

# INSIGHT


The News Magazine From Sapphire



2021  
Q1

## Setting Sustainability Goals with Dr Zainab from Wates

Page 9

A photograph of a construction site at sunset. In the foreground, a body of water reflects the sky and the construction site. Several ducks are swimming in the water. In the background, two large buildings are under construction. The building on the left is covered in white plastic sheeting, while the building on the right is a multi-story concrete frame. Two large red tower cranes are positioned between the buildings. The sky is a mix of orange, pink, and blue.

Construction's Carbon  
Dilemma: How to meet  
the challenge.

Read more on page 12



## Editor's Overview

### Editor

Hello I'm Mary, I'd love to hear your ideas for future content, or questions you would like our experts to answer in future issues. You can email me at [mary.mccollum@sapphire.eu.com](mailto:mary.mccollum@sapphire.eu.com)

Sustainability is on the minds of many in construction as Government targets aim to see an 80% reduction in emissions by 2050. With many of the largest developers setting sustainability goals of their own, the

supply chain is essential to meeting the needs of the climate crisis.

In this edition of Insight Magazine, we'll be exploring how to set sustainability goals with Dr Zainab from Wates (p.9) and the impact

balconies have on the energy efficiency of a building (p.7). We discussed the best approach to reducing carbon and how the supply chain can support clients (p.12).

We've explained the latest announcement on the combustible cladding fund and the industry's reaction (p.19) as well as the unlimited fine in store for those found to be breaking fire safety regulations (p.5).

*Mary McCollum*

Mary McCollum

## Events



### Hindsight

Unlocking Construction's Efficiency  
**3rd February 2021**

Bridging the Gap Between Design and Build  
**10th March 2021**



### Foresight

How Might Fire Safety Change Construction in the Next Few Years?  
**14th April 2021**

Fire Safety is an essential yet complex area all builders must address. As high-rise development increases so does the chances of fire hazards. At this symposium

we look to uncover the what and the why of the grey areas of fire regulation changes. We will also help our audience understand the importance of having a fully traceable information train or "Golden Thread".

Construction's Carbon Dilemma: Why, When & How?  
**26th May 2021**

The environment we are facing today means that the way we

see homes, and the role they play in our everyday lives, is forever changing. With bold government and client emissions targets, many are wondering why considering embodied carbon and carbon during occupancy so important? How can the construction industry make an impact? We'll answer these questions and more with a panel of industry experts.

Open CPDs the First Tuesday of every month. **Book at [www.resi.build](http://www.resi.build)**

## Industry Insight

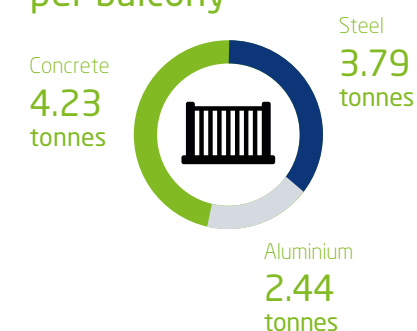
### Technical Advice

Hello I'm Nick, I keep up to date with latest industry changes and regulations, to guide clients with technical design at early design stages of projects, email me at [nick.haughton@sapphire.eu.com](mailto:nick.haughton@sapphire.eu.com)

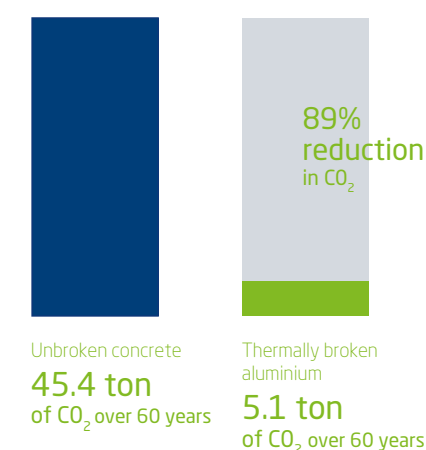
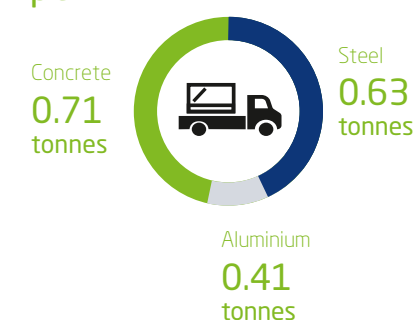
*Nick Haughton*

Nick Haughton

### Embodied carbon per balcony



### Embodied carbon per m<sup>2</sup>



## Pandemic Transforms Balcony Design and Demand

The pandemic has had a profound impact on all our working and personal lives and in many cases the two have begun to blend together. As more and more people work from home, the features of their homes become increasingly impactful on their quality of life. We are seeing a surge in demand for balconies and the ratio of apartments to balconies is climbing.

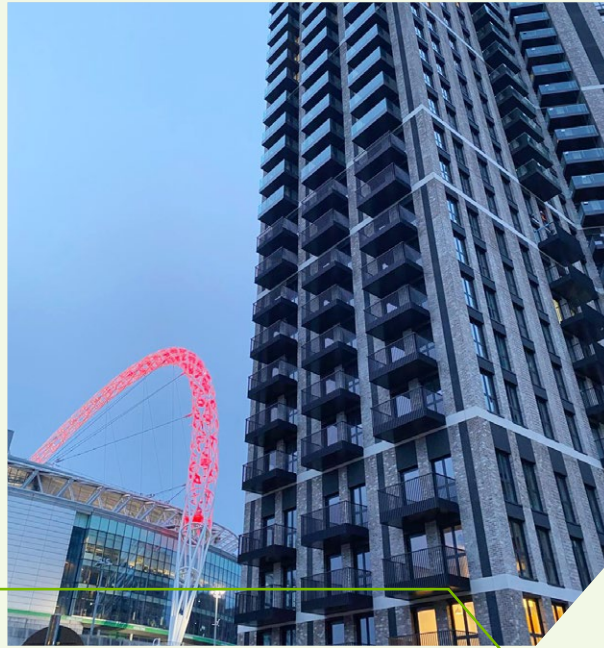
According to research carried out by Skize 63% of the 1000+ respondents would be willing to pay extra for an apartment with a balcony with 42% willing to pay 5% or more on their rent or mortgage.

The demand is also impacting balcony design as residents become more selective when looking for a new home. For almost a decade, design standards established by the Mayor of London required new apartments to include at least

5 sq. metres of private outdoor space per person in a two-person home. This requirement increased in line with the number of occupants and ensured all new homes in London would provide residents with much needed access to outdoor space. These requirements have since been included in The London Plan in addition to the requirement that all new dwellings should include a dual aspect, a feature easily achieved with the addition of a balcony.

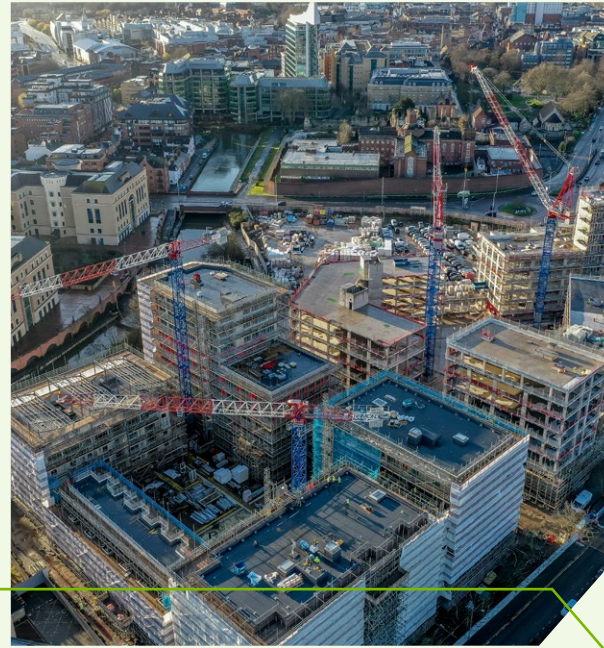
One thing is clear, resident priorities are set to be significantly changed by the experience of the pandemic with design trends transforming to meet them.





#### Eastlands E05

Glide-On™ balconies installed at Eastlands E05 with a combination of vertical and laminate glass balustrades. Credit to: B. Hooper, Dantaag.



#### Huntley Wharf

An aerial view of Huntley Wharf in Reading shows the extent of the project, with anchors cast-in. Huntley Wharf sits on the bank of the river Kennet a stones throw away from the centre of Reading and the ancient Abbey Ruins. Credit to: Berkeley Homes.



#### Cleveland Street

Balcony Cassettes manufactured off site for Cleveland Street.



#### Greenwich Millennium Village 5

A view of GMV5 with the Greenwich skyline in the background, including the O2 Arena. Turn to page 14 to learn about phase 6.

## Unlimited Fines for Flouting Fire Safety

As part of the Building Safety Bill the government has announced unlimited fines for building owners found to be breaching fire safety regulations. Following on from the Fire Safety Consultation the government's plan to crack down on fire safety, the Building Safety Bill includes new measures like the first ever national Building Safety

Regulator to overhaul residential construction.

Building owners caught obstructing or impersonating a fire inspector will also be subject to limitless fines. The government hopes to deliver the regulations following Royal Assent before the second anniversary of the first phase of the Grenfell Inquiry in October.



## Construction Output Boosted in Q1



Construction's COVID-19 recovery saw a boost in output in January as the industry works to fulfil Johnson's 'Build Build Build' pledge. Activity was up by 0.9% in January compared with December, welcome news to many industry professionals.

Activity is up by a total of 1.7% when comparing November

to January with the previous 3 months, indicating a steady incline as the nation begins to recover from a year of lockdowns and hardships due to the pandemic. January 2021 remains 3% down on the output in January 2020 but industry confidence grows, and hopes remain high for the vaccine roll out and national recovery.

## 'Beautiful Building' Proposals Released

As a result of the Building Better, Building Beautiful Commission's report last year, the Ministry for Housing, Communities and Local Government launched a consultation on the national code. The MHCLG announced in a statement that the policy revisions would "set an expectation that good quality design will be approved while

poor quality will be rejected" and all streets should be "lined with trees".

Robert Jenrick, Housing Secretary, added that the proposals will give local communities control over developments in their neighbourhoods "ensuring that they reflect and enhance their

surroundings and preserve our local character and identity". RIBA president of architecture Alan Jones has countered that "a new national design guide will not solve the crisis of quality alone" arguing that the government must break up the "monopoly" of a small group of developers too. The consultation ended on the 27th March.



© Virtual Event | 26th May 2021

# Construction's Carbon Dilemma: Why, When & How?

The UK government have set ambitious targets for lowering carbon emissions as we work towards a green construction industry, are you prepared?

At this event we'll be joined by industry experts who'll share their insights on:

- What is embodied carbon and how to avoid it?
- How and why reduce carbon during occupancy?
- When and how the industry can make an impact?
- The practical steps you can take to prepare to hit new targets and make a difference.

 **Book your free place now:**  
resi.build/carbon



**Resibuild**  
Events



## Energy Efficient Balconies

### The Impact of Balconies on Energy Efficiency

The increase in urbanisation and having such a concentrated number of people in a small space has a consequence on the environment and the carbon footprint of a city. Most notably, a high level of air conditioning in high-rise buildings, due to the difficulty ventilating at height. Emissions are only set to increase as climates change.

There is a common myth that balconies do very little to the energy efficiency of a building. Balconies, however, can contribute significantly to energy efficiency by harnessing energy from the sun and wind. The benefits depend on climate, the building's aspect and height and the effects of the wind in the area but giving this some thought in the design phase can make a big difference.

A glazed balcony, for example, can create solar gains for the apartment in a cold climate. In warmer climates with greater ventilation needs, residents can use the balcony as a buffer zone and regulator between indoor and outdoor temperatures.

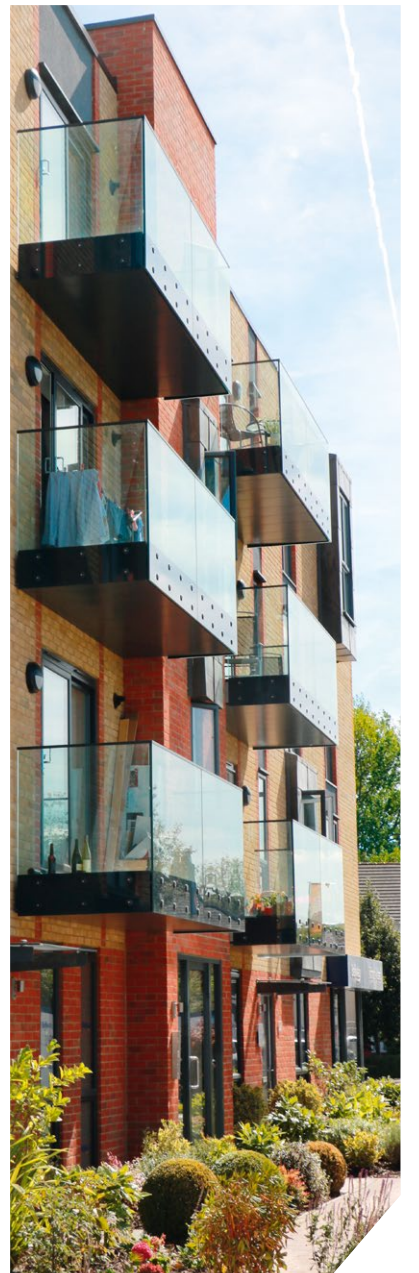
The optimum dimension, height and position for balconies affects their potential energy efficiency too. Beyond 20 storeys buildings can lose energy efficiency rapidly, so it's important to harness as much of the surrounding climate as possible. Depending on the size and orientation of a balcony, there is a potential to save up to 80% energy over the lifetime of the building.

When we think of the overall carbon footprint of a balcony, we must consider the construction as well as operational energy. There is of course carbon embedded in the production of a balcony, with the cost of energy in materials and assembly and materials used must be assessed for their overall carbon footprint. Concrete is less efficient than aluminium for instance, both in its construction, its creation of thermal breaks and its inability to be recycled.

A positive way forward is to understand how much of an impact buildings have on the climate over their lifetime. To measure this, it's important to implement BIM and performance analysis to capture the true carbon output of a building from design to operation.

Credit: Dr Humera Mughal and Dr Anbar Rana

This article is abridged, read the full article [here](#)



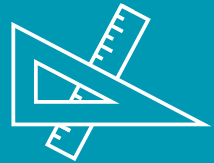


# Balcony refurbishment is not just about replacing combustible materials

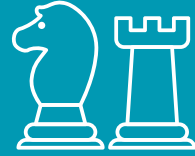
Making balconies safe can be challenging.



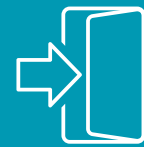
Quality and "installability" of decking products



The design of your sub structure



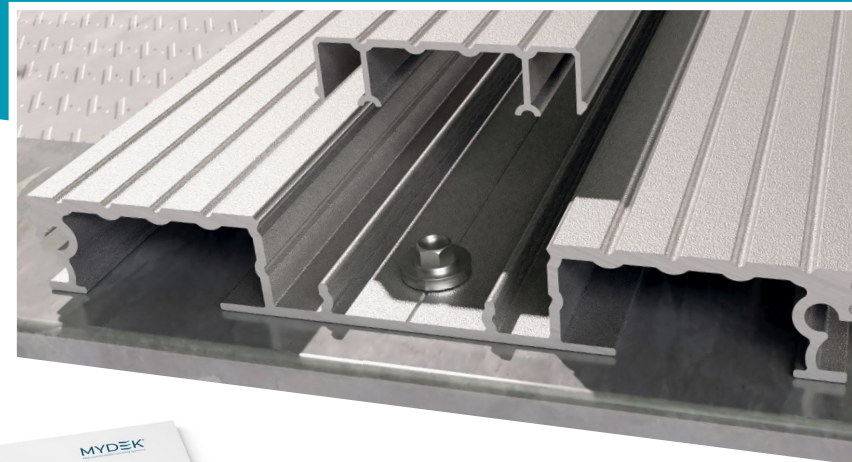
Installation strategy and optimisation



Access solutions, material movement and debris removal



Health and safety



## Talk to the experts!

Over 16,000 balconies have been made safer with MyDek.

- High performance non-combustible decking system
- Comprehensive range of colours and finishes
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If you're facing the challenge of refurbishing balconies on your high rise building, you'll be in safe hands with MyDek.

Our innovation both in products and access solutions will reduce costs and save time whilst ensuring safety and minimum disruption to residents.



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## Setting Sustainability Goals With Dr Zainab Dangana

In May 2019, the UK Government became the first national government to declare an environment and climate emergency with 70% of UK local authorities doing the same. Many professional bodies have also launched programmes in the face of climate change.

The Royal Institute of British Architects (RIBA) are one such institution that has set out sustainable development should look like for the construction industry. Following the RIBA guidelines will be beneficial to businesses, but the real systemic change comes from integrating changes and making guidelines compulsory in the years to come.

### Misconceptions to dispel

One reason for reluctance in the industry is the high upfront costs of new products, which could add 3-8% to the capital cost. There is also a lack of understanding about the credibility of the products, especially those marketed as carbon neutral – a concept about which there is a lot of confusion.

The definition of a carbon-neutral product is a product where the amount of carbon taken to produce is counterbalanced by the amount of carbon it saves in its operation. It is vital to look at the whole lifecycle of a product and the potential savings it makes throughout that time.

### Know what you want from your supply chain

To increase the standards of sustainable performance, there are particular processes and accreditations that you look for from the supply chain. For example, contractors will only work with suppliers registered with Constructionline, that have sustainable procurement policies in place.

### Setting your own sustainability goals

There are roles for everyone to play. The client, especially, needs to determine goals from the start and the drive needs to come from them. It's very important for them to be clear on their requirements, because no matter how dynamic and effective the design and construction team might be, if the client's brief isn't precise for environmental innovations, nothing is going to happen.

Setting realistic goals is the best course of action and small incremental changes make up for a lot of progress over time. Registering with the Carbon Trust to get carbon neutral accreditation is something that

can be done immediately, as can keeping abreast of Government changes in guidelines.

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Dr Zainab Dangana is the Sustainable Technology Services Manager at Wates Group and has over 15 years of experience as an architect the United States, India, Nigeria and the UK.





# Golden Balconies for Acton Gardens

Acton Gardens, situated in the heart of Acton, is an award-winning urban village in West London designed by A&Q Partnership and constructed by Countryside Properties. Sapphire was invited to create the bespoke balconies for this project. Our team of experts designed, manufactured and installed 87 modular bespoke balconies at Acton Gardens.



The Acton Gardens project required us to create some unique balconies in order to bring the design vision to life. Our designers worked closely with the architects at A&Q Partnership and devised bespoke balconies with vertical bar balustrades with a mesh panel on the bottom on both inside and out. This mesh brings additional privacy for the balconies giving residents greater peace of mind. We then added a unique design finish for these bespoke balconies using a bespoke bronze/gold metallic

powder coating. The finish of the balconies with the warm tones of the façade give the building a golden glow.

At Sapphire, our aim is to engineer innovative solutions to best complement the design vision of the client. We do so in compliance with high standards of specification and design vision to manufacturing offsite, maintaining standardised processes and designs and providing the benefits of modern methods of construction to our clients.

Once the balconies were manufactured and tested against the high specifications and quality standards, our logistics team ensured the smooth delivery of the products, fully assembled for installation, to the site. This was crucial to ensure that the balconies reached the site on time for a quick installation without creating the need for on-site storage. Upon arrival, the balconies were lifted out of the lorries and easily installed directly on to the building, reducing both time and effort on site.

The Glide-On™ cassettes manufactured for the Acton Gardens project had various benefits for the contractors, Countryside Properties. They helped reduce time on site, as the balconies were delivered fully assembled, cutting down on installation time. The cassettes were produced in a factory environment, ensuring a high level of quality control during the manufacturing and assembling process. The off-site manufacturing of the balconies also helped to reduce costs while increasing the quality of the balconies. Additionally, this method of balcony installation also reduced the duration of scaffolding on-site, resulting in a direct cost saving to the contractor.

The easy installation process of the cassettes eliminated the need for workers on-site, reducing the risks involved while working at height. The fully assembled cassettes were delivered to the site just before the installation, minimising the need for on-site storage.

The use of MMC at Acton Gardens in West London helped bring the designers' vision to life without compromising on the quality or efficiency of the balconies installed. ■

## Key Stats

Architect: **A&Q Partnership**  
 Contractor: **Countryside Properties**

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Balconies: **87 Cassettes®**  
 Storeys: **9**  
 Location: **Acton, London**





# Ask The Expert

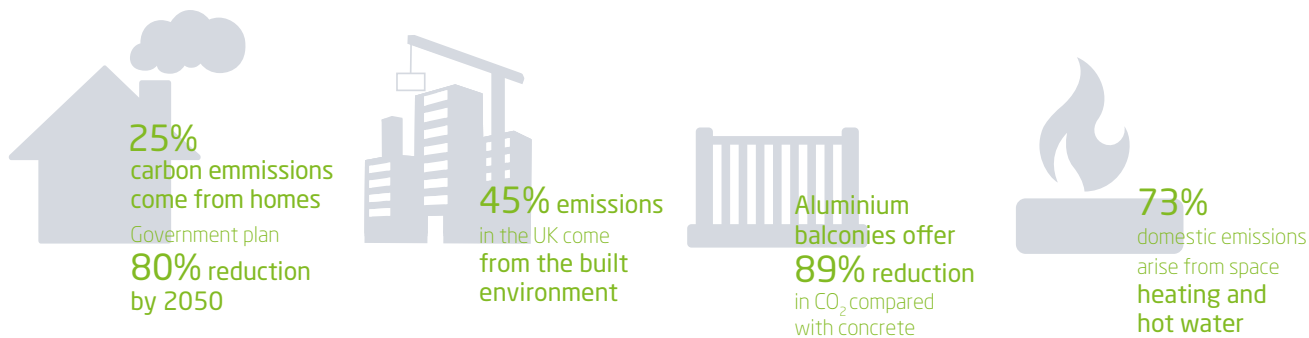
Sustainability and climate change continue to be key topics within the construction industry globally. The UK Government has set out to achieve an 80% reduction in greenhouse emissions by 2050. It is estimated that 25% of carbon emissions come from homes and a further 17% from non-domestic buildings, so the government have set out to improve energy efficiency in every household.

Nick Haughton discusses how the construction industry can meet this challenge head-on.



**Nick Haughton**

Nick is Sapphire's resident balcony expert travelling around the UK and abroad to deliver CPDs to construction professionals. His extensive research into sustainability in construction allows him to aid specifiers in reducing carbon emissions while ensuring the compliance of their balconies.



## Q: What are the main sources of carbon emissions in residential construction?

**A:** The main source of carbon emissions depends on whether you're looking at the project during construction or after occupancy. During construction the main source of carbon is in the embodied carbon which includes the materials used as well as shipping and hidden the carbon emissions in things like staff travel to site.

However, carbon emissions during occupancy make up the majority of a building's emissions. This is due to heat loss primarily through penetrations in the façade. The only way to reduce this is to limit the number of penetrations at the design and construction stages. One way to do that is to specify lightweight aluminium balconies which require fewer penetrations than traditional methods.

## Q: What practical steps can the industry take to reduce carbon emissions?

**A:** The best and simplest way the industry can reduce carbon emissions is by limiting the number of penetrations in the façade. By doing this not only is occupational heat loss significantly reduced, but the amount of material used per balcony is also kept to a minimum. The more anchors that are designed out of a building's façade the less steel is used which reduces carbon produced during manufacturing and shipping.

Designing out complexity within the façade not only makes works on site easier but also cuts down on waste and associated carbon. Opting for lightweight balconies means fewer penetrations and less complexity in the façade and less stress in the concrete slab.

## Q: What role do the supply chain play in supporting developers meet their sustainability aims?

**A:** The supply chain should focus on how they can reduce carbon from their products and operations. This way they can bring the most value to their clients and only they can act to limit their carbon emissions.

There is often a disconnect between the sustainability champions within a company and the buyers. Sustainability champions often prioritise solutions which reduce embodied carbon as this is a more holistic approach with a larger impact on tackling climate change. However, buyers often look for products manufactured with recycled material which, while helpful, has a limited impact on the wider aim.

The supply chain should work to reduce their carbon emissions and educate buyers on why this is the best approach.

## Q: What role do carbon credits play in meeting this challenge? Can we simply offset carbon emissions with credits?

**A:** Carbon credits have a role to play in construction but reducing the carbon emissions should be the priority. Planting trees faster than they're being destroyed doesn't mean you have a better forest, it is key to address the root problem and then offset.

There are many needs at play in a building, from fire safety to resident wellbeing, which means there will always be some embodied carbon involved in construction. Once the embodied carbon is kept to a minimum any remaining can be offset with credits. Credits should not be seen as a shortcut to carbon neutral.

## Q: How can we approach this challenge in the future to reduce emissions long term?

**A:** A key way to approach this challenge is to make early engagement with the supply chain a part of any building design as a facilitator for the aims discussed above. This way architects and developers can benefit from the insights of product experts and work together to avoid waste and errors in the design and reduce complexity.

The industry should also make use of the digital tools available to predict the environmental impact of a building at the design stage. For example, at Sapphire we have software which enables us to predict the heat loss per year of a balcony design, allowing clients to adjust designs as needed with this insight.

Learn more here [www.sapphire.eu.com/sustainability](http://www.sapphire.eu.com/sustainability)



# A Challenging Site is No Match for Glide-On™ at GMV6

The Greenwich Millennium Village Phase 6 is a venture by Bennett Construction Limited designed by Jestico Whiles & Associates. Sapphire was invited to design, manufacture and supply the balconies for the sixth phase of the development. This particular project was a little tricky as there were various challenges arising due to limited space on site. Our team at Sapphire had to work around obstacles on site in order to install the 84 Glide-On™ balconies for this project.

Our Glide-On™ balconies are manufactured and pre-assembled in a factory and require minimal onsite finishing, essential when working with limited space and tricky access for the installation.

Since our balconies are pre-assembled and delivered ready for installation, they reduce the amount of work and time onsite and require minimal space for the installation process. The factory-controlled environment that they are manufactured and assembled in ensures premium quality. The aluminium cassettes are lightweight compared with steel and reduce the number of façade penetrations required to fix them on the building. The balconies were designed with obscured Crystal® laminate glass balustrades providing residents with greater privacy and shading in the warmer months.

The primary challenge for the site team was navigating through tricky access conditions for the installation

of the balconies. Some of the balconies had to be installed around a bike shelter, leaving very little room of only about 4 inches clear for carrying out the installation process. We brought in specialist lifting vehicles to assist and ensure the smooth fixing of the cassettes onsite.

Installation of the balconies had to be put on hold due to the space constraints onsite as there was other work going on that could not be interrupted. The last few cassettes had to be sent in a lorry with a hiab crane so that they could be installed on time without obstructing other activities.

The final result was elegant and easily installed Sapphire balconies to the stunning Greenwich Millennium Village – Phase 6. The balconies were fitted securely, and the design adds to the experience of the residents. The glass façade of the balcony gives an elegant and modern look to the whole project.



Greenwich Millennium Village is the first of the government's Millennium Communities. This initiative set out to construct seven new 'villages', which are intended as models for 21st-century community living. Greenwich Millennium Village, which is located at the southern end of the formerly industrial 300-acre Greenwich Peninsula, is also part of the extensive Thames Gateway regeneration project. Currently, it is considered to be one of the largest regeneration projects of its kind in London.

Sustainability and inclusivity are at the heart of the project, creating eco-friendly homes for the existing and growing community in Greenwich. The developers and architects combined innovative design, construction and planning to create a variety of housing types and tenures alongside excellent amenities and green spaces. This gives a vibrant, mixed community everything they need to thrive, from schools and play areas to an IMAX cinema, all within walking distance. ■

## Key Stats

Architect: **Jestico Whiles & Associates**  
Contractor: **Bennett Construction Limited**

Balconies: **84 Cassettes®**  
Storeys: **6**  
Location: **Greenwich, London**





# Tackling Industry Challenges in Q1

Kick-starting 2021 we led two Resibuild events to tackle the most common problems facing construction sites and the professionals which design them across the UK. In February we looked at the ways we can unlock the industry's efficiency through the use of digital tools and other modern methods. In March we tackled the communication and information gap between design and build.

Unlock the recordings of all past events and sign up to attend those upcoming for free at [www.resi.build](http://www.resi.build).

## Unlocking Construction's Efficiency - 3rd February

We have seen the digitalisation of so many working practices though out the industry, particularly in 2020. At this virtual focus group, we spoke to industry professionals on how construction can be more efficient in the future through the use of digital tools.

We were joined by keynote speakers from Lendlease, Hill Group, NBS, and BD Solutions.

The panel tackled questions around the role of standardisation in improved efficiency, transparency for managers over processes and procedures and the role of the supply chain in cost reduction through BIM. We discussed how stakeholders can select and implement the best system for their needs and how to achieve consistency in data. We also looked to the future to get the panel's insight on the impact of Brexit, what new tools to expect

and how everyone from design to build can make the most of them.

Access the recording **on demand**.



## Bridging the Gap Between Design and Build - 10th March

There's often a gap between those designing a building and those building it, often due to a lack of clear communication and traceability. Collaboration with the supply chain is just one way of bridging this gap, but what stands in the way?

At this event we tried to address some of the key issues that occur because of this void and understand how the industry can overcome them with presentations from some of the leading voices in the built environment.

We were joined by keynote speakers from Willmott Dixon, FP McCann, C3 Alliance, Cooleys and Three Kit.

During the Q&A session the speakers addressed striking the balance between bridging the gap and limiting design options, when to begin collaboration, and the current roadblocks to success. Matthew from Willmott Dixon discussed 3D printing and automation and the potential limitations when working collaboratively at pre-design. Katy from Three Kit answered questions on the role of configurators and digital tools. We also looked at ways to reduce risk, cultural change, the role of the government and how collaboration may effect programme speed.

Access the recording **on demand**.



Join us at an upcoming livestream event

How Might Fire Safety Change Construction in the Next Few Years?

14th April

Construction's Carbon Dilemma: Why, When & How?

26th May







## “There is no Standard but the Steel Build Standard”

Design, fabrication and installation of:

**Structural steelwork**  
**Architectural metalwork**  
**Glazed balustrades**  
**Balconies**

I found Steel Build one of the most helpful and knowledgeable contractors on site.

The supervisors were courteous and felt as part of the team. When the programme had to be hit they pulled out all the stops. I would not hesitate to use the company again.

Job: ALTO  
John Connell  
Wates

All of the Steel Build team have been very professional.

Any issues have been dealt with, no problems and straight away.

I will look forward to working with Steel Build on future projects. One of the most professional contractors I have ever worked with.

Job: Carnarvan Road  
Stuart Bennett  
Hollybrook

What you hope for with a specialist sub-contractor is that they take ownership of their element of your works and complete them without any negative effect on the rest of your package.

I experienced a willingness to be part of the larger site team, which enabled us to provide a seamless installation to our client.

Job: Wates NW06  
Steve Harris  
OCL Facades



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# Industry Reacts to Government's Combustible Cladding Fund

In February, the UK Government announced an additional £3.5bn to be added to the existing £1.6bn fund for the removal and replacement of combustible cladding on buildings over 18 metres in England.

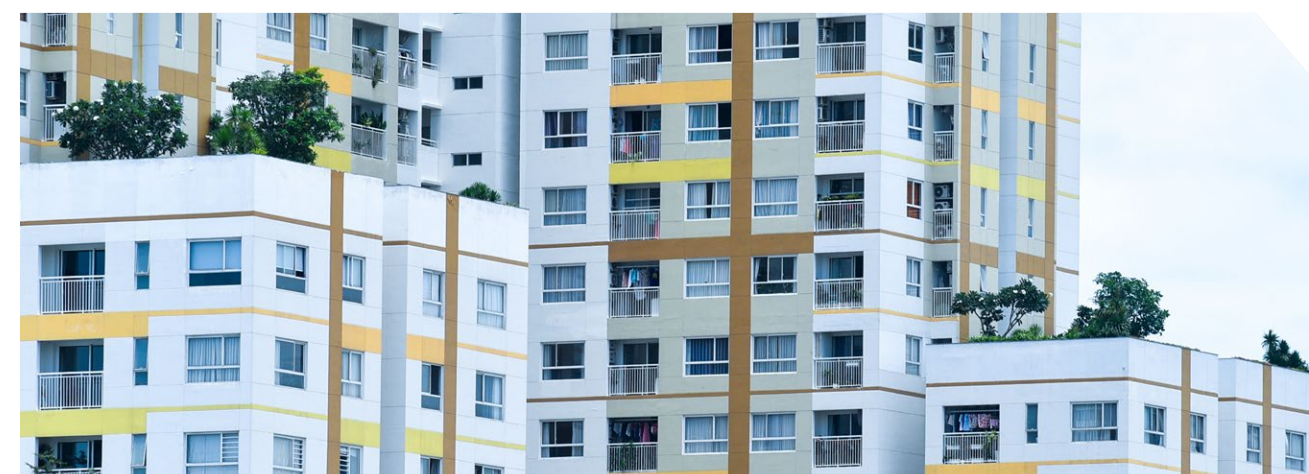
Minister Jenrick announced a multi-pronged approach to ensuring the cladding is removed while ensuring leaseholders face no, or low costs. The primary focus is around high-rise buildings which pose the greatest risk in the event of a fire. Jenrick declared an additional £3.5bn to be added to the existing fund to cover the replacement of all ACM cladding over 18 metres, to be used when the building owner or developer no longer exists or has failed to carry out the work. The Minister for Housing stated that they aim to take the pressure off leaseholders and prevent costs being passed from building owners to residents.

For lower and medium rise buildings the Minister advised that the risk in the event of a fire is “significantly lower” and the need for remediation is often not needed. In the case that replacement is required, Jenrick announced a fund for low interest loans to continue for “many years” to reduce the financial strain.

To cover the cost of the fund, totalling over £5bn, Jenrick announced plans to implement a new levy and tax on the construction industry to encourage developers to take “collective responsibility”. The new tax set to come into effect in 2022 is intended to work on a sliding scale to ensure those with the highest profits pay the most into the fund.

Some in the industry have criticised the levy for penalising developers across the board including those unrelated to the cladding scandal and have raised concerns that it could hinder new schemes and raise property prices. Others, like Barratt for example, welcomed the new levy if it eased the pressure on homeowners while ensuring the rates are fair for developers.

Former RIBA president Jane Duncan said, “fire does not discriminate by height”, critiquing the limited scope of the fund. Andrew Mellor, partner at PRP said the fund would “go a long way” but raised concerns over a lack of clarity as to what the fund would cover, such as external features like balconies.



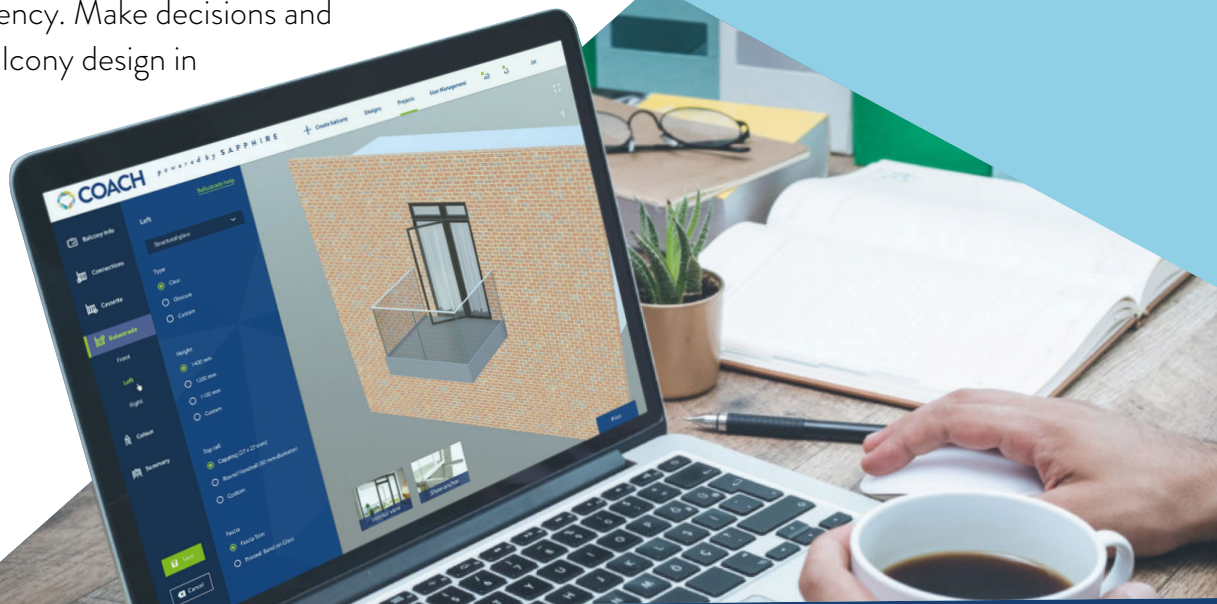


## *Balcony design, specification and pricing made easy.*

COACH is a free online software suite which enables you to design and specify your balconies in minutes.

COACH intuitively guides you through the progress, so that within minutes you can create your balcony specification. Computerised pricing shows the cost of your design, adjusting as you go and giving pricing transparency. Make decisions and value engineer your balcony design in minutes, not weeks.

This is perfect for designers, engineers, developers and consultants.



## THE FUTURE OF BALCONY DESIGN

FASTER • SIMPLER • SMOOTHER

- ✓ Computerised pricing
- ✓ Tender submissions for your balcony design
- ✓ Automatic structural calculations
- ✓ NBS Specification
- ✓ QA for every balcony
- ✓ Automated production drawings
- ✓ Guidance & Considerations
- ✓ Computer created BIM/CAD files
- ✓ Value engineering analysis
- ✓ Standard design library for customers



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