

W I N T E C H

WINDOW AND CLADDING
TESTING & LABORATORY
SERVICES

Technical Report

Client

NaturaLight Systems Limited

Accessory House

Barrington Industrial Estate

Bedlington

Northumberland

NE22 7DQ

Project

Roof light Test

Project Ref. 11574

19th July 2011

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Test Conducted at: Above address

Test Conducted for: NaturaLight Systems Limited

Competent person: S Johnston NaturaLight Systems Limited

Standards Specified: CWCT Technical Notes 66 & 67

Project No: 11574

Dates of Testing: 12th July 2011

Product Tested: Glass roof light and associated support

Tests Performed: As Listed in Section 5 – Test Procedures

Testing Conducted by: M Wass Wintech Engineering Ltd
D Potts Wintech Engineering Ltd

Report Compiled by:


E Macey

Technical Approval:
(Authorising Signatory)


M Wass
Quality & Technical Manager

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1. INTRODUCTION

This report describes tests conducted at the test site of Wintech Engineering Ltd on samples comprising of double glazed roof lights and associated support, on behalf of NaturalLight Systems Ltd.

Testing was conducted on the 12th July 2011 in order to determine the impact resistance of the test panels with respect to soft body impact, hard body impact and retention of load following impact.

The test regime was produced with reference and consideration of the recommendations contained within CWCT Technical Notes 66-67; for the fragility testing of glazed roofs; which incorporates ACR[M]001:2005 2nd edition, Test of Roofing Assemblies, as per the request of NaturalLight Systems Ltd.

Wintech Engineering Ltd is accredited by the United Kingdom Accreditation Service as UKAS Testing Laboratory No. 2223. Although this test falls outside our scope of accreditation, the principles and practices adopted during testing adhere to that of an accredited test.

2. SUMMARY OF TEST RESULTS

The following summarises the results of tests carried out.

Three panels were tested in the following sequence and the combined results are as follows:

Testing at 20°C	Sample A1	Sample A2	Sample A3
Test 1. Soft Body Impact – Outer pane intact	Pass	Pass	Pass
Did glass breakage occur	No	No	No
Test 2. Hard Body Impact – Outer pane intact	Pass	Pass	Pass
Did glass breakage occur	No	No	No
Test 3. Soft Body Impact – Outer pane broken	Pass	Pass	Pass
Did glass breakage occur	Yes	Yes	Yes
Test 4. Hard Body Impact – Outer pane broken	Pass	Pass	Pass
Did glass breakage occur	N/A	N/A	N/A
Test 5. Retention of Static Load – 90 Kg / 30 mins	Pass	Pass	Pass
Test 6. Assessment of Glass Fragments	Pass	Pass	Pass

The above results classify the products tested to a **Class 1**, as described within Table 1 within TN 67

THESE RESULTS ARE VALID ONLY FOR THE CONDITIONS UNDER WHICH THE TEST WAS CONDUCTED

3. DESCRIPTION OF TEST SAMPLES

Description of Test Sample:	NaturalSpan Mono Pitch Glass Rooflight
Sample size:	2560mm x 3060mm Overall sample size
Manufactured by:	Naturalight Systems Limited
Sample Components:	NaturalSpan 100mm system - Aluminium welded frame manufactured in 2 no. sections and mechanically connected together using internal cleats. NLS 3mm epdm gasket seals Cladfix 150mm coarse thread tek screw fixings securing frame work at 300mm centres to perimeter of framework down to steel test rig Team Valley Fasteners 6.3 x 50mm tap fix c-screws securing pressure plates to thermal break
Glass unit:	8mm toughened outer pane 16mm cavity area 8.8mm laminated Low 'E' Inner
Drainage system:	2 no. slots per transom set at 100mm to center-line of slot, slots are 6mm x 30mm

Further details can be found in the sample drawings, see Appendix A.

4. TEST ARRANGEMENT

4.1 SUPPORT STRUCTURE

Sample panels comprising of double glazed roof lights and associated support, supplied for testing in accordance with the agreed test methods, were mounted by NaturalLight Systems Ltd at an angle of 5° on to a rigid support framework constructed from steel with the same degree of restraint as used in site conditions.

4.2 INSTRUMENTATION

4.2.1 Linear Distance

A calibrated measuring device was used to measure the distance between the impactor and the test panel.

4.2.2 Temperature & Humidity

A digital data logger capable of recording temperature to an accuracy of ± 1 °C and humidity to an accuracy of ± 5 %Rh was used.

4.3 TEST EQUIPMENT

4.3.1 Soft Body Impactor

A dry sand filled cylindrical bag (45 Kg), as per the requirement of ACR[M]001:2005 2nd edition was used for soft body impacting.

4.3.2 Hard Body Impactor

A 100mm diameter steel ball with a mass of 4.11 Kg was used for hard body impacting.

All measurement devices, instruments and other relevant equipment were calibrated and are traceable to National Standards.

5. TEST PROCEDURES

The test sequence was conducted on three (3) samples. The ambient temperature was maintained at 20°C ± 5°C for 12 hours prior to and throughout the duration of the test sequence.

5.1 INTENDED SEQUENCE OF TESTING

1. Soft Body Impact – Outer Pane
2. Hard Body Impact – Outer Pane

Note: At this point, if it remains intact, the outer pane should be broken to enable further testing to be conducted.

3. Soft Body Impact – Inner Pane
4. Hard Body Impact – Inner Pane

Note: At this point, if it remains intact, the inner pane should be broken to enable further testing to be conducted.

5. Retention of Load
6. Assessment of Glass Fragments

5.2 SOFT BODY IMPACTING

The soft body impactor was dropped under gravity to impact the centre of the test panel from 1200 mm. The panel was then inspected for damage.

Outer Pane impact - Glass was not permitted to break or be displaced from the assembly. (**CLASS 1**)

Inner Pane impact - Glass was allowed to break, but penetration of the assembly by the impactor and displacement of glass panes was not allowed.

5.3 HARD BODY IMPACTING

The hard body impactor was dropped under gravity to impact the centre of the test panel from 1200 mm. The panel was then inspected for damage.

Outer Pane impact - Glass was not permitted to break or be displaced from the assembly. (**CLASS 1**)

Inner Pane impact - Glass was allowed to break, but penetration of the assembly by the impactor and displacement of glass panes was not allowed.

5.4 RETENTION OF STATIC LOAD

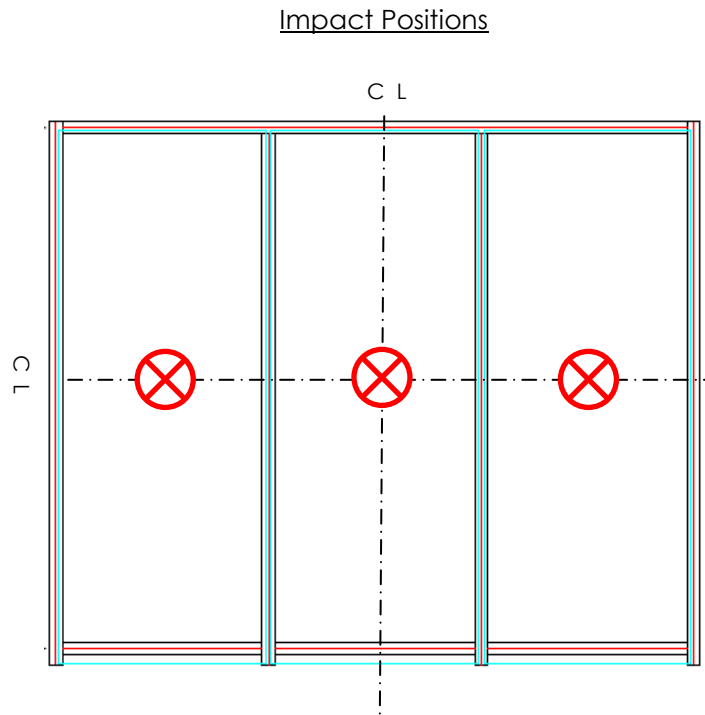
A static load of **90 kg** was applied to the broken glazing. This consisted of 2 x soft body impactors (each weighing 45 kg). The sand bags were placed onto the sample as shown in both Figure 2 and Photo. 1. Once the full load had been applied, it was required to remain in place for a minimum of **30 minutes**.

During this time there was to be no penetration of the assembly by the static load, nor displacement of glass panes from the assembly.

5.5 ASSESSMENT OF GLASS FRAGMENTS

Any glass fragments that had fallen from the test sample during testing were collected and weighed. The total mass of the collected glass was not allowed to exceed **50 grams**, and all the individual fragments should be able to pass through a 25mm square mesh, with any glass fragment not having dimension of more than **50mm**.

Figure 1

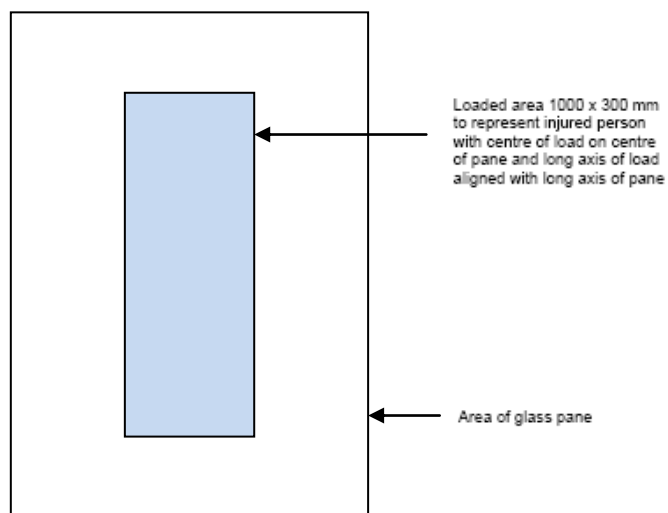


 - Impact position

Not to scale

Figure 2

Retention of Static Load Application



6. TEST RESULTS

6.1 TESTING AT 20°C Conducted 12th July 2011

6.1.1 Soft Body Impacting – Outer pane intact

Observations

Test Panel A1 – Both panes remained intact.

Test Panel A2 – Both panes remained intact.

Test Panel A3 – Both panes remained intact.

6.1.2 Hard Body Impacting – Outer pane intact

Observations

Test Panel A1 – Both panes remained intact.

Test Panel A2 – Both panes remained intact.

Test Panel A3 – Both panes remained intact.

PLEASE NOTE: It was necessary to manually break the outer pane after these tests. Afterwards the inner pane was inspected to see that no damage was caused following this action, and this was found to be the case.

6.1.3 Soft Body Impacting – Outer pane broken

Observations

Test Panel A1 – Inner pane broke. No displacement of glass or impactor was observed.

Test Panel A2 – Inner pane broke. No displacement of glass or impactor was observed.

Test Panel A3 – Inner pane broke. No displacement of glass or impactor was observed.

6.1.4 Hard Body Impacting – Outer pane broken

Observations

Test Panel A1 – Inner pane broke. No displacement of glass or impactor was observed.

Test Panel A2 – Inner pane broke. No displacement of glass or impactor was observed.

Test Panel A3 – Inner pane broke. No displacement of glass or impactor was observed.

6.1.5 Retention of Load

Observations

Test Panel A1 – The load remained in place throughout the required time with no further damage to the inner pane observed.

Test Panel A2 – The load remained in place throughout the required time with no further damage to the inner pane observed.

Test Panel A3 – The load remained in place throughout the required time with no further damage to the inner pane observed.

6.1.6 Assessment of Glass Fragments

Test Panel A1 – No glass fragments fell from the sample during testing.

Test Panel A2 – Fragments of glass fell from the sample equating to 22.6 grams

Test Panel A3 – Fragments of glass fell from the sample equating to 20 grams

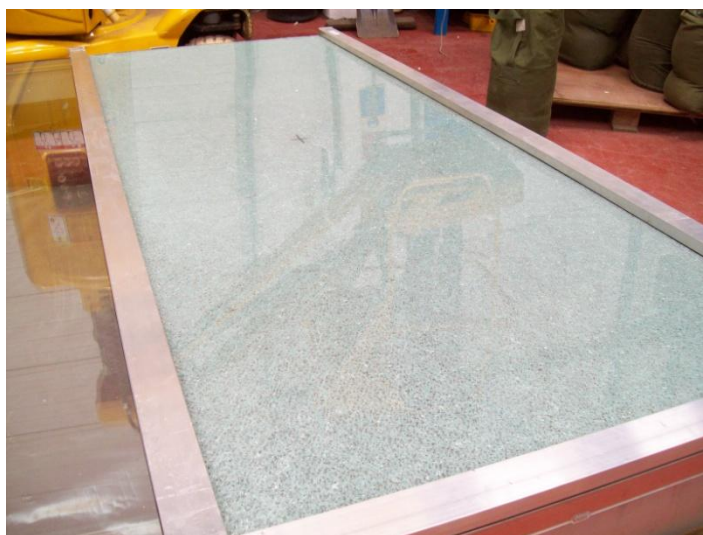
7. TEST PHOTOGRAPHS

Photograph no. 1



Photo shows the 90Kg static load applied

Photograph no. 2



Outer pane has been broken to enable testing to be conducted on the inner pane

Photograph no. 3



Underside of sample under static load (90kg)

APPENDIX A

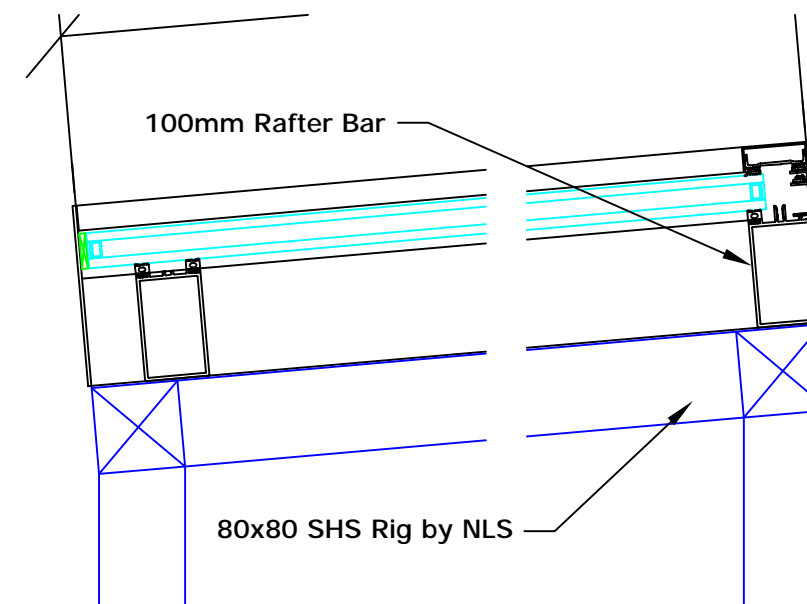
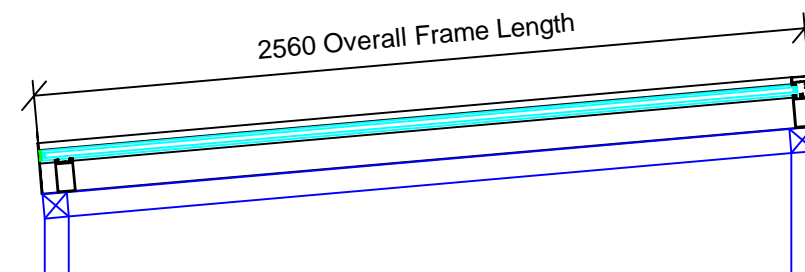
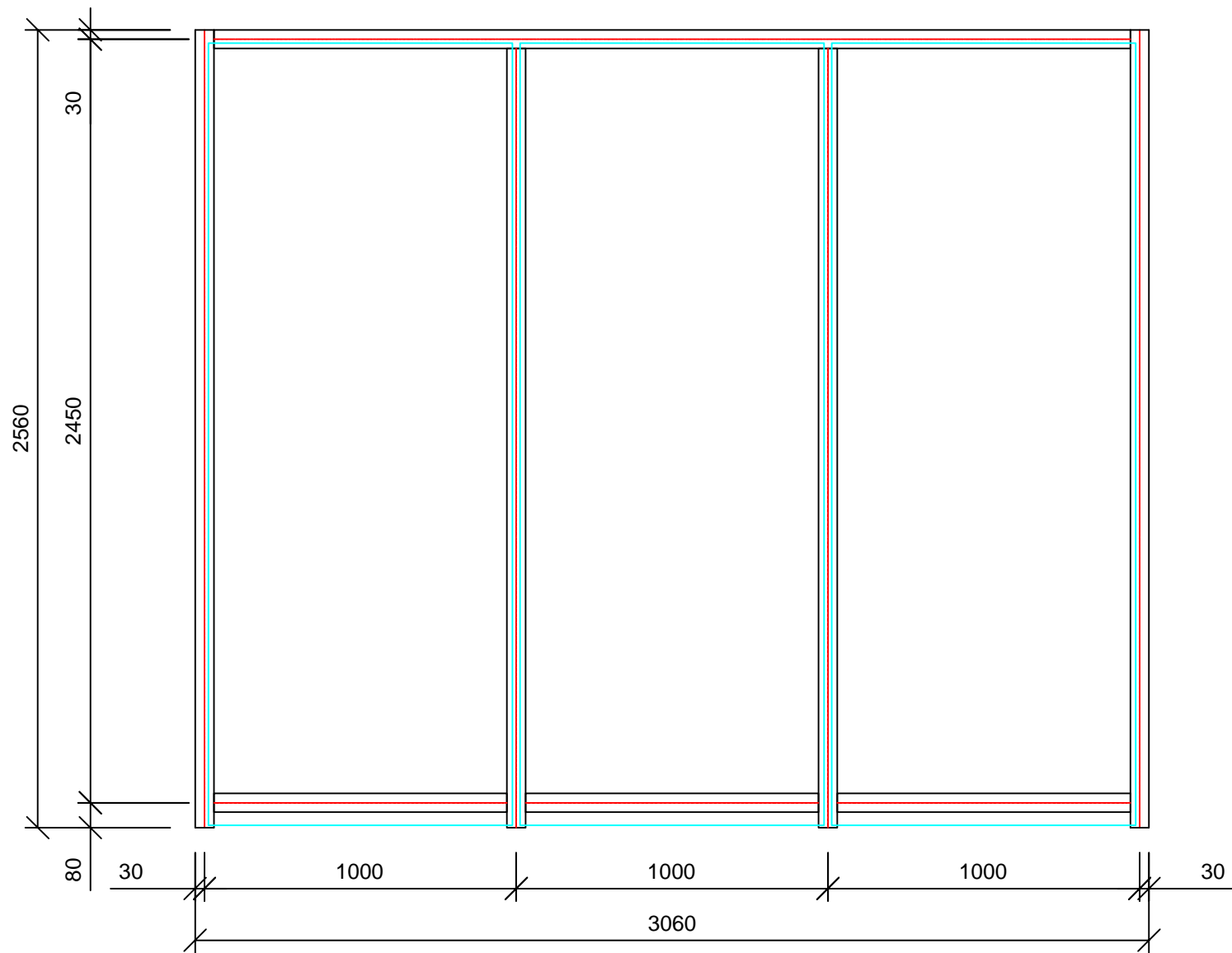
System Drawings

1 drawing on an un-numbered page

Drawing Number / Description

Drawing No.1

Drawing No. NLS-Wintech-CD-002. NLS non-fragility sample



Notes:

1. All drawings to be read in conjunction with all Drawings relevant to project.
2. Do not scale from drawings, any discrepancy should be notified immediately
3. Glazing: 32.8mm Thick
8mm Clear Toughened Outer
12mm Argon Filled Cavity
8.8mm Clear Laminated Inner
4. All Rafters To Be 100mm Glazing Bar, All Transoms To Be 100mm Glazing Bar
5. P.P.C to Required RAL N/A

REV No	DESCRIPTION	DWN	CHKD	DATE	APPR
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Project:
NLS Non-Fragility Sample

Description:
Drawing For Quotation

Drawn By: S.J./K.C.	Checked By: S.J.	Approved By: S.J.
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Date Drawn: 13.04.2011	Job Number: Wintech	Scale: N.T.S.
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Drawing No.:
NLS-Wintech-CD-002

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