



Institution of Civil Engineers (ICE): HQ Refurbishment

Delivering a specialist refurbishment and modernisation project to a prestigious Grade II listed building within the heart of London, serving the public and construction professionals within the civil engineering industry.

Built in 1913, the headquarters for ICE is one of London's most regal properties, designed to educate and inspire the organisation's 91,000 members across the globe.

The Edwardian building also houses several business tenants, along with One Great George Street – a company utilising the building's stately facilities as a venue for conferences, weddings and events.

After more than a century of use, ICE closed to allow circa three months of works designed to refurbish the building, along with improving facilities for visitors, and increasing the building's energy efficiency and accessibility.

Scope of works

A £3.396m contract to deliver the diverse scope of works was awarded to Building Solutions (the specialist building and refurbishment arm of VINCI Facilities), in recognition of its vast experience in the historic buildings sector.

Now complete, key elements of the works included:

- » Specialist clean and restoration of the external stonework to the front and side elevation façades.
- » Maintenance to roof and the four ornate glass roof lights.
- » Replacement external platform lift at the main entrance.

- » Replacement of mechanical and electrical plant, including boilers and calorifiers.
- » Conservation cleaning of the Great Hall ceiling.
- » Creation of an Interactive Learning Hub.
- » Creation of new members' resource centre.
- » Refurbishment of toilet facilities.
- » Replacement furniture, finishes and fittings.

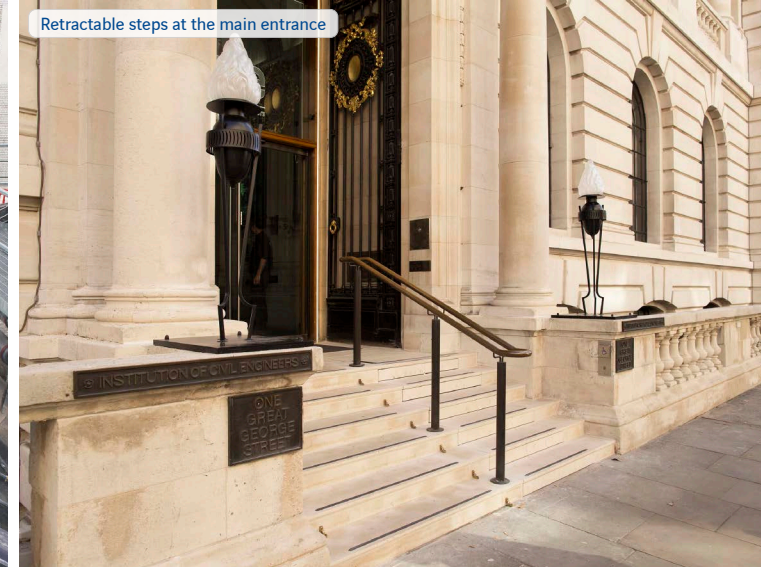
Understanding the client's needs – a strict time frame

Above all else, the client's overriding objective was for the building to be fully operational and open for business by a strict deadline, in time for scheduled events to take place.

Recognising the importance of this key objective, Building Solutions challenged ICE's initial time frame and developed a new proposal which recommended that, in order to meet the deadline, it would be essential for scaffold preparations to commence a month ahead of the core works.

The subsequent scaffold works were completed in just four weeks, a remarkable achievement considering the complexity of the intricate design, which had to accommodate a sunken moat around the perimeter of the building as well as a wealth of roof lights and mechanical and electrical systems.





External works

Key aspects of the external works included:

Roof lights

A key task was the refurbishment of the four glass roof lights, each of which were fully restored and replaced, encompassing new metal and timber frames, glazing and lead flashing. With the largest roof light measuring 45m in length, the restorations represented a major undertaking and were complicated further by the fact that, in many instances, the external roof lights also had additional internal lay lights situated just 2m below, which significantly restricted access. In response, innovative crash deck systems were utilised to maximise safety, along with lightweight aluminium scaffolding, designed to be easier to handle in confined spaces.

Tank room

Located at the rear of the roof, the tank room was another key element of the works. In addition to replacing the water tank with a bespoke fibreglass alternative, Building Solutions was due to replace the roof of the room using concrete bison beams; however, it recognised that this wasn't a viable option due to the health and safety risks associated with hoisting the heavy beams in areas with limited access. Building Solutions therefore proposed and installed an alternative rib deck system with poured concrete, resulting in a similarly robust roofing solution but with reduced risks.

Roof repair

Roof repairs were carried out to various areas of the building. Additional insulation was installed as necessary, and a liquid plastic Decothane roofing system together with leadwork replacement ensured a watertight solution with a 10-year guarantee.

Permanent access safety equipment

To further maximise safety and bring the property in line with current regulations, Building Solutions recruited safety specialists Checkmate to assess and upgrade the permanent access systems across the roof, including handrails, gantries, fall arrest system and hoop ladders.

Lift platform

The front entrance features steps that retract into the building to reveal a lift platform. Sesame Lifts were contracted to replace the entire system, with Building Solutions then cladding it with stone in keeping with the existing façade. To view a video of the system in action, please visit:

<https://youtu.be/Qo0ZGkYik28>

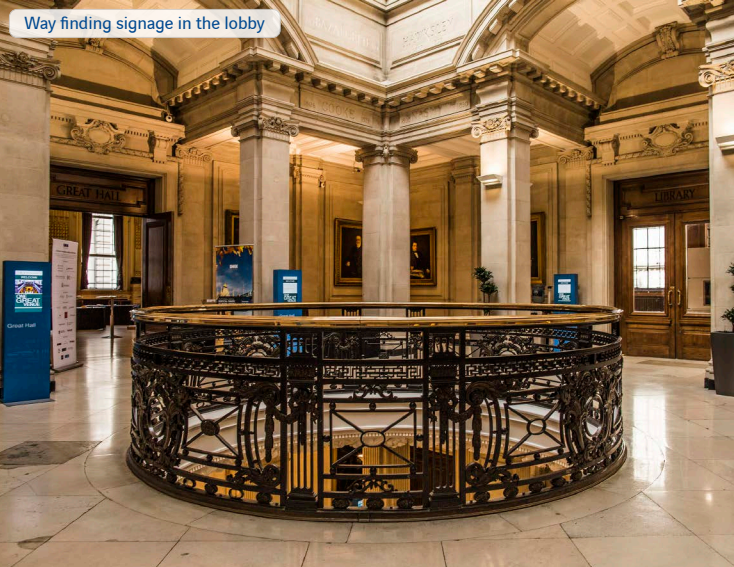
Stonework

The external stonework was DOFF steam cleaned and repaired where necessary.

Windows

All windows were fully refurbished and repainted.





Internal works

Prior to commencing the internal works, Building Solutions developed a Heritage Protection Plan to protect the historical fabric of the building. The floors, chandeliers, columns and memorials were protected with plywood as necessary in order to provide extensive protection. Work then commenced on the following key areas:

Main circulation areas

The main circulation areas benefited from tiling restoration and a bespoke reception desk created by Claremont; however, the core work to these areas was the installation of new digital way-finding signage throughout. Claremont was contracted to produce and install the signage, while Building Solutions was responsible for providing power and data supplies. Providing these supplies was no mean feat, as cables invariably needed to be fed through historical elements of the building (e.g. stone columns) without damaging the structure.

Great Hall

The Great Hall is arguably the pièce de résistance of the property, featuring lavish decorations throughout and an elaborate gold ceiling cornice. A conservation roof clean was conducted by specialist sub-contractor Richard Rogers Conservation, while Building Solutions improved energy efficiency by replacing florescent lighting with LED alternatives and installing secondary glazing to the refurbished windows.

Main and Upper libraries

Both the Main Library (home to the world's largest civil engineering collection of 130,000+ publications) and the members-only Upper Library received works including:

- » Installation of new electrical and data points within the existing floor to accommodate new interactive display equipment.
- » Upgrading of all lighting with LED alternatives.
- » Repainting and repair of ceilings and cornices.
- » Extensive French polishing to bookshelves and woodwork.
- » Installation of new carpets and Amtico vinyl flooring.

The Upper Library also benefited from the removal of a redundant heating system and associated asbestos in order to create space for the installation of a new booth area, designed with a modern aesthetic to attract a younger demographic to the Institution.

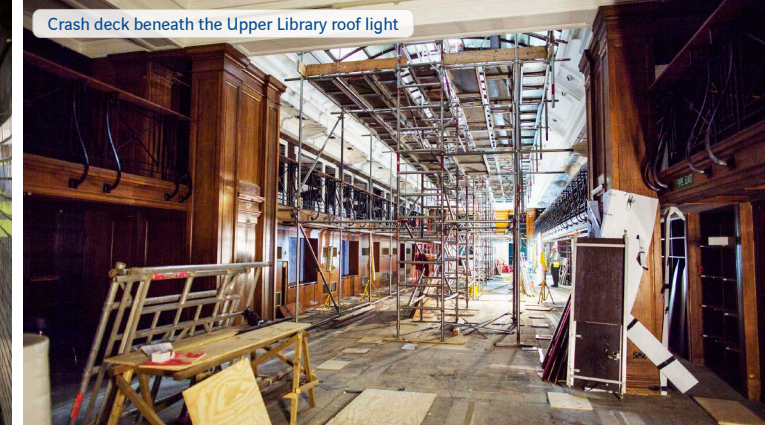
Plant room

The entire plant room was updated, including replacing the condensing boilers with modern alternatives that are 30-50% more energy efficient, installing new calorifiers, upgrading all pipework, installing new cooling fans and duct work, and repainting the floor and walls.

First floor toilets

The existing toilets were modernised with new cubicles, urinals, taps and IPS panels, along with redecorated walls and repaired tiles and grouting.





Collaborative working and strong communication

Building Solutions fostered a culture of collaborative working and strong communication from the outset. Key to this was the establishment of a site office within walking distance from ICE's office, which enabled any queries to be answered swiftly.

This was supported by daily briefings to discuss the work scheduled for that day and any requirements (e.g. the need to access certain rooms), along with formal fortnightly meetings with all key stakeholders to monitor progress and discuss upcoming works. These fortnightly meetings facilitated engagement amongst Building Solutions, ICE and its professional and maintenance teams, as well as with Arcadis, other sub-contractors and business tenants within the building.

Being a considerate contractor

Throughout the project Building Solutions endeavoured to be a considerate contractor and minimise the negative impact of its works on both the client and the surrounding area.

An example of this can be seen in the scaffold solution that was employed. Limited access was available on site, with just a single driveway to the rear providing access to both ICE and a neighbouring building. Therefore, to minimise distribution on street level, Building Solutions constructed a vast scaffold gantry capable of accommodating the various goods and equipment needed for the project. All waste was also contained upon the gantry and sorted ready for removal by just-in-time skip deliveries. Building Solutions' efforts ensured that materials were kept off the curbside, in turn enabling both the client and its neighbours to benefit from improved access and minimised safety risks.

Nurturing a culture of health and safety

Building Solutions' core team of a Supervisor, Project Manager, and two Site Managers were on site throughout the project and ensured that rigorous health and safety standards were upheld.

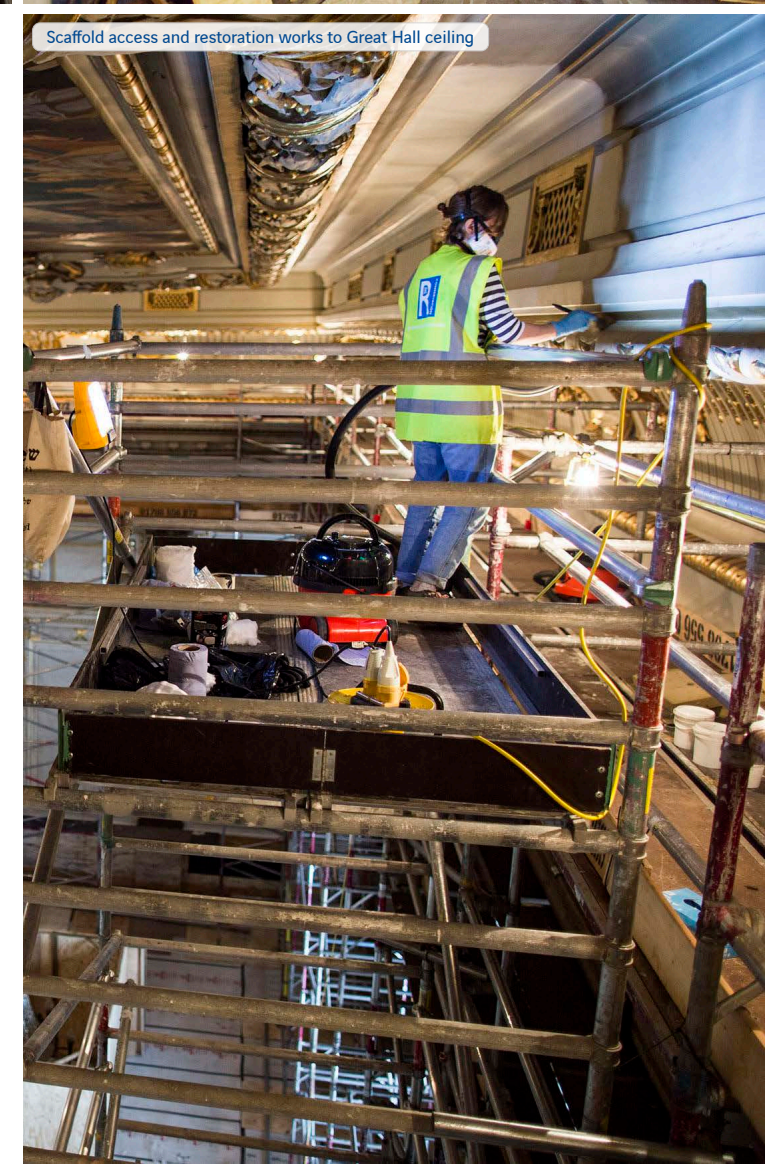
Although the majority of the building was vacated for the works, approximately 30% of its users were still active on site on a daily basis. Therefore, Building Solutions' team strategically relocated users internally to segregate them from areas of the site where active works were being conducted. Furthermore, any users that needed access to active work areas (e.g. ICE's maintenance team) received full site inductions before being granted access.

Building Solutions' team also provided training to minimise Health and Safety risks. For example, as the site presented a high risk of silica dust, Building Solutions' Supervisor conducted face fit tests for all sub-contractors to ensure that the appropriate masks were being used correctly.

In addition, Building Solutions also provided training to the site's end users as necessary; for example, providing ICE's maintenance team with training for how to use the replacement boiler systems.

Throughout the works, Building Solutions encouraged close calls and positive interventions to be reported via boxes situated across the site. All results were shared with the client and promoted via a league table in the site office.

By fostering a strong culture of Health and Safety, Building Solutions successfully completed the project with zero reportable accidents.





Flexibility and rapid mobilisation

Building Solutions was continually prepared to rapidly mobilise its teams at short notice as necessary to deal with the shifting scope of works and ongoing challenges that inevitably arise on projects of this scale.

This was none more evident than when a blocked surface water drain in the road caused ICE's basement to flood with 30,000 litres of water. Upon hearing the news, Building Solutions immediately sourced additional PPE, buckets, water pumps and dehumidifiers, and rallied all its staff, labourers and sub-contractors to assist with a two-day recovery process. Building Solutions' performance was so impressive that ICE subsequently recruited the organisation to refurbish its basement, including re-wiring and redecoration.

Further examples of Building Solutions' flexible approach include:

- » ICE requested that the schedule for cleaning the stone columns at the building's entrance be brought forward in readiness for an event the next day. Building Solutions' team dutifully worked through the night, completing the work at 4am.
- » Upon receiving delivery of the specified sanitary ware for the toilet block refurbishment, Building Solutions quickly discovered that it wasn't suitable for the existing pipework. Aware that sourcing replacement sanitary ware would cause weeks of delays, Building Solutions instead spent three days reconfiguring the existing pipework as necessary. This flexibility played a key role in ensuring that the strict delivery time frame could be adhered to.

Trust and transparency

From the outset, Building Solutions sought to develop a relationship of trust with both ICE and the Contract Lead, Arcadis. This was strengthened by operating a fully transparent approach to all costs and profit margins, both within the initial lump sum contract and for any ongoing additions to the scope of works.

The level of trust achieved played a key role in maximising the speed and efficiency of the decision-making process. Firstly, because Building Solutions gained the privileged position of being able to liaise directly with ICE, rather than through the traditional approach of communicating via the Contract Lead. And secondly, because all members of the design team worked collaboratively with Building Solutions to ensure that the decision-making process was as streamlined as possible.

Ensuring a strong supply chain

The project saw Building Solutions collaborate with a range of specialist sub-contractors as necessary, utilising firms from both its own preferred supplier list and those named by the client. Strong communication was essential in order to nurture a shared culture across the various firms, and this was achieved via pre-start meetings with each supplier, comprehensive site inductions and the issuing of Health and Safety packs to outline the required standards.

The network of sub-contractors employed proved so effective that ICE added several of Building Solutions' approved sub-contractors to its own network of preferred suppliers for ongoing maintenance works, including Avalon for abseiling and Atrium Access for scaffolding.

CUSTOMER SATISFACTION

Following scaffold preparations to the rear elevation, the core works spanned 13 weeks and were successfully delivered on time and on budget.

From its efficient mobilisation plans to its exhaustive risk management strategies and strong focus on collaboration and transparency, Building Solutions continually delivered across all remits to play a key role in helping to safeguard this prestigious building for decades to come.

Building Solutions' performance on the project saw the firm consistently achieve exceptional customer satisfaction results, securing an overall rating of 9/10, with many aspects receiving 10/10, including responsiveness, professionalism, attitude and compliance.

Mike Stephens, ICE Project Sponsor, commented:

"This was a complex project with limited time scales due to key events in ICE's calendar. Thankfully, VINCI demonstrated its understanding of, and total commitment to, our requirements. This was mirrored by the site management team and all the sub-contractors and trades.

"Speedy decision making by the client and its representatives, along with excellent personal relationships with the VINCI team meant that every element was treated with utmost priority. Solutions were sought, agreed and delivered to ensure the client's objectives were met. This resulted in a successful project which showcases the skills VINCI has in this sector."



BUILDING SOLUTIONS

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Institution of Civil Engineers

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