2.10. Mall Smoke Management System

2.10.1. Mall smoke management shall comply with the relevant general requirements for smoke control systems as per **Section 2.5** and Mall smoke management requirements of **Table 10.8.**

Table 10.8.: Mall Smoke Management System

ITEMS	REQUIREMENTS
1. GENERAL	i. The mall shall be protected by a smoke management system, designed in accordance with an engineering analysis and computational software to maintain tenable conditions (smoke interface layer) at a minimum height of 1830 mm above the highest walking surface open to the atrium or floor which serves as part of the means of egress, for a duration of 20 minutes or 1.5 times the calculated egress time, whichever is more. ii. Where atrium and large volume is part of the mall, the smoke management system shall be designed for such atrium in accordance with **Section 2.7.** iii. The minimum smoke layer depth shall be 20% of the floor-to-ceiling height except when an engineering analysis using full scale data, scale modeling, or CFD modeling indicates otherwise. iv. The engineering analysis for the mall smoke management system should include the following elements a. Fire dynamics b. Fire size and location c. Materials likely to be burning d. Fire plume geometry e. Fire plume or smoke layer impact on means of egress f. Tenability conditions during the period of occupant egress g. Response and performance of building systems, including passive barriers, automatic detection, automatic suppression and smoke control h. Response time required for building occupants to reach mall exits, including any time required to exit through the atrium, large volumes.
2. MAKE-UP AIR (REPLACEMENT AIR)	i. The makeup air velocity shall not exceed 1.02 m/s where the makeup air could come into contact with the plume, unless a higher makeup air velocity is supported by an engineering analysis. ii. The mechanical makeup air shall be designed to achieve 85% to 95% of the exhaust mass flow rate, not including the leakage through these small paths. iii. Makeup air shall be provided by fans, openings to the outside leakage paths, or the combination thereof. iv. The supply points for the makeup air shall be located beneath the smoke layer interface. v. The make-up air shall not cause door opening force to exceed allowable limits
3. MAXIMUM MASS FLOW AND SMOKE TEMPERATURE	i. Due to practical limitations, a smoke ventilation system shall have: a. A maximum mass flow not exceeding 175 kg/s b. A minimum smoke layer temperature of 18^0C above ambient.