Kanaflex®

Post Installation Testing Guidelines for Kanapipe™

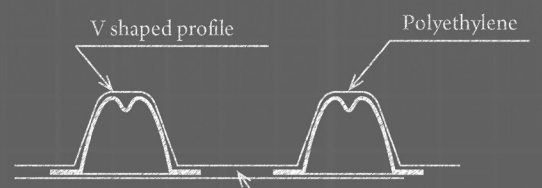

Figure 2

12" – 42"

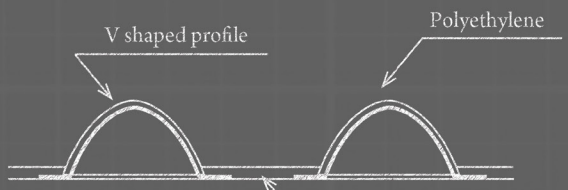

Figure 3

>48"

KanaPipe 12" Spec

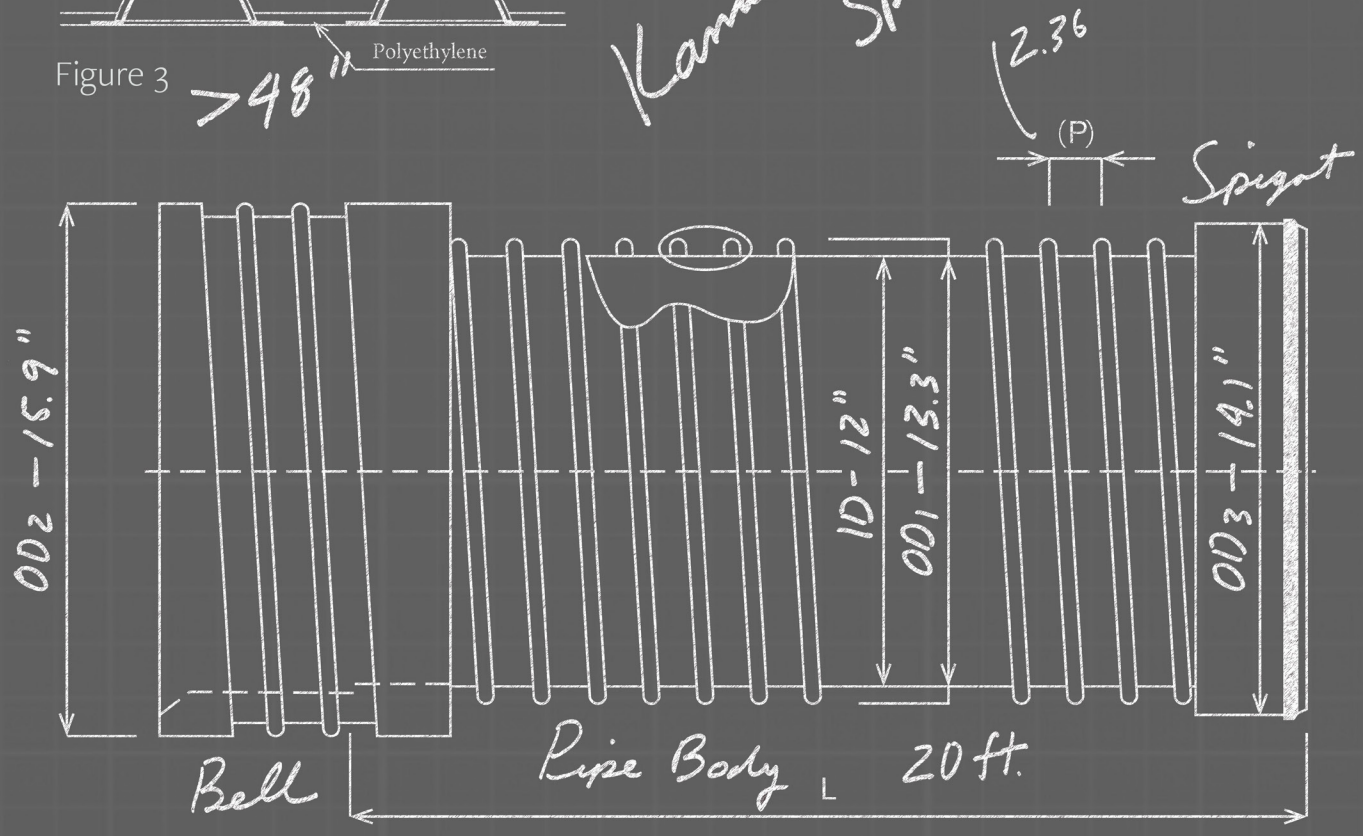

Figure 1

Flexible Pipe

Kanapipe™ is smooth interior, corrugated exterior Steel Reinforced Polyethylene (SRPE) pipe with a galvanized V-shaped reinforcing steel profile fully encased in High Density Polyethylene (HDPE). Its advanced reinforcing design and superior bell & spigot joint rated to 20 psi will provide you with excellent performance during post installation testing. Categorized as a flexible pipe material and as with all other flexible pipes Kanapipe™; through deflection, reacts to vertical soil loads when buried in a trench. As such, deflection demonstrates that the pipe works with the surrounding soil (backfill) so it can easily withstand common and even extreme soil loads. While testing for deflection is important, it is also essential to proceed with post installation testing to validate the water tightness of the sewer pipe system.

Therefore, post installation testing of flexible pipes may include deflection testing and leak testing. It is recommended that deflection testing takes place after the final backfill and compaction has been in place at least 30 days and prior to putting the pipe in operation.

A recommended sequence of testing for sewer systems follows, but please note that the utility or the design engineer may have spelled out the post installation testing in the project's documents.

1. Cleaning and flushing with high-pressure water blasting
2. Deflection testing
3. Water-tightness (leakage) testing
4. Closed Circuit Television (CCTV) testing with or without laser profiling*

* CCTV and Deflection testing can be performed simultaneously

Base Inside Diameter

Before setting out to measure pipe deflection it is important to understand exactly what we will be measuring. Allowable deflection must not be measured from the nominal diameter of the installed pipe. The base diameter used in the assessment of deflection must take into account allowable out-of-roundness manufacturing tolerances. Base diameter for Kanapipe is shown in Table 1 and is calculated using Equation 1:

Equation 1

$$D_B = D_i - \sqrt{(A^2 + B^2)}$$

Where: D_B = base inside diameter
D_i = nominal inside diameter (ID)
A = ID manufacturing tolerance (4.5% oversize or 1.5% undersize as per AASHTO
B = shipping ovality = $0.03D_i$

Table 1
Base Diameter for Kanapipe™

Nominal Inside Diameter		Base Diameter	
inches	mm	inches	mm
12	300	11.60	290
15	375	14.50	362
18	450	17.40	435
24	600	23.20	580
30	750	28.99	725
36	900	34.79	870
42	1050	40.59	1015
48	1200	46.39	1160
60	1500	57.99	1450
72	1800	69.58	1740

Deflection Testing

Deflection testing determines whether the internal diameter of the pipe's barrel has been reduced more than the allowable limit. Proper backfill and compaction of the backfill envelope are essential to control pipe deflection. Standard practices have established the allowable deflection of thermoplastic pipes, including SRPE pipes, at 7.5% of the pipe's internal diameter. You can also refer to your specific project documents to confirm the allowable deflection limit. There are several acceptable methods suitable for measuring Kanapipe's deflection; these include:

1. Go/No-Go Device

An easy and convenient way to validate that deflection has not exceeded the allowable limits is with the use of a simple go/no-go device such as a mandrel which will have been assembled to match the smallest inside diameter allowed. It is convenient to pull the mandrel through as you are performing the CCTV inspection. Your Kanaflex representative can provide support and information to help procure such a device.

2. Laser Profiling Devices

Should a more detailed deflection measurement be needed; laser profiling devices can provide additional information. Used in conjunction with CCTV equipment, laser profiling is an acceptable tool for pipe inspection. CCTV inspection alone can identify cracks or faulty joints within the pipe. However, combined with laser profilers the two provide valuable information for identifying pipe distortion including vertical and horizontal deflection. The use of laser profilers in post installation testing is growing amongst utilities. The measurements taken provide an indication of whether the pipe system meets ovality specifications and/or if cracks or joint deflects are present. Laser profiling equipment is available from a variety of manufacturers. For best results, the pipe should be free of obstructions, water and debris prior to inspection. Only qualified and trained personal should be employed to evaluate CCTV images and laser profiling information.

3. Visual Inspection/Direct Measurement

When the size of the pipe allows for it, visual inspection can be a practical to inspect a pipe. A visual inspection can be performed by examining the pipe surface for issues related to shape, cracks, and localized flattening. Direct measurement of vertical deflection can be made using a measuring tape or any other acceptable method. Often a vertical measurement is recorded every 10.0 ft (3.0 m) or at the pipe joint and in the middle of the pipe length. A minimum of four measurements per pipe installation is usually recommended.

Leak Testing

Leak testing is done to evaluate joint integrity and ensure there will be no infiltration or exfiltration in a watertight pipe system. Locations for leakage measurements and the method of testing shall be specified by the engineer. Tests are performed using either low-pressure air or water to create a constant pressure within the system. Note that the use of low-pressure air test is NOT recommended for pipes larger than 24-in (600 mm).

Water Infiltration/Exfiltration Testing

Pressure testing using water is performed in accordance with ASTM F2487 Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Corrugated High Density Polyethylene and Polypropylene Pipelines. If the water table along the length of the pipe section to be tested is above the top of the pipe throughout its length, an infiltration test is used to measure leakage. Exfiltration testing is an accepted method of testing in dry areas only. At the upstream manhole the test head shall be established as a minimum of 2.o ft (0.6 m) above the crown of the pipe, or at least 2.0 ft (0.6M0 above existing groundwater, whichever is higher. The minimum test period shall be 15 min and the maximum shall not exceed 24 h.

Allowable Leakage Rate

Leakage criteria for infiltration and exfiltration testing shall be determined by the owner based on their application and design requirements. It is worth noting that current Environmental Protection Agency's (EPA) maximum leakage allowance specified for infiltration and exfiltration acceptance for sanitary pipelines is 200 gal/inch of internal diameter/mile of pipeline/day (18.5 L/mm of internal diameter/km of pipeline/day.

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