



SOLENO

Mastering Storm Water

FOUNDATION DRAIN

Foundation drain installation : Myths and reality



FOUNDATION DRAIN INSTALLATION : MYTHS AND REALITY

Clogged drain: why?

In any installation in Quebec, the drain is surrounded by clean gravel. This gravel contains about 40% voids. In most cases, when problems arise, contaminants have successfully entered the clean gravel area and have come to interfere with the proper function of the drain. To ensure the system's long-term performance, one must isolate the clean gravel from any possible external contaminant, i.e. sand, earth, ferrous ions, etc. The polyethylene film recommended in the standard BNQ 3661 - 50/2012 can hold back some of the contaminants above the gravel, but since a void is recommended between the foundation wall and the film, and that this membrane is waterproof and not present underneath

the gravel, the insulation is only partial and may become ineffective in the medium or long term. On the other hand, since the membrane is impermeable, it cannot entirely wrap the gravel, because the drainage system would no longer capture any water. In civil engineering, it is clearly recognized that the most effective product to retain soil while allowing water to pass through is a geotextile. Therefore, in all cases where the presence of iron ochre is not suspected, it is recommended to completely wrap the clean gravel with a geotextile, which will keep contaminants out.

Smooth or corrugated inner wall drain?

In recent years in some areas in Quebec, iron ochre has interfered with the normal function of foundation drains. Some experts now advocates the use of a PVC drain, but without explaining why. The main advantage of a pipe with a smooth interior wall lies in the ability to completely drain the pipe when cleaning, which is important when faced with the presence of iron ochre. Anyone familiar with the cleaning methods used by the industry (using pressurized nozzles) knows that a pipe with a corrugated wall, once cleaned by qualified personnel,

will be just as clean as a pipe with a smooth inside wall. Always remember that iron ochre is problematic for about 10% of installations performed in Quebec (with an iron concentration greater than 3.0 mg/L) and that the corrugated pipes have always performed well when installed properly in sites without iron ochre.

Large or small holes?

As previously mentioned, certified corrugated pipes compliant with the BNQ 3624-115 standard have always performed well under normal conditions of use since certification ensures, among other things, a minimum of 32 cm² area of perforations per linear meter of pipe, which ensures a sufficient flow. Note that Soleno's Type 2 drain includes a minimum of 65 cm² area of perforations per linear meter of pipe, double the minimum required by the BNQ standard. The concept of large holes appeared when it was discovered that the presence of iron ochre tended to reduce the flow of water through a drainage system clogged with an gelatinous orange mass and a narrow perforation width could contribute, long term,

to the drain blockage. However, it is important to note that for most cases where problems have been identified, a geotextile was installed on the drain, which was a strong factor—in the presence of ochre—to clog the drain. Soleno offers MEGA 3, a drain which provides 33% more perforations areas than any competitor's corrugated pipe. This product provides an optimum flow by substantially expanding the perforations, making it virtually impossible to clog the openings.

Drain with filter or not?

Typically, a geotextile (also known as a filter or membrane) is installed around a pipe to ensure that it keeps particles beyond a certain diameter (according to the selected geotextile's filter openings) from this pipe (the finest silt can be easily carried and discharged by the pipe itself). However, it is important to note that the effective filtration area is very low (as it is limited and concentrated around the pipe perforation when compared to the huge filtration area from the installed geotextile around the clean gravel. In fact, the effective area is multiplied by 50!

Therefore, as the risk that the geotextile installed around the clean gravel becoming completely blocked is extremely low, this type of installation should be favored in all cases where iron ochre is not likely to be present (see Appendix 1). The contaminants being kept out of clean gravel, no filter is required around the drain.

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What to do in the presence of iron ochre?

When iron ochre is likely to be present, we must first make sure that access shafts are installed, to allow the inspection and regular cleaning of the drain. In these conditions, the use of a geotextile can present problems, as ochre bacteria can, in the medium term, partially or completely impede water flow between backfill soil and clean gravel. Thus, it becomes important to use an interface that will not be impacted by the bacteria. As a solution, Soleno recommends the use of Microfab. This coating, consisting of a woven geotextile coated with polyethylene, contains microperforations that allow water to pass. Unlike non-woven geotextiles, it does not contain voids that could contribute to the growth of bacteria.

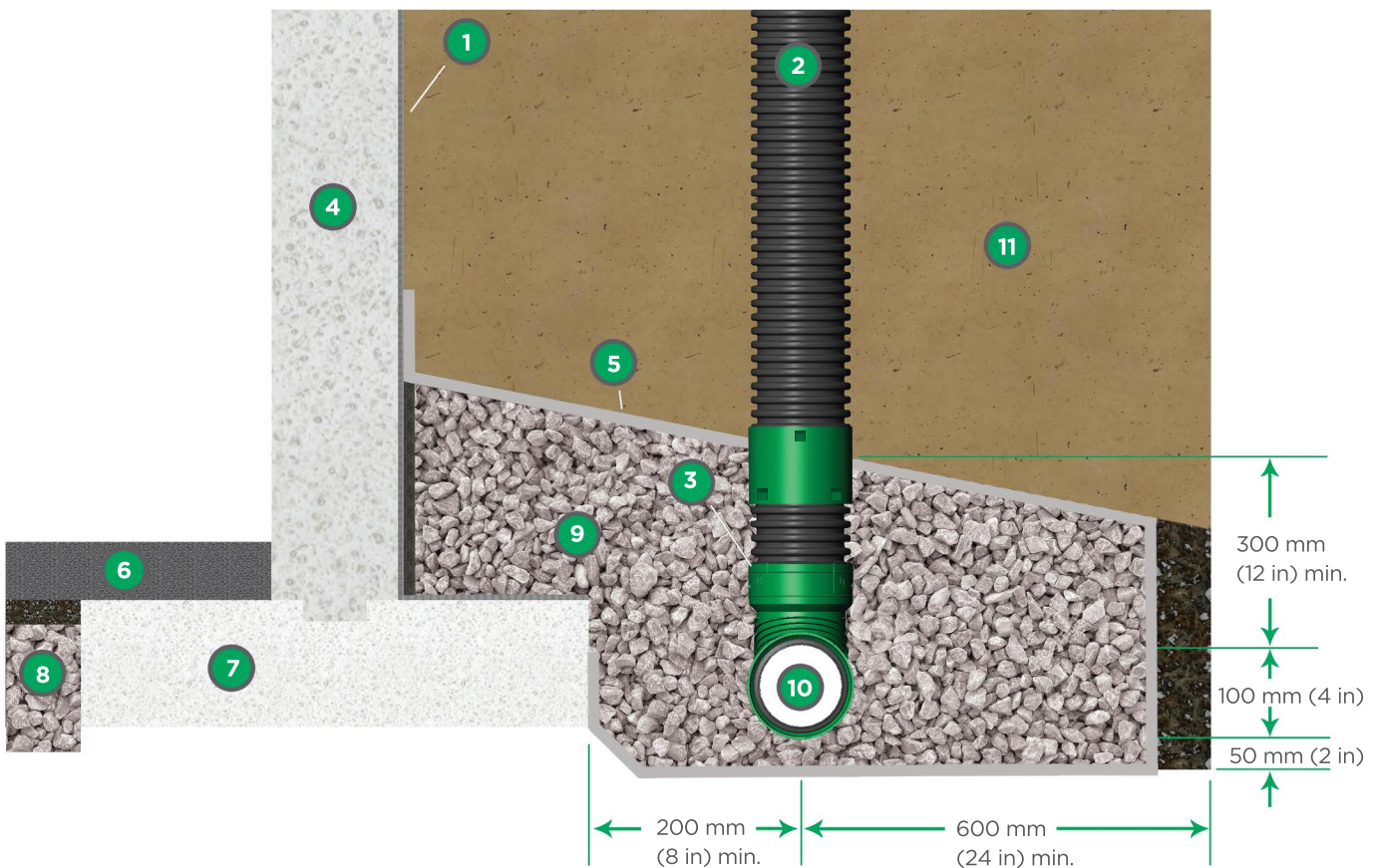
In addition, its mechanical properties ensure long-term performance under conditions of normal use. Finally, Microfab will prevent condensation under the interface, unlike a waterproof membrane.

We need to mention here that Microfab is recommended for use over clean gravel, but the rest of the periphery should be left open, in order to reduce the risk of clogging in the long term.

The suggested installation is shown in Appendix 2.

APPENDIX 1

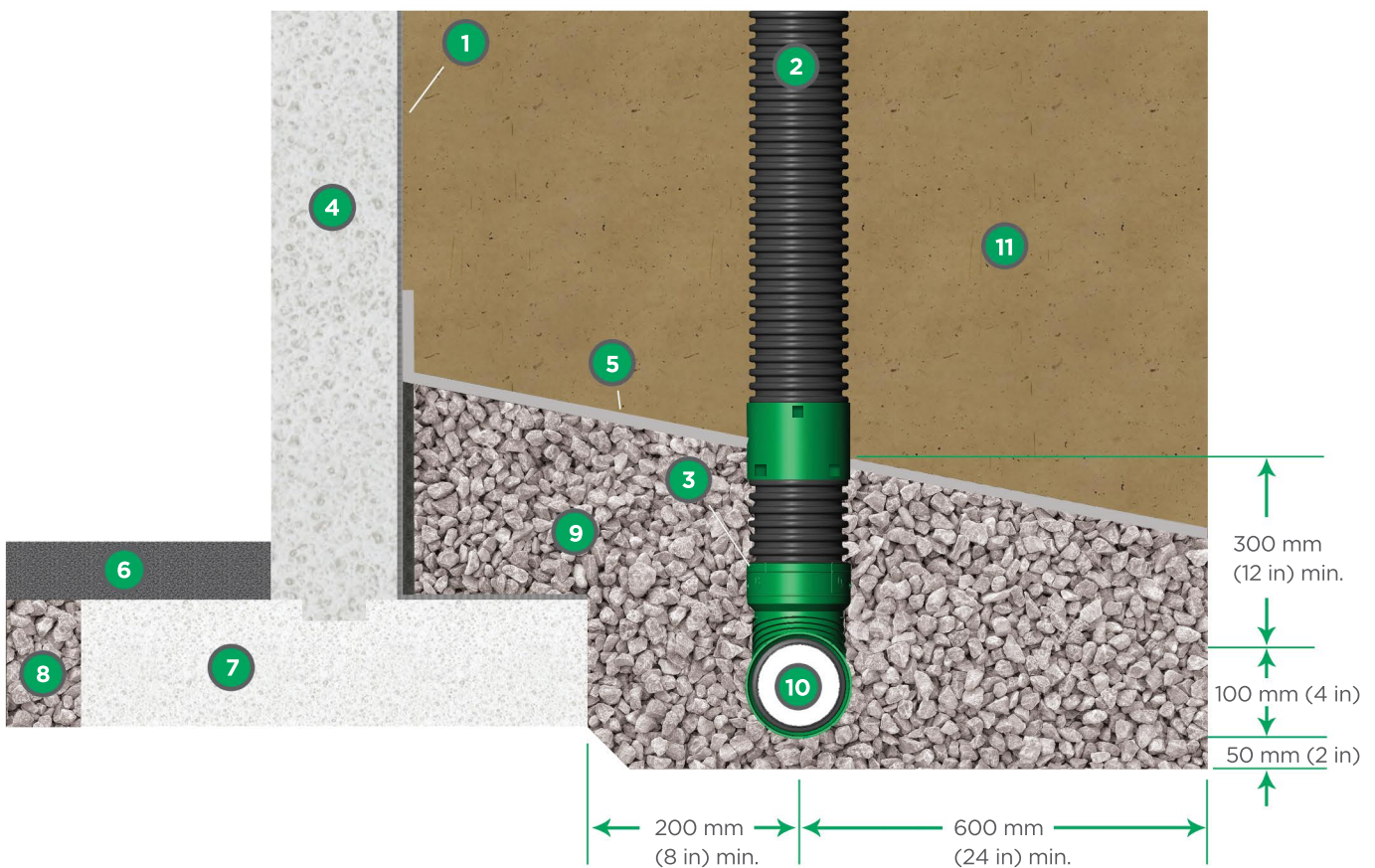
DETAILED INSTALLATION OF A DRAINAGE ACCESS SYSTEM WITHOUT IRON OCHRE.



1. Bituminous coating (waterproof membrane)
2. SOLFLO Max Pipe, 100 mm (4 in)
3. Access shaft to drainage
4. Foundation wall
5. TX-80 geotextile
6. Concrete slab
7. Footing
8. Clean gravel, 19 mm
9. Clean gravel, 19 mm
10. Soleno Type 2 or MEGA 3 Drain, 100 mm (4 in)
11. Backfill

APPENDIX 2

DETAILED INSTALLATION OF A DRAINAGE ACCESS SYSTEM IN THE PRESENCE OF IRON OCHER.



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|---|---------------------------------|
| 1. Bituminous coating (waterproof membrane) | 6. Concrete slab |
| 2. Solflo Max Pipe, 100 mm (4 in) | 7. Footing |
| 3. Drainage access chimney | 8. Clean gravel, 19 mm |
| 4. Foundation wall | 9. Clean gravel, 19 mm |
| 5. Root and vegetation-proof Microfab coating | 10. Mega 3 Drain, 100 mm (4 in) |
| | 11. Backfill |