

17—Building Construction and Maintenance

ground structures

The use of open-flame devices, such as solder pot furnaces and welding equipment, should not be permitted in or near manholes, tunnels, or trenches, in which tests indicate the presence of flammable gas

Waste disposal facilities. Waste disposal trenches of reinforced concrete have been known to settle, the side walls separating from the bottom slab of the trench and allowing water to seep out. Such seepage carries earth with it so that the trench and building footings may be undermined and the support may be removed from the underside of the floor slab at ground level.

Structural failures may result also, if waste disposal trenches are not kept in good repair. If trenches are lined with lead, acid-proof brick, or other lining, they should be checked for leakage.

Other underground pipelines. When men are to work on an underground pipeline, it is important that its approximate location be known before digging is begun. The sides of all trenches more than 5 ft in depth should be shored unless they are sloped to the angle of repose or unless the trench is in solid rock. No excavation should be made immediately adjacent to or below the level of a pipeline because of the danger of cave-in and of failure of the line, which may be carrying liquids or gases vital to plant operation. Workmen cutting into or working on a pipeline should know what the line is carrying and the dangers involved.

Before repairs are begun, pipelines should be completely drained, the connecting systems blanked off, and the valves closed and locked. Whenever a workman opens a line or valve, he should watch for back pressure in the line.

Workmen should be cautioned to open valves slowly and to equalize pressures slowly. Sudden changes in pressure can wreck equipment and endanger lives.

After a steam valve has been opened completely, it should be backed off at least one-half turn so that thermal expansion will not lock the valve in the open position.

When pipe or trenches must remain open overnight, they must be protected by barricades, signs, and lanterns.

Lighting systems

All lighting systems—fluorescent, incandescent, or mercury vapor—require regular maintenance to maintain maximum light output. (For design factors, see section on Lighting in the preceding chapter.)

To reduce the number of persons who might be exposed to flying glass and dust if lamps are broken, fixtures can be relamped on weekends or at other times when personnel are not in the area. Gloves should be worn by those who handle the lamps.

To dispose of a few lamps, put them in special containers for regular rubbish removal or wrap in several thicknesses of newspaper or wrapping paper, place outdoors in a disposal container, and crush with a heavy stick or shovel. Large numbers of tubes should be broken in commercially available machines and in a ventilated enclosure equipped with an exhaust and a dust collector. Captured dust should be wet down and removed.

Lamp burn-outs and depreciation, dirt accumulation, voltage drops, and light absorption by dirty walls and ceilings will cause a loss of light. Because dark or dirty surfaces absorb as much as 80 percent of the light that strikes them, a regular cleaning schedule is important. For dirty areas, this may be every two weeks.

A light meter can be used to check conditions, and the readings then can be checked with the minimum standards of illumination for industrial interiors, ANSI A11.1, *Practice for Industrial Lighting*. These standards, recommended by the Illuminating Engineering Society, are summarized in the table entitled Levels of Illumination in Chapter 46, "Safety Engineering Tables." These values can be used as a guide to formulate a regular maintenance program. If cleaning lamps and replacing burnouts fail to increase the illumination to standard levels, then a qualified illuminating engineer should be called upon to make a complete survey of the present system.

Fluorescent fixtures should be of the type that locks the tubes in place. Older fixtures should be equipped with shields or grids beneath the tubes to prevent the tubes from falling if vibration should loosen them.

Where reflectors or glassware cannot be taken down, the current should be shut off and a cleaner that requires no rinsing should be