

Queen Elizabeth Hospital, Birmingham



Project Outline

Contractor	Balfour Beatty Engineering Services Ltd
Location	Birmingham, UK
Sector	Healthcare
Disciplines Covered	Fire Alarm Integrated Smoke Dampers Aspirating Fire Detection Voice Evacuation & Public Address Induction Loop
Key Points of Interest	237 kilometres of cable 1,635 Integrated Smoke dampers 25,000+ Individual devices

Project Overview

The construction of Queen Elizabeth Hospital, Birmingham, one of the UK's super hospitals at the time of creation, was the largest project of its kind in the country outside of the Olympics development. The steel and glass towers of the hospital now dominate the city's skyline. The facility has the world's largest single-floor critical care unit, with 100 beds. Service personnel are treated in single rooms or four-bed bays in a 30-bed military section in the trauma and orthopaedics ward. The ward has additional features for service personnel use only and caters to their specific requirements within a secure military environment.

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The Challenge

The challenge set was to design-develop a full BS5839 and HTM05-03 compliant fire alarm system, which would also work alongside a fire damper system which prevents the spread of fire. The system would need to offer a full graphical representation of the building for control/ integration of the fire alarm system and have a voice evacuation capability to reduce the risk of alarm and distress in a fire scenario.

The Solution

A Protec Algo-Tec™ fire detection system was installed, protecting the staff, patients, visitors and buildings from fire.

Several main fire alarm control panels monitor the fire alarm system, with a further 142 Protec Algo-Tec™ 6000 LCD loop-driven panels located out in the field at specific nurse base stations throughout the entire Acute and MHU buildings. The complete network supports the two main graphic stations, which control the project, with the remaining positions filtered for the MHU Building. A further stand-alone MHU building is located off-site about six miles down the road, completed as part of the overall project.

In all, 237 kilometres of cable were used across the site, connecting over 25 thousand individual components such as manual control points, sounders, bases, panels, interfaces, beacons, etc. - all Protec 6000 series equipment.

The system controls the hospital's smoke damper systems by utilising specially designed and patented interface units. This means that via the graphics on the PC, operators can see all areas and the dampers and control them to prevent any smoke and toxic fumes from spreading, enabling people in other areas to leave safely. The fire detection and alarm systems offer state-of-the-art intelligent networks that pave the way for the next generation of designs, introducing technology that reduces cost by removing the need for duplication of wiring and power supplies.

The total number of smoke dampers used for the project was 1500 in the acute wing, with 135 in the Mental Health Unit (MHU). The associated Protec smoke damper interfaces allow the control of these devices to utilise the fire detection and alarm loop and avoid the need for separate power supplies, distribution boards, and additional circuit protection.

A voice evacuation public address system has also been linked to the fire detection system to make this a truly integrated network and improve cost-saving efficiency.

Robert Cash, Protec Fire Detection PLC Project Manager, said: "As a new build, we have been able to design and install the ideal network systems to make this a future-proof landmark development. Additionally, with the integration of smoke damper control, we have probably shaved around £100K from the overall project cost."

The Aftercare

Since the completion of the project, Protec has continued to supply the hospital with a fully comprehensive maintenance and service contract. Due to the size of the project, the hospital benefits from a site-based engineer to service and maintain the system and regularly holds meetings with the FM Provider. Also, Protec has secured multiple other buildings on-site, which all integrate into the existing fire alarm network.