

- i) Standby and Rescue: The Contractor shall ensure that a trained standby person with a fully charged, positive-pressure SCBA and other rescue equipment remain close to the work site.
- j) Written Procedures: The Contractor shall provide specific written confined space procedures for work, observation, and rescue activities.
- k) Respirators: Only air-supplying respirators shall be used in confined spaces. This rule shall be followed because air-purifying units filter only certain types of contaminants, while air-supply units are safe for any atmosphere.

9.18 Hazardous Operations

Policies and procedures for works in hazardous areas shall be adopted:

9.18.1 Below-Surface Work Areas

The principal below surface working areas include drain pipelines, manholes, pumping station wells, and screen chambers. The primary hazards include oxygen deficiency, explosive and toxic gases, falling, cave-ins, and exposure to wastewater and sludge. Virtually all of these belowground areas are confined spaces and in addition to the precautions listed previously, the following shall be provided:

- a) Place warning devices, barriers, barricades or guard rails to protect the public and Contractors before removing manhole covers or gratings,
- b) Locate trucks and other equipment to reduce traffic impediments or hazards. If possible, place trucks or equipment between the working area and oncoming traffic and ensure that vehicles have rotating warning or strobe light. In placing cones, flags or other devices to reroute traffic, comply with regulations.
- c) Always remove and replace manhole covers, with built for purpose hooks or hoists.
- d) Do not allow smoking in any underground structure or enclosure
- e) In areas with a safe atmosphere, ensure that the worker has a safety harness attached to a lifeline or a tripod and hoist before entering the area.
- f) For extended jobs, use forced-air ventilation and repeat the gas tests frequently to ensure continuing safe conditions.
- g) While work progresses in a manhole, station two people at the surface of the opening to handle the lifeline or a tripod and hoist, if necessary.
- h) When an oxygen deficiency or gas is found, purge the below-surface area by forcing fresh air into the enclosure before entering. Maintain adequate ventilation while the area is occupied and frequently repeat the tests.
- i) During an emergency, if a person shall enter an area with an oxygen deficiency or gas, ensure that a supplied-air respirator is worn.
- j) Use extreme care to avoid all sources of ignition if flammable gas is present. Use non-sparking tools and shoes. Any electrical or electronic equipment shall be rated as explosion proof.
- k) Use a portable, nonconductive ladder wherever space allows such use. Otherwise, use a harness and tripod hoist, but only after testing.
- l) When first entering the belowground area, carefully inspect for unsafe condition. Report any defects such as cracks and loose bricks in the roof, walls, floor ducts, and sumps.
- m) Allow only one employee at a time on a manhole ladder; others shall stay clear of the area beneath the ladder.
- n) Check manhole rungs and report weak or faulty rungs.
- o) If a liquid found in a manhole or vault might be flammable, test it by an approved method. If the liquid is flammable, remove it and purge the area before proceeding with any work.