

# The Design Museum advocates for low-carbon construction with the Stone Demonstrator public installation at Earls Court



The Stone Demonstrator, photo credit Bas Princen, courtesy of the Design Museum and Future Observatory

## **The Stone Demonstrator**

Opening November 2025 | Empress Space, Earls Court, SW6 1TT

PRESS IMAGES AVAILABLE [HERE](#)

Today, Future Observatory – the Design Museum’s national research programme for the Green Transition – unveils the Stone Demonstrator, a boundary-pushing prototype at Empress Place, located on the Earls Court Development site. This public installation puts the use of pre-tensioned stone structures to the test, calling for more sustainable materials and building practices in the construction industry.

The open-air Stone Demonstrator stands at three storeys tall, measuring 6.5m x 6.5m, with the ground floor and adjoining park open to the public. It has been designed by architecture practice Groupwork with engineers Webb Yates and Arup. The Stone Demonstrator, funded by Future

Observatory and the UKRI Arts and Humanities Research Council (AHRC), acts as both a 1:1 scale research tool and a call for the construction industry to hasten its efforts to transition to low-carbon materials.

Nearly 40% of global carbon emissions are created by the built environment, with 11% coming from the construction of new buildings (1). Natural stone is an extremely low-carbon material. The Stone Demonstrator is a prototype of an alternative way to build that reduces carbon emissions by approximately 70% compared to a reinforced concrete frame, and 90% compared to a steel frame.

With the government aiming to build 1.5 million homes, the construction sector urgently needs to explore low-carbon alternatives to steel and concrete. Apart from drastically lower carbon emissions, one of the advantages of the pre-tensioned stone frame is that it is prefabricated, requiring less construction time on site than traditional methods. The modular elements of the structure can also be dismantled and reused.

The Stone Demonstrator consists of stone blocks that are connected by steel tendons and compressed to create pre-tensioned beams and columns. The floorplates are a mix of pre-tensioned stone slabs, combined with timber joists and a roof of dowel-laminated timber (DLT). The structure has a self-supporting facade of stone bricks, which are at least 90% lower in carbon emissions than London's vernacular of fired clay bricks.

The equivalent structure using a steel frame with a clay brick facade would emit around 40,000kg of carbon dioxide, while a frame made of reinforced concrete with a brick facade would emit 32,000 kg of CO<sub>2</sub>. By comparison the Stone Demonstrator, produces only 3,000kg of CO<sub>2</sub> – around 92% lower than the steel or concrete (2).

Alongside the Stone Demonstrator prototype, Future Observatory has also funded engineers at University College London to develop a guide to designing stone structures. The design guide, led by Professor Wendel Sebastian at UCL, offers an invaluable tool for the construction industry to make stone structures easier to adopt, and is a key step towards a building code for stone.

The Stone Demonstrator is located at Empress Space within the Earls Court development site. Central London's largest cleared development opportunity, the 40-acre Earls Court site will be transformed over the next 20 years into a neighbourhood of 4,000 homes, 2.5 million square feet of workspace, 12,000 jobs and cultural venues set within 20 acres of green and open space. With its close proximity to the Design Museum, the development site is an opportune location to engage the construction sector in the carbon-reducing potential of stone structures.

For the last four years Future Observatory, in partnership with the UKRI Arts and Humanities Research Council (AHRC), has funded more than 100 research projects pursuing more sustainable design. Future Observatory has showcased this research through several free displays in the museum, as well as the major landmark exhibition More than Human, which opened on 11 July 2025, aiming to set a new direction for design based on humanity's collaboration with the living world.

**Justin McGuirk, Director of Future Observatory says:** *“Future Observatory is committed to supporting research into low-carbon construction methods, and the Stone Demonstrator is an ambitious contribution to the field. It’s a building as a research tool, a 1:1 scale demonstrator of an ultra low-carbon structure for the sector to study. And the accompanying design guide being produced by UCL is another key step in the adoption of structural stone.”*

**Amin Taha, Founder and Chairman of GROUPWORK, says:**

*“Intended to demonstrate a viable alternative to every day building methods but at a fraction of the embodied carbon, this structure brings together almost two decades of prototyping and testing by Webb Yates, The Stonemasonry Company, Ateliers Romeo and Arup. Its purpose is not to promote stone for sentimental reasons but as an ultra-low-carbon alternative to reinforced concrete and steel structures clad in fired clay bricks. At 90 per cent less embodied carbon as concrete and steel frames and fired clay bricks, it’s the ethical choice.”*

**Steve Webb, Board Director of Webb Yates, says:**

*“Corporations behind fossil fuel era materials such as steel and concrete do not want their investments to become obsolete, so they often promote the idea that these materials will one day be produced using green*

*electricity and hydrogen. In order to address the sustainability challenges that face us we need to reduce the growth in the amount of energy we use – simply swapping oil for hydrogen does not improve energy frugality. The stone in this frame is produced with a fraction of the energy required to produce the alternative materials. Adopting stone as a staple building material would close coal mines and not require their replacement with green alternatives.”*

**Peter Runacres, Head of Urban Futures at Earls Court Development Company, says:** *“At the Earls Court Development Company, sustainability is a cornerstone of our vision. We’re proud to host the Stone Demonstrator – a striking prototype that embodies our commitment to sustainable urban development and sparks public dialogue about the future of building responsibly”*

**Professor Christopher Smith, Executive Chair of the UKRI Arts and Humanities Research Council says:** *“Through the Future Observatory, AHRC and the Design Museum are supporting innovative design research, imagining and bringing closer to a reality in which across the UK we can have homes that are affordable, comfortable and environmentally sustainable. We are quite literally building the future.”*

**-Ends-**

## **NOTES TO EDITORS**

This type of structural frame has been designed by Webb Yates and Arup for buildings up to 80 storeys tall in seismic areas of the Mediterranean, 30 storeys tall at Canary Wharf, London and 35 storeys tall for a residential building in Bristol. Size of columns will vary according to height and load with The Demonstrator sized for either office or residential uses at up to 10 storeys.

The stone brick facades are self-supporting and at standard brick dimensions can stand 6 storeys without loading the structural frame, only needing to be brick-tied to wind-posts set within the frame and therefore lightening the superstructure, its material and cost by 30%. Under BSR and current fire regulations timber wind posts and superstructure (CLT, DLT, Glulam) are permissible up to 11m (highest inhabited floor), taller buildings removing timber from the façade line and reverting to Metsec or similar

wind-posts or swapping for a stone structural frame for building heights taller than 36m (12 floors).

### **Data Referenced**

- (1) World Green Building Council: <https://worldgbc.org/climate-action/embodied-carbon/>
- (2) University of Bath and British Services Research Institute (BSRI)  
Inventory of Carbon and Energy (ICE) and OneClick LCA

### **List of participants**

**Client:** Future Observatory at the Design Museum

**Site partner:** The Earls Court Development Company

**Funder:** The UKRI Arts and Humanities Research Council

**Architect:** Groupwork

**Engineers:** Webb Yates and Arup

**Principal contractor:** Ernest Park

**Stone Structure:** The Stonemasonry Company

**Hybrid stone and timber floorplate:** Bamberger Natursteinwerk Hermann Graser

**Dowel-laminated timber floorplate:** IQ Wood

**Structural Stone Suppliers:** Brachot, Carrière de Luget, Franken-Schotter, Lundhs, SigmaRoc

**Stone brick facade:** Hutton Stone and Albion Stone

**Stone installation:** Ryker Structures

**Facade Timber Supports:** Rossmore Contracts

**Stone brick garden wall and seating:** Germans Balague with Bricklink and Brickability

**Brick layers:** Bishop Facades

**Landscaping:** Lyndon Osborn & Team

**Lighting:** iGuzzini, Atrium and Pritchard Themis

**Electrical installation:** Switch Technologies

### **Press Enquiries**

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## **About the Design Museum**

The Design Museum is a multifaceted museum, an ever-changing space for the public, industry and education to come together and explore new ideas. A registered charity, the museum's innovative exhibitions, partnerships, research and learning programmes evidence how design can enable this planet and its inhabitants to thrive. Our landmark building in Kensington is the centre of our national network and a global hub for the transformative potential of design.

[Home - Design Museum](#)



## **About Future Observatory**

Future Observatory is the Design Museum's national research programme for the green transition. The programme is coordinated by the Design Museum in partnership with the UKRI Arts & Humanities Research Council (AHRC). Future Observatory curates exhibitions, programmes events and funds and publishes new research, all with the aim of championing new design thinking on environmental issues. In 2022, AHRC and the Design Museum launched a £40m fund bringing UK design researchers, universities and businesses together to catalyse the transition to net zero and a green economy. It has already awarded over 100 higher education institutions and 75 industry and local authority partners across the nation, making it the largest publicly funded design research and innovation (R&I) programme in the UK.

[Future Observatory](#)



## **About Arts and Humanities Research Council**

The UKRI Arts and Humanities Research Council (AHRC) funds internationally outstanding independent researchers across the whole range of the arts and humanities: history, archaeology, digital content, philosophy, languages and literature, design, heritage, area studies, the creative and performing arts, and much more. The quality and range of research

supported by the UKRI Arts and Humanities Research Council works for the good of UK society and culture and contributes both to UK economic success and to the culture and welfare of societies across the globe.

[ahrc.ukri.org](http://ahrc.ukri.org)



### **About Groupwork**

GROUPWORK are an employee ownership trust bringing together architects, designers, and at times engineers, landscape architects, and specialist contractors. Together they integrate a poetic sensibility with rigorous research into the application of low-carbon, cost-efficient materials across architectural and infrastructural projects, that have gone on to be shortlisted for the RIBA Stirling and EU Mies prizes.

## **GROUPWORK**

### **About Webb Yates**

Webb Yates is an award-winning engineering design practice working across structural, civil, and building services disciplines, with studios in London and Birmingham. We offer a collaborative, enthusiastic, and responsive service with an efficient, innovative, and creative design approach. Sustainability sits at the heart of everything we do, along with a genuine enjoyment of the creative design process. Our open, unrestrictive way of working and the wide-ranging interests of our team have shaped our multidisciplinary offering.

**WEBB  
YATES**

### **About Stonemasonry Company Ltd.**

The SMC is a manufacturer dedicated to decarbonising the built environment using prefabricated elements using dimensional stone. Partnering with engineers and architects worldwide, the company develops elegant and resilient structures using the latest in reinforcement and tensioning of stone. Originally specializing in the design and construction of one-off stone staircases, the business has transformed itself as an innovative

manufacturer of a new ecosystem called “Augmented Stone”. Using discarded, low carbon limestone, granite or sandstone, the Stonemasonry Company Ltd. select, cut, tension, supply prefabricated structural components including beams, columns and floor plates as an alternative to concrete elements.



### **About The Earls Court Development Company**

The Earls Court Development Company (ECDC) is transforming the 40-acre former Earls Court Exhibition Centre site. In September 2024, hybrid planning applications were submitted to the London Borough of Hammersmith & Fulham and the Royal Borough of Kensington & Chelsea following four years of community engagement. The masterplan will deliver c.4,000 homes, 12,000 jobs, a hub for climate innovation, three cultural venues, retail and leisure set within 20 acres of green, open space and public realm. Construction is planned to begin in 2026, stewarding the neighbourhood into a vibrant, inclusive, and future-focused part of London, with ambitions to be a global exemplar of sustainability.

**The  
Earls Court  
Development  
Company**