CHEAPER, FASTER, SAFER: FOAM TRENCH BREAKERS ARE SUPERIOR ALTERNATIVE TO SANDBAGS

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A vitally important consideration in the construction of any buried pipeline is water management or erosion control. Essentially, this entails managing the movement of water and the suspended sediment after it has permeated through the porous backfill that covers the pipeline. This consideration becomes even more critical as the pipeline passes up and down mountains.

The traditional method used to address pipeline erosion is to place sandbag barriers or trench breakers at specific intervals in the trench to slow the water movement, allowing the suspended sediment to settle. This practice involves filling sandbags with approximately 40 pounds of sand and placing them in the trench one sandbag wide to form a dam. The sandbags are arranged around the pipe and continue up the trench to within approximately one foot of the surrounding grade. Approximately six sandbags are needed to cover one cubic foot of the trench cross section. A trench that is 7 feet deep and 4 feet wide has 24 cubic feet of trench cross section (bags continue up to one foot of the top) and would require 144 sandbags, minus the area occupied by the pipeline itself. (Everyone has seen video footage of a large group filling and placing sandbags to hold back rising waters from a flood, so you have an idea of how labor intensive and time consuming this process can be.)

A newer method employed to manage trench erosion is through the installation of Spray Polyurethane Foam (SPF) trench breakers. This method involves utilizing specialized mobile equipment to combine a polyurethane resin and Isocyanate at a specific temperature and pressure. This process is done onsite and the liquid mixture is sprayed in the trench and around the pipeline. Within seconds the material begins to expand, filling the trench and adhering to both the pipeline and the trench walls with a rigid, waterproof foam. A trench that is 6 feet deep and 4 feet wide can be completed in a few minutes with a trench breaker that weighs only about 50 pounds. SPF can also be used to spray a thin, two-inch layer over the entire trench as a guard to protect the pipeline from rocks or other debris in the backfill soil that can damage the pipeline or its protective covering.

Both sandbag and SPF trench breakers will reduce erosion within the backfilled trench, but SPF trench breakers have many advantages that can't be matched by sandbags:

- Efficiency: The standard install time for a single SPF trench breaker is generally less than 10 minutes and 40 to 80 can be placed in a typical day with just two workers. Filling and placing sandbags is five to ten times slower and requires many more workers to complete the process. By using SPF trench breakers, backfilling operations become much more efficient and productive as the trench can be backfilled 15-30 minutes after the install, keeping the pipeline project on schedule. Backfilling operations are often slowed by sandbag installation but typically can't keep up with SPF trench breaker installation.

- Longevity: SPF is inert and will maintain its shape and size indefinitely beneath the soil. In addition, SPF trench breakers are completely waterproof so water can never penetrate the material. Sandbag trench breakers are not waterproof and will take on moisture and in many climates will be impacted by the freeze-thaw cycle that can shorten their functional life span.

- Safety: In virtually all applications, SPF trench breaker installers can fully complete their trench breakers from outside the trench. Sandbag trench breaker installers will require one or more installers in the trench to place the sandbags effectively. This becomes a major safety issue, especially in deep, narrow trenches. In narrow trenches, it becomes nearly impossible to carefully place and stack sandbags for maximum effectiveness because workers have to drop sandbags into place because of safety concerns.

- Performance: SPF material is sprayed into the trench in liquid form so it can easily migrate under and around the pipeline and expand to fill all voids. In addition, the material is fully waterproof and will conform to any shape and adhere to the pipeline and trench walls, fully stopping water flow. Sandbags cannot fully conform to any shape, which prevents the trench from being fully protected, particularly under the pipeline, where water erosion control is most critical.

Up to 80 foam trench breakers can be installed on a typical day with a two-person crew. Backfilling operations typically cannot keep up with a crew installing foam trench breakers, while those same operations often have to wait during labor-intensive sandbag trench breaker installation.

The old way of trench breaker installation – using sandbags – is costly, labor-intensive and slow.
• Cost: The depth and width of a trench greatly impacts the price of either option, but generally speaking, the cost per trench breaker is comparable -- at first glance. However, the efficiency and longevity of the SPF trench breaker makes it a much more attractive and cost-effective option. Considering all pertinent factors – including cost of materials, labor, longevity of the trench breakers and backfill efficiency – foam trench breakers overall can cost as little as one-third that of sandbag trench breakers.

In summary, SPF trench breakers are a superior erosion control method over sandbags in pipeline trenches. SPF trench breaker installation is much less labor-intensive and poses significantly less chance of employee injury because the SPF installers seldom need to enter the trench. Additionally, the speed of installation and the fast cure time allows for more efficient pipeline construction with significant time and cost savings. Finally, SPF trench breakers conform to any shape and adhere to both the pipeline and the trench walls, providing water containment and erosion control far superior to sandbags.

Facing ever-changing and more stringent state and federal regulations addressing pipeline safety and environmental issues such as erosion, pipeline companies can "stay ahead of the curve" with foam trench breakers and rock guards, while also saving money and greatly improving efficiency.


Foundation SupportWorks is a division of Basement Systems of West Virginia, the state's leading basement, crawl space and foundation repair company.