Cyclone Testing Station
School of Engineering and Physical Sciences
James Cook University
Townsville QLD 4811 Australia

Telephone +61 7 4781 4754
Facsimile +61 7 4781 6788
Email: jcu.cts@jcu.edu.au
www.jcu.edu.au/cts

6 April 2011

TECHNICAL NOTE No.3
Concentrated Load Testing of Roof Cladding Systems

1 INTRODUCTION

The Cyclone Testing Station (CTS) is an independent authority on the effects of high wind and related damage to low-rise building systems in Australia, South East Asia and the Pacific.

It provides a service to the building industry for testing the effects of wind forces on buildings and building components.

The CTS has the equipment and technical expertise to test existing and new roof and wall claddings to comply with Australian and International standards.

2 TESTING FACILITY AND TEST SET UP

2.1 General

This test simulates a person walking on the roof. The roof test panel is installed onto the test rig. A hand operated ram or jack is mounted on a loading frame above the rig, to allow a concentrated load to be applied to the test roof panel. This load is applied perpendicular to the roof through a rubber pad with a diameter of 100 mm.

2.2 Test Specimen

A single test using the largest cladding span is normally conducted. For the concentrated load testing we recommend using double span test arrangements, that is use three purlin cladding supports. The roof test panel comprises two cladding sheets to incorporate a side lap.

3 CONCENTRATED LOAD TESTING OF ROOF CLADDING SYSTEMS

3.1 General

The CTS performs concentrated load testing for roof cladding in accordance with *AS4040.1-1992, "Methods of Testing Sheet Roof and Wall Cladding, Method 1: Resistance to concentrated loads*". This standard sets out a test method for determining the resistance of roof cladding to incidental foot traffic. Both serviceability and strength concentrated load testing are usually performed.

3.2 Serviceability Testing

For serviceability testing, the test load (will be 0.92 kN for just one test) is specified to be applied to the location that is judged to give the maximum residual deflection (normally adjacent to a side-lap at midspan) and the maximum permanent deformation (often on a rib over the support) and so this concentrated loading is applied to both locations.

3.3 Static Strength Testing

The same test roof panel is then subjected to concentrated load strength testing, using a test load of 2.5 kN (for one test) and applied to the location that is judged to be the most susceptible to failure. Typical locations are at mid span, adjacent to the cladding “under sheet” and next to the support. The standard specifies that this point load shall be sustained, for not less than 1 minute, irrespective of any permanent deformation.

4 NATA ACCREDITED TEST REPORT

After completion of testing, the CTS will issue a commercial in confidence test report describing the test methods and results.

Note that the CTS test procedures are conducted in accordance with its quality management system which is NATA accredited.

CTS will issue Test Summary Sheets in conjunction with test reports. These Test Summary Sheets will be provided for each profile and will reference the corresponding report number. Test Summary Sheets have an expiry date about four (4) years from the date of report (either June 30 or December 31) and are valid until the expiry date noted at which time they must be reappraised.

5 REFERENCES

- AS/NZS1170.0:2002 – Structural Design Actions – General Principles
- AS1562.1:1992 – Design and Installation of Sheet Roof and Wall Cladding – Metal
- AS/NZS1562.2:1999 – Design and Installation of Sheet Roof and Wall Cladding – Corrugated Fibre-Reinforced Cement
- AS1562.3:2006 – Design and Installation of Sheet Roof and Wall Cladding – Plastic
- AS4040.0:1992 – Methods of Testing Sheet Roof and Wall Cladding – Introduction, List of Methods and General Requirements
- AS4040.1:1992 – Methods of Testing Sheet Roof and Wall Cladding – Resistance to Concentrated Loads