



HAZARD ALERT

Asphyxiation in Pits

This hazard alert is based on a hazard information bulletin from federal OSHA published after an employee entered a pit that housed the control valves for a waterfall display in a shopping mall. This alert serves as a reminder that confined spaces may not always appear as we traditionally consider them. Pits with the control valves for waterfall and water fountains in shopping malls present a potential for asphyxiation. These spaces may be permit-required confined spaces regulated by 437-002-0146.



In the shopping mall incident, an employee entered a fountain pit through a 3 foot by 3 foot opening. He descended 7 feet by a fixed ladder to the bottom of the pit to adjust the valves that control the fountain's water flow. He lost consciousness and couldn't exit the space. A second employee attempted rescue but became weak and was also unable to exit. A security guard and a passerby attempted to rescue the two employees but stopped their efforts when they became dizzy. The

second employee was able to call security, and rescue was performed by the fire department.

Both employees were rescued, treated, observed and released. Oxygen levels measured following the rescue were within acceptable ranges. A similar pit located 60 feet away had an oxygen level of 13 percent. In fact, three out of four pits in the mall had oxygen readings of less than

19.5 percent. Detector tube readings indicated carbon dioxide levels in excess of 11,500 ppm. The permissible exposure limit (PEL) for carbon dioxide is 5,000 ppm. The evaluation did not find any presence of flammable gases.



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Asphyxiation in Pits - continued

This is not an isolated incidence. Two similar cases were investigated by the National Institute for Occupational Safety and Health's (NIOSH) Fatality Assessment and Control Evaluation (FACE) program. Both cases (FACE 8637 and FACE 9117) involved employees entering valve control pits and being overcome by an oxygen deficient environment.



The condition described here could exist in any pit in shopping malls, especially if the pits are not routinely opened. Pits of this type may contain sewer traps and other contributing factors

e.g., corroded machinery or rotting vegetation that may aid in the depletion or displacement of oxygen. Carbon dioxide accumulating in pits with sewer traps is a common hazard.



Generally, pits of this kind are confined spaces. Employers must evaluate these spaces under [OAR 437-002-0146](#), and it is likely that many of the pits will be permit-required confined spaces. The rules in [437-002-0146](#) outline procedures to follow when encountering this type of confined space hazard.

