



# BUILDING CONSTRUCTION TEST LABORATORY

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## TEST REPORT

### Scaffold Plank Clip Holding Capacity Test

1. Date of test: 6 December 2016
2. Test report number: BCTL –16075
3. Client: Scaff-Hold Pty Ltd
4. Number of Test Samples: 5

5. Test Detail

Scaffold plank clips are used to prevent turnover of plank caused by uplift wind force. Uplift wind force is estimated based on AS/NZS 1170.2:2002. Test is setup to measure the holding capacity of the scaffold plank clip against the uplift force.

6. Test setup

Please see attached Figure 1 and 2.

7. Test results

Ultimate uplift force (one pair of clip)

| Sample | Uplift force (Kg) | Uplift force (N) |
|--------|-------------------|------------------|
| 1      | 34                | 333              |
| 2      | 36                | 353              |
| 3      | 34                | 333              |
| 4      | 36                | 353              |
| 5      | 36                | 353              |
| Mean   | 35                | 345              |

Self-weight of scaffold plank 14 Kg or 139 N

Therefore, holding capacity of each clip should be

$$(345 - 139) \div 2 = 103 \text{ N}$$

## 8. Reference

AS/NZS 1170.2:2011      Structural design actions Part 2: Wind actions

Uplift wind force estimation:

Design wind pressures       $p = 0.5 \rho_{air} V^2 C_{fig} C_{dyn}$  (Clause 2.4.1)

Density of air       $\rho_{air} = 1.2 \text{ kg/m}^3$  (Clause 2.4.1)

Design wind speed       $V_{des} = 30 \text{ m/s}$  (minimum, Clause 2.3)

Regional wind speed  $V_R$  where  $R$  (average recurrence interval) is the inverse of the annual probability of exceedance of the wind speed.

Regional wind speed (Sydney, 50 years recurrence interval)       $V_{50} = 39 \text{ m/s}$  (Table 3.1)

Regional wind speed (Sydney, 100 years recurrence interval)       $V_{100} = 41 \text{ m/s}$  (Table 3.1)

Aerodynamic shape factor       $C_{fig} = C_p K_a K_l$  (Appendix D3.1)

Net pressure coefficients       $C_p = 0.4$  (Table D4(A))

Area reduction factor       $K_a = 1.0$  (Appendix D1.2)

Local pressure factor       $K_l = 1.5$  (Table D1)

$$C_{fig} = 0.4 \times 1.0 \times 1.5 = 0.6$$

Dynamic response factor       $C_{dyn} = 1.0$  (Clause 6.1)

Area of plank       $A = 2.4 \times 0.225 = 0.54 \text{ m}^2$

Design wind distributed force       $f = p \times A$

Minimum design wind force       $f_{min} = 0.5 \times 1.2 \times 30^2 \times 0.6 \times 1 \times 0.54 = 175 \text{ N}$

Sydney, 50 years recurrence interval design wind force

$$f_{50} = 0.5 \times 1.2 \times 39^2 \times 0.6 \times 1 \times 0.54 = 296 \text{ N}$$

Sydney, 100 years recurrence interval design wind force

$$f_{100} = 0.5 \times 1.2 \times 41^2 \times 0.6 \times 1 \times 0.54 = 327 \text{ N}$$

The tests were carried out under my supervision

Dr. Lida Song

Signature:



B.E., M.E. PhD (Civil Eng), C.P.ENG.(659737)

Technician:      Lang Lin (B. Engineering)

Signature:



## Appendix



Figure 1: Test Setup



Figure 2: Test Setup (Clip)

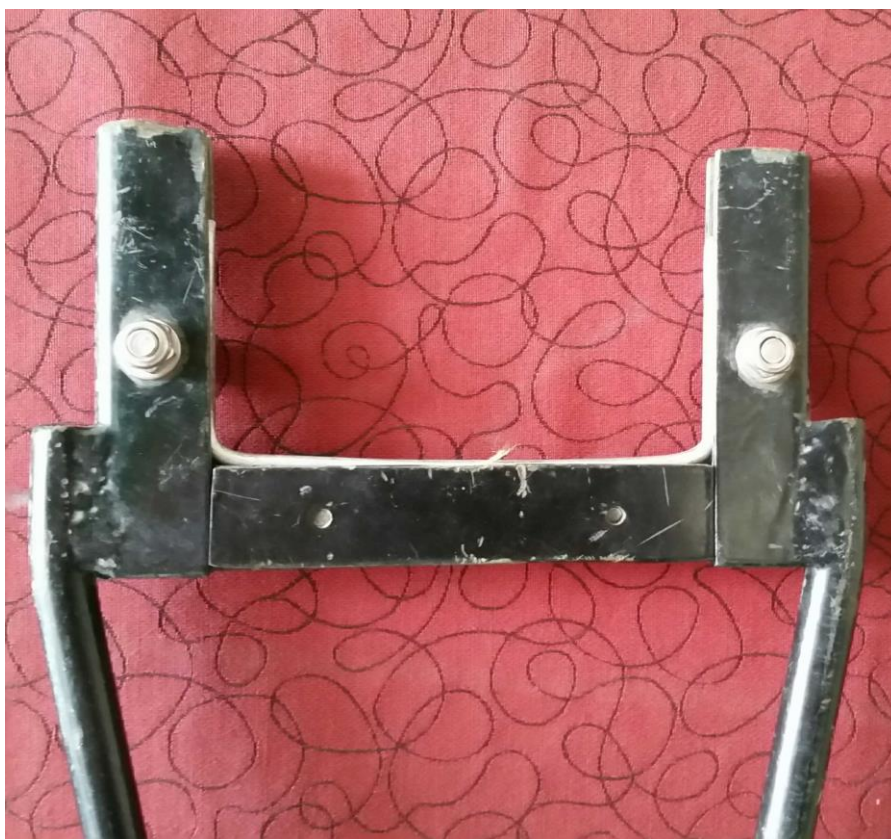


Figure 3: Clip before clamp