

# UCL EAST

## Marshgate



**T E C H R E T E**

ARCHITECTURAL PRECAST CONCRETE SPECIALISTS

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# INTRODUCTION

## AN INTRODUCTION TO UCL MARSHGATE

Along with Pool Street West, Marshgate is part of the expansion of UCL East, a new world-class University College London campus located at Queen Elizabeth Olympic Park. Marshgate will be mostly an academic centre, but will also include retail, community and engagement uses. Marshgate is one of six recent Techrete projects at Queen Elizabeth Olympic Park and we are proud to play such an integral part in the historic and important development of the area.

Our facility in Dublin produced the early samples for the three 'neighbourhoods' as well as prototypes and sample panels, while the main panel production and window fitting took place at our Brigg facility.

The installation of the 795 immense panels took just 9 months and completed in September 2021.

CLIENT : University College London  
CONCEPT ARCHITECTS : Sheppard Robson  
PROJECT ARCHITECTS : Stanton Williams  
MAIN CONTRACTOR : Mace  
PRECAST FACADE : Techrete





# ARCHITECT'S VISION & BRIEF

Designed by

Stanton Williams  
&  
Sheppard Robson

## A 'FABRIC FIRST' APPROACH

'The external appearance of the building is influenced by the desire to maximise daylighting to the building interior, whilst at the same time shielding the glazing from solar radiation. This fabric first approach aims to limit energy use which contributes to producing a building which is less harmful to the environment.

The approach the design team have adopted, in line with the conceptual approach to produce a carved sculpted volume, is to erode the outer surface and cut into the volume to produce a series of vertical fins or blades, orientated to shield the interior from the sun.

This approach visually maintains a single architectural form and allows full height glazing to be located at the back of the vertical blades, to express the depth of the façade and an expression of weight and solidity.

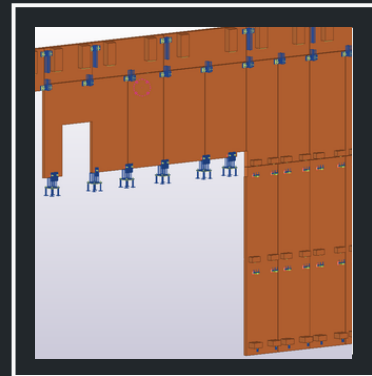
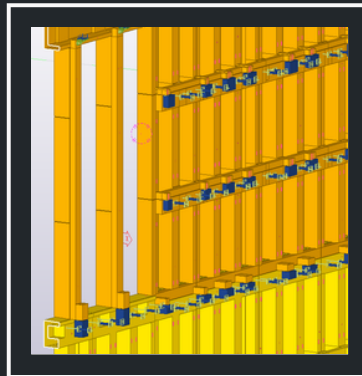
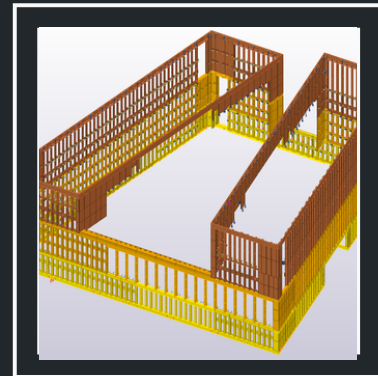
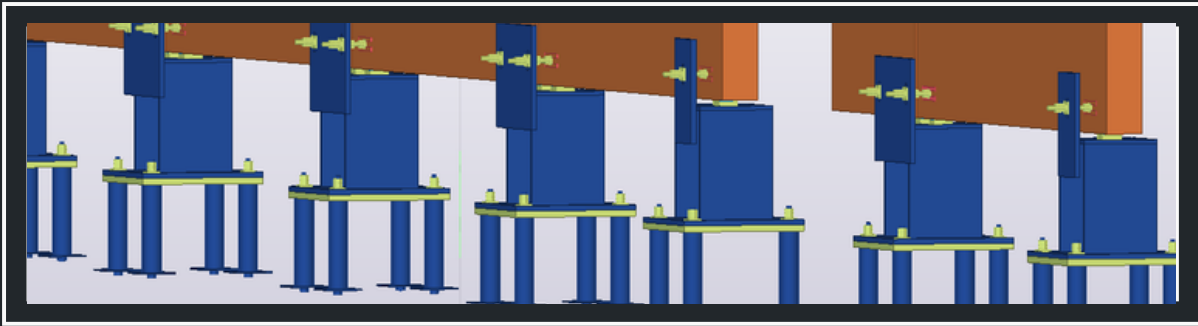
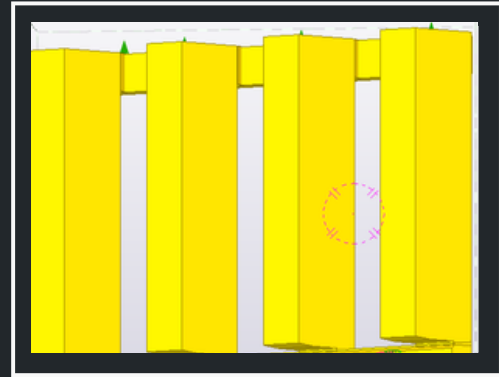
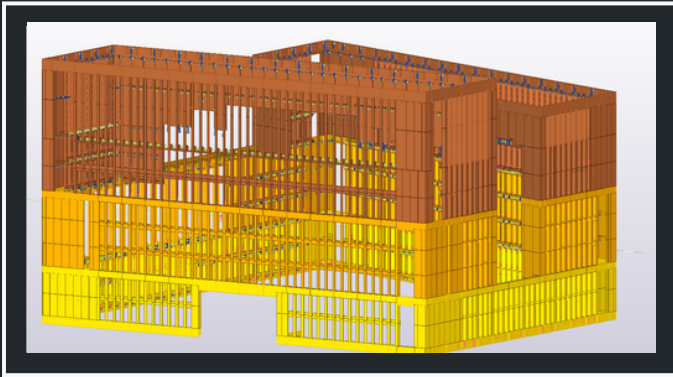
Horizontal layering is expressed at the base of each vertical neighbourhood, whilst intermediate floors are suppressed with recessed glazed spandrel panels, aligned to the glazing above and below. The materials selected are a collection of concrete specifications; a rough textured precast finish to the upper parts and pigmented layered in situ concrete at the base.'

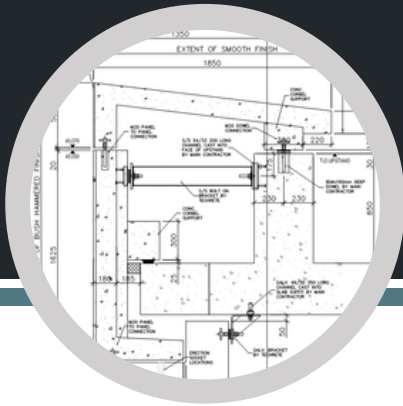
*Sheppard Robson*



# MARSHGATE 3D DESIGN

Techrete designers modelled a digital twin using real world data, identifying and solving issues before they occur, preventing downtime and creating new opportunities.





# ENGINEERING

## A FACADE WITH MULTIPLE VARIATIONS IN TEXTURE & COLOUR

Construction methodology was considered throughout the design in terms of access to pain points on the primary structure and the sequence of panel installation, especially on skewed elevations.

From the start, it was clear that in order to achieve the architectural intent, this project would present some technical challenges. The 650mm thick facade panels incorporate a rainwater drainage system, gutters and slots. The design of the facade took into consideration the interface with the follow-on trades, for example curtain walling, M&E and the glass reinforced concrete. Due to panel geometry and weights, craneage and panel transportation was considered early on. The heights of the punched window panels were designed to suit Techrete's low-load trailers.

The complex geometry comprises very heavy, thick, flat and skewed unitized window panels, each weighing up to 16 tonnes. The corner panels are solid, double storey wall panels measuring up to 17 feet in height. The mullion panels, up to three storeys high, taper in size from 400mm thick to 300mm to the top, with 25mm splays to the sides. Overall, the facade gives the impression of tapered mullions with variations in texture and colour. Spandrels are located at levels 2,4,7 and at the roof. In order to make the joints less visible they were positioned on the sides of the skewed panels, and high level panels were designed with open joints to accommodate high sway movements of the steel frame. Panel layouts were rationalized to generate as much efficiency as possible for manufacturing.

External panels were bush hammered using special rubber moulds for a textured finish from 30mm deep at the lower levels to 10mm deep at the higher levels. Drip groove-to-soffit returns were utilized for two-stage casting. An acid etched finish completed the panel returns and courtyard elevations. External corners have 'birdsmouth' details for multi-stage castings.



# MARSHGATE'S BARBICAN INSPIRATION

## The Barbican - A Picked Finish

Built between 1965 and 1982, the Barbican is one of the best examples of Brutalist architecture in London. The concrete finish was achieved by pick hammering onsite to expose the aggregate.

The concrete was allowed to dry out for 21 days, before the surface was tooled with handheld pick hammers, or wider bush hammers to expose the coarse aggregate.

The average depth of the Barbican finish is 15mm.

The Marshgate development is divided into 3 neighbourhoods and the final finish chosen by our client, UCL was as follows :

Neighbourhood 1 : 30mm depth  
C401PT800 mix

Neighbourhood 2 : 20mm depth  
C401 PT 400 mix

Neighbourhood 3 : 10mm depth  
C401 mix





# PANEL MAKING PROCESS



Aggregate is hand-levelled



Aggregate is in place



Steel cage is placed in the mould as re-inforcement



Reinforcement is placed for a two-stage cast



Casting of a unit with re-bar in place



Concrete is poured



Hand mixing of the rubber



Rubber is poured for the bush-hammered finish



Concrete is poured and trowled by hand



# FIRST PANELS ARE CAST



Panel being lifted out of the mould



Panel being lifted out of the mould



Panel being turned on a steel turning rig



Panel being lowered into position



Panel with lower band design feature



Lifting sockets with slots for temporary drainage



Panels ready for transportation to the yard



Panels ready for transportation to the yard



Panel being transported out to the storage yard



# COMPLETED PANELS





# WINDOW FITTING AT OUR FACILITY IN BRIGG

The Spider Mewp manoeuvres glass into position using suction pads. Pre-installed windows reduce programme time and on-site labour.





# INSTALLATION

The installation of Techrete precast panels and associated works was carried out by fully trained and competent operatives using certified equipment for each task at hand. Drafting and implementation of Techrete risk assessments and method statements were carried out with full communication with Mace, which took into consideration the ever changing aspects of the live site and the various restrictions and new protocols as a result of the Covid-19 pandemic.

With many panels weighing in at up to 19 tonnes each, extra heavy duty chains and lifts were utilized. Turning rigs and turning shoes were used for the double and triple storey units which stabilized the longer units at the base and prevented rotation. The level three units presented some logistical challenges in how they were aligned above and beneath adjacent elements. Their geometry and delivery constraints due to size and weight were a challenge relative to delivery orientation, offloading & pitching. Much time and planning of the sequencing of these panels overcame the challenges. Two erecting teams installed an average of 5 immense precast panels per day.

The panels were factory fitted with Rockwool RW3 and site fitted with Rockwool Duo Slab insulation. CW-FS 120 side-rise fire barrier was installed in tandem with the panels. Installation of Techrete's 795 panels began in January 2021. Covering 16,360m<sup>2</sup> of the structure's façade, our wall panels, mullions and window panels were all in place by September 2021.





# INSTALLATION

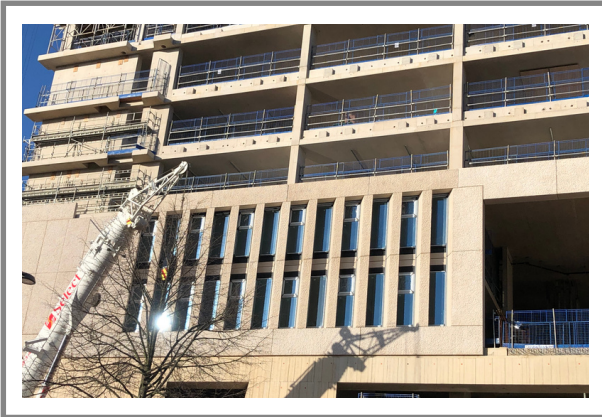
Panels arrive on Techrete's A-Frame trailers and works begin on the first floors.





# INSTALLATION

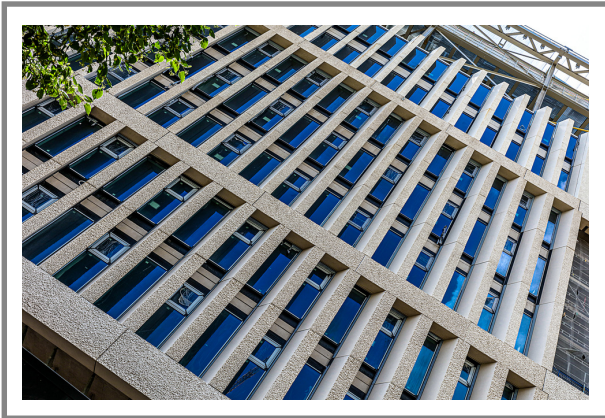
First floor installation with two storey high panels is almost complete.





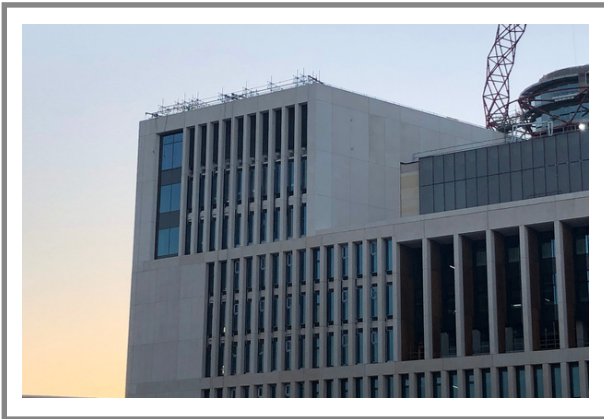
# INSTALLATION

The precast concrete facade up to level 7 has been installed.





# COMPLETED PROJECT





# COMPLETED PROJECT





# COMPLETED PROJECT





# COMPLETED PROJECT



# OUR ROUTE TO *NET ZERO* CARBON EMISSIONS



**20% LESS  
CARBON INTENSIVE  
THAN CURRENT  
STANDARD**



- ✓ *Environmental Product Declaration*
- ✓ *Independently verified*



**ELIMINATE  
EMISSIONS FROM  
OPERATIONS BY  
2022**



- ✓ *Renewable energy generation*
- ✓ *Energy sources with net zero emissions only*
- ✓ *Low carbon machinery*
- ✓ *Off-set the portion that cannot be otherwise eliminated*



**50% CARBON  
EMISSION  
REDUCTION BY  
2025**



- ✓ *Use less materials – thinner, more efficient sections*
- ✓ *Use materials with a lower carbon content*
- ✓ *Off-set the portion that cannot be otherwise eliminated*



**NET ZERO  
CARBON  
EMISSIONS BY  
2030**



- ✓ *Develop novel, low carbon concretes*
- ✓ *Off-set the portion that cannot be otherwise eliminated*



ISO 50001 : 2018



ISO 14001 : 2015



ISO 9001 : 2015



ISO 45001 : 2018



IS EN 206 : 2013



EPD Verified



Health & Safety



Building Regulations



Rating -  
Excellent



AEO Authorised  
in UK



AEO Authorised  
in Ireland



Advanced  
Member



2020 Green Awards -  
Medium Company  
of the Year



2018 Green Awards -  
Manufacturer  
of the year



2015 Green Awards -  
Medium Company  
of the Year



Rospa President's 21,  
Gold - '20, '19, '18,  
'17, '16, '15, '14, '13, '12



TECHRETE

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