

# TECH TIPS

FROM NASSCO

TECH TIPS BY NASSCO IS A BI-MONTHLY ARTICLE ON TRENDS, BEST PRACTICES AND INDUSTRY ADVICE FROM NASSCO'S TRENCHLESS TECHNOLOGY MEMBERSHIP PROFESSIONALS.

## CLEANING LARGE DIAMETER SEWERS: SIZE IS JUST THE BEGINNING

By NASSCO Member Joe Schotthoefer, Doetsch Environmental Services

Defining a large diameter sewer is not as simple as measuring the physical size. Large diameter sewers, and the subsequent cleaning of them, have a unique set of characteristics that are considerably different from small diameter sewers. The easiest definition of a large diameter pipe is one that is greater than or equal to 30 inches. But the truth is, pipe diameter alone doesn't tell the whole story.

There are many other factors that may inhibit standard cleaning methods and will instead suggest the use of large diameter sewer cleaning processes or the potential need for specialty cleaning equipment in order to successfully complete the task. A large diameter sewer can also be described as an interceptor, trunk sewer or collector. These alternate names correctly define the purpose of the large diameter sewer pipe. The sewer is a collector for many smaller pipes that it intercepts, and collects more flow as it conveys wastewater and debris to the waste treatment plant. Commonly, there is not a redundant system or means of storing flow

for maintenance. These pipes carry substantial flow which may not be stopped or diverted. In a small diameter pipe, flow is often low or no flow and debris extraction can be easily managed. This is quite a different scenario from the collectors because bypass pumping is often suspended, cost prohibitive and must be cleaned under live flow conditions. Additionally, different extraction methods are necessary to remove debris under the water. The key point is that once the jetted debris is suspended in the flow, it will remain in motion. There isn't a stop sign at the manhole, so a continuous and efficient method of extraction must be utilized.

The increased flow and velocity of the interceptor allows the light debris to travel to the waste treatment plant, whilst the heavier grit and gravel may settle at the invert of the pipe. This is unlike small diameter sewers that are often laden with organic material that is much easier to clean with conventional jetting methods. Often, however, it is not only the grit and gravel found in these interceptors but large objects of unusual shape and size. Objects commonly found include rocks, bricks, construction debris, car parts, shopping carts, broken pieces of infrastructure and any other object that someone thought was humorous to throw into an open manhole. These objects are very common and will be discovered when cleaning interceptors that have never been cleaned.

The combination of sewer grit and the unknown objects often create very high debris levels. In small diameter cleaning, production is often measured by feet cleaned per day. When working in large diameter pipes that require cleaning, productivity is often measured by tons cleaned per day. It is not uncommon to work out of a single manhole/access point for several weeks, which gives you an idea of the high levels of debris. Along with this high debris

level, it is also very common to encounter debris that is very compact and difficult to jet.

As these pipes collect or intercept wastewater from smaller pipes they will get sequentially larger. The vertical placement of these interceptors are often much deeper than the small diameter pipes that contribute wastewater to them. Small diameter sewer placement is typically shallow, and the interceptors are often 30 to 100+ feet deep in gravity flow situations. They are also spaced at much longer distances between access points due to the construction costs of the deep shafts required. In a typical neighborhood, manhole spacing is commonly 300 feet, while interceptor access can often reach several thousand feet between access points. The term access point was purposefully used, because while it is common to build manholes directly over the crown of the pipe, deep interceptor access points are most commonly offset to the side of the pipe due to the weight of the chimney on top of the pipe or the construction material of the interceptor itself. Along with the great distance between access points, another common construction feature is turns (or angles) in the pipe, which will have to be cleaned through.

Large Diameter vs. Small Diameter Comparison

	Small Diameter	Large Diameter
Size	4"-30"	>30"
Flow	Low / no flow	Constant / often surcharged
Debris Type	Soft organics / roots / encrustations	Sand / gravel / rock / larger roots / heavy encrustations
Debris Depth	Measured in inches	Measured in feet
Segment Reach	Hundreds of feet	Thousands of feet
Manhole Depths	5' to 20'	20' to 100'+
Horizontal Alignment	Usually straight	Commonly with angles

*This was a brief discussion of the defining differences between small and large diameter sewers. Please make plans to join us at the NASSCO track at the 2016 WWETT show on February 17 at 9:30AM for a continued discussion of these principles, and to help enhance your knowledge and techniques for cleaning and maintaining large diameter sewers.*