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General Design Concept

1. On detection of a fire, the extract fans should immediately respond to provide the required rate of extract.
2. After an appropriate delay, if any, the impulse fans should activate in such numbers as necessary to direct the smoke efficiently towards the extract points for a fire. The delay period should reflect the designed means of escape period.

NOTE 1 - The delay is necessary to ensure that escaping occupants are not compromised by the action of the impulse fan system.

NOTE 2 - The delay employed to achieve this outcome depends on one or more factors:

- *the size and geometry of the car park;*
 - *the number and location of extract and impulse fans;*
 - *the numbers and type of occupants;*
 - *the number and location of suitable exits; and*
 - *travel distance to exits.*
3. Any delay period should be confirmed in agreement with the approving authorities.
 4. The air change rate within the car park should be at least 10 air changes per hour.
 5. Consideration should be given to the location of the means of escape within the car park when locating the position of the extract point(s).
 6. The positions of the stairwell, means of escape corridor and lobby doors, where present, should be co-ordinated with impulse fan locations and impulse orientations to avoid exposing the doors to dynamic pressure effects which might cause smoke to enter the lobby, stairwell and/or corridors.
 7. Care should be taken to ensure that there are no stagnant areas in either daily ventilation or smoke ventilation operational mode.
 8. Provision should be made for the supply of replacement air to the car park.
 9. The velocity of air within escape routes and ramps should not exceed 5 m/s in order to avoid impeding the escape of occupants of the building.
 10. The resistance to airflow and turbulence caused by downturn beams and any other obstruction should be taken into account when siting the impulse fans.
 11. Notwithstanding the requirements for daily ventilation, in the event of fire, the extract fans, where present, should be immediately activated to provide a minimum airflow rate equivalent to 10 air changes per hour within the car park.
 12. Care should be taken to ensure that the number of impulse fans activated does not induce the movement of a volume of air greater than that which the extract fans are capable of extracting.
 13. The system should be independent from any other system (other than any system providing normal ventilation to the car park).