SMART PRACTICE CONFERENCE NEW WAYS OF WORKING 1.10.2019

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# How to use

Welcome to your interactive Delegate Resource Pack. We would like to take this opportunity to thank you for attending the RIBA Smart Practice Conference 2019. We hope you had an insightful and inspiring day. This document offers a summary of the insights shared throughout the day and links to recordings of all presentations should you wish to watch them again.

#### Click here to view the speaker presentations

Clicking on the icon below will take you to the video recordings.



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# WELCOME Alan Jone<u>s, RIBA President</u>



- Architects are facing challenging times both economically and politically. The profession must address its challenges with creativity, determination and a clear view of its value to society.
- There are two key themes to Smart Practice 2019: collaborative practice; and innovation in design and construction. Both require a shift in the architect's mindset and both are opportunities for the profession to reclaim a leading role.
- Taking on greater responsibility brings risks but also opportunity. Feedback from the 2016 RIBA report 'What clients think of architects' offers valuable insights into client expectations.

- To participate more widely in society as a whole, we need to be a more communicative discipline. Architects need to define and articulate our value proposition.
- Today's political and environmental situation requires collaboration at an international level. The profession should seek to build connections with practices and organisations in other nations.

# PUNCHING ABOVE YOUR WEIGHT THROUGH COLLABORATION Tomas Stokke, Director, Haptics Architects



#### Growing a practice via collaboration

- Collaborating with other practices can allow a small practice to move into entirely new sectors and work on new building typologies they previously had no experience of. They are also more likely to be working directly with senior staff or the practice's Principal.
- High-profile collaborations can provide a publicity boost for an emerging practice
- This process can be costly and frustrating at times: it may take many years for such collaborations to pay dividends. However, Haptic Architects has moved from working on domestic house extensions to designing major projects in less than ten years.

#### Identifying potential for collaboration

 Spotting opportunities for collaboration requires vision and imagination.

- Projects that others might reject as unpromising or un profitable might contain untapped potential, given a little lateral thinking.
- Large practices should bring in smaller practices rather than rejecting a project on the basis that it is too modest. Collaboration can reduce risk in terms of time and resources.
- An enthusiastic client and an exciting brief can compensate for projects with a challenging budget or which have a very tight time-frame.
- Small practices should examine what special skills they can provide: for example, they might excel at early-stage work such as community engagement; making models and graphics that capture local residents' imaginations; or viability assessments.

 Collaborative projects will invariably involve partners based in multiple locations, for which possessing BIM (Building Information Modelling) capabilities is essential.

### **Building bridges**

- Practices should tap into their local and international connections. Many UK-based practices have a cosmopolitan, international body of staff who can spot opportunities in their countries of origin. There are numerous European competition portals, for example.
- Make the most of networking events such as MIPIM, or those organised by New London Architecture (NLA). A practice can also proactively set up its own networking groups and events to expand its profile and connections locally and internationally.
- A small practice may be able to act as a bridge between the more obscure opportunities and the large practices with the resources to take them on.
- A successful collaboration will often lead to follow-up work in the same sector; especially when working in a specialist area such as infrastructure.

## Successful outcomes

- The designs resulting from practice collaborations can be much greater than the sum of their parts.
- A less experienced partner can provide a fresh perspective and question standard assumptions.
- Collaboration can enable a practice to understand the dynamics of large teams in large-scale operations.

### Potential pitfalls

- If the financial rewards are only modest, it is crucial to ensure that a collaboration will benefit a practice's reputation or business growth trajectory.
- Agree how credit is to be assigned upfront. Partners in a collaboration should agree a 50/50 split of the design credit, unless one party carried out significant work prior to the other's involvement.

### Key takeaways

• Create win-win situations, find ways of beating the odds, build bridges, exploit your uniqueness and make friends.

#### **Thomas Stokke's presentation**



# DISRUPTING THE PROCUREMENT LANDSCAPE: LESSONS ON INTEGRATED PROJECT INSURANCE

Panel Discussion chaired by Russell Curtis, Founding Director, RCKa



# Introduction Russell Curtis, Director, RCKa

- Since the publication of the Latham Report in 1994, little has changed. The construction industry remains litigious and combative, only the power has now shifted from architects to contractors.
- Too often a project may produce neither a quality building outcome nor the anticipated financial return.
- New collaborative procurement, such as IBA (Insurance Backed Alliancing), point to a possible solution.

# Collaborative procurement models Katie Saunders, Partner, Trowers & Hamlins

 In the aftermath of the Egan Report (Rethinking Construction, 1998), responding to the prevalence of litigation in construction projects, a new emphasis on 'partnering' began to feature in construction appointments.

- Contracts such as PPC2000 and similar NEC contracts appeared to signal a new era, with an emphasis on collaboration. However, the recession of 2007 saw terms of appointments drifting back towards an adversarial state.
- Today, 'partnering' tends to be less commonly used than terms such as 'alliancing' or 'collaboration', but the ambition to change the compartmentalised relationship between parties remains the same.
- The Government Construction Strategy 2025 strongly recommended: early contractor involvement; collaboration; and transparency in projects. The GCS first suggested Integrated Project Insurance (IPI) as a model in 2011.

- The Hackitt Review again urged early contractor engagement, alongside the importance of transparency of information and the appointment of an individual in the role of quality assurer.
- Early recommendations of the Building a Safer Future consultation include:

**1.** transparency on price within procurement and an end to selection based predominantly on the cheapest offer;

**2.** information about materials and designs to be shared among parties rather than held by only the client; and

**3.** giving a more integrated role to the contractor and designers.

#### What do collaborative contracts offer architects?

- Clarity on roles and responsibilities, as well as the overall budget and timetable.
- A reduction in risk for all parties: it becomes clear whether there is duplication of work within the project or an omission.
- Greater likelihood of retention of an architect throughout the project.
- Better integration with other professionals, contractors and the supply chain, including subcontractors.
- Control over the quality of the building and participation in decisions over value engineering.

#### Can a contract change the procurement landscape?

- The most successful examples to date of multi-party, collaborative contracts have been in large projects: these are in the public eye, with reputations at stake, so there has been an impetus for change.
- The principles of collaborative, multi-party contracts could equally be applied to small projects, especially mechanisms such as:
  - 1. early engagement of architect and contractor;

**2.** the creation of a core project team and a schedule of obligatory progress meetings;

3. other establishment of mutual duties of care;

**4.** the commitment to sharing cost and design information;

**5.** the creation of ways to resolve disputes without blame or litigation.

 To change procurement, these mechanisms need to be backed by insurance. A supportive insurance structure can prevent parties drifting back into a binary adversarial relationship

#### The client's perspective

Hannah Fox, Director of Projects and Programmes, Derby Museums

- For the Museum of Making at Derby Silk Mill, the client, Derby Museums, was concerned about potential cost overruns and litigation under D&B. They decided to adopt the IPI (Integrated Project Insurance) model.
- As equal partners in a collective committed to delivering the best for the project, all parties are aware how much money has been spent and whether the programme is on track.
- Significant issues that could scupper a project (e.g. the lease or wayleave agreements) become concerns for the whole group; problems that all parties have a common interest in solving.
- Team members share their skills and knowledge, and develop a better understanding of the client's goals and ambitions, leading to greater than normal generosity with their time.

#### Challenges of an IPI agreement

- Stakeholders require an extra level of briefing in order to understand and agree to the IPI method.
- Public-sector funding traditionally involves a great deal of reporting and monitoring. The costs and activity of an IPI project have to be translated to fit the setup of funding departments.
- If the client only has a small team, the governance-heavy aspect of IPI can challenge capacity: as a partner, the client must participate in many more meetings.

#### How IPI can improve traditional construction

- IPI could shift the expectation that capital projects always go over budget: it manages public funding much more efficiently at a time when public sector investment is hard to secure.
- Risks are reduced all round, not only to the public's money.
   Financial risks to suppliers and the risks that accompany innovation are also minimised.

# The principles of Integrated Project Insurance Kevin Thomas, Director, Integrated Project Initiatives

- IPI is a new type of procurement method, based on alignment: a process in which all parties are stakeholders with a vested interest in a project's successful outcome.
- It is based on a multi-party alliancing contract. The same terms and conditions are issued throughout the supply chain and it has a 'no blame, no claim' ethos.
- Produced in partnership with the insurance industry, IPI is not an insurance product per se, so much as a delivery mechanism with insurance attached.
- IPInitiatives is currently the sole provider of IPI, but it hopes to roll it out to the wider industry at the end of its trial period. It is currently best suited to complex projects, although an 'IPI lite' is planned.

## Tendering, appointments and set-up

- The team is appointed purely on the basis of their skills and capabilities. Applicants are invited to tender via OJEU and applications are assessed solely on quality, not on cost.
- A shortlist of applicants is drawn up and their compatibility tested in a series of workshops.
- Once appointed, the team uses the client's budget to calculate the best project solution for the money available.
- The team uses a project bank account to ensure there are always adequate funds for all parties to be paid regularly and to maintain financial transparency.

### Insurance considerations of IPI

- IPI does not require PI Insurance (PII). The cost of an IPI project is therefore excluded from any party's annual PII premium.
- A twelve-year latent defects insurance is employed, together with a built-in cost overrun insurance mechanism.
- Facilitation services are provided by IPInitiatives to make sure the team remains collaborative.





#### Key benefits of IPI

- IPI de-risks construction, delivering a better quality project at a lower total cost. The asset it delivers is operationally proven: it is not handed over unless it works.
- IPI protects the client's team, all suppliers and the project itself from 'silo' behavior. It is not possible for one party to be successful at the expense of someone else.
- All can decide their maximum liability at the project's start via a 'pain/gain' mechanism. A party's 'pain share' equates to their contribution to any excess on the cost-overrun insurance.
- A no-blame culture is encouraged, in which problems or mistakes are jointly resolved.

# The contractor's perspective Gareth McGill, Project Lead, Speller Metcalfe

- IPI's emphasis on early engagement with the client and design team allows the contractor to assess the programme, cost plan and design before the project is properly underway.
- Getting onto the site early and carrying out some investigative surveys allows contractors to anticipate any problems.

### The benefits of collaboration

- There is lower commercial risk in a collaborative contract: everyone is in it together and risk is shared.
- Additional profit can be won if the project outcomes exceed the client's criteria for success.
- The team works hard to protect each other's interests: this
  is a qualitatively different type of collaboration to merely
  trying to supply what the client wants.

#### Implementation challenges

- There are new processes to understand and thus a steep learning curve for contractors concerning what is expected at meetings and the reporting tools that must be used.
- The supply chain needs to have the working principles of IPI explained to them, in particular IPI's principle of all parties working to the jointly determined budget.
- At times members of the team fall back into default working behaviour. Conversely, teams can sometimes be too collaborative: this can prevent agreement over tough but necessary decisions.

#### The architect's perspective

#### Irena Bauman, Director, Bauman Lyons

- The IPI model aligns with many of Bauman Lyons core values in securing fulfilling work and in working collaboratively.
- There is very little administrative work; digital tools mean that key decisions and actions are recorded and shared online without the need to take copious notes.
- Practices learn a great deal about buildability and the logistics of construction through the collaborative process.
- The shared knowledge and expertise of the project team is an invaluable resource: problem-solving is quicker and easier in a supportive collaborative environment.
- The practice benefits from a reliable cash flow, receiving monthly payments from the project bank account.

#### **Challenges of IPI**

 The downside of a group dynamic is that consensus prefers the middle. Given that the incentives for success are purely financial for partners, less quantifiable considerations such as sustainability are therefore potentially at risk.

#### Katie Saunders' presentation

Hannah Fox, Kevin Thomas, Gareth McGill and Irena Bauman's presentation



# BUILDING COMMUNITIES Dr. Jan Kattein, Director, Jan Kattein Architects



#### The collaborative nature of architecture

- Architecture is not just about buildings and spaces: it is about people.
- It is always a collaborative process: the buildings themselves are almost a by-product of providing a solution to a people-focused problem.

#### The context of high-street regeneration

- London has over 600 high streets. Two-thirds of Londoners live within five minutes' walk of a high street.
   Out-of-town retail space has increased by 30% over the last decade, while online retail continues to have an impact on high-street units.
- While there has been heritage and transport investment in the UK's high streets since the 1960s, the pursuit of civic goals and community benefits is relatively new to high street regeneration.

#### Common challenges

- High streets that cross multiple boroughs are problematic: the logistical problem of engaging with several neighbouring boroughs is a big obstacle.
- Forward-thinking councils appreciate that in times of austerity or recession, investing in the public realm can pay dividends.
- Disparate ownership of buildings in a high-street terrace makes identifying the responsibility for maintenance and improvements a challenge.

#### Who are the clients?

 There are frequently over 50 clients in a typical high street regeneration. Stakeholders comprise family businesses, customers and community members that span generations.



#### Regeneration is more than filling empty units

- Design is a tool to build a communal vision. The success of a high street is not just about filling empty shopfronts but in instilling a sense of community investment in itself.
- There is potential for underused local authority assets to be transformed, be it into temporary workspaces, pop-up arts spaces or community centres.
- Solutions may be profoundly simple. The key to one regeneration project in Sutton amounted to investing in neon signage to alert locals to their valuable night-time economy.

#### Identifying challenges and solutions

- Projects may have no specific vision or well-defined brief at their commencement: this takes shape via discussions with locals at grassroots level.
- There is no one-size-fits all approach. Every high street, terrace and retailer is different.
- A successful regeneration strategy is responsive to its socioeconomic context, but also to local idiosyncrasies.

#### Encouraging community involvement

- Identifying a focus of engagement for the community can unlock a high street regeneration. This might be a local school: providing workshops for schoolchildren can be more successful than devising impressive designs.
- Beginning a community project with a party is a strong start. Children enjoy designing and making things: they make great advocates for community projects, spreading the message exponentially to families and friends.
- Other simple interventions, such as painting a building a striking colour, immediately shift perceptions and signal transformation.
- Transparency is key to maintaining community engagement. The whole planning process can be made visible, via models and drawings, in a shop window or gallery space at street level.

#### Practical boundaries of community involvement

- Inviting community input should not inhibit an architect's high design ambitions for a project.
- Collaborating with communities is not simply about building everything the community wants. The architect should provide guidance and facilitation, translating their ideas into workable solutions.

### Bringing in volunteers

- Designs at a human scale allow locals of many different skill levels to take part in construction. Materials are also more likely to be available from local suppliers.
- All ages and demographics should be encouraged to participate. There are tangible community benefits in training-up apprentices and in involving disenfranchised community members.
- Working hard for a day, learning valuable skills, meeting new people and receiving a free lunch has proven to be a winning combination for communities.
- Charities, schools and housing associations are accustomed to dealing with the insurance aspects of managing volunteers. Depending on the project, it may be possible to hand over insurance matters to the client organisation.

### Providing experience to young architects

- Community projects involving volunteers can also be a valuable way of providing early-career site management and hands-on construction experience to architects.
- Architecture students can also gain practical experience of engaging with planning departments and community stakeholders.

Jan Kattein's presentation



# REINVENTING MATERIAL PRACTICES IN ARCHITECTURE Prof. Mette Ramsgaard Thomsen, CITA, KADK Copenhagen



#### Computation and fabrication

- Material science was coined as a term in the 1940s. It was the precursor to today's rethinking of materials as something we compose rather than merely select and apply.
- The interface between computation and fabrication is increasingly transformational regarding materials.
   Computation, 'big data' and machine learning are radically increasing the possibilities of fabrication.
- Research in this area spans both the application of existing technology and more speculative work, examining possibilities some 10–15 years ahead.
- While mass production places us at one remove from materials, computation enables a fine-grain, microscopic analysis of materials such as timber.

 Digital fabrication enables working with existing materials in new ways; but also can revive traditional ways of working via new materials.

#### **Resource consumption**

- UN Sustainable Development Goal 12 seeks to ensure sustainable consumption and production patterns and stresses that urgent action is needed to prevent the over extraction and degradation of environmental resources.
- Construction today is heavily dependent on concrete and steel. Production is carbon intensive and resources are finite, basic components such as sand are starting to run out in the face of rising global demand.
- It is therefore imperative to rethink construction and work towards hyper-optimisation of material use.

#### Understanding material properties

- Digital tools such as advanced imaging and remote sensors allow the analysis of materials at an almost cellular level and their custom application to specific performance requirements, reducing waste in construction
- Microtec Goldeneye, for example, is a multi-sensor scanner that can be used to optimise wood for use. It identifies optimum points in terms of knots or quality lamella (top layer), determining where to cut beams for best placement in construction, minimising waste.
- Prior to cutting, entire forests could be 3D scanned, so that felling and cutting happens strategically, thereby further optimising timber usage.

#### Lightweight structures

- Using structures familiar from pop-up tents, new structural systems can be devised to frame knitted membranes, which are light and flexible but can nonetheless achieve stiffness.
- Knitting is an additive process that involves no cutting, thus minimising wastage and making the most of resources.
- Knit is a good prototype for scrutinising what happens when architects become active designers of materials, not simply creators of artefacts that use them.

## Harnessing the properties of biomaterials

- Construction material usage is dependent on the geosphere of non-renewables; it needs to move towards the biosphere of renewables.
- Biomaterials are abundant, inexpensive and chemically versatile. They can facilitate transition from a culture of cutting and throwing away towards additive material practices.
- CITA is conducting research into the uses and characteristics of various biomaterials, and examining ways of fabricating these materials
- One significant property of certain bacteria is their ability to de-pollute air: this is but one instance of potential biomaterials usage in the built environment.
- While much of this work is speculative it is not abstract. There is a grassroots maker movement of bio designers in the UK, who share 'recipes' online and, for example, make their own plastic.

#### Mette Ramsgaard Thomsen's presentation



# LEARNING FROM THE PRODUCT DESIGNER MINDSET Bruce Bell, Director, Facit Homes



#### The benefits of a 'manufacturing' approach to construction

- Ensures consistency in the creation of excellent quality homes. Clients want certainty that a project will be delivered on time and on budget.
- Enables a practice to become a 'one-stop shop'.
- Usage of standardised core components, such as chassis, window details and heating systems, for every project increases efficiency while parametric design allows every house to have a different look and feel.
- Enables greater efficiencies, such as the manufacture of parts that are impossible to fit incorrectly.
- Use of standardised components improved iteratively by BIM results in buildings that surpass regulations for energy performance.

#### Continuous evolution in business and practice

- The application of digital solutions into practice is a learning process, requiring an iterative, self-critical approach to business models and workflow methodologies.
- Do not be afraid to radically alter processes and even completely revise everything from scratch several times.
- After years of continuously evolving of designs and technological applications, Facit Homes has established a fully automated process.

#### Key considerations in a manufacturing approach

 Examine each aspect of design and construction and ask the question 'how could we "productise" this? Often the preferred solution will be a kit system.

- Far too much time and energy is wasted in a traditional building process through duplication: builders on site reworking what others have already done. Whereas the chassis of a car, for example, is complete when it leaves the factory.
- Rather than designing a frame, Facit are designing a chassis. Like all structural products Facit use, it is designed using BIM and manufactured from a library of standard components.
- Such components libraries are invaluable, but a large one is difficult for a small practice to maintain. The number of components should be kept to an essential core.
- It is an approach that works well for new builds, but their application is currently limited with regard to existing buildings; interventions to existing buildings are inevitably reactive.

#### Digital transformation across the board

- The opportunity for transforming construction depends less on the use of modular or panelised systems than a focus on across-the-board use of digital tools.
- Instead of merely mechanising processes that have existed for years, digital tools allow the manufacture of components that could not be made by hand and entirely new working processes.

 This does not mean that all construction needs to be carried out offsite. A CNC machine can be installed onsite, for example, and new designs submitted to site by email to maximise efficiency in a project with a fast turnaround.

#### Agile and flexible design

- Digital tools allow for the rapid development of a design, the prototyping of components and their manufacture.
- This extends to significant changes of direction in midproject. An entire floor can be redesigned, moving from an idea to a working prototype to a fully operational version over the course of a day.

#### The future of Design for Manufacture & Assembly (DfMA)

- DfMA does not remove creativity from design; it simply facilitates better buildings.
- It is likely to become de-centralised: large factories are cOstly to develop and subject to boom and bust, while a network of smaller suppliers can respond flexibly to demand.
- Making the most of DfMA requires more collaboration and a lack of hierarchy between industrial design and architects. This is a challenge for traditional practices.

#### Bruce Bell's presentation



# CLIENT STRATEGIES IN DESIGN FOR MANUFACTURE AND ASSEMBLY Russ Edwards, Design & Technical Director, Lendlease



#### The client's view of DfMA

- Lendlease is both a developer and contractor. It aims to double its annual output of homes and reach a target of around 1500 homes per year without doubling the size of its team. It also seeks to improve quality, safety and sustainability across its output.
- There are three imperatives for the housing client: 'investability', deliverability and scaleability.

#### Application of DfMA methods

- DfMA methods lend themselves to small-scale affordable housing. Modular construction sped up the total build time of Pocket Living's housing scheme in Mapleton Crescent, Wandsworth, by around 6 months.
- Timber and timber products, such as CLT (cross-laminated timber) have a valuable part to play in DfMA projects.

dRMM's Trafalgar Place scheme of 235 homes demonstrated CLT's value in large-scale residential projects.

#### DfMA does not necessarily mean offsite construction

- There is a balance to be struck between offsite, onsite and near-to-site construction. DfMA does not preclude onsite work.
- As part of Lendlease's housing delivery for local authorities, it agrees to provide skills and training: this is an activity best conducted onsite.

#### Key performance indicators

 To ensure good decision-making, Lendlease assesses its options in materials or technologies against a range of key performance indicators, including: safety; customersatisfaction; commercial advantage; productivity; design metrics; and sustainability.

#### Financial backing for DfMA

- DfMA projects are generally quicker and cheaper, with sustainability and programme advantages, so are appealing to those financing them.
- Any qualms tend to be over perceived shortcomings of the look of modular buildings and misconceptions about their build quality.

#### Safety issues and regulatory advantages

- Offsite construction can improve health and safety, placing workers in an environment that is easier to control.
- The introduction of regulatory advantages for DfMA would encourage its uptake: if Building Control regarded factory-based performance testing as advantageous, for example.
- Adoption of DfMA principles could be made a material consideration by planning departments.

#### Obstacles to implementation of DfMA

- New skill sets are needed within the construction industry, which requires significant re-training.
- More manufacturers need to set up shop. Currently, delivering 1500 homes per year using modular construction would require the entire existing capacity of modular manufacturers in the UK.
- The construction industry's digital tools are not fit for purpose in the context of DfMA.

#### Minimizing waste and optimising production

- DfMA can reduce waste and cut down on the overall amount of materials used. It is essential in addressing whole-lifecycle carbon impacts.
- For every £1 currently spent on a UK building projects, only 50p is manifested in the asset. A significant part of the rest is in risk and transaction costs. DfMA allows us to interrogate that gap and identify opportunities for efficiencies.
- Increasingly sophisticated digital simulation can render every microscopic detail, right down to every fixing.
- This enables a much more informed engagement with colleagues across construction.

#### Implications for architects

- Architects alone have the ability to lead on quality of outcomes in modern methods of construction (MMC).
   Other parties are much more likely to sacrifice quality of place.
- Digital skills must become central in how practices present themselves to clients.
- When Lendlease appoints architects, it tries to gauge their appetite for innovation: this is more important than their experience to date.

#### **Russ Edwards' presentation**

# BALANCING STANDARDISATION AND CUSTOMISATION IN MODULAR HOUSING

Panel Discussion Chaired by Holly Porter, Director, Surface to Air



# House by Urban Splash Amber Beare, Design Manager, Urban Splash Modular

- The design for House needed to anticipate the changing demands of its residents.
- Different configurations of its design can be optimised for the needs of a young professional couple or a family in terms of lifestyle, work, living spaces and storage.
- All House units are manufactured in one offsite factory and are built predominantly from cassettes and wall panels.
- Though these are factory-built, Urban Splash work with architects and do not compromise on considerations of light, space and height.
- Urban Splash make a point to provide high-quality quality green spaces

## Standardised and customisable elements

- Each House module has a central service core that houses either a bathroom or kitchen: these can be configurated onto different floorplates, but with standardised service connections.
- House can be configured to have 2-4 bedrooms on a given floorplate in a 2-3 storey building, with a choice of garden living or loft living. There is a total of 27 configurations possible.
- House currently offers one standardised cladding but it can be adapted to meet different planning requirements.
- An approach to sustainability is standard to all buildings, with use of photovoltaic panels (PV) and rainwater harvesting planned for future implementation.

#### **Beechwood West**

## Carl Vann, Partner, Pollard Thomas Edwards

- PTE are seeing increasing demand for housing that combines the efficiencies of standardised production with the distinctive design of a particular locale.
- Post occupancy evaluation revealed that customisation helps promote community building: residents are naturally curious to see what their neighbours have done.

#### Customisable modular homes

- The Beechwood West development in Basildon, Essex, consists of 250 fully customizable modular homes.
- The essential house design had to complement the masterplan (in terms of the local housing vernacular) and yet be suitable for customisation by the resident.
- All of the buildings are modular and fitted out to a resident's specifications, with windows added, in a factory.
- Owners can configure internal layouts from a range of options, pick from a selection of house typologies, choose exterior finishes and opt to extend the living area into the roof.

#### Getting planners on side

 Demonstrating to planners the degree to which customisation was already part of the local vernacular proved to be powerful and convincing.

- For the Beechwood project, stakeholders including local planners were taken to Almeer, near Amsterdam, to provide an example of how a suburb of custom-build homes can work.
- Houses were rendered from a number of views, demonstrating to planners the possible variants.

#### From software to assembly

- PTE commissioned web-based software to allow residents to configure their house, with projected costs updated live. The final configuration data is exported straight to the factory for manufacture.
- Houses were built in the factory using cross laminated timber (CLT). In order to complement the local Essex building vernacular the product was finished in brick onsite.

### Technical and site considerations

- The dimensions of modules are crucial. They must be transportable, so logistics such as the height and width of footbridges and tunnels are significant.
- The realities of materials on the site must be considered.
   CLT modules require working to accuracies of millimetres, while positioning heavy modules onto concrete shoes in wet weather conditions is challenging.



# The U-Build system Wilf Meynell, Director, Studio Bark

- U-Build is a flat-pack self-build system. Its standard component is a wooden box and it can be used to construct self-assembly structures without any fixings.
- The system is complemented by configuration software and VR, which provides interactive real-time instruction on how to manually fit it together.
- Lack of fittings in the construction facilitates any future disassembly and reconfiguration.

## Community usage

- Self-assembly systems allow for a multi-skilled and multigenerational approach to building. They lend themselves to non-professional build teams such as families or community groups.
- Different team members or even entirely different groups can be constructing various parts of a structure simultaneously without the need for a contractor.

## Applicability

- These systems can provide a simple construction for 'meanwhile' spaces, such as temporary accommodation or breakout areas in a warehouse.
- While self-assembly systems lend themselves to smallscale projects they can be scaled up to larger projects, such as Studio Bark's two-bedroom Box House.

### Amber Beare's presentation

**Carl Vann's presentation** 

Wilf Meynell's presentation



# CLOSING REMARKS Lucy Carmichal, Director of Practice, RIBA



- The profession is at a crossroads. Traditional modes of practice may not be adequately serving architects, the public or the environment.
- Collaborative approaches show us a new way forward, in which ego is put aside and knowledge and risk is shared. There are genuine opportunities for architects committed to doing things differently.
- If the profession seizes agency and embraces responsibility it can de-risk future outcomes. Architects can take this disruptive opportunity to make sure the built environment generates social value.
- Architects should look beyond the parapet of current practice, as it would be irresponsible to continue to do things traditionally.

