

CASE STUDY: The Leeds Grand Theatre & Opera House

Sector: Public

Main Contractor: Theatre Things Ltd

Client: Leeds City Council

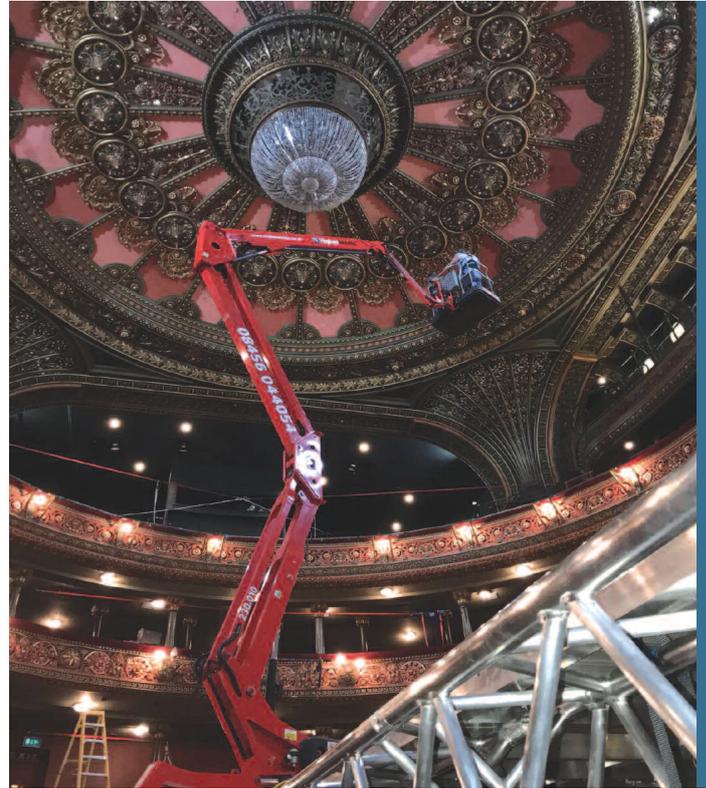
Services

- Survey of the plaster in the auditorium ceilings and balcony fronts
- Detailed report on condition and budget rates for repairs
- Subsequent completion of all repairs required
- Issue of Ceiling Safety Certificate

The grade II listed Leeds Grand Theatre and Opera House was built in 1878 on a $\frac{3}{4}$ acre site on New Briggate, one of the city's main streets, at a cost of £62,000 (equivalent to about £8 million today). The architects, George Corson and James Robert Watson, were strongly influenced by continental ideas – hence the distinctive gothic ecclesiastical spires of the exterior and the fan vaulting and clustered columns of the interior. The Leeds Grand is regarded as a prime example of Victorian theatre building.

The theatre seats 1550, more than twice the capacity of London's Apollo Theatre, where on 19th December 2013, approximately ten square yards of plaster fell onto the stalls 45 minutes into a performance, injuring 76 of the audience. More than 700 people were in the theatre at the time. Witnesses described the panic that spread as the ceiling began to crumble, masonry and plaster fell onto the stalls and the theatre filled with clouds of thick dust. An investigation conducted by Westminster City Council showed the cause to have been the deterioration over many decades of wadding ties which supported the ceiling, dating from around 1900. The ties, made of hessian and plaster of Paris, were used to lash timber frames together to support the suspended ceiling.

This incident caused widespread concern among owners of historic buildings and prompted The Association of British Theatre Technicians to issue guidance notes which, if complied with, will ensure public safety through improved facility management, greater vigilance by theatre staff and regular inspections by structural experts. In buildings with the capacity of The Leeds Grand Theatre there could be major tragedies if ceilings were to collapse completely.



Ornate Interiors have worked on hundreds of the nation's prized historic buildings, including theatres such as Hammersmith Apollo, Stockport Plaza and Wolverhampton's Grand Theatre.

Ronnie Clifford, founder and managing director of Ornate Interiors, explains the various issues encountered in such projects, assisted by his brother Iain:

“Over many decades the hessian inside the wadding will deteriorate while the plaster around it remains strong, creating what we call an empty egg shell. This is often not evident in a visual inspection and more intrusive investigations are necessary. When we re-wad ceilings as part of the restoration process we wrap tying wire around the fixing frame and through the lathed ribs. We then wad with plaster and hessian around the wire. If at any time the wad fails the tying wire would remain in place, ensuring a firm fix.”

“Wad-deterioration can also be caused when theatre crew or other trades workers walk across the fixing frame, standing on top of the wads and weakening them. Unsympathetic repairs can also be a contributory cause.”

“There is wide variation in the quality of plasterwork in different historic buildings. We also have to bear in mind that today’s theatre environment is very different, with the combination of vibration from high-volume sound systems, external traffic, subsidence, and modern heating systems. None of those factors could have been envisaged by the original architects and builders.

“Apart from the required five-yearly inspections we recommend more frequent inspections of the roof and guttering to prevent water ingress and ensure adequate ventilation at the back of the ceiling. Timber supports can be affected by insect and fungicidal attack as well as by dry or wet rot.”

With their extensive experience Ormate Interiors are well-placed to help avoid potential disasters. An increasing part of their business activity is raising awareness of the duty of care that managers of historic buildings have to ensure all suspended ceilings are inspected and certified at least every five years, and, working in conjunction with an appointed structural engineer and a timber treatment specialist, providing detailed reports and recommended solutions for any problems discovered.

Carrying out the survey was made easier because a load-bearing structure designed to carry a mobile elevated platform had previously been installed. This enabled a full inspection of the ceiling from below. It was still necessary to inspect other areas using harnesses, ropes and pulleys.

The main finding was that following a major refurbishment in 2005 a state-of-the-art automated flying system had been installed so that the theatre could meet the production needs of major West End musicals and plays, the first of these being The Phantom of the Opera. Leeds Grand Theatre is also now home to Opera North. Regular usage of the new system increased the number of staff working above the ceiling and added to the load of equipment stored there. Walkways had been directly supported on the ceiling structure, weakening it.

The solution was to remove the old walkways and replace them with a form of support that shifted the load from the ceiling itself. New metal channels were installed behind the ceiling and wire supports were attached to these. Ormate Interiors then carried out remedial works to the plaster areas affected by the removal of the old walkways. Loose plasterwork was re-secured and missing or damaged mouldings were replaced.

In the Balcony areas lights had been inadequately supported off the timber framework, causing damage to the plasterwork they were sitting on. Some cracks were also evident. Ormate Interiors used screws to fix back loose and cracked plasterwork, repaired cracks and dropped junctions, and removed wires from plasterwork and re-secured these to the timber.

Various public areas including ladies and gents toilets, some stairway walls and the bar were found to have been affected by water ingress, mostly from high-level original cast iron guttering that could not cope with the volume of rainfall but some from other penetration of the building fabric. There were also places where internal plumbing was leaking, causing accumulated damage to comparatively small areas of walls and ceilings and in some places to underlying timber or steel supports. Water had also damaged the moulding around the Upper Light Well to the front steps.

Once the causes of water damage had been rectified by other trades, Ormate Interiors carried out the relevant plaster work – removing damaged lath and plaster from sagging or collapsing areas of ceiling, re-securing timber wall plates and installing new ceiling joists, then plaster-boarding and skimming with a lime finish. New mouldings were formed to replace the worst damaged surrounds to the Light Well and other patching was also done.



Paul from Ormate Interiors checking 1878 open fret work cast plaster panels forming Gothic Fan Vaults at the corners of theatre ceiling

This project illustrates some of the complex solutions that need to be found to avert other instances of ceiling failures not only in theatres but in other historic large public buildings.

Ronnie Clifford comments:

“When and wherever the public is involved there is a clear duty of care. It’s vital the public have the reassurances that inspections are carried out and the necessary works are being undertaken by contractors qualified to undertake specialist tasks.”

Alan Dawson, Head of Technical and Property, Leeds Grand Theatre and Opera House Ltd:

“We have been working with Ormate Interiors for several years in maintaining and preserving our 140 year old ornate plaster ceiling.

To gain access from both below and above, clean, inspect and carry out any repairs to our auditorium ceiling is a two week undertaking.

Ormate Interiors also inspect all other ceilings in public areas and work with us around our busy programme.

The confidence and service we receive from Ronnie and his team in maintaining this Historic Grade II* listed building is second to none.”



View this project lookbook on our website.