

PROCEDURES

EXCAVATION / BACKFILL / COMPACTION

5.0 PURPOSE

The requirements for backfill and compaction pertain to new construction and repairs and are applicable any time the pipeline is uncovered and the back fill is replaced.

5.1 SCOPE

- A. Excavation
- B. Protection against shear loads
- C. Padding & Shading
- D. Backfill Material
- E. Compaction
- F. Trench Breaks

5.2 EXCAVATION

- A. The operator/contractor shall be responsible to mark planned excavation area and call the appropriate **One-Call System**. Appropriate time shall be allowed for applicable locates to take place before any excavation begins.
- B. Dust control shall be maintained throughout the job by watering and clean up of materials creating the dust.
- C. Noise control is the responsibility of the company/contractor performing the work. All work equipment shall have appropriate noise muffling devices. Local noise ordinances must be followed throughout the job.
- D. The Company/contractor shall limit normal hours of operation between the hours of 7:00 AM and 7:00 PM unless emergency conditions warrant otherwise.
- E. The company/contractor shall remove all foreign water entering the trench. **Refer to Section E-10**
- G. All excavations shall be clearly marked with barricades / cones / caution tape to protect the general public and keep unauthorized individuals from entering work site. **Section B-5, Traffic Safety**

5.3 PROTECTION AGAINST SHEAR AND BENDING LOADS

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- A. Protective measures such as protective sleeves and properly placed, compacted backfill are necessary at a connection where an underground polyethylene branch or service pipe is joined to a branch fitting such as a service saddle, branch saddle or tapping tee on a main pipe.
- B. Protective measures are necessary for all types of plastic and non-plastic branch connections including heat fusion, mechanical, and electrofusion types.
- C. A protective sleeve and properly placed, compacted backfill are generally used together, but whether or not a protective sleeve is installed, the area surrounding the connection must be embedded in properly placed, compacted backfill to protect the polyethylene pipe against shear and bending loads.

5.4 **PADDING AND SHADING**

- A. When protection from the back-fill material and operation is required, the pipe must be padded a minimum of 6" under and shaded a minimum of 6" over the pipe.
- B. Shading and bedding shall be a sandy/silty material smooth, free of rocks, and must be able to sift through a 3/8" screen. In certain conditions additional shading may be required.

NOTE: **Manufactured material, such as crushed rock, should not be used due to sharp edges. If only manufactured material is available, close inspection is necessary.**

5.5 **BACK-FILL MATERIAL**

The back-fill material and its compaction shall meet the requirements of the political subdivision under whose jurisdiction the work is to be done.

- A. In general, back-fill material shall be of the same material as that removed from the excavation except:
 - 1. Where no-shrink material, or other imported material is required by the governing authority.
 - 2. Where material is of such a nature as to be harmful to the pipe. Avoid rocks larger than 3" in diameter back-filled in the first lift above the shading material.
 - 3. Where wet conditions have rendered the back-fill material too soft for adequate support.

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5.6 COMPACTION

- A. Excavations shall be compacted as required by the City of Victorville or the Operator's standard as may apply.
1. Adequate support for the pipe must be provided during the back-fill process to avoid damage to pipe caused by torsion forces.
 2. Pay particular attention to material providing adequate support under tees, particularly service / tap tees.
 3. No lift shall be greater than 12".
 4. Where slurry cement backfill is necessary it shall consist of a fluid, workable mixture of commercial quality concrete sand, cement and water. Not less than 94 pounds of cement shall be used for each cubic yard of material product.
 5. An appropriate aggregate base equal to any removed shall be place back at the top of the trench in preparation for asphalt or as required by the political subdivision.
- B. The purpose of compaction is to prevent trench failure i.e. sinking, washout, etc.
- C. Acceptable methods of achieving compaction are:
1. Wheel roll (non-paved and non-travel areas only)
 2. Mechanical and air tampers
 3. Water jetting
 4. Compaction wheel
- D. Outside laboratory testing should be utilized when practical
1. Shall meet the requirements of the City of Victorville.

5.7 TRENCH BREAKS

Where uphill trenches may be subject to heavy water run-off it may be necessary to install trench breaks to prevent loss of backfill material which may subject the gas pipe to potential damage.

- A. Slope grade exceeding 20%:
1. Trench breaks shall be placed at intervals of 100 linear feet in separation.
 2. Trench breaks may consist of sand bags, clay bags, and / or other material sufficient to slow potential erosion of the trench backfill materials.
 3. Trench breaks shall be carefully placed under and around the gas pipe as not

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- to damage the pipe.
4. Over excavation of the trench bottom and side walls at the placement location will assist in holding the trench breaks in place.