

# Formwork takes flight

On a residential project in Battersea, London, Cordek embraced the challenge of designing a formwork solution to produce 100 flights of stairs spanning 14 floors in each stair core

## MEMBER PROJECTS

The familiar silhouette of Battersea Power Station on the London skyline has long awaited regeneration and revitalisation. Since its closure as a working power station in 1983, the riverside location has become an ideal setting for both a residential development and new community. Cordek was invited to propose a reusable formwork solution to precast the two spiral staircases within Phase One's residential block, Circus West.

Cordek was tasked with designing a set of forms that would produce 100 flights of stairs spanning 14 floors in each stair core. The design needed to be functional and efficient, with the formwork capable of producing 50 no casts as a minimum requirement, making it essential that the formers be durable and robust.

The architect's design consisted of 30 helical staircases with four variations of riser heights. Cordek provided four glass fibre reinforced plastic (GFRP) moulds so that the stairs could be precast upside down. This allowed for a quick, safe and simple installation of the stairs prior to landings being cast in situ tying the spiralling risers into the core.

The accuracy of the formers was essential to ensure the exacting dimensions of the staircase design was achieved. The fully integrated formwork design included demountable side formers to allow easy striking of the concrete units and multiple reuses.

From the architect's 3D design,





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Cordek's project design team created an inverted 3D model of the staircases orientated to optimise the precasting process. This digital model was programmed into Cordek's five-axis CNC router to manufacture an accurate pattern for the staircase.

### Painting preparation

The pattern, made from an expanded polystyrene core coated in an epoxy tooling paste, was painted in preparation for the manufacture of the GRP mould. The fibreglass mould could then be laminated on to the pattern and reinforced with plywood stiffeners to provide sufficient strength and rigidity to withstand the casting of the 3-tonne concrete units.

The detachable side formers included alignment tabs and bolted connections.

After the moulds had been manufactured, the four patterns were shipped to Byrne Brothers to be used as templates for the fabrication of the reinforcement cages.

Detailed planning and design at the beginning of the process, combined with modern digital methods of manufacture, resulted in a cost-effective formwork solution that achieved the quality and multiple reuses required from this demanding project.