

XYPEX WATERPROOFING OF ANNULAR SPACES

Waterproofing of Annular Spaces Surrounding Through Concrete Utilities

2019-11

Pipes and conduits that are installed through round or square block outs in concrete are a common part of concrete construction. The following are procedures for waterproofing of the annular spaces that are created between the edge of the concrete and conduit, pipe or other utility feature after its installation through the wall or slab. These details are based on circular "block out" shapes but may be modified for other shapes as appropriate. These procedures are appropriate for many common piping materials including steel, iron, PVC and HDPE.

Note that fluid bearing pipes may vibrate or move due to the hydraulics within the system or thermal expansion and contraction. This type of ongoing movement may interrupt the crystalline based healing. In these cases contact Xypex Technical Services for assistance.

For Annular Space Gaps of 1" (25 mm) or Less

STEP 1: Remove all loose materials and thoroughly clean and profile (ICRI CSP-3) the inner surface of the concrete void and the surface of the concrete to a 6" (150 mm) area around the block out. Clean and roughen to as far through the wall or slab as possible. Lightly sand and clean as much of the surface of the pipe / conduit as possible to provide a profile. Saturate the prepared concrete with water. Allow water to soak into concrete and then remove all surface water.

STEP 2: Apply one slurry coat of Xypex Concentrate at a coverage rate of 1.5 lb./sq.yd. (0.8 kg/m²) onto the pipe / conduit, to the surface of the concrete in the block out and to the surface of the concrete to 6" (150 mm) around the block out. Apply through the full depth of the concrete. Application may be performed by brush or gloved hand.

STEP 3: On the wet side of the wall or slab, while slurry coat is still tacky, apply Xypex Patch'n Plug into the space to a depth of 2" - 3" (50 - 75 mm) to create a solid ring of Patch'n Plug material. Finish the Patch'n Plug flush with the surface of the concrete.

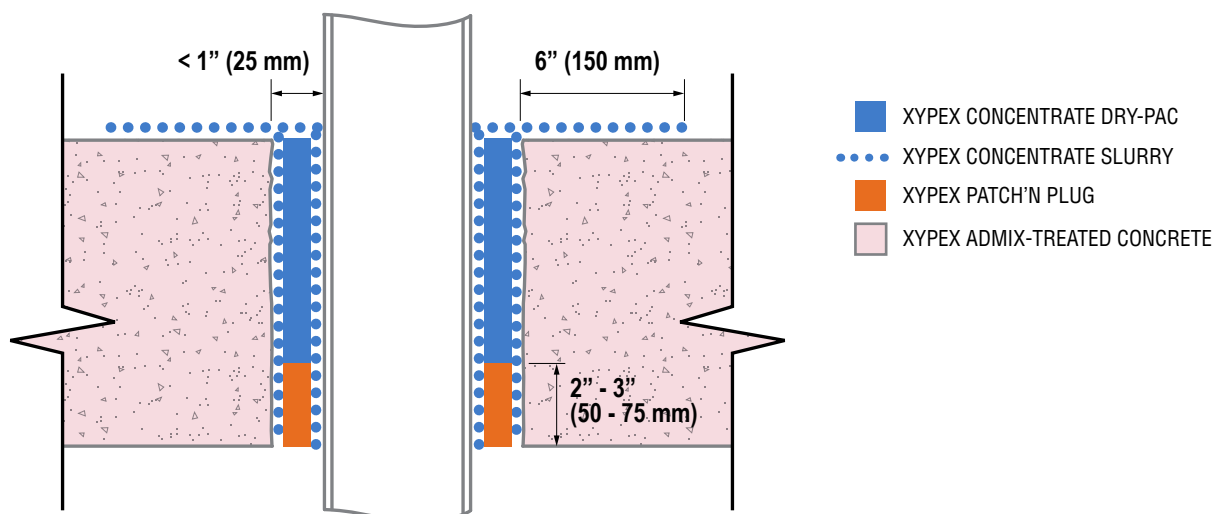
STEP 4: While slurry coat is still tacky, fill the space behind the Patch'n Plug to the surface of the concrete with Xypex Concentrate Dry-Pac mixed in the following proportions: one part clean water to six parts Concentrate by volume. Blend Dry-Pac by trowel for 10 - 15 seconds only (lumps should be present in the mixture). Apply Dry-Pac by gloved hand, and then compress it tightly using a pneumatic packing device or a hammer and block.

STEP 5: Wet the surface of the Dry-Pac lightly with water, then apply a slurry coat of Xypex Concentrate at coverage rate of 1.5 lb./sq.yd. (0.8 kg/m²) over the filled area and to 6" (150 mm) onto the slab away from the space.

STEP 6: Cure by keeping moist by fog spraying periodically with water for two to three days. Open to water contact per Xypex Coatings guidelines.

Note:

If the concrete does not contain Xypex admixture then also apply Xypex Concentrate slurry coat to the Patch'n Plug side per Step 5. Contact Xypex's Technical Services Department or your local Xypex Technical Services Representative regarding appropriate time for exposure to water contact.



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For Annular Space Gaps Between 1" - 4" (25 - 100 mm)

STEP 1: Remove all loose materials and thoroughly clean and profile (ICRI CSP-3) the inner surface of the concrete void and the surface of the concrete to 6" (150 mm) around the block out. Clean and roughen all the way through the wall or slab. Lightly sand and clean the surface of the pipe / conduit to provide a profile. Saturate the prepared concrete with water. Allow water to soak into concrete and then remove all surface water.

STEP 2: Apply one slurry coat of Xypex Concentrate at a coverage rate of 1.5 lb./sq.yd. (0.8 kg/m²) onto the pipe / conduit, to the surface of the concrete in the block out and to the surface of the concrete to 6" (150 mm) around the block out. Apply through the full depth of the concrete. Application may be performed by brush or gloved hand.

STEP 3: On the wet side of the wall or slab, while slurry coat is still tacky, apply Xypex Patch'n Plug into the space to a depth of 2" - 3" (50 - 75 mm) to create a solid ring of Patch'n Plug material. Finish the Patch'n Plug flush with the surface of the concrete.

STEP 4: While slurry coat is still tacky, fill the space behind the Patch'n Plug with a 1" (25 mm) layer of Xypex Concentrate Dry-Pac mixed in the following proportions: one part clean water to six parts Concentrate by volume.

Blend Dry-Pac by trowel for 10 - 15 seconds only (lumps should be present in the mixture). Apply Dry-Pac by gloved hand, and then compress it tightly using a pneumatic packing device or a hammer and block.

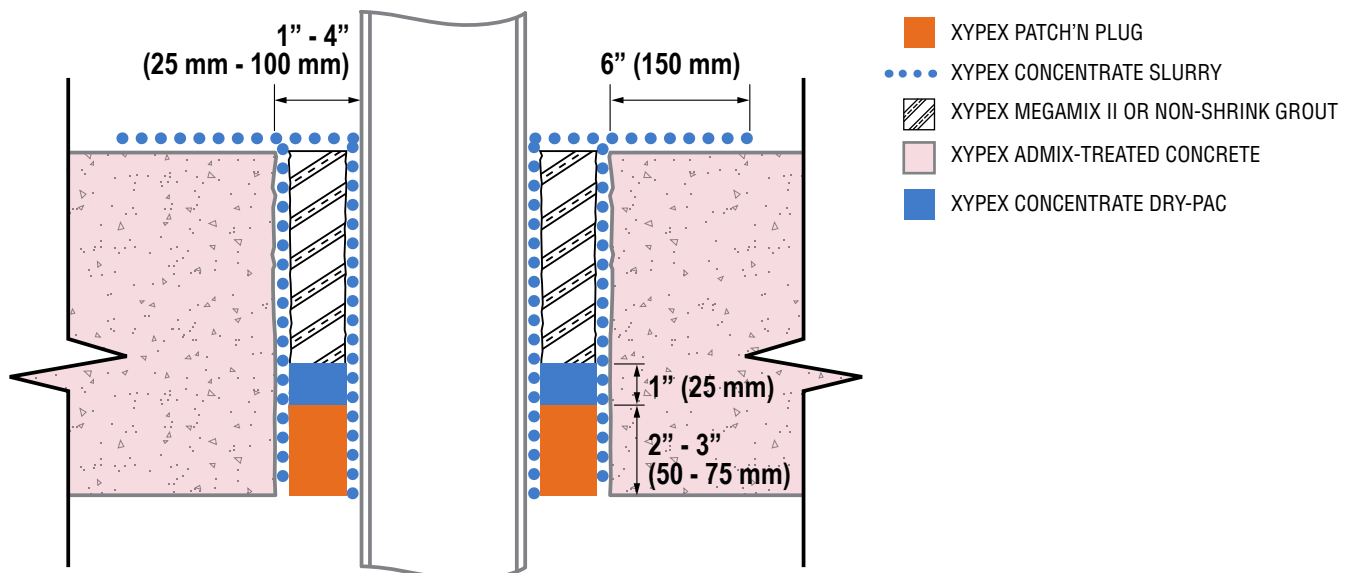
STEP 5: While slurry coat is still tacky, fill the space behind the Concentrate Dry-Pac to the surface of the concrete with a good quality non-shrink structural grout.

STEP 6: After the grout has fully set apply a slurry coat of Xypex Concentrate at a coverage rate of 1.5 lb./sq.yd. (0.8 kg/m²) over the grout filled area and to 6" (150 mm) onto the slab away from the space.

STEP 7: Cure by keeping moist by fog spraying periodically with water for two to three days. Open to water contact per Xypex Coatings guidelines. This assembly may be opened to water contact on the Patch'n Plug side immediately.

Note:

If the concrete does not contain Xypex admixture then also apply Xypex Concentrate slurry coat to the Patch'n Plug side per Step 5. Contact Xypex's Technical Services Department or your local Xypex Technical Services Representative regarding appropriate time for exposure to water contact.



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For Annular Space Gaps Greater Than 4" (100 mm) Using "Form and Pour" Techniques

STEP 1: Remove all loose materials and thoroughly clean and profile (ICRI CSP-3) the inner surface of the concrete void and the surface of the concrete to 6" (150 mm) around the block out. Clean and roughen all the way through the wall or slab. Lightly sand and clean the surface of the pipe/conduit to provide a profile. Saturate the prepared concrete with water. Allow water to soak into concrete and then remove all surface water.

STEP 2: Apply one slurry coat of Xypex Concentrate at coverage rate of 1.5 lb./sq.yd. (0.8 kg/m²) onto the pipe/conduit, the inner surface of the concrete in the block out and to the surface of the concrete to 6" (150 mm) around the block out. Apply through the full depth of the concrete. Application may be performed by brush or gloved hand.

STEP 3: In conjunction with Step 4 create forms on either side of the block-out to allow a concrete or grout to be poured into and contained in the block-out.

STEP 4: On the wet side of the concrete element, modify the forms around the pipe and the edge of the block out to create "sealing strips" or linear grooves in the finished concrete surface. The sealing strips are to be 1" (25 mm) wide by 1½" (37 mm) deep and are to completely encircle the pipe and the circumference of the block out void.

STEP 5: It is recommended that swelling waterstops be installed as per the diagrams below. Inclusion, type and position of swelling waterstops are at the discretion of the designer. Expanding waterstops may be placed on Xypex after it has dried or before Xypex slurry application. Xypex slurry may only be applied over waterstop if approved by waterstop manufacturer.

STEP 6: Fill the void with a good quality, well consolidated Xypex Admix treated concrete or grout. After the concrete has set strip the forms including the sealing strips.

STEP 7: Clean sealing strips thoroughly. Apply Xypex Concentrate slurry to sealing strips at the rate of 1.5 lb./sq.yd. (0.8 kg/m²). Fill sealing strip with Xypex Concentrate Dry-Pac and pack tightly to create a "sealing strip".

STEP 8: Apply Xypex Concentrate slurry coat at 1.5 lb./sq.yd. (0.8 kg/m²) over entire block out infill and extending to 6" (150 mm) on either side.

STEP 9: Cure by keeping moist by fog spraying periodically with water for two to three days. Open to water contact per Xypex Coatings guidelines.

Note:

When early exposure to water is required:

1. In Step 5, on the wet side, replace the top ¼" - ½" (6 - 12 mm) of Xypex Concentrate Dry-Pac with Xypex Patch'n Plug.
2. On the wet side, eliminate Step 6.
3. Allow materials to gain sufficient strength for exposure to liquids.

