

Bristol Housing Festival
Lessons Learnt Series
Revision 1 - February 2022



BoKlok on the Brook

Innovation in Practice



BOKLOK ON THE BROOK

LESSONS LEARNT REPORTING

The Bristol One City Approach aims to make Bristol a fair, healthy and sustainable city by leveraging public, private, voluntary and third sector collaboration around a shared vision for 2050.

Faced with universal environmental, economic and social challenges, this joined-up approach calls for collaborative solutions that address specific needs and contribute to making Bristol a city of hope and aspiration.

The One City Plan sets out Bristol's aspiration to become a city where:

Everybody has access to affordable housing in a safe, thriving community.

Bristol Housing Festival partners with the One City office to champion, enable and share lessons learnt from collaborative action in housing.

The development of the Modern Methods of Construction (MMC) sector in housing has created a window of opportunity for system-wide, structural change in the delivery and lived experience of new housing, but we're not just interested in new ways to build houses, we're interested in new ways of thinking about the role of housing in creating great places that support diverse and thriving communities.

Bristol Housing Festival is bringing healthy and resilient communities to the forefront of the conversation on housing and is a platform for action-learning, sharing what works and what doesn't, and identifying opportunities for improvement.

We believe that sharing lessons learnt is key to providing valuable insight for future developers and collaborators and maximising the rate at which best practice is advanced, affecting positive change for society.

In this series, we interview project teams delivering MMC housing in the South West to hear their stories, highlight outcomes and produce evidence-based lessons learnt reports, which can be shared widely to support positive growth in the MMC sector.

EDITOR'S SUMMARY

BoKlok on the Brook is a development of 173 new volumetric MMC homes on Airport Road, South Bristol. The scheme was brought forward by BoKlok UK, a sustainable and high-quality home provider jointly owned by Skanska and IKEA. Prior to this project in Bristol, BoKlok had developed around 12,000 homes in Sweden, Finland and Norway, but this was their first development in the UK.

This innovative modular housing solution, coupled with a grant from Homes England, helped Bristol City Council unlock a challenging site allocated for housing in the local plan. This project was first proposed in 2019 and despite the site requiring substantial ground works to enable construction to begin, the homes will be occupied in 2022. It has been a privilege to explore the details of this fast-paced UK first with the people involved in making it a reality.

As we unpacked the story, it became clear that this innovative development was made possible not only by the technical potential of this MMC housing solution, but by the vision, courage and commitment of the project team. We hope you will enjoy reading some of their observations and comments, which we have included throughout this document. We think such personal reflections, not only give us a fascinating insight but also serves as a helpful reminder that technological innovation is ultimately a social process.

Whether you're interested in how grant funding was leveraged to make this project viable or BoKlok's unique approach to selling homes by ballot, we trust you'll find something to learn from this project's story. For us, it has become evident that this project was driven by the desire to achieve positive outcomes for future residents, and this people-centred approach was critical in channelling the effort, investment and political support needed to make Airport Road a reality.

We would like to thank everyone involved for their hard work and willingness to share their lessons learnt and experience.

Dr Ellen Grist,

Research and Evaluation Lead

Bristol Housing Festival



RECOMMENDATIONS TO DATE

- 1. Successfully bringing about innovation in housing demands collaboration. Time needs to be invested at the beginning to clearly frame the vision and task in hand, secure buy-in from individual stakeholders and build strong cross-organisational relationships. Time spent talking and listening to each other is foundational in enabling a team approach.**
- 2. Although the flexibility of MMC products and systems is necessarily limited, it is helpful to provide feedback on MMC products. It might not be possible to change a product at any given time within a project, but this user/commissioner feedback could help shape the development of the product in the future.**
- 3. MCC suppliers should be prepared to provide physical samples/models which demonstrate the materiality and build-up of their building systems. This will better enable prospective customers to assess the nature, and crucially the quality, of their product through touch (haptic/tactile perception).**
- 4. A credible and engaging project narrative, that paints a clear and compelling vision, is a constructive way of framing design development and appraisal conversations including Planning Committee meetings. This vision should communicate the ambition of the project and make clear how it contributes to the bigger picture, for example how this project will help address key challenges faced by the local area and or wider region.**
- 5. Housing commissioners working in an MMC environment need to be prepared to adapt to a faster delivery pace. This might include adopting new ways of working, allocating a higher level of resource upfront and committing to proactively resolving programme risks within their control.**

1. PROJECT OVERVIEW & INITIATION

BACKGROUND

In the early 1990s Ingvar Kamprad (founder of home furnishing company IKEA) and Melker Schörling (CEO of construction company Skanska) were in conversation and struck that *'it must be possible to build good homes for ordinary people with ordinary jobs.'*

They went on to co-found the Swedish home ownership concept BoKlok (which translates Live Smart), leveraging the skills of their respective organisations to develop *'sustainable, quality homes, at a low price for all'*. Consulting Sweden's leading household economist Pia Nilsson, they started with the question: *"How much can a nurse afford to spend on a home?"* Only when they understood how much future residents would be able to afford after taxes and living expenses, did they start developing their new modular homes.

The first BoKlok homes were completed in Sweden in 1997 and around 12,000 homes have now been delivered throughout Sweden, Finland and Norway. Whilst continuing to comply with Nationally Described Space Standards, BoKlok homes were developed to create the opportunity for those within the lower economic thresholds, such as key-workers and first-time buyers, the chance to own their own home.

Key to delivering high quality homes at prices accessible to these buyers, is volume and repetition. Precision engineering and the efficiencies of scale associated with offsite manufacturing are central to this sustainable, human-centric housing model.

BOKLOK ON THE BROOK: PROJECT INCEPTION

In March 2019 BoKlok launched in the UK, identifying TopHat as a factory partner with the required manufacturing skills, capabilities and ethos. Land became the critical enabling factor in entering the UK and they sought out suitable sites, which they determined should be outer suburban with good connectivity, suitable for delivery of circa. 50-150 homes in a single phase. They were keen to partner with councils and local housing companies to unlock land for new modular BoKlok homes.

"We have got just one ambition which is to build sustainable, quality homes for people who need them." Graeme Culliton, Managing Director, BoKlok UK

BoKlok's Executive Vice President Henrik Johnsson met Bristol's Mayor Marvin Rees at MIPIM, the world's leading real estate exhibition, in 2019. They spoke for an hour and a half, not about BoKlok's modular housing product per se, but about their shared values and ambitions for pursuing the UN Sustainable Development Goals, and reducing the inequalities associated with home ownership.

"We had a ninety-minute conversation with {Bristol Mayor} Marvin - not about MMC - that's quite important...instead, we spoke at length about

how we share the same values and agenda” Henrik Johnsson, UK’s Executive Vice President, BoKlok

The market research they carried out identified the people of the south-west of England as being open to new ideas, with a higher degree of sustainable awareness compared to other areas in the UK they had looked at. Additionally, Bristol City Council were embarking on an Innovate UK funded research programme, focussing on enabling and evaluating the performance of a wide range of modular housing typologies.

25.6.20. We're looking for vacant plots that could accommodate new sustainable neighbourhoods! #boklokUK #sustainablehomes <https://twitter.com/BoklokUK/status/1276174616323600384?s=20>

The site at Airport Road (land west of Salcombe Road, Knowle) had been identified in the local plan as an area suitable for housing that Bristol City Council were keen to see developed. Although long and narrow the site was of a sufficient size, and well enough connected, for BoKlok to consider this as an opportunity to deliver their first UK development. They presented Bristol City Council with a proposed site layout and the conversation went from there.

The first scheme of its kind this project gave BoKlok the opportunity to demonstrate their ability to work in collaboration with a local authority to serve the needs of a city in terms of housing, placemaking and mixed communities. For Bristol City Council it was an opportunity to deliver new Affordable Homes at pace, showcase their leadership position on MMC and further evidence that they are increasingly ‘development fit’, that is primed and proficient at delivering MMC.

“It was the first deal BoKlok had done in the UK. They were chasing deals elsewhere in the country, and we were keen to be the first” – Miles Reynolds, Head of Property Development, Bristol City Council

3.12.20 Great article in @ExploreOffsite on the @BoklokUK development on airport road. It's fantastic to partner with BoKlok and @bristolcouncil to see 173 new homes delivered in the city. @GraemeCulliton https://twitter.com/Bristol_HF/status/1334474660516409344?s=20

The success of this project being brought about is directly linked to the relationships formed between individuals within BoKlok, Bristol City Council, the Bristol Housing Festival and others. Innovating in housing takes collaboration and this comes through trust and a joint commitment to the vision of providing good homes to people in Bristol.

2. TEAM AND STAKEHOLDERS

THE CORE PROJECT TEAM

Bristol City Council Local Authority Client

BoKlok UK Principal Designer and MMC supplier

WIDER PROJECT TEAM

Bristol Housing Festival Championing MMC in the region

Homes England Grant funding

JTP Architect for BoKlok

Skanska UK Civil and M&E Engineer, CDM Planning Supervisors

Savills Valuation surveyor

Tremain Powell Partnership Employer's Agent

Ecology Consultants ACD Ecology

Landscape Architects Neil Tully Associates

Ashfords Legal advice (Bristol City Council)

Towers and Hamlins Legal advice (BoKlok)

TopHat Factory partner manufacturing BoKlok houses in Derby

Harmet Factory partner manufacturing BoKlok apartments in Estonia

Complete Moves Sales and Marketing Agent (HRA Shared Ownership homes)

'If we are to make MMC a recognised area of residential development – and in turn contribute to the housing shortage the country faces - then we need to encourage teamwork' – BoKlok: Supporting the UN Sustainable Development Goals.

The importance of the partnering relationships has been emphasised in conversation with BoKlok about their experience of the project. It was these relationships that enabled obstacles to be overcome, and solutions to be sought out in order to bring the project to fruition.

"The single one most important thing that made it happen was a really strong relationship. – We had a tough time during Christmas and New Year...and without that strong relationship, it would not have happened. I'm 100% sure on that. That is a very important take away. Why did we have that relationship? Because we have spent a lot of time talking and listening to each other." Henrik Johnsson, UK's Executive Vice President, BoKlok

The Coronavirus pandemic made the relationship building that bit more difficult, preventing the partners gathering in person.

"The challenge is making sure that everybody is on the bus...without COVID, we could have gathered in a room." Henrik Johnsson, UK Executive Vice President, BoKlok

RECOMMENDATION:

Successfully bringing about innovation in housing demands collaboration. Time needs to be invested at the frame beginning to clearly the vision and task in hand, secure buy-in from individual stakeholders and build strong cross-organisational relationships. Time spent talking and listening to each other is foundational in

Asked about their experience working in Bristol, BoKlok commended the role that the Bristol Housing Festival played in setting the scene for engaging with alternative models of housing delivery in the city.

"... having spoken with over 12 councils in the last 12 months, the catalyst [for] improved communication and improved understanding that Bristol [City Council] has that none of the other [council's] have is the Housing Festival Even before we got involved, the Housing Festival had got established and then set the scene and done all the foundation work.

Don't under-estimate that." Graeme Culliton, Managing Director, BoKlok UK

3. DESIGN & PLANNING

THE SITE

The Airport Road site consists of two parcels of land; the northern parcel Site #1 (1.45 hectares) and the southern parcel, Site #2 (3.7 hectares). Collectively the two sites (Local Plan ref BSA1113 and BSA1117) were identified as being suitable for circa 150 new homes, with a number of significant site constraints noted in the Development Management – Site Allocations plan.

"The site is a very challenging site. It doesn't stand out as an obvious development site. It's got as many constraints as you can possibly imagine on one site." Gary Collins, Head of Development Management, Bristol City Council

The site's topography slopes from gentle hills down towards Brislington Brook which runs through the site. The majority of the site falls within Flood Zone 1, with the brook itself in Flood Zone 3 and categorised as a 'main river' by the Environment Agency. Whilst this obviously required careful consideration in the design and planning process, (ensuring no homes were vulnerable to flooding) the brook was also seen as a very positive contribution to the potential living experience of the future community, with the plans worked up for developing landscaped areas to play, grow and commune.



Figure 1: Airport Road, courtesy of BoKlok UK

DESIGN

The Airport Road development is made up of a total of 173 homes which includes houses and apartments. There is a mix of one and two bed apartments in four, four-storey blocks on the south of Site 2 (along Airport Road) and a mix of two- and three-bedroom houses on both Sites 1 and 2.

These Nordic-inspired homes are designed with excellent levels of thermal insulation and airtightness, resulting in lower CO₂ emissions and reduced running costs for residents. Also, using the timber frame as the main construction material reduces the embodied energy in the BoKlok home compared to traditionally constructed homes.

BoKlok appointed JTP, an award-winning international placemaking practice of architects and masterplanners, to develop the design of the modular apartment blocks for the UK market, to ensure they were compliant with UK space standards and building regulations. You can read about JTP's role in this project on their website [here](#), and find JTP's description of the scheme [here](#).

The design of the homes originated from BoKlok's experience in Scandinavia but was modified on the basis of their UK market surveys. The expectations of customers in the UK market were found to be slightly different. For example, in Sweden it is not uncommon to have washing machine in the bathroom, and Scandinavians tend to take showers whereas in the UK people like to have a bath available. You can hear an interview with Graeme Culliton, talking about the BoKlok project [here](#).

The BoKlok homes were designed with high ceilings, open plan layouts and tall windows to create light and spacious interiors. The finishes are described as 'current, contemporary and bright.' The kitchens (supplied by IKEA) are designed to maximise storage and workspace and comply with the design guidance set out in the [Housing Quality Indicators \(HQI\)](#). All the apartments have access to a private balcony as well as the communal landscaped open space.

Off-site manufacture is key to BoKlok's aim of providing high quality homes at a predictable price. They use advanced timber frame construction technology to build full volumetric modules in a safe and dry factory environment. The modules are fully fitted out externally and internally and then craned into position on site. As an industrialised modular product there was limited scope to change the design of the buildings themselves.

"With MMC there is a particular way of working, you can't completely design bespoke solutions, that's against the whole ethos of it." Gary Collins, Head of Development Management, Bristol City Council

"It was a pilot scheme for buying off the shelf units, that were every different to a standard HRA product." Miles Reynolds, Head of Development in the Property Team, Bristol City Council

"When you look at these MMC products, every time you make one small alteration it has got to go back for testing, BOPAS and all those organisations, have to approve every single change – so you are losing the benefits of MMC if you add another 9 months on to get it tested." - Gary Collins, Head of Development Management, Bristol City Council

There was however the flexibility to choose some of the elements of the construction, including the module layout, height of each block, colour and finish of the cladding materials and the windows and roof types. Through the planning process Bristol City Council pushed for six as opposed to eight apartments per floor plate, opted for a red-brick finish in keeping with the local vernacular, and chose aluminium powder coated windows. Other design changes were more difficult to incorporate, but Bristol City Council also insisted on inclusion of air-source heat pumps (ASHPs) and for exposing the vaulted ceiling on the upper floors of the houses.

"We pushed the standard BoKlok product to be a better product. We went for little things like vaulted ceilings on the upper floor, which looks great when you see it in real life. We pushed for aluminium powder coated windows, which was the right thing to do from a sustainability point of view. Bizarrely, we also pushed for air source heat pumps,

because they didn't have that in their design." Miles Reynolds, Head of Development in the Property Team, Bristol City Council

"Local authorities have the power to mature the whole supply chain, in a quality and sustainable direction – which is why I am so committed to local authorities really driving that quality" Jez Sweetland, Project Director, Bristol Housing Festival

There were also aspects of the standard BoKlok product that could not be changed. This ranged from major considerations such as the creation of single aspect flats and the impossibility of duplex apartments, to minor details such as the provision of locks on kitchen cabinets.

"For example, BoKlok are using IKEA kitchens...this a small example but we would normally ask for one of the kitchen units to be lockable so you can keep bleach etc in there, from a H&S perspective. IKEA don't do a lockable kitchen cabinet, so we had to take a decision to pay for somebody on-site to fix a lock on one of the kitchen cabinets. If you go to other kitchen manufacturers in the UK, they have a contract range specifically for use in social housing, IKEA don't have that. So, it's things like that – little bits and pieces." Tim Bluff, Interim Development Consultant, Bristol City Council

"The specification takes a while to agree – if the council is commissioning social housing through its own construction, the council specifies exactly what it wants, with these deals we are buying built units from a developer, we don't have that influence over the design." Tim Bluff, Interim Development Consultant, Bristol City Council

All the homes met the M4(2) Building Regulations for visitability and adaptability, which ensured people with reduced mobility can easily navigate around and within a BoKlok home. 2% of the homes on the site are designed as suitable homes for those in wheelchairs in line with M4(3), as required by local plan policy DM4. All the apartment buildings have lifts to ensure full access throughout each floor.

The BoKlok MMC system has a minimum 60-year durability accreditation from BOPAS (the Build Offsite Property Assurance Scheme). This assurance scheme demonstrates to lenders, valuers and purchasers that these homes, built in non-traditional methods, will stand the test of time for at least sixty years. In November 2020 BoKlok became one of the first MMC suppliers to be adopted on the new NHBC Accepts pathway, securing the eligibility of their Flex UK build system to be allocated a ten year NHBC warranty on completion. The houses were sold with a ten-year Checkmate new home warranty.

21.11.20 BoKlok UK We're pleased to now have this seal of approval for NHBC Accepts.

<https://twitter.com/BoklokUK/status/1330069400603533314?s=20>

RECOMMENDATION:

Although the flexibility of MMC products and systems is necessarily limited, it is helpful to provide feedback on MMC products. It might not be possible to change a product at any given time within a project, but this user/commissioner feedback could help shape the development of the product in the future.

PLANNING

BoKlok appointed Turley as their Planning Consultant for the development, to assist with the pre-application consultation process and subsequent planning submission.

A meeting was held on 18th October 2019 to gain advice from the Environmental Agency and the Local Lead Flood Authority. In November and December 2019, BoKlok consulted with key stakeholders and held two consultation events with the local community. BoKlok then submitted a pre-app and met with Bristol City Council planning officers in December to seek their comments. Following an Environmental Impact Assessment (EIA) Screening Opinion, Bristol City Council confirmed that an EIA was not required for the development.

BoKlok found the planning process in the UK more involved than in any other of their European markets commenting,

"We have about 17 more sub-consultants in the UK than you might in any other BoKlok market e.g. ecology...flood...That's what complicates the planning process in the UK and what makes it more expensive than BoKlok has experienced elsewhere." Graeme Culliton, Managing Director, BoKlok UK

"Housing is a complex regulated regime in the UK, so there's a lot of coordination to be done." Jez Sweetland, Project Director, Bristol Housing Festival

A significant challenge in the case of this UK first was in visualising and understanding the quality of the finished product, as there were no precedents to visit, or material samples that could be looked at or handled. The Airport Road scheme will be hugely beneficial in enabling others to envisage and assess the materiality of the BoKlok build system.

"This [architectural render] is just a visual...I don't know what it is going to look like in reality" City Design Officer, Bristol City Council

RECOMMENDATION:

MCC suppliers should be prepared to provide physical samples/models which demonstrate the materiality and build-up of their building systems. This will better enable prospective customers to assess the nature, and crucially the quality, of their product through touch (haptic/tactile perception).

In January 2020, the Full Planning Application was submitted (Planning Portal ref 20/00299/F). The development proposal consisted of:

- 173 homes made up of 121 open market sale homes, 30% homes allocated for affordable housing (12 low-cost home ownership and 40 social rented homes).
- The affordable houses and apartments are 'tenure blind' i.e. the internal layout and appearance is no different to the open market homes.
- Car and cycling parking provision will include disabled parking, car club and electric vehicle charging points.
- Public, communal amenity space and play areas
- Provision of footpaths throughout the site, connecting to the adjacent land.
- Brislington Brook improvements, tree planting, biodiversity enhancements
- Inclusion of low-carbon heating system: individual ASHP (Air Source Heat Pumps) for each home and communal ASHP for apartments.
- Replacement footbridge and new open span vehicular bridge over Brislington Brook
- Widening of access off Airport Road and two new vehicular accesses via Salcombe Road and Ilminster Avenue.

The site layout was designed to make Brislington Brook the focal point of the development. This necessitated a complete reinstatement of the brook, which was considered to be in poor condition, being overgrown with scrub and littered with debris from fly-tipping. The proposed work included removing the debris and then enhancing the ecology of the brook: cutting back excess scrub, creating tussocky grassland and installing hibernacula and log piles to encourage the habitats of invertebrates, birds, reptiles and amphibians and small mammals.

The layout of the homes also sought to retain as many of the existing trees as possible and ensure that no homes were located within Flood Zones 2 and 3. Open space of 2.28 hectares were kept with the proposed design, 1.19ha for ecological enhancement and 1.09 hectares as informal open space. The proposed development also included a Community Hub and play area.

"There was a lot of positive aspects - policy compliant affordable housing, new areas of open space" Angelo Calbrese, Planning Officer, Bristol City Council

The planning committee hearing was held on 24th June 2020 and can be listened to in entirety online [here](#) (1h58mins in). There were two contentious issues that the committee discussed at length, the adequacy of the cycle path (was it wide enough) and the proximity of some of the houses to the road. This was recognised to be a genuine dilemma as widening the cycle path would have reduced the buffer between the front of the properties and the cycleway along Airport Road.

Reflecting on the planning committee hearing Jez Sweetland, Project Director of the Bristol Housing Festival recalls:

“The conversation had been quite negative. Then one of the councillors cut through the noise and just said – can we look the scheme as a whole, this is creating community, this is creating affordable houses, and the whole debate suddenly changed.” Jez Sweetland, Project Director, Bristol Housing Festival

“The brilliant thing about it is the child friendly nature of it. Not only is there a playground there is a brook and trees! This is what our kids need...This is the kind of scheme we need! I think this is a really good scheme and I am totally in favour of it.” Local Area Councillor

The planning committee then went on to vote unanimously in favour of granting the development planning permission. BoKlok's delight in securing permission to progress this UK first, is captured in co-founder Skanska's press release available [here](#).

RECOMMENDATION:

A credible and engaging project narrative, that paints a clear and compelling vision, is a constructive way of framing design development and appraisal conversations including Planning Committee meetings. This vision should communicate the ambition of the project and make clear how it contributes to the bigger picture, for example how this project will help address key challenges faced by the local area and

26.6.20 BoKlok UK We're pleased to announce the unanimous decision by Bristol City Council's planning committee to approve its first UK housing development at Airport Road, Bristol. #boklokUK #sustainablehomes #inclusivecommunities

<https://twitter.com/BoklokUK/status/1276499863438536705?s=20>

Commenting on the decision, the Planning Officer, commented:

“They made the right call ultimately; you could tell they wanted to support the application. We were able to improve the cycle path by condition, which solved that dilemma.” Angelo Calbrese, Planning Officer, Bristol City Council

Focusing on the bigger picture and positive aspects of the scheme; the homes, the community and the access to green spaces that this scheme would deliver on this site, enabled a pragmatic and hopeful approach to be taken at the planning stage.

“I always push to get everything absolutely 100% perfect but it’s just not possible, when you’ve got such a heavily constrained site. You’ve got to make some compromises. The positive aspects outweighed the aspects that were less than perfect.” Angelo Calbrese, Planning Officer, Bristol City Council

“If we don’t do our bit and get this [Airport Road development] over the line it is zero affordable housing.” Gary Collins, Head of Development Management, Bristol City Council

4. PROJECT DELIVERY

This was not a traditional and well-trodden development process, rather it required a high level of innovation. Innovating in the context of a high-profile UK first, and in the face of a necessarily fast delivery programme, demanded vast amounts of time, energy, collaboration and courage on the part of all involved.

“There was a lot of innovation to make it work and quite a bit of pressure – but that’s why we’ve now got houses coming up.” Jez Sweetland, Project Director, Bristol Housing Festival

“The imagination and courage of the politicians and senior officers in Bristol does not get applauded enough” Graeme Culliton, Managing Director, BoKlok UK

There were three primary contractual arrangements that had to be worked through and agreed.

- [Homes England](#) grant funding
- Land valuation and disposal
- [Housing Revenue Account \(HRA\)](#) buy back of the affordable units

These three deals were contingent on one another, so they all had to be worked up in parallel and signed off together.

HOMES ENGLAND GRANT FUNDING

Given the extensive remedial works needed to the site, BoKlok's scheme (which needed to include a policy compliant 30% affordable homes) was not viable. Crucially, any housing development on Airport Road was going to be dependent on securing a significant amount of grant funding (£5.9 million) to prepare the site.

At this time Homes England were supporting local authorities in unlocking residential development sites for new affordable housing by offering Small Sites Grant Funding, to cover the cost of the site remediation, enabling works and securing planning permission. This funding was recognised to be critical in unlocking the Airport Road site for new housing but came with strings attached and imposed additional external project deadlines.

"Neither us, nor Bristol City Council could do Airport Rd without Homes England...the £6 million grant was a game changer in making the development viable. Without that money, that site wouldn't be developed now, or probably for the next ten years, so that partnership was critical." Henrik Johnsson, UK Executive Vice President, BoKlok

"Our role as the Government's housing and regeneration agency is to intervene where the market isn't working to support partners in accelerating the creation of new places." Homes England

Only Bristol City Council, as the Local Authority, could receive funding from central government and novate BoKlok to undertake the work. Cabinet approval had to be sought for Bristol City Council to negotiate the terms of the drawdown of Homes England grant funding, which would then be passed on to BoKlok in a separate Funding Agreement of equivalent value. This Funding Agreement had to include the same terms, including the clawback mechanism, as the Homes England grant agreement in the event that the scheme failed to deliver the affordable homes it was intended to enable. The Cabinet paper can be read [here](#).

In early 2020, when the Coronavirus pandemic hit the UK, the treasury had to reduce its spending and the grant funding for many projects, including the Small Sites Funding for the Airport Road project was withdrawn. BoKlok who had cultivated their own relationship with Homes England and helped them lobby the treasury for the required funding. Together they were successful in securing the same offer in monetary terms from an alternative funding pot (the Homes England Accelerated Construction Fund), a grant fund specifically set up to enable the delivery of MMC housing.

Leveraging external grant funding was a learning curve for Bristol City Council's development team and demanded frequent meetings with Homes England.

"It was very difficult, as we were on new ground really, trying to develop the draw down mechanism. I was meeting with Homes England two or three times a week just to get that across the line... It required lot of external advice, a lot of legal advice generally to get it thorough.... The

State Aid advice was very helpful going forward on other projects, when we're trying to lever in external funding. So, it was good learning." Miles Reynolds, Head of Property Development, Bristol City Council

"The grant funding provided to Bristol City Council has enabled BoKlok to use its sustainable construction methods to bring forward new homes which will help to meet our mission of encouraging the creation of sustainable and well-planned communities of the future." Homes England

Gratefully received, this grant funding was recognised to be critical in enabling the project, but it imposed conditions on the development process that caused additional complications in project delivery.

LAND VALUATION AND DISPOSAL

Subject to completion of the enabling works in accordance with the planning consent and the Homes England funding agreement, Cabinet had also authorised Bristol City Council to transfer the site to BoKlok at best consideration (in accordance with Section 123 LGA 1972), for them to deliver the new homes as per the planning application.

Section 123 of the Local Government Act (1972) legislates Local Authorities to only sell land for best consideration i.e. at market value.

"We can sell anything for market value whether it is worth a pound or whether it is worth 20 million pounds, that's irrelevant" Miles Reynolds, Head of Property Development, Bristol City Council

When development land is valued from a market value point of view, the assessed development costs are deducted from the assessed sales value, with the remainder being the land value.

With the site having been shown to require £5.9million of external grant funding to make any residential development activity viable (a valuation undertaken by Savills for Homes England), then the market value of the site was shown to be minus £5.9 million. On this basis best consideration for disposal of the land was £1.

An alternative developer with a cheaper product might have been able to develop the site for less, but with £5.9million pounds worth of remediation works being necessary, the calculation of the market value of the site would still have returned a land value less than zero, so best consideration of the land would still have been £1.

"The Swedish way [of appraising projects] just seemed different, but when we looked at the nuts and bolts it was pretty much the same as the way everybody else deals with it." Miles Reynolds, Head of Property Development, Bristol City Council

HRA BUY BACK OF THE AFFORDABLE UNITS

Arrangements to deliver new homes on Airport Road in partnership with BoKlok were discussed and voted on at the Cabinet meeting on 1st October 2019. The cabinet report is available online [here](#). The cabinet voted in favour of Bristol City Council negotiating and enter into a non-binding Memorandum of Understanding (MOU) with BoKlok to work in partnership to deliver new homes in Bristol over a five-year period, with the first circa. 200 homes at Airport Road.

The recommendation was that the affordable housing would then be transferred back to Bristol City Council on completion (Plan A), with the fallback option of the homes being sold to a Registered Provider of BoKlok's choice (Plan B).

The final scheme comprises 173 new homes. 52 of these homes (30%) are covered by the Section 106 agreement, so had to be sold back to the Council (or to a Housing Association) as social housing. On this development BoKlok took the decision to offer to sell Bristol City Council 27 additional homes for social housing, as a testament to their long-term commitment to the area and ongoing partnership with the Council. Bristol City Council chose to purchase the 79 homes they were offered, making 45% of all the homes council owned housing. The remaining 94 homes being sold by BoKlok on the open market.

Choosing to sell an additional 27 council homes to the Council also benefitted BoKlok reducing the legal costs associated with selling to individuals and guaranteeing the sale of these innovative modular homes in an uncertain new marketplace.

In the case of this project the buy-back of the affordable housing was complicated by a) the fact the homes were being manufactured offsite and b) conditions imposed by the Homes England grant funding which prevented ownership of the land being transferred to BoKlok.

"It was an incredibly complicated transaction. I have been doing these kind of things for twenty years, it was probably the most complicated one that I have dealt with...It really was quite a challenge." Tim Bluff, Interim Development Consultant, Bristol City Council

Normally affordable housing would be bought back on a 'Golden Brick' basis, that is once the floor slabs are installed and the first brick (or golden brick) is laid, the developer transfers ownership of the land to the Council (or Housing Association). The Council (or Housing Association) then gives the developer a license back to build the homes and pays on the basis of a monthly valuation.

"Normally, you put the floor slab in the land is transferred to the Council or the HA, you'd see four walls go up – you pay for it, you see a roof go on – you pay for it, you see a bathroom and kitchen go in you pay for it... Once the home is completed, we own the land, we've paid for the build, hey presto we own the house. [In the case of MMC] ...all of that is being

done somewhere else so you can't see it." Tim Bluff, Interim Development Consultant, Bristol City Council

When procuring modular homes that are manufactured offsite, your cash flow is totally different. Capital has to be released up front to enable the production in the factory to begin. When you can't see your homes being built on the site and pay as you go, on the basis of a monthly valuation, a lot of commercial negotiation is needed to agree both exactly what you will ultimately get and what happens in the event that something goes wrong.

"I need to understand exactly what I am getting, when I'm going to get it and the what if scenario if something were to go wrong. What is my security? ...Some of the units were being made in a factory in Estonia, what happens if the boat sinks? Who is responsible? If they are held up at the docks...Is that a delay? Is that my responsibility or the developer's responsibility?" Tim Bluff, Interim Development Consultant, Bristol City Council

Having engaged in this project Bristol City Council now have a template to use for similar deals going forward.

These commercial negotiations were complicated by the conditions of the Homes England grant, which prevented ownership of the land being transferred to BoKlok before the grant funded enabling and infrastructure works were completed. It was foreseen that phasing of the work on site was going to prevent the land itself being used as security for completion of the contract, and instead a parent company guarantee from Skanska was utilised.

Working on these three interlinked commercial deals was recognised to be a learning curve.

"We're an end user, who have never acquired affordable houses in this way before, and a developer that has never done a development at all in the UK. You've two very different organisations both on a very different learning curves." Tim Bluff, Interim Development Consultant, Bristol City Council

The learning curve Bristol City Council had to go on, was compounded by the pressure on the programme. In this particular case the pressure was two-fold a) the Homes England grant had to be spent within a certain timescale and b) BoKlok had to complete on the deal to meet their PLC company reporting deadlines, (in light of the grant funding deadline they had started work on site in good faith).

SPEED OF DELIVERY

Reflecting on the delivery process, all stakeholders commented on the speed of the delivery programme:

“From my first meeting in Spring 2019, they were on site in November 2020...that’s really quick! That’s REALLY quick! So, it was great.” Gary Collins, Head of Development Management, Bristol City Council

Speed is often cited as a key benefit of MMC, but often this is attributed solely to reduced construction times on site. This project provides evidence that the programme benefits are significantly greater than this alone and reduce the duration of the whole development process. This scheme is therefore an important case study for MMC residential development.

‘Our way of working also considerably reduces the overall duration of the development process. In fact, it is reduced by over 50% compared to traditionally built homes’ – BoKlok: Supporting the UN Sustainable Development Goals.

A comparison undertaken by BoKlok considering two residential developments in Bristol of circa 170 homes, showed that the Airport Road development was more than twice as quick (see [here](#) for details).

Traditional developer building 170+ homes: 4.5 years

BoKlok on the Brook (173 homes): < 2 years

Commenting on the pace of the programme the team reflected:

“When you’ve established you share the same agenda, you then need to be clear with people, that either we get this moving, or we’ll invest our money somewhere else.” Henrik Johnsson, UK Executive Vice President, BoKlok

“[BoKlok] work at a million miles an hour...They were a very fast, expectant organisation to deal with. It is often nicer to do that, than deal with a developer who is incredibly slow and incredibly frustrating. It is always a pleasure to deal with somebody who can get the deal done, it’s fantastic and you’ve signed it, done it and you can see tangible things happening on site.” Miles Reynolds, Head of Property Development, Bristol City Council

Successfully delivering this scheme at pace, Bristol City Council have shown what they are capable of and what is possible.

***"The challenge of working in that PLC environment, where they have reporting deadlines which was putting pressure on them [BoKlok]. That put a huge pressure on Bristol City Council, and pressure on them... Credit to the Council there was an empathy to get that done, which was not straight forward. There is not enough credit really for individuals working through complex systems and complex governance. That has created a lot of trust and enhanced reputation; the sense of Bristol City Council being development fit. It's very positive."** Jez Sweetland, Project Director, Bristol Housing Festival*

RECOMMENDATION:

Housing commissioners working in an MMC environment need to be prepared to adapt to a faster delivery pace. This might include adopting new ways of working, allocating a higher level of resource upfront and committing to proactively resolving programme risks within their control. BoKlok expressed their desire to use the Airport Road development to demonstrate their ability to deliver high quality MMC homes at pace. They wanted Bristol City Council to challenge them to deliver on tight programmes, and then to work with them to enable them to do so.

OFFSITE MANUFACTURE

The apartments for Airport Road were manufactured by Harmet in Estonia and the two- and three-bedroom homes by TopHat in their factory in Derby. TopHat secured a five-year framework agreement with BoKlok in 2020, to be their UK manufacturing partner.

***"We are delighted to be working with TopHat. We share the same ambition to bring innovation and sustainability to the UK housing market, which means attractive and good quality homes for people on average incomes."** Graeme Culliton, Managing Director for BoKlok UK*

29.6.20 Top Hat: 'We are delighted to be able to help bring forward BoKlok's first project in the UK' <https://twitter.com/TopHatIO/status/1277537969709162498?s=20>

Talking about the process of preparing to manufacture a new housing product line, Andrew Shepherd Managing Director of TopHat Solutions, explained:

"So, we have standard house type, a standard product that we sell based on standard details...So, if it's a four-storey apartment or a one storey bungalow, it is all the same engineering and structure, so that hasn't changed. What has changed is that BoKlok have a particular layout that they've asked for, and particular bits and pieces...- I will call them,

BoKlok-isms...specific design requirements that fit with the IKEA-Skanska branding, so we put in an IKEA kitchen, unsurprisingly, ...so there are various subtle nuances and design changes that we've made to meet the requirements of BoKlok, but not to the engineering." Andrew Shepherd, TopHat Solutions MD



Figure 2: BoKlok homes on TopHat's factory finishing line, photo courtesy of TopHat Solutions

Talking about how the design is translated into a manufactured product, Andrew Shepherd went on to explain:

"Firstly, we do the desktop drawing. So, there's desktop activity where the engineering design is drawn up. We then build a prototype so we make sure that the engineered solution works... So, for BoKlok where they've asked for something specific, we'll prototype that we will make sure it works, identify any design issues, any engineering structural coordination issues." Andrew Shepherd, TopHat Solutions MD

The prototype house is then used for a suite of tests including fire testing, impact testing and all the other performance and durability tests required by Building Regulations and BOPAS, or the Warranty provider.

One of the benefits of this manufacturing approach in construction is that it encourages continual improvement. This both realises value for the manufacturer through the

production process improvements and enhances the quality and performance of the product.

“The whole principle with off-site and manufacturing is that it is a process of continual improvement. So, we are always looking for ways to continually improve the product, make it more efficient, make the process quicker. We really, really focus on always looking at challenging the structure, the solution, the manufacturing process...There's always an activity going on, where we want to look at how we can improve those things.” Andrew Shepherd, TopHat Solutions MD

Key to the learning approach embedded in offsite construction, is the formation of long-term partnerships, which support learning, innovation and investment. Andrew Shepherd describes, how this plays out in their partnership with BoKlok:

“And obviously, both IKEA and Skanska are really focused on the wider Environmental, Social and Governance (ESG) angle. So that's really important and again, having customers that are supportive and actively, proactively shall we say, looking to improve outcomes allows, and encourages us, to further invest in relevant areas of what we do.” Andrew Shepherd, TopHat Solutions MD



Figure 3: BoKlok homes on TopHat's factory finishing line, photo courtesy of TopHat Solutions

Such long-term partnership arrangements create the conditions and shared culture in which to collaboratively scope out and shape plans for future projects, future reviews and future investments.

“So, for example, we are actively looking at some zero carbon schemes, which is something we'll do together, that's pretty much the next phase.”
Andrew Shepherd, TopHat Solutions MD

5. NEW RESIDENTS

HOMES FOR PRIVATE SALE

To target local buyers BoKlok's 94 homes, available to the general public, were sold through the IKEA store, as they are in Norway and Sweden. You can hear Graeme Culliton, Boklok's UK Managing Director, talking about their sales approach [here](#).

For the two- and three-bedroom houses prices started at £255,000. For the apartment's prices started at £150,000 (see BoKlok FAQ's [here](#)).

Over 1800 prospective buyers registered their interest online in advance of the ballot. Those interested received a development brochure and were contacted by a BoKlok representative to discuss their requirements and the homes available. Every prospective buyer keen to proceed was then invited to submit an entry into a ballot. Names were then drawn from the ballot at random, with the selected buyers invited, in the order drawn, to both speak to a BoKlok mortgage advisor and then to a sales event appointment. At this event, held on the 26th-28th March 2021 at the Mercure Hotel in Bristol, the buyers had the opportunity to select and reserve their new homes.

“We've 1800 customers express an interest in a home, and over half of those are from a Bristol city postcode, over half of them first time buyers” Graeme Culliton, Managing Director, BoKlok UK

“All homes have sold in 5 months. 46 apartments (of 48) sold in the first weekend. This fast sales pace indicates we were very competitively priced, as it's twice the speed of normal market conditions” Graeme Culliton, Managing Director, BoKlok UK

BoKlok's express priority was that their homes went to local first-time buyers, to 'ensure that the community atmosphere is protected, and people can stay where they love and put down roots' - from [BoKlok: Supporting the UN Sustainable Development Goals](#). You can read about the experience of BoKlok's first UK buyers Aisling & Lewis [here](#).

'We are delighted to have seen 84% of our first homes sell to local buyers and 97% to first time buyers. Further to this, of the 16% who didn't have a Bristol post-code, all but one lived just outside Bristol' from BoKlok: Supporting the UN Sustainable Development Goals.

Part of BoKlok's service offering is to walk buyers through the process, putting individuals in touch with solicitors as needed. The reservation process is done in advance so that the buyers can see their homes being constructed on site and meet their neighbours. The purchase is completed once the home is finished and the buyers can be invited to a personal home demonstration, at which they'll be walked through the heating and appliances.

IKEA Family Card holders are offered a £300 voucher to spend in store, a free 1.5-hour session with an IKEA interior designer and a free 2-hour handyman service to help hang fixtures and fittings once buyers have moved in.

HOUSING OPTIONS AND NOMINATIONS

55 of the HRA's Affordable Homes are to be made available at Social Rent and allocated by Bristol City Council's Housing Nominations and Allocations team to individuals and families on the housing waiting list.

SHARED OWNERSHIP

24 of the HRA's homes are to be Shared Ownership (SO). The Shared Ownership scheme makes homes affordable by allowing buyers who cannot afford to buy a property outright on the open market, to initially buy a share of a leasehold property and pay rent on the remainder. The equity share people buy at the outset is typically between 25% and 75%. In a mechanism called staircasing, homeowners can at any time opt to buy an additional 5% or more, of their home as they can afford. The cost of each additional share is dependent on the value of the property at the time (as determined by a RICS surveyor).

This is a new form of tenure for the HRA and Leasehold Team. Complete Moves were appointed to provide the HRA with an end-to-end solution for the market and management of the Shared Ownership homes at BoKlok on the Brook.

ESTATE MANAGEMENT

Before completion of the first homes BoKlok were contracted to have set up a resident owned Management Company to manage common areas of the site. Bristol City Council will be a member of the Management Company and have voting rights that reflecting the number of homes they own.

Service charges for the Section 106 units will be in line with Bristol City Council's Affordable Housing Practice Note 2018, to ensure that the total occupation costs to affordable housing occupiers remain affordable in the long term. The Council would not expect a service charge to exceed £250 per annum in respect of a house and £650 per annum in respect of a flat (Index linked (CPI) respectively). This service charge will cover all

estate management charges, ground rents, services, repairs, maintenance and improvements of a communal nature and the insurance of the building

COMMUNITY ENGAGEMENT AND SOCIAL VALUE

One of BoKlok's four values is care. As a developer their commitment to this value was seen in their creation of a Community Engagement Lead role, to head up their communication with the local residents and seek out opportunities to contribute positively to the wider community.

"We recognise that we have a responsibility to contribute to the surrounding community in more ways than simply providing new housing" Harry O'Connor, BoKlok Community Engagement Lead

Community engagement initiatives included:

- Regular meetings with local ward councillors from Knowle and Filwood wards to answer questions and update on community matters. This included addressing questions around community infrastructure, for example which schools and surgeries, new residents would be directed to.
- A regular newsletter delivered to each house adjacent to the site, outlining site developments, site safety instructions and on-going community engagement.
- Attendance of Knowle West Futures (KWF) local community planning group.
- Community Update Webinars on Zoom with a Q&A (22nd June and 16th November 2021).
- Community website on which updates were posted about progress on site, introducing members of the BoKlok team, addressing FAQ's, highlighting community engagement opportunities and providing updates on the delivery programme.
- Three community noticeboards around the perimeter of the site with news and updates.
- Design of the play areas with local youth charity, Youth Moves.
- Brokered a relationship between the property management sub-contractor Jones Robinson, and a local social enterprise Re:work to offer training, and involve young people in the management and maintenance of the gardens and landscaping.
- Involvement in UWE's Agency Project (May-June 2021) providing a real-world case study for final year architecture and planning students, for whom they acted as 'clients', posing the questions '*how do we viably create homes which are accessible to real people and not simply to tick the box of building regulations?*'
- Conducted an assembly on Site Safety and ran a Homes for the Future session for year 3s and year 5s, in two local primary schools. The children's designs were then reproduced on the site hoarding to be appreciated by the wider public.

- Site tours with Social Enterprise Sixteen Cooperative, giving four students aged 16 to 17 who were interested in pursuing careers in construction, insight into a working construction site. Conversations have begun regarding a potential placement for one of these students, shadowing the project lead.
- Involvement in two evening sessions with Shape My City, introducing around 20 students aged 15-18 to careers in construction and residential development.
- Engagement with the Social Value Portal to evaluate how such social value contributions can be effectively reported to help supplement procurement processes with an evaluation of social value.
- Partnered with local charity, Bristol Uniform Exchange which supports local families with the cost of school uniforms.

6. CONCLUSION

Realising this UK-first in conjunction with a Local Authority has provided a real-world project context in which to work through and overcome all the challenges associated with applied-innovation in construction. This was the first time that this cutting edge volumetric MMC technology, and supplier, had been required to respond to the multifarious site-, programme- and industry- specific, cultural, temporal and financial requirements of a UK housing development. Only in this socio-political context can new technologies respond to real needs, galvanise action to bring them to fruition, and ultimately bring forth and demonstrate their value. Learning on the part of each project partner will be invaluable in unlocking future projects.

It is recognised that true value of this development will ultimately be experienced by the residents whose homes these houses and apartments will become. We very much hope to have the opportunity to assess the ongoing value, and return on investment, that these new homes offer to their occupants, the BoKlok community and wider area.

A huge thank you to all the contributors to this report for being willing to share their experiences of working on this innovative housing development in South Bristol. We hope this project story will inspire others to embark on similar value-led housing projects and provide helpful insights that will maximise the rate at which best practice in modular housebuilding is advanced.

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The Bristol Housing Festival supports the Sustainable Development Goals