

PLUMBING SHOP

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Ref. Code: P-BM-5

WORKING IN STEAM MANHOLES		
Activity	Hazard Identification	Required Precautions
1. Driving to and from work site.	1. Motor vehicle accident; striking pedestrians, bicyclists, or individuals using rollerblades.	1. Wear prescription lenses, if required, and seatbelt. Verify that all equipment on vehicle is secured properly. Stay alert for pedestrians, bicyclists, and individuals using rollerblades.
2. Lifting manhole cover.	2. Back strain or overexertion from lifting heavy weight; dropping cover on fingers or feet.	2. Use lifting tools to remove and slide cover. Know your weight-lifting capacity and get help if needed. Lift using leg muscles. Keep back straight. Use two people to lift cover when necessary.
3. Preparing to work in manholes.	3. Burns from steam or hot water.	3. Inspect area for water or steam leaks before entering. Take appropriate measures as needed. Lock out all sources of steam and condensate to manhole when repairs are to be made. Verify inactivity of lines by opening purge valves.
4. Turning valves on or off.	4a. Suffocation due to lack of oxygen if water hammer causes pipe to burst; burns from steam, hot water, or hot pipes.	4a. Operate the valve remotely if possible, if you must enter the manhole to operate the valve, reduce the possibility of injury by optionally wearing protective clothing: coveralls, boots, head covering, gloves, and/or respirator.
	4b. Hitting self or others with wrenches.	4b. Handle long-handled wrenches carefully to avoid hitting self or others.
5. Working in manholes.	5a. Serious illness due to lack of oxygen or exposure to methane gas.	5a. Before working in confined area, verify that it is safe by monitoring air (get confined space permit as required). While working, always ventilate area using fan. In vertical tunnels, always use tripod and harness in case worker becomes ill and must be pulled up. Always have at least one person outside confined area to monitor safety of those working inside.
	5b. Slipping/falling from ladder.	5b. Repair ladder rungs when necessary. Wear rubber boots. Climb/walk slowly and carefully to maintain footing.
	5c. Dark work area.	5c. Use flashlights or droplights plugged into GFCI-protected outlets to light up area.
	5d. Slipping.	5d. Pump out surface water before

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		entering manhole.
	5e. Getting hit by equipment/objects being lowered into manhole.	5e. Do not stand under equipment being lowered in. Use guide rope to guide object into hole.
	5f. Tripod tipping over when equipment is being lowered or lifted.	5f. Be sure tripod is adequately supported. Manually support if necessary.
	5g. Electric shock; electrocution.	5g. Always use GFCI protectors.
	5h. Burns from hot pipes or concrete manhole walls.	5h. Wear protective clothing: long sleeves or welding jacket.
6. Working near (above) manhole.	6. Falling into manhole.	6. Orient your work so that you are facing the hole. Never work with your back to an opening.
7. Removing bolts, valves, and pipes.	7. Getting hit by falling pipes, valves, or fittings.	7. Wear a hard hat. Cut using a torch. Stand back so pipe or valve does not hit you. Support pipe from underneath or with cable before cutting through it to prevent it from dropping.
8. Storing or transporting compressed gas cylinders and oxygen/acetylene torch.	8a. Explosion of compressed gas.	8a. Do not allow cylinder valves or regulator assemblies to come into contact with grease, oil, or lubricants.
	8b. Rupture of cylinder if valve breaks off.	8b. Always install protective valve cover. Always secure cylinder to a stand or a wall.
9. Using oxygen/acetylene outfit.	9a. Regulator diaphragm rupturing when torch is turned on.	9a. Turn regulator adjusting screw counterclockwise to disengage plunger before turning on cylinder.
	9b. Acetylene explosion.	9b. Stand acetylene tank vertically before using.
	9c. Torch explosion.	9c. Install spark arrestors on torch and regulators.
	9d. Burning self.	9d. Wear gloves, overalls, and leather chaps. Always burn away from yourself.
	9e. Starting a fire.	9e. Always keep fire extinguisher nearby and have a person stand by as a firewatch. Must have a burning permit.
	9f. Burns form metal dripping on self.	9f. Do not reach to burn; always work level with torch.
	9g. Inhalation of fumes.	9g. Work in a well-ventilated area. Use exhaust fans and tubes for ventilation.
	9h. Flash burn to eyes.	9h. Wear burning goggles to protect eyes.
	9i. Burning tar coating and/or	9i. Tar coating is usually wrapped in

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	galvanized coating creates a poisonous gas.	cardboard. Silver coating on pipes or plates indicates galvanized coating. If possible, use reciprocating saw to cut instead of burning with torch. If it is not possible to saw the pipe or plate, the area must be very well ventilated with incoming and outgoing air. Wear air pack to avoid breathing fumes.
	9j. Buildup of acetylene from leaks.	9j. Check hose and connections for leaks and damage before using.
10. Using power tools, such as grinder or portable saw.	10a. Electric shock; electrocution.	10a. Inspect cord before use. Keep power cord away from work area. Plug tools into GFCI-protected outlets. Do not use electric tools if work area is wet. Prevent cord from lying in water.
	10b. Tripping over or cutting power cord.	10b. Keep power cord away from work area. Keep cord slack out of pit.
	10c. Injury from flying bits of material.	10c. Wear safety glasses, and optionally a dust mask, gloves, long-sleeve shirt and/or coveralls.

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	10d. Saw catching; severe lacerations or abrasions; dismemberment.	10d. Keep tools in good condition. Inspect tools before use. Verify that guards work properly. Do not put hands near blades. When using tools, make sure you have a good center of gravity and are properly balanced. Hold tools securely with two hands to maintain control.
11. Using hand tools including large wrenches.	11a. Cuts, pinches, smashes, punctures, severing of fingers.	11a. Keep tools in good condition. Inspect tools before use. Ear safety glasses. Work away from yourself. Use normal caution required for all hand tools.
	11b. Wrench slipping and worker hitting self or others with wrench or dropping wrench on self or others.	11b. Wear hard hat. Handle tools carefully with dry gloves or hands. Make sure you have a firm footing so you do not fall.
12. Welding.	12a. Getting flashed.	12a. Wear welding mask. Prevent reflected arc rays by changing angle at which you are working. If it is not possible to change your angle, put up a nonreflective board on the wall behind you. All non-essential personnel should leave the area.
	12b. Getting burned.	12b. Wear protective clothing: welding jacket, gloves, and welding mask.
	12c. Hot metal bouncing up into face or eyes.	12c. Wear goggles or safety glasses under welding mask.
	12d. Fire hazard from flying sparks.	12d. Remove flammable materials from work area. Wear welding jacket. Have coworker fire watch with an extinguisher.
	12e. Inhalation of fumes.	12e. Use fans to ventilate area. Wear respirator.
	12f. Electric shock; electrocution.	12f. Wear dry clothing. Make especially sure that gloves are dry. Keep leads in good repair and out of standing water. Do not stand in standing water.

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	12g. Injury to others.	12g. Be aware of other workers or pedestrians in the area. Block welding area with a screen.
13. Lifting heavy weight.	13. Back strain; overexertion.	13. Know your weight-lifting capacity and get help if needed. Lift using leg muscles. Keep back straight. Use mechanical lifting equipment. Ensure safe and adequate access to mechanical room.
14. Working in area of pedestrian traffic.	14. Pedestrians falling into trench or pit; other injuries to pedestrians.	14. Make sure work area has been barricaded properly and signs posted to alert pedestrians to dangers.
15. Working in area of vehicular traffic.	15. Workers being struck by vehicles.	15. Make sure area has been barricaded properly to prevent traffic from coming near work site.