

Category 2 Standard

S2101

Fire Engineering - Fire Suppression and Fire Fighting Equipment

Issue No.: A1

Issue date: October 2014

Review date: October 2019

Contents

1	Purpose	3
2	Scope	3
3	Requirements	3
3.1	General	3
3.2	Sprinkler Systems	4
3.3	Escalator Water Suppression Systems	6
3.4	Water Fog / Mist Suppression Systems	7
3.5	Alternative Suppression Systems	7
3.6	Fire Main Systems	7
3.7	Hose Reel Systems	8
3.8	Portable Fire Equipment	8
4	Responsibilities	9
4.1	Project Manager	9
4.2	Asset Managers	9
4.3	Designer	9
4.4	Contractor/Supplier	9
4.5	Fire Engineer	9
5	Supporting information	10
5.1	Background	10
5.2	Safety considerations	10
5.3	Environmental considerations	10
5.4	Customer considerations	10
5.5	Construction	10
5.6	Fault Rectification	11
5.7	Drawings and Information	11
5.8	Inspection	11
5.9	Acceptance Testing & Handover	12
6	References	13
6.1	References	13
6.2	Abbreviations	14
6.3	Person accountable for the document	15
6.4	Document history	15

1 Purpose

The purpose of this Standard is to define how London Underground will apply the requirements for design and installation of fire suppression and fire firefighting systems and equipment, to ensure compliance with fire legislation and meet the requirements of LU Category 1 standard 1-081 – *Design and installation of fire protection systems and compartmentation measures* and LU Category 1 standard 1-082 - *Active fire protection systems and portable fire equipment*.

2 Scope

2.1 This standard applies to all works undertaken by London Underground on London Underground (LU) premises, including all railway facilities (but not trains). This includes LU premises occupied by London Underground or their suppliers. This engineering Standard applies to new premises and shall also be applied to modifications, maintenance repairs and extensions to existing premises.

2.2. Interface with Other Systems

There are significant interfaces with the following systems:

- a) Fire Safety Strategy/ Operational Procedures
- b) Lifts and Escalators
- c) Fire Detection Systems
- d) Electrical Supplies
- e) Water Supplies (Water Utilities Companies e.g. Thames Water)
- f) Pumps and drainage

3 Requirements

3.1 General

- 3.1.1 The provision, extent and location of fire suppression and firefighting systems and equipment in any particular premises, station, or railway facility, shall be determined by a review of the fire risk to the premises, and shall meet the requirements of LU Standards.
- 3.1.2 The systems and equipment designed and installed in compliance with this standard shall be of the types described in the Guidance Document G0101 Fire Suppression and Fire Fighting Systems or equivalent alternatives approved by LU offering comparable performance characteristics
- 3.1.3 The standard S1538 Assurance shall be followed for the provision of new or work to modify existing suppression and fixed fire fighting systems.
- 3.1.4 All proposals to provide new equipment or to modify existing suppression and fixed fire fighting system provisions on other premises shall be approved by a competent accredited LU Fire Engineer and the Local Fire Brigade Fire Safety Officer informed either through local Building Control application route or through correspondence from the project (if this route is not being followed).
- 3.1.5 Design, of fire suppression systems and firefighting equipment shall be performed by competent designers in accordance with BS 5306/EN12845 and working within

a quality system certificated by a recognized European independent certification body.

- 3.1.6 Design verification, installation and commissioning of sprinkler systems shall be undertaken by suppliers that are approved under a European accreditation scheme for fire system installers (Loss Prevention Council LPS1048 or similar approved) and shall certify the completed works in accordance with BS 5306 / EN12845.
- 3.1.7 Detailed design, installation and commissioning of other suppression and fixed firefighting provisions shall be performed by London Underground approved suppliers with a proven competence in those systems
- 3.1.8 All pipe work used in the installation of suppression systems and fixed firefighting equipment (excluding water fog / mist systems) shall be heavy quality galvanised, all fittings shall be malleable iron, galvanised and joints will have appropriate electrical continuity as part of the integral design.
- 3.1.9 All component joints shall be LPCB approved (for sprinkler / water mist systems) with a galvanised finish and shall have appropriate electrical continuity as part of the integral design (or LU approved equivalent).
- 3.1.10 Wet pipework that may be subject to temperatures below 4° C shall be lagged and trace heated to protect against freezing. The trace heating panel shall be monitored for faults by the fire alarm system

3.2 Sprinkler Systems

- 3.2.1 Automatic sprinkler systems shall generally be designed as “wet” systems for life safety. Where deluge systems are proposed their application shall be approved by LU.
- 3.2.2 Automatic Sprinkler systems shall be designed in accordance with the LPC Rules for automatic sprinkler installations in compliance with the recommendations made in BS EN - 12259, BS EN - 12845 and BS - 5306 Part 2 together with any relevant Technical Bulletins (including LPC Rules for Automatic Sprinkler Installations).
- 3.2.3 The design shall be in accordance with the relevant hazard classification for the premises. For typical LU stations, Ordinary Hazard Group 3 (OHG 3) shall be regarded as the relevant hazard classification.
- 3.2.4 Detailed construction design, manufacture, and installation, shall only be undertaken by companies that are approved under the relevant Loss Prevention Council Board (LPCB) certification scheme (LPS 1048) or equivalent scheme.
- 3.2.5 The sprinkler valve assembly shall be housed within a purpose built sprinkler valve chamber (SVC), which shall be sufficient in size to incorporate the valve assembly and to allow personnel to maintain, remove or replace any part of the assembly. There shall also be adequate room allowed for any necessary drainage arrangements (e.g. bund or tank) and an adequate drain provision for all testing and operational requirements.
- 3.2.6 The sprinkler valve assembly shall be equipped with a:

- a) Flow switch
- b) Pressure switch
- c) Monitored isolation valves

to ensure that the valve position and any water flow in the system will be monitored via the fire alarm system. The assembly shall incorporate a flow test arrangement and by pass valve.

- 3.2.7 The SVC shall be located at a position readily accessible to the Fire Brigade.
- 3.2.8 The SVC shall be fitted with suitable heating where the temperature of the SVC may go below 4° C.
- 3.2.9 Water supplies shall be either of the following:
 - a. Superior supply fed directly from the towns main:
 - b. Duplicate supply fed directly from the town main.
- 3.2.10 To enable the station staff to undertake pressure checks glycerine filled gauges shall be clearly marked and easily accessible.
- 3.2.11 The main stop valves to sprinkler systems shall be monitored via the fire detection system.
- 3.2.12 Valves shall be labelled, strapped and padlocked in position and plugged where necessary.
- 3.2.13 Where the supply does not meet that for OHG 3, the system shall be fully hydraulically calculated to confirm the required flow and pressure. Where the calculated flow and/or pressure are above that of the supply, means of augmenting the supply shall be considered, such as storage tanks and or pumps.
- 3.2.14 A pressure switch, gauge and test cock shall be fitted within the incoming water mains supply pipework to monitor water pressure at the point of entry into the building. The pressure switch shall be set 500mb above the pressure required for the correct operation of the sprinkler system. There shall be a 20-second time delay incorporated to reduce the possibility of erroneous signals being indicated, caused by pressure surges (consideration shall be given to the provision of a retard chamber in areas where pressure fluctuations are known to cause problems). This switch shall be monitored by the fire alarm system.
- 3.2.15 Sprinkler heads shall be positioned to cover the total area to be protected in accordance with the LPC Rules.
- 3.2.16 Sprinkler head shall be positioned to avoid clashes with the existing services. No subsequent installation of services shall be allowed to impede coverage of an existing sprinkler installation (by shielding the flow from the sprinkler heads or in any other way). Where this is unavoidable the project making the change shall be responsible for gaining approval for and implementing changes to the sprinkler system to achieve the required coverage.