2.13. Mechanical Smoke Purging System Using Dedicated Ducting

2.13.1. **The** mechanical Smoke Purging System using dedicated ducting shall comply with the relevant general requirements for smoke control systems as per **Section 2.5** and **Table 10.11**

Table 10.11.: Mechanical Smoke Purging Using Dedicated Ducting

ITEMS	REQUIREMENTS
1. MECHANICAL SMOKE EXTRACT FANS	i. Mechanical smoke extract fans shall be listed and approved by Civil Defence as per the test requirements of **Section 6.** ii. The mechanical smoke extract fans shall be dedicated smoke extract fans and electrically operated. iii. Jet fans shall not be permitted to be part of the mechanical smoke purging system using dedicated ducting. iv. Hurricane type and Natural type smoke extract fans without electrical power shall not be acceptable for smoke purging purpose. v. Smoke extract fans shall comply with **Table 10.1.1.** and shall be approved and listed for effective operation at 400^0C for 2 hours.
2. EXTRACTION DUCTS	i. Ducting for the mechanical smoke extract shall be dedicated, independent of any other system in the building and shall comply with **Table 10.1.3.2.**
3. DESIGN CRITERIA	i. The mechanical smoke purging system shall be designed to achieve 10 air changes per hour in a single smoke zone of not more than 3600 m^2, assuming a single smoke zone is active at any single point in time. ii. Smoke zone areas can vary if justified by an engineering analysis. iii. The capacity of the exhaust fan and any associated ducting should be calculated on the basis that the pressure close to the extract points or discharge points is equal to the external atmospheric pressure.
4. MAKE-UP AIR (REPLACEMENT AIR)	i. Makeup air shall be drawn directly from the external and its intake shall not be less than 5 m from any exhaust discharge openings. ii. Outlets for the supply air shall be adequately distributed over the area. iii. Mechanical makeup air is permitted to be provided at a minimum rate of 85% of the extract air via openings directly to the exterior of the building. iv. Make-up air shall not exceed an inlet velocity of 5 m/s. v. Sufficient makeup air shall be available for the natural vents. vi. Makeup air shall be provided by either fans, openings to the outside leakage paths, or the combination thereof. vii. Where mechanical make-up air is supplied, the supply points for the makeup air shall be located beneath the smoke layer interface. viii. Where there is natural supply of air for areas, openings not less than 2.5 % of the floor area of such story, shall be considered as a satisfactory make-up air for the smoke purge system. ix. However, such 2.5 % of the floor area openings shall be evenly distributed over the entire area.
5. LOCATION AND SPACING	i. Mechanical smoke extract fans shall be located at the exterior of the building. ii. The extraction inlets shall be permitted to be located at the ceiling or on sidewalls, provided the distribution achieves the required 10 air changes per hour. iii. Extracted air shall be discharged directly to the external and shall not be less than 5 m from any air intake openings.