Neutral Sloped Trench Drain Flow Rates vs. Sloped Trench Drain Flow Rates

It has been the custom in the United States and Canada to specify trench drain systems that have presloped bodies – under the assumption that presloped trench drains will provide a greater flow of water due to the sloped sections. Like many things in today's world, this custom has been accepted as the common practice. In contrast, for decades, specifiers in Europe specify neutral sloped trench drain systems as their standard design. This is because neutral trench drain systems perform just as well (if not better) than sloped trench drain systems.

The advantages for the specifier, building owner, contractor and wholesaler to use neutral sloped trench drain systems are:

1. Faster delivery to the jobsite as fewer sizes of trench drain bodies are needed.
2. No chance of installing the incorrect trench drain body in the proper numerical sloped order of the system.
3. Faster installation preparation because one size trench drain body does not require complicated site organization.
4. Faster installation due to same height of the trench drain body. Often, sloped trench drain bodies are mixed on a pallet - requiring time to sort and identify them. This is not the case with neutral sloped bodies.
5. Increased flexibility, because the contractor can easily increase the number of neutral sloped trench drain bodies in order to be have extensions or replacements. This is not possible with sloped trench drain bodies.
6. Lower overall cost to the building owner.

The flow rate of a trench drain is affected by three main factors: height of the bodies, width of the bodies and length of the run. Trench drain bodies with a greater height (assuming the width is the same) have more volume capacity and therefore a greater flow rate because the head pressure is greater when the water height is higher. Trench drain bodies that are wider than others have more volume capacity (assuming that the height of the water is the same) and as a result, a higher flow rate. The shorter the trench drain run, the greater the flow rate because of the build up of head pressure and greater velocity of water draining to the closer outlet.

A typical sloped trench drain system (see Figures 1-A and 1-B in the adjacent page) starts off with a shallow sloped body section and ends with a deeper sloped body section. This means that the body height is not consistent and the volume capacity of the sloped system is less than the volume capacity of a neutral sloped system that has the same body height throughout the run. (see Figures 2-A and 2-B in the adjacent page).

Figures 1-A and 1-B illustrate a typical sloped trench drain system with flow rates of 98.27 GPM in the 10 metre run and 142.60 GPM in the 20 metre run. Figures 2-A and 2-B illustrate the MIFAB – FILCOTEN T1520N neutral sloped trench drain system with flow rates of 99.20 GPM in the 10 meter run and 149.80 GPM in the 20 meter run. Note that the ending body height in a typical sloped 10 meter trench drain system (195 mm) is the same as all of the body heights in the MIFAB – FILCOTEN T1510N system (195 mm) and the ending body height in a typical sloped trench drain system (245 mm) is the same as all of the body heights in the MIFAB – FILCOTEN T1520N system (245 mm).

Therefore, take advantage of the greater flow rates and easier installation of the MIFAB-FILCOTEN neutral sloped trench drain systems instead of the industry standard sloped trench drain systems.

Flow rate comparison calculation according to MANNING and STRICKLER

Note: You can see in the details below that the inner slope changes between a 10 meter run and a 20 meter run. This also explains why the flow rate will be substantially higher with a 10 meter run.

6" Wide Sloped vs Neutral Sloped Flow Rate Comparison

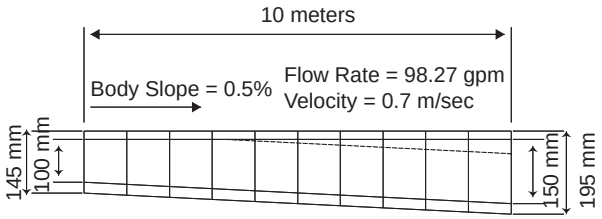

Figure 1-A **Typical Sloped Trench Drain from Others**

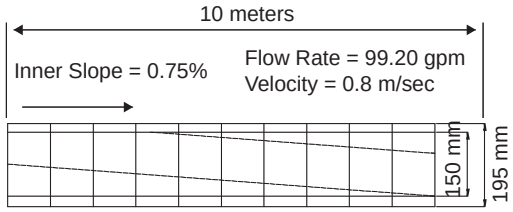

Figure 2-A **Filcoten T1510N**

This line refers to the open water level, which will start lowering after 1/3 of the run towards the outlet.

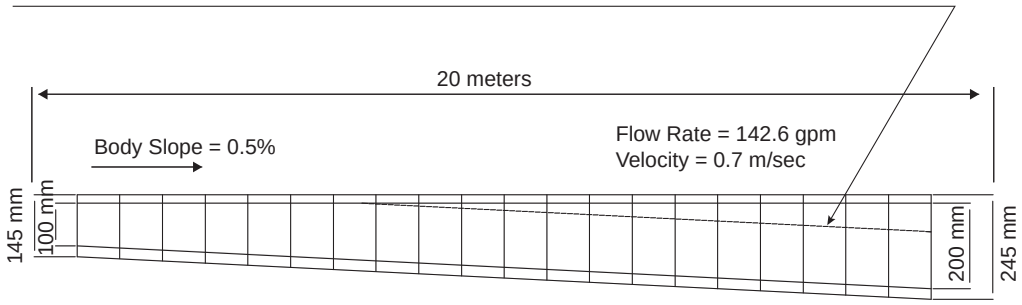

Figure 1-B **Typical Sloped Trench Drain from Others**

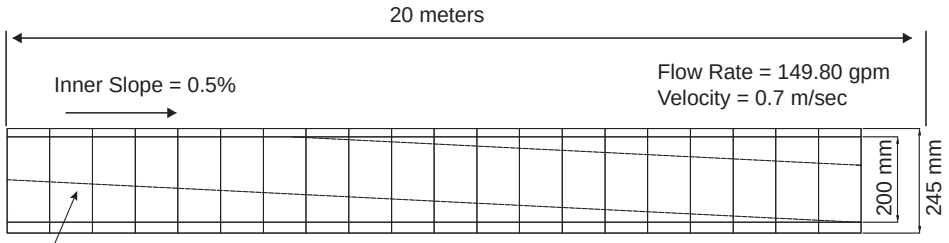

Figure 2-B **Filcoten T1520N**

This line refers to the “inner slope”, which is created by the height of the body and the length of the run. This is based on the principle of the Gauckler Manning Strickler formula.

Note: A neutral run with a constant height of the bodies will always have a higher flow rate, because the total trench drain volume will be higher than a sloped system with 0.5 to 0.6% slope. An substantial increase in flow rate can only be achieved with a sloped system that has an slope of more than 1.6%. Note that sloped bodies available typically have a body slope of only 0.5% to 0.6%