



Standard Guide for Installing Plastic DWV Piping Suspended from On-Grade Slabs¹

This standard is issued under the fixed designation F2536; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide provides procedures for the installation of DWV piping in buildings that are built where soil conditions require the use of pier or piling supported grade beam construction or in filled ground where the soil compaction is less than 95 %. These procedures are intended to ensure that the DWV piping suspended from the on grade concrete slabs is not damaged or destroyed by movement of the soil or fill under the slab after the building is completed and occupied.

1.2 In this type of construction, the area within the grade beams is filled with soil up to a level that allows the concrete slab to be poured directly on the fill without a supporting form. In this process the sanitary waste piping is installed by trenching into the fill, and then putting hangers with support rods on the pipes as they are installed. The hanger rods extending upward must be long enough so that the top of the rod will be embedded in and anchored in the concrete.

1.3 The hanger rods are intended to provide adequate strength and corrosion resistance to assure long term service.

1.4 The details of installation are intended to ensure that the rods remain vertical, that they extend into the concrete an adequate amount and that the upper ends are terminated so that they have adequate “pull out” strength.

1.5 The details of backfill are intended to limit or minimize the loads on the a suspended piping. These loads result from consolidation or movement of the soil/fill beneath the slab.

1.6 The values stated in inch-pound units are to be regarded as standard. No other units of measurement are included in this standard.

1.7 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

¹ This guide is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.63 on DWV.

Current edition approved Feb. 1, 2011. Published March 2011. Originally approved in 2006. Last previous edition approved in 2006 as F2536 – 06b. DOI: 10.1520/F2536-06BR11.

2. Referenced Documents

2.1 *ASTM Standards:*²

D653 Terminology Relating to Soil, Rock, and Contained Fluids

D2665 Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings

F412 Terminology Relating to Plastic Piping Systems

3. Terminology

3.1 *General*—Definitions used in this guide are in accordance with Terminologies in F412 and D653 unless otherwise indicated.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *grade beams*—concrete beams around the perimeter of a building and within the building. They support the slabs, the exterior walls and interior bearing walls.

3.2.2 *piers & pilings*—these are the supporting members that carry the grade beams and transmit the loads to adequate bearing soils and strata.

3.2.3 *on grade slabs*—these are reinforced concrete slabs poured directly on the fill without a form under the slab. They are supported by the Grade Beams.

NOTE 1—PPGB is the acronym for pier piling grade beam construction covered by this guide.

4. Significance and Use

4.1 This guide is for use by designers, specifiers, installation contractors, regulatory agencies, owners and inspection organizations who are involved in these piping installations in buildings of this type.

5. Materials

5.1 The plastic piping used in these systems is listed in the Plumbing Codes as ASTM D2665.

NOTE 2—In this guide there is reference to only D2665 pipe (schedule 40 solid wall) because beam load tests reveal that the cellular core pipes

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

have much less strength than the solid wall pipe.

5.2 The hangers to be used shall be the clamp-on type, shall match the pipe size and they shall be made of hot dipped galvanized steel or stainless steel. The hanger shall be fastened to the rod so that the rod is held in a vertical position.

5.3 The rods shall be stainless steel and shall conform with the sizes shown in **Table 1**. Rods shall extend up through the fill and shall terminate with a bend or hook that will be embedded in the slab.

5.4 Hangers and rods shall be placed at four-foot centers maximum. Each fitting shall have a hanger.

6. Installation

6.1 Piping shall be installed at the prescribed elevation as the fill is being placed within the grade beam area or the piping shall be installed in trenches cut into the fill.

6.2 Clamping pipe hangers with rods extending upward shall be installed as the work progresses. The clamping hangers shall be fastened securely to the pipe or fitting and shall hold the rod vertical.

7. Limiting Load on Piping

7.1 In order to minimize load on the piping, it shall be installed as close as possible to the underside of the slab. It shall be carried at this elevation out to and through the exterior grade-beam (foundation wall) before dropping to meet the sewer elevation. Pipe shall be installed at the appropriate grade.

TABLE 1 Hanger Rods

Pipe Sizes	Minimum Rod Size
2 in. and smaller	3/8 in.
3 in. and 4 in.	1/2 in.
6 in.	5/8 in.
8 in. and larger	3/4 in.

7.2 Wherever the top of the suspended piping is more than 6 inches below the bottom of the concrete slab, the loading on the piping shall be limited by one of the following two methods. See **Fig. 1**.

7.2.1 *Pea Gravel or Clean Sand Fill*—This selected fill shall be placed around and above the pipe line all the way up to the slab grade. In addition the same fill shall be provided for a distance of 12 in. or more on both sides of the pipe line. During the placement of this fill the hanger rods shall be kept vertical and they shall be in alignment directly above the pipes.

7.2.2 *Foam Insulation Shear Plane*—Sheets of 1 in. thick foam insulation shall placed on both sides of the rods and shall extend down to and over the pipe to the centerline. Fasten the two sheets together at each hanger with wire ties. The maximum foam sheet width required is 48 inches. Backfill shall be placed on both sides of the insulation so that the rods and insulation remain vertical.

8. Inspection

8.1 For the sand fill method a proper installation can be verified before the concrete slab is poured by observing and verifying the quality of the fill material around the hanger rods and along the length of the pipe line. The depth of sand fill can be verified with a probe down to the pipe.

8.2 For the foam insulation method, a proper installation can be verified before the concrete is poured by checking for the presence of the two layer foam sandwich enclosing the hanger rods.

8.3 Just before the slab is poured, all the hanger rods must be present at the proper elevation and in alignment. All rods shall terminate with a hook or other means that will assure ample pull out resistance.

9. Keywords

9.1 hangers; suspended DWV; underslab

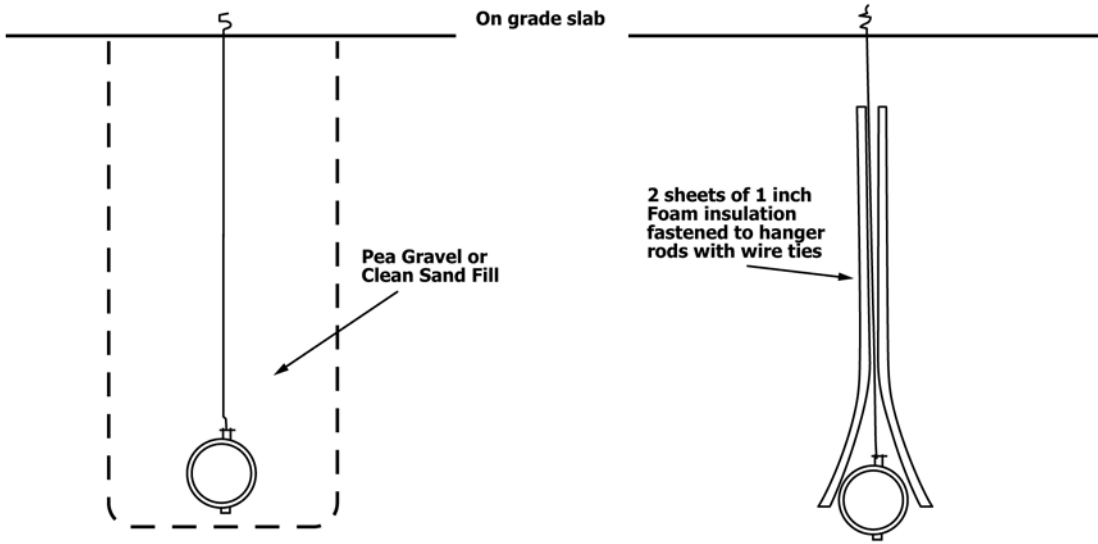


FIG. 1 Load Limiting Methods

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org). Permission rights to photocopy the standard may also be secured from the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, Tel: (978) 646-2600; <http://www.copyright.com/>