

Table 10.12.: Jet Fan Smoke Clearance System

ITEMS	REQUIREMENTS
7. DESIGN FIRE SIZE	<ul style="list-style-type: none"> i. Where Jet fans are allowed by Section 3. Application of smoke control systems, for parking and tunnels, the design fire size [heat-release rate produced by a vehicle(s)] shall be used to design the jet fan smoke clearance system. ii. The selection of the design fire size (heat-release rate) shall consider the types of vehicles that are expected to use parking or the tunnel.
8. FAN DISTRIBUTION	<ul style="list-style-type: none"> i. The jet fans shall be distributed at a spacing of 2/3 of the tested effective range of the particular jet fan. The tested effective range of the jet fan shall be taken as the distance up to the point at 0.2 m/s of the air-velocity distribution profile. ii. The minimum headroom available from jet fans shall not be less than 2.4 m.
9. SYSTEM ACTIVATION	<ul style="list-style-type: none"> i. Jet fan system shall be monitored by the smoke control panel (SCP). ii. The jet fans system shall be activated by the Fire Detection or Deluge or sprinkler system serving the Jet Fan Zone. iii. The activation of the jet fans system shall at least be confined to the smoke control zone on fire and all its adjacent zones. iv. A fireman cut off and activation (override) switch shall be available on SCP, located at the Fire Command Centre or an approved location. v. If the fire alarm signal is isolated, the exhaust or extract fans and jet fans shall continue to run at high speed. If the Civil Defence personnel stops the fans and restart them, both the extract fans and jet fans shall continue to run at high speed. This arrangement shall continue until the fans are reset to low speed at the smoke control panel (SCP).
10. STANDBY POWER	<ul style="list-style-type: none"> i. The jet fan smoke clearance system, the control panel, the automatic Smoke curtains and extract fans shall be provided with both normal and emergency power. ii. The system power wiring and ducting shall be located and properly protected to ensure a minimum of 60 minutes of operation in the event of activation.
11. ACCEPTANCE CRITERIA	<ul style="list-style-type: none"> i. Not more than 1000 m² shall be smoke-logged for at least 20 minutes, regardless of whether the fire is located within the smoke control zone or across the zone boundaries (Note: After 20 minutes duration, smoke is expected to remain confined within the 1000 m² area). ii. Within this smoke-logged area, there shall be at least 1 viable route for the fire-fighters where the following conditions are satisfied. <ul style="list-style-type: none"> a. Smoke temperature shall not exceed 250⁰C at a height of 1.7 m from floor level. b. Visibility shall not be less than 5 m at a height of 1.7 m from floor level. iii. These conditions shall commence at a distance of 5 m from the fire location in the direction opposite to the induced bulk air flow induced by the jet fans. iv. All other areas outside the smoke-logged area shall be kept substantially free from smoke i.e. smoke temperature not more than 60⁰C and visibility of at least 25 m. v. Note: If the hot smoke test is performed, assessment is to be made on the operation of the jet fans system, movement of smoke towards the extraction or discharge points and smoke spread.