

Vylon® Pipe Provides Better Option

Bellevue, Nebraska, gateway to the upper Missouri and the fur trade empire, is the oldest continuous settlement in Nebraska. It is a burgeoning residential community that is home to the Offutt Air Force Base and STRAT-COM Headquarters, the center of defense for the western world.



Dennis Hilfiker, Bellevue Public Works

As a growing city, Bellevue is an established residential community with all the same environmental concerns and demands on its infrastructure as any other community in the United States. The July 1993 flooding of the Missouri River strained the infrastructure and almost washed away the city's Haworth Park. The wastewater systems are maintained by the Bellevue Public Works under the guidance and direction of Dennis Hilfiker.

The city was recently faced with the costly burden of a deteriorating sewer system that had been experiencing high amounts of infiltration for many years. Constructed during the 1950's, the existing system was comprised primarily of concrete pipe. Hilfiker contracted Omaha, Nebraska based consultants, Kirkham-Michael & Associates to develop the project plans and specifications to replace the deteriorating sanitary sewer trunk with a new and larger interceptor for one of the city's drainage areas.

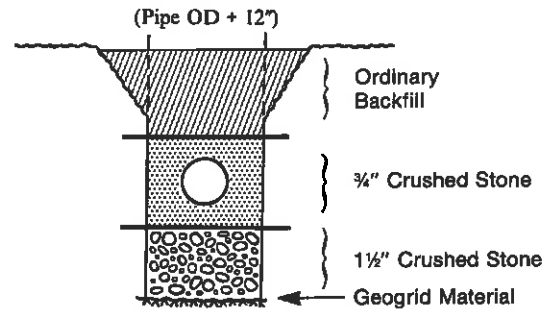
Plans and specifications were developed for the Mud Creek Sewer Interceptor, a project consisting of 13,000 linear feet of 21- through 36-inch gravity sewer pipe. A leakage allowance was specified to curtail ground water infiltration and expensive treatment costs. The project was competitively bid and the successful bidder was Andrus Enterprises Inc. of Omaha, Nebraska. Andrus was awarded the project based on using reinforced concrete pipe (RCP) with the "O" ring gasket and a "R-4" sewer joint. This is the standard RCP joint in the region which meets the 200 gallon/day per inch-diameter leakage allowance.

Soon after Andrus Enterprises, Inc. began installing 36-inch concrete pipe along Mud Creek, they experienced problems keeping the pipe on grade because of unstable soils and a high water table. There were many leaking joints that had to be repaired by the concrete pipe manufacturer to pass the exfiltration test.



Meanwhile, 21-inch Vylon pipe was being successfully installed on a similar project in the City of Bellevue. Upon hearing of the problems facing the Mud Creek project team, Lamson Vylon Pipe's marketing and technical staff contacted Andrus Enterprises, Inc. and supplied them with bedding requirements for the unstable area and competitive pricing for the pipe. Lamson Vylon Pipe recommended an undercut of approximately 15- to 18-inches. The undercut was filled with 1 1/2-inch minus crushed stone (well graded) on top of a geogrid and up to 6-inch below the pipe. Next, 3/4-inch minus crushed stone was then used from 6-inches below the pipe to 6-inches over the top in a trench that was one foot wider than the pipe's outside diameter.

TRENCH WIDTH



Bedding detail that stabilized poor ground conditions.

The bedding recommendation stabilized the Mud Creek foundation and Andrus Enterprises, Inc. successfully installed 24-inch Vylon pipe where 24-inch RCP had sunken off grade. Lightweight, closed profile Vylon pipe was installed at a much faster production rate than the concrete pipe. Vylon pipe passed the initial 5% deflection test and, one year later, was re-mandrelled successfully.

"Large diameter, PVC, closed profile pipe has made an immediate impact on Bellevue and the surrounding area...with zero-leakage jointing system, superior chemical resistance, and the ability to be installed in deep, wet conditions, we will specify Vylon pipe on future Bellevue projects," said Hilfiker.



Haworth Park



Wastewater Treatment Facility

Vylon pipe was further used to replace concrete pipe located in landscaped residential lots of this developing community. The concrete pipe was continuously failing the exfiltration test and dramatically slowing the project down. Facing liquidated damages, Andrus Enterprises, Inc. removed the concrete pipe and within 24 hours had successfully installed and air-tested 454 linear feet of 24-inch Vylon pipe.

Vylon pipe is available in long lengths that reduce the number of joints needed and allow for faster, more efficient installation. Vylon pipe also provides a smoother internal wall surface that minimizes fluid friction and flow resistance. This hydraulic smoothness inhibits slime buildup and thereby lowers sewer maintenance costs. According to Curt Andrus of Andrus Enterprises, Inc., "The bedding recommendations from Lamson Vylon Pipe stabilized the foundations. The lightweight, closed profile PVC pipe was installed at a much higher production rate than concrete. Vylon pipe air tested perfectly...that's why we switched from concrete to Vylon pipe." Ease of installation and superior performance of Vylon pipe eliminated any fears of late charges. The contractor finished the project with 3,300 linear feet of 21-inch through 24-inch Vylon pipe.

Eight-inch through 24-inch pipe supplied by Lamson Vylon Pipe was also used on the city's Squaw Creek Interceptor and the 25th Street and Childs Interceptor. The new interceptors eliminated seven lift stations that will reduce the city's maintenance budget and reduce capital outlays.

The decision to use Vylon pipe can be attributed to performance characteristics of the product combined with the technical expertise provided by Lamson Vylon Pipe. PVC Vylon pipe is engineered with deep insertion, gasketed joints that provide superior resistance to costly leakage. Infiltration is a problem in Bellevue. One joint leaking one gallon per minute equals over 500,000 gallons per year. With the cost of sewage treatment today, that's a very expensive leak. One leaking joint can easily add several thousand dollars a year to the cost of operating the treatment plant. Leaking joints overload the treatment plants, steal the capacity of the collection lines and cause the streets to cave-in when the soil washes into the pipe. Vylon pipe bends or flexes when subjected to external loads rather than cracking, breaking or shearing. Not only does the ability to flex serve to eliminate fracturing and leakage associated with cracking, but Vylon pipe's flexibility, in combination with the surrounding soil, enables it to sustain loadings that would crush rigid pipes.

Typical pipe embedment conditions will permit loadings approaching 6,000 lbs. per square foot (50 ft. depth), without excessive deformation.

In addition, PVC Vylon pipe provides exceptional durability. Vylon pipe is resistant to virtually all chemical attacks found in both domestic and industrial wastewaters. Sulfide corrosion does not occur with Vylon pipe and abrasion wear has been observed as insignificant.

Years of research and development, hands-on experience, and dependable products have made Vylon pipe the preferred piping system. Lamson Vylon Pipe Technical Services is staffed to analyze any particular project needs. They provide finite element analysis, suggested bedding material analysis, services, post installation inspections, and much more.

Lamson Vylon Pipe has been making quality pipes for more than 30 years, and was the first manufacturer of 18-inch PVC gasketed sewer pipe. Large diameter Vylon pipe is an extension of the company's proven technology. Produced in 13 foot length sections, Vylon pipe derives its strength from a superior profile wall construction that enables Lamson Vylon Pipe to produce Vylon pipe in 21-inch through 48-inch diameters. All sizes meet and exceed ASTM D - 3212 joint tightness requirements. The long-term ability of Vylon pipe to meet "zero-leakage" criteria, resist corrosion, provide excellent flow rates and reduce operating and maintenance costs, has enabled Lamson Vylon Pipe to provide better options for cities across North America.



Concrete pipe replaced with Vylon pipe.

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