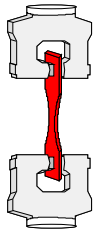


Mechanical Testing

- Tensile
- Compression
- Bend
- Shear
- Load
- Structures
- Fasteners
- Tensioning & Staying Systems
- Structural Bearings



IN CONFIDENCE TO THE CLIENT

REPORT NO: MT-07/288-B

VERTICAL LOAD TESTING OF AN ASSEMBLED MODULAR SCAFFOLD

CLIENT: **SYNERGY METALS**
C-143 PH-7 INDUSTRIAL AREA
MOHALI (PUNJAB) INDIA

DATE OF TEST: AUGUST 29TH 2007

DATE OF REPORT: SEPTEMBER 5TH 2007

TEST SYNOPSIS:

A modular scaffold assembly supplied by Elegant Hardware was delivered to Melbourne Testing Services (MTS) for testing. At the request of the client, load testing was to be carried-out to determine the vertical load carrying capacity of the assembled frame. Testing was to be conducted in accordance with an approved test procedure conforming to the requirements of AS/NZS 1576.3-1995 SCAFFOLDING, PART 3: PREFABRICATED AND TUBE-AND-COUPLER SCAFFOLDING.

The scope of the test was to determine the maximum limits including the assembled height, number of planked out platforms and the number of working platforms.

SCAFFOLD IDENTIFICATION:

Prior to conducting the load test, each individual item used in construction of the scaffold was visually inspected for markings. It was noted that none of the items exhibited a unique identification marking, however the mark “ISM 239, Medium, RAVINDRA and HISAR” was stamped onto the scaffolds tubular components. Detailed drawings of the scaffold components identified the manufacturer as SYNERGY METALS C-143, INDUSTRIAL AREA, PHASE VII MOHALI (PUNJAB), INDIA.



FIG.1.
SCAFFOLD TEST ASSEMBLY

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DATE: 05/09/07

TEST PREPARATION

Prior to testing, the mass of each item was accurately recorded for the determination of the dead loads (G). Weighing was conducted using a calibrated balance and the individual and unit mass of the items, as shown in Figure 2, was recorded. These recorded masses and the dead loads of individual components are provided in Table.1.

SCAFFOLD TEST SET-UP:

In accordance with AS/NZS 1576.3 Appendix B, the test scaffold was constructed to provide a three bay long by three lift high assembly. At the height of the second lift, rigid ties located at both ends of the structure were fixed to an adjacent solid wall. A description of the test scaffold assembly is summarised as follows:

- Scaffold height 6.0m, eg. three 1.98m lifts.
- Bays 2.4m long x 1.2m lateral (nominal)
- Standards 1.98m and 2.972m long, mixed with staggered joints.
- Transoms Located at 2m elevations, on each pair of lateral standards.
- Ledgers Located at 2m elevations, on each pair of longitudinal standards.
- Face bracing One brace per 3.0m elevation, located every 3rd bay on the non-working face.
- Lateral bracing Not provided and not fitted for the test scaffold.
- Adjustable legs Extended to 450mm at both test standards

Load testing was to be conducted on two adjacent standards referred to as B1 and B2 in this report. Both standards were located at the third cross-section or bay 3 of the test structure. Transoms and ledgers placed at two metre height intervals were used to connect the standards to each other as well as the other supporting elements. The use of diagonal bracing was omitted from the test standards and adjacent bays.

SCAFFOLD TEST SCENARIOS:

In consultation with the client three (3) test scenarios were planned in order to achieve a staged increase in test load and with each stage commensurate with a nominated scaffold height and number of working platforms. All three tests were conducted with dead loads commensurate with the scaffold fully planked at 2.0 metre intervals and ledgers installed at 0.5m spacings on the outer side and at 1.0m spacings on the inner side. Two board hop-ups were considered to be fitted at the working platform levels.

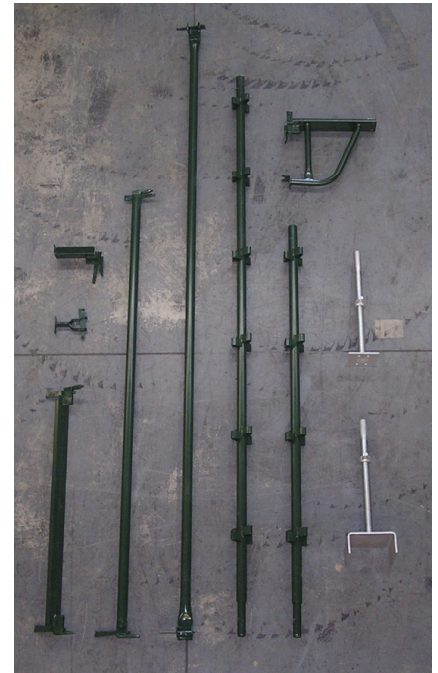


FIG.2.
SCAFFOLD COMPONENTS

Scaffold Item	Part Drawing No.	Mass (kg)	Gravity Load (kN) (kN/m)
1.980m Standard	SMM-02-00	11.30	0.055
2.972m Standard	SMM-04-00	16.50	0.054
2.4m Ledger	SMM-08-00	8.50	0.083
1.2m Transom	SMM-11-00	9.40	0.092
3.6m Brace	SMM-13-06	12.70	0.125
Toe Board Bracket	SMM-17-00	0.79	0.008
Two Board Hop-Up Bracket	SMM-14-00	6.50	0.064
One Board Stage Bracket	SMM-12-00	2.36	0.023
U-Head Jack	N/A	10.00	0.098
Adjustable Base Jack	N/A	6.60	0.065
Planks & Toeboards	N/A	12.50	0.123

TABLE 1.
COMPONENTS WEIGHTS

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CALCULATION OF TEST LOADS:

Test loads B1 and B2 were calculated in accordance with AS/NZS 1576.1 and AS/NZS 1576.3 Appendix B. Dead loads “G” were calculated from the test data recorded in Table.1. A live load “Q” of 6.6 kN, corresponding to a heavy duty scaffold was adopted for the tests.

Dead Load Calculations (G):

Test Scenario 1

Scaffold height: 20m

No. of Working Platforms: 1

G = 1594kg or 15.6kN

W= 239kg or 2.35kN

Test Scenario 2

Scaffold height: 30m

No. of Working Platforms: 1

G = 2366kg or 23.21kN

W= 239kg or 2.35kN

Test Scenario 3

Scaffold height: 20m

No. of Working Platforms: 2

G = 1626kg or 15.95kN

W= 239kg or 2.35kN

Live Load Calculations (Q):

Test Scenario 1

Scaffold height: 20m

No. of Working Platforms: 1

Q = 9.24kN Standard B1

Q = 3.96kN Standard B2

Test Scenario 2

Scaffold height: 30m

No. of Working Platforms: 1

Q = 9.24kN Standard B1

Q = 3.96kN Standard B2

Test Scenario 3

Scaffold height: 20m

No. of Working Platforms: 2

Q = 18.48kN Standard B1

Q = 7.92kN Standard B2



FIG.3.
LOADING & FORCE DEVICE



FIG.4.
**DEFLECTION IN STANDARDS
FROM TEST LOADING**

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Test Loads (B1 & B2):

Test Scenario 1

Scaffold height: 20m

No. of Working Platforms: 1

B1 = 23.7kN

B2 = 18.4kN

Test Scenario 2

Scaffold height: 30m

No. of Working Platforms: 1

B1 = 31.3kN

B2 = 26.0kN

Test Scenario 3

Scaffold height: 20m

No. of Working Platforms: 2

B1 = 33.3kN

B2 = 22.7kN

LOAD TEST METHOD:

Testing was conducted by placing loading beams beneath the two adjustable legs and on top of the test standards. Force measuring devices were located between the base-plate of each adjustable leg and the lower loading beam (See Fig.3.). Load was then applied using two hydraulic cylinders symmetrically positioned on the outer side of each loaded standard B1 and B2. Once the nominated test loads B1 and B2 were achieved, the load was maintained for a period of 15 minutes. A test chart for each test scenario showing the applied test load vs elapsed test time for test loads B1 and B2 is shown in Figure 5.

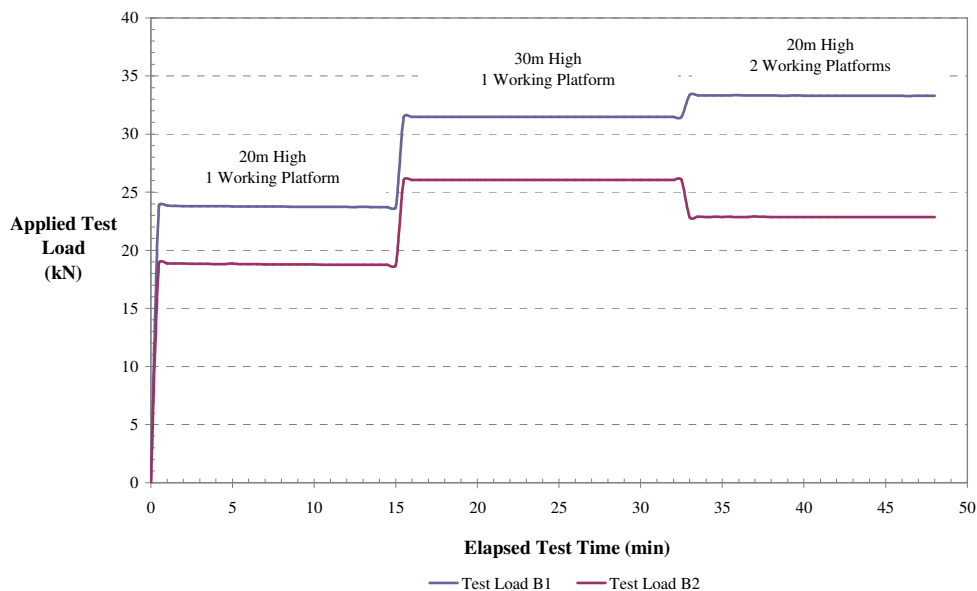


FIG.5. TEST LOADING CHART

R. Wilkie

RODNEY WILKIE

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TEST OBSERVATIONS AND COMMENTS:

As can be seen from Fig.5, the scaffold structure successfully maintained the applied test loads B1 and B2 for each test scenario for the specified period of 15 minutes. The peak lateral deflection of 61mm was recorded in standard B1 and corresponded with the test scenario No.3. Upon release of the load the deflection was noted to have rebounded and there was no sign of permanent yielding or deformation in either of the test standards.

SUMMARY:

The scaffold test structure described herein successfully passed the "TEST ON ASSEMBLED FRAME" conducted in accordance with AS/NZS 1576.3 Appendix B.

It is important to note that this test report is limited to the structure described herein and is specific to the specified items and maximum limits as listed in Table 2 of this test report.

<i>MAXIMUM ASSEMBLED HEIGHT</i>	30 METRES
<i>MAXIMUM NUMBER OF PLATFORMS</i>	15
<i>MAXIMUM NUMBER OF WORKING PLATFORMS</i>	1

TABLE 2A. 30M HIGH ASSEMBLY MAXIMUM LIMITS:

<i>MAXIMUM ASSEMBLED HEIGHT</i>	20 METRES
<i>MAXIMUM NUMBER OF PLATFORMS</i>	10
<i>MAXIMUM NUMBER OF WORKING PLATFORMS</i>	2

TABLE 2B. 20M HIGH ASSEMBLY MAXIMUM LIMITS:

TEST FACILITY & WITNESSING:

All testing was carried-out by Rod Wilkie of MTS and at the premises of DAP Constructions 252 - 256 Hammond Road Dandenong. Testing was witnessed by Mr Kunal Khanna and conducted during the morning of Thursday August 30th 2007.

Notes:

1. Melbourne Testing Services Pty Ltd shall not be liable for loss, cost, damages or expenses incurred by the client or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Melbourne Testing Services Pty Ltd be liable for consequential damages including, but not limited to, lost profit, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested.
2. This report only indicates compliance of the scaffold assembly in its state at the time of testing. It should not be taken as a statement that all similar scaffolds or components of scaffolds in all states of repair, would also be found to comply.
3. It remains the responsibility of the client to ensure that the test scaffold and components of the test scaffold as reported herein are representative of the entire production batch.
4. This report only covers the structural integrity of the scaffold and is specific to the requirements of AS 1576.3:1995 Appendix B. The report is specific to an assembled scaffold structure including dead loads contributed from the components listed in Table 1. MTS shall take no responsibility for scaffold structures erected with components or additional materials which are not specifically listed in Table 1.
5. Melbourne Testing Services shall take no responsibility for the performance of scaffold assemblies which are erected other than as described under the heading of "Scaffold Test Scenarios" on Page 1 of this report.
6. Melbourne Testing Services shall take no responsibility for the procurement and authenticity of the scaffold as described herein.
7. Melbourne Testing Services shall take no responsibility for the installation procedures used for the scaffold described herein.



RODNEY WILKIE

AUTHORISED SIGNATORY

DATE: 05/09/07