STAKKAbox ULTIMA 1500mm x 750mm : SIDE LOAD TO BS5911-200 : 4.2 TONNES

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TEST CERTIFICATE

C4 Industries Ltd.
Units 3-5 Yardley Road
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Kirkby
Liverpool
SN5 6PB

File: D3237
Date of tests: 1st September 2003
PO. TBA
Report: D3237 Issue 2.

SIDE LOAD TEST OF GFRP MANHOLE SECTION

1.0 Received item

One test specimen (part no. 10024521) in ready to test condition was delivered to Bodycote Material Engineering for side-wall load testing. The laboratory has tested the material supplied by the clients, as sampled in accordance with their own requirements

2.0 Test Piece Description

The sample dimensions were 1585 x 830 x 1225mm (L x W x H) and sample was made up of 8 stacked box sections mounted on a GRFP base approximately 10mm thick. For lateral loading the assembly was secured by two packing straps.

3.0 Test Specifications / Method

The tests were carried out generally using the methods detailed within Bodycote Technical Works Procedure BMT-D/M11 and the customer's specific requirements. The loading rate was calculated as per BS5911-200:1994 section 4. As per this standard the target load per 1m of effective length is required to exceed 20kN. Therefore for the side load test with an effective length of 1.225m the target load is 24.5kN. *The component tested does not fall within the ambit of BS5911-200:1994 and the results of the test in no way infer approval or otherwise to the requirements of the standard.*

The test specimen was placed on its side on a 25mm deep layer of builders sand. A similar depth of builders sand was placed on the top surface of the manhole section. A stiffened 10mm steel plate was placed on the top sand layer and load was applied to the plate through a pair of packers at a rate of 25.5kN/minute. The test was terminated at an actuator load of 38kN. The side-wall deflection was measured using an LVDT that contacted on one side-wall mounted on a section connected to the opposite side-wall.

4.0 Equipment

All samples were tested using a 150kN Servo Hydraulic testing actuator TZ101 suspended on a cross beam above the strong floor. Load was limited to 38kN due to the level of beam deflection that occurred

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above this load. The actuator is calibrated to ASTM E4 and BS EN ISO 7500-1999 Class 1 in both tension and compression. The side-wall deflection was measured using LVDT TN090 with associated amplifier TH207. The test data was recorded using a pc-based data acquisition package running on test computer TC029.

5.0 Test Results

The test specimen reached the maximum load specified in the table below.

Sample Ref:	Maximum Actuator Load (kN)	Load Induced by fittings (kN) *(load plate, sand and packers)*	Total Compressive Load (kN)
3237-1	38.00	4.6	42.6

6.0 Observations

6.1 No visible damage to the assembly was noted after testing.

6.2 The manhole section side load exceeded the target load stated in section 3 of this certificate.

This document replaces issue 1of the same number, which has been withdrawn to include new information requested by the client

The results contained within this report have been reported in an abbreviated format. The test data and results sheets containing more detailed information in accordance with the technical works procedures or standards used are held at Bodycote Materials Engineering as part of the accredited quality assurance system.

Issue date. 3rd September 2003
Reported by: J. Jones
Tested by: B. Hayter

Signed.....
For and on behalf of
Bodycote Materials Engineering (Daventry)

Copy No: 2

END OF TEXT- Figures attached

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Figure1
Test Load Vs Displacement Plot

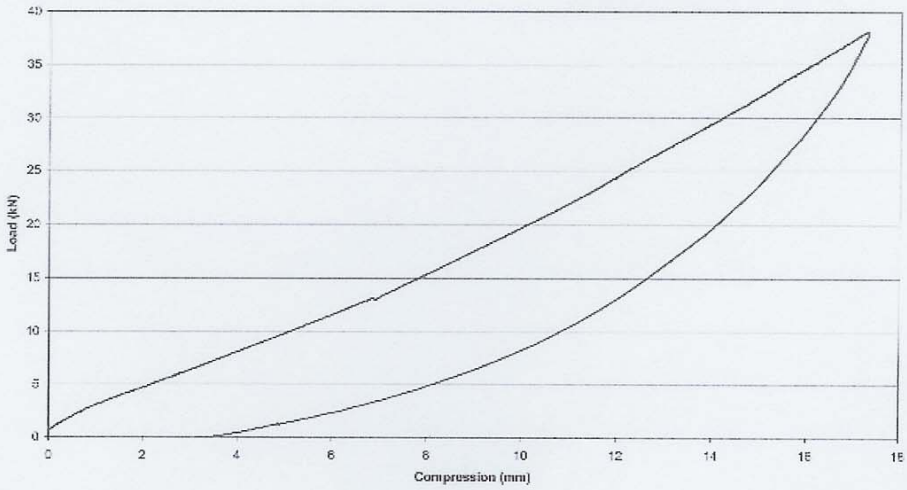
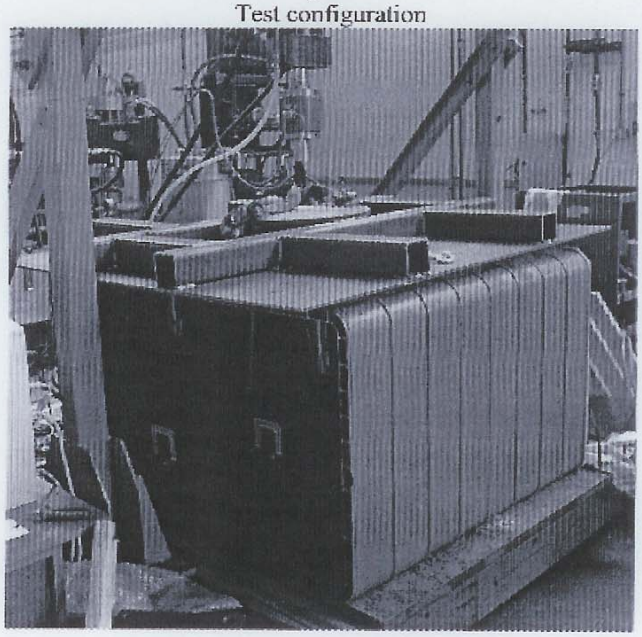


Figure 2
Test configuration



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