PVC-U STORMWATER PIPE & FITTINGS SYSTEM

TESTING

TESTING STORMWATER PIPELINES

Modern construction practice is to adopt some rigorous form of acceptance test on newly constructed stormwater lines. It is usual for two separate tests to be made: one prior to backfilling and another towards the end of the job when backfilling has been completed and settled, and manholes and sidelines constructed. The purpose of testing a non-pressure pipeline is to ensure that the line has been correctly laid to line and grade, will flow satisfactorily and is sealed at each joint and fitting. Recommended practices follow.

PREPARING FOR THE TEST:

During the installation careful checking and adequate supervision will ensure that stormwater lines are laid to line and grade. If an installation specification exists it should be followed. Otherwise the pipeline section to be tested should be backfilled leaving all couplings and fittings exposed for inspection during testing. In solvent weld PVC-U jointed non-pressure pipelines, at least 24 hours should have elapsed since the last joint was made before testing commences.

TEST PROCEDURES:

Two types of testing are in current use - hydrostatic testing and low pressure or vacuum air testing. The choice of the type of test, its duration and test pressures required depend on the requirements of the authority concerned and may also be governed by the availability of water on the site, but in general hydrostatic testing is recommended.

HYDROSTATIC TESTING:

The single opening at the top of the test section should be fitted with a special test plug. The test plug should have two entries; an upper one connected to a calibrated container capable of supplying make-up water when filled, and a lower entry connected to a water supply. The pipeline should be filled with water allowing air to escape through the upper entry in the test plug via the calibrated container. Unless otherwise specified by the client or relevant Government Authority, the following figures are recommended. When pipeline is full, using the calibrated container raise the pipeline pressure to between 2m and 3m above the natural surface at the top of the test section. Allow the pipeline time to settle during which period make-up water should be added. This period should be a minimum of 24 hours. During a subsequent one hour test the water loss measured by the drop in water level should not exceed 0.55 litres per 10mm internal diameter per 100 metres of pipe length. During the test all joints should be inspected. Should the pipeline fail to pass the test it must be further examined to locate the leak, then drained, repaired and retested.

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VOLUME OF WATER REQUIRED TO FILL LINE:

For a guide as to the amount of water required to fill the test section of stormwater line, the following table has been calculated. The amount of water required in practice will vary slightly from the tabulated figures due to variations in pressure and temperature.

NOMINAL DIAMETER (MM)	VOL. IN M3/KM OR L/M
75	4.5
90	5.8
100	8.5
150	18
225	43.9
300	69.6
375	112.2

MAKE-UP WATER:

Make-up water will generally be necessary to obtain a satisfactory test, even if the pipeline is laid with the best of care under favourable conditions because of entrapped or entrained air.

LOW PRESSURE AIR TESTING:

All inlets, outlets and access points shall be capped and sealed. Air shall be introduced slowly, since rapid pressurization can cause significant air temperature changes that may affect testing accuracy.

Apply an initial test pressure of approximately 15kPa. Close the valve on the pressure line and shut off the pump. Allow the air pressure to stabilize for at least 3min to identify any initial leakage.

When the pressure has stabilized and is at or above the starting test pressure of 10kPa commence the test by allowing the gauge pressure to drop to 10kPa, at which point initiate time recording. Record the drop in pressure over the test period.

The length of drain under test is considered to pass if the pressure drop is ≤3kPa for the relevant time interval specified in table below.

COMPLETING FINAL BACKFILL:

After testing of the pipeline, selected material should be hand shovelled over each exposed joint and tamped to give 300mm minimum cover. Final backfilling to ground level can be completed by hand or machine, using the soil originally excavated from the trench. Care should be taken to exclude large rocks and stones from the final backfill.