

Constructing our future

**Product Improvement
and Innovation Strategy**
2018-2020





Context

Construction is historically inefficient.

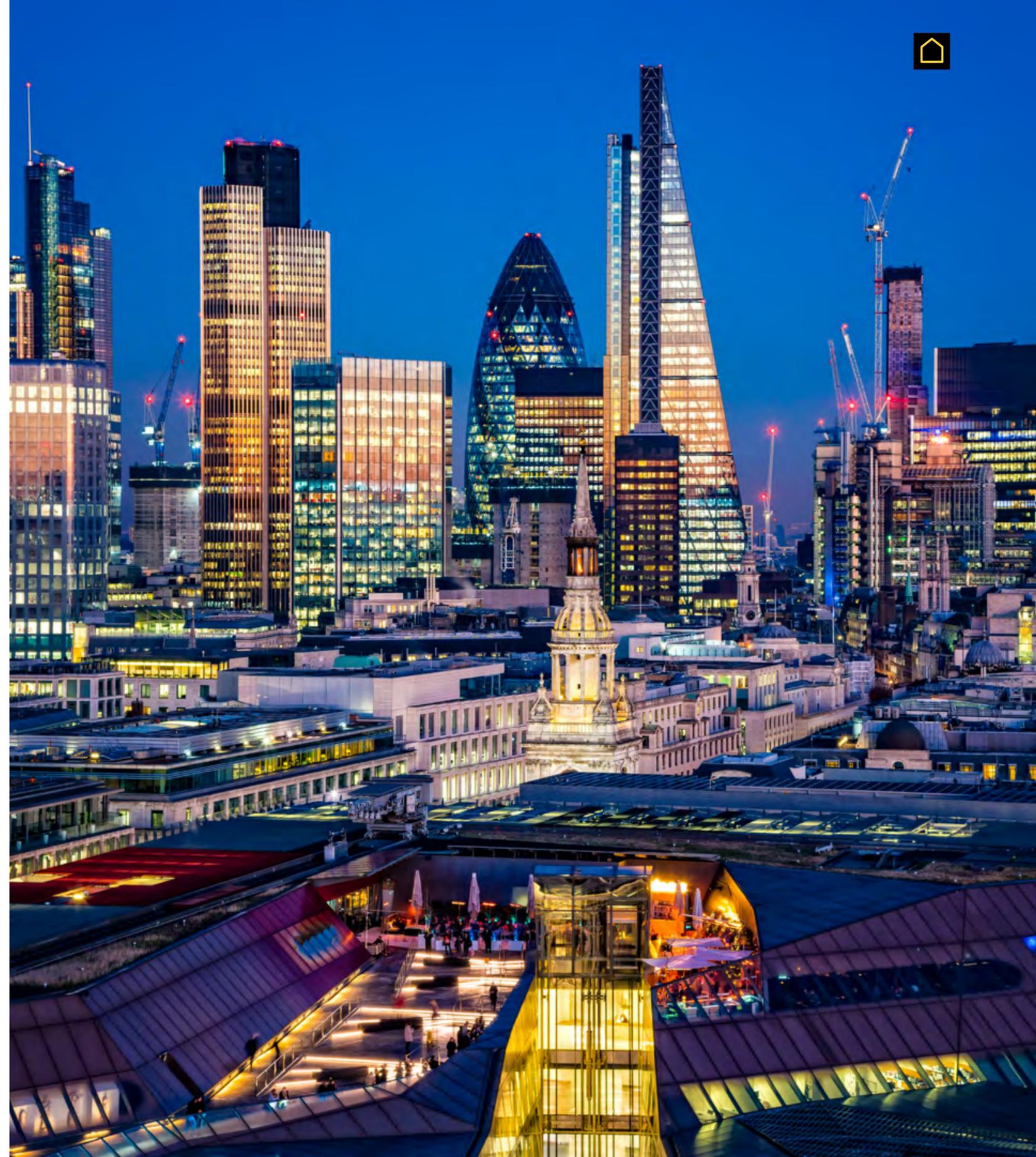
We rarely build the same thing twice, instead reinventing the wheel time and time again. We are great at developing prototypes, but rarely fully benefit from the learning generated by them.

Our industry is facing a skills and capacity crisis – as identified in the **Government Construction Strategy 2016-2020**, the **Farmer Review** and **Construction 2025**. If unaddressed, this will inevitably lead to a continued rise in tender costs and a reduction in the quality of our product and our capacity to deliver.

This ‘perfect storm’ offers a significant threat. To our reputation, our market share and our operating margin. If we continue to adopt the same historical approaches to design, manufacture and delivery, we can only expect to achieve the same outcomes.

One of the key pillars of Building on Better is a commitment to innovate and improve the design, planning and delivery of our products, ensuring a right-first-time culture.

Business as usual is no longer an option.





Our vision

We exist to build lives less ordinary, which means we need to deliver a 'Perfect Product' for our customers.

Unafraid to 'dream big', we will embrace innovative digital design and manufacturing approaches to deliver a revolutionary offer.

We will obsess about quality, and strive to get it right-first-time, every time – recognising that a quality product begins with great design.

We will create solutions that far exceed our customers' expectations in every respect and **dramatically improve our productivity.**

We will create a value culture where our people are encouraged to dream; and provide every opportunity to nurture these dreams into reality.

Together, we will construct our future.





Our mission

A quality product will continue to enhance our reputation with our customers long after we have completed our works.

We will recognise the dangers of complacency, and be passionately committed to the identification and promotion of innovative methods and products.

We will constructively challenge our existing approaches and improve the quality, efficiency, cost effectiveness, sustainability and end-user experience for our customers.

Engineered Value™

Our new approach – Engineered Value™ – will define our components, their methods of assembly and our key supply chain partners at the earliest stage possible. This will enable us to assess a project from a true manufacturing perspective; designing in certainty and efficiency at every stage of the process.

We will create a value culture where our people believe their good ideas will be listened to, explored, and implemented.

We will embrace the use of BIM, component-led design, Design for Manufacture and Assembly (DfMA), strategic procurement, and the promotion of Off Site Manufacturing (OSM) wherever beneficial.

We will drive up quality without additional cost through committed partnerships with key suppliers – whilst the fixed costs of factory production will help provide protection against market inflation and resource scarcity.

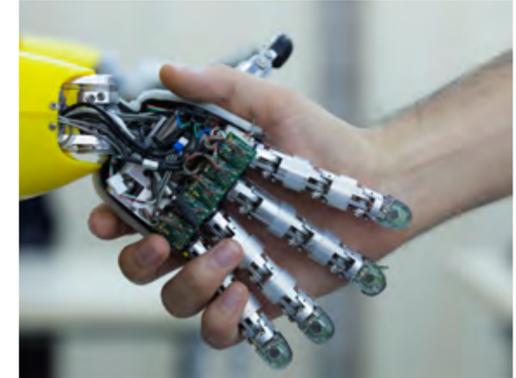
We will capture and connect key business metrics to enable us to quantify the impact of this strategy on our product and its delivery.

Our product is our legacy.





Our mission has already begun.





Engineered Value™

Engineered Value™ is based on a number of key cornerstones. Embracing these will:

- ✓ Generate new, disruptive market offers.
- ✓ Improve lasting product quality.
- ✓ Improve product performance in use.
- ✓ Reduce product capital cost.
- ✓ Reduce the environmental impact of our products.
- ✓ Maximise the use of off site/factory produced components.
- ✓ Minimise wet trades on site.
- ✓ Ensure our key partners feel part of our family.

Engineered Value™ will positively improve our productivity – lowering our prelims through improved delivery programmes and an associated reduction in on-site resource.

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Summary



Design for Manufacture and Assembly (DfMA)





We will fully embrace and adopt DfMA.

We will deliver higher quality buildings to our customers using fewer components, interfaces, and on-site resources.

We will use standard components. These will reflect our Mandated Supplier arrangements and be made available via The Yellow Book.

We will reduce the total number of parts by maximising the use of standard components and assemblies.

We will develop standard designs. Our Pre-Designed Solutions will be designed around modular design principles and assembled from our standard components.

We will design for ease of fabrication.

We will produce as many standard components as possible off site in controlled factory conditions. We will extend our existing Supply Chain Frameworks to cover all major building elements – for example cladding and envelope solutions, pre-fabricated groundwork solutions, etc.

We will design for ease of assembly.

In conjunction with all relevant iit Teams we will review our approach to procurement, logistics and programming from a DfMA perspective. We will promote ‘plug and play’ solutions.

Wherever practicable, we will eliminate wet trades from our construction sites.





The Yellow Book will be the foundation of our approach.

Our manual for efficient design, its solutions will capture proven, robust design choices, define our components and reinforce our commitment to design quality. It will promote value, ensure buildability, design out defects before they ever occur by capturing feedback and lessons learned from completed projects through our quality and aftercare teams, and enshrine our best commercial deals.

We will extend the scope of The Yellow Book from its current focus on education to offer guidance on each of our key sectors, sharing cross-sector learning wherever relevant.

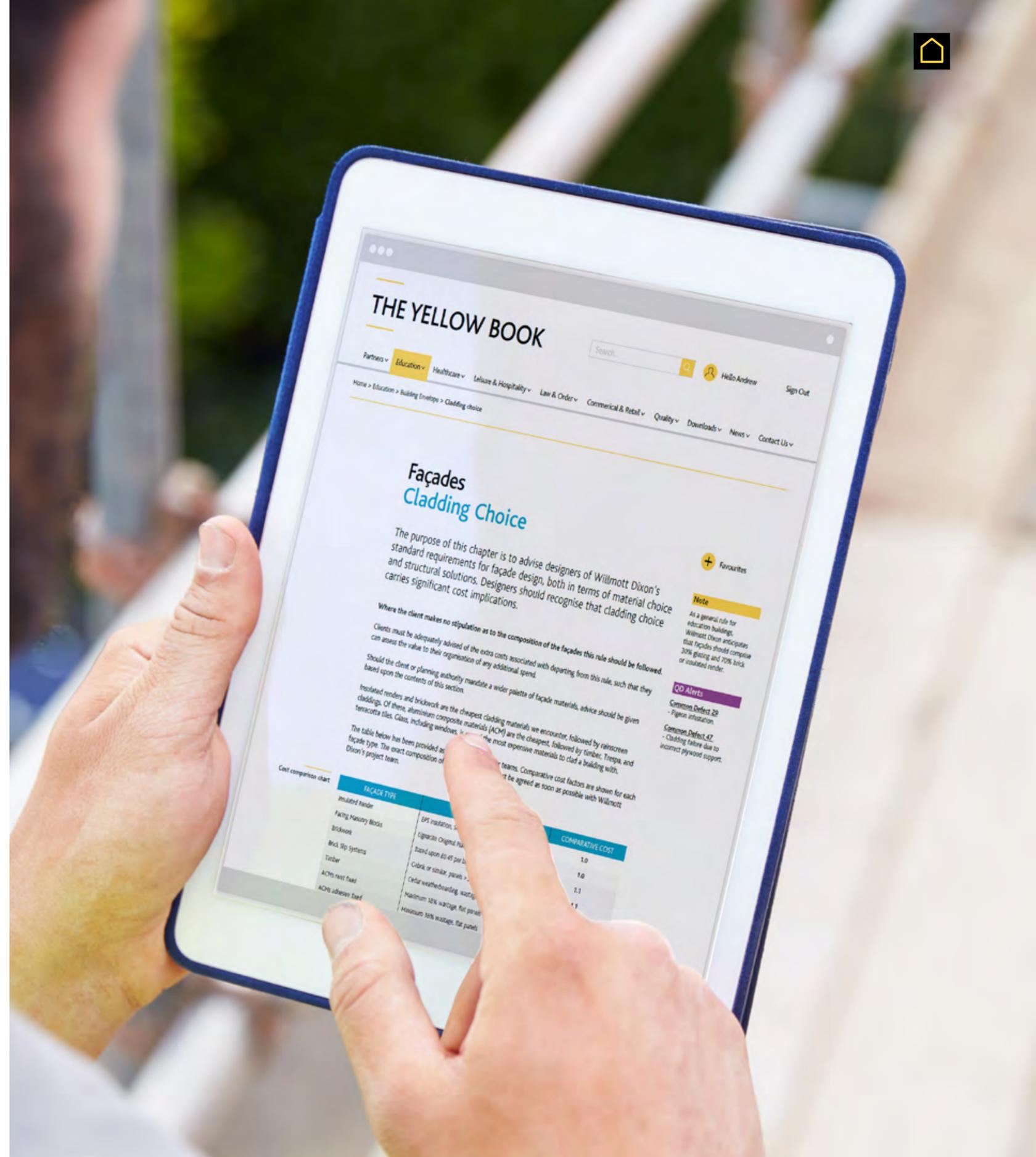
We will develop and launch a new, secure, digital platform
 – www.theyellowbook.online

A new, secure, digital platform
www.theyellowbook.online

This will provide our people, supply chain partners, customers and consultants with a fully searchable database of relevant guidance and best practice – including approved details, manufacturer’s details, BIM families, lessons learned and quality checklists/alerts.

We will identify and incorporate critical ‘touch point’ controls within our Management Systems to ensure adoption, and tools to generate a compliance score for each project – enabling Yellow Book adoption to be reviewed at both a company and LCO level.

The Yellow Book will be regularly updated with content produced by both our Sector and Design Leads, and our new **National Product Team**.



THE YELLOW BOOK

- Partners
- Education
- Healthcare
- Leisure & Hospitality
- Law & Order
- Commercial & Retail
- Quality
- Downloads
- News
- Contact Us

Façades Cladding Choice

The purpose of this chapter is to advise designers of Willmott Dixon's standard requirements for façade design, both in terms of material choice and structural solutions. Designers should recognise that cladding choice carries significant cost implications.

Note
 As a general rule for education buildings, Willmott Dixon anticipates that façades should comprise 20% glazing and 70% brick or insulated render.

CO Alerts
 Common Defect 29 - Pigpen infestation.
 Common Defect 47 - Cladding failure due to incorrect plywood support.

Cost comparison chart

FAÇADE TYPE	COMPARATIVE COST
Insulated render	1.0
Factory Made Dry Bricks	1.0
Brickwork	1.0
Brick Slip Systems	1.0
Timber	1.1
ACM's next best	1.1
ACM's adhesive based	1.1



Mandated suppliers





Our new National Product Team will work closely with both our central and regional Supply Chain teams to ensure that our Supply Chain Partners are at the heart of everything we do.

We will define and implement three distinct tiers of GOODS Suppliers:

- **MANDATED** – suppliers appointed under a Framework Agreement. These suppliers, and their products, must be specified and used where we are in control of the specification.
- **RECOMMENDED** – suppliers whose products offer proven solutions.
- **OPEN** – elements subject to a performance specification only.

We will work to extend our existing Mandated Supplier arrangements to encompass all major components for each key sector in which we operate.

We will forge closer links with our Supply Chain Partners to promote the sharing of knowledge and product development.

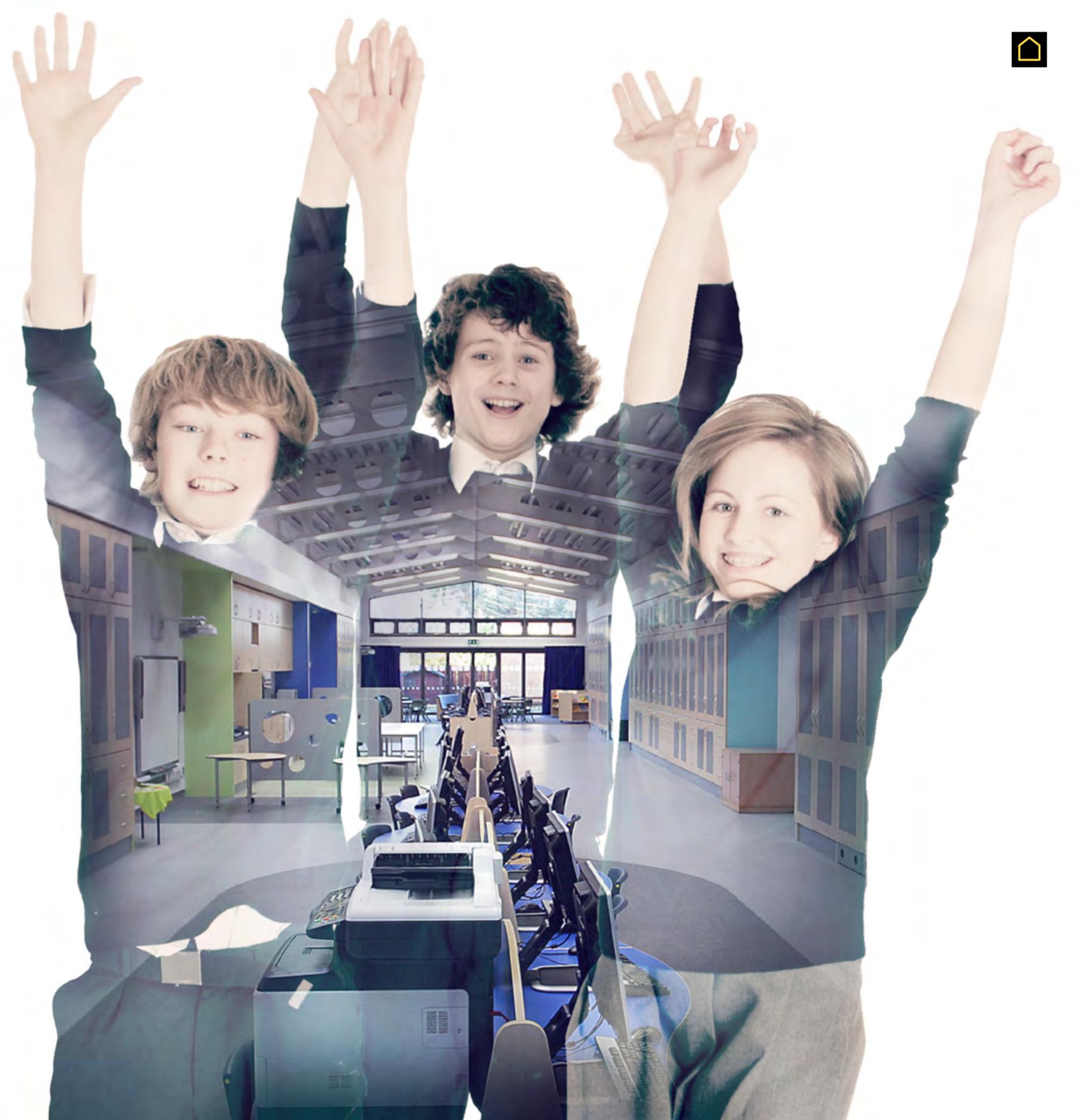
We will be Better. Together.

We will promote the use of Off Site Manufacturing wherever beneficial, and will create an OSM Supply Chain Framework covering each major technology.





Pre-designed solutions





We will actively promote and sell these offers as our ‘solution of choice’.

Each solution will be assembled from our standard components, designed in conjunction with our Mandated Suppliers, and include fully realised 3D (design), 4D (time) and 5D (cost) models.

As examples of success, our Sunesis and CODE products offer absolute guarantee of specification, programme and cost from Day One.

- **Sunesis** has successfully delivered over £180m of schools since 2010. Across over 40 projects and 18,000 new school places this has saved our customers over £4.2m compared to traditional alternatives.
- **CODE** offers Home Office-approved pre-designed custody solutions, with a current pipeline of over £100m.

In the future all of our products will offer the same differentiators.

To maximise design efficiencies and ensure consistency, the development and maintenance of these solutions will be managed by a new **National Product Team** – in conjunction with our sponsor LCOs.

We will invest to create solutions for each of our core sectors.



sunesis™



R&D partnerships



Research and Development
New Technologies
Improvement
Digital
Investigation
Verification
Observation
Analysis

Ideas
Creativity
Knowledge

- > Products
- > Materials
- > Processes
- > Revolutionary
- > Disruptive
- > Imagination
- > Examination



We will create innovative R&D Partnership Agreements with leading academic bodies and our key Supply Chain Partners.

The average business spends less than 5% of its revenue on research and development (R&D). Innovation is the only sustainable competitive advantage a business can have – however the costs and risk involved in such initiatives often limit such investment.

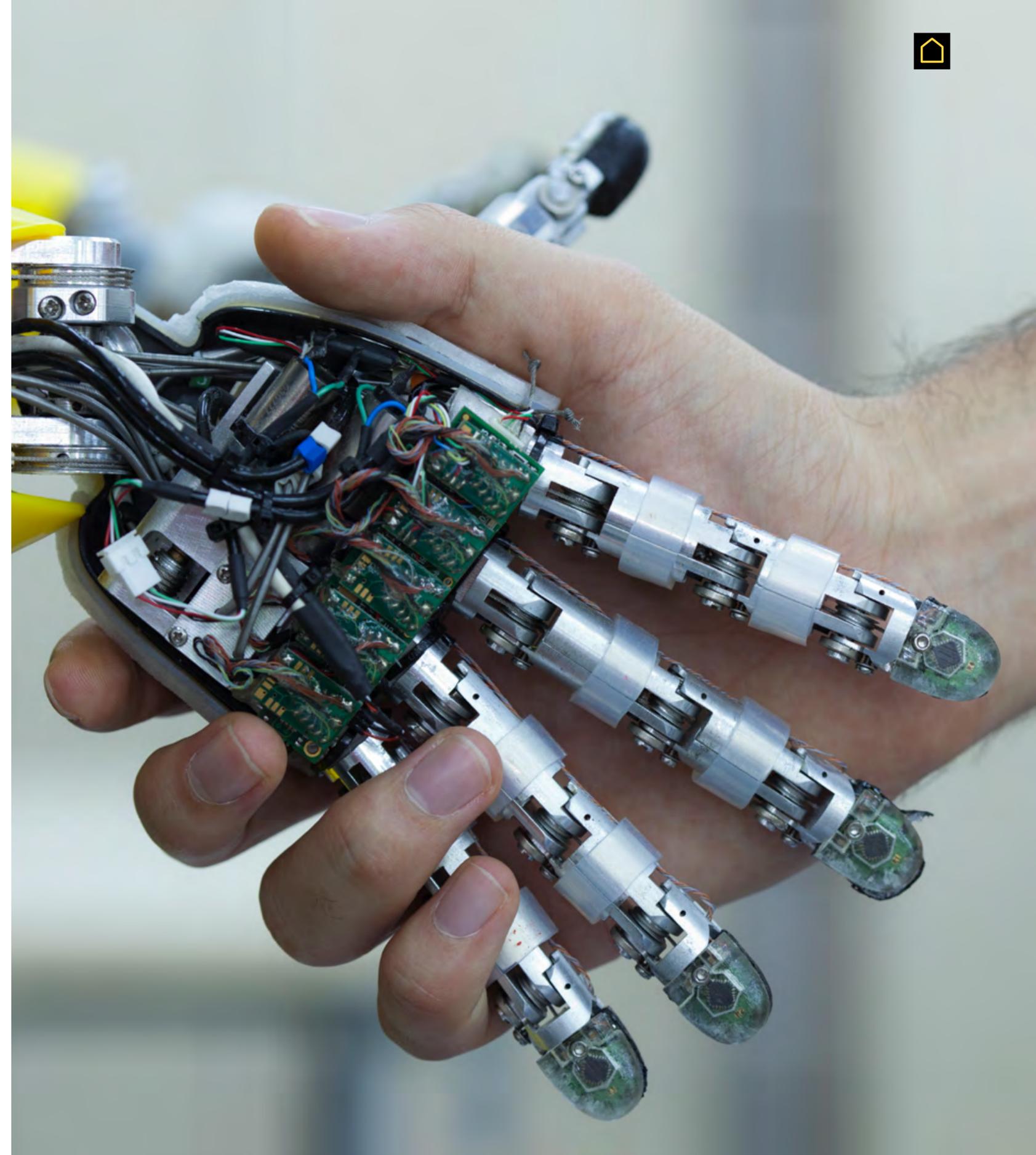
Creating R&D partnerships will offer us a way to address this.

These partnerships will connect us with the best people, advance our thinking, and help us to:

- ✓ Stay ahead of our competition.
- ✓ Decrease our time-to-market for new solutions – by pooling resources like funding and special knowledge with partners, we will be able to produce results faster than if we develop them alone.

- ✓ Benefit from resource sharing – providing the opportunity to improve our own systems and offerings without investing in often costly assets like prototyping equipment, etc.
- ✓ Access new markets.
- ✓ Capitalise on R&D tax incentives.

We will stimulate the creativity inherent in our people by establishing a National R&D Fund to see their dreams developed into reality.





Design and technical capability





We will establish Gateway design reviews to ensure that we meet cost, time, and quality requirements at every step of the design journey.

Peer review groups – formed from LCO personnel not directly involved in the specific project – will undertake a new, constructive design critique process.

We will develop a design management training plan, and deliver this to our people. It will:

- Focus on both the traditional practical aspects of design management (ensuring design/product quality, cost control, etc.) and our Engineered Value ethos (The Yellow Book, Pre-Designed Solutions, DfMA, OSM, Digital Construction).
- Be developed and delivered in a structured manner and facilitated both internally and externally as appropriate.

We will align our Standard Appointment Deeds with the RIBA DfMA Plan of Work, The Yellow Book and CIC BIM Protocol.

We will establish a new Design ‘Board’ to help share our local expertise across the wider business.

In conjunction with our iit and Supply Chain Teams, our new National Product Team will:

- ✓ Develop and maintain **The Yellow Book** and our **Standard Components Library**.
- ✓ Develop and maintain all existing and future **Pre-Designed Solutions**.
- ✓ Provide central design leadership.
- ✓ Manage all relevant **Mandated Supplier Frameworks** and our new **Off Site Manufacturing Framework**.
- ✓ Manage our new **Central R&D Fund**.
- ✓ Ensure that **project-based learning is captured and shared** for the benefit of all.

Our aim will be to pro-actively influence and manage the evolution of each design so that we always present deliverable solutions.





Digital construction





We will harness the potential of existing and emerging digital construction to enhance the lives of our Customers, People and Supply Chain, and inspire and attract the next generation.

We will help deliver our 2020 Digital Strategy through the establishment and maintenance of our own library of BIM families – each created in conjunction with our Mandated Suppliers and hosted on The Yellow Book Online.

Virtual Reality (VR) will enable us to navigate and interact with a virtual copy of our buildings before any work starts on site – speeding up and optimising feedback, enabling better, more informed design decisions to be taken earlier in the design process.

Augmented Reality (AR) viewing will enable our BIM models to be transposed directly onto a real site, enabling everyone on our projects to be able to visualise exactly what the finished product will look like.

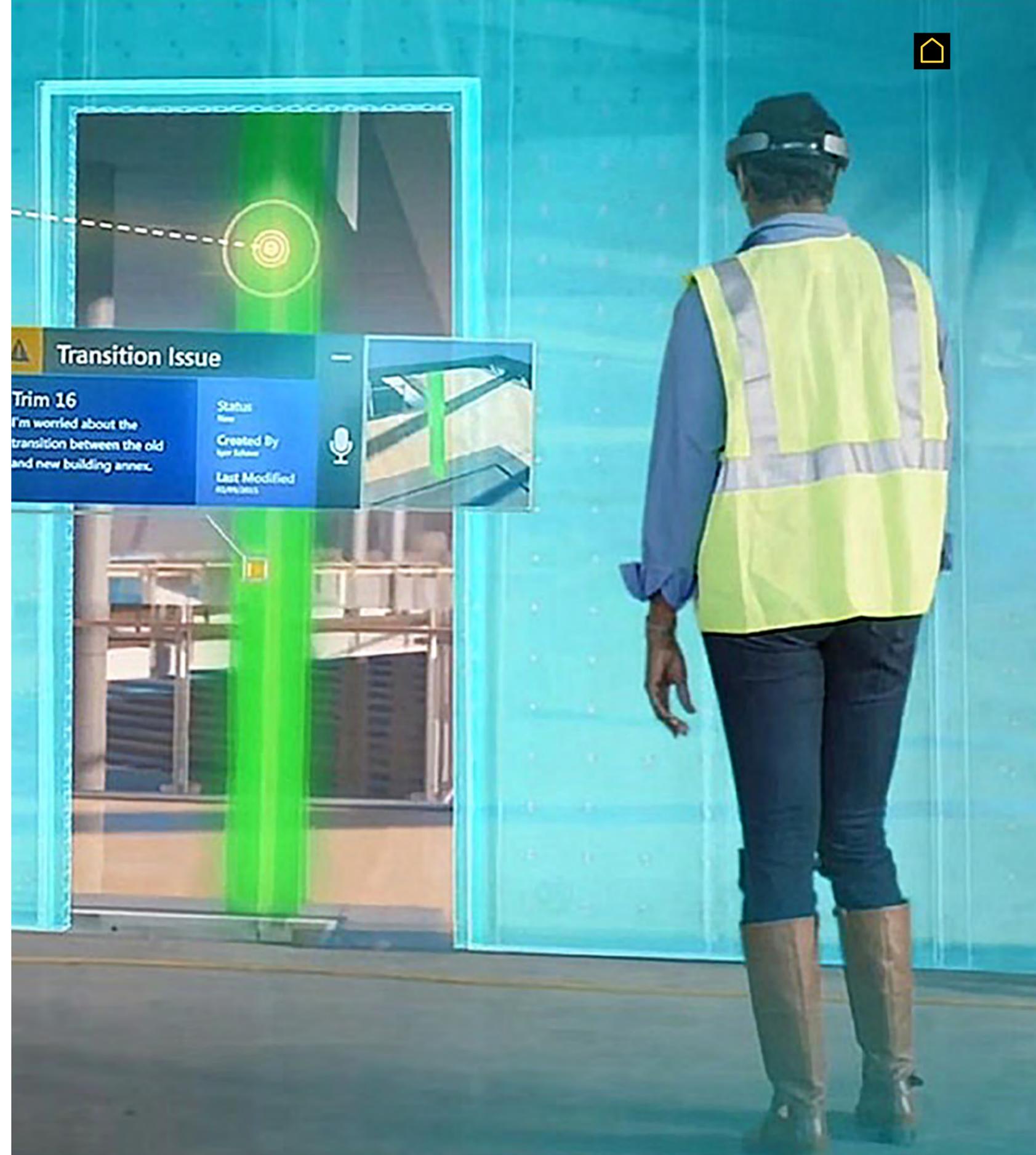
3D Printing – we will invest in the capability to create our own 3D printed models, and investigate the potential of larger scale 3D printed solutions (for example concrete printing).

We will establish a central library of high quality drone footage and ‘virtual walkthroughs’ of our projects.



The Future of
Building Better

Through digital construction we will raise our stakeholder engagement and bidding approaches to the next level.





Summary

Business as usual is no longer an option if we are to continue to Build on Better and delight our customers.

This strategy represents the first step in our new journey, but many equally important ones lie ahead of us.

If you would like to play your part in Constructing our Future we would love to hear from you.

A handwritten signature in black ink, appearing to read 'Tim Carey', positioned above the name and title.

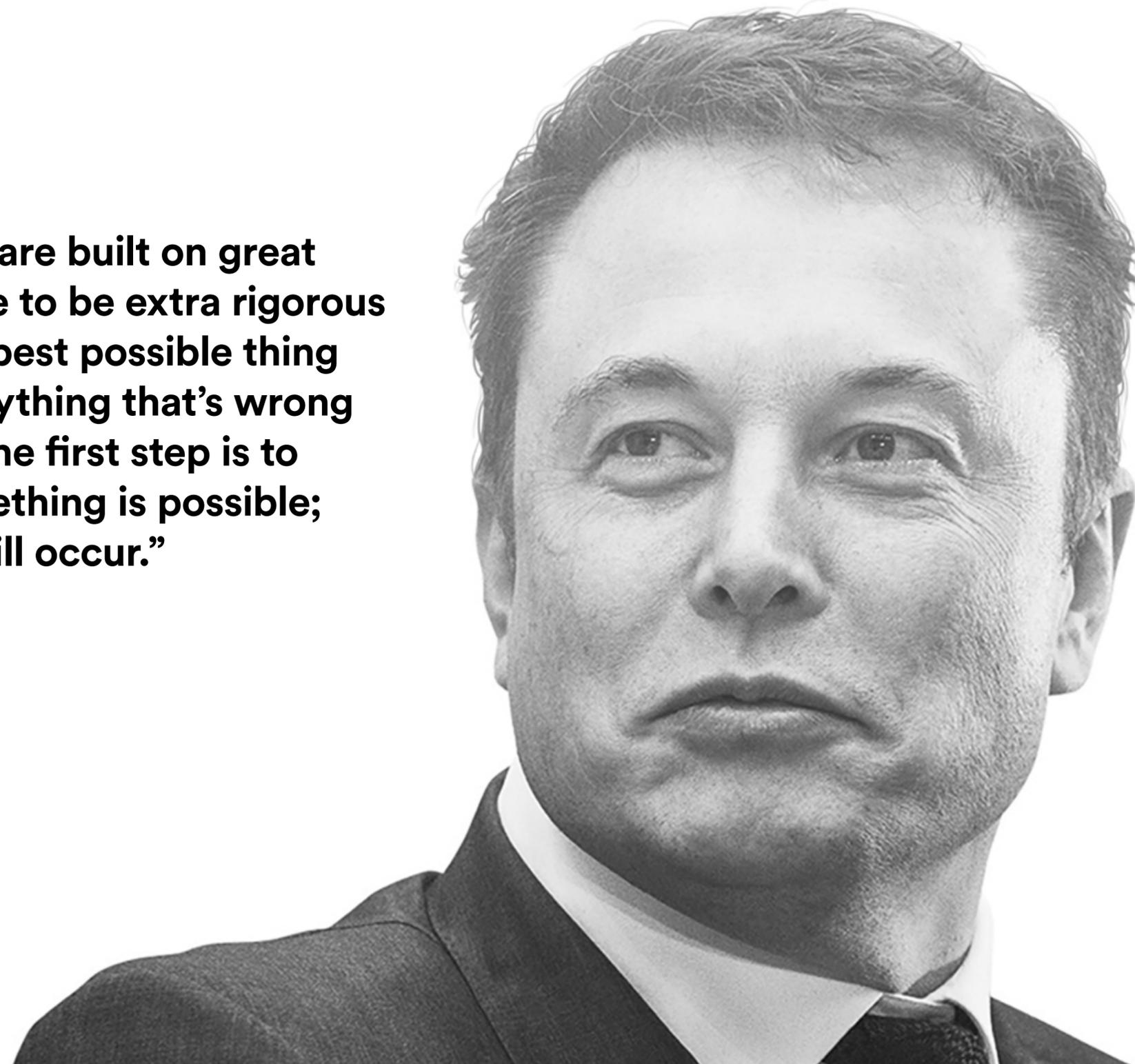
Tim Carey
National Product Director





“Great companies are built on great products. You have to be extra rigorous about making the best possible thing you can. Find everything that’s wrong with it and fix it. The first step is to establish that something is possible; then probability will occur.”

Elon Musk
SpaceX, Tesla and SolarCity





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