Tight Joints Are Needed in Storm Drainage

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Storm sewers have always presented special needs for jointing systems. Because of their function they are subject to rapid changing flow levels. Flows are high during storm periods but quickly fall to low or no flow situation at the storm ends. This sudden rise and fall of flow levels leaves storm sewers susceptible to backfill migration into the sewer itself unless soil tight or watertight joints are used. This loss of backfill reduces the soil support of the pipe and causes settlement at the surface. Where storm sewers are below the existing water table, watertight joints are a must to maintain capacity during a storm event and preserve bedding integrity at all times.

With the Clean Water Act, effective October 1, 1992, the U.S. Environmental Protection Agency’s (EPA) National Pollutant Discharge Elimination System (NPDES) has increased attention and focus on non-point surface water pollution control (both quality and quantity). The Clean Water Act provides that storm water discharges from a specific source (including discharges through a municipal separate storm sewer system) to waters of the United States are unlawful unless authorized by a NPDES permit. The permit requirements address limiting runoff and the discharge to the degree attainable. Unwanted and uncontrolled runoff through inappropriate connections or open joints in storm drainage systems that may have been approved in the past are no longer acceptable practice.

There are nationwide performance specifications existing to preclude either soil tight or watertight joints for storm drainage applications. AASHTO Standard Specifications for Highway Bridges Section 26.4.2.4 titled “Joint Properties” is the referenced standard for soil tight joint criteria for corrugated metal and thermoplastic pipes. Specifically, AASHTO states: “As a general guideline, a backfill material containing a high percentage of fine-grained soils requires investigation for the specific type of joint to be used to guard against infiltration. Alternatively, if a joint demonstrates its ability to pass a psi hydrostatic test, without leakage, it will be considered ‘soil tight.’” In many cases, local storm drainage material and testing specifica-
tions are developed to be used over a wide range of projects and job site conditions. Consideration for individual job site conditions is not always practical. To eliminate the need and expense of the “investigation” the alternative (2 psi hydrostatic test) should be the standard.

When water tight joints are necessary or desirable, joints meeting the requirements of ASTM D3212 “Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals” have long been proven in PVC sanitary sewer applications. These top quality joints are a must in applications below the water table or where EPA regulations control.

Recent technology developments have expanded the available size range of profile wall PVC storm drainage pipe systems. All quality systems are offered with a choice of soil tight and watertight (ASTM D3212) joints. With EPA’s recent regulation to minimize stormwater pollution as well as their need to protect the public from the damage effects of soil migration through open storm sewer joints, the time has come to consider tight drainage systems.