

30th August 2017



Attention: Rob Dickerson
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Auckland

Job No.1-LA105.17
File Ref: AL1734/1
Page 1 of 4

Recycled plastic safety cover for open holes – Load testing.

Client:

Transnet Ltd.
Attention: Rob Dickerson

Client Instructions:

The purpose of this test is to determine how many people would be able to safely stand on the plastic cover while it is covering a hole of approximately 500mmØ. Apply an increasing load to the centre of the submitted test sample and record observations until deformation is such that the plastic fails, or is deformed to the point where people would be unlikely to stand on it.

Test Method:

The submitted plastic safety cover was cut to fit within the platens of a Shimadzu REH100TV Universal testing machine complying with Grade 1.0 of International Standard EN ISO 7500-1:1999 Part 1.

The plastic cover was placed over the top of a steel manhole 550mmØ opening in between the platens of the Universal Testing Machine.

A steel foot of 250mmØ was placed in the centre of the plastic to approximately simulate the load area of two adult shoes.

The load was then applied to the steel foot as per the photos on page 2.

Sample description:

Recycled Plastic Safety Cover for Open Holes.
Transnet Part Number: TNHC12x10

Test Findings:

All items were tested at Opus International Consultants' Auckland Laboratory on the 30th August 2017. Refer to table 1 for test results.

Test Findings:

| Applied Load (kN) | Applied Load (kg) | Figure number for photo at load (refer to pages 2-4) | Deformation at Centre (mm) | Observations |
|-----------------------------|-------------------|--|----------------------------|--|
| 0 | 0 | - | 0 | Increasing deformation as load increases. Refer to figures 1-3. No Failure observed. |
| 1 | 102 | 1 | 7.12 | |
| 2 | 204 | - | 10.52 | |
| 3 | 306 | 2 | 12.93 | |
| 5 | 510 | - | 16.65 | |
| 7 | 714 | - | 24.57 | |
| 10 | 1019 | - | 29.4 | |
| 20 | 2039 | - | 40 | |
| 35 | 3568 | - | 48.5 | |
| 45 | 4587 | 3 | 54 | |
| 0 (After 45kN load removed) | 0 | 4 | - | Substantial permanent set after 45kN load is removed. |

Test photos:



Figure 1 1kN load applied

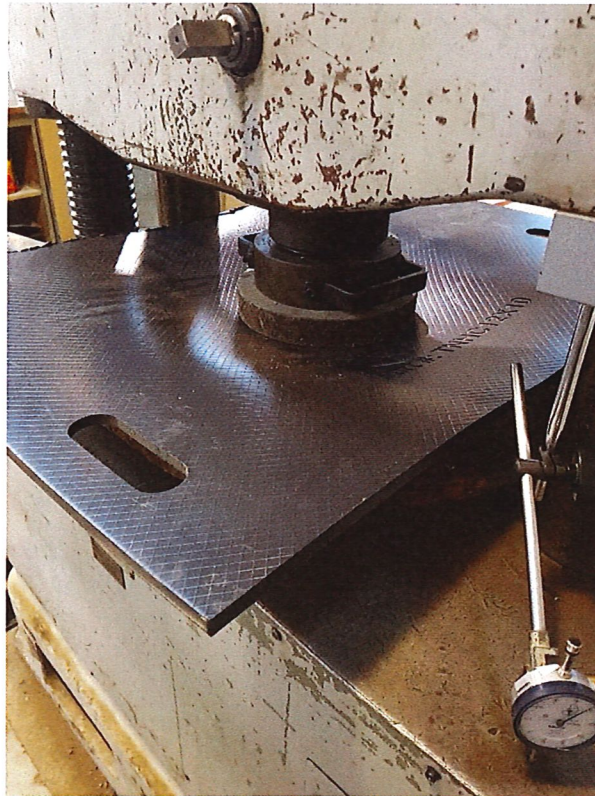


Figure 2 - 3kN Load Applied

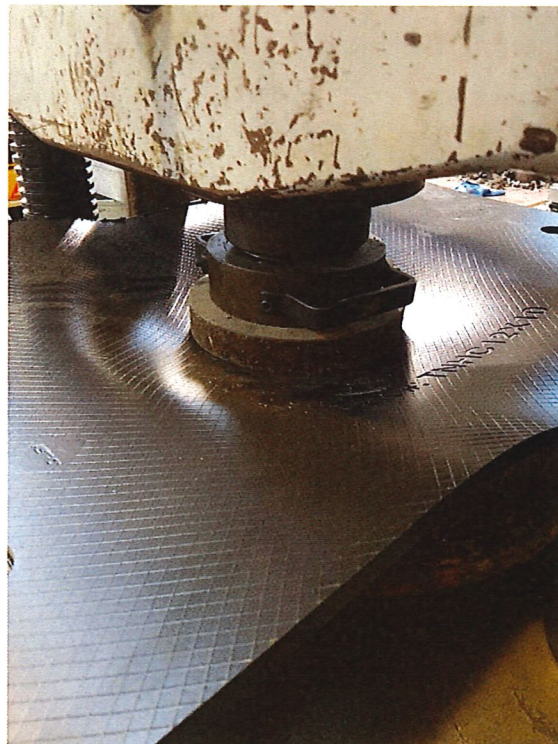


Figure 3 - 45kN Load applied



Figure 4 - After 45kN load is removed

Tested by: Ben Richardson
Senior Engineering Technician

Date tested: 30/08/17

Approved by: Ben Richardson
Senior Engineering Technician

Date: 30/08/17