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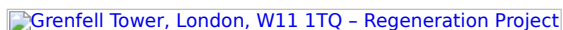
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By Witt In Case Study, PSB, Witt UK Group

GRENFELL TOWER, LONDON, W11 1TQ - REGENERATION PROJECT

Grenfell Tower built in 1974 is a 24-storey prominent residential estate managed by Kensington and Chelsea TMO (Tenant Management Organisation) on behalf of the council. The £9.7million investment is a major commitment by the council and the TMO to regenerate the tower, with numerous improvements set to raise the value of the estate significantly with residents still in occupation.

The large scale works which includes an upgrade of the cladding to the exterior of the building, new windows, a totally new heating & lobby smoke ventilation system all of which will greatly enhance the energy efficiency of the tower and contribute to reducing resident's living costs.

Additionally, unused spaces were redeveloped to increase the number of residential units on the estate and both the community boxing club and nursery will be upgraded.

PSB UK Ltd recently handed over this prestigious project to J S Wright & Co Ltd for the new lobby smoke ventilation system.

The lobby smoke ventilation system has been designed to provide the existing stairwell with protection from the ingress of smoke from a fire within a dwelling by means of a mechanical extract system. The system has been designed to provide an average open door velocity, across an open lobby / stairwell door of 2.0m/s, this velocity is in accordance with the recommendation for a Class B pressure differential system as defined in Code of Practice BS EN 12101 Part 6: Specification for pressure differential systems Kits. (BS EN 12101-6).

The system is controlled by PLC and has links to the new fire alarm system to provide an initiating signal (one signal per floor). Once a signal is received all the dampers will close (extract and inlet air) and all four dampers in the smoke affected lobby will then open and all dampers on the other floors are to remain closed.

A human Mechanical Interface Panel (HMI) is located within the entrance area to provide the fire and rescue service with a central override facility to close all dampers in a single operation.

Each ventilated lobby is provided with a key override, switch located within the stairwell, at each storey level providing the fire and rescue service with a local override facility to open the dampers on any one floor.

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There are two pairs of smoke extract fans (one duty and one standby in each pair) one pair on the roof top plant room roof and one pair mounted within the new ductwork section on Level 02. There is also a single environmental fan located in the ductwork on Level 02.

The environmental fan and the smoke extract fans on Level 02 will have a set of bypass dampers so that in environmental mode the smoke fan is isolated from the system and in smoke mode the environmental fan is isolated from the system.

The control system will also have pressure sensors added into each ventilated lobby to control the speed of the fans to ensure that when the doors on the escape route are closed that the opening force on the door does not exceed 100N as detailed in BS EN 12101-6.

The mechanical system operates as follows:

Smoke Extract mode: The by-pass damper assembly will shut off the connection to the environmental fan system and all four dampers in the lobby open, to extract air from the lobby through all four openings. Make up air will be provided via the open lobby door.

The environmental system will operate as follows:

Environmental Mode: The by-pass damper assembly will open and shut off the smoke extract fan set and isolate the two shafts. One shaft will act as a mechanical environmental extract shaft and the other will act as a mechanical fresh air make up shaft.

During normal environmental activities the system damper to the smoke ventilation fan set will be closed and the dampers to the environmental fan sets will be open.

On receipt of a fire alarm signal the environmental system dampers will close and the damper to the smoke ventilation system will open.

On receipt of a signal from the fire alarm system all environmental controls will be overridden by the smoke control system.

The Boxing club and the common room lobbies have a single Wall mounted Automatic Opening Ventilator (AOV) fitted in each space. The AOV will consist of a bottom hung window which has a 24vDC actuator fitted. Each of the ventilated lobbies are fitted with a dedicated smoke detector linked into the central smoke control system and will both be complete with a fire override switch.

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IAN SEO
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