SIGNIFICANCE

Buildings with enclosed, basement, or underground parking facilities require suitable ventilation to ensure adequate air quality for the health and safety of people using the parking areas. Open parking facilities may have natural ventilation and may not require additional mechanical ventilation. Enclosed parking facilities require mechanical ventilation to ensure adequate indoor air quality and the safety of users.

Indoor air quality within parking facilities can present several problems, such as high concentrations of carbon monoxide (CO), oxides of nitrogen (NO_x), sulphur dioxide (SO_2), volatile organic compounds (VOC), particulate lead and particulate matter less than 10 µm (PM10). Exposure to higher concentrations of these chemicals will lead to adverse health effects.

By providing adequate ventilation, the concentration levels of toxic gases are bought within safe limits, ensuring health and safety of parking facility users. Also, by providing adequate ventilation, it helps preventing build-up of gases and particulates in parking areas thereby preventing degradation of coatings and painted surfaces and corrosion of metal parts.

APPLICABILITY

This regulation is applicable to all building types. Refer to Table 101.07(1) in Section One - Administration for detailed applicability levels.

IMPLEMENTATION

An open parking area is one which is used for parking of motor vehicles and which requires uniformly distributed openings on two or more sides for natural ventilation on every level of parking. The total area of openings to the atmosphere must be at least 20% of the total perimeter wall areas for each level of parking. Although openings on a third side are not required, openings on opposing sides are preferred for cross ventilation.

An enclosed parking area of a building is one which is used for parking of motor vehicles but is not an open parking area, i.e. it does not meet the criteria for open parking areas. Mechanical ventilation of all enclosed parking areas is required to compensate for the lack of natural ventilation.

Generally, CO emission rates from conventional fuel powered motor vehicles are substantially higher than emission of NO_x, SO_2 and VOC. Hence, by providing adequate ventilation to dilute carbon monoxide to acceptable levels will also control the other contaminants to safe levels.

Projects with enclosed car parking shall have mechanical ventilation systems to ensure the CO concentration in the enclosed parking area is maintained below 50 ppm, by utilising at least one of the following ventilation systems:

1. **Constant Volume System:** In this system, ventilation fans (as shown in fig. 401.10(1)) are operated at constant speed during the entire occupancy period. It shall be designed to meet the minimum ventilation flow of 6 air changes per hour (ACH).

Fig 401.10(1): Parking Ventilation Fan