



Department of Public Safety

Division of Fire Safety

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MEMORANDUM

From: Bob Patterson, Deputy Director

To: Inspectors, Architects, Engineers & Contractors

Date: April 18, 2014

RE: Enclosed Parking Structures

This memorandum clarifies the Division's position of providing adequate ventilation in parking structures qualifying as "enclosed". Traditionally enclosed parking structures have required constant mechanical ventilation during hours of normal operation (NFPA 88A 6.3.1). With the consideration of applying of newer technology using carbon monoxide detector/sensor systems; it has been proven to be an effective way to protect the structure from the harmful effects of carbon monoxide and substantially reduces energy cost. NFPA 88A or the following criteria shall be used in the design, installation and maintenance of an enclosed parking garage.

- CO (Carbon Monoxide) shall be monitored with at least one detector/sensor per 7,500 square feet (or as required by the manufacturer of the device, whichever is less), but not less than 2 sensors in any garage floor area, located approximately 5' above floor. Detectors shall be installed and spaced in accordance with the manufacturer's published instructions.
- All "enclosed" parking garages shall be provided with a mechanical exhaust system to maintain a continuous rate of ventilation of .05 cfm per square foot of area of the garage at all times. This can be achieved as an integral component of the installed system or as a separate, monitored stand-alone system.
- When the CO level reaches 25 ppm a signal shall be sent from the controller to energize the Parking Garage exhaust fan(s) and VFD (variable frequency drive) (where applicable) at minimum fan speed. If the CO levels are not reduced after 60 seconds the exhaust fan shall ramp its speed up (where a VFD is present). The fan shall achieve its full speed if CO levels are not reduced within 5 minutes. If a CO level of 50 ppm is reached, the exhaust fan(s) VFD (where applicable) will go to full speed. If a CO level of 75



ppm is reached, an alarm shall be annunciated (both audibly and visually) adjacent to the Mechanical Room in the Parking Garage.

- Mechanical ventilation rate shall be capable of producing an airflow rate of 0.75 cfm per square foot of floor area.
- The coldest temperature of the parking garage shall be monitored and shall automatically activate the ventilation system when the interior of the parking garage temperature is 5 deg. F above the lowest listed operating range of the installed CO detectors.
- As a failsafe, the failure of any one component shall place the entire system into maximum designed operational mode.
- Where a garage is classified as enclosed (0-40% open), permanent fresh supply air openings shall be sufficient to ventilate the garage area, in addition to the garage door opening. Permanent openings shall provide sufficient free area to have a maximum intake face velocity of not more than 300 FPM. Permanent openings may include louvers equipped with fail open motorized dampers.
- Inspection, testing and calibration of the CO sensors (NFPA 720 Chapter 8) and ventilation system shall be accomplished and documented annually by a TQP (Technically Qualified Person). The building owner shall be required to maintain an inspection log for any required system.
- Standard for installation of carbon monoxide Detection and Warning equipment shall be tested and certified to standard UL2075 or Nationally Recognized Testing Agency.
- In all enclosed parking garages, to prevent the migration of CO to adjoining occupiable spaces, a minimum .05 cfm of air flow/ventilation must be maintained at all times. The design must include appropriate measures to control the migration of contaminants from the garage to adjacent occupiable spaces including: weatherstripping/gasketing of the door(s) to the occupiable space; or providing a vestibule between the garage and the occupiable space; or providing sufficient ventilation to prevent migration of contaminants from the garage to the occupiable space. Stairway or habitable areas connected to the parking garage shall be protected with CO detectors.
- When a building has a fire alarm system, the CO detection system shall be connected and supervised, when available, to the building fire alarm system. Where no fire alarm system is present a local visual and audible alarm(s) shall be present in the garage.