

# Inside the structural challenges of redeveloping Edinburgh's 120 year old King's Theatre

17 DEC, 2024 BY THOMAS JOHNSON

Edinburgh's King's Theatre is undergoing a major redevelopment to turn the historic site into a venue that people visit for more than just the plays and pantomimes, but the teams on the project have had to overcome numerous structural challenges.

Being delivered by Robertson Construction, the redevelopment of the Grade A listed heritage building that was built in 1906 is now over 60% complete.

While work for the redevelopment has been taking place, the structural and civil engineering firm on the project Will Rudd has come across a number of challenges that have delayed the full reopening until spring in 2026.

Will Rudd senior associate and lead engineer on the project Shirley Evatt spoke to *NCE* about how those challenges were being addressed for the project.

The first element of the redevelopment revolved around involved alteration of the fly tower system (rigging system) of the theatre stage, which needed to be raised.

"When people put on performances and the stage scenery gets lifted up and down it wasn't high enough; you could always just see a bit hanging below the top of the stage," Evatt said.

"Part of the project was to raise the stage house behind so that they could introduce a new flying system that would be able to support heavier equipment and scenery but also allow it to be invisible to the to the view in public."

The roof of the existing fly tower had to be raised to allow replacement of the fly system, which would upgrade the loading capacity and improve the operation of the theatre rigging. This required additional height to accommodate the large steel support structure, complex steel grid, ropes and pulleys.

As part of this, Evatt and the team were tasked with designing a new roof structure that was capable of supporting the increased weight of the additional height of the building as well as supporting the new fly system.

"That was quite a complex process for us – to understand the kind of stage engineering element to it – and it's a counterweight system, which is quite involved," Evatt said.

"I'm still not quite sure how we got to the bottom of it. There was a lot of coordination with the stage engineers, the architects, Capital Theatres [the owners] themselves to understand it and position the structure so it would suit how that system works and, of course, the structural job that we needed to do."



*The theatre is due to reopen in spring 2026*

Due to access restrictions posed by the theatre's location, only limited use of plant was permitted.

"It's on a busy corner with limited parking," Evatt explained. "It did require closure of Tarvit Street, which is on the north side of the building.

"They did manage to get crane access into there, but we also had to consider as a heritage building there's lots of ornate plaster in the building which was all to be maintained and protected."

Careful sequencing and methodology was considered to allow the new structure to be installed in advance of removing the original roof.

"We didn't want to take the roof off and leave it open to the elements. We had to come up with a sequence of works where we left the existing roof."

It was decided for the new roof to be built up on top of the existing roof and to build the structure for the new roof beneath it only once the roof itself was in place and sealed. Only then was demolition of the original roof carried out.

"It was a very kind of careful sequencing and quite complex for the contractor," Evatt said.

"To get the structure into the building they had one little hole in the original roof, which was an existing roof light space.

"Lots of steel just came in vertically through that. It was pretty amazing how they managed that."

Another major element of the works is to alter a bar in the basement to increase the floor plan and headroom within the space by dropping the floor by a metre.

To do this, the existing rear wall to the bar which bounded the rear of the auditorium floor needed to be pushed back by 2m. This was a complex operation as there was limited information available on what was below the stalls floor.

“We did have a lot of historical drawings but a few of these things that we unearthed during the pit bar works weren’t on them, so it was a detective exercise to try and determine what we were doing,” Evatt said.

“The building does sit on rock but the rock is kind of at variable levels so we were never quite sure what the extent of underpinning was.

“Then we undertook cores through the back wall and managed to determine that behind it was just backfill.

“The stalls floor was sitting on the ground, essentially, so if removed that to push the wall back, we were basically taking out the floor.”

This ultimately meant that Robertson, as contractor, would have to “lose part of the floor, which was then reinstated”, Evatt said.

“The contractor sequentially removed the wall and took away the ground at an angle to keep it stable as they went back,” she continued.

“At one point, standing in the middle of it, it felt like we were standing in a quarry. It was just surrounded by earth and rock.”

Work continues on the redevelopment of the theatre but it still intends to operate and put on performances in 2025 before the planned full reopening in 2026.

Capital Theatres chief executive Fiona Gibson said: “The King’s Theatre is set to reopen in spring 2026, marking a once-in-a-lifetime transformation of one of Edinburgh’s most cherished cultural landmarks.

“Capital Theatres remains dedicated to realising its vision of creating a fully accessible, high-quality venue that will inspire and serve future generations.”



*Works being done to increase the height of the fly tower roof*