

Sheldon Square Amphitheatre Redevelopment

London, W2 6HY



Main Contractor:	8build Ltd
Specialist Sub-Contractor:	Byrne Bros. (Formwork) Ltd
Landscape Architect:	Gillespies
Engineer:	Davies Maguire

Located in London's Paddington Central, the amphitheatre in Sheldon Square has long provided a communal space for work teams, families and friends to meet and relax. Following a public consultation in 2020, British Land engaged the services of Landscape Architects Gillespies to design an updated scheme which would provide improved accessibility and inclusivity, a dynamic and more exciting performance space and an increased area of seating for visitors.

Cordek were requested to design and supply a formwork system that would aid the construction of a new and improved arrangement of tiered reinforced concrete seating within the amphitheatre.

Project scope

Gillespies proposed an exciting new design with visual references to the previous structure but featuring a more dynamic layout and a central water feature providing a focal point.

Demolition of the existing scheme began in March 2021, with hoarding set up around the site perimeter to allow continued access to the surrounding businesses. The issue of site access would be a key defining aspect of the proposed solution for the new seating with a like-for-like precast solution ruled out because the weight of the units would require crane access.

The solution

The pre-construction team at Byrne Bros approached Cordek to design a system of moulds that could be used to cast the bench units in-situ.

The design underwent several revisions and Byrne Bros cast a number of sample units off site using Cordek formers to test jointing techniques and allow the Architects to define the finish of the concrete. This was finally agreed to be a jet-washed finish, exposing some of the aggregate within the 100% GGBS/PFA environmentally friendly concrete mix.

It would not be possible to cast the complex shapes required using traditional on-site timber formwork so a system of lightweight double curving Filcor 45 moulds were designed that could be used to cast the complex geometry required. These would be supported on site by straight sections of traditional formwork.

In addition to this, around 400m3 of Filcor 20 void former would be required to make up the difference in ground levels between the old to new scheme. This was supplied in sheets and profiled to suit the foundations on site using a Cordek hand-held hotwire cutter.

The process

Landscape Architect Gillespies provided Cordek with 3D layouts of the existing structure and the new design intent. The Project Design team used these in conjunction with details provided by the Structural Engineers Davies Maguire to create a unified 3D model of the site. Following approval of the 3D model, individual mould units were designed in sizes that would allow them to be manually placed by hand and propped in position. CAM data was extracted from the master model and 209 individual units were machined using a combination of hotwire CNC cutting and 5-axis routing.

A thin skin of resin and fibreglass was applied to the casting faces of the moulds to provide release from the cured concrete and impart a smooth finish that could achieve level joints to an NSCS Plain finish.

The foundations for the new benches were built up using a combination of reinforced concrete and blockwork to the required level and steel reinforcement was fixed in position. The Cordek moulds were then carefully arranged, and joints between units were sealed with mastic to provide a grout tight joint.

With space at a premium, the site sequence of pouring concrete was optimised for speed with each bench split roughly into thirds. This allowed the site team to simultaneously pour one level whilst fixing steel and supporting formwork at the next level up – effectively allowing them to leapfrog themselves on each subsequent concrete pour and reduce the overall programme.



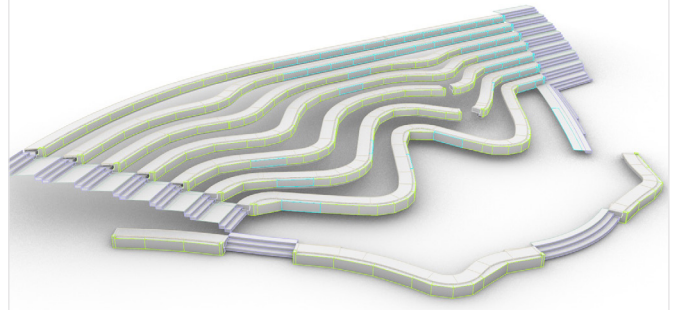
Once the concrete had been poured the top face was float finished by hand to the required level and allowed to cure. The Cordek moulds were then removed and the exposed concrete face jet-washed to expose aggregate to the Architect's specification.



Example of the 'as struck' finish prior to jet-washing

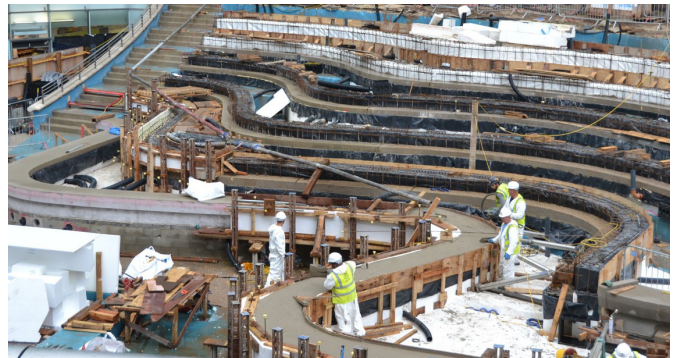
Summary

Cordek designed and supplied 209 bespoke mould units, with 7 deliveries made over an eight week period. This enabled the contractors to adhere to a tight construction programme, intended to minimise disruption to the surrounding businesses.



"To have done this any other way would have been so complicated. These moulds are the way forward."

Albert Neza, Site Construction Manager



The works are due to be completed by March 2023.

Please contact us for more information

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