stored in a way to protect it from mechanical damage (slitting, puncturing, etc.).

2.3.2 **Thermal Expansion**. The pipe shall be snaked in the trench bottom with enough slack to provide for thermal expansion and contraction. The normal slack created by residual coiling is generally sufficient for this purpose. If, however, the pipe has been allowed to straighten before it is placed in the trench, six (6) inches (152 mm) per one hundred (100) feet (30,480 mm) of length shall be allowed for this purpose. [UPC 313.0]

2.3.3 **Exposed Piping**. Vertical piping may extend a maximum of twenty-four (24) inches (610 mm) above grade when located on the exterior of the building or structure and protected from mechanical damage to the satisfaction of the Administrative Authority. Where exposed to sunlight, the pipe shall be wrapped with at least 0.040 in. (1.02 mm) of tape.

2.4 **Trenching and Cover.** Trench bottoms shall be uniformly graded and shall be of either undisturbed soil or shall consist of a layer or layers of compacted backfill so that minimum settlement will take place. [UPC 315.0]

2.5 Joints

2.5.1 **General**. Polyethylene pipe joints shall be made as follows (see Section 2.2.1). ASTM D 2239 polyethylene piping shall be joined only through the use of mechanical fittings. ASTM D 2737, D 3035 or F 714 polyethylene pipes shall be joined by butt fusion of pipe to pipe or through the use of butt fusion fittings.

2.5.2 **Procedure**.

2.5.2.1 Mechanical fittings for joining only D 2239 PE pipes shall be made as follows:

Step 1. Pipe shall be cut square, using a cutter designed for plastic pipe, and chamfer ends to remove sharp edges.

Step 2. Place two strap-type stainless steel bands over the pipe.

Step 3. Check that fittings are properly sized for pipe, as tubing fittings are not of proper size.

Step 4. Force the end of the pipe over the barbed insert fittings, making contact with the fitting shoulder (the end of the pipe may be softened by placing in hot water).

Step 5. Position the clamps 180° apart and tighten evenly, so as to make a leak-proof joint. [UPC 316.1]

2.5.2.2 Butt fusion for joining only D 2737, D 3035, or F 714 PE pipes shall be made as follows:

Step 1. Install the pipe/fitting in the fusion machine.

Step 2. Face the pipe/fitting ends to mechanical stops.

Step 3. Align the OD's of the ends to be fused.

Step 4. Heat the ends using in accordance with ASTM F 2620.

Step 5. Remove the heater and apply the fusion force specified in ASTM F 2620.

Step 6. Maintain the fusion force on the joint until it is cool per ASTM F 2620.

2.5.3 **Other Joints**. Polyethylene pipe shall not be threaded. Joints in polyethylene pipe made with adhesives or "solvent cementing" techniques are prohibited.

2.6 Materials

2.6.1 **Location.** Polyethylene piping shall be installed only outside the foundation of any building or structure or parts thereof. It shall be buried in the ground for its entire length except vertical piping may be extended above grade per Section 313.3. It shall not be installed within or under any building or structure or mobile home or commercial coach, or parts thereof. The term "building or structure or parts thereof" shall include structures such as porches and steps, whether covered or uncovered, roofed porte-cocheres, roofed patios, carports, covered walks, covered driveways, and similar structures or appurtenances. [UPC 604.0]

2.6.2 **Harmful Materials**. Polyethylene that has been in contact with gasoline, lubricating oil, or aromatic compounds, shall not be installed.

2.7 Installation.

2.7.1 **Pipe.** Kinked pipe shall not be used. PE pipe shall not be flared. [UPC 609.0]

2.7.2 **Fittings.**

2.7.2.1 Compression type couplings and fittings shall be used only when installing one and on-half (1-1/2) inch (38 mm) and larger pipe. Stiffeners that extend beyond the clamp or nut shall not be used. [UPC 606.0]