

CURTAIN CLOSED ON AIRPORT EXPANSION

When the terminal building at Stansted airport underwent an extension, it had to remain operational throughout the project. **Arthur Nelmes** explains how a 160m wide fire curtain provided a cost-effective solution.

THE INSTALLATION OF A HUGE FIRE CURTAIN, THE largest ever assembled for commercial use in the UK, during the recent project to extend Stansted Airport's main terminal, not only saved the main contractors Mace Group over £600,000 but also significantly reduced the amount of time spent during the enabling phase.

The 12m high x 160m wide fire curtain was installed to act as a temporary fire break between the construction zone and the main terminal at Stansted, to protect passengers and staff from the risk of fire and smoke.

The terminal extension project, which started in April 2007, was part of a programme to develop and expand the UK's third busiest airport. The extension, which was opened 14 months later, has eased congestion by adding an extra 5900m² of floor space to the international arrivals area of the terminal, with expanded immigration, baggage and customs halls that will provide the anticipated passenger capacity to 2015.

The airport's main terminal had to remain operational throughout the project, making it necessary to erect a fire barrier. Conventional wisdom suggested an insulated, solid barrier would have to be erected to maintain a fire break between the live terminal and the construction area, as implemented during a previous extension project at Stansted Airport in 2001. At that time, a solid wall took over 12 weeks to erect and cost over £800,000.

SBS London had already been commissioned by Mace Group to apply intumescent paint to the steelwork of the new extension. We had encountered fire curtains that provided temporary fire breaks in voids and larger cavities during previous construction projects we had worked on, but nothing on this scale. However, the principle remained the same and there was no reason, in theory, why a curtain could not perform the job of a solid barrier in a temporary situation such as this.

The curtain, from Firetherm Ltd, consisted of a woven glass fibre fabric which was coated with the company's proprietary fire resistant coating. Due to the width involved the curtain was supplied in 1m x 12m strips.

Temporary fixture

Since the curtain was only a temporary fixture and would be constantly in use during the construction work, it was deemed a passive fire break and therefore not fitted with an automatic remote activation system nor



The custom-made fire curtain spanned 160m (top); curtain sections were bolted to floor angles and then stapled together (above)

integrated into the airport's fire alarm system. BAA had highlighted the need for any barrier to retain the ambient temperature of the terminal. In order to withstand the differential air pressures created by the existing terminal's air conditioning, an extra thick and tough fire retardant material with a 90 minute rating was used to create the curtain, and a bespoke supporting detail was designed to withstand the conditions and prevent breaches forming in the barrier.

The installation was carried out by SBS London working alongside Mace Group's demolition team. It involved affixing the supplied rolls of curtain fabric mechanically to the top of the building. Strips were bolted to a metal punch strip and screw-fixed to the circular hollow sections of the terminal's roof beams. Once attached the glass could be removed and the curtain sections were unfurled like a roller blind and bolted to floor angles which were screwed to the floor. The strips were then stapled together to form a robust, smoke-tight barrier.

This was carried out progressively as sections of the party wall were dismantled. According to BAA guidelines, since the work was carried out in an 'airside' area (i.e. beyond

the passport and security check), it could only take place at night between the hours of 1.00 am and 6.00 am. Once completed, the installation was subject to a rigorous inspection by the airport's insurers and its fire safety officer.

BAA guidelines demanded at least a 30-minute barrier to be installed between construction works and airport zones frequented by the public. The fire curtain was certificated at 90 minutes.

The airside restrictions, together with the incremental nature of the work, meant the erection of the fire curtain took four weeks. However, this was still approximately a third of the time estimated to install a solid barrier. Needless to say its dismantling was also much quicker and easier. The flexibility in erection and dismantling proved extremely useful when building the modules that traversed the boundary between existing and new terminal took place. Some elements, such as toilets and retail units, needed to be erected across the boundary between new and old. The contractors were able to quickly and easily remove sections of the curtain to accommodate this.

The logistical benefits notwithstanding, perhaps the more eye-catching element of the fire curtain was the cost saving it delivered. Although the curtain fabric cost twice as much as a usual fire curtain due to its high fire rating and bespoke features, the material supplied and its installation cost just £200,000.

The concept having been proved at Stansted, one might assume fire curtains will become the 'de rigueur' solution for temporary fire barriers in construction projects. However, they are only suitable in certain circumstances. Although their performance in resisting the spread of fire and protecting occupants is commensurate with a solid barrier, fire curtains do not afford the same security. This issue was accounted for at Stansted by a 3m high solid hoarding that surrounded and enclosed the extension zone. Also, in locations where there is a high risk fire risk or with heights above four storeys, the fire rating required of any barrier would typically exceed 90 minutes and therefore require a solid fire break to be established. ■

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