



uponor

PRE-INSULATED
PIPE SYSTEMS

ECOFLEX® WALL
PENETRATION

INSTALLATION GUIDE

Ecoflex® Wall Penetration Systems:
An efficient, sustainable solution for
penetrating concrete or block walls



Pre-insulated Pipe Systems Wall Penetration Installation Guide

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Wall Penetration Options

Wall Sleeve with Heat Shrink Seal Kit

Uponor's Wall Sleeve with Heat Shrink Seal Kit offers a simple solution for new concrete walls, new-block construction or installation in an existing wall with an irregular hole. Wall Sleeves, though not engineered for specific bearing loads, offer installation convenience and compatibility.



Figure 1: Wall Sleeve with Heat Shrink Seal Kit

Wall Sleeve

Uponor's Wall Sleeve with the Compression Wall Seal (sold separately) offers a simple solution for new concrete walls, new-block construction or installation in an existing wall with an irregular hole. The Wall Sleeve can be field cut for proper fit within concrete forms. Wall Sleeves, though not engineered for specific bearing loads, offer installation convenience and compatibility.

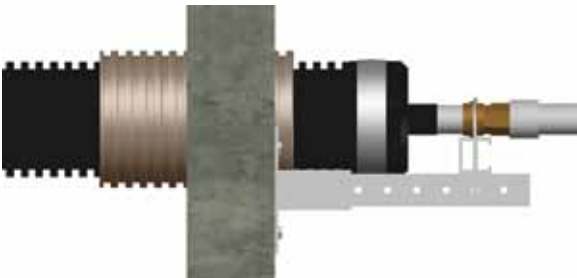


Figure 2: Wall Sleeve

Compression Wall Seal

Use the Compression Wall Seal with the Wall Sleeve or use alone when a field core drill is preferred.

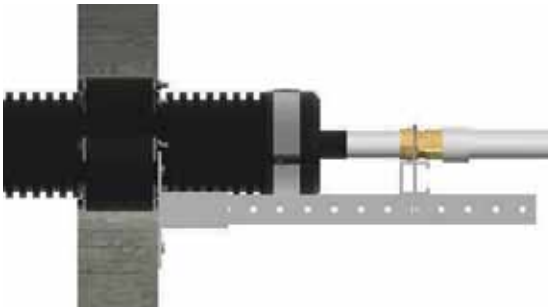


Figure 3: Compression Wall Seal

If a field core drill is preferred, use the Compression Wall Seal alone. Refer to **Table 1** for the required core drill size.

Wall Seal Part No.	Jacket Size	Core Drill Size	Wall Seal Length	Compatible Wall Sleeve
1007360	5.5"	8"	4"	1007365
1007361	6.9"	10"	4"	1007366
1007362	7.9"	10"	4"	1007366

Table 1: Core Drill Sizes

Wall Penetrations

Use this section for tips on watertight penetration of a concrete wall.

New Concrete Block or Existing Wall

For new concrete block or existing walls, Uponor offers the Wall Sleeve with Heat Shrink Seal Kit. The Wall Sleeve can be used with the Compression Wall Seal for block-wall installations or for irregular holes in existing walls. The Wall Sleeve can easily be grouted into place in the irregular hole. Either the Heat Shrink Seal Kit or the Compression Wall Seal will ensure a watertight connection between the Wall Sleeve and the Ecoflex outer jacket. Uponor recommends routing the pipe as straight as possible through the Wall Sleeve to ensure a proper seal. Refer to **Figure 4** for an example of a Wall Sleeve with Heat Shrink Seal Kit installation.



Figure 4: Wall Sleeve with Heat Shrink Seal Kit

New Concrete Wall

When requiring a watertight penetration of a new concrete wall, cut the Wall Sleeve in the field for a proper fit between the concrete forms. The Compression Wall Seal is a mechanical expansion device installed over the pipe and into the Wall Sleeve to provide a watertight seal.

Note: The above wall penetrations require the following.

- Wall Sleeve
- Compression Wall Seal (See **Figure 7**)
- Wall Sleeve with Heat Shrink Seal Kit (See **Figure 4**)

Existing Wall with Field Core Drill

The Compression Wall Seal creates a watertight seal between the core drill surface and the outer jacket of the Ecoflex pipe (see **Figure 5**).

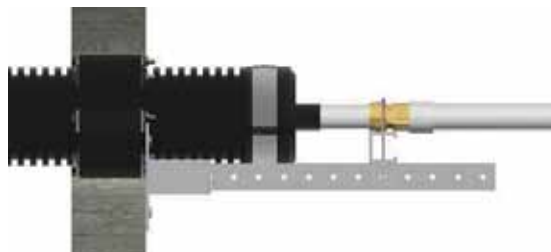


Figure 5: Compression Wall Seal

Note: This type of wall penetration requires the following.

- Core drill
- Compression Wall Seal (See **Figure 5**)

Installation Methods

This section illustrates the various Wall Seal installation applications. Typical examples show procedures for use. Applications vary depending on installation design requirements.

Required Components

Tools and components needed for this installation include the following.

- Compression Wall Seal — with included hardware
- Wall Sleeve (optional)
- Epoxy resin
- Protective end caps or plastic covering
- Pipe clamp (optional)
- Cutting tools
- Drill (optional)



Figure 6: Wall Seal, Pressure Waterproof up to 7.0 psi (0.5 bar)

Compression Wall Seal

Use the Uponor Wall Seal to provide sealing against high-pressure water. Insert the Wall Seal into the core hole or casing pipe on the outside wall. When installing, insert Wall Seal with nuts facing toward the inside wall or basement side.

Use the Compression Wall Seal with the Wall Sleeve or alone in applications where a field core drill is preferred.

Uponor Ecoflex Jacket	Core Hole
5.5"	8"
6.9"	10"
7.9"	10"

Table 2: Core Hole Sizes

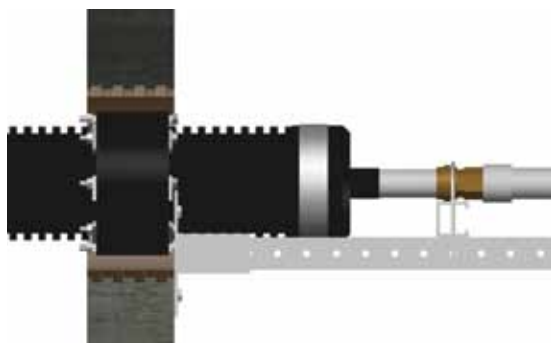


Figure 7: Wall Sleeve, Pressure Waterproof up to 7.0 psi (0.5 bar)

For new concrete walls, use the Wall Sleeve with the Compression Wall Seal to simplify the installation process. It is easy to cut for proper fit within concrete forms. The Wall Sleeve offers an extra convenience for the installer. The Wall Sleeve provides a tight seal under pressurized water and is easy to cast when pouring new cement walls.

Core Holes in Water-impermeable Concrete

At the designated area, bore through the wall with an appropriate cement drill.

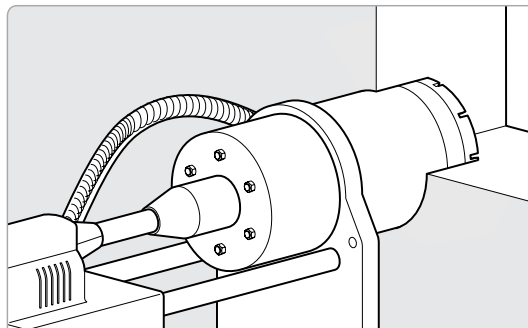


Figure 8: Drill the Core Hole

After drilling, protect the bore wall with epoxy resin. Wearing protective gloves, cover the inside cut of the core hole according to the directions on the resin container.



Figure 9: Protect the Bore Wall with Epoxy Resin

Protect the bore from contamination and moisture during the unfinished phase of the installation. Tape plastic over the core hole on both sides of the wall, or insert protective end caps (supplied by installer) onto both sides of the core hole as shown in **Figure 10**.

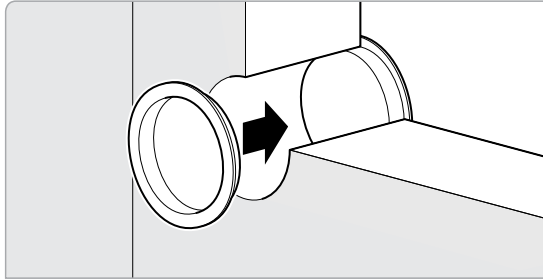


Figure 10: Protect the Bore During Installation

Uponor Ecoflex Jacket	Core Hole
5.5"	8"
6.9"	10"
7.9"	10"

Table 3: Core Hole Sizes

Wall Sleeve Installation

If pouring new walls, cast the Uponor Wall Sleeve in the same time. The special pipe casing in combination with the Wall Sleeve ensures a tight seal under pressurized water.

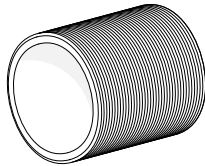


Figure 11: Wall Sleeve

Install the Wall Sleeve either flush with the casing or projected out from the wall casing (see **Figures 12 and 13**).

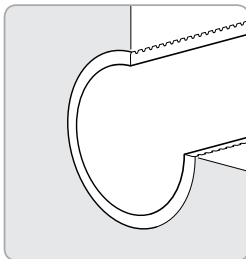


Figure 12: Flush with Casing

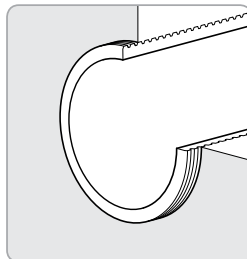


Figure 13: Projected from Casing

Fasten a steel framework to the Wall Sleeve so it is either flush with or protruding from welded joints or with a pipe clamp (supplied by the installer).

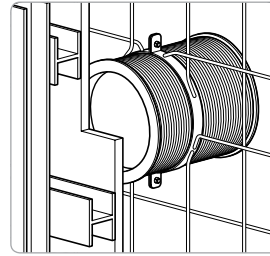


Figure 14: Fastened in Steel Framework

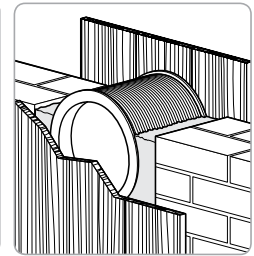


Figure 15: Built into a Wall

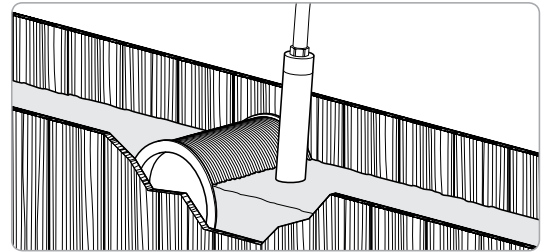


Figure 16: Compact the Cement

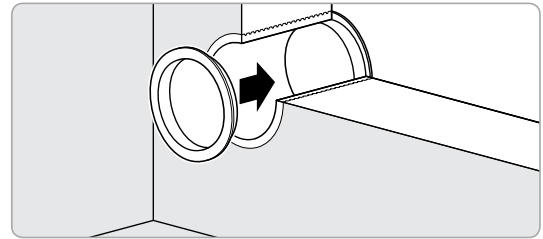


Figure 17: Protect Core Openings

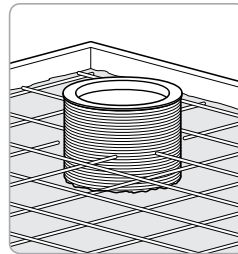


Figure 18: Installed into a Floor or Ceiling

It is also an option to build the Wall Sleeve directly into walls or install them into floors and ceilings as shown in **Figures 15 and 18**.

When installing Wall Sleeves, compact the cement around the seams of the pipe casing thoroughly as shown in **Figure 16**.

Protect the bore openings from contamination and moisture during the unfinished phase by inserting protective end caps or securely covering (taping) the bore with plastic. **Table 4** shows the required size of the Wall Sleeve for specific sizes of Uponor Ecoflex.

Uponor Ecoflex Jacket	Wall Sleeve
5.5"	8"
6.9"	10"
7.9"	10"

Table 4: Wall Sleeve Sizes

Installing the Wall Seal into the Core Hole or Wall Sleeve

Note: The following illustrations show the basement on the left side of the wall.

Insert the Wall Seal flush with the end of the core hole on the outside wall (the water side). Note that nuts face toward the inside wall (the basement).

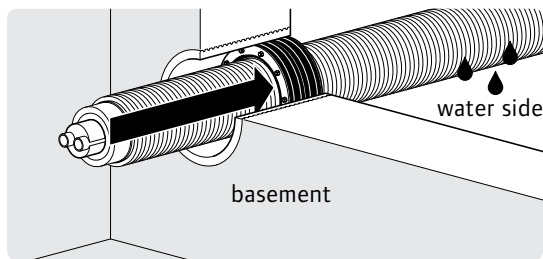


Figure 19: Wall Seal Flush with Outside Wall

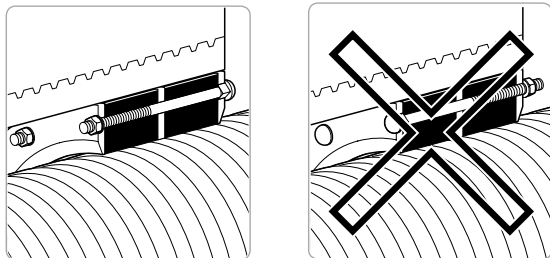


Figure 20: Correct and Incorrect Wall Seal Installations



Caution: Make sure the nuts are facing toward the basement when inserting the Wall Seal.

Install the Wall Seal at right angles to the pipe as shown.

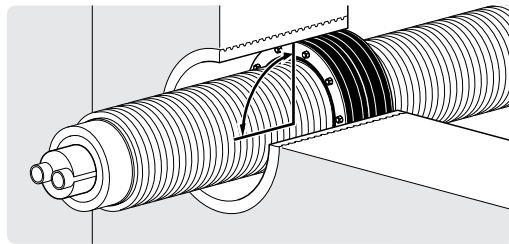


Figure 21: Install Wall Seal at Right Angles to Pipe

When tightening to the maximum torque, keep the following in mind.

- During final assembly, successively tighten each nut clockwise with a torque wrench to reach the maximum torque ($M_{\max} = 5 \text{ Nm (M6)}/3.7 \text{ lbf}\cdot\text{ft}$; $M_{\max} = 8 \text{ Nm (M8)}/5.9 \text{ lbf}\cdot\text{ft}$).
- Tighten the nuts several times.
- Repeat this procedure after two hours.
- To ensure no damage to the Ecoflex jacket, tighten the nuts of the Uponor Wall Seal until the rubber seal wraps around the Ecoflex jacket pipe and the core hole, or if used, the Wall Sleeve. **Figure 20** illustrates the correct and incorrect way to install the Wall Seal.
- The house lead-ins are neither fixed points nor supports and serve solely to provide an elastic seal for the jacket pipes of Ecoflex.
- The installer can gently turn the Ecoflex jacket pipes in an axial motion.
- Before filling in the pipe trench, place compressed, stoneless sand under the Ecoflex piping so no additional stress can affect the seal.

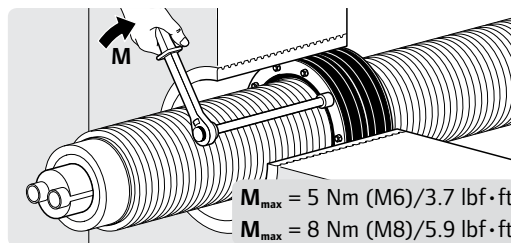


Figure 22: Tighten to Maximum Torque

Wall Sleeve with Heat Shrink Seal Kit
Installation Method

This section illustrates how to install the Wall Sleeve with Heat Shrink Seal Kit in a typical application. Applications vary depending on installation design requirements.

Tools Required

Tools and components needed for this installation include the following.

- Wall Sleeve with Heat Shrink Seal Kit
- Brush (scrub/utility)
- Clean Rag
- Torch (medium flame)
- Soap (non-casutic)

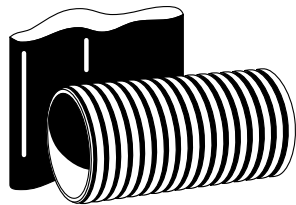


Figure 23: Wall Sleeve with Heat Shrink Seal Kit

If pouring new walls, you can cast the Uponor Wall Sleeve at the same time. The special pipe casing in combination with the Heat Shrink Seal Kit ensures a water tight seal.

Install the Wall Sleeve projected out from the wall casing a minimum of 4" (see Figure 24).

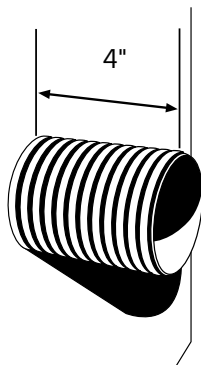


Figure 24: Projected from Casing

You can fasten a steel framework to the Wall Sleeve so it is either flush with or protruding from welded joints or with a pipe clamp (supplied by the installer).

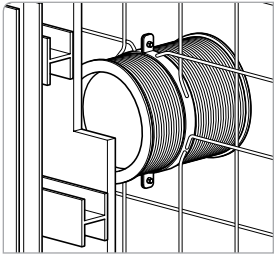


Figure 25: Fastened in Steel Framework

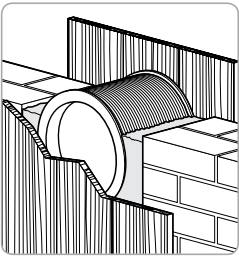


Figure 26: Built into a Wall

You can also build the Wall Sleeve directly into walls as shown in Figures 25 and 26.

When installing Wall Sleeves, compact the cement around the seams of the pipe casing thoroughly as shown in Figure 27.

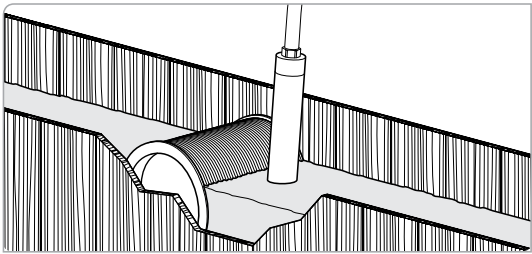


Figure 27: Compact the Cement

Protect the bore openings from contamination and moisture during the unfinished phase by inserting protective end caps or securely covering (taping) the bore with plastic.

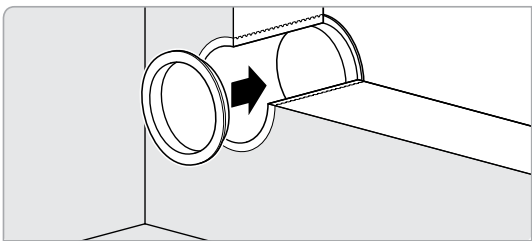


Figure 28: Protect Core Openings

Table 5 shows the required size of the Wall Sleeve for specific sizes of Uponor Ecoflex.

Uponor Ecoflex Jacket	Wall Sleeve
5.5"	1018269
6.9"	1018270
7.9"	1018268

Table 5: Wall Sleeve Sizes

Note: Before Installing Ecoflex pipes through a Wall Sleeve, ensure grout is fully cured.

You can install Ecoflex pipes before the Wall Sleeve is grouted into place if the pipes are fully installed and pressure tested before the wall sleeve is grouted into the wall.

Install Heat Shrink Seal Kit over the Ecoflex piping before installing the piping through the Wall Sleeve as shown in **Figure 29**.

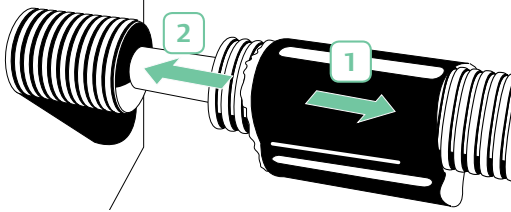


Figure 29: Heat Shrink Seal Kit over Ecoflex Pipe

Note: Complete all connections and pressure test before proceeding.

Prepare the surface by removing debris with a dry scrub brush as shown in **Figure 30**. Using a dry clean rag, clean both the Wall Sleeve and Ecoflex pipe of all debris in the full circumference of the area being sealed (approximately 4" to 6" on each side.) Uponor recommends using soap or non-caustic cleanser to ensure the surface area is completely clean prior to sealing the kit. Ensure the surface area is thoroughly dry after cleaning.

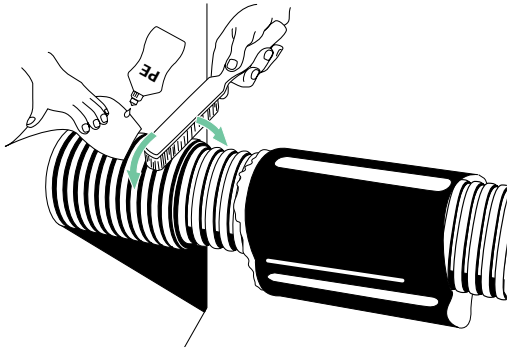


Figure 30: Prepare Surface

Remove plastic liner from Heat Shrink Seal Kit before applying heat as shown in **Figure 31**.



Figure 31: Remove Plastic Liner

Using a soft, medium flame, preheat the Wall Sleeve and Ecoflex pipe, keeping the flame in constant motion as shown in **Figure 32**.

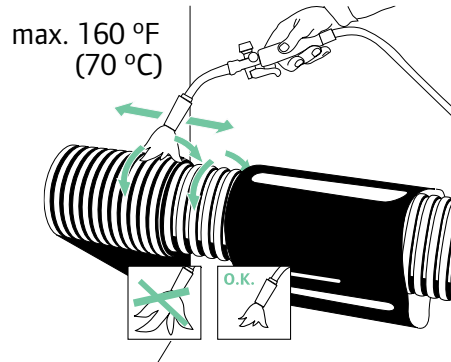


Figure 32: Preheat Wall Sleeve

Slide the Heat Shrink Seal Kit evenly over the Wall Sleeve and Ecoflex pipe. Evenly apply heat to the Heat Shrink Seal Kit starting from the wall and working toward the Ecoflex pipe, being careful not to overheat the components (see **Figure 33**).

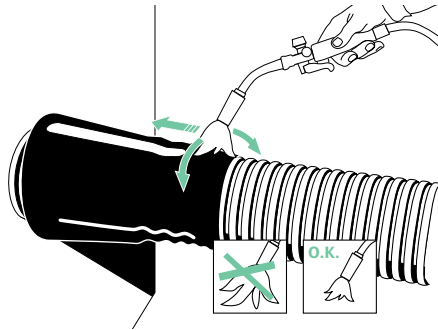


Figure 33: Apply Even Heat

Remember to use continuous movements with the torch and never apply direct flame to the surface of the pipe or Heat Shrink Seal Kit. The temperature of the surface should never exceed 158°F (70°C).

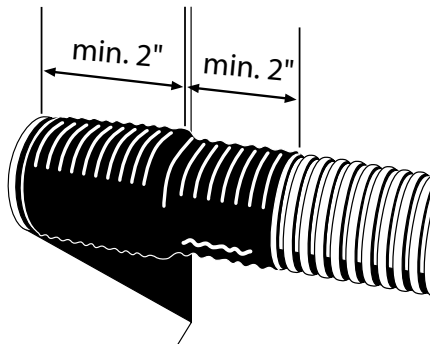


Figure 34: Wall Seal with Heat Shrink Seal Kit

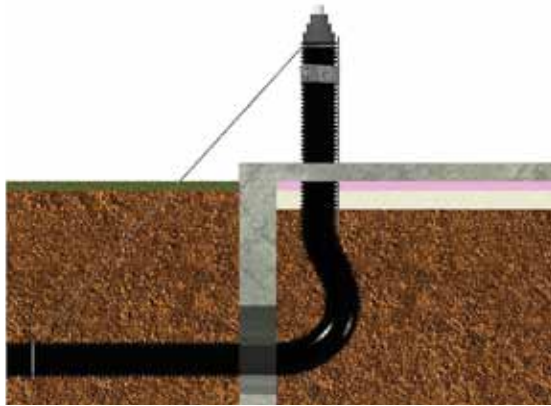


Figure 35: Slab-on-grade Installation Example



Figure 36: Slab-on-grade Installation Example



Figure 37: Slab-on-grade Installation Example

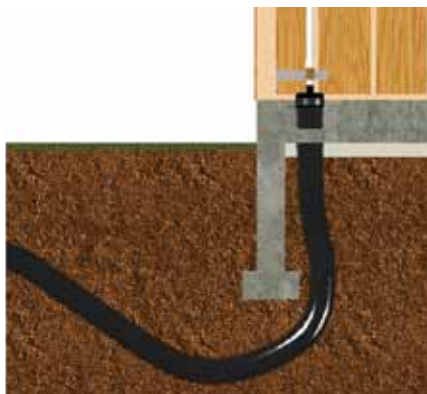


Figure 38: Slab-on-grade Installation Example

Slab-on-grade Installation

In most cases, Ecoflex piping makes slab-on-grade installations easy. Ecoflex pipe jackets are safe for direct contact with concrete or mortar. Occasionally, the trench will require additional depth adjacent to the building to accommodate the bend radius of the Ecoflex pipe. To secure the pipe radius during construction, simply use a suitable strap to tie the end of the pipe back a short distance upon itself. Place a reinforcement bar in the soil and secure the pipe to it to avoid lateral movement during construction, as illustrated in **Figure 35**.

See **Figures 36** through **47** for other variations of slab-on-grade installation methods.

Dry Well

If you cannot achieve a suitable trench depth to allow for the bend radius, construct a concrete dry well to provide accessible space for fitting connections (see **Figures 39, 46** and **47**).

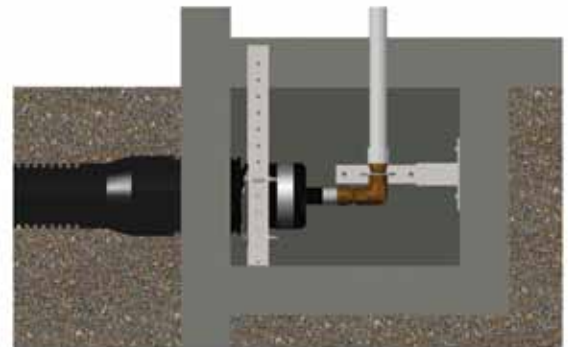


Figure 39: Concrete Dry Well

Slab-on-grade Through Knockout Installation — Outside Wall Attachment

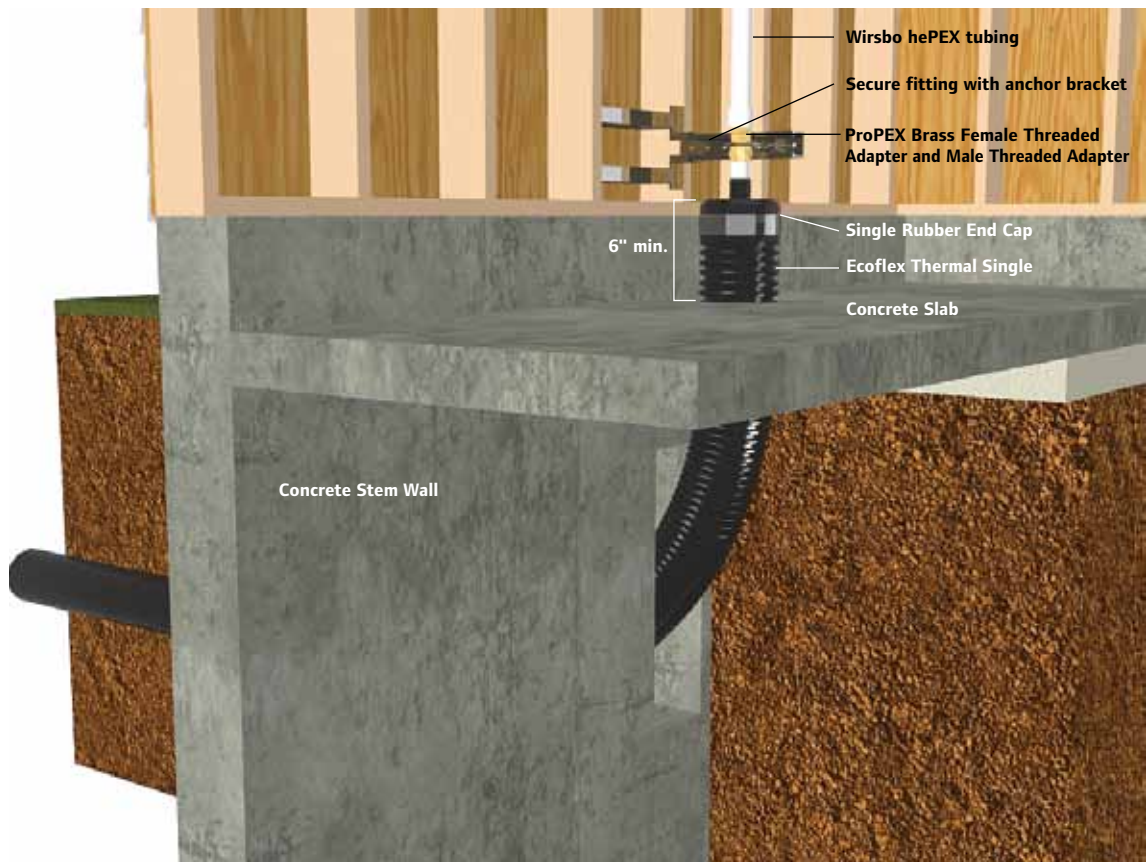


Figure 40: Slab-on-grade Through knockout Installation – Outside Wall Attachment

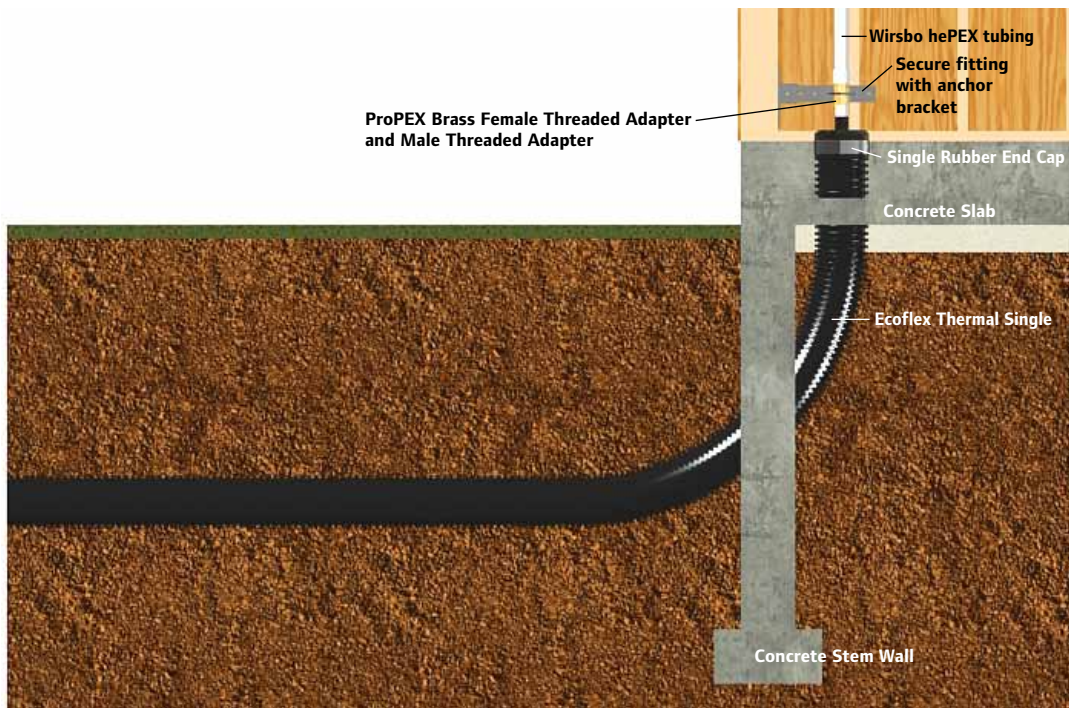


Figure 41: Slab-on-grade Through knockout Installation – Outside Wall Attachment

Slab-on-grade Through Sleeve Installation — Interior Wall Attachment

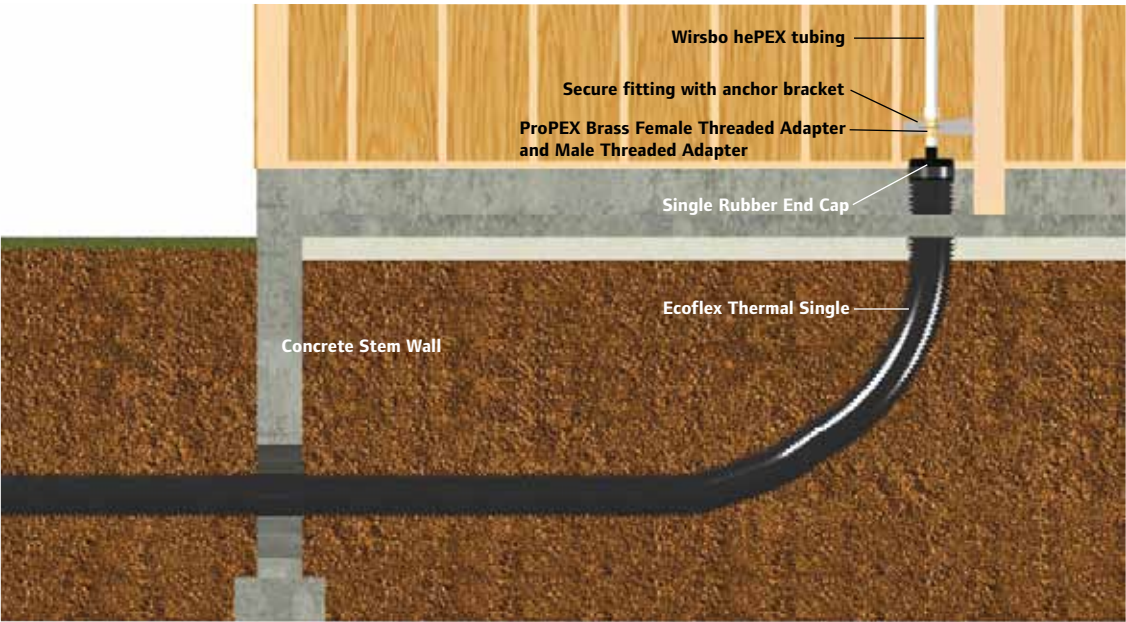


Figure 42: Slab-on-grade Through Sleeve Installation – Interior Wall Attachment

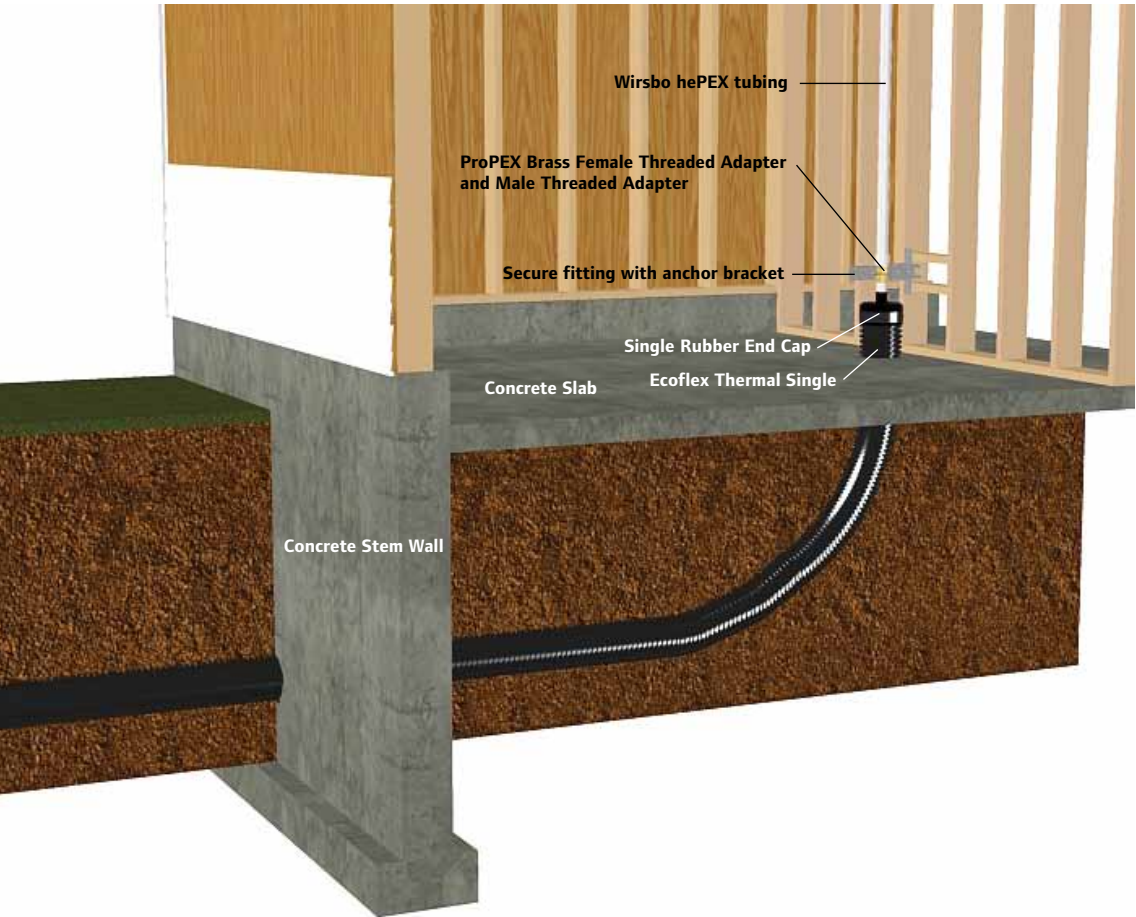


Figure 43: Slab-on-grade Through Sleeve Installation – Interior Wall Attachment

Slab-on-grade Under Footing Installation — Interior Wall Attachment

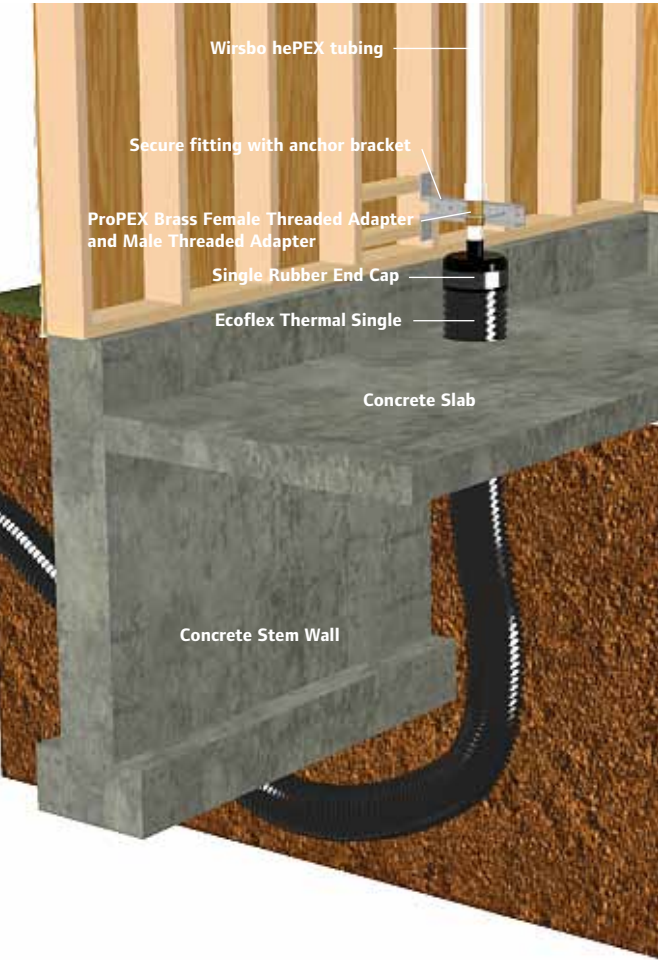


Figure 44: Slab-on-grade Under Footing Installation – Interior Wall Attachment

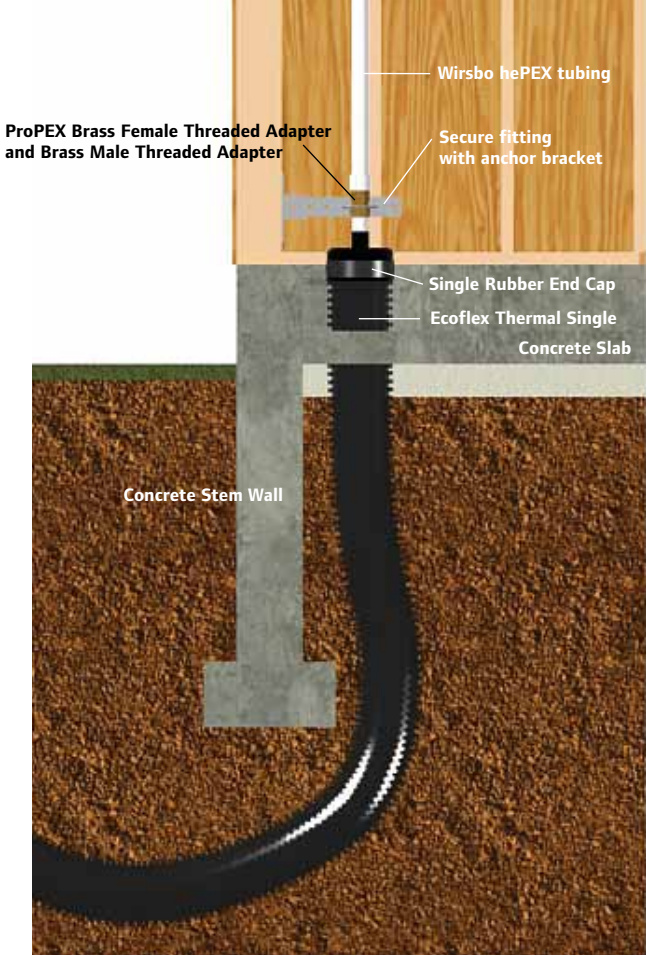


Figure 45: Slab-on-grade Under Footing Installation –Interior Wall Attachment

Slab-on-grade Dry Well Installation — Interior Wall Attachment

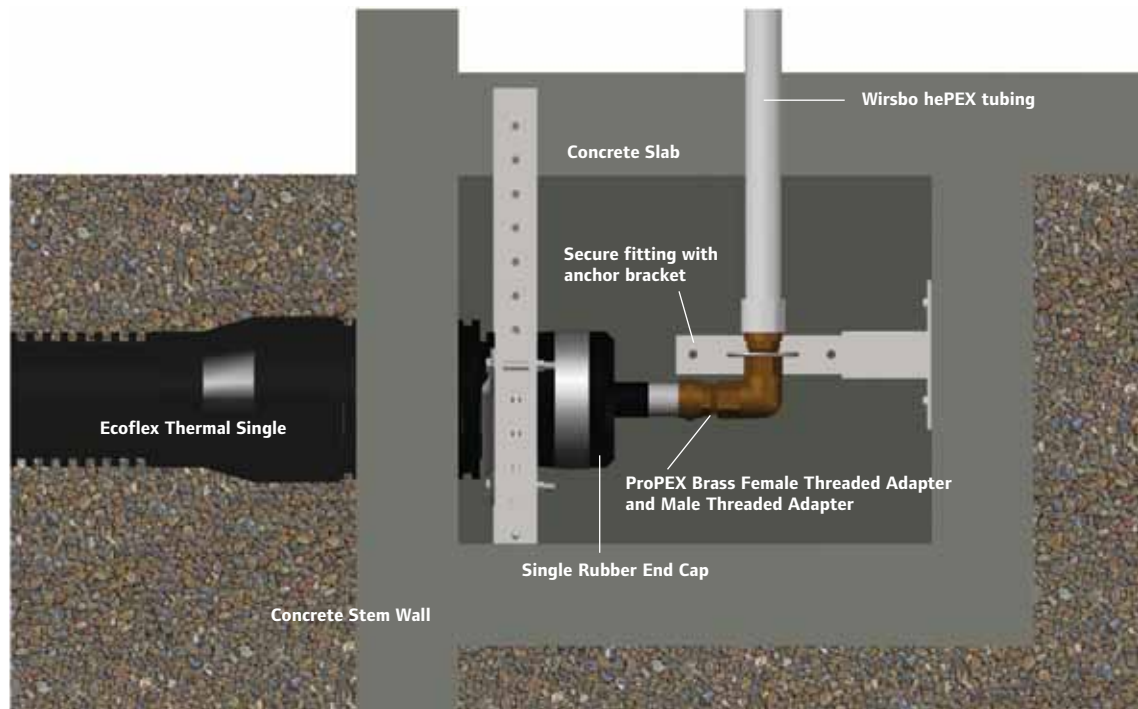


Figure 46: Slab-on-grade Dry Well Installation – Interior Wall Attachment

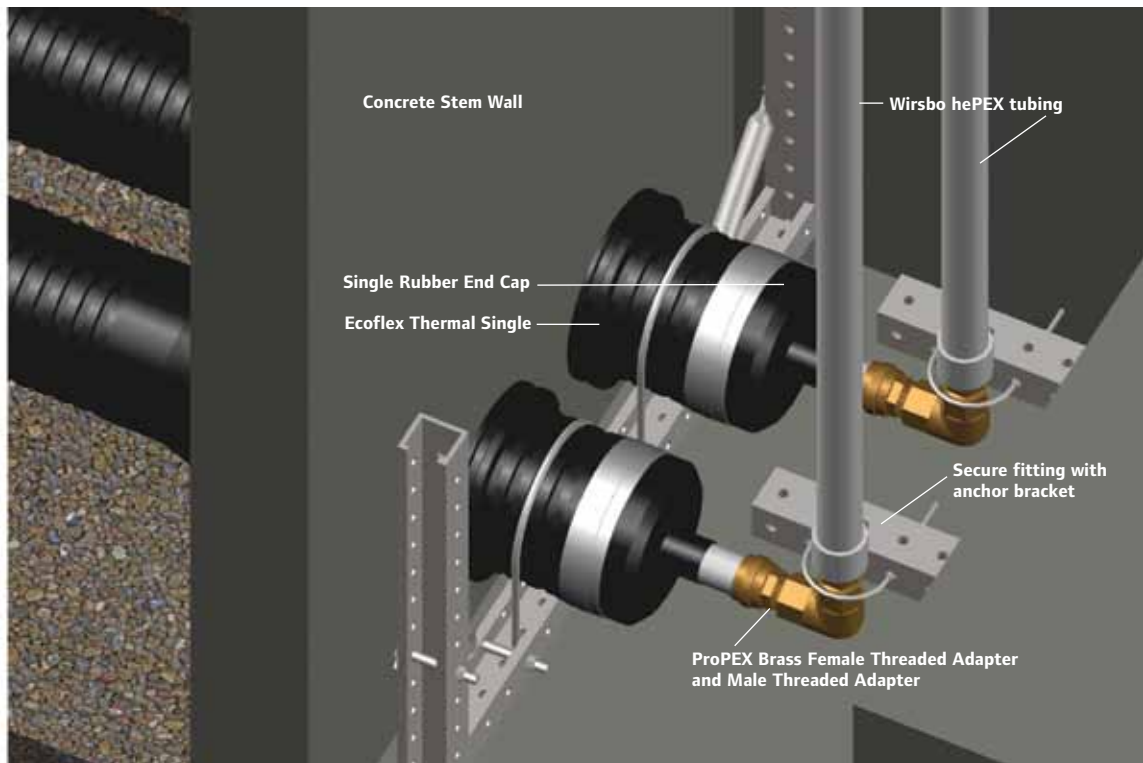


Figure 47: Slab-on-grade Dry Well Installation – Interior Wall Attachment

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