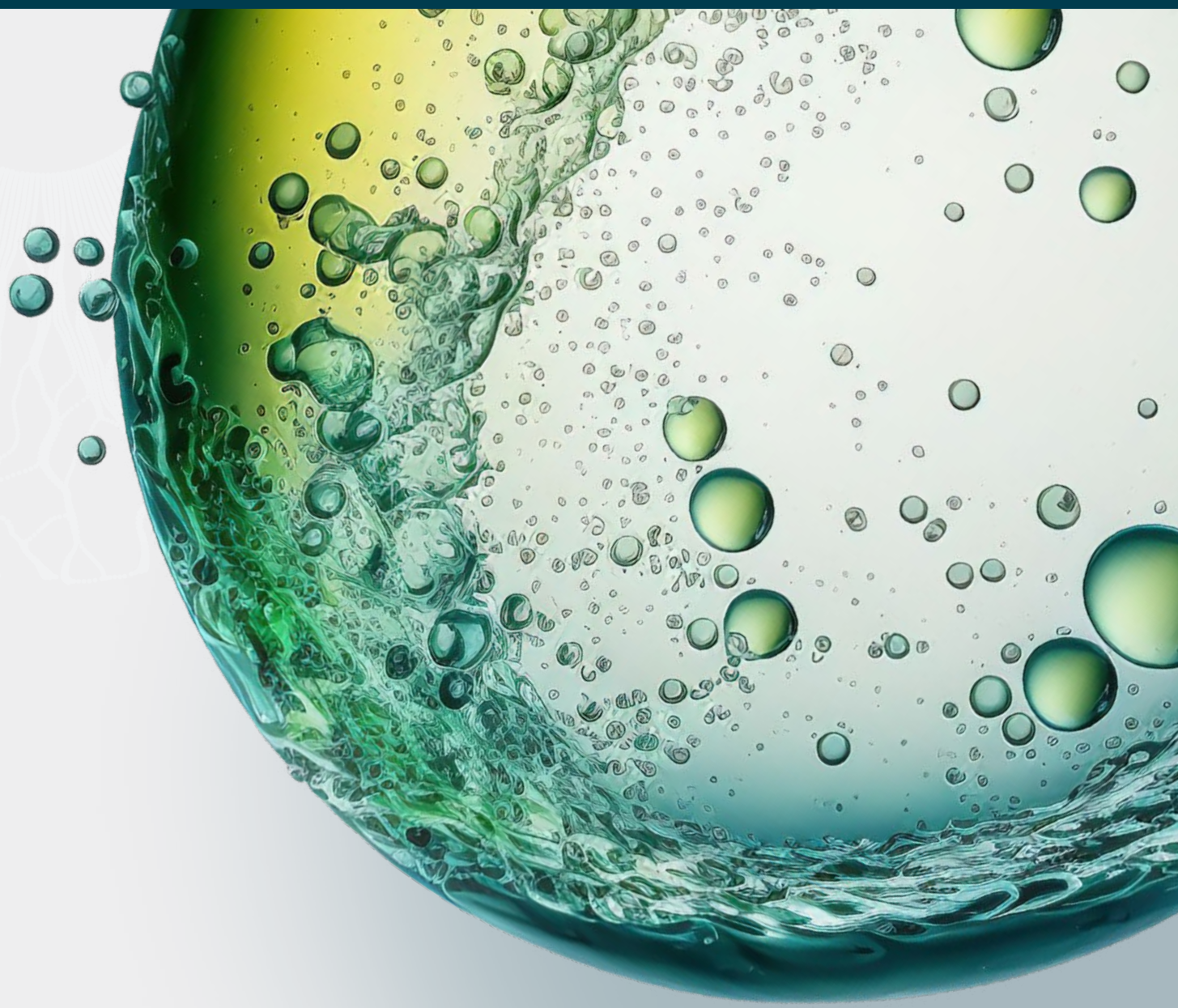

Life Sciences BUILDINGS

SPEED TO MARKET

Q2 2023

A whitepaper by **Ramboll** and **Wates**

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EXECUTIVE SUMMARY

It's clear that the Life Sciences sector presents a huge opportunity for developers.

The Government has ambitions to make the UK a "Science Superpower" by 2030 and the sector will benefit from continued Government R&D funding as part of a package to deliver this.

The challenge for developers is that we don't yet have the blueprint for Life Sciences buildings, and the time to enter the market is now. Here our experts consider your roadmap to a Life Sciences buildings solution – including the location and types of space, flexibility and future proofing, standardising the brief and construction, understanding regulation and taking learnings from other sectors.

The key to making the most of this opportunity is the speed required to enter the market – we know that competition between developers, operators and science park owners is driving identity, branding and differentiation more explicitly.

More tenants are asking **'what is your offering?'** and key considerations include - the right space in the right location, interconnectivity, sustainability and speed to market.

Once you are armed with the specific requirements of this sector, and are clear on your role in delivering them, you will be able to move at speed to deliver and differentiate from your competitors.

For speed we also consider a range of tools at your disposal – early-stage suitability and sustainability assessment, smoothing planning and understanding regulation and greater leveraging of MMC.

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Life Sciences

Demand, Investment, and Occupancy

We are currently in the 'age of biology' (Stavridis, 2014) which is reflected in the proliferation and diversification of life sciences, driven in part by the application of new technologies and techniques. A wider societal understanding of the critical role life sciences plays in addressing global challenges is better understood post-Covid, and this has heightened public interest.

The economic importance of the UK life sciences sector is increasingly recognised, and the newly formed Department for Science, Innovation and Technology seeks to enable greater investment within its overarching Framework (DSIT, 2023).

At the same time, widespread coverage of how hybrid working has reduced office/lab occupancy rates has spooked the office/lab market and prompted developers to cast around for alternative uses. In combination, these drivers have intensified interest in developing space for life sciences uses by established operators and new entrant developers alike.

As the UK market has heated, a consensus that there is significant shortfall of commercial life sciences laboratories has emerged. This bullish view about high levels of demand is reflected in the 'red-hot' developer-led commercial office/lab market we are currently experiencing.

The movement of pension funds and large-scale investors into the development market proves there is a return to be made – and this is the big opportunity right now.

DRIVERS FOR DEVELOPMENT

Uptick in interest in life sciences post-COVID

Investment by UK government

Venture capital investment model that is able to generate viable return on science sector real estate developments

Economic value of the sector

Lower occupancy and utilisation of office/lab space due to rise in hybrid working

New entrants in the science and research development market looking to convert offices to office/lab

The retro-fit model suits new entrants to the market who are looking to flip empty office space and/or dry lab space

Established Science Sector real estate developers pushing to meet demand from the market

Who is the space for?

People working in the commercial life sciences research and development (R&D) sector, and who are seeking spaces to work, collaborate and interact with others, are the primary occupants of new office/lab space. They are typically working at newly formed university/hospital start-ups; or within companies that are established and scaling up (often at speed); or for corporates who desire proximity to these. The type of commercial office/ lab provision they require does not normally incorporate highly complex ('heavy') technical labs or manufacturing capability.

What spaces are needed?

As a developer, we understand you may not be involved in the fit-out aspect for tenants. If you are involved in fit-out, the lens we provide into the requirements for labs will go a long way in showcasing you as a trusted partner. If you're not involved in fit-out, having a comprehensive understanding of the requirements of life sciences clients will support the base-build in being delivered with core considerations of your tenants at the heart, and supporting your speed to enter the market.

To suit the variety of clients and tenants in the life sciences sector, facilities can range from small, self-contained 'incubator' office/lab units to large-scale workplaces with suites of laboratories. However, most in demand currently is a generic wet lab and office/lab combination that will encourage collaboration between occupants, is located within existing science clusters, and is easily accessed by transport networks.

As company ESG requirements increasingly influence property decisions, a developer's goal of creating a sustainable, flexible space that will suit a large segment of the life sciences tenant market while realising return on investment, must also now address questions of spatial adaptability, flexibility, utilisation, re-use and re-purposing opportunities. The same applies for whole-life asset value, construction methodology and implementation of modern methods of construction (MMC).

Key concepts for us to convey to our less experienced clients is that although research activities are diverse, many can be accommodated within a wet CL2 lab, and we understand how to design and construct this space type well; and that the most complex – thus expensive - environments for life sciences research will remain on university and hospital campuses.

Labs or lab-enabled?

This is a hotly debated topic. Some interpret 'lab enabled' as a light-touch uplift of an orthodox office specification so that bioinformatics, data science or med-tech can be accommodated. This suits many of our new-entrant clients who want space that can be quickly and economically reverted to conventional office space when this market picks up.

With the emphasis the DSIT Framework places on AI and engineering biology, we predict an increase in specialist dry labs designed for engineering and heavy computing use, and this type of space may also fit a 'lab-enabled' specification.

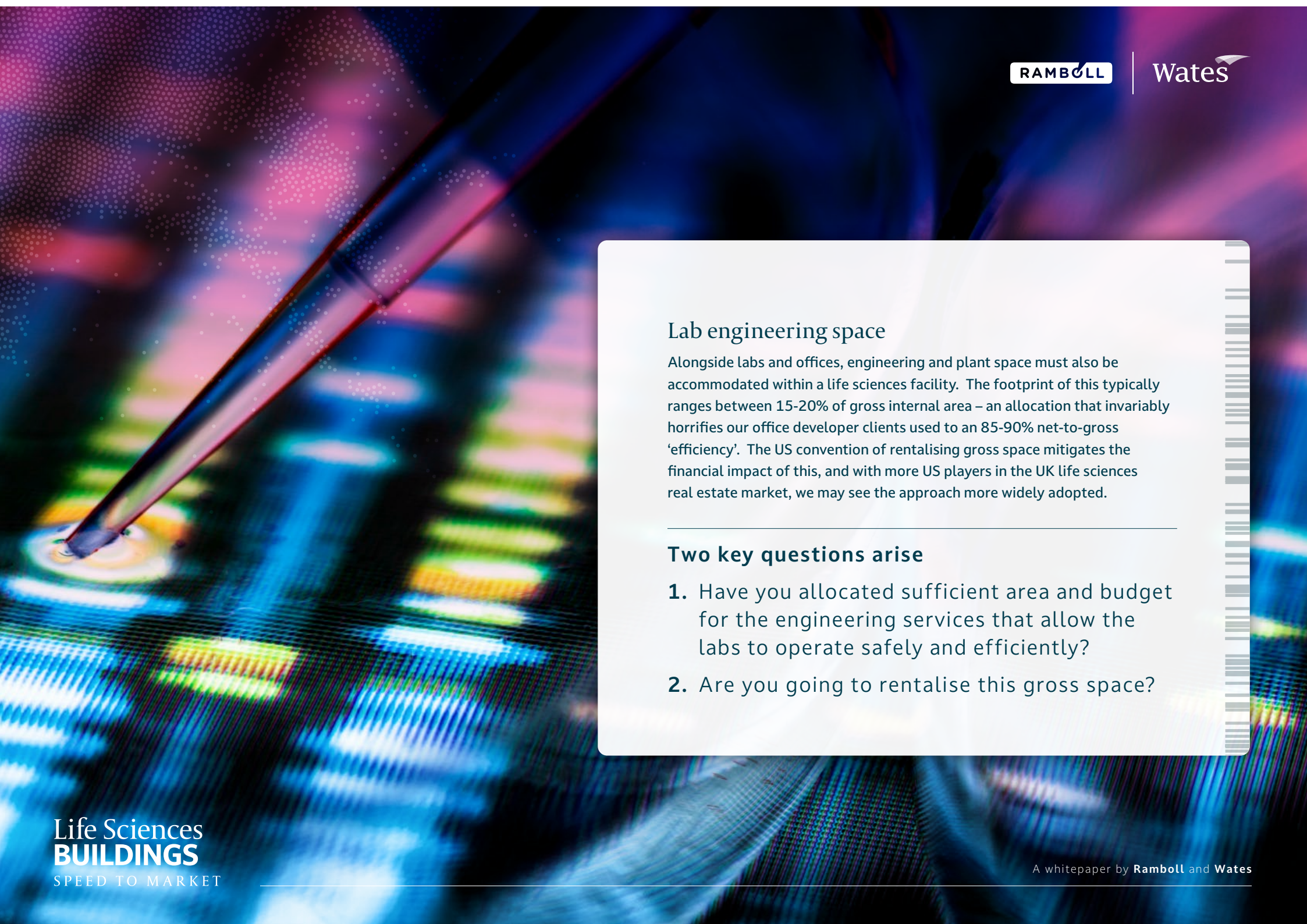
Conversely, our established owner/operator clients want offices alongside 'wet laboratories' ie: environments that incorporate benching, sinks, fume hoods and specialist HVAC. Our order books are currently weighted towards this type of conventional wet lab space, and US clients are leading the charge for providing this on a speculative basis and at scale.

Lab complexity

Laboratories can become extremely complex but within the context of this current developer-driven market, we believe it's important not to overegg this.

Conceptually, if we think of laboratories as spanning a spectrum of spatial and engineering complexity, with school laboratories at the 'easy' end and high-containment laboratories or GMP manufacturing suites at the 'complex' end, then the 'bulge' of the resulting bell curve corresponds to 'CL2 wet labs'.

Here, 'wet' refers to provision of sinks/water services and the use of chemicals, meaning work surfaces and finishes must be non-porous and easily cleanable. 'Specialist HVAC' means mechanical ventilation which maintains an inward flow of air to the laboratories from non-laboratory space. 'CL2' refers to bio-containment level and the ability to work with pathogens within designated hazard groups as defined by UK regulatory authorities. 'Dry' laboratories simplistically mean similar provisions but without the sinks. Both wet and dry labs can become progressively more complex as their equipment and engineering services demands are ramped up.



Lab engineering space

Alongside labs and offices, engineering and plant space must also be accommodated within a life sciences facility. The footprint of this typically ranges between 15-20% of gross internal area – an allocation that invariably horrifies our office developer clients used to an 85-90% net-to-gross 'efficiency'. The US convention of rentalising gross space mitigates the financial impact of this, and with more US players in the UK life sciences real estate market, we may see the approach more widely adopted.

Two key questions arise

1. Have you allocated sufficient area and budget for the engineering services that allow the labs to operate safely and efficiently?
2. Are you going to rentalise this gross space?

Flexibility and future-proofing labs

Defining what 'flexibility' means to tenants is important within a CL2 laboratory context, and which design strategies are useful and bring value to tenants, can be nuanced as 'flexibility' rarely means installing 'moveable' walls, although these can easily be provided within office space.

For labs, we suggest it is more useful to enable new equipment and workflows to be accommodated without either disrupting operations, needing inputs from construction teams, nor incurring significant expense.

A common apportionment of offices to labs is 50:50 based on research staff splitting their time between a desk space and a lab bench space. However, designing a 10-20% zone of the floor to accommodate either office or lab can be a cost-effective way to generate a 40:60 or even a 30:70 mix, and can help maintain overall building occupancy levels when hybrid working/WFH is adopted for maximum flexibility.

TO MAKE YOUR LAB FLEXIBLE, YOU SHOULD –

Specify mobile benching that can be reconfigured easily by tenants so that labs can be re-arranged fast to suit new processes and equipment

Establish 'wet' zones for sinks to rationalise fixed supply and drainage points

Design engineering services such as gases, water, power and data to be accessible, for easy modification

Safeguard spare capacity in ceiling service zones and within service risers, to ensure additional services can be installed with minimal disruption

Consider future-proofing reversionary value. The cost of transforming a customised lab back to a generic one is significant and typically very wasteful. Our experienced clients place emphasis on designing and constructing a fit-out for multiple re-use and support our circular economy approach in achieving this

Collaborative workspace

Designing space to encourage collaboration between scientists is a must given the evidence that interactions and serendipitous collisions support innovation and research breakthroughs. However, delivering this through design and ascertaining its success can be challenging. Some organisations are using occupancy and activity monitoring to generate data on how their facilities are used and which locations form natural interaction 'hot-spots'.

We think you should sprinkle meeting and amenity settings within workplace areas and use glazing to showcase science activities and equipment. These approaches become proxies for collaboration and engagement, and thus form common features of contemporary life sciences buildings.

Sustainable labs

Given the climate crisis there is an intensified focus on reducing embodied and operational carbon within lab environments, not least as traditionally these have been 'gas guzzlers'. UK targets for carbon and energy intensity usage across building typologies are emerging but as 'labs' are not yet defined, extrapolation and interpolation from industry guidance for 'office' typologies and reference to NHS 'heavy technical' accommodation is necessary.

Our involvement and contribution to the carbon debate via multiple industry bodies and initiatives is vital. We need to ensure a robust set of targets are adopted and that our approach is underpinned by benchmarks collated from our built projects and supplemented by our in-house research.

It is imperative that you consider the full spectrum of sustainability. The community legacy, local biodiversity and net gain, as well as social value fundamentals are as important as the embodied and operational carbon.

If we are serious about sustainability, we need to challenge and push industry performance, and ensure the project brief captures this.

THE FRANCIS CRICK INSTITUTE

The return of URBAN SCIENCE

The Crick Institute at Kings Cross in London has had a seismic impact on the UK life sciences community. The scale of Government investment (the Institute provides almost 1M sqft of space) demonstrates both a commitment to and confidence in UK life sciences. It's prominent city-centre location and public engagement remit celebrates science and makes scientists and their research activities visible.

This illustrates a notable shift from the twentieth-century model of science 'fortresses' at out-of-town and greenfield sites and reflects the wider trend of promoting greater public knowledge and engagement with science. Almost single-handedly the Institute boosted the return of 'urban science' that complements the magnetism that London, Oxford and Cambridge, exert in relation to talent, lifestyle and finance.

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Location is critical

Life sciences do not operate within a vacuum but need a critical mass of activity to thrive, hence the emergence of research clusters. As already noted, providing opportunities for scientists to collaborate underpins innovation, and close physical proximity for collisions and interactions, can be key to this. New and emerging life sciences companies look to locate within clusters for this highly valued collaboration potential, as well as for practical support with facilities, business services, and funding that cluster ecosystems provide.

For some of our tenant clients, **location is the critical factor** for their company move. This means where new facilities are to be provided is a key question for all UK life sciences developers.

The pipeline of new space in development has intensified as global pension fund investors have backed leading life sciences owner-operators. Currently, new development is greatly skewed to the 'Golden Triangle' of London-Oxford-Cambridge due to the scale and quality of research and clinical activity at these world-leading academic health-science campuses. Intense competition and bidding wars are edging-out residential developers as well as bringing more complex sites into play.

Developing these successfully requires greater investment and problem-solving ability of the project team, with some developers turning this capability into a market differentiator. Nevertheless, we think securing sufficient space of appropriate quality for future life sciences provision presents an ongoing challenge.

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Life Sciences **BUILDINGS** SPEED TO MARKET

Science in mixed-use buildings

Smaller spatial footprints due to hybrid working mean landlords must work harder to fill their buildings, and more diverse tenant mixes are emerging as a consequence.

Life sciences companies previously consigned to out-of-town parks or hospital/university sites are shifting to multi-tenanted city centre locations and these moves bring challenges, both technical and around perception.

Competition between developers

The significant influx of investors and real estate developers into the UK life sciences market is turbo-charging development. Once supply catches up with demand tenants will be presented with a choice of spaces to lease.

We are already seeing competition between developers, operators and science park owners which is driving identity, branding and differentiation more explicitly. More tenants are asking 'what is your offering?' and your considerations should include the right space in the right location, interconnectivity, sustainability and speed to market.

TECHNICAL ISSUES YOU NEED TO CONSIDER

Size and location of engineering plant and how this accommodates lab functional needs, given that 'office' buildings typically have small plantrooms, few riser shafts, and lower floor-to-ceiling heights when compared to a purpose-designed lab building

Using on-floor plant space and specifying recirculating fume hoods to avoid external ductwork and rooftop flues

Address the perception that 'life sciences' is an undesirable neighbour and reassure neighbouring tenants about the activities that will be taking place in a newly fitted-out lab demise. The growth of organisations such as WeWork that have normalised co-working, and the trend for 'curation' of tenants helps, but proactive engagement and communication led by the landlord/operator is essential to allay concerns and lay the ground for a thriving tenant community

Speed to market

With the current high profile of development within the life sciences sector, speed to market is becoming a critical factor. This is particularly acute for new entrants who are not necessarily familiar with life sciences tenants and cannot easily identify who their potential new occupants may be.

We have observed a nervousness that whoever's space lands first in the market, will capture the tenants - meaning viability of new sites and re-positioning propositions are becoming increasingly dependent upon project delivery timescales.

A common challenge from our clients is **'how can we go faster'**?

Options for this include off-site manufacture, modular components, and standardisation.

One size does not fit all, but there is likely to be a solution that meets the needs of most – the right floor grid, the right floor to ceiling height, the right services provision, and with sufficient future-proofing – which will not necessitate the team collectively starting with a blank piece of paper for every new project.

How can we help?

Educating and knowledge-sharing

Like any property sector, the life sciences market has its own language and rules. You need to understand what a 'cluster' is, what 'CL2' means and how designing for biocontainment shapes the space and engineering services.

The same applies to engineering plant provisions and the un-photogenic back-of-house facilities that specialist waste streams, chemical stores, gas bottles and cryogens require.

Where tenants are known, we engage to define and translate their needs into an accommodation brief. For success, our role is one of educator, translator and in many instances broker, so that timely agreement between clients and tenants can be reached.

Every design and construction team has a part to play in sharing expertise with clients so that general knowledge and understanding of the nature of life sciences facilities is better understood.

LEARNING FROM OTHERS

The opportunity to utilise learnings and best practice from other sectors could be embraced.

The Schools Framework (by the Department for Education), is characterised by standardised sizes and configurations for rooms, alongside specific BIM and sustainability standards.

The NHS has a long history of proscribing detailed spatial and environmental design so that hospital facilities can accommodate standardised processes and procedures.

WeWork uses design algorithms to create efficient space planning and standardised design concepts for their portfolio of properties.

When used thoughtfully and creatively, a combination of these approaches could codify aspects of laboratory design to bring efficiency and speed, while still leaving room for design identity and expression.

Standardising the design brief

For speculative projects a robust brief must identify a base architectural and engineering provision that will facilitate multiple research activities while simultaneously avoid over-providing, becoming inflexible or unaffordable.

Formulating common principles into a standardised design brief for life sciences provision akin to the 'BCO Guide to Specification' (BCO, 2019) is a challenge for the whole design and construction industry.

Some initial guidance was outlined in the BCO **'What the Tenant Wants' Report** (BCO 2022), and the **Constructing Science** group has developed this into a common baseline specification for speculative CL2 laboratories.

If you adopt a common specification, there is potential to simplify design and procurement, reduce development risks and enable project costs and timescales to be more accurately gauged.

Early-stage suitability and sustainability assessment

An initial 'quick and dirty' assessment of suitability of a property or site for future life sciences use is essential as there is little point in exploring a site in detail if it can't meet specification fundamentals without exorbitant cost.

A baseline of location, architectural and engineering attributes can allow an early view on development potential to be determined quickly by a professional team.

We think the same approach is required for defining an initial sustainability brief that covers net zero carbon ambitions, project certifications, whole-life value, and future or re-use of the asset.

Smoothing planning and understanding regulation

New development for life sciences facilities must pass through the town planning system like any other typology, and the time taken for this is often hard to predict. Early engagement, a supportive policy environment and simplified planning mechanisms are helpful and can lessen planning risk.

You must engage early with planning officers to build confidence in how proposals meet local policy (for example, the London Borough of Camden has a local policy that specifically supports life sciences uses).

With the revision of planning use-classes in 2021, no specific 'use-class' for laboratories is identified.

Speculative office/lab space typically falls into Class E 'business/R&D/light industrial', which gives research laboratories the same classification as 'offices'.

For re-purposed space, this should mean no planning change of use is needed (subject to any changes to the exterior) which has obvious programme benefits.

Some laboratory activities and processes are intrinsically hazardous so there is a raft of additional regulations that design and construction teams must adhere to compared to office development. This adds complexity and time to design and delivery programmes.

Using a design team who are experienced in laboratory design, who are not learning about these challenges and how to solve them on the project, is an obvious way to reduce risk and mitigate delay.

Ventilated workstations (such as fume hoods) typically extract contaminated air from the laboratory to atmosphere, via rooftop flues and fans.

Flues are visible elements on the roofline so can be contentious for town planners, particularly in conservation or heritage locations.

Rising concerns about air quality and close proximity of life sciences buildings to housing (within city centres), necessitate extensive dispersion modelling to prove design proposals are safe.

Greater leveraging of MMC

Pushing a standardised brief towards a fully-developed MMC solution is the next step to speedier delivery. Most new-build laboratories already incorporate a degree of off-site manufacture such as pre-assembled service riser shafts, plant rooms, etc. but evolving this into a complete kit-of-parts offers great potential.

Introducing elements of standardisation, or a base design brief suitable for a range of sites and tenant configurations, will be advantageous because repetition, standardisation and uniformity bring efficiencies in supply chain management and delivery, which in turn bring cost and time benefits.

The importance of the supply chain cannot be underestimated, and in the highly technical life sciences sector, supply chain resilience and expertise are crucial. Resilience relates to specialist equipment and systems that research staff use, as well as the plethora of construction trades and service providers who construct or fit-out the space and enable it to work.

Key examples are building services (MEP) sub-contractors; controls, fire and HVAC engineers; lab furniture suppliers and specialist finishing trades.

Standardisation is coming and will be scaled-up to encompass multiple components and systems including structural grids, floor plates, etc. This will offer a step-change in speed and quality of delivery, meaning the design and production of fully modular off-site laboratory units could become commonplace.

The approach should not be at the expense of design integrity or flair. Differentiation, materials and aesthetic expression are integral to design quality and tenants, but the superfluous reinvention of basic elements would be avoided.

What have we learnt?

The shortfall of suitable space for commercial life sciences office/labs within the UK is driving a heated developer-led market fuelled by bluechip investors and new entrants.

Speed to market of new facilities is increasingly important to capture tenants but there are challenges in delivering the right space in the right location with the right specification.

Greater knowledge-sharing and cross-industry working is key to designing and constructing a product that is technically robust, sustainable and flexible to suit the majority of tenants.

Learning from other sectors to increase standardisation in design and delivery, and an integrated and knowledgeable supply chain needs to play a greater role. Rising to this challenge is within our collective capability and will equip us to deliver high quality office/lab development to the market at speed.

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Life Sciences BUILDINGS SPEED TO MARKET

About Ramboll

Ramboll is a global architecture, engineering and consultancy company founded in Denmark in 1945. As The Partner for Sustainable Change, we enable our stakeholders to realise their goals and navigate the transition to a more sustainable future.

Ramboll's 17,500 experts create sustainable solutions across Buildings, Transport, Architecture & Landscape, Water, Environment & Health, Energy and Management Consulting.

Across the world, Ramboll combines local experience with a global knowledgebase to create sustainable cities and societies. We combine insights with the power to drive positive change to our clients, in the form of ideas that can be realised and implemented.

We call it: **Bright ideas. Sustainable change.**

Read more on **ramboll.com** and follow us on **LinkedIn** and **Twitter**.

RAMBOLL Bright ideas. Sustainable change.

About Wates Group

Established in 1897, we are the UK's leading family-owned development, building and property maintenance company. In 2022 we employed over 4,000 people and generated profits of £33.7m from a turnover of £1.89bn, working with a wide range of public and private sector customers and partners. Now in our fourth generation of family ownership, we're committed to the long-term sustainability of the built environment and to making our industry more inclusive and representative of the communities we work in. We are one of The Times Top 50 Employers for Women and an Investors in People Gold accredited company. We are driven by our shared purpose of working together to inspire better ways of creating the places, communities and businesses of tomorrow.

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