2.5. General Requirements for Smoke Control Systems

2.5.1. Smoke Control Systems shall comply with the general requirements of **Table 10.3.** The relevant components of Smoke Control systems shall comply with **Table 10.1. Components of Smoke Control and HVAC Systems.**

Table 10.3.: General Requirements for Smoke Control Systems

ITEMS	REQUIREMENTS
1. DESIGN FIRE SIZE HEAT OUTPUT (DESIGN FIRE LOAD)	i. The building to be provided with an engineered smoke control system shall be sprinkler protected unless an engineering analysis is provided with technical justifications and approved by Civil Defence. ii. The design fire load over 9.3 m^2 floor space shall be restricted to the following and shall be detailed and justified in the smoke engineering analysis. **a.** Office building atrium- fire load shall be 2.1 MW at 12 m of fire perimeter. **b.** Shops and mercantile-fire load shall be 5 MW at 14 m of fire perimeter. **c.** Hotel guest rooms-fire load shall be 0.5 MW at 6 m of fire perimeter. **d.** Hotel Public Areas-fire load shall be 2.5 MW at 12 m of fire perimeter. **e.** Assembly with fixed seating-fire load of 2.5 MW at 12 m of fire perimeter. **f.** Malls and Atrium smoke engineering analysis shall be done by use of computer models.
2. MINIMUM DESIGN PRESSURE DIFFERENCE	i. The minimum allowable pressure difference across the boundaries of smoke control zones shall be as per **Table 10.3.a.** ii. The pressure difference across a barrier must not result in door-opening forces that exceed the maximum force of 133 N. iii. The maximum allowable pressure difference (ΔP) across the door shall be in accordance with **Table 10.3.b.** iv. The makeup air shall not cause door-opening force to exceed allowable limits.

Table 10.3.a.: Minimum Design Pressure Differences Across Smoke Zones

BUILDING	CEILING HEIGHT	MINIMUM DESIGN PRESSURE DIFFERENCE
1. SPRINKLERED	Any	0.05 w.g. (12.5 Pa)
2. NON-SPRINKLERED	3 m	0.10 w.g. (25 Pa)
3. NON-SPRINKLERED	4.5 m	0.14 w.g. (35 Pa)
4. NON-SPRINKLERED	6.5 m	0.18 w.g. (45 Pa)

Table 10.3.b.: Maximum Allowable Design Pressure Differences Across Door

DOOR CLOSER FORCE (N)	DOOR WIDTH 0.81 m	DOOR WIDTH 0.91 m	DOOR WIDTH 1.0 m	DOOR WIDTH 1.11 m	DOOR WIDTH 1.22 m
1. 25 N	113 Pa	102 Pa	92 Pa	84 Pa	78 Pa
2. 30 N	108 Pa	97 Pa	88 Pa	80 Pa	74 Pa
3. 35 N	103 Pa	93 Pa	83 Pa	77 Pa	71 Pa
4. 40 N	98 Pa	88 Pa	79 Pa	73 Pa	67 Pa
5. 45 N	92 Pa	83 Pa	75 Pa	69 Pa	64 Pa
6. 50 N	87 Pa	78 Pa	71 Pa	65 Pa	60 Pa
7. 55 N	82 Pa	74 Pa	66 Pa	61 Pa	56 Pa
8. 60 N	77 Pa	69 Pa	62 Pa	57 Pa	53 Pa