



Air Quality Report

Prepared For

TWK Steel Pty Ltd

Report No. J 2003121

19 March 2020

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BACKGROUND

MAGdrain is a newly developed plumbing accessory designed to prevent sewer gases and aerosols entering homes and workplaces through drain hole (plug) connections. MAGdrain is essentially a magnetic plug. A magnetically actuated piston causes the metal plug/closure to seal against a silicone ring from below. Water pressure from above causes the valve to open allowing water to drain.

BELL Laboratories was requested to determine the effectiveness of MAGdrain with regards to aerosols passing through the device from the sewer side to the clean side (indoors).

TEST METHODOLOGY

The MAGdrain device was installed into an environmental chamber. The device was installed so that the top of the device (clean side) was inside the chamber while the bottom of the device (sewer side) was exposed to an environment contaminated with aerosols/particles. The chamber was supplied with aerosol free air.

The concentration of particles and aerosols was measured on both sides of the MAGdrain device using a laser particle counter. Any aerosol/particle counted within the chamber is assumed to have passed through the MAGdrain device.

Parameter	Test Method
Particle count (0.3µm, 0.5µm, 1µm, 2.5µm, 5µm, 10µm)	ISO 14644

ISO – International Standards Organisation

TEST SCHEDULE

Test No.	Configuration	Test Parameters
1	Low pressure (plug closed)	Clean side: particle count (0.3µm, 0.5µm, 1µm, 2.5µm, 5µm, 10µm) Sewer side: particle count (0.3µm, 0.5µm, 1µm, 2.5µm, 5µm, 10µm)
2	High pressure (plug open)	Clean side: particle count (0.3µm, 0.5µm, 1µm, 2.5µm, 5µm, 10µm) Sewer side: particle count (0.3µm, 0.5µm, 1µm, 2.5µm, 5µm, 10µm)

PHOTOGRAPH OF TEST ITEM – MAGDRAIN

Environmental chamber showing MAGdrain installation



TEST OUTCOME

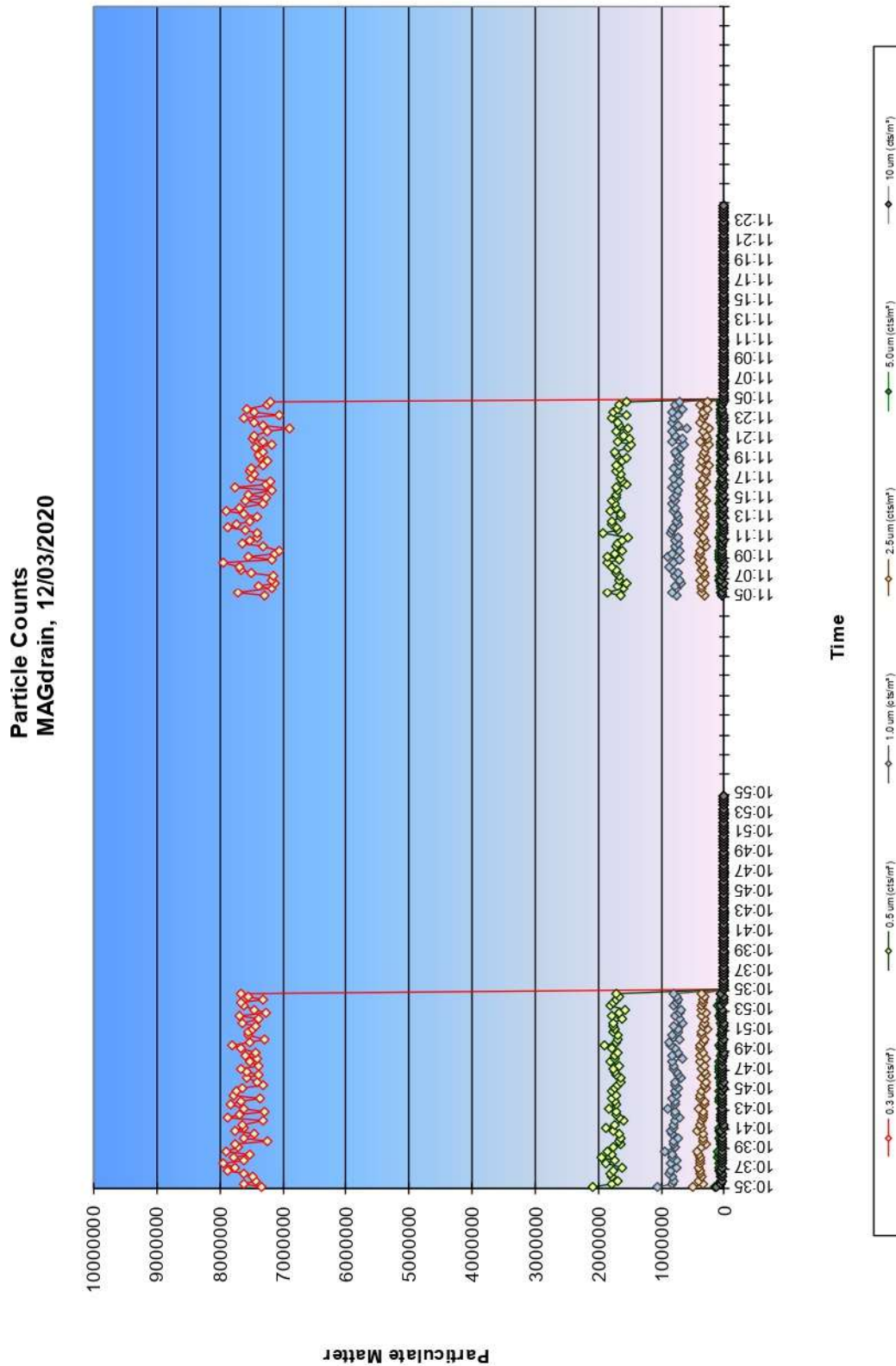
Tables and graphs of test results are presented on the following pages.

TABULATED PARTICLE COUNT RESULTS

Particle counts (Plug closed)	Date	Sewer side 12/03/20 Concentration cts/m ³	Clean side 12/03/20 Concentration cts/m ³	Efficiency (%)
0.3 um		7.49 E+06	<1	>99.99998
0.5 um		1.71 E+06	<1	>99.99994
1.0 um		7.69 E+05	<1	>99.99987
2.5 um		3.38 E+05	<1	>99.99997
5.0 um		57900	<1	>99.99827
10 um		27200	<1	>99.99632

Particle counts (Plug open)	Date	Sewer side 12/03/20 Concentration cts/m ³	Clean side 12/03/20 Concentration cts/m ³	Efficiency (%)
0.3 um		7.41 E+06	<1	>99.99998
0.5 um		1.67 E+06	<1	>99.99994
1.0 um		7.55 E+05	<1	>99.99986
2.5 um		3.28 E+05	<1	>99.99969
5.0 um		52500	<1	>99.99809
10 um		23400	<1	>99.99572

GRAPHED PARTICLE COUNT RESULTS



QUALITY ASSURANCE

BELL Laboratories operates to ISO 17025 – General Requirements for the Competence of Testing and Calibration Laboratories. ISO 17025 requires that laboratories have an ISO 9002 compliant quality system. ISO 17025 also requires that laboratories have suitable equipment and instrumentation, as well as laboratory staff with the training and technical competence to perform the analytical/test procedures. The quality assurance system is administered and maintained by the Quality Assurance Manager.

A formal Quality Control program is in place at BELL Laboratories to monitor field sampling activities as well as laboratory analyses. The program is designed to check sampling reproducibility as well as analytical precision & accuracy. The Laboratory Manager is responsible for administration and maintenance of this program.

STATEMENT OF LIMITATIONS

This report has been prepared in accordance with the agreement between BELL Laboratories Pty Ltd and TWK Steel Pty Ltd. Within the limitations of the agreed scope of services, this work has been performed in a professional manner, in accordance with generally accepted practices, using a degree of skill and care ordinarily exercised by members of its profession and consulting practice. No other warranty, expressed or implied, is made.

Any reliance on this report by a third party shall be at such party's sole risk. The report may not contain sufficient information for the purposes of a third party or for other uses.

This report shall only be presented in full and may not be used to support any other objective than those set out in the report, except where written approval with comments are provided by BELL Laboratories Pty Ltd.

DEFINITIONS

The following symbols and abbreviations may be used in this test report:

<	Less than
NA	Not applicable
ND	Not detected
NS	Not specified
µm	Micrometre
µg/m ³	Micrograms per cubic metre
mg/m ³	Milligrams per cubic metre
ppb	Parts per billion
ppm	Parts per million
kPa	Kilopascals
Pa	Pascals
CFU	Colony forming units
CO	Carbon monoxide
CO ₂	Carbon dioxide
NCC	National Construction Code
PM ₁₀	Particulate matter less than 10 micron
RH	Relative humidity
STEL	Short Term Exposure Limit
TSP	Total suspended particulate matter
TWA	Time Weighted Average, SafeWork Australia