WESTERN UNDERGROUND COMMITTEE
GUIDE 3.4 (3.4/00/0565)

PLASTIC CONDUIT AND FITTINGS PLACING INSTRUCTION

NOTE: This "Guide" summarizes the opinions, recommendations, and practices of the Western Underground Committee members and is issued only to assist these members in preparing their own specifications, or in making recommendations to specification agencies. Thus, this "Guide" may not reflect the complete requirements of each individual utility and is not binding upon them.

1.0 SCOPE

This standard provides placing instructions for plastic conduit and fittings.

2.0 BASIC MATERIALS

The plastic conduit and fittings used in this standard are those designed to meet Western Underground Committee Model Specification No. 3.1, Plastic Conduit and Fittings. Refer to the latest issue of this standard.

3.0 INSTALLATION

3.1 Preparation

a) Make certain that all foreign matter has been wiped from both the conduit and the fittings at the joints.

b) The conduit should not insert over ¾ way into fitting to make a good interference cement weld.

c) Where practical to do so, change conduit sizes at manholes, splice boxes, pull boxes, etc. (See section 8.1)

3.2 Cutting – Use a hacksaw to cut conduit ½" to 1 ½" diameter, or fine tooth wood saw on sizes over 2" diameter. A hacksaw can be used on all sizes. The conduit must be cut straight. Clean off burrs.

3.3 Mechanical Damage Minimization

a) Conduit should not be left exposed in an open trench longer than absolutely necessary.

b) Provide support for the full length of conduit when transporting long lengths.

c) Do not permit unsupported overhangs.

3.4 Cementing Conduit

a) Apply a liberal and uniform coat of cement to the conduit for the full length of the depth of the socket and apply a uniform coat to sufficiently wet the socket of the fitting. Excess cement on the fitting should be avoided as it is wiped into the joint and tends to weaken the pipe.

b) Work fast.

c) Slip conduit straight into the fitting with a slight twist until it bottoms. Hold the joint for 15 seconds, (1 minute in extreme cold weather), so that the conduit does not push out of the fitting. Do not twist or drive conduit after inserting is complete.

d) The joined members shall be cured undisturbed for five minutes or more before they are handled or transported. After this initial cure, care must be exercised in handling or transporting to prevent twisting or pulling the joint. (In cold or damp weather, this interval should be increased to allow for the slower evaporation of the solvent.) All ducts should be assembled above ground and allowed to lay undisturbed for the weld cure before being lowered into the ditch.

e) Be sure to wipe off the excess solvent that is left on the outer shoulder of the fitting. Plastic bristle brushes should not be used. On large diameter conduit, the brush should be a minimum of 1 inch wide.

f) Use only small cans of cement since it dries rapidly. Keep container covered when not in use and away from excess heat and flames.

g) Another fitting or duct section can be added to the opposite

end within two or three minutes if care is exercised in handling so that strain is not placed on the previous assembly.

h) Any joint included in section of conduit to be bent in ditch may be made up above ground and allowed to lay undisturbed for 12 hours or more before installation.

i) The plastic joint must be held rigid after insertion for the cure period. In cases where a plastic connection is made with the union under stress due to misalignment or other factors. This will relieve stress on the joint until the conduit is backfilled or encased.

4.0 TEMPERATURE

4.1 All plastic conduit and fittings to be joined should be exposed to the same temperature conditions for a reasonable length of time before assembly.

4.2 Precautions – Due to expansion and contraction of plastic duct of 1 ½" per 100' for every 20° F change in temperature, the following precautions should be taken:

a) Allow extra conduit footage at each tie-in for contraction when duct temperature is higher than that of earth; or extra room for expansion, if the reverse condition exists.

b) Backfill from center of ditch toward ends or from one tie-in point toward the other end of duct run.

c) After ditch is backfilled and compacted and duct temperature is the same as that of surrounding soil, lines may be cut off and matched up for connections with tie-ins. All conduit tie-ins entering manhole, vault, or handhole walls shall be grouted into walls and concrete encased for a minimum distance for 15" outside of walls.

5.0 TRENCH

5.1 The trench must be uniformly graded and the bottom rock free, and of select material. The backfill shall be:

a) Type A select fill 6’ or more surrounding and above direct buried conduit.

1) Sand or sand slurry.
2) Decomposed granite
3) Rock free sandy loam

b) Type B select fill for the remainder of the backfill.

1) Mixture of sand or earth and rock, rock not to exceed 1” in diameter and not to comprise more than 50% of material by volume. All backfill should be placed and compacted in layers.

c) Earth or sand or a mixture may also contain rock not to exceed 1 inch in diameter and not more than 50 percent by volume.

5.2 Backfill shall be made in layers of 6” and tamped or flooded after a 6” cover is in place. It shall be dense and compacted sufficiently to prevent future settling. It must meet local ordinances.

6.0 CONCRETE ENCASEMENT

6.1 Tie and fasten all conduit to prevent floating.

6.2 Spacers shall be placed at 10’ intervals or less for all sizes of conduit (see section 10.1).

6.3 Minimum spacing of conduit as required.

6.4 Minimum concrete coverage shall be 3” on top, bottom and sides of conduit.

6.5 Backfill will be as specified in this standard after concrete has cured.

6.6 Conduit is subject to temperature rise as concrete cures. Therefore, allow free end to expand. This can be accomplished by pouring concrete from center of run or from one tie-in point.

7.0 CEMENT AND THINNER

7.1 Use only furnished or recommended cement from conduit fabricator.

7.2 Do not use thinner.

8.0 CONDUIT FITTINGS

8.1 Use approved "male-male" reducer coupling when changes in conduit sizes are required.

8.2 Use approved adapter coupling to convert to other types of conduit.

9.0 CONDUIT TERMINATION

9.1 Cap free end of conduit terminated in ground with a plastic cap.

9.2 Terminated ends of conduit must be free of support into the manhole for a distance of at least 10 feet. This is to permit alignment of the conduit and the knockout opening. The conduit will be supported inside the manhole with proper spacing and will be cut to length after the concrete envelope has cured.

10.0 CONDUIT SPACES

10.1 Duct spacers should be of the type recommended by conduit manufacturers and approved by the utility. Horizontally and vertically, spacers should be placed as follows:

Duct Size	Spacing
0" to 2"	10 feet
3" & 3-1/2"	8 feet
4" to 6"	6 feet

10.2 Base spacers are to be used.

10.3 Grid spacers when used must be 12 inches or more distance from any coupling or joint. When conduit is assembled above ground, the grid spacer may be supported in vertical position by use of a bent re-bar inserted in holes top of adjacent spacers.

10.4 Grid spacers should not be located at the center of a radius bend: (1) On fabricated bends, locate the spacer in the tangent free of the coupling, (2) On trench formed radius, place the spacer midway between the tangent and center of the bend.

11.0 REVISIONS

11.1 Suggestions for revision and correspondence concerning this specification should be addressed to the:

Chairman,
Western Underground Committee.
(For address, see any member of the committee)

11.2 This specification may be reproduced in whole provided proper credit is given the Western Underground Committee.