

Action on climate change – special issue:

Imperial War Museum archive plays it cool

Snøhetta's energy-positive office

Greening your practice in trying times

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The RIBA Journal

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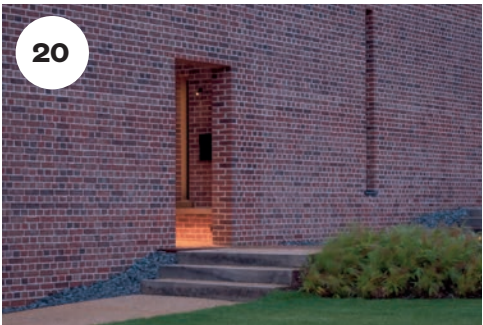
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On the cover
Imperial War Museum archive at Duxford airfield, designed by Architype. Photograph by Richard Ash

Our printer was positioned on the site and printed the entire building envelope in one piece, including the foundations

Marijke Aerts on the first house to be 3D printed without any prefabrication: ribaj.com/kampchouse



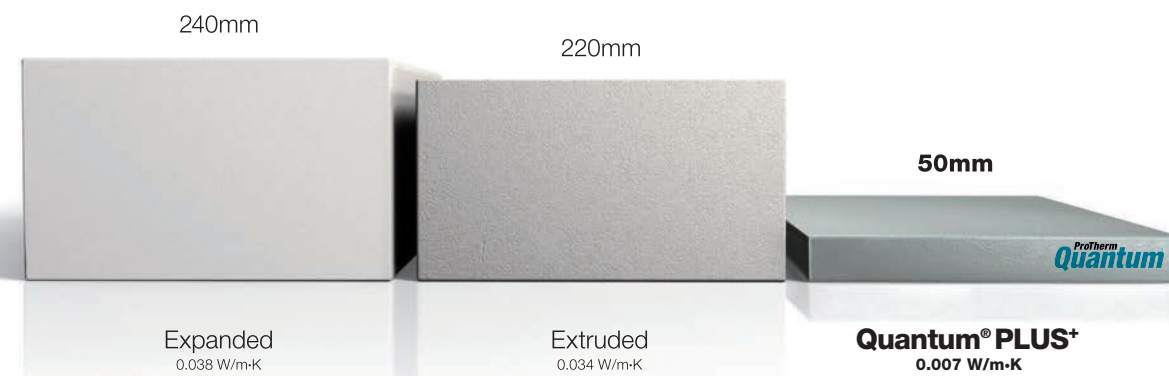
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Sustainable design is more complicated than it looks. What features top your agenda? Tell us at letters.ribaj@riba.org

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1: Buildings

Plenty to argue over here. How best do you define ‘sustainability’, that very elastic word? Would it be a spec office building in Trondheim which is energy-positive in construction as well as use – but has a (presumably finance-driven) calculated lifespan of just 60 years? Well, that’s way better than the UK where 25 years is often the write-down date for spec office construction, after which they are vulnerable to the wrecking ball and all that embodied energy is thrown away.

Would it be a museum archive building that is designed to exploit the constant-temperature benefits of the ground it sits in, is remarkably airtight, uses a lot of concrete (and visible Corten steel) in its construction – but has a design life of 200 years? Simple longevity is

one of the best things you can do in construction.

Would it be a leisure centre with new steel-and-glass additions, but which carefully preserves and enhances the existing building – this being a building type again very vulnerable to wholesale demolition and replacement?

Or would it be a large energy-positive one-off Passivhaus which generates 40% more power than it consumes – but is for just one fortunate retired couple? Well, a lot of that power goes back into the grid and it’s obviously an exemplar: its techniques are as applicable to social housing but there’s an obvious up-front cost to that.

Your responses please! Write to us with your views – letters.ribaj@riba.org ●

**Snøhetta’s energy-positive Powerhouse
Brattørkaia in Trondheim, page 26.**

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This is not heritage done in isolation, but as part of and central to the wider debate over architecture, public realm and urban design

Andrew Fuller on how heritage has joined the urban development mix in Birmingham:
ribaj.com/birminghamheritage



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Urmston keeps it lean



A new front section to the existing pool and sports hall is fronted up with a climbing wall.
Right The gym.

Trafford's commitment to fitness extends beyond the users of its refurbished leisure centre to the sustainable building itself

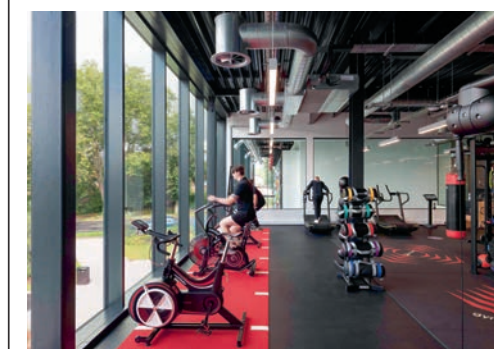
Words: Eleanor Young
Photographs: Tom Bird

Urmston's leisure centre, Move Urmston, is not a new building. Nor is it a special old one. But it has gone a long way for £6.4 million by reworking the front of the building. Remarkably, even in lockdown, while closed, its membership has grown, perhaps thanks to an intensive two weeks of fully booked, half-hourly tours of the building in early March.

So how is it sustainable? First, in encouraging more people to be active. And secondly in presenting a new face to the world but with relatively little demolition, thus saving a huge amount of embodied carbon. In operational terms it is also bringing down energy use.

Public health is now firmly on the local authority agenda. And we saw how local this can be in August when a surge of Covid-19 cases caused Greater Manchester, which includes Urmston, to declare a major incident over a coronavirus spike, as other parts of the country continued to open up. This incident saw Move Urmston, which had reopened post-lockdown, close down for the second time. But long before we had heard of Covid-19, Trafford Council decided to invest in public health through its leisure centres.

For 5 Plus Architects, bidding to design these was a long shot, despite director Paul Norbury's stint at FaulknerBrowns working on sports buildings. The practice hadn't got 'three of these' under its belt. But its track



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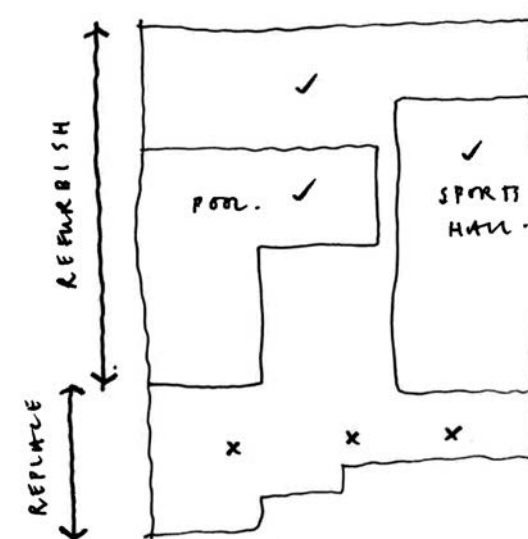
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Buildings Leisure centre



IN NUMBERS

£6.4m
construction value

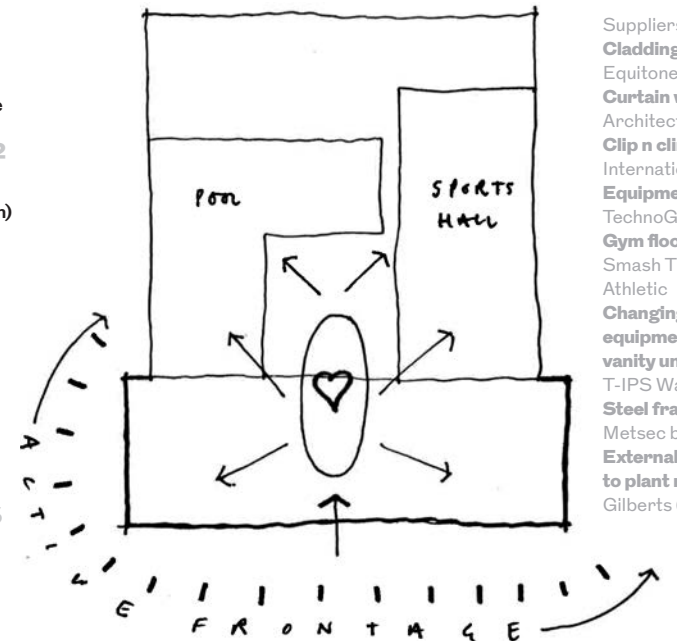
3,757m²
total building GIA
(including extension)

666m²
extension GIA

B (28)
EPC rating

338
kWh/m² per year

60 years
whole building
design life



Suppliers
Cladding (Equitone Linea)
Equitone
Curtain walling Dortech
Architectural Systems
Clip n climb Multiplay
International
Equipment supplier
TechnoGym
Gym flooring (Everlast
Smash Tile) Ecore
Athletic
Changing room
equipment (cubicles and
vanity units)
T-IPS Washrooms
Steel framing system
Metsec by Voestalpine
External louvres
to plant room
Gilberts (Blackpool)

record on its BREEAM Excellent Trafford Town Hall did count. Not only that but its design touched a chord and when it found the budget didn't match the council's aspirations the authority decided to focus its budget on Urmston, rather than other projects.

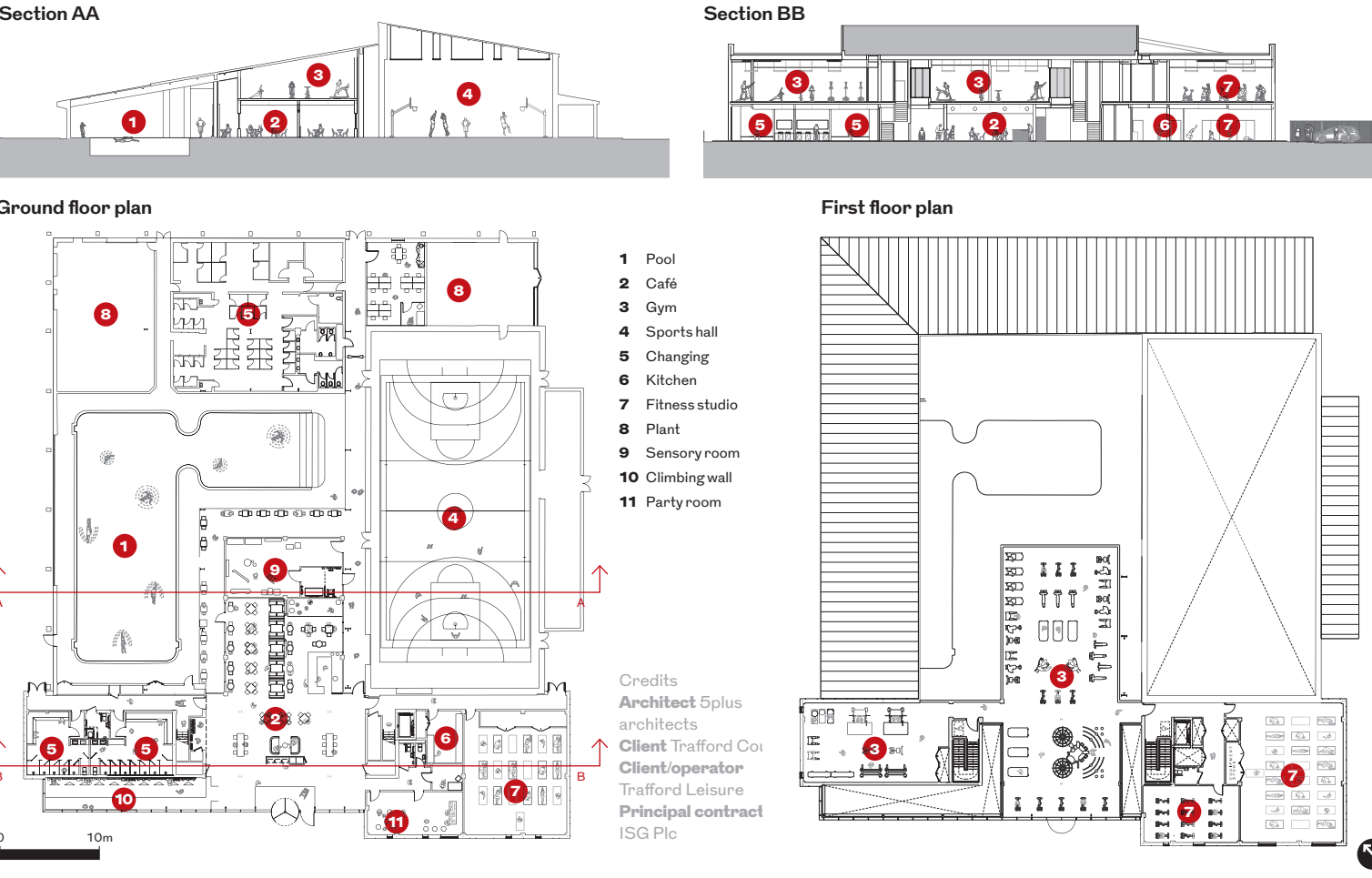
5 Plus kept the existing pool and sports halls and rebuilt the warren of rooms at the front of the building into a simply navigated space, starting with an open entrance, without turnstiles, and a climbing wall that acts as the energising face of the building behind the glass facade. An old and underused 'conservatory' becomes a poolside café and a sensory room. Studio spaces have been designed to work with different class sizes and give natural light even while, in one, the immediate plan is for a more immersive space where the big screen takes precedence.

Originally the brief had the sports hall chopped up into studios. 5 Plus argued to keep the generous flexible space – the sort of space few private gyms have access to. That will pay off as distanced activity returns. The sports hall was also seen as problematic, horribly overheating those who were already hot from their games and workouts. A study of the build up and possible solutions prescribed roof insulation and the addition of vents both high and low to allow for natural ventilation – a nice simple solution compared to the option of using air conditioning to keep players cool.

The government has often been urged to use its power as a client to effect change. Here, a requirement in the Trafford Core Strategy



Insulating the roof of the sports hall has reduced overheating problems.



for a CO₂ reduction of 5% on Part L (Building Regulations notional equivalent) has nudged the team into a better result. The leisure centre achieved a 6.9% reduction on the carbon emissions from the notional equivalent, a reduction of 5.3kg CO₂ emissions per m²/year. This came from a lot of small moves, though it started with the big one of revising the design to address solar gain. Savings were found in the fabric efficiency and that of heating, cooling and ventilation (an invisible intervention of replacing the 30-year old plant, a loss in embodied carbon but a chance to run the building more efficiently). Auto-off and dimming lights cut waste alongside a design to maximise natural light – noticeable in the entrance and in the clerestories of the existing axial spine. Air permeability has also been reduced to half that of the standard and the hot water system has been insulated.

Urmston shows that reworking, repairing and retrofitting, with plenty of attention to the tiny unglamorous practicalities, can start to make a difference to the climate as well as to people's lives. ●



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Non

Photograph Steven Pippin

Words Jan-Carlos Kucharek

Obsessed with photography as a child, artist Steven Pippin grew up asking existential questions about why we take pictures at all. This led him to create 'meaningful' photos with self-made cameras to take a very specific photograph. He began with a naked self-portrait taken – literally – by the bath using the plug hole as the iris, but things were to get more complex. A fascination with the pioneering time and motion studies of Eadweard Muybridge was conflated with the development process itself. 'Laundromat-Locomotion' was an artwork that turned 12 commercial washers into cameras, with the exposure on the back of the drum and the glass door as the lens. Even the negatives were developed 'in-drum', adding the chemicals as the rinse cycle, to come up with an eerie, scratched sequence of images of a customer (Pippin himself) that wouldn't have looked out of place in Muybridge's time. It was nominated for the 1999 Turner Prize.

Older now and more philosophical, Pippin is still dogged by the same questions. He is irked by the sheer profligacy of images; the millions of photos of the Eiffel Tower or Big Ben led him to muse on the mediocrity of the act of recording. It made him wonder by how many times the weight of analogue photos of these sights would outweigh the building itself. Digital media didn't help either. A full hard drive may weigh only fractionally more than an empty one but there's a calculable carbon cost in the servers that store our selfies and electron microscope scans; pixels incrementally working away at the ice sheets.

His image Non is a conceptual reconciliation with the medium: a reductio ad absurdum that is, in its way, a form of perfection. Contrived of four mirrors that reflect the exposure back round into the camera to be born again in the film chamber, this is photography inverted on itself; a camera as a thought experiment, explains Pippin. 'It makes a photograph of the point that records the photo... producing an idea of the photograph.'

And what does he imagine this cradle-to-cradle photo might look like? 'Of course, the image would be black,' he says, adding, in case there was any uncertainty, 'just a very particular form of it.' ●



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Inside the Duxford bunker

Architype's Corten-clad concrete repository provides unassisted temperature control for the Imperial War Museum archive

Words: Jan-Carlos Kucharek Photographs: Richard Ash

Say the word Duxford and architects are more likely to think of the great arc of Norman Foster's 1998 Stirling Prize-winning American Air Museum in Cambridgeshire than they are the airfield it sits on. But there's a lot of history to the site of the First World War aerodrome which also served as the WWII base for the RAF's elite No.19 Spitfire squadron and the US Air Force – not to mention the Cold War and Frank Whittle.

It was all in the mind of Mark Barry, director at Architype, the firm appointed by the Imperial War Museum (IWM) to design a new-build repository for its 100-year-old archive of artworks, photographs, letters and diaries, to create a major European archive of aviation history. IWM had been looking to move the collection out of London and for reasons both logistical – the local council was keen – and perhaps sentimental (it worked up the proposal with Duxford Aviation Society), plumped for the airfield as a site.

IWM wanted to safeguard the collection for posterity in the best environmental con-

Above The real magic lies behind the imposing facade.

Below A partly perforated Corten skin wraps round the concrete box.



ditions and according to the highest standards; and its interest had been piqued by Architype's 2015, £8 million, Herefordshire Archive and Record Centre (HARC), the first archive storage building in the UK built to Passivhaus standards. The budget here was significantly lower but what's been delivered for £2.8 million is arguably far more radical. With 0.03 air changes per hour, the store holds the world record for air tightness in a building; and its design strategies also obviated the need to adopt any failsafe backup. IWM, conceptually at home with the notion of risk and holding your nerve, ran with the proposition, bringing along the same consultant team for the project.

It involved big thinking from the outset, explains Barry. IWM had intended to refurbish one of the many disused, historic red-brick 'working' buildings on the site's less glamorous north end. This was possible, said Architype, but meeting the technical challenges as a retrofit would be difficult and would cost. Why not a new exemplar facility,

designed from first principles and for optimum performance, but which also gave an identity to a notable archive? Historic England, happy that a run-down shed was being spared an unsuitable iteration, concurred.

Park the store's imposing Corten facade for the moment; that's not where the real magic's happening. HARC, for all its innovation, bore its own burden of history in an outdated performance specification that demanded 5% fresh air supply, a client balking and demanding back-up plant – and two storeys. But IWM felt that if the structure was so highly insulated and airtight, it wouldn't need plant to deal with the temperature differentials and stale air pockets that necessitate air movement in the first place. And going from two floors to one meant no problematic detailing of wall/floor interfaces where tenths of a degree matter. So they did away with both. Instead, the idea was to keep the storage 'box' as cool as possible without any intervention at all. Of course, that meant

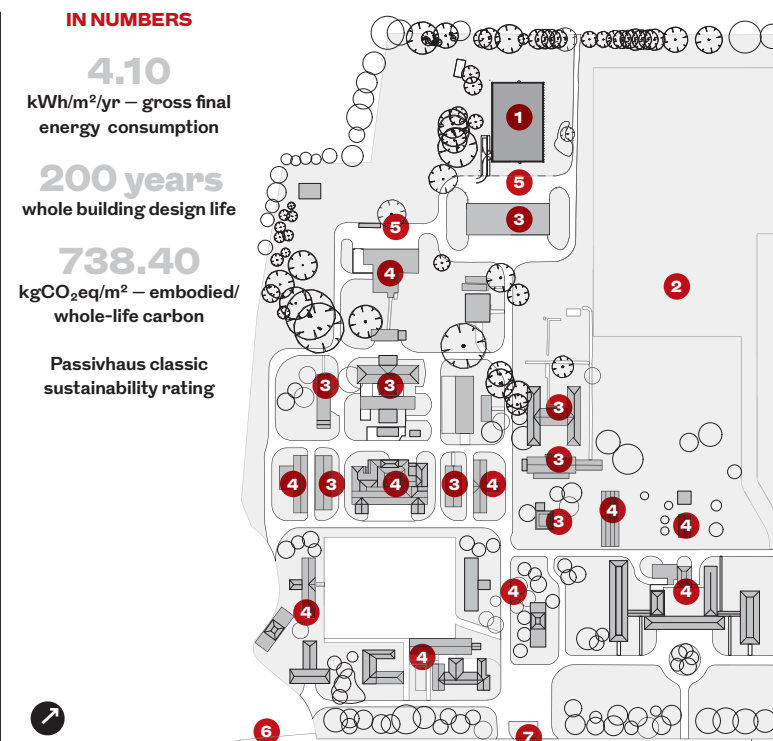
IN NUMBERS

4.10
kWh/m²/yr – gross final
energy consumption

200 years
whole building design life

738.40
kgCO₂eq/m² – embodied/
whole-life carbon

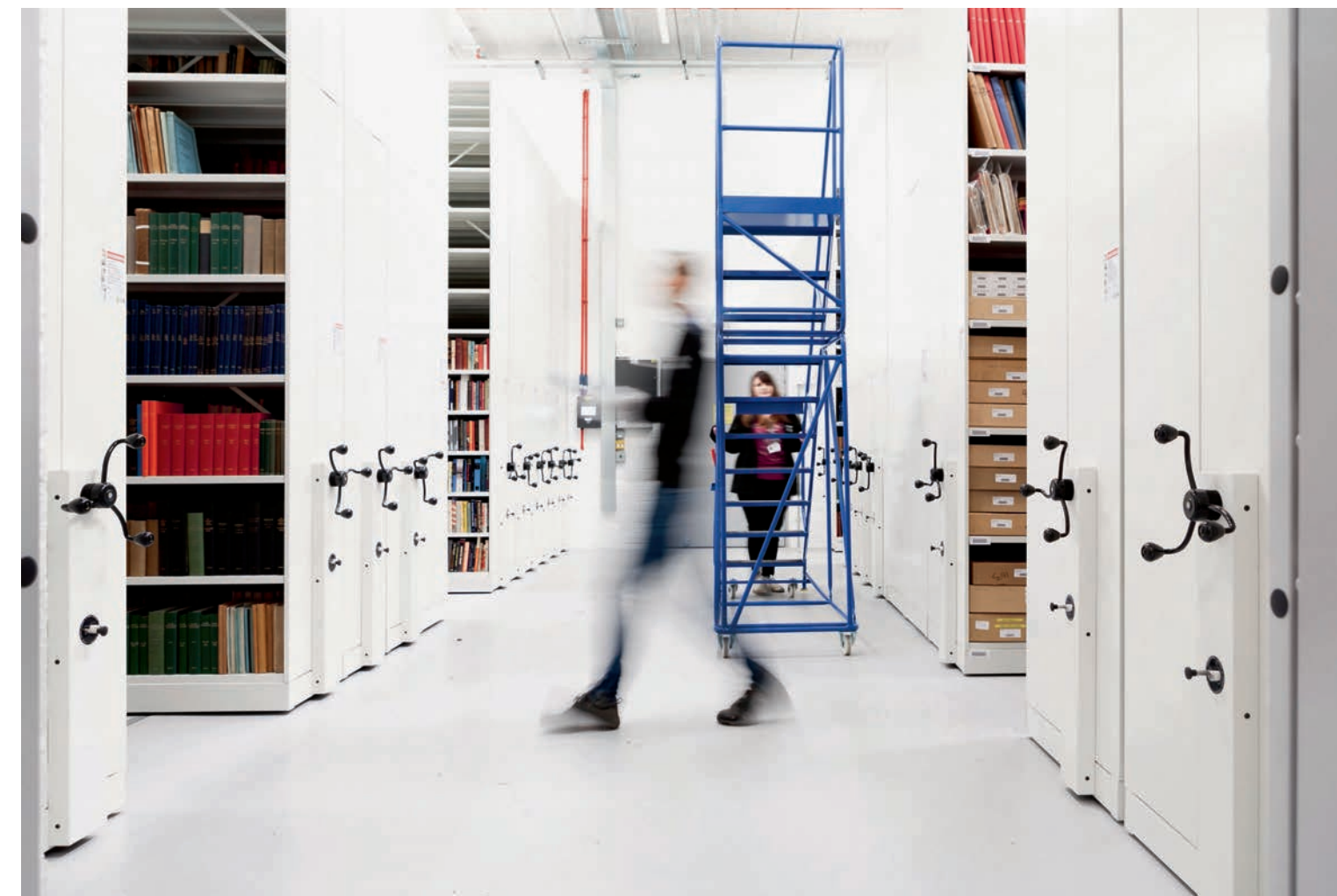
Passivhaus classic
sustainability rating



Site plan

- 1 IWM Duxford paper stores
- 2 IWM Duxford Airfield
- 3 Significant buildings
- 4 Listed buildings
- 5 Protected historic surface
- 6 A505 main road
- 7 Site entrance

Below The IWM archive is the most air tight building in the world, with just 0.03 air changes every hour.



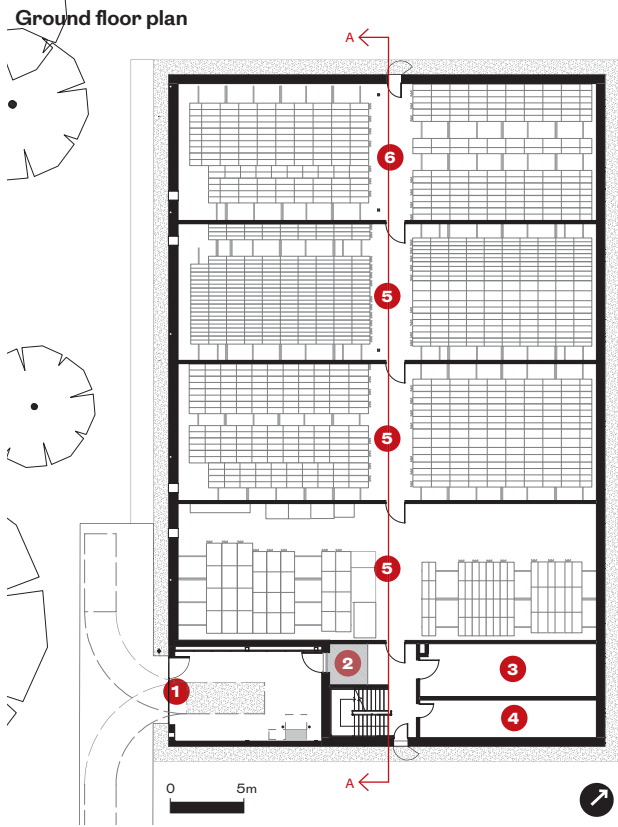
Archtype convinced IWM to go for a new exemplar building.

The concrete slab is a 12°C chiller plate in the summer and a 12°C low temperature radiator in winter

thermal mass and the creation of a sizeable concrete structure with 215mm thick walls and 200mm thick roof slab, around which runs a continuous sheath of 200mm PIR insulation.

But Barry emphasises that the innovation of ‘ground coupling’ ensures the building fabric itself works as hard as it can. And here it’s not just the 300mm thickness of the slab that’s key, but where it is and what it’s doing. The whole ground area site was dug out 400mm below ground level, a waterproof membrane laid and then the slab cast directly on the ground. ‘Below the frost layer, the ground in the UK remains at a constant 12°C,’ says Barry. ‘So by casting the slab here and running the insulation down past it, we were able to effectively turn it into a 12°C chiller plate in the summer and a 12°C low temperature radiator in winter.’ Insulation creates an unbroken thermal line while the slab transfers its heat/cooling up the walls and onto the roof. ‘It’s brings incredible thermal stability benefits,’ he adds. He knows, because of the sensors placed all around the perimeter.

The super-insulated, airtight box reduces the supply air requirement to a minimum but means that fresh air supplied at, say 20°C, will cause a spike in the relative humidity of the internal air. Rather than installing a commercial dehumidifier – like using a hammer to crack a nut – Archtype combined a chiller and MVHR unit, recovering coolth from the chiller to pre-treat the incoming air, lowering its temperature and reducing energy requirements even further. ‘All the



- Credits
- Client** Imperial War Museum
- Architect** Archtype
- Contractor** Fabrite
- Project manager** Fraser Randall
- Structural engineer** Momentum
- M&E consultant** E3 and Elemental Solutions
- Quantity surveyor** Avison Young
- Suppliers
- M&E** Sheridan
- 3mm thick Corten panels** Fabrite
- Airtightness membrane** Blowerproof Liquid
- Insulation** Warmcel cellulose fibre insulation (product), installed by Devana
- Roofing** Bauder Total Roof System (product), installed by Voland
- Timber frame** Greenroom
- Fire proofing** Davroy
- Screed** Clarke Contracts
- External Doors** Thoroughbred Doors
- Shelving/racking** Rackline
- Cladding to loading bay** Medite Tricoya Extreme
- Waterproofing** Visqueen
- Paint, internal** Keim Ecosil
- Airtightness tape** Proclima Tescon Vana
- VCL at junctions** Proclima Intello Plus
- MVHR unit** Zehnder
- Breather membrane** Powerlon UV 145 FR
- Air permeability test provider** STROMA Technology

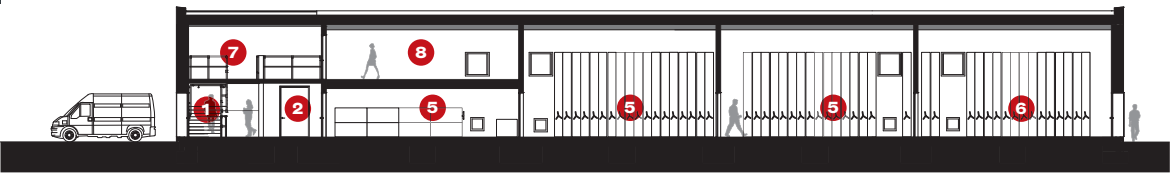


An MVHR unit recovers cool from a chiller to pre-treat incoming air.

Section A-A

- | | |
|--------------------------------------|---------------------|
| 1 Vehicle access | 5 Storage room |
| 2 Entrance | 6 Cold storage room |
| 3 Entrance lobby & temporary storage | 7 Landing |
| 4 Plant room | 8 Mezzanine |

0 5m



Below The architect feels the sacrificial outer skin resonates with the story of war.

Bottom right Each panel represents one of IWM's 100 years.



chiller’s doing is dehumidifying the air in an efficient way at low volume.’ he says.

As for the outer skin, Barry says there are thermal benefits in the cavity between it and the box, and that it hides the loading bay – but the sense is that it’s about the architecture. Why Corten? Why not some other high performance/low carbon rainscreen cladding? It’s only now that the architect talks about a feeling for the site and a respect for its materiality and history, and the formal play that arose. Each of its 100 panels represents a year of IWM’s centenary, and each perforation an archive acquisition; some blank, others shot through- each carrying its own trace of the past. Barry says they weren’t looking for an icon or a ‘jewelled box’, but to pick up on the colours and textures of Duxford’s wartime buildings, yet the store has assumed a sense of quiet monumentality all the same. He finally confesses: ‘What we liked about the material is that its outer surface becomes sacrificial to protect the rest behind it and we felt this resonated with the story of war.’

Inside this sacrificial skin, the store is gradually shedding its latent heat to go from 18°C to its working baseline of 12°C. Currently costing £2000/ year to operate, it will be half that when it finally settles and 1/100th of what it would have once cost for an archive building of this size. It took concrete and a lot of embodied energy but IWM can enjoy the spoils. A battle won in a climate war we can’t lose. ●



Devon's Roman villa

In a deeply collaborative venture, client and architect worked together to create an elegant sustainable home in a country village

Words: Hugh Pearman Photographs: Jim Stephenson



The wall game: the house slots in next to an existing walled garden on a gap site, expressing itself as a screen.

This understated and beautifully finished new house, a Roman villa with added technology, hunkers down next to an extensive existing walled garden in an East Devon village. Moreover it is a certified Passivhaus design which is ‘energy plus’, generating up to 40% more power than it consumes over a year. Unlike some other ‘Paragraph 79’ (previously Par 55) houses – that’s the clause in planning law demanding exceptional design for one-off houses in normally off-limits open countryside – it is not at all showy. Indeed, says client and resident Nigel Dutt, in discussions with the planners, he at

| IN NUMBERS | |
|---|---|
| confidential contract cost | 10W/m ² heating load |
| 388m ² area | 26 kwh/m ² a energy demand |
| -2.44 kg CO ₂ /m ² /yr net carbon emissions | 30 kwh/m ² a energy generation |

one point encountered the objection that it was not exceptional or innovative enough for the clause, which was an odd interpretation for a house as advanced as this. Moreover, it is not really in open countryside, with other village houses to either side of it. Nonetheless it was clear from the outset that this would be a tough one to get through planning and so the Par 55/79 route was the one to take. Despite the enthusiastic support of the local design review panel, the planning officers remained set against it. But the planning committee was in favour, and so eventually it came to pass.

Architect is McLean Quinlan, very much a family practice. Fiona McLean runs the London office, her daughter Kate Quinlan and son-in-law Alastair Bowden the Winchester one – strategically placed for the south of England one-off homes market. All were involved with this project along with others in the practice. The clients approached them directly, which is characteristic of their attitude: for instance the Dutts saw no point in hiring a planning consultant, preferring to do the necessary legwork themselves, and have designed and are implementing the landscape.

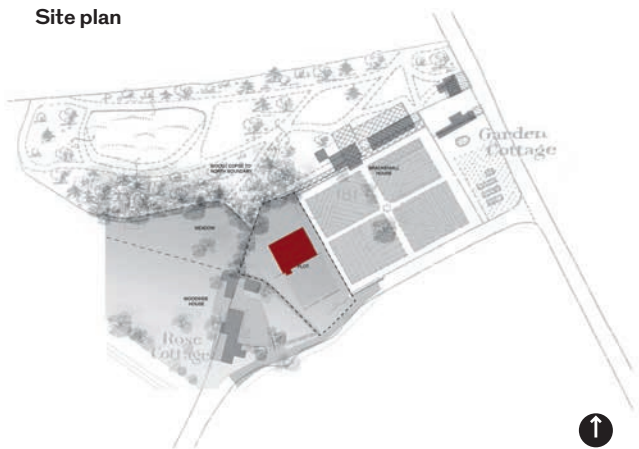
The Dutts – Nigel and Eileen – are mathematicians and retired software specialists (Nigel’s first place of work in 1970, he notes as an aside, was the young Norman Foster’s air-supported temporary HQ for Computer Technology in Hemel Hempstead). They lived in the village before the gently sloping gap site for this house came on the market. And, they point out, this is their home for life. It’s not a holiday home as such places can tend to be.

Living so close, the pair were closely involved in the design and construction, with Eileen taking on the landscape and both – given their backgrounds – fully up for the tech aspects of the design. There’s quite an impressive array of tech, which includes a 10kW rooftop PV array and battery storage, air source heat pump for underfloor heating, a phase-change heat storage battery for hot water purposes, a mechanical ventilation and heat recovery system, water from a bore-hole, and off-grid sewage system.

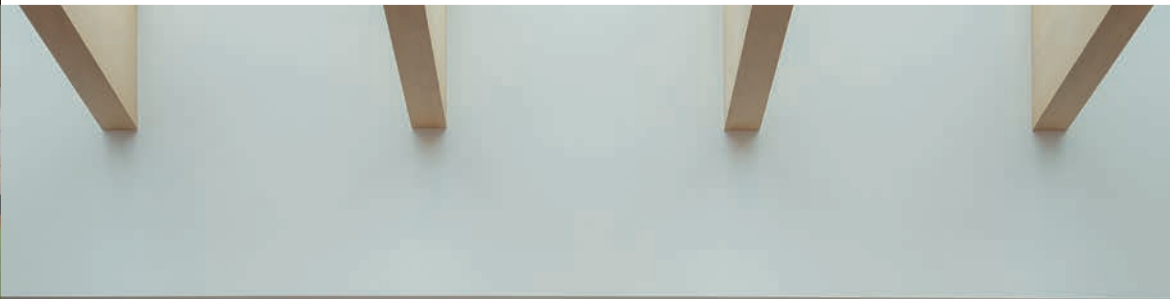


The Dutts are going to invest in an electric car to soak up some of their surplus power

Above On the south-west elevation the brick gives way to triple glazing and dark render.
Below left The front door, bang on axis, is an understated recess in the main elevation.



Buildings House



This image The central atrium, through which the activities of the house interconnect.
Above right Stairs to the basement with its media room, study, storage and plant rooms.



In the summer months the house generates more power than the local electricity supply company can handle (even with battery storage), and they have imposed a feed-in limit of 6kWh. The clients have had more than a year of occupation to monitor, and report: ‘In year one, the solar panels produced 10.450kWh of power. Total consumption was 7,480kWh, so the house is comfortably energy positive, with production exceeding consumption by 40%. Of the solar production, 4,920kWh was self consumed and 4.450kWh was exported to the grid. The remaining solar generated power was effectively lost because of the feed-in limitation. Of this 4,920kWh self-consumption, 2,250kWh was used via the battery. In total, just 2,550kWh was imported from the grid. The first year was also calculated to be carbon negative at around minus 500kg of CO₂’.

In consequence the Dutts are going to invest in an electric car to soak up some of their surplus summer power. In the winter months they draw on the grid for the small energy needs of this massively insulated house, but can still use off-peak power to charge their storage battery.

Structurally the house has a smaller basement level cast in concrete lined inside with Tribus 4Wall panels – this contains a ‘living and media room’ flanked by the plant room on one side and storage space on the other. Above that it is a hybrid structure deploying SIPs, or insulated structural panels (again the Tribus 4Wall system, made locally), composite timber/steel beams, and some steel framing.

The plan is close to that of the classic Roman house, the Vitruvian ‘Domus Italica’

The long brick entrance elevation steps down the slope, jointed in lime mortar to reflect the old garden wall alongside. It extends beyond the house footprint on both sides as perforated screen walls. Behind this, the house is expressed as a simple rectangular structure clad in black Sto render. All glazing is triple-glazed Josko units.

The house is arranged as a sequence of rooms and spaces around an entrance hall/courtyard, gained by a narrow lobby. The plan is therefore pretty close to that of the classic Roman house, the Vitruvian ‘Domus Italica’. No need for the Vitruvian ‘hortus conclusus’ or enclosed garden at the back, because here the hortus conclusus is the land between the house and the wooded site boundary. Besides, another is close by in the form of the pre-existing walled garden. The Dutts have bought a broad rectangular strip of this for their own use.

In a Roman villa the atrium would be open to the sky but in this Passivhaus the sky is seen through a triple-glazed rooflight, shaded by an external horizontal blind. The idea of a sliding roof was considered but rejected on cost grounds.

Perhaps one can see the memory of Ancient Rome also in that brick entrance elevation which gives little away beyond the oriel window to the dining room behind. The front door is clearly indicated but downplayed. A narrow vertical slit lights a bedroom. The windows get larger on the bedroom side of the house, facing the walled garden, and expand into a large framed view in the library at the back. Finally, on the south-west elevation to the main living/dining spaces, the walls dissolve into glass to take in the longer views to the hills beyond. In turn the glass walls can open up to a broad timber external deck.

The Dutts are clear that while some expensive items were ruled out, the quality of build and of finish was sacrosanct. Hence the use of warm recycled floor tiles and oak. Besides, the house is also something of a gallery for their collection of ceramics.

Lockdown meant that Eileen Dutt could

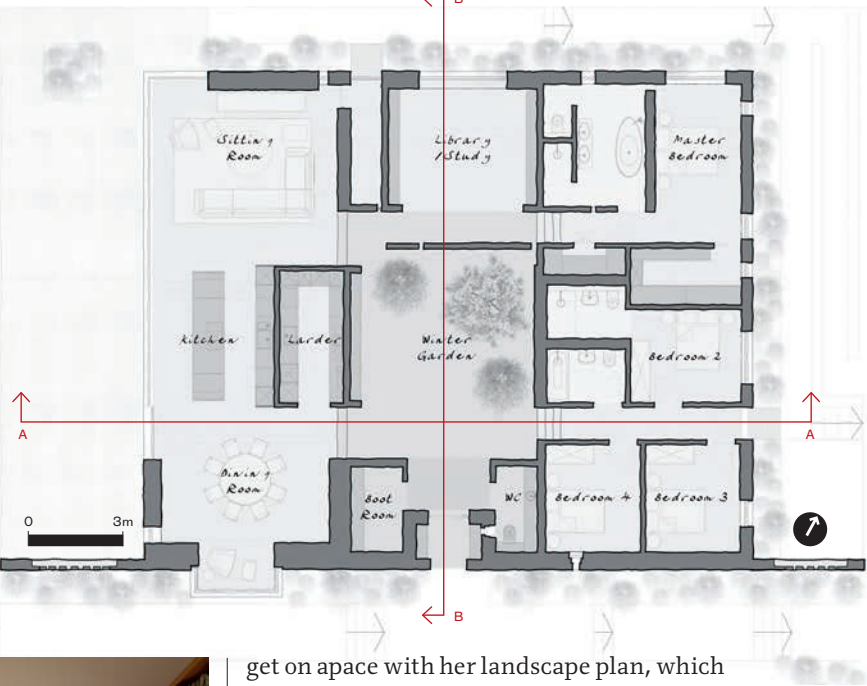
This image Looking from the living area across the kitchen to the dining room with its oriel window.

Below The library with its huge triple-glazed window looking across to the woods behind.

Credits
Architect McLean Quinlan
Structural engineer Tribus; Airey and Coles
QS Hosken Parks
M&E WARM
Landscape design Client
Contractor Goulden and Sons
Building control Devon BCP
Passivhaus certifier Cocreate

Suppliers
Structural system Tribus 4Wall
Rooflights Lamilux
Windows and external doors Josko
Bricks Wienerburger, Pastorale multi
Render Sto, Stotherm Stolit K
Internal wall finishes Clayworks Plaster, Farrow and Ball
Floor tiles MOSA Quatz
Wood floors Skema Oak
Terracotta tile Lubelska Luby

Ground floor plan



get on apace with her landscape plan, which also has a practical consideration – a stand of silver birch trees will in time provide summer shade to that south-west elevation. Even so, after this summer’s hot spells the couple and their architect plan to fit some brises-soleils to the house to reduce peak temperatures.

With that tweak and with the landscape maturing, the house will bed into the land next to its neighbouring brick wall. An environmentally beneficial house of calm inter-linking spaces, in and of its gardens. ●

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Black knight

Smothered in solar panels, this energy positive office in Trondheim is one of several projects built by a crusading alliance that includes its architect Snøhetta

Words: Isabelle Priest Photographs: Ivar Kvaal

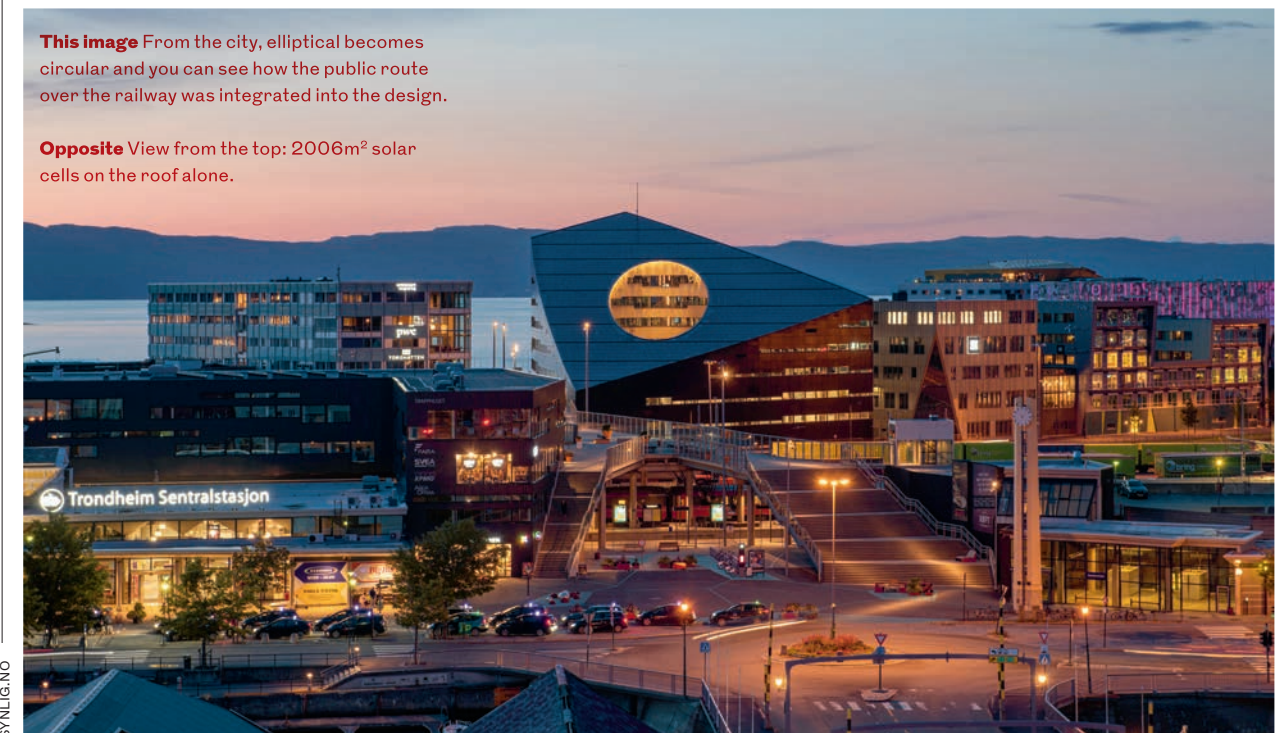
‘Form follows environment’ is the mantra that guides Powerhouse Brattørkaia in Trondheim, the first office building in Norway that produces more energy than it uses. Designed by Snøhetta, it is energy positive in construction as well when all its figures cradle to grave are included. The building is expected to use 21kWk/m²/year, and has embodied energy amounting to 22kWk/m²/year, but will produce 49kWk/m²/year, enough to power neighbouring buildings and a fleet of the city’s electric buses through a local micro grid. Unusually, though, this is not the new headquarters for an on-the-pulse eco company, it is a speculative office for commercial tenants.

‘Buildings account for 40% of the world’s energy consumption,’ explains Rune Grasdøl, Snøhetta senior architect and project manager for the scheme, by video call. ‘Energy positive construction is an important part of the solution to global warming.’

The project emerged out of an alliance of big companies in Norway, including Snøhetta, in 2010. The other parties are contractor Skanska, property company Entra, environmental organisation ZERO and consulting firm Asplan Viak. They met at a conference and decided the only way forward with sustainability was to set themselves as a group the challenge of producing zero emissions buildings.

This image From the city, elliptical becomes circular and you can see how the public route over the railway was integrated into the design.

Opposite View from the top: 2006m² solar cells on the roof alone.



The main shape was determined by planning regulations but the concept design was about finding the best possible way to collect sunlight

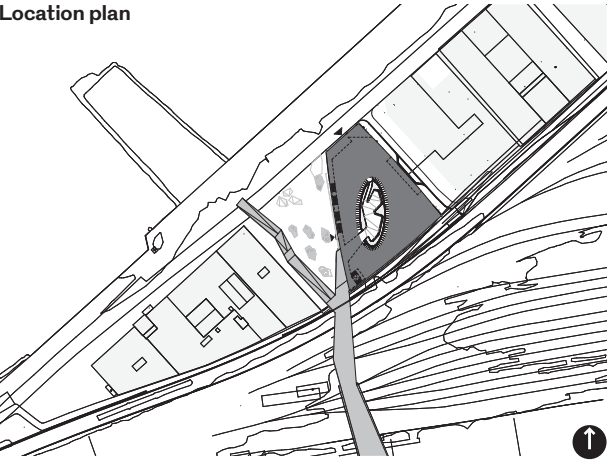
A decade later, that goal no longer seems as ambitious as it would have then, yet the alliance has completed four projects, known as ‘powerhouses’ because they produce more energy than they use over their defined lifespan of 60 years, including construction, demolition and embodied energy. The energy they produce is renewable and clean. The first project was a 5,200m² refurbished 1980s office scheme just outside Oslo in Sandvika (‘the best thing is not to build at all’, says Grasdal). And next month the group will complete Powerhouse Telemark, another office possibly even more striking than this one, but its second project was a school and it is also working on a hotel.

At 17,800m², Brattørkaia is the largest to date. Like the others, it prioritises solar power to meet its energy needs. The requirement sets the building’s architectural expression as a kind of black iceberg that has inexplicably become neatly wedged into the fjord-side of downtown Trondheim, between otherwise ordinary looking buildings. From a distance, though, the slightly arched pointed top of its huge sloping roof forms another peak in the horizon of mountains behind.

The aim of the project was threefold: to maximise the amount of clean energy produced by the building, to minimise the energy required to run it, and to serve as a pleasant space for its tenants and the general public.

The building occupies a brownfield site next to a public plaza in the city’s former industrial port area, which has been redeveloping over the past 20 years.

Location plan



This image The corrugated yellow composite cladding panels frame the view to the city.



SYNLIGNO

One neighbour is Entra’s headquarters, the other is a new business school commissioned by Entra. The site is an important route to the city centre for people arriving at/leaving from the speedboat terminal via an existing walkway and series of stairs and lifts over the railway tracks that needed to be integrated into the scheme.

‘The main shape of the building was determined by planning regulations, building out to the maximum footprint by the public square,’ says Grasdal, ‘but the concept design was about finding the best way to collect sunlight.’

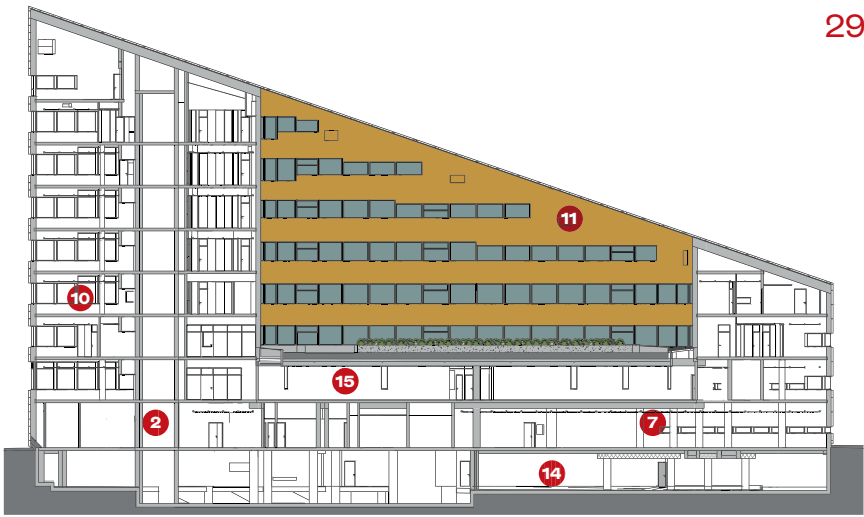
The principal design idea is the building’s vast south-facing sloping roof, which is covered in 2,006m² of solar cells that generate much of the building’s electricity. The roof is strategically angled to 19°, the closest possible to the optimum 30° that the planners would allow. Any steeper and the building would have been too much taller than its neighbours, but averaged out over the footprint, the 10 storeys was permissible.

The elevations, meanwhile, all have a gentle bow outward, an architectural feature designed to express a ‘bursting with power’ analogy to the pentagonal plan. Like the roof, the south facade is entirely covered with solar cells (503m²), and part of the western one is too. Over a year, the cells are able to collect nearly 500,000kWh of green energy, with the near total daylight summer months compensating for the near total darkness of winter. A rack system on the roof allows for easier maintenance and prevents snow build-up collapses, although minimal snow is expected to settle in this location as it is so close to the sea and because the cells and building are black, absorbing what sunlight there is.

All over, the solar cells graduate into the aluminium sandwich cladding panel facade, deliberately chosen in black to make them disappear and to discreetly infill the triangular gaps around the rectangular solar cells on the roof, creating an environmentally conscious building almost in disguise.

‘We also wanted the building to look all like one. We didn’t want to express the solar panels,’ explains Grasdal.

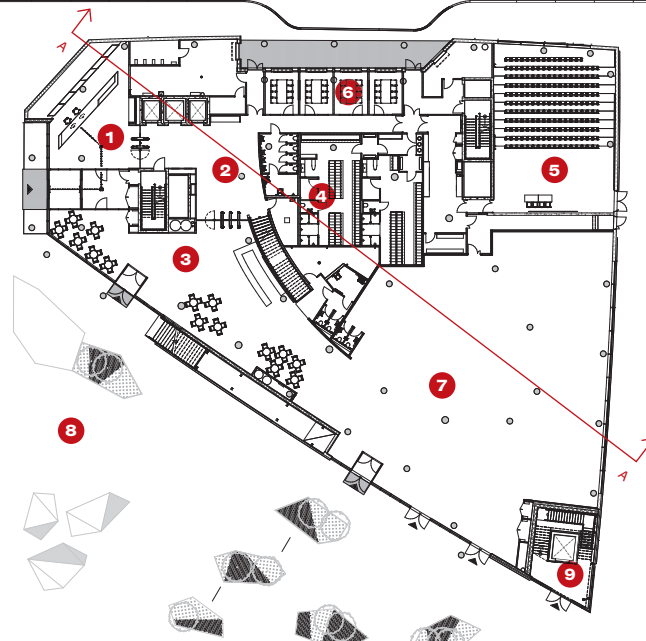
In the middle of the roof, however, is a giant elliptical courtyard that appears completely circular when seen from the city centre because of the roof pitch. It



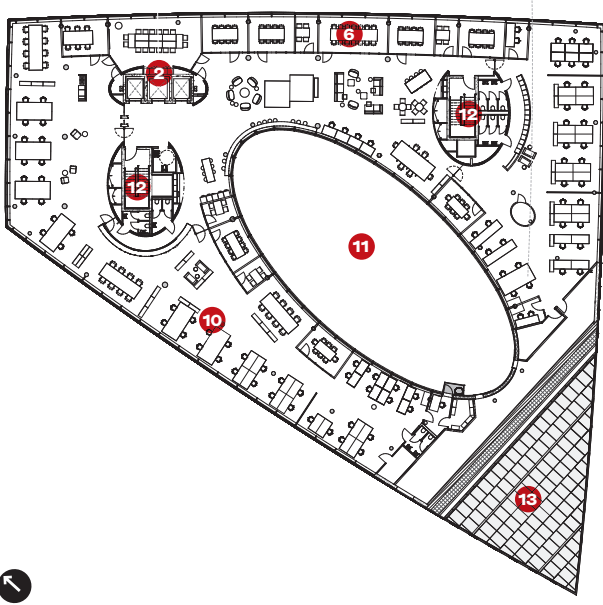
Section A-A

- 1 Entrance and reception
- 2 Lift lobby
- 3 Café open to public
- 4 Cyclist changing area and lockers
- 5 200-seat auditorium
- 6 Meeting rooms
- 7 Retail unit – now divided
- 8 Public plaza
- 9 Public lift to walkway route over railway to city centre
- 10 Open plan offices
- 11 Courtyard void
- 12 Staircase cores and WCs
- 13 Solar panel roof
- 14 Basement bike and car parking
- 15 Canteen

Ground floor plan



Typical office plan



Credits
Architect Snøhetta
Client Entra
Entrepreneur Skanska Norge
Advisors Sweco Norge
Tension covers Thilt
Lighting AF Lighting

also makes a spectacular frame for views out towards the city centre and the cathedral. In contrast to the all-black exterior, this area of the facade is clad in corrugated yellow panels, made of the same aluminium composite, that bring extra daylight into the deep office plan. The courtyard is publicly accessible via a tunnel through the building from the walkway level on the second floor. It is designed to form part of the ventilation system as well.

Yet solar is not the only means by which the building powers itself. It conceals multiple technologies that both radically reduce energy use for its daily operations and leverage surplus energy. The heating and cooling system includes a water-to-air heat exchange system connected to sea pumps – a system that operates in a similar way to ground source heat pumps by making the most of the building’s harbourside location in using the relatively stable 4°C temperature of deep water. Low-speed air circulates through the building from the basement via ventilation hubs in the lift and stair cores as well as through specially designed columns. The air is let out close to the floor, while the extraction takes place centrally by suppression in the stair shafts.

Meanwhile, triple glazed, sun protected, externally aluminium encased timber windows are extra large on the north elevation to make the most of the views to the fjord and maximise daylight, avoiding much need for artificial lighting. But the windows get progressively shorter and narrower as you go round the east and west elevations towards the south, to prevent too much solar gain. The building also employs a concept called ‘liquid light’, which allows the artificial light to smoothly dim or brighten according to internal activity, reducing energy demand. Together, these strategies mean Powerhouse Brattørkaia consumes only about half the amount of energy for lighting of a typical commercial office building of comparable size.

Likewise, the plan itself is designed to maximise energy efficiency. All enclosed meeting rooms are positioned along the eastern elevation to ensure daylight heating can circulate in the largest spaces, preventing the small rooms from getting too hot. This combines with building’s structural system of low-emission concrete, which uses its thermal mass to absorb and retain heat and cold, to regulate the temperature in the building without using electricity. Automated windows help regulate night-time cooling alongside the stack-effect of the courtyard.

Inside, this means that towards the facade, the underside of the structure is as exposed as possible to allow air circulation beneath. Acoustic panels therefore accumulate in the centre of the footprint where less cooling required. ‘There is always a conflict between heating/cooling and sound design,’ says Grasdal. What’s certain is that very few of the choices for the building were solely aesthetic ones – even the yellow panels on the

IN NUMBERS

430m
Project cost in
Norwegian Krone
(£36.9m)

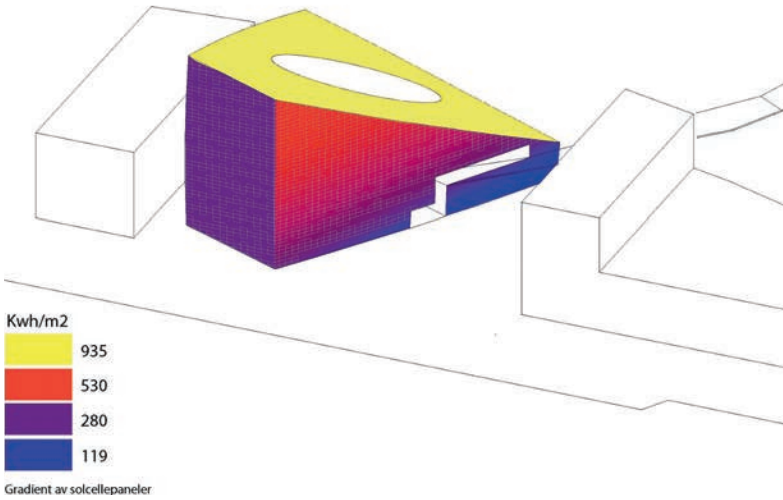
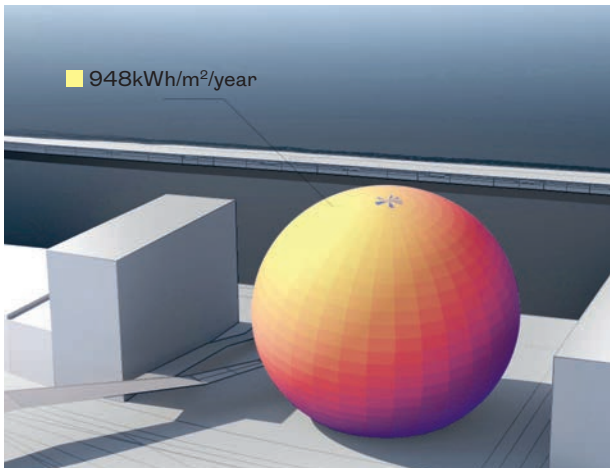
17,800m²
GIA

2,867m²
area of solar panels

458,457
kWh
approximate total solar
production per year

Right The initial solar study of the site and how much electricity can be gained on each surface of the building.

Below North harbour-side elevation. Battery technology has not been incorporated as the architect did not feel the technology has advanced enough, but there is a store room for the future.



| Solutions of Continuity |

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Critique Office

In future you may not need such an expressively sloped roof to achieve the same results

‘It’s important to understand you can’t build this building wherever you want. This is surrounded by public space, the challenge for many other sites are neighbouring buildings that cast shadows.’

‘But Brattørkaia is also a building that expresses where we are in 2020. As new facade systems and more efficient solar panels develop, in future you may not need such an expressively sloped roof to achieve the same results. The cost of solar cells will also go down, it will take less energy to produce them and they will be available in different colours and textures.’

Back in Britain, if anything good is to come out of the government’s overhaul of planning right now, perhaps it’s that one of these modern mini power station should be integrated into each of the new regulated planning zones, making the space around them for each to thrive. Meanwhile for the Powerhouse Alliance, it is ramping up its goals in line with the Paris Agreement on embodied energy with the vision set for energy-positive and carbon neutral. ●

Left Circular staircases connect office floors and are also crucial to lighting and ventilation.

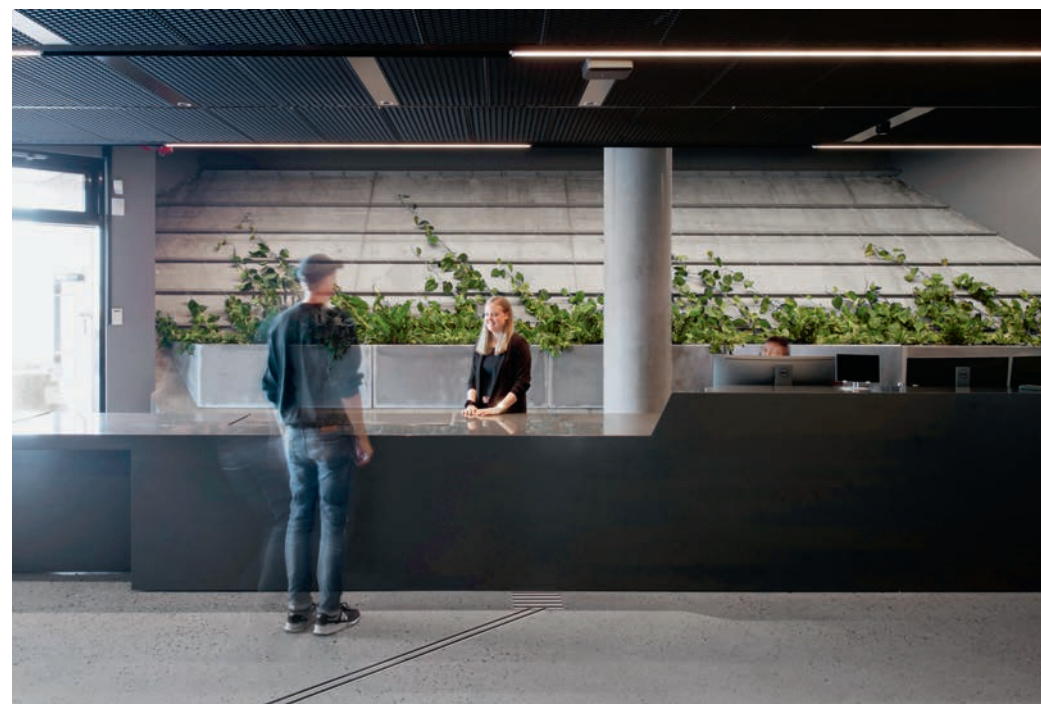
Below The exposed concrete ground floor reception desk.

external stair to the public walkway over the railway are primarily for wayfinding.

So, what does the building provide?

On the ground floor by the main entrance there is a café that opens onto the plaza, a retail unit (currently a florist) and a visitor centre where people, particularly schoolchildren, can learn about the building and its sustainable attributes. There is also a 200-seat auditorium for use by the offices or for hire, as well as changing facilities and lockers to encourage users to arrive by bike. On the first floor is a canteen, daylit by rooflights surrounding the garden in the courtyard, and above there is office space for 600 desks, already let to tenants including construction and shipping companies.

For its efforts, Powerhouse Brattørkaia has received the BREEAM Outstanding certification, which doesn’t quite say enough about its impressive credentials. This project provides a wealth of inspiration for how to implement technologies that produce energy-positive, environmentally friendly buildings. But in Grasdal’s closing comments he fires a warning shot as well as expressing hope:



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Judges: Mary Arnold-Forster, Mary Arnold-Forster Architects; Joanna Asia Grzybowska, Rising Star 2019, Powell Tuck Associates and Mycelium Associates; Klaus Bode, Urban Systems Design; Jo Dimitri, National Trust; Alex Ely, Mae Architects; Shahed Saleem, Makespace Architects and University of Westminster; Eleanor Young, RIBA Journal

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Deadline: 2pm, 12 October 2020
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Enter at ribaj.com/risingstars/enternow

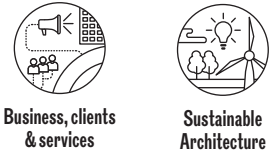
Read what’s driving previous Rising Stars at ribaj.com/risingstars



Reuser friendly – waste innovation 36

Digging for Britain – Eden’s geothermal bid 44

2: Intelligence



Simon Allford



The government’s ‘Build build build’ can happen best by ‘Design design design’ says Simon Allford, a director of Allford Hall Monaghan Morris, whose year as RIBA president elect began on 1 September

How do you feel about winning the next RIBA presidency?

It is a privilege. We need an institute of ideas with architecture front and centre, hosting debates, lectures and exhibitions reflecting changing cultural and practice contexts, as well as one that is a practice friend and celebrates members’ work worldwide.

What ideas from the other candidates did you most admire?

I was struck by Valeria Pasetti’s focus on membership, to understand what the RIBA might offer them. Nick Moss’ singular focus on procurement, Sumita Singha’s interest in alternative methods of constructing and the associated environmental benefits, and Jude Barber’s vision of a more intelligent, productive and generous model of architectural education and practice.

How would you tackle the climate emergency as RIBA president?

Architects have a key role in this. We must work with clients to design, build and evaluate exemplary low-carbon buildings, demonstrating that these are an achievable essential. The RIBA can help by capturing that knowledge and promoting it to clients. I would like to form a low carbon alliance with consultants and clients to push government to help push ourselves. I have experience of all this. AHMM’s building performance team worked on the RIBA’s 2030 Climate Challenge, Plan of Work and on an Innovate UK-funded Knowledge Transfer Partnership with UCL.

What would be your first action to help practices recover from the coronavirus crisis?

The RIBA needs to support students, by promoting apprenticeship and related programmes for those entering the profession – otherwise we will lose our future. And practices, by capturing, sharing and promoting excellent examples of post Covid-19 architectural design that address the challenges of redesigning our environment. RIBA needs to lobby government, meet ministers and show how architects can make ‘Build, build, build’ happen best by ‘Design, design, design’!

How will you prepare for the role as president elect?

Writing my statement of candidature and the campaign was good preparation. Now I need to meet more people on the RIBA Council, Board, staff and members (always members!) to see how to bring it into practice. The post-Covid recession, Grenfell and climate change remain the challenges. We need to analyse changes proposed in the new planning white paper and offer constructive advice on achieving its design aspirations. I am an optimist – what I hope to help change is the RIBA’s ability to support our talented, diverse membership.

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The service is suitable to map reuse opportunities in retrofit or extension projects or to identify materials that can be sold from buildings slated for demolition

Stephen Cousins on a digital/expert service to reuse building parts from White Arkitekter: ribaj.com/recapture



Intelligence is officially approved RIBA CPD. Look out for icons throughout the section indicating core curriculum areas.



Waste warriors

Ambitious young architects pioneer Re-fabricate with new ideas to tackle global waste

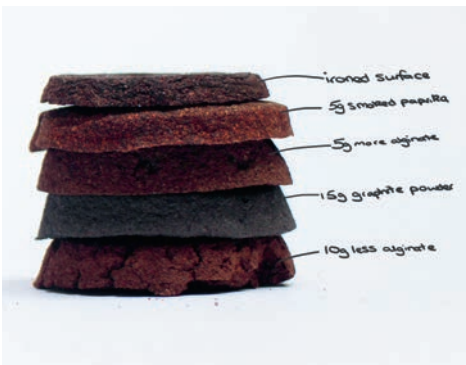
Isabelle Priest

Last summer a group of young architecture graduates decided to try to bridge the yawning gap between academic study and industry in terms of thinking and working. The group included Kate Ridgway and Paul Daramola, whom Dian Small of RIBA London put in touch with Rosanne Scott because of the latter’s interest in Architects for Change, particularly around supporting architects with disabilities and dwarfism. They all felt the RIBA could do more to support people at their career stage and wanted to develop wider networks. They all had an interest in sustainability, waste was in the news a lot at the time, and they decided they wanted to do something. That is how Re-fabricate began.

The initial interest developed into an idea of finding teams that would each tackle the reuse of a type of waste material – timber, plastic, textile, aggregate and glass – by collaborating with other design and industry professionals. The project launched at the RIBA Sustainability Festival in September last year, which led to link ups with Tiziana di Ronco, Sophie Zara James and Guiseppe Ferrigno. This group became the committee that ties the project together. They put out calls for collaborators through organisations such as the Royal College of Art, Landscape Institute and Association of Industrial Designers. They set up a website and sent out flyers and enewsletters and received more than 200 responses from a huge range of



Below Early meetings with Re-fabricate members took place through RIBA London.



Left The Aggregates group devised a product using coffee grounds as an alternative to sand in the production of concrete.

Above The coffee ground concrete testing samples showing some of the different mixes.

professionals – architects and designers spanning concept, service, landscape, urban, product and digital, as well as material developers. The responses were narrowed down to around 60 people and each person was assigned a group, with about a 50% split of architectural designers to other backgrounds for each type of waste material.

‘We had such high interest,’ explains Scott, ‘that the initial five groups turned into six, with two for timber.’

The project, which started officially in February with a series of workshops and lectures on the circular economy, has just completed. For the final virtual presentation each group had to explain their idea, the research and testing and develop a potential business model with help from external mentors. The idea was to use a Remakery co-operative workshop space in London to develop and test ideas, but coronavirus meant this was not possible and teams had to switch to working from home.

Nevertheless, the energy and products that have come out of the project are remarkable. Some teams focused on creating new products out of old. Aggregates, for example, used coffee grounds as a sustainable alternative to sand in the production of concrete and ceramics. Glass, meanwhile, invented Glass-Pass, an environmental certification tagging to make recycling more efficient – a project the committee and the RIBA are considering rolling out to other regions. Three of the teams’ creations are detailed here.



Timber 01 – WoWood

This team of seven included a landscape architect, service designer and product and concept designer. The group started by researching the different grades of timber waste from A-D and how to interrupt that process. The initial focus was on grade D waste because so much of it goes to landfill. The team found that the finest grains of sawmill waste dust particles cannot be used for MDF manufacture. They wanted to create a new product that would use this waste and use natural binders. They sourced several big boxes of sawdust of different types of timber, including cherry and chestnut. They also collected bark from a local forest and ground it down.

Three members of the group were responsible for testing, turning their homes into micro labs. Using household instruments such as a coffee grinder they bought with the seed funding money and natural binders made from potato peel, carrageenan (from seaweed) and another agar-based binder, they went about creating samples. They made about 30, 10cm radius samples in total, exposing them to the elements, then heating and reshaping them for testing. For the final presentation they used a sawdust and carrageenan mix named WoWood, formed into an acoustic panel using a steel mould. Once dried and solid, the product is 100% biodegradable and can be reshaped into other things later. The surface is deliberately multifaceted, including holes for acoustic purposes.

The team is keen to progress the product into a business. The immediate next step will be to send the samples for toxicity, waterproofing and further acoustic testing, then to investigate how to amass the waste to create the material and possibly switching to a binder they could make out of waste collected from restaurants. The group sees opportunities in all kinds of interior products – they even made a coat hanger out of it. If it succeeds in waterproof testing, it could even be used for fencing.

Above WoWood is a new product made from waste sawdust and carrageenan natural binder.

Below It could be used for acoustic panels, even partition walls. Early tests show it is easily reshapable.



Textiles – WeRope

The eight people on this team were committee member Sophie James plus four architects and a mix of other designers, including textile specialists. Again, the group started with research and was shocked to discover statistics such as the fact that globally a truck’s worth of textiles is dumped into landfill every second. But the problem with this waste is it contains many different fabric types, which are often in themselves composite fabrics. Early on they engaged with the IKEA shop in Greenwich and the issue of uniform waste disposal – the logo causes additional problems for recycling. At that point the team was considering two options: creating a new bio material by shredding and grinding material down and binding with natural resins, or finding a way to use the textiles’ strength properties to create new items.

Starting with the bio material, the team went about creating samples at home. However it didn’t work and was just creating more waste. So members started experimenting with traditional ropemaking, learning how to do it through online videos. They tried out different thicknesses, knots and combinations of textiles. Team member Rashmi Bidasara’s family background is in textiles and during lockdown she returned to India and started ropemaking at home with her grandmother and mother using an old weaving loom. The final product became a prototype charpai, a traditional woven bed used in the Indian subcontinent, made using a metal frame and the recycled rope technique. They made strips out of the recycled textiles which they attached to a drill to spin it quickly to form a braid. This was then held taut by 6kg kettlebells and tested with five different types of knot.

At the same time, the team formulated a business model called WeRope. The first part would be to provide the rope, the second



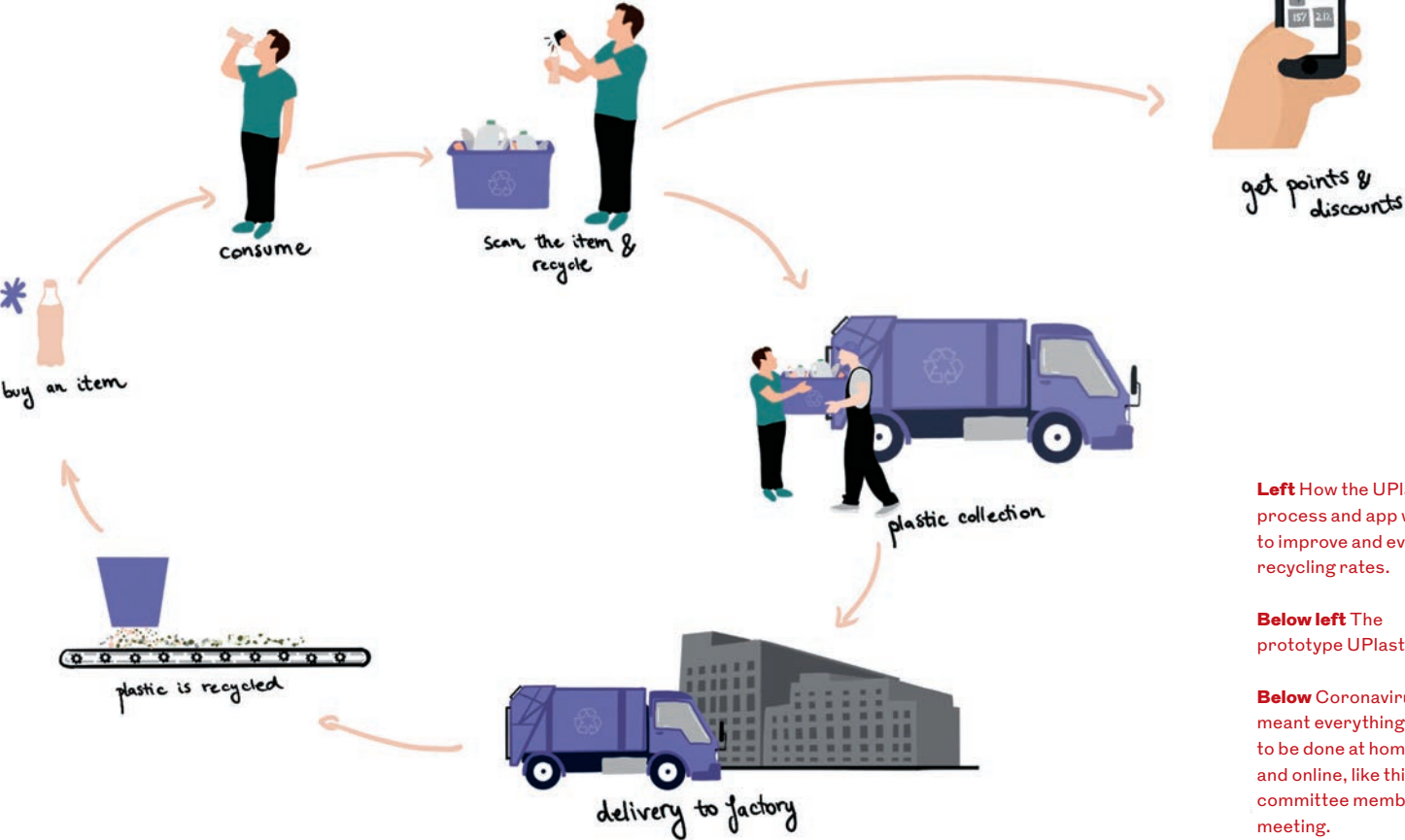
Above and bottom left
The ‘WeRope’ testing
process of making ropes
with unwanted clothing.

This image: The textile
group’s final product
was a charpai, made by
Rashmi Bidasara with
her family in India.



Ropemaking skills turned
old textiles into braids for
a charpai, a traditional
Indian woven bed

stage to provide rope panels for use in smaller items, the third stage would be to create modular panels and the fourth stage repair and recycling. The team see potential for the technique to be applied to all sorts of items: noticeboards, benches, stools, even wall partitions. And there’s potential to team up with companies like Zara and H&M Home, sourcing recycled waste textiles from them and then selling the furniture items in their shops to create a circular economy.



Left How the UPlastic
process and app works
to improve and even out
recycling rates.

Below left The
prototype UPlastic app.

Below Coronavirus
meant everything had
to be done at home
and online, like this
committee members’
meeting.

Plastics – UPlastic

The eight-strong Plastics group was an interdisciplinary mix including landscape architects and urban designers. It took on the challenge that many people are trying to solve – how to stop a truckload of plastic going into the ocean every minute. They decided early on that the biggest problem with plastic is the waste disposal and recycling process, and the lack of trusted system to deal with it. They discovered, for example, the huge variation in the uptake and success of recycling between UK councils. The best, like the South Riding of Yorkshire, have a recycling rate of 60%, whereas the worst are

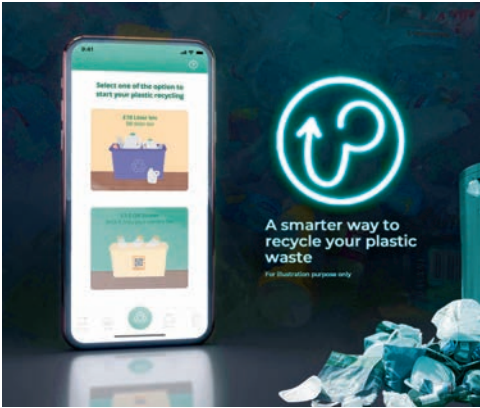
generally around 30%. However, Newham in London has a rate of just 14%. Many councils’ solution to recycling was to export as much as 1 million tonnes per month to South Asian countries, but since China banned that in 2018, it has fallen to 500,000 tonnes a month. With this in mind, the team decided what was most needed was a way to improve, rationalise and even out rates of recycling, rather than a method that would create new materials. They wanted to remove the local, postcode lottery aspect and incentivise consumers at the same time. They decided this would be best done with a mobile phone app in which the users are individuals and small businesses, the client is the council and the target market is medium to large recycling companies that process the plastic appropriately. Partners in the process were found through the UK Plastic Pact.

The group developed a prototype app for their presentation. To use it, individuals scan a plastic item’s barcode, which is linked to a database that shows what type of plastic it is, which parts are recyclable, and how to prepare and sort it. The item is put in a container which is collected when full and taken to the partners for recycling. Users can track the progress of their recycling from beginning to end and get points and rewards based on

weight and number of items they recycled which they can exchange for discounts. They can also share their successes on social media within the app to develop a culture of recycling. For example, if you recycle 10 Coca-Cola bottles, you might get one for free. In time, the team thinks organising its own collection process would be the most reliable and efficient system.

The group now plans to undertake surveys of different recycling habits and demographics, as well as user flow analysis of the app. It is targeting Newham council to run a test project. ●

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Contractors join green crusade

Contractors Declare spreads construction's battle against global warming. Multiplex is leading the charge

Eleanor Young

Architects Declare has become an international brand. Architects have signed up across 23 countries from the Czech Republic to Australia, each branch set up by those on the ground. The UK has also has a growing number of other professions creating their own declarations. And at the end of June, as lockdown eased ever-so-slightly, with pubs given permission to open, eight major contractors launched Contractors Declare. The founders, brought together by Multiplex, represent a major slice of the UK construction industry: BAM Construct UK, BAM Nuttall, Canary Wharf Contractors, Morgan Sindall, Sir Robert McAlpine, Skanska UK and Willmott Dixon. They are part of the missing link between architects and subcontractors and, of course, they are architects' clients too.

Starting points

The driving force behind this was Eva Gkenakou, sustainability director at Multiplex Europe, with the backing of the chief executive officer Callum Tuckett and, ultimately, the board. The process of bringing together the contractors was eased by most already being members of the contractors forum at the UK Green Building Council, some with targets set, though for many net zero looks 'ambiguous' Gkenakou explains. She saw it as a chance to bring as many organisations on board as possible and start sharing knowledge. Contractors Declare has also added in net zero and the UN Sustaina-



On Make Architects' recently completed 80 Charlotte Street, London, for Derwent London, Multiplex used green tariffs during construction to save 450 tonnes of CO₂.

Multiplex started investing in offsetting as it decarbonised, and may continue when it meets zero carbon to become carbon positive

ble Development Goals to the commitments brought across from Architects Declare.

But the first step was building consensus in Multiplex. The contractor has 15 live UK projects including a tower at Nine Elms, Chelsea Barracks and £300 million worth of campus development at Glasgow University, working with practices like Foster and Partners and KPF. Gkenakou runs a team of sustainability experts who are assigned to each of Multiplex' projects – tasked with ensuring BREEAM and other sustainability criteria are hit. Over the last 12 years she has also tried to establish a culture of sustainability among the teams on site and in the office, and to get backing at high level. Sustainability has been on the corporate risk register – a risk to be managed and a risk for Multiplex to

stay ahead of – since 2018. That is when the Intergovernmental Panel on Climate Change issued its report detailing how far off track we are in the goal of keeping rising temperatures to below 1.5° to avoid climate breakdown. A board briefing by Chapter Zero, which specialises in empowering directors to ask the right questions on climate change and corporate governance, led to board requests for a more detailed briefing on climate change. Multiplex started investing in offsetting as it decarbonised, and may continue when it meets zero carbon to become carbon positive.

‘We are not in on the concept stage but we can influence equipment selection, types of products and materials,’ explains Tuckett. He points out that it is seen as important to cut air travel which makes up 2% of global emissions, while constructing and operating buildings is estimated at 40%. ‘Simple stats tell us we can contribute,’ he says. He has concrete in particular in his sights.

Two years ago Multiplex was the first contractor in the world to sign up to Science Based Targets, a scheme backed by the UN Global Compact and World Wildlife Fund, which aligns company targets to avoid a 1.5° rise in temperature. The firm banned plastic from canteens and offices and switched to green tariffs for sites, powering everything from tower cranes and lift hoists to other energy intensive equipment. This reduced

‘We can influence equipment selection, types of products and materials’

operational carbon emissions by up to 70%. Tuckett is proud he had the confidence in Multiplex to sign up to these targets, though he admits it doesn’t fire up everyone: ‘It can get lost in statistics and become a box ticking exercise.’ Contractors Declare gives something to rally around, to promote discussions and for the leadership to talk about. He goes back to the core of the business: ‘We are a people business. We are selling a service, selling skills. If we are not genuinely addressing what matters to people we won’t attract the best people and retain them.’ This may be less of a driver as the economy shrinks, Multiplex itself has just made 120 redundancies.

Business imperative

The need to understand what fires up staff seems supported by IPSOS Mori research that shows 71% of people globally believe climate change is a crisis as significant as coronavirus. When Gkenakou started talking to subcontractors and suppliers – on steel, con-

crete, plasterboard and more – about sustainability she got widespread agreement on the importance of change but the cost of investing in greener construction and materials was just too high for those she talked to. ‘They needed a stronger business driver,’ she says, ‘to know there was a market.’ That’s why it is important to make the commitment of more contractors public with Contractors Declare. But launching it during the Covid-19 crisis? ‘I think people are more motivated now,’ she says. ‘We see the value in caring for the long term and for health.’ She is also an optimist and sees a future where the concrete and steel industries’ investment in green energy pays off, to leave them at zero carbon.

For many architects, design and build has been a bête noir, or at best a necessary evil, as the tables are reversed and contractors take over the reins. Tuckett – who left university in the mid 90s as D&B was just starting to be used on complex projects – is aware of this tension. And he recognises the limits of influence for a contractor coming into a project halfway through: ‘complex things like the orientation of a building are baked in’. Contractors Declare could align architects and the client contractors they are novated to more closely on sustainability. Over 55% of Architects Declare members reported that persuading clients about implementing change was where they encountered the most challenges. In the meantime Gkenakou has a plea for architects, to include the sustainability performance of materials they specify – grey timber door with 25% recycled content and FSC certification is better than straight grey timber door. ‘These things are hard to rewrite when there are thousands of pages of architects specifications,’ she says.

Only two of the top 10 contractors by revenue have signed up to Contractors Declare but more – smaller firms – have joined since launch, taking numbers to 28 as we go to press. We know from architects who have signed up to Declare that keeping to commitment is hard; only 13% surveyed said their practice had not broken any. But it is a commitment to a direction of travel. Until we have legislation that is as much as we can hope for. ●

Left Contractor, architect and client working together secured BREEAM Excellent at design stage for 80 Charlotte Street. Targeting LEED Gold and EPC B, it was designed to achieve 28% lower embodied carbon intensity than the RICS benchmark, and has solar thermal and air source heat pumps.



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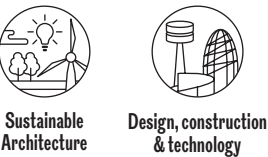
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Eden meets the underworld

Geothermal energy from 4.5km below the Earth’s surface could supply Eden’s biomes, a growing Green Ribbon and local homes

Stephen Cousins

Drilling a 4.5km-long hole through the Earth’s crust could provide the Eden Project with enough geothermal energy to heat and power its entire site and potentially thousands of nearby homes, but will the £17 million experiment pay off – and what is its significance for wider sustainable development? When lockdown kicked in and people steered clear from tourist destinations, the Eden Project, in Cornwall, understandably suffered, but the concomitant collapse in oil prices provided it with an unexpected boost. Faltering demand for the black stuff should make it cheaper for the visitor attraction to hire heavy drilling machinery and services needed to bore down into the local

bedrock to extract geothermal energy. Eden is about to embark on one of the greatest engineering experiments the county has ever seen, backed by a £16.8 million injection of funding from the European Regional Development Fund, Cornwall Council and institutional investors. This December, a massive 450-tonne, 55m-tall drilling rig will arrive at the former clay quarry site to begin five months of hard grind through mud and rock. Working day and night 24/7, its sights will be trained on an area of naturally fractured granite thought to be 4.5km below ground. Water pumped down from through the complete 25cm-diameter well (the size of a medium pizza) into the fissures will, it’s hoped, return to the surface hot enough to



warm all of Eden’s famous biomes, green-houses and offices, as well as a proposed new hotel and spa. A second phase of the scheme would involve expanding the well. This would produce steam to generate 5-7MW a year of electricity in a new energy plant, enough to meet the needs of the site plus nearby homes. Eden’s greenhouse jungle currently relies on a partially-sustainable mix of heat from gas boilers and a biomass digester, which makes this clean energy alternative an attractive option.

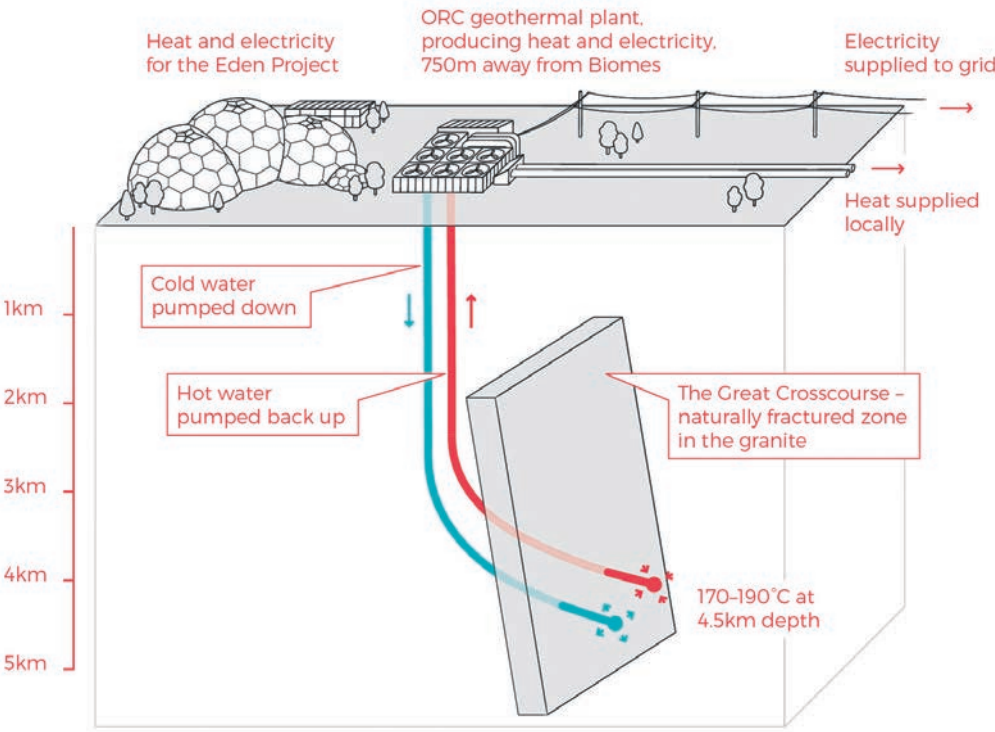
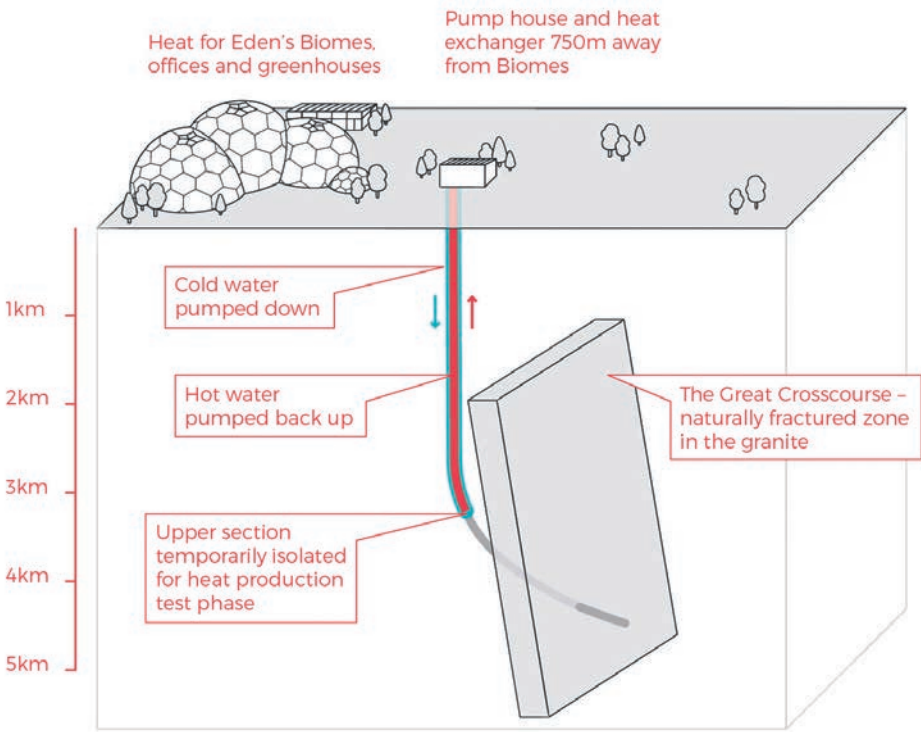
Unicorn renewable
‘Geothermal is the “unicorn” of renewable technologies in the sense that it is baseload, it is on all the time and it is not affected by the weather,’ says Augusta Grand, climate change lead at the Eden Project and executive director of Eden Geothermal. ‘It has the smallest surface footprint of any energy source; you’re literally drilling into the ground and that’s it.’

The initial research phase will drill a single well, fitted with a heat main, to prove the extent of the underground resource. To create it, a rotational mud drilling system will churn out 2m-8m of granite per hour, simultaneously encasing the sides of the well in steel to prevent contamination of the surrounding groundwater. The well will supply the existing district heating system for Eden’s biomes, offices and greenhouses, and pave the way for the second 4.5km coaxial well of the second phase. That could generate enough renewable energy to

Left First the Eden Project was built into the old clay quarries around St Austell to designs by Grimshaw; now the project is going down in search of natural heat sources.

This could make Eden carbon positive by 2023, and supply 7,000 local homes

Below Phase one will drill a well and install a heat main to prove the extent of the resource at 4.5km underground.



Above Phase two will add the ability to generate renewable electricity in a new plant on the site – enough to allow Eden to become carbon positive by 2023 as well as supply the local area.

make Eden carbon positive by 2023, while additionally providing heat and power for the local area. There’s talk of supplying 7,000 homes – equivalent to almost half of nearby St Austell. Extensive geological temperature data for Cornwall provides an accurate forecast of underground temperatures, but a big unknown is the extent of rock permeability at 4.5km at the location. Eden is drilling into the Great Crosscourse fault line that runs directly below its north road. ‘The first well is risky because we don’t know if we’ll hit that permeability,’ says Grand. ‘But there is quite a lot of geological evidence from mine records of ground fractures and a major recent Lidar survey of the Southwest highlights the existence of faults.’ A less severe risk is seismic activity. The process has similarities to fracking, but works with natural fractures in the rock rather than creating new ones by forcing in fluids at high pressure. Grand says any tremors will be very deep underground and unlikely to be felt or cause damage at the surface.

Green Ribbon hotel
Geothermal is a potent energy source and Eden’s well is expected to achieve a Coefficient of Performance of 25 (every unit of electricity put in can produce 25 units of heat), where more established air or ground source heat pumps can only reach a CoP of 4-5. A key beneficiary will be a proposed 109 bedroom hotel, designed by London based practice Tate Harmer and recently granted planning permission, but pending final approval by Eden’s board. The fully timber building is the centrepiece of the ‘Green Ribbon’, a series of landscape and building interventions around the site perimeter.

Geothermal will contribute 30 to 40% of its carbon neutral status, effectively eliminating the need for photovoltaics on the roof. Jerry Tate, partner at Tate Harmer, explains: ‘The geothermal system has a legal lifespan of 60 years and an actual lifespan of 100 to 200 years, whereas PV panels typically have a warranty of 15 years. In terms of long term impacts, it’s a better strategy.’ The hotel will plug into the site’s existing heat distribution network through a heat exchanger. While district heating is widely used in other countries in Europe, notably in Holland where much of city of Almere is connected to a heat distribution system, the

599 ISTOCK

EDEN GEOTHERMAL (2)



Geothermal has the potential to supply 20% of our electricity needs and could significantly transform where developments spring up

technology is rarely seen in the UK. This may prevent other developments from looking to geothermal as a viable heat source.

‘There is a lot of anxiety about the technology in the UK,’ says Harmer. ‘Low carbon developments typically favour individual heat pumps over a network system because developers are worried about selling houses to people that are tied to an energy service company or a certain energy distributor.’

There are also limitations related to geology and the drilling technology. The higher temperatures needed to generate electricity are deeper down and can only currently be reached at locations in Cornwall, Devon and some areas in the north west and Northern Ireland. The potential for heat is much greater in these places thanks to the presence of shallower fractured sedimentary basins.

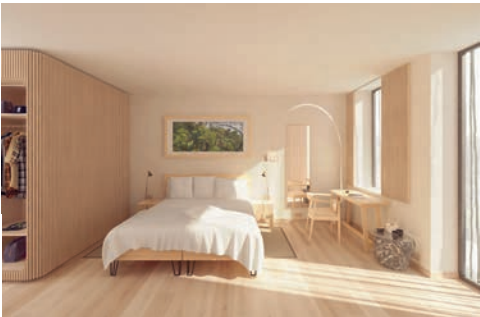
Potential trailblazer

Access to such abundant ‘free’ underground energy could have significant implications for UK energy generation. A recent study by engineering consultant Sinclair Knight Merz concluded that geothermal has the potential to supply 20% of our electricity needs.

Geothermal could significantly transform where developments spring up and the types of buildings they include.

Above The proposed hotel designed by Tate Harmer has planning permission and is halfway through RIBA Stage 4, but is on hold.

Below The hotel is part of a wider landscape and building strategy for the Eden site called the Green Ribbon.



‘It could attract energy intensive buildings like data centres,’ says Harmer. ‘The excess heat could feed into things like insect bioreactors that feed locusts, or prawn farms, or intensive agricultural operations which need heat to keep going but are struggling to maintain viability.’

This raises the question: what is more important for future development, proximity to markets and services or access to a low carbon economic energy source?

Cornwall’s big experiment could become a vital proof-of-concept and a trailblazer for a greener energy landscape. The fact that it took European money to make it happen is an irony not lost on Grand.

‘It’s a mystery why the UK, with its history of North Sea oil drilling and associated technology, isn’t already drilling for heat and electricity instead of for fossil fuels,’ she says. ‘Now we think the message is beginning to sink in – Eden is one of two substantial geothermal projects going ahead, the other is United Downs Deep Geothermal Power plant in Redruth in Cornwall, plus other research locations in Cheshire and Glasgow. A really concentrated effort to bring down drilling costs could enable the UK potentially to drill anywhere. There’s a vast amount of heat down there,’ she concludes ●

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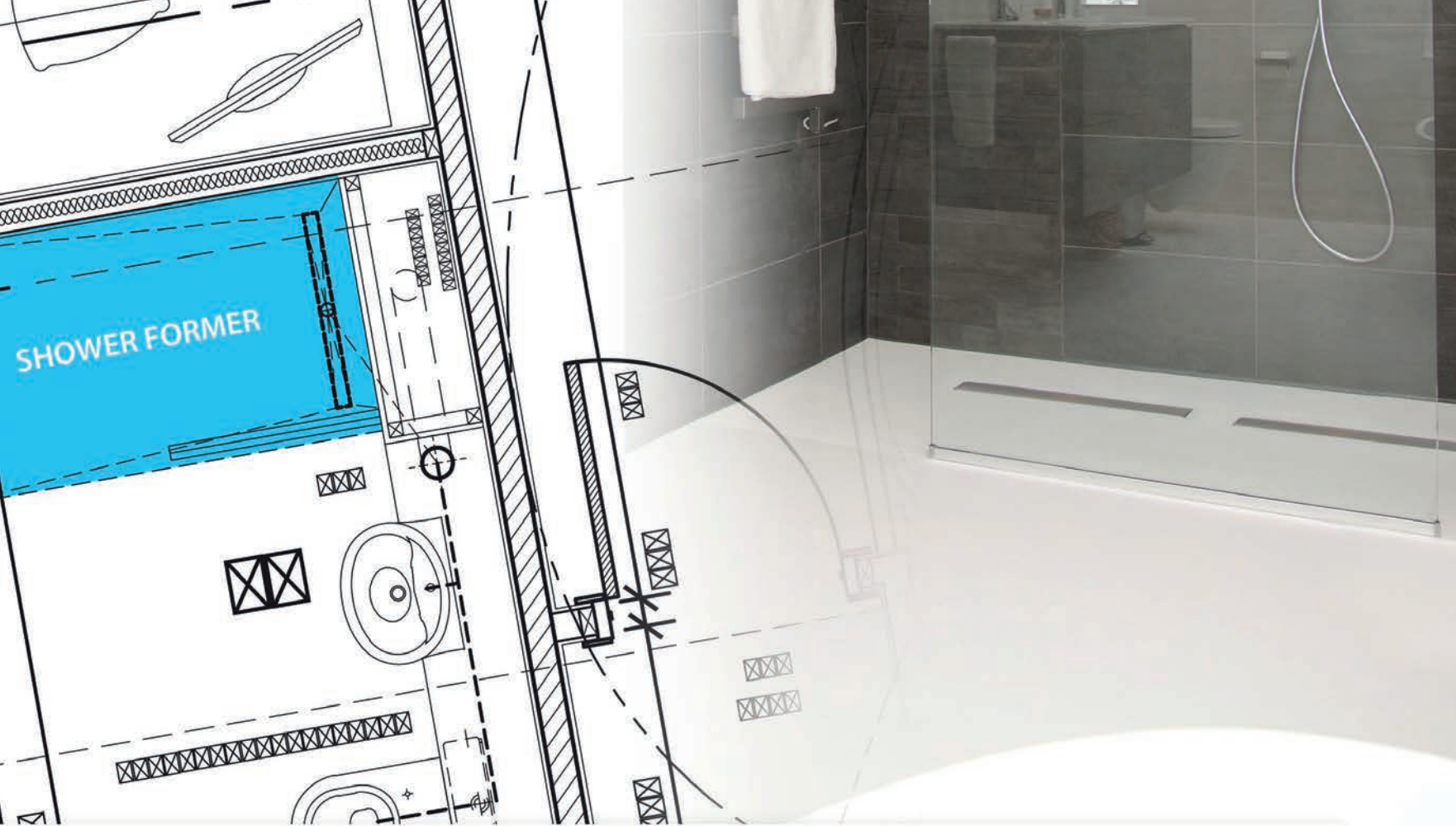
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Business survival is all consuming at the moment, but green legislation is more urgent than ever

Matthew Barnett Howland

The standard commercial impulse is to report that our sustainability drive is just fine and dandy, and to trust that a focus on regenerative design will be an essential advantage as we emerge from the significant social and economic impacts of this pandemic.

It is true that we have continued pushing our 'form follows lifecycle' approach very hard on specific projects, and in particular on a Paragraph 79 house targeting net zero carbon and involving extensive reuse of on-site ruins and materials (pictured). This scheme has provided the opportunity to work with two leading consultants on broadly distinct sections of the building lifecycle, one for structure and embodied carbon (stages A1-A5) and one for environmental design and operational carbon (stages B6-B7). Though not intended at the outset, it has generated a very productive dynamic. Given the re-use nature of the project, we are also looking forward to developing the detailed design of the project with lifecycle stages C and D in mind.

However, it would be unhelpful to deny that in the last few months it has been difficult to prioritise environmental sustainability across the whole office, and that to some extent our intended transformative process has been trumped in the short term by economic survival. In the context of an uncertain future and temporary dip in productivity, for us, like many businesses, the basics of getting work in and out again are where it's at right now. To update a metaphor from the first article in



this series, changing the wheels while the car is moving isn't the immediate goal anymore – it's how to keep the car moving at all!

But rather than focus on the possible (and often false) tensions between 'the economic' and 'the environmental' from the narrow perspective of managing a business, there is a much broader and more profound way in which this crisis provides a parallel view on the climate emergency – we were warned, we didn't act, disaster struck and now the fragility of our economic system has been exposed, largely at the expense of some of the most vulnerable in society.

Whatever one thinks are the underlying reasons for these crises that face us, above all

Above The stone ruins (on the right) are re-used as the fourth wing of the new house to create a sunken courtyard garden, which also preserves something of the existing 'forgotten' character of the site.

Below Stone and brick strewn around the site will be re-used to build large sections of the new house.



the pandemic has shown that inaction is not a good bet – the political, social, economic, and ecological are all interconnected, and indeed so are we. In the pragmatic here and now we need political leadership that is prepared to develop a robust and proactive strategy to address the climate emergency.

What does this mean for the architects' office on the high street? We are used to doing our best to fulfil the architect's responsibility to make beautiful, generous environments that will be seen and used by many people for years to come; now we are adapting to doing so in different working circumstances, against a background of anxiety about the future. So it is much easier to attempt to practise 'architecture as usual', to retreat into our existing knowledge base and specify familiar materials and construction methods. But it is surely an unacceptable risk to delay the necessary shift towards the development of new knowledge and new ways of thinking and designing.

So although it might sound counter-intuitive, what we really need at this challenging time is immediate and mandatory legislation on embodied carbon and other environmental performance issues. This kind of 'in at the deep end' approach to regulation is obviously not without its risks, and significant government support would probably be required, especially under current circumstances. But as we have seen, what are the likely environmental and social costs in the future of a lack of political leadership now? Anything non-mandatory is a non-starter, and very difficult to

make a priority when backs are to the wall – not to mention the core issue of approaching clients for the extra work – and fees – involved in meeting voluntary targets.

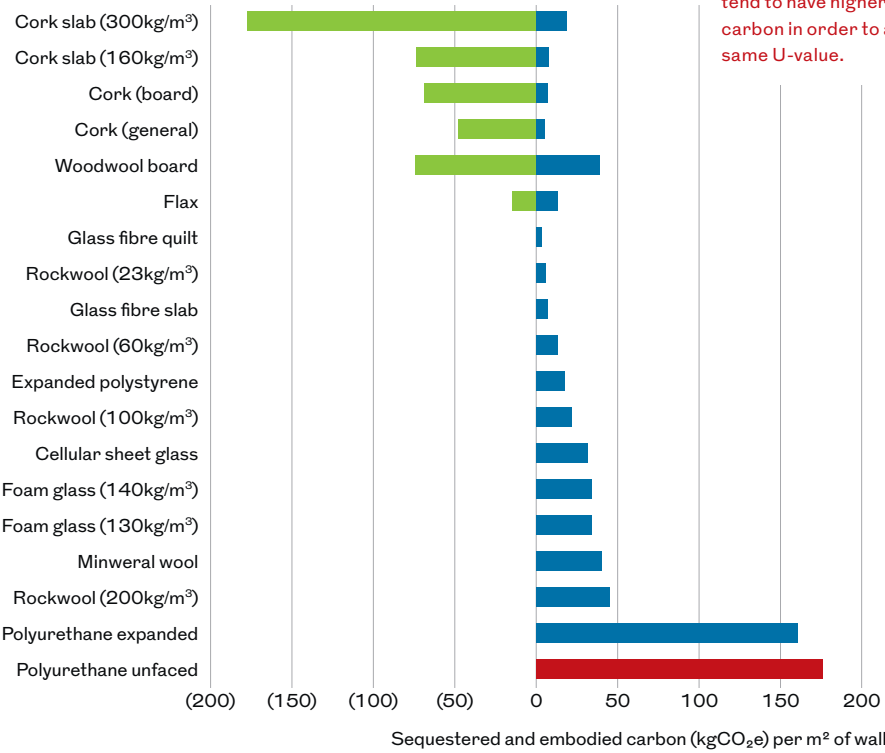
Beyond this hard line case for more legislation across all industries, better regulation would also create the oft-repeated notion of the ‘level playing field’ within the architectural profession. For example, we often work on projects where space is restricted on tight urban sites, or where external dimensions are limited in relation to existing buildings, or where planning areas are calculated on gross external footprint. In these cases, there are obvious benefits to a client to minimise wall thickness, which in turn places a strong emphasis on using materials that save space. In this context, it is difficult to explain to the client why for example one has chosen a type of insulation that isn’t the most space efficient on the market – ‘by the way, you’re not getting as much space as you could, but isn’t it great that we’ve used an insulation that is very low in embodied energy and high in recycled content? Or better still, we could offer you a range of even less space efficient types of insulation that are also more expensive – but don’t worry, they do sequester carbon and are made from biorenewable resources.’

Even if one believes there should be a choice, surely it’s time to incentivise architects (and clients) to choose environmentally-friendly building products, rather than relying on their good nature and willingness to be ‘seen as the crusties in the room’?

These issues are too important to be left to market forces (which might get there in the end via a slow shift in consumer consciousness and behaviour), or to voluntary codes, or to the impact of what must be a minority of practices that are already exemplary in this respect. As has often been noted, the pandemic has shown we can all radically change how we do things at short notice, and how government can provide huge levels of support during periods of rapid transition. No doubt politicians and civil servants are having to prioritise the most urgent issues at the top of the pile – the current pandemic, social injustice, unfinished political projects etc. But down on the high street, we wonder when the climate emergency will be considered urgent – though perhaps ‘Get Embodied Carbon Done’ is not quite such an appealing mantra? ●

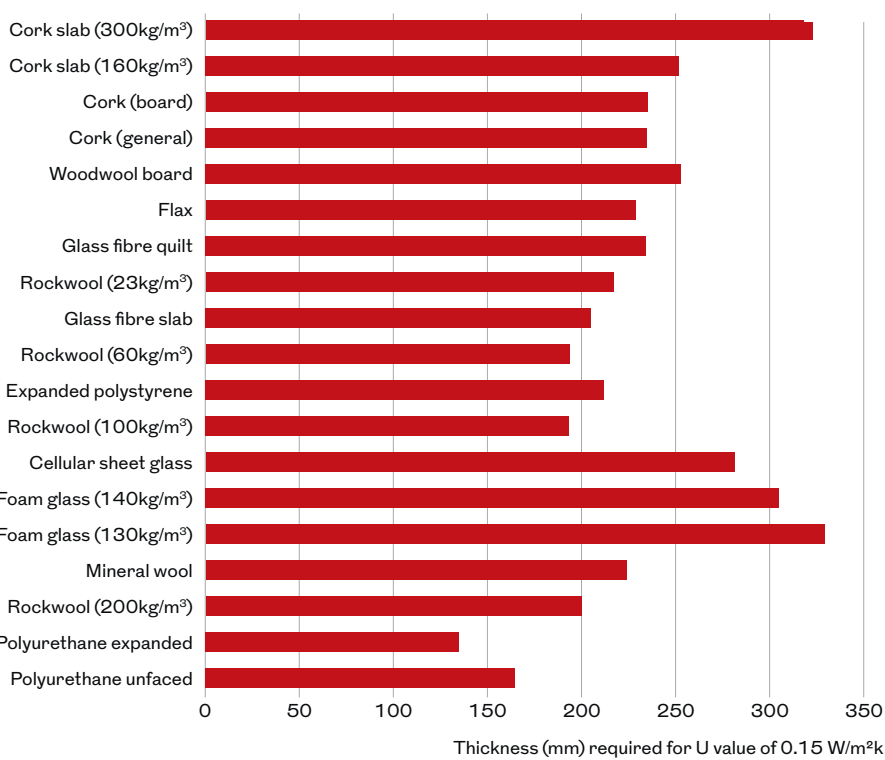
Matthew Barnett Howland is director of research and development at CSK Architects

Embodied and sequestered carbon of insulation materials per m²



As this table shows, more space-efficient materials tend to have higher embodied carbon in order to achieve the same U-value.

Thickness of insulation materials for U value of 0.15



Drawn from Inventory of Carbon and Energy v2.0. with gaps filled using information at [greenspec.co.uk](https://www.greenspec.co.uk/building-design/embodied-carbon-of-insulation/)
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Recovery needs a stronger home improvement fix

The Green Homes Grant recognises that we need better homes. But is it enough to combat the post-Covid recession?



Could the Green Homes Grant, with its focus on insulation and heat pumps, create more work for architects? BanksPhotos Istock

Brian Green

It's a bit worrying when The World Bank puts out a press release headlined 'Covid-19 to Plunge Global Economy into Worst Recession since World War II'. Certainly, architects and builders know economic downturns hit construction particularly hard.

So it's no surprise that industry leaders are formulating policies that might boost construction activity. Inevitably, sectoral interests will infect discussions over what should be promoted ahead of what. But the most obvious answer is private housing RMI (repair, maintenance, and improvement), especially if the aim is to preserve jobs.

Home fronts

In policy terms, there are at least four good reasons to focus on improving private homes above other construction right now.

The UK has the oldest housing stock of any major nation; 20% is over 100 years old and about half built before 1960. They leak

heat and need a huge backlog of work to meet climate change targets. The private sector is worse: the business department BEIS estimates that around 15% of UK CO₂ emissions came from residential buildings in 2018.

The pandemic has both increased awareness of our need for better homes and accelerated a trend towards working from home.

Home improvement is labour intensive; it tends to generate twice as much employment for a given amount spent on construction.

This work is widespread across the country, so can be targeted to where a boost is most needed. Fortunately, the government's announcements on a Green Homes Grant for England show that it recognises some of this.

Admittedly, its planning of the scheme reflects a government out of touch with the real world. The timing of announcing 'free money for home improvements' was naively botched and the scheduling is weird. But it does mean work. And, importantly, it shows the government's willingness to support a subsector that accounts for about an eighth

of all construction work and a larger share of jobs – a sector that can swell to widening gaps in workload forming elsewhere.

The government's intervention to improve private sector homes raises important questions. How hard and in what direction should the industry be pushing private home improvement? Are we missing a trick?

Clearly, architects would want to seize an opportunity to go a lot further. The Green Homes Grant has merit, but much of the work is specialist. The wider home improvement market – including extensions and loft conversions – on the other hand is bread-and-butter work that supports numerous architects across the country.

Here there's cause for concern if the government doesn't back home improvement further. The private housing RMI sector has been drifting gently downward for two years, and even before the pandemic this trend looked set to continue.

Research by Barbour ABI shows that, while there may be a huge need for private housing RMI, spending tends to be driven by solid overall economic activity, a vibrant housing market and consumer confidence. Activity throughout the economy and within the housing market appears to have been held back by uncertainty created by Brexit. This in turn has dampened appetites for spending on home improvement.

As Chart 1 shows, already slowing planning applications for home improvement accelerated at the start of 2018. On past performance this would be expected to herald falls in private housing RMI about a year later.

The onset of recession caused by Covid-19 will further speed this trend. Work in the pipeline held back by the lockdown will inevitably create a surge in activity on the ground. But as this fades the likelihood is that we will see a deeper softening of the market.

Bleak outlook

The Office for Budget Responsibility (OBR) suggested in July in its 'central scenario' that GDP would fall 12.4% this year, bouncing back in 2021 but to a level almost 5% down on that in 2019. This compares starkly with its forecast in February that suggested growth in both years would be close to 1.5%. And the unpredictable path of the pandemic makes any forecasts of future economic activity extremely uncertain. But while assessments may vary, the fact is the economy is taking a

huge hit and the worst is yet to come, certainly in terms of unemployment.

So we should expect a big fall in annual home improvement work in 2020. The latest scenarios for future activity from the Construction Products Association (CPA) suggest that, with the lockdown having halted a large slice of work for an extended period, this year we should expect to see a fall of close to 20%. It indicates a bounce back in 2021 of a bit above 10%, but this would still mean about 10% less work in 2021 than in 2019 (Chart 2).

This means a lot of job losses at a time when the construction sector is desperate to recruit talent for the future. And these job losses will add to a wider surge. OBR expects unemployment to rise close to 12% this year, falling slightly next year to 8.8%. This compares with its expectations in February of unemployment holding level at 4.1%.

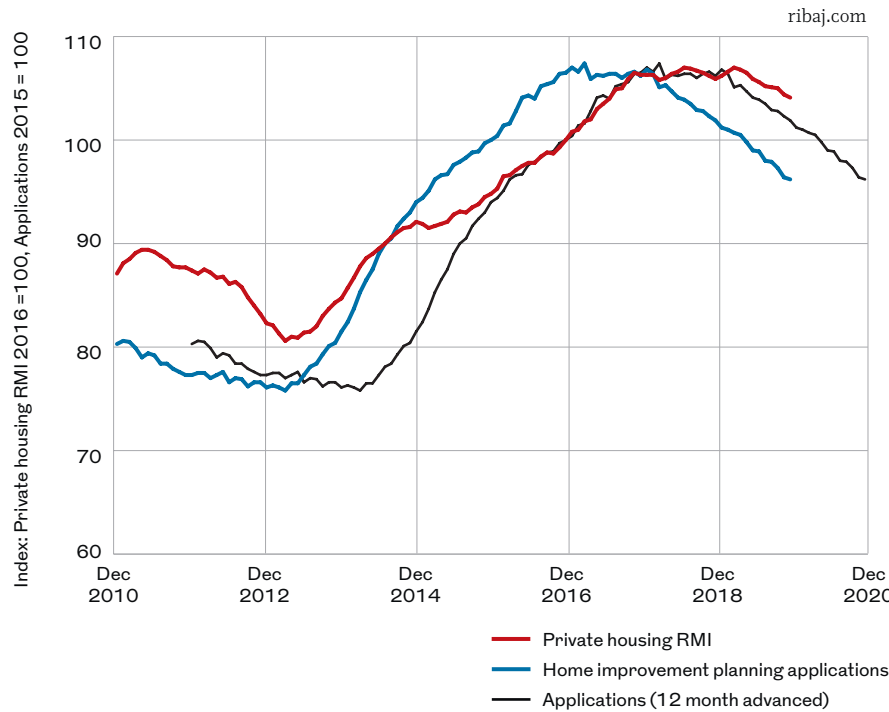
Nothing in the economic crystal ball suggests vibrancy or growing consumer confidence to encourage big ticket purchases. As for house prices, it is hard to know. They tend to be very sticky with vendors withdrawing if offers don't match their desired price, which is often anchored close to the peak. It is hard to imagine strong price growth.

However you look at it, prospects for private sector home improvement look precarious. The £2 billion earmarked for the Green Homes Grant may seem like a lot. But with inefficiencies and out of sector activities taking a slice, not all of that will go into construction. Set beside 2019's £21.4 billion of construction output in private housing RMI it might just take an edge off a painful fall. But it is a short-term measure and the funding is likely to dry up as the industry begins to feel the greatest pain from a shrinking market. Indeed, it is hard not to fear that it may give false hope and disguise what by next spring may be more worrying problems.

Boosting home improvement is probably the most effective way to retain a wide range of essential construction jobs. It is also vital that homes are made more energy efficient. And, if we are to be spending more time working from home, there will be a need to expand the capacity of many dwellings.

The case for wider support for home improvement is strong – and with the economic shadow cast by Covid-19 it will seldom be stronger. It seems architects will need to push this message vigorously if they are not to witness sublimation in a vital market sector. ●

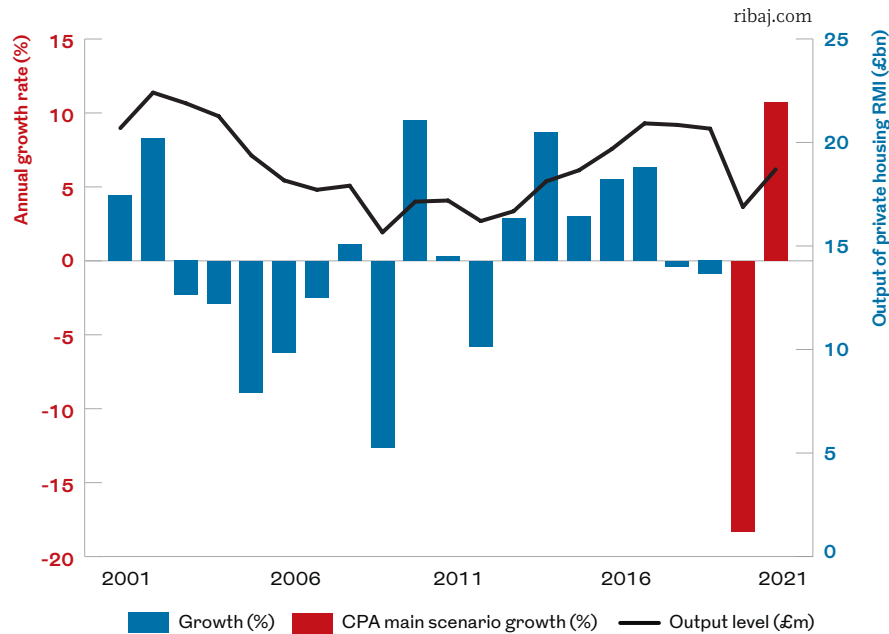
Private housing RMI construction and home improvement applications



Source: Barbour ABI construction industry analysts

Home improvement is the most effective way to retain jobs

Growth and level of private housing RM&I construction activity 2001 to 2021



Sources: Construction Products Association, Construction Industry Scenarios 2020-21, Summer 2020; ONS Construction output

RIBA Fellow Membership

RIBA fellow membership recognises our inspirational chartered members – the sometimes unsung heroes of the profession – who have made a significant contribution to architecture, and the community. Here we showcase three projects by current FRIBA Members.



Caring Wood, designed by James M Wright FRIBA and Niall Maxwell RIBA.

As RIBA members we can all contribute to the advancement of our profession. I have met a lot of engaged members who do so much for our organisation, I hope they pluck up the courage and apply for fellow membership – Valeria Passetti FRIBA

Relish
The creation of the multi-award-winning Relish (Residents 4 Low Impact Sustainable Homes) was a response to the 80% CO₂ target in 2008. The initiative compared low cost retrofit interventions in affordable housing coupled with behavioural change. The research study, supported by KTP, demonstrated that significant reductions in household CO₂ and fuel bills could sensibly be achieved. Adopted by others and continuing today, it was selected as one of 100 exemplary projects launched to world leaders at the Rio+20 conference. The subsequent ‘Smartwire’ sought to minimise appliances being left on standby, coupled with behavioural support.



Kwanari Ecolodge
Kwanari Ecolodge borrowed from the basic design principles and typology of form used in Dominican vernacular architecture and then created a sustainable aesthetic that is a ‘continuity of the vernacular’. The project introduced a new style of architecture, Forest Caribbean. This hybrid of classic Caribbean architecture (with its intricate fretwork, balconies, dormer windows) and ‘cabin in the woods’ (logs, stone, rustic,) harmonises the buildings into the forest. Organic building materials produce a timeless architecture. Kwanari Ecolodge’s aesthetics of form and space of will sustain through the ages.

Caring Wood
Multi-award-winning Caring Wood is a model of sustainability, achieving Code for Sustainable Homes Level 6, an EPC rating of A and offsetting all CO₂. It is a low energy design and uses clean green technologies, but is also sustainable through its regional building form, material choices and detailing. The importance of local materials was key, and with extensive planting and landscaping, the project contributes to, protects and enhances the local environment, with scope to effectively respond to and mitigate the effects of future climate change.

Left Relish, ‘Residents 4 Low Impact Sustainable Homes’, by Robin H Roberts FRIBA FRICS.

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3: Culture

It’s now or never

We’ve always worried about the planet, but there’s no more time to waste



Hugh Pearman Editor

Recently I came across an interview I did with James Lovelock, inventor of the ‘Gaia’ hypothesis of our planet as one self-regulating mechanism/organism. It was in 2011 for RIBA’s ‘Towards Zero Carbon’ issue and Lovelock was pretty old at 91. He is now even older at 101 and happily still pretty chipper at the time of writing, to judge by a recent Guardian interview. How has architecture managed the climate crisis in the intervening years?
Going through the journal archives reveals that environmental concerns have always been there, back through the early low-energy building designs following the oil shock of the early 1970s to Edwardian times, where you find discussion on air pollution and the effects of soot – and the RIBA president trying out the new-fangled smokeless coal in his study.

You find discussion on air pollution and the effects of soot – and the RIBA president trying out the new-fangled smokeless coal in his study

out. And remember how the Stirling Prize became in 2019 a force for positive change, when most of its living UK winning practices joined forces to establish Architects Declare, the declaration being of a global climate and biodiversity emergency, with actions set out for tackling it. At the same time the RIBA itself instigated its 2030 Climate Challenge programme which has its own stringent carbon reduction targets. And out in the streets, Extinction Rebellion protestors were closing them down to make their impassioned point.
So what’s new, you might ask. In 2006, under president Sunand Prasad, RIBA Council signed up to the rigorous ‘Contraction and convergence’ methodology to reduce and even out global carbon emissions. A key date for that was also 2030. One of the most enduring earlier contributions came from the far-seeing president Alex Gordon in 1972 with his famous ‘long life, loose fit’ mantra: bang on for today with our urgent need to refurb-and-adapt rather than demolish-and-rebuild.
So nobody can say that all this is a recent arrival on the agenda of architects and now 2030-aligned ‘sustainable outcomes’ are enshrined in the Plan of Work too.
But is it all too late? Lovelock thought so in these pages, back in 2011. In his genial way he pointed out that sustainable development would have been a great idea in 1800, say, when there were only a billion people on the planet. ‘If we’d adopted it then we wouldn’t be in the mess we are now. Now it’s far too late...what we’ve done already would take thousands of years to go away.’ This year in the Guardian he noted: ‘I would say the biosphere and I are both in the last one per cent of our lives.’
However Lovelock does offer a gleam of hope: us. He notes that we are the first collective intelligence ever on Earth. In other words: if we USE that collective intelligence then – why, we might think of and implement enough clever things to make a difference. So don’t give up. Redouble your efforts. ●

ONLY ON RIBAJ.COM
We still have far too many children taught in older buildings which are cramped and poorly ventilated... much has been learned in terms of school design from Covid-19.
Rethink: Pamela Buxton talks to four experts on how school design can make the most of the government’s £1bn fund: ribaj.com/rethinkschools



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Space shifters

The ingenious set of the NT's Madness of King George is a pertinent display of the possibilities for space



Will Wiles

One unexpected feature of the coronavirus lockdown was that we watched a surprising number of plays. The performances, pre-recorded, were beamed into our living room via YouTube thanks to the National Theatre at Home, one of those extraordinary acts of civic generosity that made the first months of the pandemic more bearable.

Among those plays was Alan Bennett's The Madness of George III, starring Mark Gatiss. Recorded at the Nottingham Playhouse two years ago, this production was directed by Adam Penford and designed by Robert Jones, and Jones's design was so fascinating it almost distracted from a very entertaining play.

The challenge is to create a variety of grand Georgian interiors – palaces, parliaments – alongside more intimate spaces, with scope for frequent changes. These are familiar challenges for the theatre designer, but Madness approached them in a satisfying and elegant way. Indeed, the machinations on stage were so subtle and yet so totally transforming, that it was at times hard to follow exactly how the architecture of the play worked; it's not impossible I have this a little wrong, but I'll do my best.

At the centre of the design were two free-standing architectural elements, cross-shaped in plan, producing four internal corners, decorated in an Adam style. Two of the four walls in each cross were just walls, one had a window and the fourth a door. By rotating these elements, and moving them closer together or further apart, a remarkable variety of interiors could be created. A further mobile element behind them could be moved closer or

As well as framing what happened on the stage, the screens' movement provided an element of dance between scenes

further away to give a sense of depth, as needed, but the whole space was defined by these rotating room fragments. And as well as framing what happened on the stage, their movement provided an element of dance between scenes. It even made symbolic sense: the stable classical form, the architectural embodiment of order and continuity, spinning and dissolving with the progress of the king's madness.

Simple forms making endless configurations with artful transitions – it reminded me of OMA's Prada Transformer from 2007. This temporary events space in Seoul, Korea, was a steel frame covered in taut white plastic. Each face was a different shape, making the 3D form rather mysterious, and it could be picked up and set down on different sides by cranes, changing the layout of the interior. It was a performance space that was a performance. Over-engineered and dubiously high concept for a temporary pavilion, perhaps, but beguiling, and it seemed to point to future possibilities.

Yesterday's future has a forlorn feel viewed from a present still gripped by a deadly pandemic. We won't need pop-up social condensers for a while. Today it's social separators that are in demand, and here the National's Madness feels relevant. Post-lockdown we have emerged into a world of temporary partitions, screen and barriers. These will not be needed forever. There are dozens of conceptual projects floating around imagining a world in which the virus has permanently transformed hotels, restaurants, sporting events and so on, and I'm sceptical of them all. Filthy, loveable species that we are, we have always needed to get close to each other. That urge will survive this pandemic just as it has survived all others.

A more pertinent project might be to look ahead at what we can do with all these perspex screens when they're no longer needed. Now, we need original temporary solutions to flexibly divide and recombine the spaces around us. The artful choreography of the National's on-stage architecture shows how that might be done. More importantly, it shows something larger: the debt architecture owes to the stage. It has always been a place for architectural innovation and creation, driven by the necessary impermanence and economy of theatrical productions. Now theatre itself seems worryingly impermanent, driven to the edge of disaster by the pandemic. It is the perfect time to get back into the play-watching habit. ●

Will Wiles is an author. Read him here every other month and at ribaj.com

Below The amazing reconfigurable screens of the Madness of George III, as seen on National Theatre at Home.



NOTTINGHAM PLAYHOUSE

PROTECTED TITLE?

It might not come from the theatre, but the word 'architect' has been associated with the stage since antiquity. Greek dramatists including Euripides used the term 'architect' to describe their protagonists, not because they built, but because they ordered events.

Planning our future

Without a sound planning system the PM’s housing drive will be a disaster



Alan Jones

This time last year Goldsmith Street was heading toward the Stirling Prize, and on the night it received the award housing secretary Robert Jenrick was the RIBA’s guest speaker. The scheme showed how well designed, low energy homes can positively affect health and wellbeing, minimising ‘heat or eat’, and so improving health to reduce the burden on our NHS and optimise attendance at school and work – an integrated example for the future.

One year on, England’s Planning Reform White Paper has started its consultation period. The primary reason given for the reforms is to accelerate construction of homes, but the paper relates to all forms of buildings and development. Under-resourced for decades, England’s planning system is, like many, cumbersome, slow and unpredictable. It is political, subject to persuasion and those with the loudest, most articulate voices and the deepest pockets. It needs updating.

Homes are much more affordable in certain parts of our country, but those areas lack work opportunities. So planning at its highest level is the geographic and strategic distribution of economic activity and the associated local infrastructure of roads, schools and hospitals, and homes for everyone. Covid-19 demonstrates the increasingly important relationship between where we live and work. We are now less keen to commute, and businesses and their workers can see the benefits of working from home. What impact this will have on neighbourhoods, high streets and traditional work areas needs to

Accelerating
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proud of

be explored. Central business districts will have lower densities of workers and many office buildings will likely be retrofitted to residential. This will change weekend and evening occupation of cities, improving city environments and liveability rankings. We have also seen how overcrowding, caused by multi-generational living in unsuitable housing, increases the risk of infection.

People need more types of homes, based on data and research, that match supply and demand, rather than taking what is on offer, either as older, existing stock or new ‘take it or leave it’ homes mostly from the small number of large volume house builders. Homes built is not a numbers game, but what type, to what quality and where.

It is urgent to level equality, give access to affordable homes and ‘Get Britain building’, but accelerating unbridled development is not the way to reduce 30% of the population living in poor housing, address climate emergency or leave a built legacy to be proud of. For each philanthropic Bourneville, enlightened housing association and noble development company, we already have too much development focused on the financial bottom line – with all the poor spatial, environmental and construction qualities that implies. The White Paper emphasises ‘good design’ but we must not cut corners on quality nor open flood gates to poorly considered development, mean spatial standards inside and out, and low performance. We urge the hiring of local chartered architects to fill the laissez-faire planning system staffing gap. Government regulated and knowing the locality, demand and what will be appropriate, chartered architects can be held accountable.

What we build becomes the physical legacy of our ideals and ethics; it is the fabric of our society. The RIBA’s focus is on ensuring the planning system works in the interests of society and on the ability of architects to play a leading role in shaping the built environment. Members hold a range of views on the proposals and we seek their input and support.

To be more predictable and less political, planning must be based on economics, data and evidence and be geographically based, with better defined spatial and environmental standards and regulations. Such a planning system will deliver value for all. ●

The consultation period for the Planning Reform White Paper closes on 29 October 2020 @AlanJonesFRIBA

DISCIPLINARY SANCTION: PUBLIC REPRIMAND

Following a hearing before the Professional Conduct Committee on 16 June 2020, Mr Toby Howell was deemed to have breached RIBA Code of Professional Conduct Principle 2.1. Mr Howell failed to apply high standards of skill, knowledge and care in his work on a project between May 2017 and October 2017, in relation to contract administration.

In accordance with Schedule 2 of the Disciplinary Procedures made under Byelaw 4.3 (Appendix L to the Regulations), the Committee issued Mr Howell with a Public Reprimand.



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Sustainable bank Triodos uses its money with conscious thought about its environmental, social and cultural impact says UK CEO Bevis Watts

Words: Hugh Pearman Portrait: Paul Box

Ethics man

Bevis Watts makes an unusual bank boss – his background includes running a wildlife trust and working in waste management, and he’s a young looking, casual dress type. ‘I think it’s important not to be wedded to the current paradigm for banking,’ he observes drily, while pointing out he’s got all the necessary business experience. True enough, what have central casting bank bosses done for us in recent years? Brought the world to its knees, that’s what. ‘Fred the Shred’ springs to mind. So perhaps we might consider something different. Watts, as UK CEO of Triodos Bank, presents that something: sustainable banking.

And what might that mean, exactly? Watts can recite his firm’s definition easily enough: ‘Sustainable banking means using money with conscious thought about its environmental, cultural and social impacts,

and with the support of savers and investors who want to make a difference, by meeting present day needs without compromising those of future generations.’

You might not have heard of Triodos – it’s still small, a ‘challenger bank’, though growing steadily with some €18 billion of assets under its management, now operating in six European countries including the UK. Not that the idea is ever to go head to head with a big conventional bank. ‘Growth for growth’s sake is not why we’re here,’ says Watts. ‘We try to be a reference point for change.’ Founded in the Netherlands in 1980 and with its British subsidiary in Bristol since 1995, it has recently built itself an energy positive, supergreen kit-of-parts timber group headquarters in woodland near Zeist east of Utrecht in the Netherlands by architect and circular economy guru Thomas Rau.

It’s a building that could if necessary be dismantled, moved and erected elsewhere like a Shakespearian theatre, its curvilinear form perhaps echoing the firm’s original adherence to the anthroposophical principles of philosopher-architect Rudolf Steiner. It locks up more than 1.6 million kilos of CO₂ in its 2,623m³ of structure but then, as Rau calculates, in the enormous managed German forests that produced it, that amount of timber grows back in just 11 minutes and 36 seconds. This really is a regenerative way to go about things.

Watts turns out to be not just a sustainable banker, but one who thinks, talks and writes on the subject, recently critiquing the Bank of England for its stance on the economy as it emerges from the pandemic. The BoE is not taking the lead it should on climate change, he argues. ‘The central bank must be



Bevis Watts at St George's, Bristol – Regency church turned concert hall with extension by Patel Taylor. It's an important loan customer for Triodos.

bold and go beyond stress testing and reporting to strong asset steering, incentivising or penalising banks based on their behaviours related to climate change and potentially other environmental issues that are creating similar global systemic risks.'

In an issue of this magazine devoted to sustainability concerns, and given that all buildings need financing, the source of that money becomes a topic of interest. Where is the money you borrow originally invested, for instance? It's not a question you may normally think to ask, but perhaps you don't want to find that it stems from unethical investments, Big Oil, or whatever.

So I ask Watts where Triodos gets its money from, expecting some complicated web of international finance and further, doubtless carefully vetted, borrowing extending to a vanishing point on the horizon. But no.

'We don't borrow from other banks – it all comes from deposits,' he says. 'That's something that used to be true of any bank, and



Above and below 'A wooden cathedral' is how architect Thomas Rau describes the new super-green Triodos HQ near Utrecht which could be disassembled and rebuilt elsewhere.

it stood us in very good stead in the banking crisis. We were isolated from the contagion.' So there was no buying of bundles of sub-prime loans for them. Some 82% of the bank deposits they receive are then lent out, and – as this is a bank that makes a great deal of its transparency policy – you can find details of every organisation it has lent to.

The UK operation is, as you'd expect, based in a BREEAM 'Excellent' building; it is in Bristol's central Deanery Street mixed-use redevelopment (building by Alec French Partnership with thoroughly informal and rigorously sustainably sourced interiors by White Design). Bristol was originally chosen, says Watts, because a lot of businesses in the South-west were already well attuned to the philosophy of the bank, from organic farmers and the Soil Association to wildlife trusts and clean-energy companies. And 1995 was also just after Triodos bought the UK's first ethical bank, the tiny Bristol-based Mercury Provident, so there were the beginnings of a customer base. These days they



The UK operation is in a BREEAM Excellent building

all the boxes. Vitsoe's shelving and other products, designed by Dieter Rams, are made for longevity and reconfiguration: even their packaging is reused. There Triodos did a re-financing deal in the project's later stages. Second, Winchester University's just completed green West Downs campus by Design Engine: this was Triodos's first venture into UK higher education, a £30m loan towards the BREEAM 'excellent' building complex which also carries WELL certification for human health and wellbeing. Winchester's ambition is to become the most sustainable university in the UK. As Watts points out, that's not just the carbon footprint of the place, but also the values that are inculcated there – a broader, planet-aware education.

Triodos is not alone. It founded a 'global alliance for banking on values' with 63 other like-minded financial organisations around the world. Together they have more than 70m customers and \$210 billion of assets. Still small in international finance terms. But this comes back to the business of being a reference point for change. 'If we can shift the needle just a little bit', as Watts puts it, 'we can have massive impact.'



DESIGN ENGINE

operate nationally, with regional branches in London and Edinburgh.

You can open a current account with them, and the accompanying card won't be the usual laminated plastic but (microchip aside) a biodegradable corn-starch material. Obviously they don't just lend to anybody: you have to be aligned with their values and be doing something that they regard as improving the lot of humankind far into the future. So charities, organic farms, educational initiatives and, yes, buildings. An early client was the Bristol Architecture Centre.

Social housing built to Passivhaus standards and zero-energy custom-build housing projects are their British staples, Germany is big on sustainable buildings of all kinds, while in Spain there are a lot of solar energy projects, Watts says. Two customer examples: first the all-timber Vitsoe factory in Royal Leamington Spa (RIBA July 2017) which, like Triodos's new group HQ, can be dismantled and re-erected elsewhere, ticks

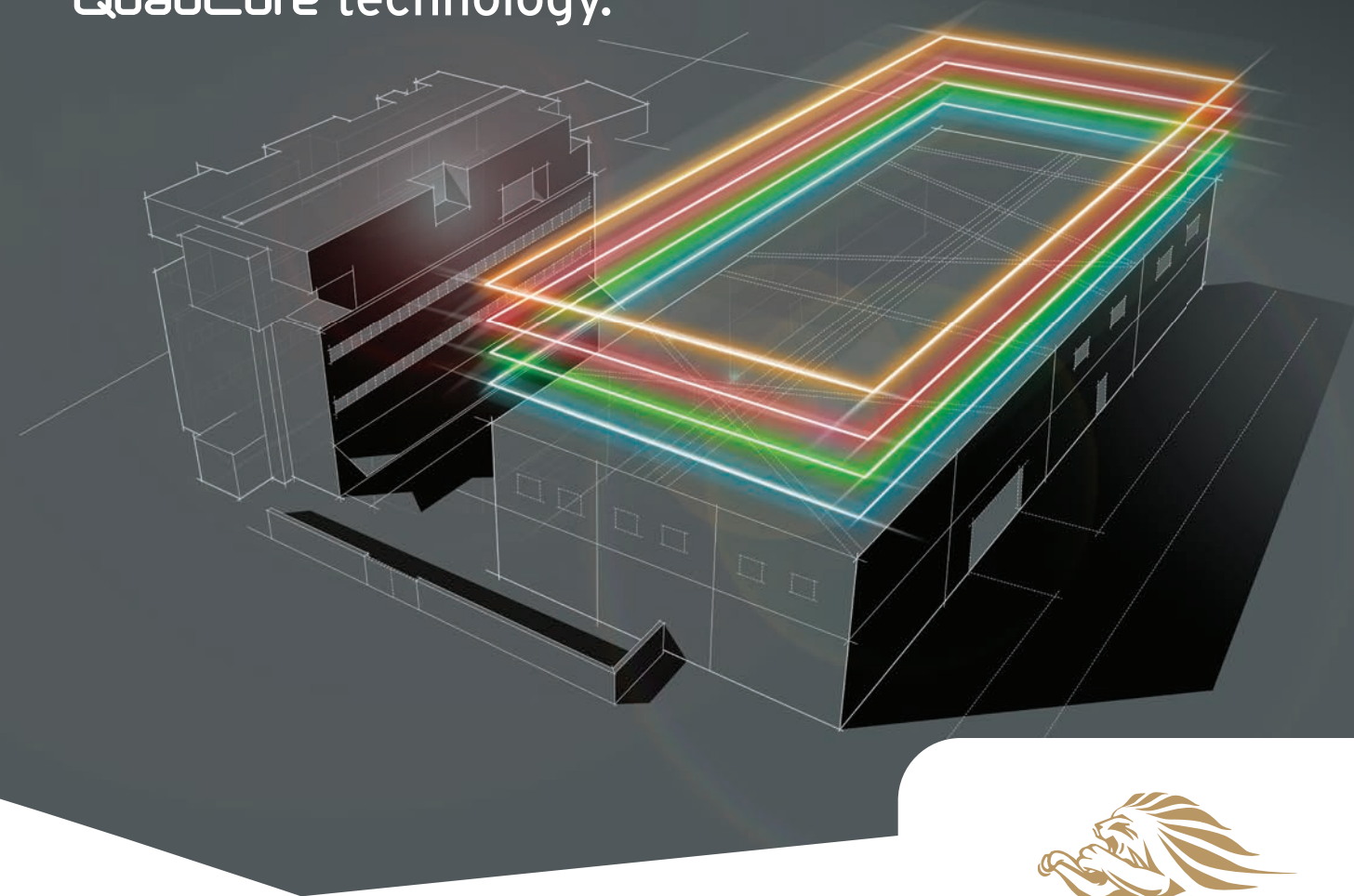
Above Entrance interior of University of Winchester West Downs campus by Design Engine. This was Triodos's first venture into higher education with a £30m loan. **Right** Watts on his home ground at St George's Bristol.



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Porritt ducks the political questions

Yes – there is hope we can escape the worst of global warming, but technical fixes are the easy bit

Piers Taylor

Jonathon Porritt's new book, *Hope in Hell*, is written from the perspective of one working at the forefront of climate activism in the UK for the last 50 years. From Friends of the Earth to the Green Party and the UK Sustainable Development Commission to Forum for the Future, Porritt has always been there, championing environmental causes.

Porritt's message here is one of hope – hope that we can do over the next decade what is needed to reverse runaway climate change. Porritt believes the next 10 years is THE key decade to cap global warming to a maximum of 1.5° above pre-industrial levels. In the first part of *Hope In Hell*, he reminds us of where emissions come from – 75% globally come from power generation, transportation and the built environment – with its concrete and steel hungry industry norms.

Hope

The hope Porritt feels is expressed by articulating that we have the means, knowledge and solutions already at hand to make the changes necessary to address climate change in such a manner that total global emissions peak in 2020 and are halved by 2030 – which is what is needed (at the very least) to limit further destructive global warming.

Typically, the changes he suggests we need to make are technical fixes. The big change, he proposes, is in terms of renewables. At present only 25% of power (within the UK) is generated from renewables and yet we have the technology and investment necessary to double that in five years, and get

How politics can change is the central issue, particularly as they seem stuck in the old ways of old leaders who are resistant to change

to 100% of power needed by the UK by 2035.

The big question, of course, is that having declared a climate emergency, why doesn't the UK make these changes as a matter of urgency? The simple answer is politics, which is in thrall to the oil industry (which has served so well the dominant politics of the right) and conventional business systems and infrastructures that are resistant to change.

And... that's it. Porritt spends so much time telling us how we can solve things there's little left to really unpick how politics can change – which, given that we have the knowledge, technical solutions and, increasingly, collective social will – is the critical requirement to limit climate change. This, more than technical fixes, is the central issue of our time, particularly now, when politics seems stuck in the old ways of old leaders who are resistant to change.

If the coronavirus crisis has taught us anything, it is that we can change overnight if there is the political and social will. UK carbon emissions dropped almost instantly by 36% at the start of lockdown, although this has now halved and will quickly be back at near pre-Covid levels. Nothing else has made such an instant reduction to emissions so quickly and yet, as Porritt reminds us, the climate emergency is far bigger than the coronavirus emergency. As he also reminds us, the needs of today always win over those of tomorrow.

Disappointment

My main frustration with Porritt's arguments focused on how technically we can reduce emissions is not that they're not interesting, relevant or accurate. It is more that they are

Above Technical fixes to the climate emergency such as renewables could get to 100% of UK power need by 2035. But there are other issues.

ISTOCK/ROBEDERO



well known and well argued by others too. Understanding socially and politically how we can make change is the key issue of our time, particularly in the face of self-serving structures that are so resistant to change and politicians who label those who care about the environment ‘activists’. Dealing with climate change, of course, isn’t about one thing alone – the technical solutions, or the political will – but of entire connected systems of change. Focussing on one without the other is useless, as Stewart Brand has argued so thoroughly in Whole Earth Discipline – so where, here, is the chapter on the politics of change?

In his book, Brand describes how change can occur on a huge level. His volume is much more convincing than Porritt’s in describing how social and political change is key; and by relating how the manner in which we live in cities can make enormous environmental change he shows how social change in terms of urbanisation has reshaped everything. For example, Brand describes at length how living densely in urban centres is the most important thing we can do – we consume less, travel less, have fewer children, share resources efficiently and free up land for more environmentally sustainable uses than intensive agriculture or low density living. These changes are far more interesting – and useful – than Porritt’s technical fixes alone. Indeed, Brand goes as far as to suggest that the city is the greatest contribution to sustainability we have ever known, regardless of how we heat, produce power or build, but this doesn’t fit with Porritt’s view of simply investing in renewables and green transport.

Practicality
However... what (else) can we do as architects, other than moving to the city, having fewer children and building nothing new? As Porritt sees it, our (architects’) big problem is the carbon intensive industries that produce steel and concrete on the scales we demand. As a profession, we have never really tackled the issue of embodied energy – focusing for too long on energy use. Given that the embodied energy of a building can be as much as 80% of the total carbon emissions over its entire lifecycle, we are miles away from any significant building that is anything approaching zero carbon. It is on carbon, rather than mere energy, that we architects need to focus. The big challenge for the profession is how we build with low carbon materials in an

Since the embodied energy of a building can be as much as 80% of its total emissions, it is carbon, rather than energy, architects need to focus on

Below Social and political change is critical, as Stewart Brand showed in his book The Whole Earth Discipline, which showed how living densely in urban centres is the most important thing we can do.



industry that has few, and within a political and planning systems and a post-Covid landscape that are not necessarily conducive to models of developments and settlements that are the most sustainable – super dense ones.

My other frustration with Porritt’s book – particularly when he has spent his entire adult life effectively using such language – is that this rhetoric is so similar to so many others’. Porritt tells us that we need to act now – so did Al Gore 15 years ago, and Lovelock, who now phlegmatically suggests that it is far too late, and anything we do is akin to trying to row a boat against the flow up the Niagara falls. We have seen that ‘disaster speak’ doesn’t make change, and ultimately, suggestions on how to achieve real change is missing from Hope in Hell. The real question has to be – in a global climate dominated by reactionary buffoons hell bent on propping up the status quo, how on earth (literally) can we legislate to make change happen quickly? If there is some hope in hell it is perhaps in younger people who don’t have the same attitudes to existing financial structures. Perhaps (hopefully) they will overthrow the status quo, challenge the existing models, and re-value society’s assets. ●

Piers Taylor is an architect and founder of Invisible Studio

Hope in Hell
Jonathon Porritt
Format: Hardback
Pages: 384 pages
Publisher: Simon & Schuster



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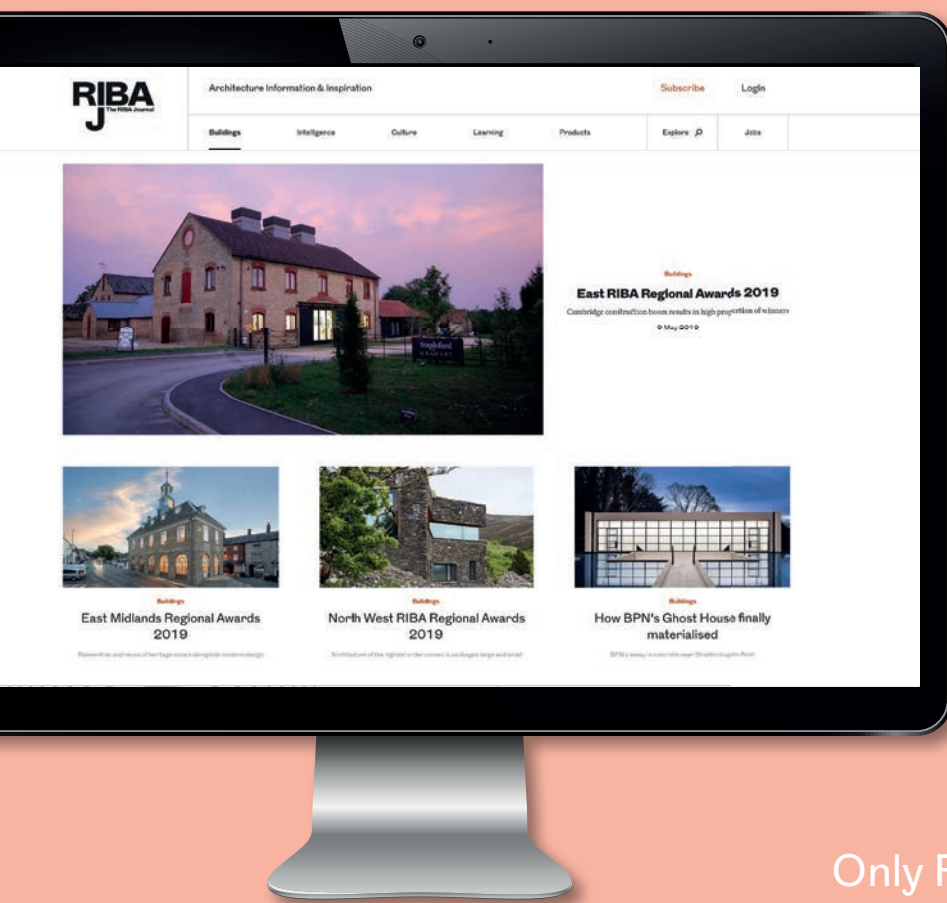


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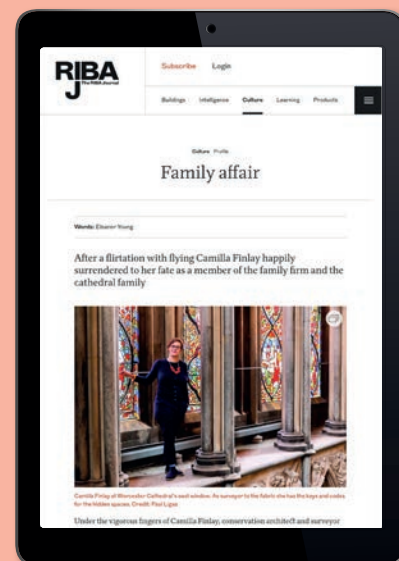
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Culture
Exhibition review

Plug in, turn on and connect

The Design Museum's ELECTRONIC: From Kraftwerk to the Chemical Brothers exhibition reveals the significance of the movement in all its energy

Susan Corrigan

A longing for darkened rooms, bodies moving together in a kind of spiritual hedonism, and immersion in crystal-clear electronic beats is but one aspect of pre-Covid nostalgia that underpins this intriguing – and intriguingly kinetic – pan-generational survey of machine-powered music, its cultures of place, and its accompanying, evolving aesthetic. Is the concept of ‘dance music all night long’ now consigned to history, to museum-based assessment through a curatorial gaze? Or do the current clandestine rural raves re-engage a long-buried sense of rebellion centred on gathering in the ephemeral, liminal place of clubs, abandoned warehouses and raves?

Contained in a black box immersive experience by French practice 1024 Architecture, this show was initially curated by Jean-Yves Laloup for the Musée de la Musique – Philharmonie de Paris and is here adapted for a post-lockdown experience by Design Museum curators Gemma Curtin and Maria McClintock. Beginning with the first rumblings of instruments adapted to produce electric sounds in 1901, the exhibit maintains an ageless exuberance attractive to hardcore synth nerds and club culture aficionados alike. Through glimpses of landmark technology (think Daphne Oram, Robert Moog, the BBC Radiophonics Workshop, and Jean-Michel Jarre's custom-built rigs) and ‘rooms’ in tribute to spaces in Chicago, Detroit, London, Manchester and Berlin, the



Jean-Michel Jarre
imaginary studio.

immense cultural magnitude of the art form is clear. Navigating these spaces under heavy Covid manners, masked and wired-up, wearing 3D specs, feels anything but isolating: the sensation of being plugged in underscores the connectivity its proponents always cite as an idealistic outcome of club culture.

First, the spatial: efforts to recreate settings such as Berlin's Berghain, Manchester's Hacienda and Sheffield's Gatecrasher are broadly successful, from the Ben Kelly designs for the Hacienda reconstructed from archived signage and iconography, a 3D immersion in a Kraftwerk concert, to the recreation of a Chemical Brothers festival set complete with belching smoke machines and foam-based costuming by long-time collaborators Smith and Lyall. Most delightfully of all, the electric rain of 1024's kinetic light sculpture sits in its own box, with a five-hour DJ set by Laurent Garnier – a journey encompassing the beginnings of modern clubbing at gay house parties such as The Loft, the chart-friendly days of the Second Summer of Love, and latter-day nods to garage and grime (also available via link to enjoy at home).

Complementing the history of its music and venues, the curators demonstrate how the aesthetic has permeated high and mainstream culture. High fashion offers the queer, fetishistic contribution of Walter Von Bierendonck, Charles Jeffreys of Loverboy and Raf Simons, now Prada co-creative director, whose work links record-label T-shirts to the house of Dior. Andreas Gursky's wide-scale

images of revellers, Jeremy Deller's Acid Brass diagram showing the socio-political connections thrown up by dance music, and Christian Marclay's disc-based Body Mix, evocatively render the intersection with fine contemporary art. Graphic designers – perhaps the first cohort from outside music to integrate the genre with commercial success – are represented here by Designers Republic, Factory's Peter Saville, and Tomato. But the real aficionado – and those seeking representation of Black, LGBT and countercultural impulses – can find acknowledgement in countless examples of ‘disposable’ ephemera: the club flyers and membership cards promoting early parties in Chicago and Detroit, or release campaigns by artistes from Aphex Twin to Detroit's Underground Resistance.

In these straitened and isolating times, the balm provided to marginalised communities and youth culture via electronica's accidental provision of places to gather hangs over the whole exhibit, with special attention paid to the efforts of authorities to ban at first impulse, and co-opt for profit at the second. At every turning there's a rush of recognition, of potent reminders of the transportive and transformational power of simple, repetitive beats, of times when one nation really was under a groove – and inevitably will be a cultural current in years to come. At ELECTRONIC, you're never just dancing on your own. ●

ELECTRONIC: From Kraftwerk to The Chemical Brothers, Design Museum, London, to 14 February 2021

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Gordon Frederick Taylor 1923 – 2020

Influenced by Le Corbusier and Aalto, Sheppard Robson partner whose designs for housing and award-winning universities helped shape much of Britain's post war architecture



Gordon Taylor, who died in March this year, was a member of the second generation of partners at Sheppard Robson whose foundation in 1938 goes back to the last years of the modern movement. Gordon shared in the production of a formidable output of architectural work. Driven by the force of nature that was Sir Richard Sheppard, they shared with other similar sized firms of that time the responsibility of shaping much of Britain's post-war architecture.

Gordon's body of award winning educational work was influenced by his early exposure to Alvar Aalto and Le Corbusier. His residential housing schemes and designs for the houses he built for his family in Harpenden also embody his understanding of light and his talent for sensitive planting and landscaping. They pay homage to Frank Lloyd Wright and Gordon's own Miesian approach to merging house and garden.

War interrupted Gordon's early student studies at Leicester School of Architecture and in 1942 he enlisted with The King's Own Sappers and Miners, finding himself in Libya and India building bridges and docksides in Tobruk and Roorkee. It was an experience he enjoyed enormously and which was to influence his life, when he later held a warm friendship with Indian architect Mohan Sharma who worked closely over some 15 years with Le Corbusier on Chandigarh. By 1947 Gordon was studying at the University of Delft having won a British Council Scholarship. Dutch culture and lifelong friendships flavoured his work and associations throughout his life.

Finally able to complete his RIBA finals in 1949, he joined Richard Sheppard, Geoffrey Robson and Jean

Shufflebottom (founding architect partner with her husband Sheppard) in 1950. This was the year he married Barbara Newick, a young fashion designer, and by the time he was made an associate in 1954 they were already living with a young family in the first house he designed in Harpenden. In 1960 Gordon was made a partner, and the new decade was the beginning for the practice of a hugely creative time in the field of educational buildings.

When in 1959 the practice won the competition for Churchill College Cambridge, its reputation soared. Gordon's own career was also reaching a zenith. Throughout the 60s he was responsible for the masterplanning and design of many educational schemes including Manchester University, City University London and Loughborough University. Internationally, his competition successes included schemes for universities in Baghdad and Bahrain, and projects in Libya which demanded a prison design with gallows – drawing criticism for Sheppard Robson from Private Eye for taking on such work.

Between 1961 and 1979 Gordon and the practice won RIBA awards for his Loughborough University Library and administrative building, Manchester Metropolitan University's All Saints Building, and Abbey Gateway Boys School in St Albans. Such close educational partnerships continued down the years, bringing repeated commissions for the practice in the university and schools sector.

In 1981 Gordon's successful competition schemes included Merck, Sharp and Dohme Research Laboratories in Harlow and the masterplan for the Arabian Gulf University in Bahrain. Nearer to home was his design for Campus West theatre and amenity centre in Welwyn Garden City, which is still thriving today.

It is Gordon's warmth, humour and humanity for which he will be lovingly remembered by surviving colleagues, many, many friends, his children Simon, Gillian and Meredith and granddaughter Elizabeth-Daisy.●

Gillian Knights

IN MEMORIAM

Clifford Maurice Measday
ELECTED 1950, ST LAWRENCE,
JERSEY

Gerald Bennett Dix
ELECTED 1950, BANBURY

Thomas Henry Brightman
ELECTED 1963, PERTH

Armagan Tekvar
ELECTED 1975, LONDON

Karen Beaty-Pownall
ELECTED 2007, LONDON

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Culture
Letters

Exchange

Streetwise

Thank you for raising the issue of road design in your leader 'Feel the width' (RIBA July 2020, p53). As I am probably one of the few RIBA members (class of 1963) who is a member of the highways and transportation institution (CIHT), I am keen to make contact with like-minded people.

Over the years some forward thinking schemes have been built. I like to think I have done a couple myself. Unfortunately they were all one-offs. Though well documented in the highway profession at the time, they have had very little impact on ordinary practice, which is now far behind levels of everyday design seen for example in Denmark or Germany.

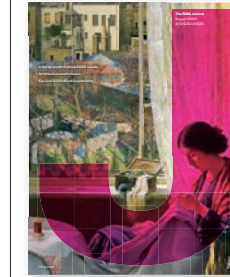
A likely reason is that the primary set of standards and design rules, the Design Manual for Roads and Bridges, DMRB, is out of date. Even though it was put online this year, at 8,000 pages it takes a little application to identify exactly which rules are so destructive.

For example the requirement to provide in urban areas a kerb radius of 10m with sight lines, at every street corner, prevents normal urban topology ever being built. The effect is that almost all new development has a suburban feel. Urbanism as understood by the Academy of Urbanism is virtually impossible to achieve.

Another interesting point is that no single profession is responsible for or capable of designing the complete built environment. It would greatly improve the quality of road design if more architects were involved.

To encourage them, about 10 years ago I set up a short, mid-career interdisciplinary training course to help demystify highways and transportation. Though it no longer runs, my book Streetscapes, produced with the kind help of the staff at RIBA Publications, covers the main points.

Colin J Davis, Esher



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And street widths

I was interested to read July's leader about street widths. For our mews houses at Trent Basin, Nottingham, the street width is just 7.5m, measured between main walls. Each first floor living area has a large oriel window (these are 5.7m apart across the street) angled towards the river. The new 4.5m wide 'shared-space' roadway provides access to integral carports. They sold very well, apparently.

Robert Evans, Evans Vettori, Matlock

It's a breeze

The interview with Shaun Fitzgerald of CIBSE (RIBA July 2020, p33) legitimately raises concern over air conditioning in city centre offices with regards to coronavirus, but worries about overheating in summer and low internal temperatures in winter. For over 20 years natural ventilation has been a requirement in law courts. These are infinitely more complex to design than offices, but work fine with natural ventilation. Manchester Civil Justice Centre was the largest and tallest naturally ventilated building in Europe when it was built. Lincoln, Newport, Bristol, Caernarfon and Bournemouth have other recent examples. Natural ventilation has also been successfully reinstated in historic buildings such as York Assizes. For more detail read The Architecture of Law Courts, published just before lockdown.

Jon Wallsgrave, Sunbury, former head architect, Ministry of Justice UK

Planning opportunity

I serve on our civic society and despair at the quality of planning applications. It is not just a matter of architectural merit but the applicant or agent not being able to put together a comprehensible, accurate presentation. Overstretched planning authorities register applications that don't comply, usually done by non-architects. The RIBA and ARB should fight for their membership's livelihood by securing this work area by law. There is a role also for the Chartered Institute of Architectural Technologists (CIAT), which could establish an appropriate qualification.

Andrew Bain, Chichester

No one profession is capable of designing the complete built environment. It would greatly improve the quality of road design if more architects were involved

Colin J Davis, Esher

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Apollo Pavilion, Sunny Blunts Estate, Peterlee, 1970

Built under the 1946 New Towns Act, Peterlee was the only post-war new town requested by the inhabitants of the area themselves through their MP and was meant to provide modern housing and services for the mining and rural communities of East Durham. The original scheme by Berthold Lubetkin, based on tower blocks, was considered unsuitable to the geology of the area; he was replaced by George Grenfell Baines, whose programme of quick building often resulted in poor quality construction. The design team for landscaping was headed by British abstract art pioneer Victor Pasmore, whose Apollo

Pavilion, in the Sunny Blunts estate, references in its name the contemporary Apollo Space Programme. Pasmore described this work as ‘... an architecture and sculpture of purely abstract form through which to walk, in which to linger and on which to play, a free and anonymous monument which, because of its independence, can lift the activity and psychology of an urban housing community on to a universal plane.’ After a long period of neglect, the pavilion was restored in 2009 and is now grade II* listed. ● Valeria Carullo

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architectural acoustic finishes

Crossway, Birmingham (formerly Civic House).

SonaSpray fc applied to the ceiling throughout the impressive foyer area of Crossway, Birmingham. Chosen for its attractive, lightly textured & seamless finish, SonaSpray fc achieves superb acoustics without design compromise.

Credit to Associated Architects.



A place in your home
to disconnect together



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