

Science Museum Group Wellcome Wing Roof Replacement



PROJECT DETAILS

CLIENT Science Museum Group

PROJECT Wellcome Wing Roof Replacement

LOCATION London, England

RTM Invitation to Tender – Open Procedure

CONTRACT JCT SBC 2016 w/CDP

VALUE £1,360,000

ROLE Principal Contractor

END DATE June 2024

PROJECT SUMMARY

PROJECT OBJECTIVES

The primary objective of the project was to provide a robust and long-lasting roofing system that met functional requirements and longevity standards, and improved u-value performance.

This was achieved by replacing the existing roof with a modern, effective waterproofing solution as well as ancillary works. This upgrade enhanced the overall durability and weather resistance of the structure.

PRE-CONSTRUCTION AND PROJECT DELIVERY

We collaborated closely with Principal Designer, Gardiner & Theobald, and Lead Architects, Studio Downie LLP, to utilise our specialist roofing expertise. Together, we selected the Bauder LiquiTOP cold-applied liquid system, featuring a seamless carrier membrane and vapour control layers, coupled with their tapered roofing insulation. This choice was optimal for refurbishing extensive roof areas while achieving an industry-leading u-value of 0.18 W/m²K or lower.

During the initial investigation, we identified three cooling tower pipes requiring removal before work could begin, necessitating their reinstatement afterwards. Given the limited roof space already allocated for replacements and additional M&E activities, the complex removal process posed potential budgetary and operational challenges. To address this, we proposed 'lifting' the pipes, allowing us to proceed with resurfacing while avoiding costly removal, storage, and reinstallation procedures.

Our pre-construction phase focussed on minimising the visual impact of the temporary works, access installations, and site facilities, for the visiting public and adjacent building occupiers. We presented several design solutions and the selected scheme included concealment of sensitive areas with recyclable OSB cladding, overlaid with a bespoke artwork installation.

We conducted thorough environmental testing to uphold environmental stewardship and minimise disruption to local ecosystems. Assessing construction impacts on existing surfaces and habitats was key to mitigating potential harm. Soil testing ensured stability and minimised disturbance to surrounding habitats, while rigorous risk assessments addressed soil contamination and organic materials. Early risk identification enabled timely mitigation measures, ensuring smooth project progress and aligning with the client's sustainability goals.

DIGITALISATION

We employed the Field View Management System to streamline digital interfacing and coordination throughout the project. This cloud-based, offline mobile solution captured communication at each stage, acting as a centralised repository for easy information access. Integrated across company smart devices, Field View facilitated real-time data collection, reporting, and customisable Smart Forms to enhance collaboration among trades. It consolidated data on a central dashboard for insights into project progression, trends, and metrics. Custom reports were issued to support informed decision-making and transparency for Project Managers and Contract Administrators. Field View also managed quality inspections, defects, and snagging processes efficiently, ensuring comprehensive oversight via secure logins for the client's project and design teams.

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SCOPE OF WORKS

- ▶ Access and Temporary Works
- ▶ Strip Out of Existing Level 3, Level 4 and Level 5 Roof Coverings Down to Structural Slab
- ▶ Undertake Remedial Works
- ▶ Reinstall New Waterproofing Covering System
- ▶ Amend and Adapt Local Interfaces with Roof-top Plant, Wall Cladding, Plant Screens and Door Thresholds
- ▶ Maintain and Reinstall Lightning Protection
- ▶ Adapt and Install Existing Fall Restraint Solutions

CRITICAL SUCCESS FACTORS

- ▶ Due to the presence of three large chiller units in the main plant zone, it was impractical to decommission them temporarily for waterproofing below and then reposition them. Instead, our solution involved removing existing paving flags and ballast pebbles, installing a Bauder cold liquid system, and applying inverted insulation and membranes while utilising existing finishes to meet manufacturer recommendations. This approach avoided costly measures like crane operations and out-of-hours work, maintained warranty coverage across all roof areas under the same manufacturer, and provided a thermal upgrade. This delivered significant cost savings and reduced the project timeline by 10 weeks, ensuring efficient delivery and meeting client requirements effectively.
- ▶ Upon commencement on site, we encountered a significant setback with the scaffolding design, which prompted the client to halt operations for a thorough reassessment of logistics. The hoist had to be fixed through an architectural screen and this was caveated at tender stage due to limited details and design information that neither SMG or the consultant were aware of. It led to a significant element of temporary works design to determine the structural capabilities of the steel frame that the architectural screen was fixed to. We had to abseil and remove elements of the screens in pockets whilst ensuring internally (within the museum) we developed a shrouding system to maintain the privacy screening. We finalised the scaffolding design and obtained approval to commence erection. Conducting thorough ground bearing testing before scaffold erection ensured the safety and stability of the setup, pre-emptively addressing potential safety risks and complications.
- ▶ A substantial leak was reported to us which was not due to McConnell's work, but we conducted investigations and discovered a worsening leak in



the existing water chiller units, which allowed water to enter the new gallery ceiling. Taking a proactive approach, we contacted our supply chain partners to contain the leak, installing a pump to remove water that had submerged the roof's night seals by 200ml. Our team responded swiftly and effectively by employing a specialist contractor, assigning 24-hour supervision, and implementing an out-of-hours detection and escalation plan, demonstrating our commitment to resolving the issues. The leak was contained, and our proactive approach prevented further damage to the gallery ceiling. Our prompt, reliable, and effective response ensured the new gallery was opened on time.

- ▶ We recognised the diverse range of stakeholders from Security, Estate Management, Conservation, Legislation & Compliance, and Visitor Services, so McConnell ensured that everyone could effectively voice their perspectives. Monthly progress meetings were conducted to address stakeholder concerns, discuss upcoming work, and anticipate potential challenges. These meetings provided a platform for stakeholders to share updates, voice thoughts, and collaborate on solutions. By regularly convening these meetings, McConnell and the Science Museum Group's project teams stayed informed, proactive, and aligned, successfully overcoming obstacles and ensuring the project's overall success.
- ▶ We facilitated the stringent security protocols, ensuring that the works were sequenced to mitigate any security risks, particularly in high-risk areas such as the main exhibition and viewing areas.
- ▶ McConnell has gone on to directly negotiate further works with the Science Museum Group, including a £2.1m structural refurbishment project, and this is a direct result of the genuine spirit of collaboration and teamwork that was developed on this project between the client, the client's project team, and McConnell.