fully-equipped machine shop).

Client: Leigh Academies Trust **Architect:** Jestico + Whiles **Contractor and Structural Engineer:** BAM Construction **Structures and M&E Engineer:** Qoda **Planning Consultant:** DHA Planning



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INSPIRATION ACADEMY

Oakfield Lane, Dartford, Kent DA1

Completion: March 2018

University Technical Colleges (UTCs) have been struggling with recruitment at 14, when children are already settled in schools elsewhere. UTCs are different: a more business-like environment, industry-focused, with the direct involvement of local partners. The Inspiration Academy is a unique project aiming to solve this problem: a feeder school for children aged 11-14 for The Leigh UTC, which completed on an adjacent site in 2014. The first in the country, it allows the UTC to recruit like any other school at age 11.

Client: Leigh Academies Trust **Architect:** Jestico + Whiles **Contractor:** BAM Construction **Structural Engineer:** KSA **M&E Engineer:** MLM **Planning Consultant:** DHA Planning



UNIVERSITY CENTRE FARNBOROUGH

Boundary Road, Farnborough, Hampshire GU14

Completion: May 2016

A primary aim of this scheme was to provide for community and College use, announcing the presence of the College and tying it into the town by providing a new and inviting entrance to the College, with a library, internet café, meeting rooms, seminar rooms and informal study spaces. Designed to have a distinctive and recognisable form (known locally as the Titanic), the project uses innovative CLT and steel construction – appropriate for a College with a strong reputation in engineering.

Client: Farnborough College of Technology **Architect:** Nicholas Hare Architects **M&E:** Full Electrical Services Ltd **Structural Engineer:** Peter Brett Associates **Project Manager:** MEA Ltd **Landscape Architect:** Colour Urban Design Ltd **Planning Consultant:** Pegasus Group **Contractor:** Mace



THE JENNER BUILDING, THE PIRBRIGHT INSTITUTE

Ash Road, Pirbright, Woking GU24

Completion: November 2015

The Jenner Building brings 100 scientists into a new home for the BBSRC National Vaccinology Centre at the Pirbright Institute. It provides cutting edge facilities for research into viral diseases in animals and viruses that spread from animals to humans. Accommodation includes generic and specialist laboratories designed to biosecurity protocols, collaborative offices, meeting and social areas. Our challenge was to design for adaptability within the campus' evolving context and changing research programmes and setting new standards for sustainability, contextual materials and quality of experience.

Client: The Pirbright Institute **Architect:** NBBJ
Contractor: John Sisk & Sons **Structural Engineer:** Ramboll **MEP Engineer, BREEAM Consultant:** Hoare Lea **QS:** Faithful & Gould **Landscape Architect:** Robert Myers **Project Manager:** AECOM **Approved Building Inspector:** MLM Building Contractors **Architect:** Scott Tallon Walker



CARE & REHABILITATION CENTRE

Woodlands Road, Leatherhead KT22

Completion: August 2019

Building upon LOM's original masterplan, the scheme consolidates QEF's residential services into new facilities set within a restful woodland setting. The fully-accessible campus includes 48 en-suite bedrooms for a range of dependencies, with therapy, recreation and social spaces designed to promote the rehabilitation of people affected by neurological injury or illness. Facilities are housed within an environmentally sensitive building focused around a landscaped quad. Brick, clay tile and timber were selected to reflect local vernacular architecture and foster a contemplative non-institutional ambience.

Client: Queen Elizabeth's Foundation for Disabled People (QEF) **Architect:** LOM architecture & design **Project and Cost Manager:** Capital & Provincial **Structural Engineer:** Conisbee **Services Engineer:** Pinnacle **Landscape Architect:** Outer Space



THE QUADRAM INSTITUTE

Norwich Research Park, Norfolk NR4

Completion: April 2018

The Quadram Institute brings food and health science researchers, clinicians, patients and academics together for the first time. It promotes multi-disciplinary collaboration, dialogue and idea generation. Bringing together the Institute of Food Research, the University of East Anglia and the endoscopy unit from Norfolk and Norwich University Hospital, the Quadram Institute conducts bench-to-bedside research and clinical care related to diet, nutrition and food-related illnesses and disorders. The facility will house 300 researchers and clinicians, support staff and up to 40,000 endoscopy outpatients each year.

Client: The Quadram Institute Partners **Architect:** NBBJ **Contractor:** Wates **Landscape Architect:** Fira **Structural Engineer:** Ramboll **MEP Engineer and BREEAM Consultant:** Buro Happold **QS and Project Manager:** AECOM **Approved Building Inspector:** MLM



CENTRUM, NORWICH RESEARCH PARK

Norwich Research Park, Norfolk NR4

Completion: June 2014

This three storey building offers offices and laboratories for growing science and IT businesses and a business centre with meeting areas, seminar rooms, restaurant, café and catering facilities. Norwich Research Park is a centre of excellence in research for life and environmental sciences, employing 12,000 staff. BDP is responsible for the holistic masterplan covering the entire park, offering a further 160,000 sqm of accommodation. Centrum is key to the realisation of the Norwich Research Park vision and is designed as the anchor point for future development.

Client: Norwich Research Park **Architect, Masterplanner, Civil, Structural and Building Services Engineer, Landscape Architect, Lighting Design and Acoustics:** BDP



JOHN INNES CENTRE, NORWICH RESEARCH PARK

Colney Lane, Norwich NR4

Completion: July 2015

This visioning and feasibility study breaks down barriers between plant, microbial scientists and horticulturists and entomologists working in glasshouses, controlled environment rooms and insectary. The proposal draws scientists together into multidisciplinary houses creating a 'collaboratory' of wet and dry science activities across chemistry, biology, physics and ecology to better understand plant and microbial phenotypes and how they impact the evolution of plant genetics and development. A variety of spaces in the landscaped research park are linked by a central public outreach gallery.

Client: John Innes **Architect and Masterplanner:** BDP



THAMES VALLEY SCIENCE PARK GATEWAY

TVSP Shinfield Campus, Reading RG2

Completion: January 2018

The Gateway is the catalyst for the successful delivery of the wider Thames Valley Science Park (TVSP), a 74,000sqm new build masterplan. It has established an early identity and brand aspiration for the park. The laboratories and offices anticipate change through flexible and adaptive design to suit a generation of occupiers and technologies. The landmark entrance to TVSP is aimed at attracting ambitious, innovation led and technology based companies of all sizes which are developing and delivering cutting edge new products.

Client: The University of Reading **Architect:** Ryder Architecture **Science Park Advisor:** Cam-Sci **Contractor:** Graham Construction **Project Manager:** WSP **Cost Consultant:** Rider Levett Bucknall **Structural and Civil Engineer:** WSP **Services Engineer:** AECOM **Landscape Architect:** Oobe **Planning Consultant:** Barton Wilmore



BASINGSTOKE & NORTH HAMPSHIRE HOSPITAL, CANDOVER CLINIC AND RADIOTHERAPY UNIT

Aldermaston Road, Basingstoke RG24
Completion: December 2013

The brief called for a contemporary and innovative Private Patients Facility in a short timeframe. At a later stage, a Radiotherapy Unit was required by the Trust to provide interim cancer treatment. An off-site modular system was the solution to meet the fast programme; the design analysed the spatial, functional and qualitative requirements of the brief meshed with optimum module dimensions. The clinical environment, with high-tech diagnostic and treatment facilities, has been softened by introducing intimate courtyards.

Client: Hampshire Hospitals NHS Foundation Trust **Architect:** Paul Murphy Architects
Landscape Architect: John Medhurst & Mo Smith **Structural Engineer:** ExtraSpace Solutions UK LTD **Services Engineer:** S.I. Sealy & Associates **Civil Engineer:** Glanville



PURFLEET ON THAMES

Purfleet, Essex RM19
Phased Completion: 2019 – 2035

This project will transform Purfleet into the creative heart of the Thames Gateway, delivering world class educational opportunities to support 1,000,000 sqft of Film and TV production studios and accelerate delivery of health professionals to address the shortage in the South East. A new university campus will deliver education on health and the creative industries. A new integrated health centre will ensure that the benefits of this £1 billion regeneration extend to the locals who currently face significant health and wellbeing challenges.

Client: Purfleet Centre Regeneration Limited – joint venture with Swan Housing Association and Urban Catalyst Limited **Architect:** KSS, AHMM, dRMM and ALL **Landscape Architect:** Exterior Architecture **Engineer:** Waterman **Planner:** Savills **Cost Consultant:** Gleeds **Commercial:** Forty

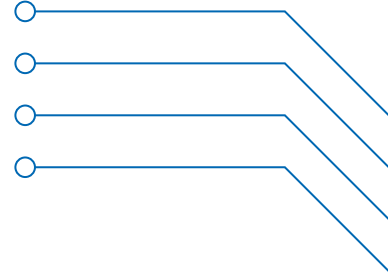


BOB AND TAMAR MANOUKIAN COSTUME CENTRE, THE ROYAL OPERA HOUSE

Purfleet, Essex RM19
Completion: May 2015

Located at High House Production Park, a hub for the creative industries, the Costume Centre creates new workshops with optimised daylighting and servicing for making and repairing costumes, and specialist storage for them. The Centre provides a dedicated workshop for South Essex College, where students train closely with ROH staff, gaining first-hand experience on live briefs for productions. The Centre has an innovative hybrid steel and timber construction, highly insulated, with a green roof, low energy use and renewable energy provision.

Client: Thurrock Council and The Royal Opera House **Architect:** Nicholas Hare Architects **Project Manager and Cost Consultant:** Gardiner & Theobald **M&E:** Arup **Structural Engineer:** Integral Engineering Design **Fire Engineer:** The Fire Surgery **Contractor:** Interserve



NEW SPORTS BUILDING, SOUTHAMPTON

East Park Terrace, Southampton SO14

Completion: Spring 2019

Designed as a beacon for sporting excellence, the Southampton Solent University sports building unites the university's academic and extra-curricular sport facilities on a key civic site on the East Park Terrace campus. The building brings sports teaching to the heart of the campus with facilities for elite and amateur sports sitting alongside other academic departments. It will enable excellence for the teaching of 23 sport science and fitness related degree programmes and specialist teaching spaces will be housed in a 'shop front' tower with a laser cut wrap façade.

Client: Southampton Solent University

Architect: ArchitecturePLB **Main**

Contractor: Morgan Sindall **Structural**

Engineer: Arup **M&E Consultant:** Arup

EASTLEIGH COLLEGE ADVANCED TECHNOLOGY BLOCK

Chesnut Avenue, Eastleigh SO50

Completion: April 2017

The new building reflects the College's commitment to providing high technology learning environments. Sitting adjacent to a landscaped courtyard, the scheme replaces previously outdated buildings on a satellite campus. The building provides maximum long-term flexibility and robustness, whilst providing the college with an 'impact' building on a tight budget. The ground floor accommodates large scale workshops and practical areas for subjects such as construction, and electronic engineering, whilst the upper floors are designed for open learning, IT and computer sciences.

Client: Eastleigh College **Architect:**

ArchitecturePLB **Main Contractor:** Amiri

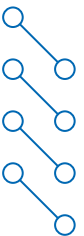
Construction **Structural Engineer and**

BREEAM Consultant: Scott White and

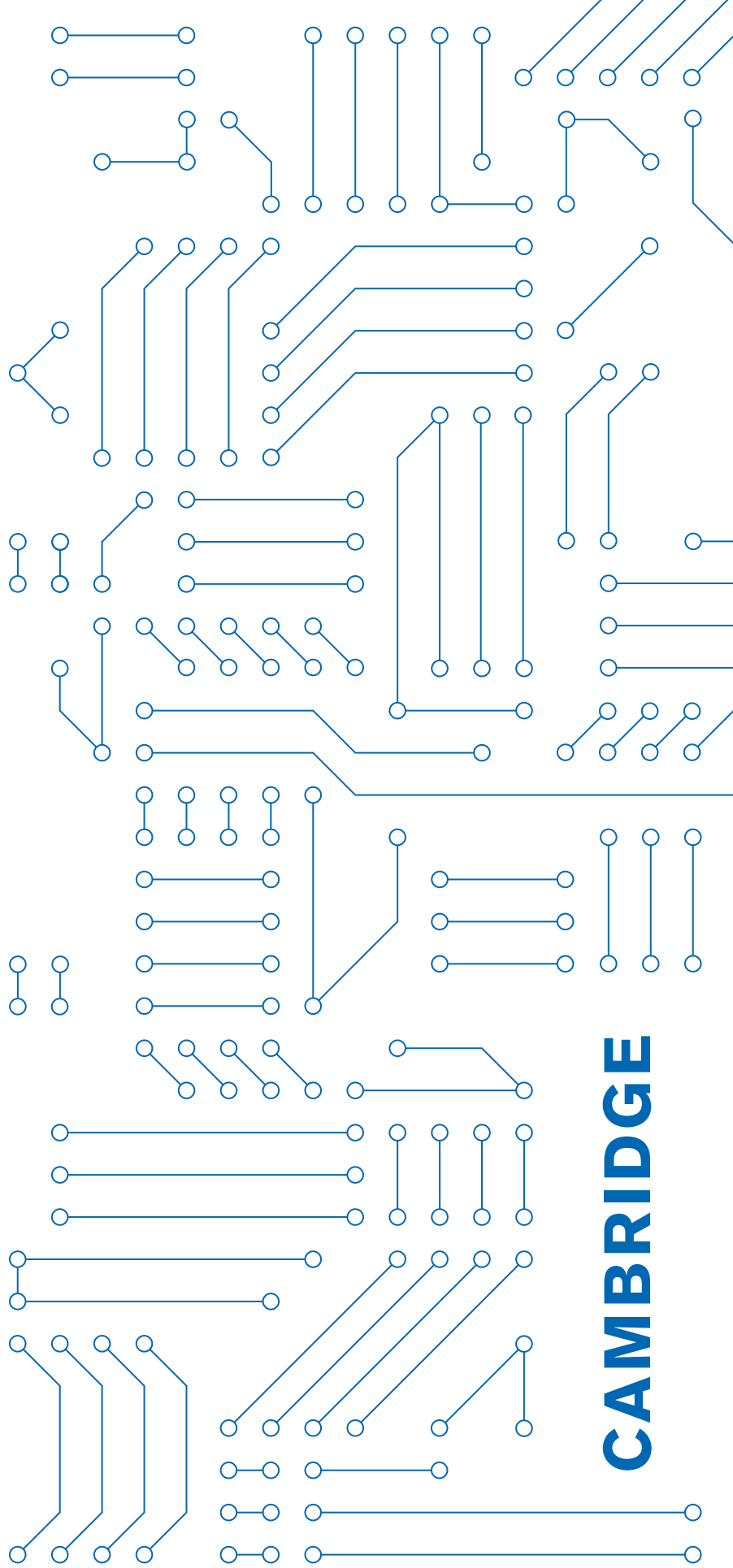
Hookins **M&E Consultant:** Ion and Accolade

building services **Brise Soleil Manufacturer:**

Levolux **Cost Consultant:** RLS









THE BRADFIELD CENTRE

Cambridge Science Park, Cambridge CB4

Completion: October 2017

The Bradfield Centre is a collaborative entrepreneurial community of technology start-ups and scale-ups – designed to appeal to entrepreneurs, researchers and students – at the heart of the Cambridge Science Park. Inspired by its lakeside setting, the recognisable arc-shaped form of the building houses scalable, immersive, state-of-the-art facilities and is expected to become the gateway and focal point for Cambridge's ever-expanding technology cluster. Members have access to spacious communal facilities, while non-members can use the café and public areas which are open 24/7.

Client: Trinity College Cambridge / Bidwells

Architect: Aukett Swanke **Structure:**

MLM **Landscape:** Bidwells **M&E:** Couch

Perry Wilkes **Interior Design:** Born

Design **Transport:** Bryan G Hall

PLOT 420

Cambridge Science Park, Cambridge CB4

Plot 420 Cambridge Science Park aims to create a flexible Smart Lab to provide growing SMEs with agile laboratories and R&D spaces. The building's form is functionally expressive, while responding to its context in scale and massing, with central core enabling flexible floorplates for different sized tenancies that benefit from maximum available daylight. A clear internal strategy defines bespoke laboratory use and office spaces, while a central agile space provides flexibility for operations to expand and contract over time.

Client: Trinity Hall **Architect:** Aukett

Swanke **Structure:** AECOM **Services:** KJ

Tait **Façade:** Aukett Swanke **Landscape**

Architect: Turkington Martin

ASTRAZENECA GLOBAL R&D CENTRE AND HEADQUARTERS

Francis Crick Avenue, Cambridge CB2

Completion: December 2018

This new office headquarters and laboratory complex for 2,000 employees will support AstraZeneca's drive for scientific leadership by investing in Cambridge, one of the world's pre-eminent biosciences hotspots. A central hub of labs will form the focal point for the centre, which will encourage collaborative working across the organisation and provide easy access for the wider scientific community through an open design and campus environment.

Client: AstraZeneca **Executive Architect, Civil and Structural Engineer, Environmental Engineer, Interior Design, Landscape Architect, Lighting Design, Acoustic Consultant, Graphic Design:** BDP
Concept Design: Herzog & De Meuron



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SAINSBURY LABORATORY

Bateman Street, Cambridge CB2

Completion: April 2015

This 11,000 sqm plant science research centre, set within the University of Cambridge's Botanic Garden, brings together world-leading scientists in a high quality working environment. The design reconciles complex scientific requirements with a need for architecture that responds to its landscape setting and provides a collegial, stimulating environment for innovative research and collaboration. The building comprises laboratories, support areas and meeting spaces, together with the University's Herbarium, new public café and seminar room.

Client: Sainsbury Laboratory **Architect:** Stanton Williams **Funder:** The Gatsby Charitable Foundation **Strategic Project Manager:** Stuart A. Johnson Consulting Ltd **CDM Coordinator, Project and Contract Administrator:** Reed **Project Officer:** University of Cambridge Estate Management **Representative User:** Cambridge University Botanic Garden, The Gatsby Charitable Foundation **Main Contractor:** Kier Regional **Civil and Structural Engineer:** AKT II **Building Services Engineer:** Arup **Cost Consultant:** Gardiner & Theobald **Landscape Architect:** Christopher Bradley-Hole Landscape and Schoenaich Landscape Architects **Approved Building Inspector:** Cambridge City Council **Artist:** Norman Ackroyd, Susanna Heron, William Pye **Arts Consultant:** Insite Arts **Furniture Consultant:** Luke Hughes and Company

THE JAMES DYSON BUILDING

Trumpington Street, Cambridge CB2

Completion: April 2016

This flexible, highly energy-efficient research facility is located on a prominent site within a conservation area and at a major gateway into Cambridge, providing a prominent new face to the department. The building is being used by researchers as a 'live laboratory' – active stress-sensing probes have been incorporated into the structure to measure building performance. Chimneys running through the building enable natural ventilation across deep floorplates and exposed concrete assists in maintaining thermal stability.

Client: University of Cambridge **Architect:** Nicholas Hare Architects **Cost Consultant, M&E and Structural Engineer:** AECOM **Project Manager:** Peter Brett Associates **Fire Engineer:** Fire Ingenuity **Acoustics:** Ramboll **Contractor:** Morgan Sindall

CAMBRIDGE BIOCENTRUM MASTERPLAN

Mill Lane, Cambridge CB2

Completion: June 2039

Focusing on the redevelopment of two sites in central Cambridge, Biocentrum brings world-class facilities to the University's School of Biological Sciences. The departmental structure will be reconfigured into a series of academic clusters, fostering interdisciplinary research, located in flexible and linked research space. The most valued and historic buildings will provide a home for a dedicated teaching hub. The buildings are set out around a new social 'heart' framing a green campus court.

Client: University of Cambridge **Architect:** Feilden Clegg Bradley Studios **Landscape Architect:** Grant Associates **Structural, MEP and Fire Engineer, Cost and Sustainability Consultant:** AECOM **Transport Consultant:** Peter Brett Associates **Heritage Consultant:** Beacon Planning



DAVID ATTENBOROUGH BUILDING

Pembroke Street, Cambridge CB2

Completion: March 2016

Leading international biodiversity conservation organisations, the University of Cambridge and the Cambridge Conservation Initiative (CCI), are collaborating to secure a sustainable future for all life on Earth. This vision has formed a cross disciplinary conservation campus which fosters creative interaction and allows partners to share skills and networks.

The transformation of the seemingly unpromising context of an iconic Brutalist structure had to deliver an inspirational and vibrant workplace for 350 conservationists and 150 academics, whilst also demonstrating the highest sustainability credentials and illustrating how biodiversity could be enhanced even in the middle of a major city.

A new full-height atrium unites the upper levels of the building, creating a collaborative hub at the heart of the building. Views across the atrium and the cluster of shared meeting places around it enhance opportunities for encounters and interaction between the partners. Within the atrium, a living green wall is irrigated by rainwater and shaded by photovoltaics set into the rooflight above.

A new extension also provides space to display the world-class collections of the Museum of Zoology to the wider community, which were previously hidden within the depths of the podium. The whale skeleton has been restored and re-hung at high level in the new entrance and a suite of new education spaces, linked to the refurbished galleries, enables staff to plan events and exhibitions specifically for the public.

The refurbishment strategy has enabled 82 per cent of the building's embodied carbon to be saved. Passive design principles were followed to make best use of the building's existing assets – including the concrete frame and extensive ribbon glazing. Pioneering a bespoke Sustainability Framework which reaches beyond BREEAM, initial feedback shows that the building is close to delivering its target of 40 per cent energy reduction.

A new green roof has created a living biodiversity laboratory, incorporating photovoltaic arrays, and also forms part of a SUDS 'rain garden' strategy that irrigates planting and creates different habitats. The towers provide peregrine falcon ledges and nesting places for swifts. Webcams provide live feedback to the CCI and the Museum on how the building is creating new habitats within the city.

VIEWPOINT

"Our aim was to establish a collaborative hub and centre of excellence to transform the understanding and conservation of the natural environment. At the same time, we wanted the building to exemplify and achieve high levels of sustainability. Through iterative consultation (via focus groups led by NHA) we have together created a building that fosters collaboration between academic disciplines, ten independent organisations and over 500 individual researchers and practitioners. It has become a dynamic, creative place that facilitates and drives innovation, new thinking, novel collaborations and significant impact; evidence shows that the level of collaborative activity has increased significantly post-occupation."

Dr Mike Rands, Executive Director, Cambridge Conservation Initiative

Client: University of Cambridge
Architect: Nicholas Hare Architects
Project Manager, Cost Consultant and Structural Engineer: AECOM
M&E, Fire Engineer and Sustainability Consultant: BuroHappold Engineering
Biodiversity & Infrastructure: The Green Infrastructure Consultancy and Robert Bray Associates
Contractor: Kier Construction

CIVIL ENGINEERING BUILDING, UNIVERSITY OF CAMBRIDGE

JJ Thomson Ave, Cambridge CB3

Completion: April 2019

When the Engineering Department moved from the city centre to the new campus in the west of Cambridge, it provided the perfect opportunity to apply the Energy Cost Metric (ECM) – a tool devised by the late Sir David MacKay, a world leading authority in sustainable energy. The ECM assists the construction industry in delivering truly low energy buildings within a cost-conscious framework. By combining lifecycle energy and costing assessments into a single equation, the ECM provides a new way to objectively evaluate the costs associated with an energy minimising initiative over a building's lifetime.

The result is a new Civil Engineering Building which is highly functional whilst still minimising the building's total lifetime energy demands as much as practicably possible. Through its application, the design utilises a quantified view of how cost effective the energy saving benefits are on a broad range of issues, spanning different scales within the building. For example, when evaluating the façade options, the design team wanted to know if total energy saved by specifying triple- instead of double-glazing would be worth the additional cost over the building's lifetime. Under the ECM, triple-glazing's energy minimising potential, when compared to double-glazing, was ultimately outweighed by a higher lifetime embodied energy and cost. This conclusion would not have been apparent from a simple evaluation of each options' embodied energy alone.

The ECM's application has provided a wider case study for the university's estates team and is being considered for inclusion as part of their project design standards. It has also been established, through wider industry engagement, that there is interest in the ECM within the construction sector as it strives to minimise environmental impact by reducing the built environment's energy demands.

This experience also demonstrates the ECM's versatility and scalability; it could just as easily be applied to anything from infrastructure planning through to boiler replacement within a refurbishment project – highly relevant to institutions looking for ways to support the sustainable growth and maintenance of their buildings portfolio.

VIEWPOINT

“David Mackay’s book, Sustainable Energy Without the Hot Air has inspired me and I had a sense that his engagement with this project was the start of something important, and so it transpired. My involvement through conception, development and implementation of the ECM has given a first-hand view of translating academic insight into practical implementation. I have observed the value of simplicity as all parties have grasped the aims and execution of the ECM, from architects during strategic design to contractors during delivery. The tool has proved invaluable at generating a quantified understanding and support of design decisions that impact energy use.”

Joel Gustafsson, Project Lead and
Partner, Max Fordham

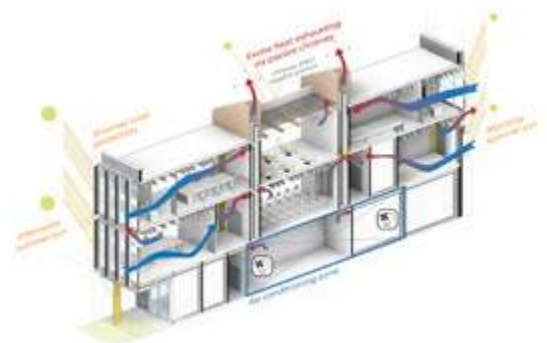
Client: University of Cambridge,
Department of Engineering **Architect**
and **Lead Consultant:** Grimshaw
Architects **Client Representative:**
Brian Williams **Engineering Energy**
Group: Sir David Mackay (Regius
Professor of Engineering), Prof.
David Cebon, Dr Jonathan Cullen,
Prof. Peter Guthrie, Dr Andrew
Gee **Services and Sustainability**
Engineer: Max Fordham **Civil and**
Structural Engineer: Smith &
Wallwork **Landscape Architect:**
Turkington Martin **Project and**
Cost Manager: AECOM



Environmental Design Principles

- A** Natural Ventilation_Operable windows & passive chimneys
- B** Adaptive Solar Shading_Thermochromic glass interlayer
- C** High Performance Envelope_U-value & air tightness exceed building regulations
- D** Roof Terrace_Courtyard integration to aid cross ventilation of offices for improved health & well being
- E** Solar Panels_On-site renewable connected to ground source heat pumps
- F** Extensive Green/blue Roof_Rainwater attenuation & enhanced site ecology
- G** All Electric HVAC_Ground source heat array for heating & cooling

- A** Building Cross-Section_Summer time natural ventilation strategy





©Daniel Romero



©David Barbour



STUDENT SERVICES CENTRE, UNIVERSITY OF CAMBRIDGE

Bene't Street, Cambridge CB2

Completion: October 2018

The new Student Services Centre for the University of Cambridge rehouses several student support functions from across the city into a single, consolidated location, while the replacement Examination Halls provide flexible seminar and multi-use space outside of the exams season. The project also implements the second phase of the New Museums Site masterplan to improve the public realm of this historically important site. The building's design is contemporary yet historically sensitive.

Client: University of Cambridge **Architect:** Bennetts Associates **Structural Engineer:** AECOM **Heritage Consultant:** Beacon Planning **Services Engineer:** BDP (Environmental Engineering) **Cost Consultant:** Edmond Shipway **Contractor:** Kier

SITE 6 GRANTA PARK

Granta Park, Abington, Cambridge CB2

Completion: July 2017

Set over three storeys, this new office building includes a dramatic top-lit central atrium space arranged at the heart of the floorplates. The building will allow the end user, a leading international biotechnology company, to operate in exemplar facilities with a flexible environment to meet current needs, planned growth and evolving working patterns – including future proofing for laboratory uses. The design's embodiment of quality, simplicity and elegance, allowed for rapid construction to meet the proposed occupation date, providing visual intrigue and a dramatic backdrop to the established landscaped setting.

Client: BioMed Reality **Architect:** Aukett Swanke **Structure and Transport:** Glanville **Façade:** Thornton Tomassetti **Landscape:** Turkington Matrin **Lighting and M&E:** KT Tait

CHEMICAL ENGINEERING AND BIOTECHNOLOGY BUILDING, UNIVERSITY OF CAMBRIDGE

Philippa Fawcett Drive, Cambridge CB3

Completion: October 2016

This new building brings together researchers from numerous locations, working across different fields, to promote collaboration and foster interdisciplinary working among researchers and students. Laboratories wrap around a researchers' hub which contains academic offices, teaching and social space and a library, together with central imaging support and pilot plant space to allow larger scale installations. The building celebrates the value of the 'in between' space, with projecting oriels creating niches where small groups can gather adjacent to the laboratory.

Client: University of Cambridge **Architect,** **Landscape Architect, Acoustics:** BDP



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PHYSICS OF MEDICINE & MAXWELL CENTRE

University of Cambridge CB3

Completion: June 2008 (Phase I)
& April 2016 (Phase II)

The Physics of Medicine building forms a new gateway and identity for the world-renowned Cavendish Laboratories. A range of environments from intensive research, quiet study and areas for social interaction are set around an atrium. A timber treehouse structure rises through the central space, serving as a convivial environment for the exchange of ideas. The Maxwell Centre, phase two of the project, promotes collaboration with industry, with an innovative layered laboratory design, ensuring services to individual laboratories can be changed without affecting others.

Client: University of Cambridge **Architect, Interior Design, Landscape Architect, Acoustics:** BDP

SHARED FACILITIES HUB

JJ Thomson Avenue, Cambridge CB3

Completion: March 2021

The University of Cambridge's vision for the redevelopment of its West Cambridge campus is to develop a world-class, well connected research and development environment. It will accommodate numerous research institutions with the student hub at its heart, transforming it into a lively research campus. The student hub building will include flexible spaces that provide an inspiring place for working, learning, dining and meeting, to support the neighbouring academic institutions and foster collaboration and a sense of community.

Client: University of Cambridge **Architect:** Jestico + Whiles **Structural Engineer:** Ramboll **M&E Engineer:** Hoare Lea **Landscape Architect:** Plincke **Catering Consultant:** Tricon **Access Consultant:** David Bonnett Associates

CAVENDISH LABORATORY

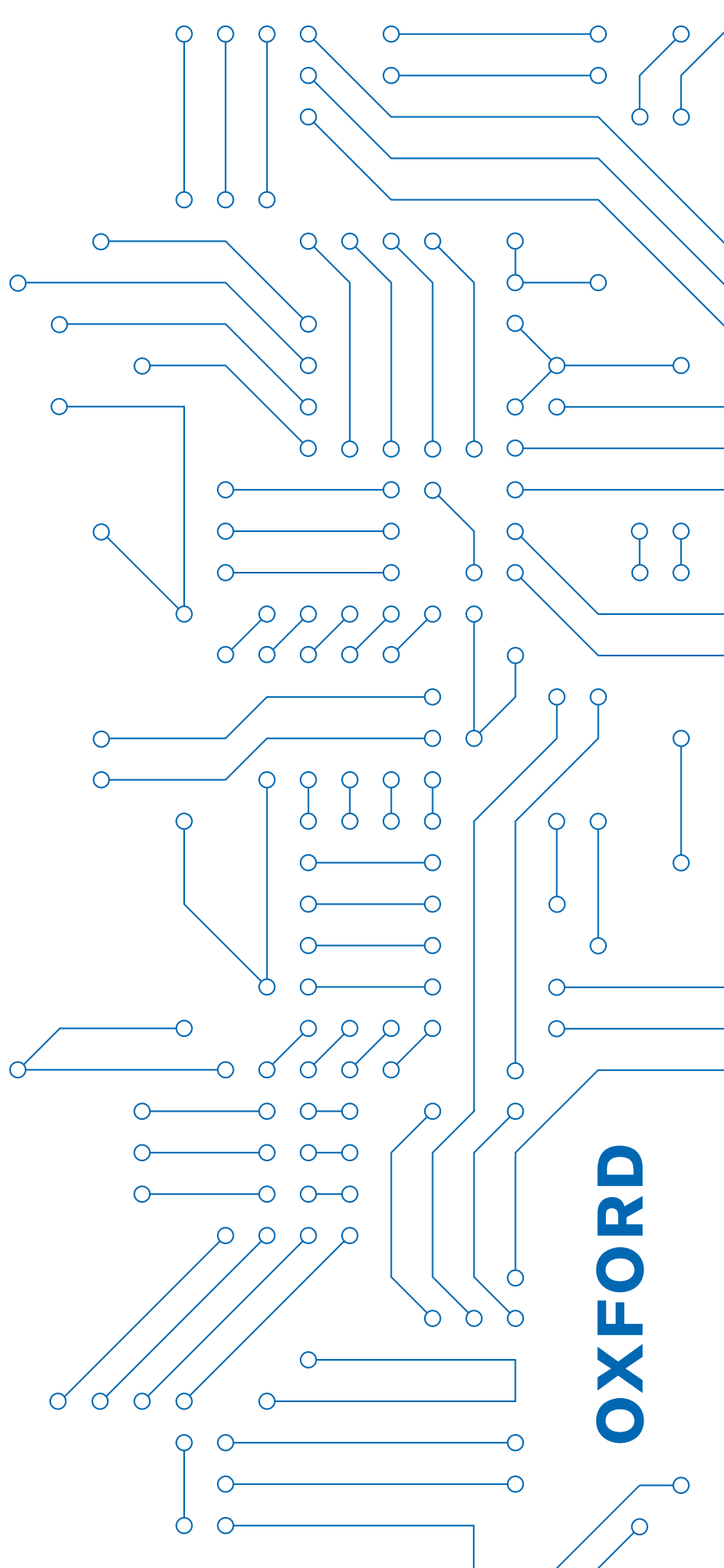
JJ Thomson Avenue, Cambridge CB3

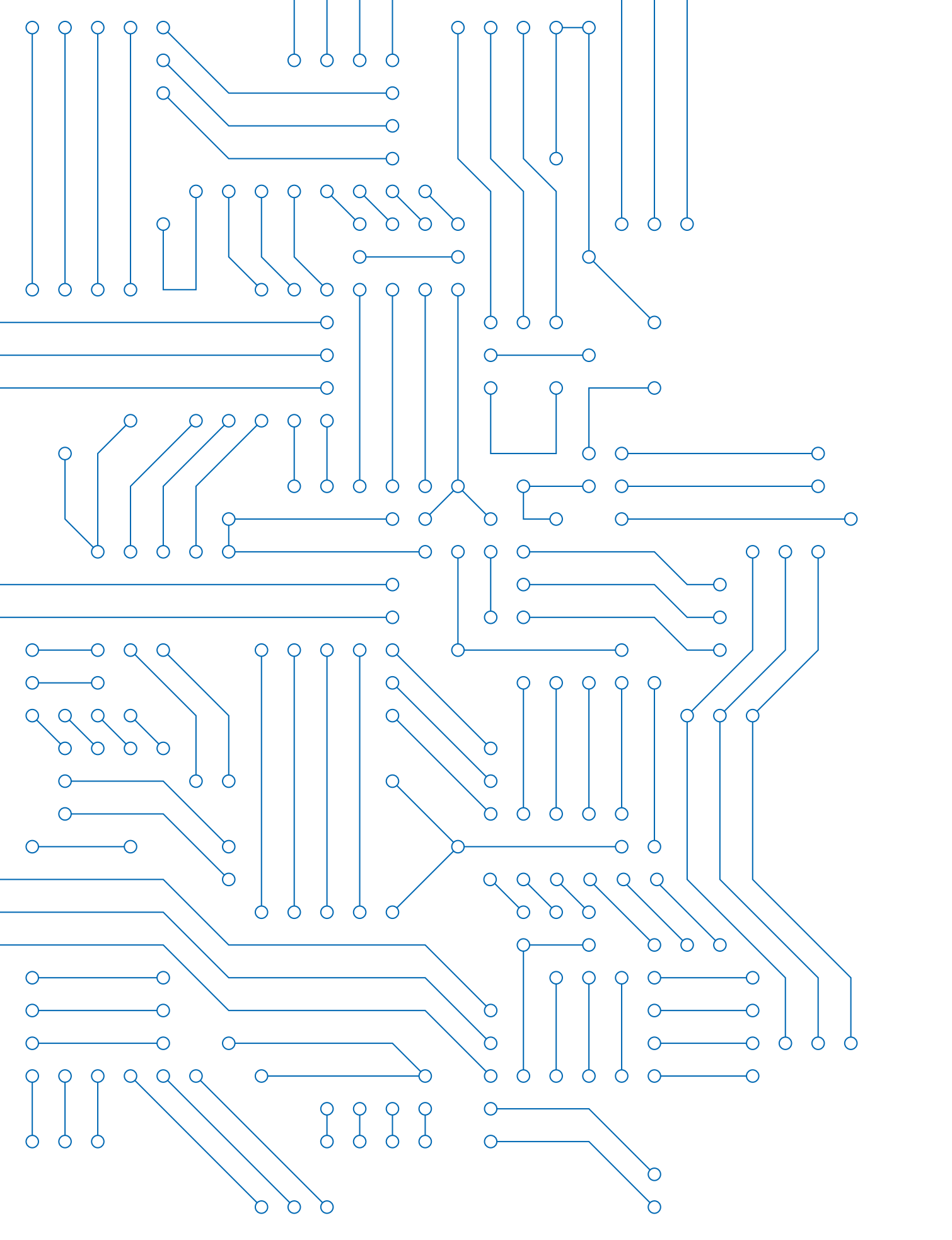
Completion: December 2021

The West Cambridge campus provides facilities that help the university to retain its globally competitive position by continuing to attract and retain the world's best academics and researchers, as well as one that supports entrepreneurship and collaboration with industry. The Cavendish Laboratory will provide a new home for the university's world-famous Department of Physics – somewhere that has seen the atom split, sub-atomic particles discovered and DNA unravelled.

Client: University of Cambridge **Architect and Lead Consultant:** Jestico + Whiles **Technical Architect:** Jacobs **Project Manager and Principal Designer:** Currie & Brown **Masterplanner, Cost Consultant, Transport Consultant and Landscape Architect:** AECOM **Civil, Structures and Vibration Engineer, Fire and Acoustic Consultant:** Ramboll **Landscape Architect:** Plincke **M&E Engineer:** Hoare Lea **Accessibility Consultant:** David Bonnett Associates **Lighting Design:** Studio Fractal









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HARWELL VISION

Harwell Campus, Didcot OX11

Completion: March 2032

Harwell delivers world-leading scientific innovation, seeking to ensure the UK remains a leader in the Life Sciences, Space and Energy sectors. This project seeks to rejuvenate a 75-year-old campus, involving decommissioning nuclear sites, with a masterplan that harnesses urban qualities of complexity, mixture and density to foster innovation whilst exploiting Harwell's location within an Area of Outstanding Beauty. Through creating a coherent urban structure, increasing densities and encouraging people to interact, the project hopes to create advanced manufacturing buildings, laboratories and offices that are more than the sum of their parts.

Client: Harwell Campus Partnership

Architect: Hawkins\Brown Architects

Project Manager: CBRE

OSNEY MEAD INNOVATION QUARTER MASTERPLAN

Osney Mead Industrial Estate, Oxford OX2

Completion: May 2017

Due to its proximity to the city centre, the Osney Mead Industrial Estate in west Oxford could provide greater economic benefit to the city and region, but currently the 16.5 hectare site is under-utilised. This masterplan provides increased opportunities for employment, homes and supporting uses, with better pedestrian and cycle connections, creating a pleasant waterside quarter in which people will want to live, work and meet, with new publicly accessible outdoor spaces and improved landscape quality.

Client: Oxford Health NHS FT **Architect and**

Project Manager: Shephard Epstein Hunter

Planning Consultant: Savills **Transport**

Consultant: IMA Transport Planning **Flood**

Risk Management: Clive Onions

INVESTCORP BUILDING

St Antony's College, Oxford OX2

Completion: May 2015

Providing modern academic space for the Middle East Centre of St Antony's College in Oxford, this link building consists of archive storage, a café, gallery, library and a lecture hall, designed in response to a constrained environment. It creates a new place to inspire people to study and socialise in the surrounding area. This iconic structure knits a modern form of architecture – a curved form of timber and concrete with a stainless-steel façade – within a space framed by historic, traditional buildings.

Client: St Antony's College **Architect:**

Zaha Hadid Architects **Structural**

and Civil Engineering: AKT II



HEADINGTON CAMPUS MASTERPLAN, OXFORD BROOKES UNIVERSITY

Gipsy Lane, Headington, Oxford OX3

Completion: July 2014

Transforming a highly constrained and fragmented site, this award-winning 1.95 hectare campus redevelopment comprises 24,000 sqm of refurbished, extended and new-build teaching and learning spaces – whilst remaining operational throughout the works. Key to the successful integration of the new elements was the influence of interlocking architectural forms, where a series of pegs reach outwards from a central hub. These provide refreshed elevational backdrops to newly landscaped courtyards and open spaces. This idea flowed from the university's desire to create a more inclusive and integrated campus.

The integration of internal and external spaces, held together rather like an oriental wooden puzzle, breathe movement across the new campus, allowing academic spaces to co-exist with internal and external social spaces for the enjoyment of students and staff alike. The project is seen as an achievement in terms of maximising the development potential of what had been a highly constrained site, with very little quality outdoor space.

The simplicity in surface belies the complex systems, including PV cells, green roof, rainwater harvesting, passive air cooling labyrinths, rainwater attenuation and CHP, which have been carefully coordinated to reduce energy costs and demands on the existing public infrastructure.

Designed to BREEAM Excellent rating, the project maximises environmental benefits through energy and water conservation, flexible accommodation for changing curricula and ecological diversity. Locally distinctive materials used in the landscape create an individual character that is also respectful of its conservation area setting. The campus' relationship with its wider context is enhanced with a fully accessible public route linking Headington with the open space of South Park and its views of the 'Dreaming Spires' of Oxford city centre.

VIEWPOINT

"This scheme has a classic simplicity that combines a dignity and scale with subtle colours and textures that make it approachable but not populist. The drama of its external spaces form an extension of the buildings to create a series of spaces and places with immense character and presence – a place that creates a memorable outward face to the University yet has proved extraordinarily popular with students and staff. These attributes are the hallmark of public realm design at its finest – they deservedly set a standard of excellence in the assembly of Knowledge Capital."

Richard Hannay, Project Director, LUC

Client: Oxford Brookes University

Capital **Architect and Lead**

Consultant: Design Engine

Architects **Project Manager**

and Quantity Surveyor: Turner

& Townsend **Contractor:** Laing

O'Rourke **M&E Engineer:**

Grontmij **Civil and Structural**

Engineer: Ramboll **Lighting**

Design: Spiers and Major **Access**

Consultant: QMP **Planning**

Consultant: West Waddy ADP

WARNEFORD HOSPITAL MASTERPLAN

Warneford Lane, Oxford OX3

Completion: 2050

Developed jointly by the Trust and the University of Oxford, the masterplan for the Warneford Hospital site puts forward a vision of how the site can best provide the highest quality care and research over the next 10-50 years. The masterplan is illustrative, intended to ensure stakeholders can realise the site's full potential for mental health and dementia treatments in coming years.

Warneford Hospital was named in 1843 in memory of Samuel Wilson Warneford whose significant donations enabled the opening of buildings in Oxford in 1826. In more recent decades the University of Oxford has based its Department of Psychiatry at Warneford, allowing mental health research to be informed by clinical practice, and vice-versa.

The masterplan develops a site with five listed buildings up to 200 years old at its heart, with protected green spaces in and around it, and a mix of subsequent development of varying quality no longer all fit for purpose, and transforms it into a model of world class collaborative healthcare innovation, research and best clinical practice, with accommodation for key workers and beautiful spaces available for public use.

The location of the Warneford Hospital in between two protected green spaces – Warneford Meadow and South Park – provides the opportunity to create a landscape framework that opens the site and creates a natural connection between them.

The existing hospital building has potential to be transformed in a central hub for the entire site. It will comprise common facilities for the hospital's workers and visitors, university's researchers and residents, such as cafes and restaurants, conference facilities, childcare facilities, seminar rooms, library and computer rooms, gym, estates and security's offices, plus small retail units. These facilities are housed in the new covered area formed between the buildings, while the historic buildings themselves are remodelled to provide key worker housing for the health trust, graduates and researchers with the final layouts determined by the mix of accommodation required. A new hospital with 96 bedrooms is also provided on the site, with one- and two-storey preliminary options developed for consideration.

VIEWPOINT

“The Master Plan development is all about ensuring the promise of the academic and clinical excellence that the University has for innovative treatments translates from basic science to power new treatments and new ways of preventing mental illnesses. Warneford is a fantastic opportunity because it's a site where the University can bring together the research and the clinical care that can produce something that is actually globally important; it is very unusual to have the opportunity of an existing hospital site where there is real academic and research power right alongside real clinical excellence.”

Dr. Patricia del Guayo, Architect,
Shepherd Epstein Hunter

Client: Oxford Health NHS FT

Architect and Project Manager:

Shepherd Epstein Hunter **Planning**

Consultant: Quadrant Town Planning



Phasing



Existing



Short-term



Medium-term



Long-term





**The following pages
illustrate ideas for the
future of the education
and health sectors
in London and the
wider South East.**

IDEAS



VERTICAL CAMPUS, REACHING FOR THE SKY

London presents both a challenge and opportunity for its universities. The upgrading of a legacy campus is a painful and long exercise. Complex, phased refurbishments go on for years and are costly. For city centre universities, with ageing estates who want to start over and re-locate, is there an alternative to selling out to suburbia? Learning from the best commercial high-rise developments could offer great potential for a vibrant 24-hour mixed-use academic community in a 'vertical campus' at the heart of the city.

Architect: ArchitecturePLB



YOUTH IS WASTED ON THE YOUNG

We are creating communities that isolate both student and aging populations, with a serious gap in the market for a more interesting and supportive residential typology. Could a more integrated society be created by interlinking universities and retirement communities? The retirement age demographic is a valuable resource, both financially and intellectually, and many 'active agers' are looking for new opportunities. These integrated communities might include retirement housing on campus or shared mansion blocks, with elders as house masters offering a higher degree of mentoring.

Architect: ArchitecturePLB



LABORATORY REVISITED R&D

The in-house initiative, Building 16 looks at the laboratory typology – specifically the speculative laboratory. This building type has long been viewed by clients and architects as an office building with a slightly bigger plantroom provision and possibly some soft spots in the floor that could form additional risers should they be necessary. This study looks at the planning grid, structure, servicing and plantroom strategy to propose a new approach to speculative laboratories – that is cost effective, sustainable low energy environment, flexible at the outset and adaptable in the future.

Architect: Aukett Swanke



THAMES TIDAL UNIVERSITY RESEARCH OUTPOST

Cousins Lane, London EC4

Powered entirely by the River Thames, this bespoke higher education, tidal research and enterprise facility would house a series of turbines beneath a pontoon that draws energy and acts as a heatsink – offering temperature control, renewable energy, and stunning views of the river. The 'tidal research and enterprise hub' would become a focal point for the whole learning community; a place where students, staff, governors, parents and members of the local residential and work communities can visit in a symposium space to experience and grow a greener London.

Architect: Curl la Tourelle Head
Architecture Engineer: Elementa Consulting
Visualisation: Forbes Massie



SPACES TO THINK: INNOVATION DISTRICTS AND THE CHANGING GEOGRAPHY OF LONDON'S KNOWLEDGE ECONOMY

Appraising and making a case for innovation districts in London, this research follows on from methodologies first pioneered by the Brookings Institution in the US, providing evidence through in-depth analysis of the economic, networking and physical assets of twelve higher education-based innovation districts across London. Paired with an audit of physical, economic and network assets across emergent or potential innovation districts, a large range of datasets was deployed including patent registrations and OMS/BRES data, which led to an understanding of the importance of spatial characteristics to successful innovation districts. Completed April 2016.

Client, Researcher, Author: Centre for London
Researcher: Hawkins\Brown & also thinktank

WHY 13.5? – CHALLENGING THE NORM IN STUDENT ACCOMMODATION

Competition for the development of sites into new student accommodation is fierce, particularly in London and the south. The value of a given site is governed by numerous factors: what the developer feels the market can support in terms of rental values, how cheaply they believe they can build the scheme out, and how many units a developer feels able to fit on a given site which ultimately governs the return. Typically, each of those factors reduces in certainty, in the order they appear above.

One such developer saw the existing room provision and market offering as flawed – for example, why was the norm always to include a full desk in a cluster room when students were working from a laptop sitting on their bed? Could we abandon some of the typically accepted offering and adopt a 'less is more' approach? Could we fit more units on the same sites and allow the developer to outbid the market without hitting either their return or, importantly, the student experience?

This project questions this norm and determines how the student offering could be shrunk down without compromising the overall experience. Following research on other built examples, there was a prevailing minimum room size that became apparent of 13.5 sqm. Why?

Reduced room sizes were applied to a theoretical development scheme to estimate the increase in numbers and overall feasibility. Experience with Yotel on capsule hotel rooms provided an example and lessons were applied by reducing the en-suite to a fully integrated wet room. Desks became smaller or were stacked beneath a folding bed, leaving enough of a gap between bed and desk so that users didn't have to clear their desk every time they wanted to go to sleep. All room concepts considered ways to pre-fabricate services at high level so that connections to primary horizontal and vertical services distribution was kept straightforward. Door swings were in the opposite direction.

Current plans are to test the concept, either in the fabrication of a one-off room module that gets market tested around the country on a portable flatbed, or alternatively fitting out a wing of a new scheme with the reduced room sizes to gauge market reaction.

Client: McLaren Property **Architect:**
Waind Gohil + Potter Architects
Project Manager: 2210 Consult



Type A Cluster Room

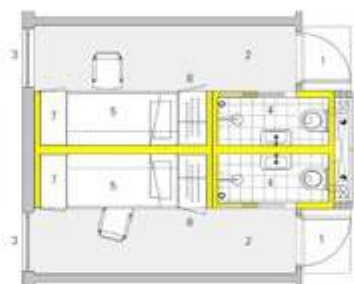


- Key**
1. Outward opening entrance door
 2. Circulation area
 3. Window
 4. Back to back en-suite pod
 5. Back to back study / sleep pod
 6. Accessible service riser from communal corridor

Area 8 sqm



Type B Cluster Room

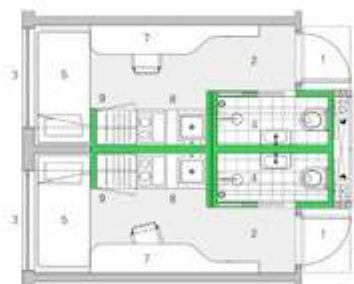


- Key**
1. Outward opening entrance door
 2. Circulation area
 3. Window
 4. Back to back en-suite pod
 5. Back to back study / sleep pod
 6. Accessible service riser from communal corridor
 7. Storage
 8. Wardrobe

Area 9.5 sqm



Type C Cluster Room



- Key**
1. Outward opening entrance door
 2. Circulation area
 3. Window
 4. Back to back en-suite pod
 5. Back to back bed
 6. Accessible service riser from communal corridor
 7. Desk
 8. Kitchenette
 9. Wardrobe

Area 9.5 sqm



Type D Cluster Room



- Key**
1. Outward opening entrance door
 2. Circulation area
 3. Window
 4. Back to back en-suite pod
 5. Back to back bed
 6. Accessible service riser from communal corridor
 7. Desk
 8. Kitchenette
 9. Wardrobe

Area 12 sqm

HALFWAY HOME

The issue of bed-blocking in hospitals is at the top of political and news agendas. 2,500 beds a day are usually occupied by elderly people unable to be discharged for lack of home support – up 70 per cent since 2012 and at a cost of £820 million a year. Readmission within 30 days costs a further £2.2 billion. These sums far outweigh the estimated cost of caring for them in their own communities, where there are also many social advantages to be gained.

Halfway Home is a plan for a network of small community run 'homes' where those discharged from hospital can either receive care until fit to return home, or support within their own home. Whether in purpose-built or converted redundant buildings, care would be provided by a combination of family members, volunteers and qualified staff. The service would be commissioned by the local council or Clinical Commissioning Group.

The tradition of voluntary hospitals goes back to the early 18th century – in 1827, a local squire converted cottages in a village near Hemel Hempstead into the first Cottage Hospital, providing free medical services. Thousands followed in towns and villages across the UK, but they later became the unintended casualties of the Welfare State and NHS efficiency measures. Yet community-based voluntary care still thrives – for example through the Royal Voluntary Service, whose 35,000 volunteers support 100,000 older people in their homes.

Halfway Homes might have a formal relationship with local hospitals; ownership might be in the hands of a Development Trust, CIC, charity or a collection of local patrons. Local authorities could contribute by way of Community Land Trusts. There are precedents for these models in providing care services and the new London Plan is calling for such initiatives. Using local architects, contractors and trades, a Halfway Home could be built on an infill site, converted from a former pub, post-office or bank; they could be suitable for self-build and/or co-design.

They will all have in common the use of social capital and self-help. Such mutual support proves to be very beneficial to communities. People appreciate contributing to something designed to fit their own needs and see the advantages of capitalising on existing relationships and local knowledge.

A cost-effective, community-driven solution like Halfway Home is likely to have strong popular support. It is unaffordable for the taxpayer and the NHS not to back this or a similar scheme. Quite apart from addressing a need in all existing communities, in future it could become part of the planned social infrastructure of major new developments.

Concept: Footwork





A DIORAMA OF HOPE FOR MAGGIE'S BARTS, LONDON

Completion: December 2018

Continuing a project shown at the London Festival of Architecture in 2017 with “(Re)constructive memory”, this project aims to continue research on experiential design, concerning the identification of relevant parameters of design effects and an appraisal of people's response to spatial settings. Creating a three-dimensional representation of 19 Maggie's Centres, the project creates dioramas which represent the perceptual experience of the interior space, to demonstrate the beneficial psychological effect of the beautiful bespoke architecture on its visitors.

Maggie's Cancer Care Centre is expanding to provide support to the Oncology Department at St. Bartholomew's Hospital. Maggie's Barts will be serving many visitors, helping to satisfy the wide and growing demand of psychological support within the cancer experience. Located within an historical site, the building reveals the basic concept of 'A within B within C' – the glass out-skin (two sheets of matte glass with colored fragments between), the concrete structure shaped almost like an open hand, and the bamboo stairs. Throughout the day and from different perspectives, the perceptual experience through the triple shell keeps changing. The matte glazed façade seems made of alabaster during the day, while it fades away at night, enhancing the colored figures together with the big shadows of the concrete structure and human figures. A public roof garden surprises the Centre's visitors with more space for relaxation and visual experience.

In particular, the Maggie's Barts diorama is able to reveal the phenomenology of the building through its materiality, transparency, light and colour, all at the same time in the same space. The character of the building is shaped by coloured light reflecting off the floors and walls, changing by the time of the day and season. The Maggie's Barts diorama wants to attract, impact and emotionally engage the London public on the theme of cancer care and patient empowerment – recreating “in loco” the unique experience of walking into Maggie's Barts, establishing the synergy between people and places.

VIEWPOINT

“The Maggie's Centre Architectural Programme provides a definition of value in terms of people's dignity and active participation in therapeutic environments. To this, the architects add their site-specific design strategies, effectively attempting 'functional' and aesthetic creations of value instilled by a deliberate manipulation of functional, ergonomic, and experiential parameters. Although, I believe that the Maggie's Centres work efficiently not despite their exuberant architecture, but neither simply because of it. They work because they have defined a specific programme of care for staff and patients – the Maggie's Centre Architectural Brief – stipulating a higher level of psychological and physical interaction among people. This, in turn, leaves to the architects the task of giving form to the programme in relation to the restrictions/ opportunities of each different given site.”

Andrea Placidi, Subject Coordinator
Interior Architecture,
Oxford Brookes University

Architect: Steven Holl **Research:**
Oxford Brookes University, Interior
Architecture, Year 3 – Andrea
Placidi, Subject Coordinator
Interior Architecture – Caterina
Frisone, Associate Lecturer

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Kathryn Tombling, BDP

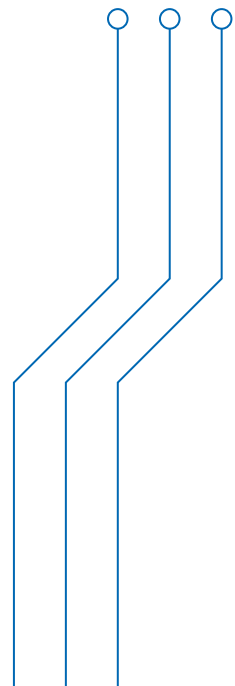
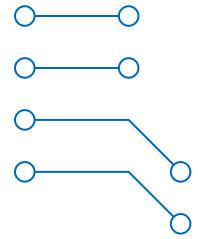
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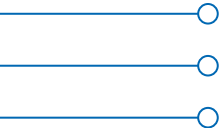
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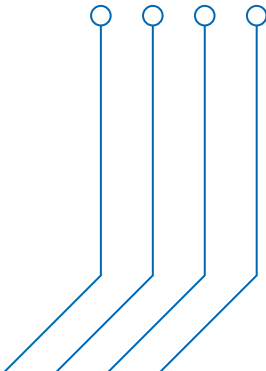
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JRA's offices are based in the Bankside area of Central London across five studios. The practice's teams have considerable expertise in the higher education sector and JRA has an established fit out team dedicated to this type of work.

JRA is currently working on a wide range of exciting and challenging new-build and refurbishment projects, as well as interior design commissions. Recent projects that JRA has completed include King's College London's Strand campus, 1-19 Torrington Place for University College London and the commercial development, 33 King William Street for HB Reavis.

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The Knowledge Quarter is a partnership of over 85 academic, cultural, research, scientific and media organisations within a one-mile radius comprising of King's Cross, Bloomsbury and Euston.

Collectively, the geographic area of the Knowledge Quarter contains possibly the greatest knowledge cluster anywhere in the world and is the UK's largest innovation district.

The KQ's partners range from internationally significant research institutes to emerging organisations in the creative industries. Partners include the British Museum, Google, UCL, University of the Arts London, Digital Catapult, Wellcome Trust, and the British Library. The partners might be vastly different, but we all share one common purpose: the creation and dissemination of knowledge.

Within the KQ, choreographers are meeting surgeons, biochemists are meeting poets and activists are meeting archivists. The more disparate the worlds, the deeper the connections that are being formed.



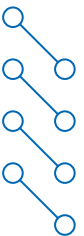
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0207 636 4044

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EDUCATION AND HEALTH PROGRAMME

This NLA Research was published by New London Architecture (NLA) in May 2018. It accompanies the NLA exhibition and events programme *Knowledge Capital: making places for education, innovation and health* taking place from May-July 2018 and is part of NLA's year-round Education and Health programme, exploring the changes and developments in London's education, health, research and innovation sectors.

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