Installation of Smoke Effect beneath "Rubble Pile"

USAR Training Centre, Fire Service College – Moreton in Marsh





Concept were commissioned to come up with the design and installation of a smoke distribution system for the Urban Search and Rescue facility at the Fire Service Technical College, Moreton in Marsh in late 2004.

The extensive, primarily external facility is designed to be representative of a scenario after an urban building collapse, and, depending on training scenario being run, smoke was required to be emitted from one, two or three zones under the pile.

Smoke Generator Selection

As an outdoor environment, with a requirement for the smoke to remain visible and hang over and around the rubble pile (given the right environmental conditions), the ViCount 5000/180/2.2kw smoke system was selected as the most suitable system. The ViCount produces a tremendously persistent food quality oil based smoke ideally suited to large volume and external applications (where water based smokes would simply evaporate too quickly).

Smoke Distribution

Concept suggested the smoke be ducted through heavy duty 110mm MDPE or thermoplastic ducting from a plant room area where the smoke generators (3 off) and matching centrifugal blowers were to be mounted. The smoke systems and their respective fans would be operated via a PLC to enable them to function automatically given the training scenario chosen.

Ducting

In effect each ViCount / fan combination supplied smoke laden air down a branch and sub branches) of 110mm high strength MDPE ducting, into which up to 16 smoke outlet holes were drilled along its length (35m). In effect, beneath the rubble pile, approximately 110 m of ducting was laid with a total of 45 smoke outlets, split amongst the 3 main branches. There was a continuous though slight fall in the ducting back to the smoke generation point. The ends of the ducting branches and sub branches were all sealed off.

The Ducting was laid on a prepared surface beneath which a number of passages and crawl ways were constructed. It was suggested that a damp course membrane might be beneficial to prevent egress of smoke deeper into the prepared surface, but it was deemed to be un-necessary.

Commissioning

Concept attended site to commission the installation prior to the covering of the smoke ducting and prepared surface with several hundred tons of rubble. The effect, even without the rubble pile in place, was very effective, and an even distribution of smoke from every outlet was achieved.

Subsequently, after the rubble pile had been put in place, Concept were again asked to attend to carry out a final smoke test that would be representative of a training scenario. The end result is shown here.



