

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

SECTION G55.090.1
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UNDERGROUND CABLE

PRECAUTIONS

Contents	Page
1. General	1
2. Protection of Manholes	1
3. Gas in Manholes	2
4. Protection of Cables	4
5. Open Flames	4
6. Cable Reels	4

1. GENERAL

- 1.01 This section outlines the precautions to be followed when working at open manholes.
- 1.02 The information previously contained in Section G55.090, which is replaced, has been rewritten and brought up to date. In addition, a change to further restrict the use of open flames at manholes has been included.
- 1.03 Refer to G10. sections of the practices for additional information on guarding work areas.

2. PROTECTION OF MANHOLES

- 2.01 Open manholes should be guarded at all times with a manhole guard or barricade. These and other warning devices should be set up at the manhole before the cover is removed.
- 2.02 Where practical, all work areas should be roped off by use of one-inch cotton tape or equivalent.
- 2.03 Kerosene lanterns should be clean, adjusted and fueled before using. Lanterns should be displayed between sunset and sunrise and when required on dark days. When lanterns are to be used to protect a work area or equipment overnight, they should be lighted not later than 1/2 hour before sunset. It is desirable to light and place the lanterns about

5 minutes before leaving the location which will afford an opportunity to observe their operation.

2.04 Along railroads, near bridges, or at other points where red lanterns might be confused with operational signals, the supervisor should determine the type of warning to be used. Also, amber color in flasher lenses may be required by local laws or ordinances in certain locations.

2.05 Initial warning devices for traffic control should be placed sufficiently ahead of work areas to give a vehicle driver time to stop, if necessary, before reaching the work area. Where, because of hills, curves, etc., a vehicle driver cannot see the work area from the vicinity of the initial warning sign, a high level warning mast with flags and/or flasher should also be placed at this location.

2.06 At locations such as crowded streets, dangerous intersections, highways, etc., an additional workman or the assistance of local or state police may be needed to supplement the approved warning devices. A supervisor should be consulted in regard to extra help for this purpose. Such a workman should be keen and alert and equipped with a flag in the daytime and a lantern at night.

2.07 Arrange material in the vicinity of the manhole in such a manner that there will be no probability of its falling into the manhole or unnecessarily interfering with pedestrian or vehicular traffic. **Practice good housekeeping.**

2.08 Manhole ladders shall be inspected each time before using and shall be replaced promptly when found in a deteriorated condition. When the bottom of the ladder is in water, or otherwise invisible, it should be drawn up for inspection.

2.09 If, at the conclusion of the day's work, it is desired to leave manhole guards or barricades near the work location, secure them to a pole, post or a trailer where they will be off highways and least likely cause interference to property owners and pedestrians. Do not secure guards or barricades to corner poles, fire plugs, nor to poles carrying either fire or police call boxes.

3. GAS IN MANHOLES

3.01 **Every manhole or cable vault opened for the first time during the day or reopened after having been closed for any length of time, shall be tested to determine if gas in dangerous quantity is present or if there is an oxygen deficiency. A manhole shall be entered only after test indicates that the atmosphere is safe.**

3.02 Tests shall be made immediately upon removing the cover. Never enter a manhole that has not been tested for the presence of gas.

3.03 When it is known or suspected that nitrogen gas has escaped into a manhole, oxygen deficiency tests shall be made prior to entrance in accordance with the precautions for underground and buried work, and the instructions on testing manhole atmosphere given in the G10 Division of this series. Manholes with an oxygen deficiency must be ventilated.

3.04 **When gas is found in the initial test, the manhole shall be ventilated with a power blower** and test satisfactory before the manhole is entered. While working in a manhole being ventilated with a power blower, test the atmosphere every hour. If gas is found on a test with the blower operating leave the manhole at once and notify your supervisor. The blower shall remain in operation until the work in the manhole is completed and the cover is replaced.

3.05 Operate the blower outside of the manhole covering. If the blower stops, leave the manhole at once and do not re-enter until ventilation has been restored and the atmosphere tests satisfactory.

3.06 In placing cable, if the test for gas indicates a gassy condition in the conduit run, it is desirable to consult a supervisor regarding the possibility of opening several manholes in advance so as to have them ventilated before setting up for the placing operations.

3.07 In working in manholes where a power blower is not being employed it may be desirable to ventilate the manhole with a sail provided sufficient breeze is blowing. The sail can be a strip of muslin, wide enough to extend across the manhole opening fastened to the top rail of the manhole guard and tied at the bottom to cable racks in the manhole. **The sail is not a substitute for blower operation.**

3.08 If gas is entering the manhole from adjacent subway sections, all ducts should be plugged as outlined in other sections of the Bell System Practices.

3.09 When household gas is detected in a manhole or cable vault, the matter should be reported to the local gas company in accordance with local routine to ensure that the condition is taken care of. The presence of gasoline should be reported to your supervisor.

3.10 If work is done with a truck not equipped with an overhead exhaust and the truck is stationed near a manhole, care should be taken to direct the exhaust gases of the

truck away from the manhole opening. Exhaust from gas driven generators, blowers, pumps, etc., shall be directed **away** from the manhole.

4. PROTECTION OF CABLES

4.01 When working in manholes, care should be taken to prevent damage to cables in setting up the pulling apparatus or in placing tools of any kind. **Do not step on cables when entering or leaving a manhole.**

5. OPEN FLAMES

5.01 **Open flames, torches, lighted cigars, cigarettes or pipes shall not be brought within 10 feet of an open manhole, into a cover or tent over a manhole opening nor taken into a manhole even though tests indicate that the atmosphere is satisfactory.** Only approved lighting and heating equipment shall be used in a manhole or vault.

5.02 **Furnaces, kerosene lanterns and other open flames shall be kept at least 10 feet from the manhole opening.**

5.03 Since the breaking of an electric circuit usually results in an arc, connections and disconnections of electric lighting equipment should not be made in the manhole. When in use, batteries should be located outside of the manhole.

6. CABLE REELS

6.01 Reels that are delivered to the job which are not to be set up immediately for placing operations should be securely blocked or secured to a pole or other substantial support to prevent rolling. Do not leave them on a grade or in a traffic lane if this can be avoided. When it is necessary to leave a reel on a grade, cant it against the curb and block it so that it cannot roll downhill.

6.02 Cable reels left on streets or highways overnight shall be marked in accordance with local regulations. Otherwise, attach red lanterns lighted not later than 1/2 hour before sunset.