

DWV PIPE & FITTINGS SYSTEM

TESTING

TESTING PIPELINES

Modern construction practice is to adopt some rigorous form of acceptance test on newly constructed sewer 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.

In the case of a sewer pipeline system, three distinct areas require testing.

1. The sewer rising mains
2. The gravity pipeline sections
3. The gravity reticulation sections

THE RECOMMENDED PRACTICES FOR TESTING GRAVITY PIPELINES ARE AS FOLLOWS:

Preparing for the Test:

During the installation careful checking and adequate supervision will ensure that sewer 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:

All new sewers and sanitary drainage and other non-pressure installations shall be tested using either hydrostatic test, low pressure air test or vacuum testing. The tests shall also be applied to any section of existing pipeline or drain that has been repaired or replaced. All openings in the pipeline below the top of the section under test shall be sealed.

Hydrostatic testing:

The pipeline shall be filled with water to a height of not less than 1m above the natural ground level at the highest point of the section being tested, or to the flood level of the lowest sanitary fixture, but not exceeding 5m at the lowest point of the test section.

The pressure shall be maintained without leakage for at least 15 minutes. The source of any leaks shall then be ascertained and any defects repaired. The pipeline shall then be retested.

Volume of water required to fill line:

For a guide as to the amount of water required to fill the test section of sewer 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.

NORMINAL DIA. (MM)	VOL. IN M ³ /KM OR L/M
100 SN6	8.5
150 SN4	18
225 SN4	43.9
300 SN4	69.6
375 SN4	112.2

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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 $\leq 3\text{kPa}$ for the relevant time interval specified in table below.

Vacuum air testing

All inlets, outlets and access points shall be capped and sealed.

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

When the vacuum has stabilized and is above the starting test vacuum of 10kPa, commence the test by allowing the vacuum to drop to 10kPa, at which point initiate time recording.

Record the drop in vacuum over the test period.

The length of drain under test is considered to pass if the test vacuum loss is $\leq 3\text{kPa}$ for the relevant time interval specified in table below.

Pressure and vacuum air testing acceptance times for 3kPa pressure change:

PIPE SIZE DN. (MM)	TEST LENGTH, METRES					
	50	100	150	200	250	300
MINIMUM TEST DURATION, MINUTES						
<100	2	2	2	2	3	3
100	2	2	2	2	3	3
150	3	3	3	5	6	6
225	4	5	8	10	13	15
300	6	9	14	18	23	29
375	7	14	22	29	36	43

NOTE:

1. Timing of the test duration shall commence after the 3 minutes initial period.

2. Test duration times for other combinations of pipe size and test length may be interpolated.

Closed circuit television (CCTV) inspection:

CCTV acceptance inspection of sanitary drains shall be conducted in accordance with the requirements of WSA 05. In addition, the operator shall investigate, describe, identify and report on the defects or features in accordance with the criteria in this Clause.

Inspection shall be conducted under no-flow conditions, that is the sanitary plumbing system is not being used so that the flow (water) level can be measured and reported.

NOTE: It is recommended that the sanitary drain be cleaned prior to inspection.

AS/NZS 2032 and AS/NZS 3500 may also be referred to for information on testing DWV installations.

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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.



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