LOAD TESTING

FOR SYNERGY

ALUMINIUM

TOWERS PROPS

FOR

SYNERGY ALUMINIUM TOWERS PTY LTD

Revised

October 2014

BY

BUILDING CONSTRUCTION TEST LABORATORY

1. Introduction

At the request of Synergy Aluminium Towers Pty Ltd, we attended during 04 February to 26 May 2013 testing sessions n props with a view to confirming its vertical working load capacity. Four sizes of props were tested, which were for general use for formworks and scaffolding. The tests were carried out at 6 Gatwood Close, Padstow, NSW. The test load and method of testing evolved from consideration of the Australian Standard AS 3610: 1995, Appendix A, and AS 3610 Supplement 2: 1996, Appendix CA.

2. Test Apparatus

The test was carried out using a test loading frames with Hydraulic system (30T), digital reading and load cells which has been calibrated by Wedderburn Scales in October 2012. Accessories include:

- Oregon timber beams,
- loading bars and couplers,
- Rule, laser measures, and
- Levers

3. Specimen

There are four sizes of Synergy props being tested. They are Number 0, Number 1, Number 2 and Number 3. The range of height for the four sizes is set in Table 1 below.

Size	Closed Height (mm)	Open Height (mm)	Est. Weight (kg)
No.0	1000	1710	12
No.1	1700	2600	16
No.2	1980	3400	19
No.3	2580	3960	22
No.4	3200	5100	30

Table 1: Specification of Synergy Props

Two samples were used for each size of the props, i.e. for either close, or open performance status of the props.

We are advised that the props were designed by Synergy, and manufactured in China for commercial purpose.

4. Test Method

The props were supported between test frames, under Hydraulic cylinder and load cells, with the specified eccentricities 25mm on top and 20mm at bottom. The steel plate base of the props is sat on a shaped steel block with slope of 1:40.

To prevent lateral movement, two steel tubes are installed on scaffolding, which is a separate structure from the test frames, at mid level of the height of the props, and loosely guide the test prop in plumbing line from the hydraulic cylinder down.

Two laser distance estimators are attached on the test samples at mid height level. They are in right angle directions between each other, and are used to measure distortion

occurred during testing.

Test load applied to the samples with a reasonable speed until visible distortion is observed. At this point, it is deemed the samples may sustain the test loads without signs of failure or excessive distortion. The load data were recorded and then used for calculation of strength limit state load capacity, and convert to working load capacity.

5. Test, Results and Observations

The testing results and observations are set in Table 2 below.

Sample	Status	Test Force (KN)	Observation
No. 0	Close	108.6	The maximum distortion at mid height level is 17mm. No failure, collapse or separation of component was observed.
No. 0	Open To Max	55.3	The maximum distortion at mid height level is 29mm. No failure, collapse or separation of component was observed.
No. 1	Close	109.4	The maximum distortion at mid height level is 25mm. No failure, collapse or separation of component was observed.
No. 1	Open To Max	28.2	The maximum distortion at mid height level is 39mm. No failure, collapse or separation of component was observed.
No. 2	Close	76.6	The maximum distortion at mid height level is 33mm. No failure, collapse or separation of component was observed.
No. 2	Open To Max	42.0	The maximum distortion at mid height level is 54mm. No failure, collapse or separation of component was observed.
No. 3	Close	86.9	The maximum distortion at mid height level is 28mm. No failure, collapse or separation of component was observed.
No. 3	Open To Max	49.5	The maximum distortion at mid height level is 43mm. No failure, collapse or separation of component was observed.
No. 4	Close	45.7	The maximum distortion at mid height level is 51mm. No failure, collapse or separation of component was observed.
No. 4	Open To Max	12.6	The maximum distortion at mid height level is 73mm. No failure, collapse or separation of component was observed.

Table 2: Testing Results and Observations

6. Working Load Capacity Convert

The test method selected is non-destructive testing for sample evaluation. Sample size is one.

Based on Table A1 and A2, and A.4.4.3 of AS 3610:1995, we select value of modification factor as 0.15. Further, we select value of sampling factor as 1.9.

The strength limit state load capacity can be obtained from the equation *Ru = X (test data) / 1.9.*

Based on Table 4.5.1 of the same standard, the working load capacity may be converted as:

*L = 0.8 * Ru = 0.8 * test data / 1.9.*

Using the test data in Table 2 and the equation above, the working load capacities for various sizes of Synergy props are converted in Table 3.

Sample	Status	Modification Factor	Sampling Factor	Working Load Capacity (KN)
No. 0	Close	0.15	1.9	46
No. 0	Open To Max	0.15	1.9	23
No. 1	Close	0.15	1.9	46
No. 1	Open To Max	0.15	1.9	12
No. 2	Close	0.15	1.9	32
No. 2	Open To Max	0.15	1.9	18
No. 3	Close	0.15	1.9	37
No. 3	Open To Max	0.15	1.9	21
No. 4	Close	0.15	1.9	19.2
No. 4	Open To Max	0.15	1.9	5.3

Table 3: Working Load Capacity of Synergy Props

4. Conclusion

Based on the results of single sample test, non-destructive and sample evaluation method as specified in AS 3610: 1995, the working load capacities for Synergy props in 5 sizes are obtained through testing by this laboratory.

The limitation of the small sampling in this test indicates that the results should not represent working load capacity for all prop products in the 5 sizes. More reliable information in regards the capacity should be obtained from tests with a reasonable large sampling process.

The test is supervised by

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Photo A: Test Setups

Photo B: Eccentricity Setups

Photo C: Slop base for test

Photo D: Props under load