

PVC tops pipe joint performance tests

In tests conducted by the CSIRO Building, Construction and Engineering Division, to measure the performance of various pipe materials to root penetration, PVC pipes came out with a perfect score in that there was nil root intrusion in any of the samples tested.

This compares with penetration of 87% for vitreous clay pipes (VC) and 37% for fibre reinforced concrete (FRC) in accelerated trials over a period of 32 months.

This is despite that PVC was tested with a ring system having a much lower interfacial pressure compared to VC and FRC joints.

It is accepted that low interface pressures promote ease of root intrusion, and the tests also concluded that porosity and surface roughness of the pipe material played a major role in joint failure.

In this respect the impervious nature of PVC, together with its smooth inner and outer wall, and its ability to withstand ground movement, thermal expansion and contraction, make it ideal sewer and storm-drain pipe.

The consequences of inadequate sewer pipelines abound in all major Australian cities, from tree root intrusion to cracked pipes caused by ground settlement.

This leads to pipe blockages, ground water infiltration and sewage exfiltration.

Infiltration through pipe joints or cracked pipes can cause silting of pipelines as well as larger weather flows into the sewerage system which raises operating and installation costs, as larger capacity pipes and effluent treatment facilities are needed.

In extreme cases infiltration leads to overflows and untreated discharges being made by utilities.

The overflow pipeline being constructed in Sydney's Middle Harbour at a cost estimated at \$600m is a consequence of inadequate and leaking old sewer pipelines.

Exfiltration through pipe joints can lead to contamination of ground water and waterways and cause a public health hazard.



TEST HIGHLIGHTS:

Root penetration accelerated trials over a 32-month period:

Types of pipe	Percentage of root penetration
PVC pipes	0%
Vitreous clay pipe	87%
Fibre reinforced concrete pipe	37%

PIPA wishes to acknowledge and thank all our Technical Committee members and Industry Consultants for their contribution, expertise, and assistance in the development of this technical document.

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