2.11. Smoke Venting System Using Natural Vents on Roof

2.11.1. Smoke venting systems using natural vents to the outside shall comply with the relevant general requirements for smoke control systems as per **Section 2.5** and **Table 10.9.**

Table 10.9.: Smoke Venting Using Natural Vents on Roof

ITEMS	REQUIREMENTS
1. NATURAL SMOKE VENTS	i. Smoke vents shall be listed and approved by Civil Defence as per the test requirements of **Section 6.** ii. The smoke vents shall be dedicated smoke vents, with fail safe option such as the thermal valve, the fusible links and the electrically driven actuation devices. iii. Vents shall be automatically resettable after operation. iv. Hurricane type smoke vents or vents without electrical power and inability to interface with Fire and Sprinkler systems shall not be acceptable for smoke venting purpose.
2. MAKE-UP AIR (REPLACEMENT AIR)	i. Sufficient makeup air shall be available for the natural vents. ii. Makeup air shall be provided by either fans, openings to the outside leakage paths, or the combination thereof. iii. Where mechanical make-up air is supplied, the supply points for the makeup air shall be located beneath the smoke layer interface.
3. LOCATION AND SPACING	i. Smoke vents shall be located on the roof, where smoke plume and reservoir is available vertically above the fire loads. ii. The smoke vent opening shall be sized based on the floor area as per **Table 10.9.a.** iii. The smoke vent distribution shall be based on the volume of the space in accordance with **Table 10.9.a.** iv. In no case the distance between two vents shall exceed **4H**, where **H** is the total floor to ceiling height of the volume. v. Alternatively, in an irregular vent plan, the distance between any point on the floor and the nearest vent should not exceed **2.8H**, where **H** is the total floor to ceiling height of the volume.
4. SMOKE SCREENS	i. Listed and approved smoke curtains should be provided to enhance the performance of the natural smoke vents, where floor area exceeds 4000 m^2 . ii. All smoke curtains unless permanently fixed in position, shall be brought into position automatically to provide adequate smoke-tightness and effective depth. iii. The effective depth in general is 20% of the total floor ceiling height of the space. iv. Minimum headroom of 1800 mm shall be maintained on circulation and evacuation paths when smoke screens or curtains are activated. v. Smoke screens shall be located strategically to channel and create smoke reservoir below the smoke vents. vi. Downstands, complying with 20% of the hazard height shall be permitted in lieu of smoke screens.
5. ACTIVATION	i. The smoke vents shall be monitored by a control panel, interfaced with Fire detection and sprinkler activation. ii. Smoke vents shall also be equipped with actuation devices such as thermal valve, fusible links or other such devices for fail safe actuation. iii. Smoke vents shall be operable manually with manual overriding switch. iv. For natural smoke control system, the natural ventilators shall be a. In the “open” position in the event of power/system failure. b. Positioned such that they will not be adversely affected by positive wind pressure.