Technical Report

Title: Product weathertightness and impact testing of a sample of PSP Architectural Matrix SF and Matrix SFC Rainscreen Cladding

Report No: N950-12-16557rev1

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Title:	Product weathertightness and impact testing of a sample of PSP Architectural Matrix SF and Matrix SFC Rainscreen Cladding
Client:	PSP Architectural Limited, Unit 11, All Saints Industrial Estate, Shildon, Co Durham DL4 2RD
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1 INTRODUCTION

This report describes tests carried out at the Technology Centre at the request of PSP Architectural Limited.

The test sample consisted of a sample of Rainscreen Cladding manufactured by PSP Architectural Limited.

The tests were carried out between May and July 2012 and were to determine the Weathertightness and impact resistance of the test sample. The test methods were in accordance with the CWCT Standard Test Methods for building envelopes, 2005, for:

Air permeability.

Watertightness – static pressure, dynamic pressure.

Wind resistance – serviceability & safety.

Impact resistance.

The testing was carried out in accordance with Technology Centre Method Statement C4264MSrev1.

This test report relates only to the actual sample as tested and described herein.

The results are valid only for sample(s) tested and the conditions under which the tests were conducted.

Technology Centre is accredited to ISO/IEC 17025:2008 by the United Kingdom Accreditation Service as UKAS Testing Laboratory No.0057.

Technology Centre is certified by BSI for:

- ISO 9001:2008 Quality Management System,
- ISO 14001:2004 Environmental Management System,
- BS OHSAS 18001:2007 Occupational Health and Safety Management System.

The tests were witnessed by J. Burrell and B. Gittins from PSP Architectural Limited

2 SUMMARY AND CLASSIFICATION OF TEST RESULTS

The following summarises the results of the tests carried out. For full details refer to Sections 6, 7, 8 and 9.

2.1 SUMMARY OF TEST RESULTS

TABLE 1

Date	Test number	Test description	Result
29 May 2012	1	Watertightness – static (pre-test on whole sample)	Pass
27 June 2012	2	Air permeability (backing wall)	Pass
2 July 2012	3	Wind resistance – serviceability (backing wall)	Pass
2 July 2012	4	Wind resistance – safety (backing wall)	Pass
2 July 2012	5	Wind resistance – serviceability (rainscreen)	Pass
2 July 2012	6	Wind resistance – safety (rainscreen)	Pass
2 July 2012	7	Air permeability (backing wall)	Pass
2 July 2012	8	Watertightness – dynamic (whole sample)	Pass
4 July 2012	9	Impact resistance (rainscreen)	Pass

2.2 CLASSIFICATION

TABLE 2

Test	Standard	Classification / Declared value
Air permeability	CWCT	A4
Watertightness	CWCT	R7
Wind resistance	CWCT	2400 pascals serviceability -2400 pascals serviceability 3600 pascals safety -3600 pascals safety
Impact resistance	BS8200	Category B

3 DESCRIPTION OF TEST SAMPLE

3.1 GENERAL ARRANGEMENT

The sample was as shown in the photo below and the drawings included as an appendix to this report.

The test sample measured 4 m high by 12 m wide.

Insulated backing wall panels were screwed onto the 100 mm x 100 mm steel angles of the test rig support frame. A water proof membrane was located over the backing wall panels and then the Matrix T carrier frame and support brackets were secured to the backing wall.

The aluminium Matrix SF and SFC rainscreen panels were then secured to the carrier frame.

PHOTO 1010851

TEST SAMPLE ELEVATION

3.2 CONTROLLED DISMANTLING

During the dismantling of the sample no water penetration or discrepancies from the drawings were found.

The following photographs were taken during the controlled dismantle.

PHOTO 1010987

BACK OF MATRIX RAINSCREEN PANEL

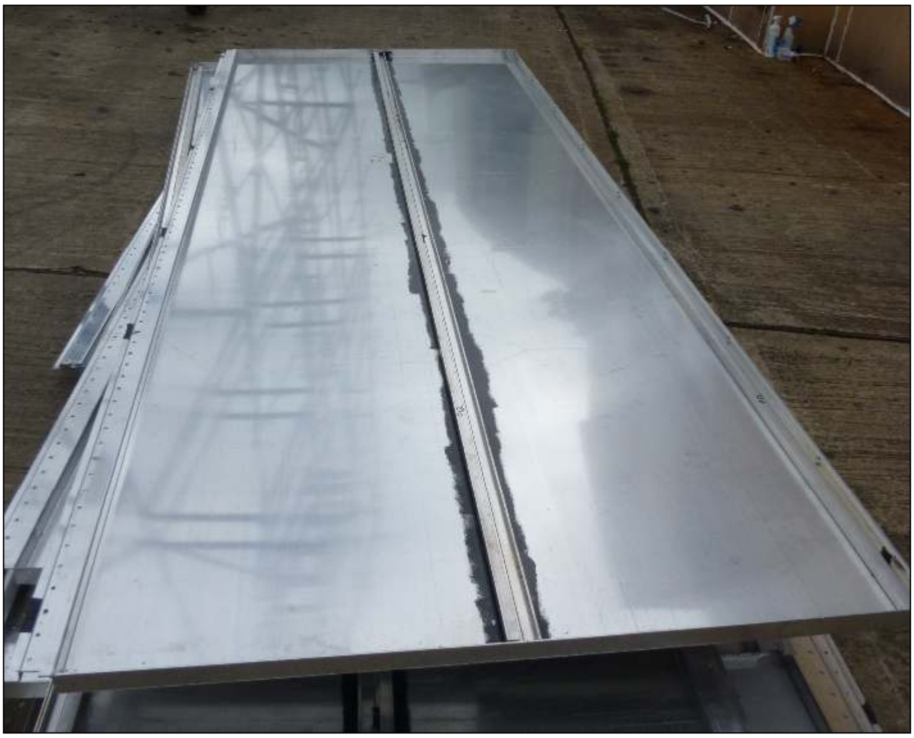


PHOTO 1010979

MATRIX CARRIER FRAMEWORK

PHOTO 1010982

CARRIER FRAME SUPPORT BRACKET

PHOTO 1020030

VIEW OF BACKING WALL PANELS

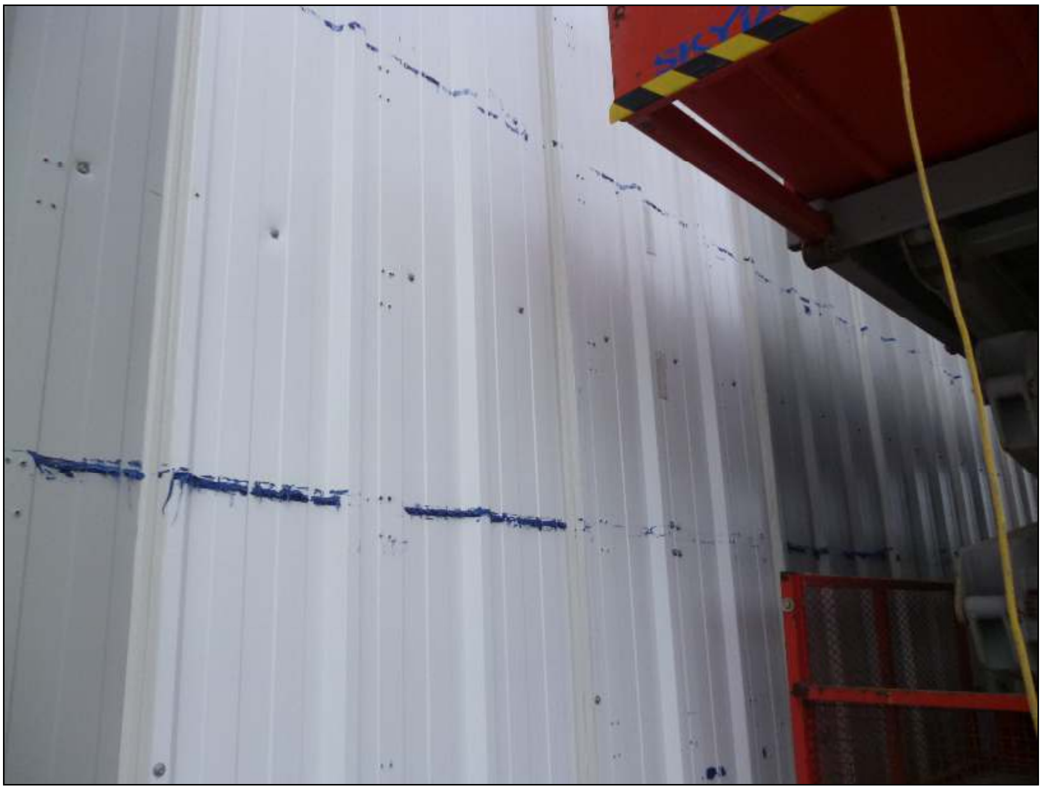


PHOTO 1020044

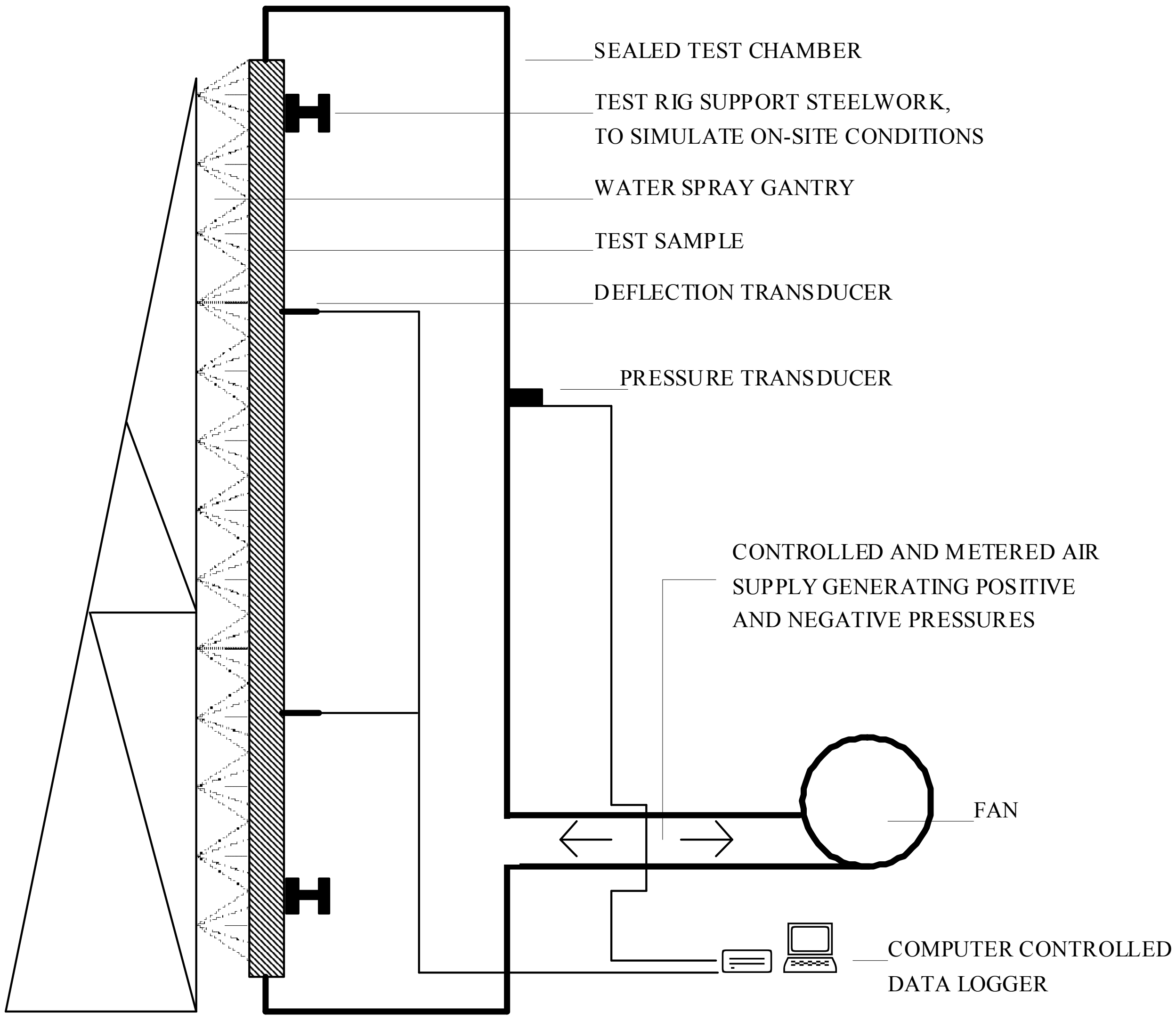
TEST RIG STEEL SUPPORT STRUCTURE

4 TEST RIG GENERAL ARRANGEMENT

The test sample was mounted on a rigid test rig with support steelwork designed to simulate the on-site/project conditions. The test rig comprised a well sealed chamber, fabricated from steel and plywood. A door was provided to allow access to the chamber. Representatives of PSP Architectural Limited installed the sample on the test rig. See Figure 1.

FIGURE 1

TYPICAL TEST RIG SCHEMATIC ARRANGEMENT



SECTION THROUGH TEST RIG

5 TEST SEQUENCE

The test sequence was as follows:

(1) Watertightness – static pre-test (whole sample)

(2) Air permeability (backing wall)

(3) Wind resistance – serviceability (backing wall)

(4) Wind resistance – safety (backing wall)

(5) Wind resistance – serviceability (rainscreen)

(6) Wind resistance – safety (rainscreen)

(7) Air permeability (backing wall)

(8) Watertightness – dynamic (whole sample)

(9) Impact resistance (rainscreen)

6 AIR PERMEABILITY TESTING

6.1 INSTRUMENTATION

6.1.1 Pressure

One static pressure tapping was provided to measure the chamber pressure and was located so that the readings were unaffected by the velocity of the air supply into or out of the chamber.

A pressure transducer, capable of measuring rapid changes in pressure to within 2% was used to measure the differential pressure across the sample.

6.1.2 Air Flow

A laminar flow element mounted in the air system ductwork was used with a pressure transducer to measure the air flow into the chamber. This device was capable of measuring airflow through the sample to within 2%.

6.1.3 Temperature

Platinum resistance thermometers (PRT) were used to measure air temperatures to within 1°C.

6.1.4 General

Electronic instrument measurements were scanned by a computer controlled data logger, which also processed and stored the results.

All measuring instruments and relevant test equipment were calibrated and traceable to national standards.

6.2 FAN

The air supply system comprised a variable speed centrifugal fan and associated ducting and control valves to create positive and negative static pressure differentials. The fan provided essentially constant air flow at the fixed pressure for the period required by the tests and was capable of pressurising at a rate of approximately 600 pascals in one second.

6.3 PROCEDURE

Three positive pressure pulses of 1200 pascals were applied to prepare the test sample.

The average air permeability was determined by measuring the rate of air flow through the chamber whilst subjecting the sample to positive pressure differentials of 50, 100, 150, 200, 300, 450 and 600 pascals. Each pressure increment was held for at least 10 seconds.

Extraneous leakage through the test chamber and the joints between the chamber and the test sample was determined by sealing the sample with adhesive tape (polythene sheet as mentioned in CWCT clause 5.10.3.1 was not used on this occasion) and measuring the air flow at the pressures given above.

The test was then repeated with the sample unsealed; the difference between the readings being the rate of air flow through the sample.

The test was then repeated using negative pressure differentials.

6.4 PASS/FAIL CRITERIA

The permissible air flow rate, Q_o, at peak test pressure, p_o, could not exceed:
1.5 m^3 per hour per m^2.

At intermediate pressures, p_n, flow rates, Q_n, were calculated using $Q_n = Q_o(p_n/p_o)^{2/3}$
The area of the sample was 48 m^2.

6.5 RESULTS

TABLE 3

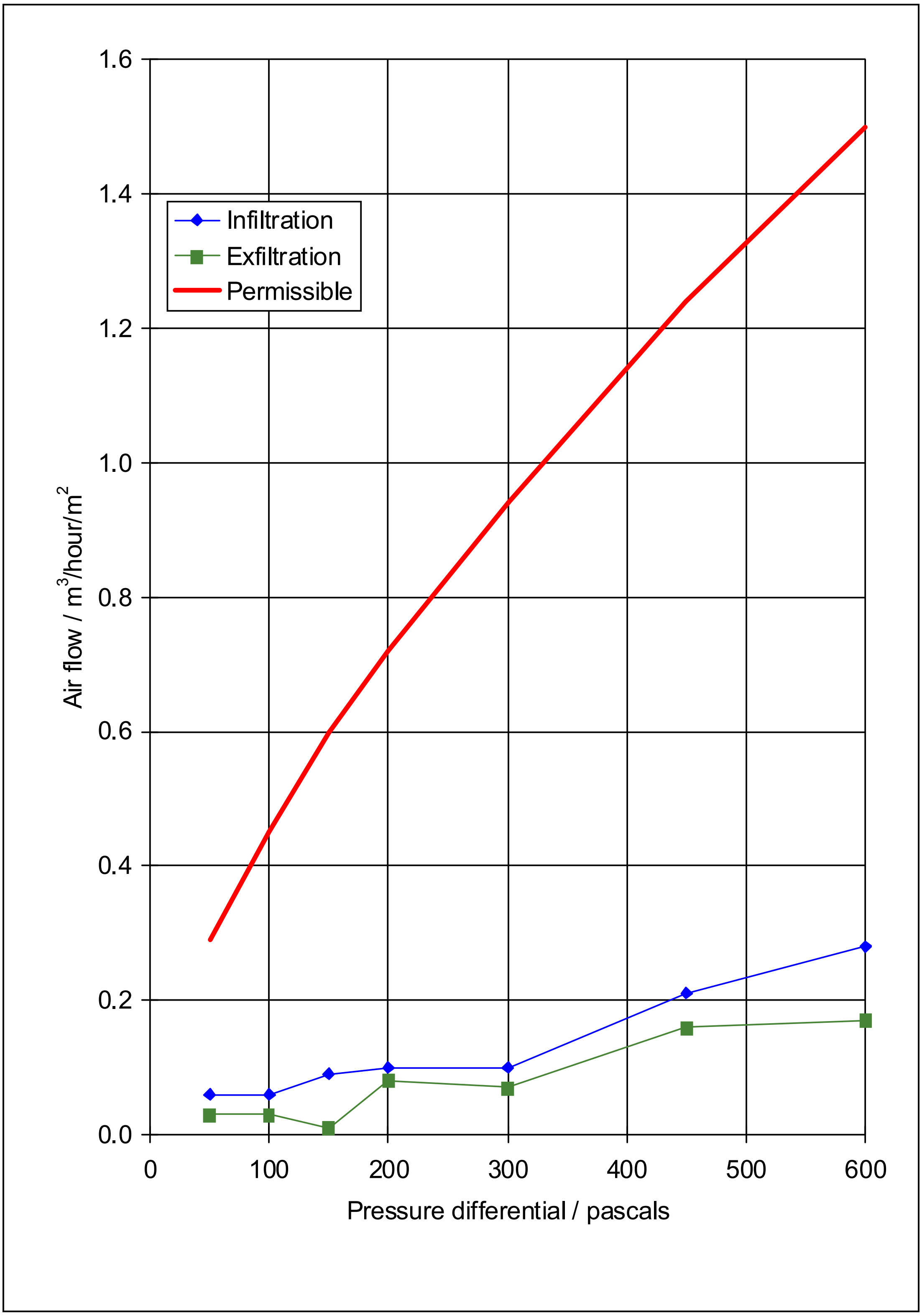
Pressure differential (pascals)	Measured air flow through sample (m^3/hour/m^2) Test 2 Date: 27 June 2012	
	Infiltration	Exfiltraion
50	0.06	0.03
100	0.06	0.03
150	0.09	0.01
200	0.10	0.08
300	0.10	0.07
450	0.21	0.16
600	0.28	0.17
Temperatures	Ambient = 23°C Chamber = 24°C	

The results are shown graphically in Figure 2.

Note: For test 7 overall air permeability readings showed no increase compared to test 2. Therefore a full set of readings was not carried out.

FIGURE 2

Air permeability test results



7 WATERTIGHTNESS TESTING

7.1 INSTRUMENTATION

7.1.1 Pressure

One static pressure tapping was provided to measure the chamber pressure and was located so that the readings were unaffected by the velocity of the air supply into or out of the chamber.

A pressure transducer, capable of measuring rapid changes in pressure to within 2% was used to measure the differential pressure across the sample.

7.1.2 Water Flow

An in-line water flow meter was used to measure water supplied to the spray gantry to within 5%.

7.1.3 Temperature

Platinum resistance thermometers (PRT) were used to measure air and water temperatures to within 1°C.

7.1.4 General

Electronic instrument measurements were scanned by a computer controlled data logger, which also processed and stored the results.

All measuring instruments and relevant test equipment were calibrated and traceable to national standards.

7.2 FAN

7.2.1 Static Pressure Testing

The air supply system comprised a variable speed centrifugal fan and associated ducting and control valves to create positive and negative static pressure differentials. The fan provided essentially constant air flow at the fixed pressure for the period required by the tests and was capable of pressurising at a rate of approximately 600 pascals in one second.

7.2.2 Dynamic Pressure Testing

A wind generator was mounted adjacent to the external face of the sample and used to create positive pressure differentials during dynamic testing. The wind generator comprised a piston type aero-engine fitted with 4 m diameter contra-rotating propellers.

7.3 WATER SPRAY

The water spray system comprised nozzles spaced on a uniform grid not more than 700 mm apart and mounted approximately 400 mm from the face of the sample. The nozzles provided a full-cone pattern with a spray angle between 90° and 120°. The spray system delivered water uniformly against the exterior surface of the sample.

PHOTO 1010871

WIND GENERATOR

7.4 PROCEDURE

7.4.1 Watertightness – static

Three positive pressure pulses of 1200 pascals were applied to prepare the test sample.

Water was sprayed onto the sample using the method described above at a rate of at least 3.4 litres/m^2/minute for 15 minutes at zero pressure differential. With the water spray continuing the pressure differential across the sample was then increased in increments of: 50, 100, 150, 200, 300, 450 and 600 pascals, each held for 5 minutes.

Throughout the test the interior face of the sample was examined for water penetration.

7.4.2 Watertightness – dynamic

Water was sprayed onto the sample using the method described above at a flow rate of at least 3.4 litres/m^2/minute.

The aero-engine was used to subject the sample to wind of sufficient velocity to produce average deflections in the principle framing members equal to those produced by a static pressure differential of 600 pascals. These conditions were maintained for 15 minutes. Throughout the test the inside of the sample was examined for water penetration.

7.5 PASS/FAIL CRITERIA

There shall be no water penetration to the internal face of the sample throughout testing. At the completion of the test there shall be no standing water in locations intended to remain dry.

7.6 RESULTS

<u>Test 1 (Static pressure pre-test)</u> Date: 29 May 2012

No water penetration was observed throughout the test.

Chamber temperature= 22°C
Ambient temperature = 22°C
Water temperature = 19°C

<u>Test 8 (Dynamic pressure)</u> Date: 2 July 2012

No water penetration was observed throughout the test.

Chamber temperature= 17°C
Ambient temperature = 16°C
Water temperature = 17°C

8 WIND RESISTANCE TESTING

8.1 INSTRUMENTATION

8.1.1 Pressure

One static pressure tapping was provided to measure the chamber pressure and was located so that the readings were unaffected by the velocity of the air supply into or out of the chamber.

A pressure transducer, capable of measuring rapid changes in pressure to within 2% was used to measure the differential pressure across the sample.

8.1.2 Deflection

Displacement transducers were used to measure the deflection of principle framing members to an accuracy of 0.1 mm. The gauges were set normal to the sample framework at mid-span and as near to the supports of the members as possible and installed in such a way that the measurements were not influenced by the application of pressure or other loading to the sample. The gauges were located at the positions shown in Figure 3.

8.1.3 Temperature

Platinum resistance thermometers (PRT) were used to measure air temperatures to within 1°C.

8.1.4 General

Electronic instrument measurements were scanned by a computer controlled data logger, which also processed and stored the results.

All measuring instruments and relevant test equipment were calibrated and traceable to national standards.

8.2 FAN

The air supply system comprised a variable speed centrifugal fan and associated ducting and control valves to create positive and negative static pressure differentials. The fan provided essentially constant air flow at the fixed pressure for the period required by the tests and was capable of pressurising at a rate of approximately 600 pascals in one second.

8.3 PROCEDURE

8.3.1 Wind Resistance – serviceability

Three positive pressure differential pulses of 1200 pascals were applied to prepare the sample. The displacement transducers were then zeroed.

The sample was subjected to one positive pressure differential pulse from 0 to 2400 pascals to 0. The pressure was increased in four equal increments each maintained for 15 ±5 seconds. Displacement readings were taken at each increment. Residual deformations were measured on the pressure returning to zero.

Any damage or functional defects were recorded.

The test was then repeated using a negative pressure of -2400 pascals.

8.3.2 Wind Resistance – safety

Three positive pressure differential pulses of 1200 pascals were applied to prepare the sample. The displacement transducers were then zeroed.

The sample was subjected to one positive pressure differential pulse from 0 to 3600 pascals to 0. The pressure was increased as rapidly as possible but not in less than 1 second and maintained for 15 ±5 seconds. Displacement readings were taken at peak pressure. Residual deformations were measured on the pressure returning to zero.

Any damage or functional defects were recorded.

The test was then repeated using a negative pressure of –3600 pascals.

FIGURE 3

DEFLECTION GAUGE LOCATIONS

Internal View

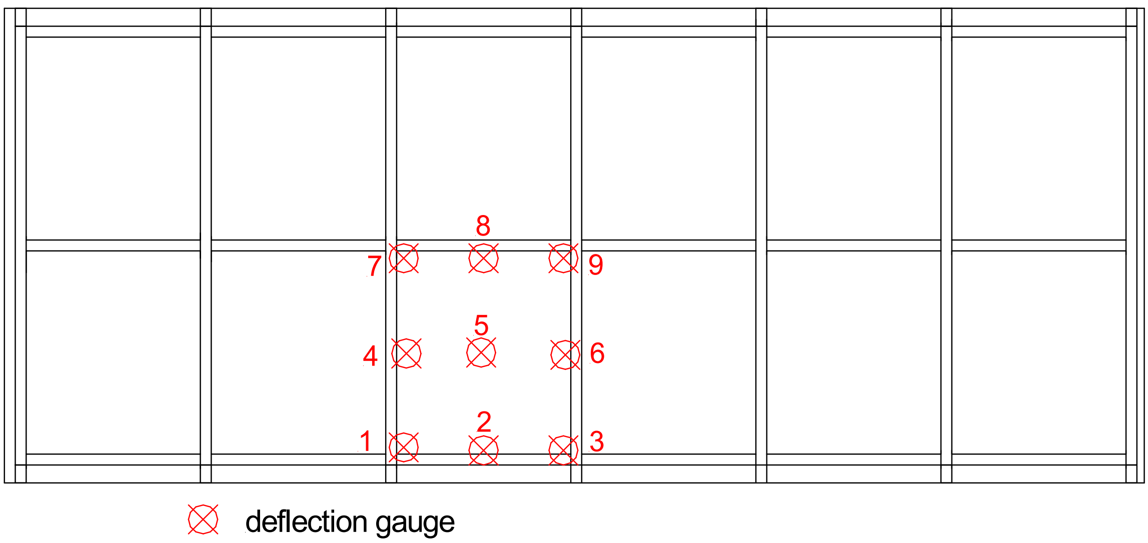
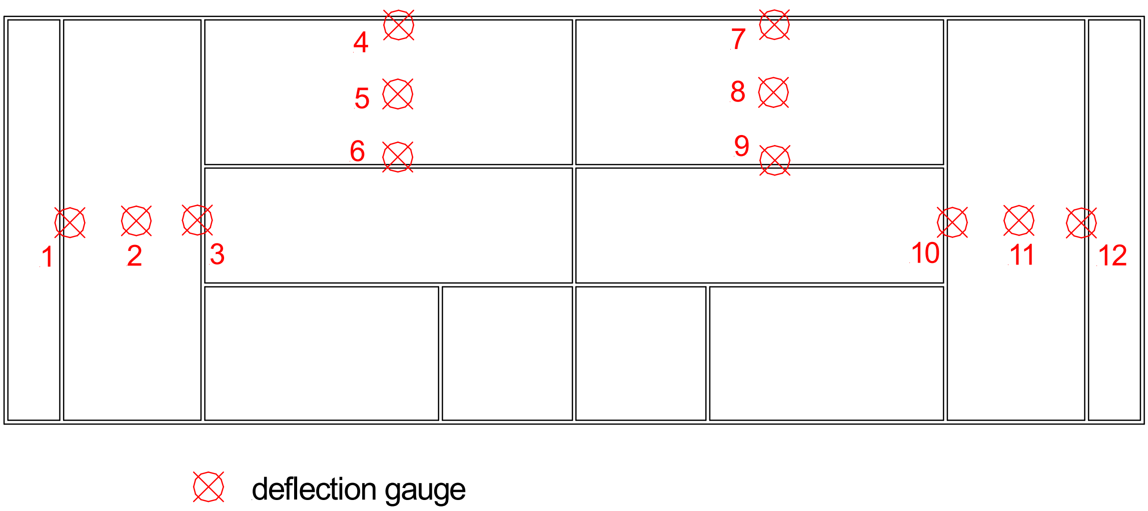


FIGURE 4

DEFLECTION GAUGE LOCATIONS

External View



8.4 PASS/FAIL CRITERIA

8.4.1 Calculation of permissible deflection for backing wall

Gauge number	Member	Span (L) (mm)	Permissible deflection (mm)	Permissible residual deformation
2	Backing Wall	1900	L/200 = 9.5	1 mm
5	Backing Wall	1900	L/200 = 9.5	1 mm
8	Backing Wall	1900	L/200 = 9.5	1 mm

8.4.2 Calculation of permissible deflection for rainscreen panels

Gauge number	Member	Span (L) (mm)	Permissible deflection (mm)
2	Rainscreen panel	1400	L/90 = 15.5
5	Rainscreen panel	1400	L/90 = 15.5
8	Rainscreen panel	1400	L/90 = 15.5
11	Rainscreen panel	1400	L/90 = 15.5

8.5 RESULTS

8.5.1 Backing Wall

Test 3 (serviceability) Date: 2 July 2012

The deflections measured during the wind resistance test, at the positions shown in Figure 3, are shown in Tables 4 and 5.

Summary Table:

Gauge number	Member	Pressure differential (Pa)	Measured deflection (mm)	Residual deformation (mm)
2	Backing wall	2405 -2396	1.3 -1.6	0.0 0.0
5	Backing wall	2405 -2396	2.1 -1.0	0.1 0.0
8	Backing wall	2405 -2396	1.7 -1.5	0.1 -0.1

No damage to the test sample was observed.

Ambient temperature = 15°C
Chamber temperature = 16°C

Test 4 (safety) Date: 2 July 2012

The deflections measured during the structural safety test, at the positions shown in Figure 3, are shown in Table 6.

No damage to the sample was observed.

Ambient temperature = 15°C
Chamber temperature = 16°C

8.5.2 Rainscreen

Test 5 (serviceability) Date: 2 July 2012

The deflections measured during the wind resistance test, at the positions shown in Figure 4, are shown in Tables 7 and 8.

Summary Table:

Gauge number	Member	Pressure differential (Pa)	Measured deflection (mm)	Residual deformation (mm)
2	Rainscreen panel	2396 -2396	4.2 -3.9	0.0 0.0
5	Rainscreen panel	2396 -2396	0.9 -1.1	0.0 0.0
8	Rainscreen panel	2396 -2396	2.2 -2.1	0.0 -0.1
11	Rainscreen panel	2396 -2396	4.6 -4.4	0.1 -0.1

No damage to the test sample was observed.

Ambient temperature = 15°C
Chamber temperature = 16°C

Test 6 (safety) Date: 2 July 2012

The deflections measured during the structural safety test, at the positions shown in Figure 4, are shown in Table 9.

No damage to the sample was observed.

Ambient temperature = 15°C
Chamber temperature = 16°C

TABLE 4

WIND RESISTANCE – POSITIVE **SERVICEABILITY** TEST RESULTS

Position	Pressure (pascals) / Deflection (mm)				
	615	**1208**	**1816**	**2405**	**Residual**
1	0.8	1.6	2.3	3.0	0.0
2	1.2	2.3	3.5	4.6	0.0
3	0.8	1.7	2.6	3.4	0.0
4	2.4	4.6	6.7	8.9	0.0
5	2.9	5.7	8.6	11.5	0.0
6	2.5	4.9	7.5	10.0	-0.1
7	2.8	5.6	8.5	11.3	-0.1
8	3.5	6.9	10.5	14.0	-0.1
9	3.3	6.6	9.9	13.1	-0.2
2 *	0.4	0.7	1.0	1.3	0.0
5 *	0.4	0.9	1.5	2.1	0.1
8*	0.4	0.8	1.3	1.7	0.1

* Mid-span reading adjusted between end support readings

TABLE 5

WIND RESISTANCE – NEGATIVE **SERVICEABILITY** TEST RESULTS

Position	Pressure (pascals) / Deflection (mm)				
	-621	**-1211**	**-1796**	**-2396**	**Residual**
1	-1.1	-2.5	-4.2	-6.1	-0.5
2	-1.6	-3.5	-5.5	-7.9	-0.5
3	-1.2	-2.7	-4.5	-6.6	-0.4
4	-2.9	-6.0	-9.5	-13.2	-0.2
5	-3.3	-6.8	-10.6	-14.7	-0.3
6	-3.2	-6.6	-10.2	-14.2	-0.3
7	-3.3	-6.8	-10.5	-14.5	0.0
8	-4.0	-8.1	-12.4	-17.0	-0.1
9	-3.9	-7.9	-12.0	-16.5	0.0
2 *	-0.5	-0.9	-1.2	-1.6	0.0
5 *	-0.3	-0.5	-0.7	-1.0	0.0
8*	-0.4	-0.8	-1.1	-1.5	-0.1

* Mid-span reading adjusted between end support readings

TABLE 6

WIND RESISTANCE - **SAFETY** TEST RESULTS

Position	Pressure (pascals) / Deflection (mm)			
	3589	**Residual**	**-3607**	**Residual**
1	4.6	-0.1	-10.1	-1.4
2	6.9	0.0	-13.1	-1.3
3	5.3	0.0	-11.5	-1.3
4	13.3	-0.3	-20.9	-0.9
5	17.6	-0.1	-23.3	-0.8
6	15.4	-0.2	-22.6	-0.7
7	17.0	-0.4	-22.9	-0.5
8	21.1	-0.4	-26.7	-0.4
9	20.0	-0.5	-25.9	-0.2
2 *	1.9	0.0	-2.3	0.0
5 *	3.3	0.1	-1.5	-0.1
8 *	2.6	0.1	-2.3	-0.1

* Mid-span reading adjusted between end support readings

TABLE 7

WIND RESISTANCE – POSITIVE **SERVICEABILITY** TEST RESULTS

Position	Pressure (pascals) / Deflection (mm)				
	603	1200	1813	2396	Residual
1	1.9	3.5	5.2	6.7	0.3
2	2.8	6.0	9.2	11.8	0.3
3	2.4	4.3	6.4	8.5	0.2
4	2.0	3.3	4.5	5.6	0.3
5	3.0	5.1	7.6	9.8	0.3
6	3.5	6.4	9.5	12.2	0.3
7	1.4	2.4	3.4	4.3	0.1
8	3.4	5.8	8.4	11.6	0.1
9	4.3	8.5	11.7	14.5	0.2
10	2.1	4.4	6.7	9.0	0.1
11	2.9	6.1	9.7	12.1	0.1
12	1.2	2.7	4.4	6.0	0.0
2 *	0.6	2.1	3.4	4.2	0.0
5 *	0.3	0.3	0.6	0.9	0.0
8*	0.6	0.3	0.9	2.2	0.0
11*	1.3	2.6	4.2	4.6	0.1

* Mid-span reading adjusted between end support readings

TABLE 8

WIND RESISTANCE – NEGATIVE **SERVICEABILITY** TEST RESULTS

Position	Pressure (pascals) / Deflection (mm)				
	-586	**-1219**	**-1801**	**-2396**	**Residual**
1	-2.2	-4.5	-6.8	-9.1	-0.5
2	-4.5	-7.2	-10.8	-14.4	-0.5
3	-2.8	-5.8	-8.9	-11.9	-0.4
4	-2.4	-4.8	-7.0	-9.2	-0.4
5	-3.3	-6.8	-10.2	-13.4	-0.5
6	-3.8	-7.8	-11.6	-15.4	-0.6
7	-2.1	-4.1	-6.0	-8.0	-0.3
8	-3.1	-4.5	-9.7	-12.6	-0.4
9	-3.6	-7.3	-11.1	-15.0	-0.6
10	-2.2	-5.0	-7.9	-12.0	-0.4
11	-2.1	-4.8	-7.6	-14.4	-0.4
12	-1.6	-3.7	-5.9	-8.0	-0.3
2 *	-2.0	-2.1	-3.0	-3.9	0.0
5 *	-0.2	-0.5	-0.9	-1.1	0.0
8*	-0.3	-0.8	-1.2	-2.1	-0.1
11*	-0.2	-0.4	-0.7	-4.4	-0.1

* Mid-span reading adjusted between end support readings

TABLE 9

WIND RESISTANCE - **SAFETY** TEST RESULTS

Position	Pressure (pascals) / Deflection (mm)			
	3597	Residual	3578	Residual
1	9.4	0.4	-13.3	-0.8
2	19.4	0.4	-22.3	-1.3
3	14.3	0.3	-17.8	-1.0
4	7.5	0.3	-13.6	-1.5
5	14.0	0.4	-19.6	-1.9
6	17.4	0.4	-22.9	-0.9
7	5.9	0.3	-11.9	-0.7
8	15.8	0.5	-18.4	-1.0
9	20.5	0.5	-22.4	-0.8
10	13.4	0.4	-16.6	-0.6
11	19.4	0.3	-22.5	-0.7
12	8.9	0.2	-12.0	-0.5
2 *	7.5	0.0	-7.3	-0.4
5 *	1.5	0.1	-1.4	-0.7
8 *	2.6	0.4	-1.2	-0.3
11 *	8.2	0.0	-8.2	-0.1

* Mid-span reading adjusted between end support readings

9 IMPACT TESTING

9.1 IMPACTOR

9.1.1 Soft body

The soft body impactor comprised a canvas spherical/conical bag 400 mm in diameter filled with 3 mm diameter glass spheres with a total mass of approximately 50 kg suspended from a cord at least 3 m long.

9.1.2 Hard body

The hard body impactor was a solid steel ball of 62.5 mm diameter and approximate mass of 1.0 kg.

9.2 PROCEDURE (BS 8200)

9.2.1 Soft body

The impactor almost touched the face of the sample when at rest. It was swung in a pendular movement to hit the sample normal to its face. The test was performed at the locations shown in Figure 5. The impact energies were 120 Nm, carried out three times and 500 Nm carried out once at each location.

9.2.2 Hard body

The impactor almost touched the face of the sample when at rest. It was swung in a pendular movement to hit the sample normal to its face. The test was performed at the locations shown in Figure 6. The impact energy was 10 Nm.

9.3 PASS/FAIL CRITERIA

9.3.1 At impact energies for retention of performance

There shall be no failure, significant damage to surface finish or significant indentation.

9.3.2 At impact energies for safety

The structural safety of the building shall not be put at risk, no parts shall be made liable to fall or to cause serious injury to people inside or outside the building. The soft body impactor shall not pass through the wall. Damage to the finish and permanent deformation on the far side of the wall may occur.

9.4 RESULTS

Test 9 Date: 4 July 2012

No damage to the sample was observed during the soft body impact tests.

Minor indentation was observed at locations 1 and 2 after hard body impacts at 10 Nm. These indents were less than 1 mm deep.

Ambient temperature = 14°C

PHOTO 1010880

HARD BODY IMPACTOR

FIGURE 5

SOFT BODY IMPACT TEST LOCATIONS

External View

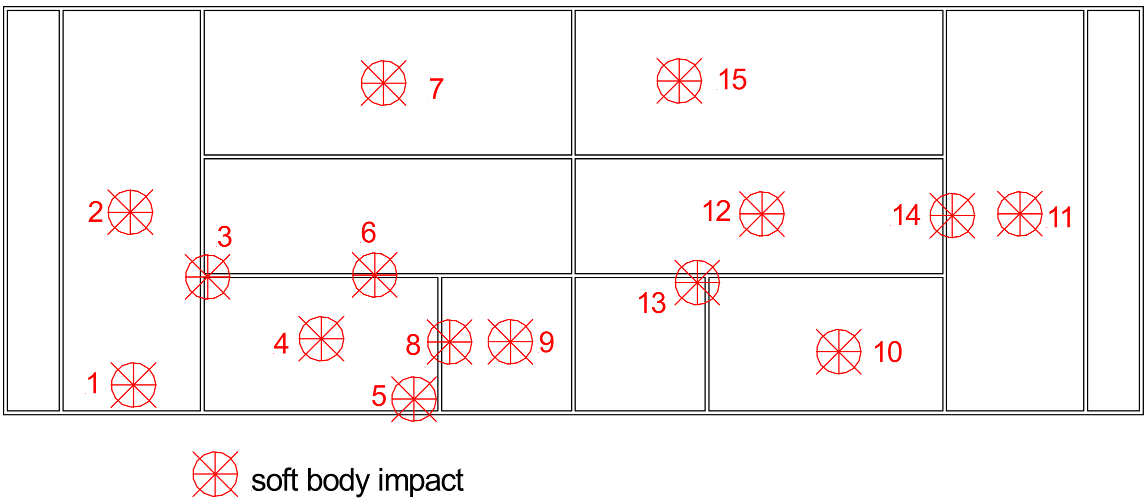
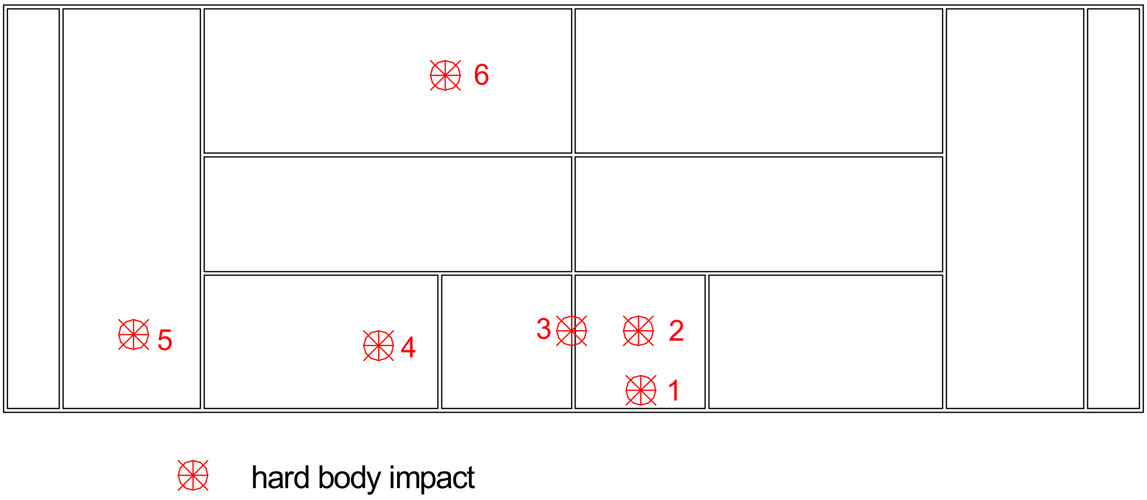


FIGURE 6

HARD BODY IMPACT TEST LOCATIONS

External View



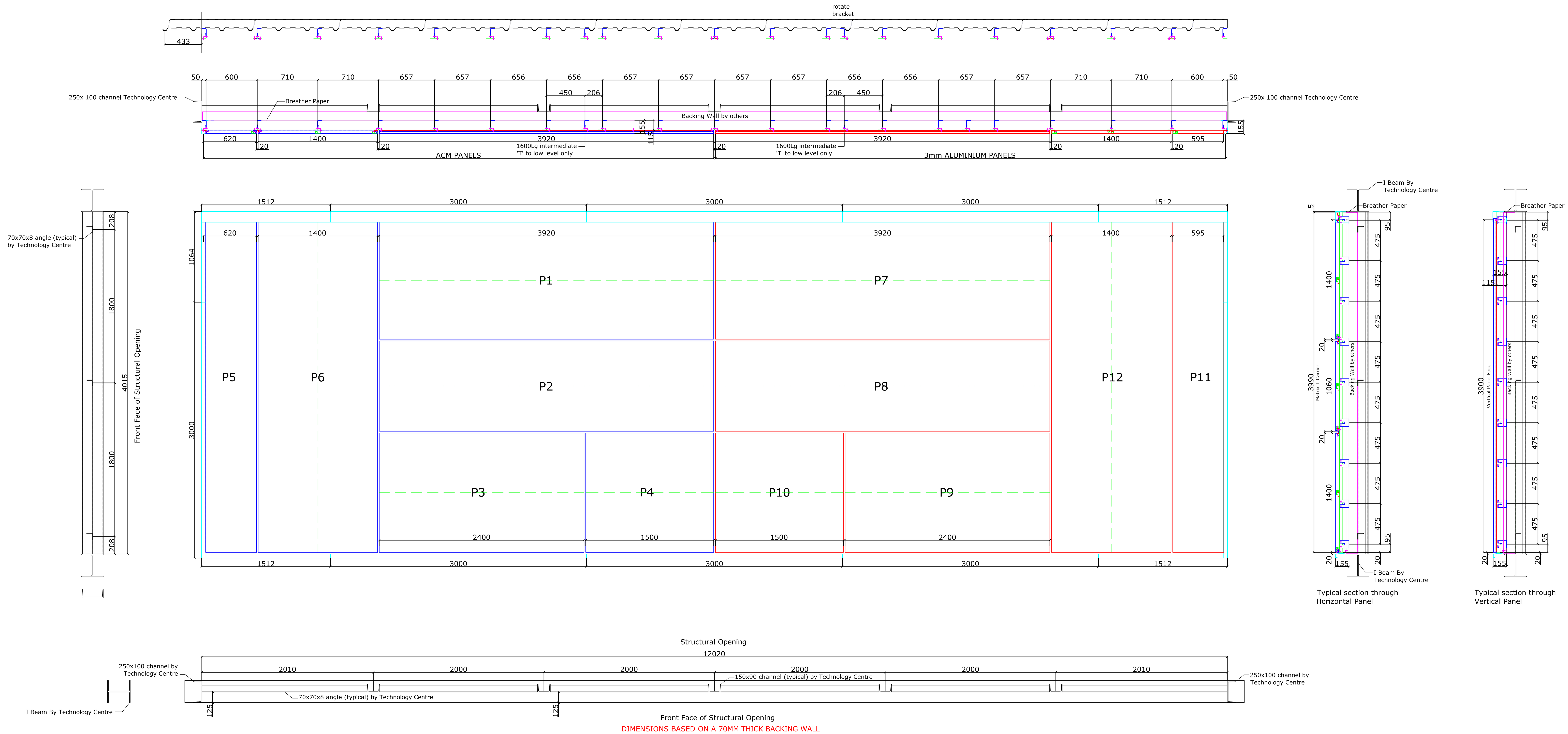
10 APPENDIX - DRAWINGS

The following 2 unnumbered pages are copies of PSP Architectural Limited drawings of the test sample.

M2-3T TR1 rev A,

M2&3T-Details rev A.

END OF REPORT



Front Face of Structural Opening

DIMENSIONS BASED ON A 70MM THICK BACKING WALL

— — — - Denotes Intermediate Extrusion

PSP Alum. Panel Extrusion @ Midpoint	
Panel Ref. No.	**No. of Supports**
P1	1no. intermediate extrusion
P2	1no. intermediate extrusion
P3	1no. intermediate extrusion
P4	1no. intermediate extrusion
P5	None required
P6	1no. intermediate extrusion
P7	1no. intermediate extrusion
P8	1no. intermediate extrusion
P9	1no. intermediate extrusion
P10	1no. intermediate extrusion
P11	None required
P12	1no. intermediate extrusion

Revision	Date	Details
A	13/06/12	CARRIER RAILS AMENDED, VERTICAL PANELS AMENDED.

Drawn by:- J Burrell | Checked by:- | Date:- 18-04-2012 | Scale:- N.T.S.

Title:- Matrix 2&3T Test Rig

Client:- PSP Architectural Ltd

Project:- Vinci Technology Centre

Revision Dates: Original 18-04-12

Drwg. No.:- M2-3T TR1 | Latest Revision:- A

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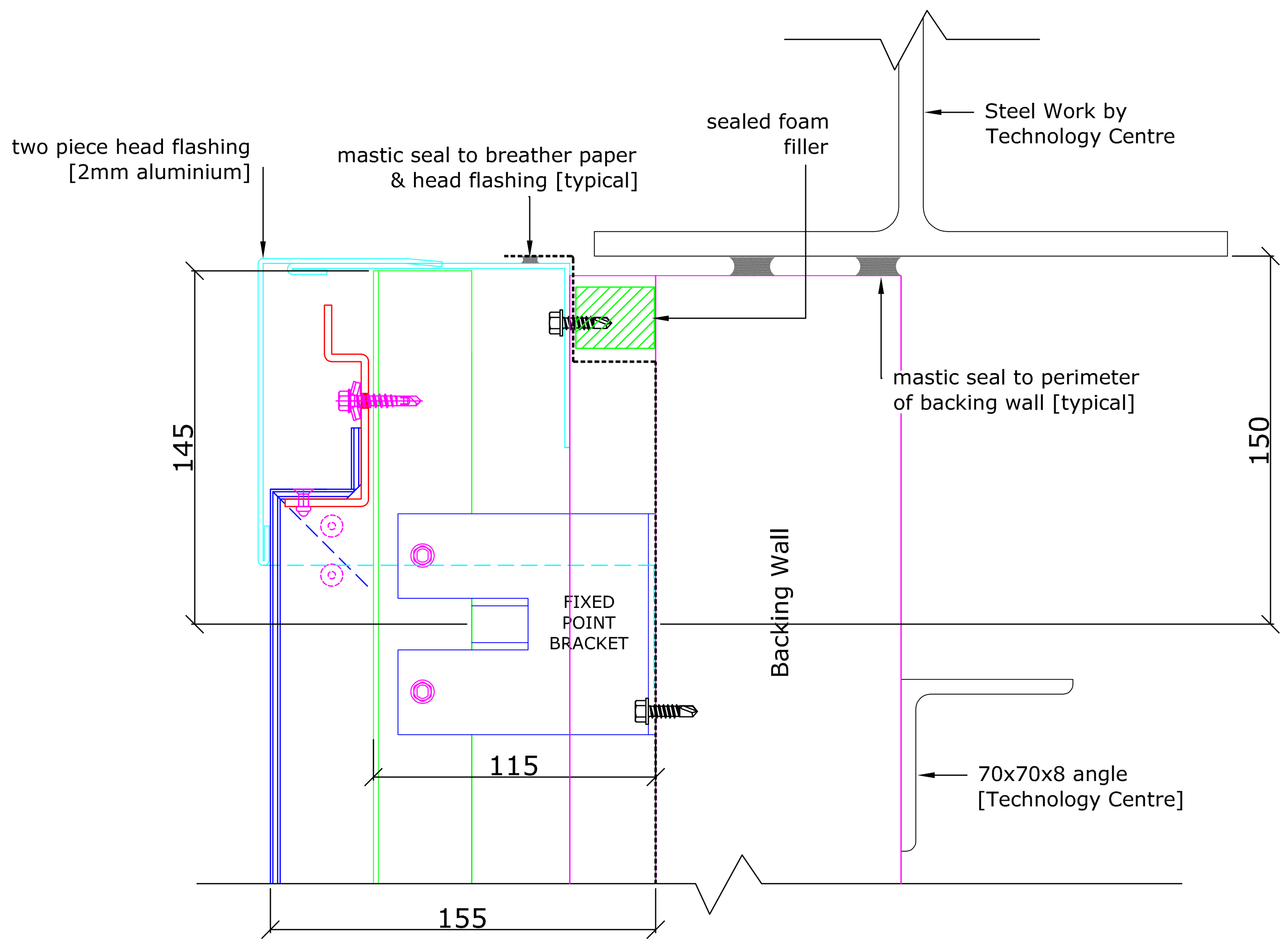
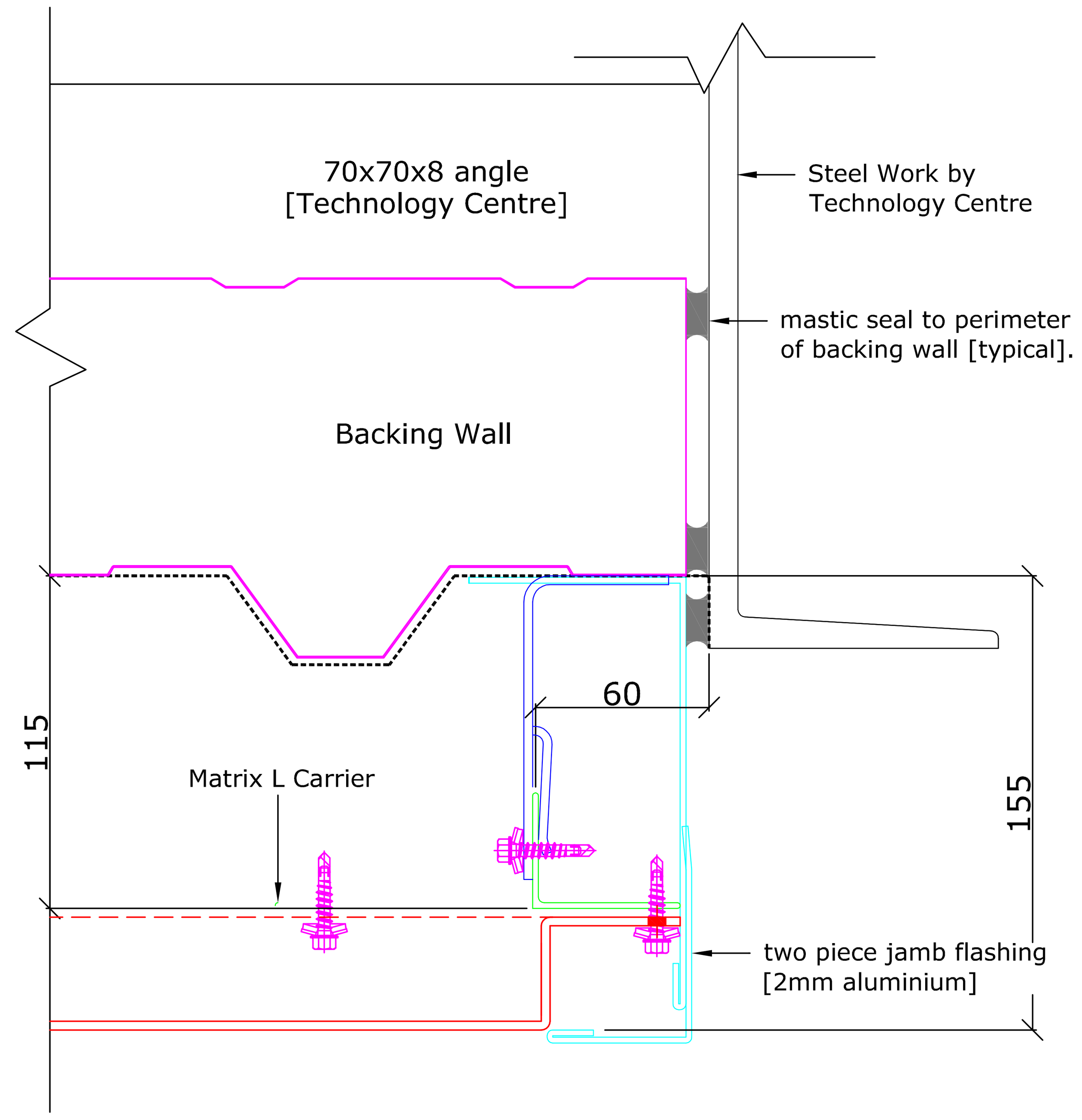
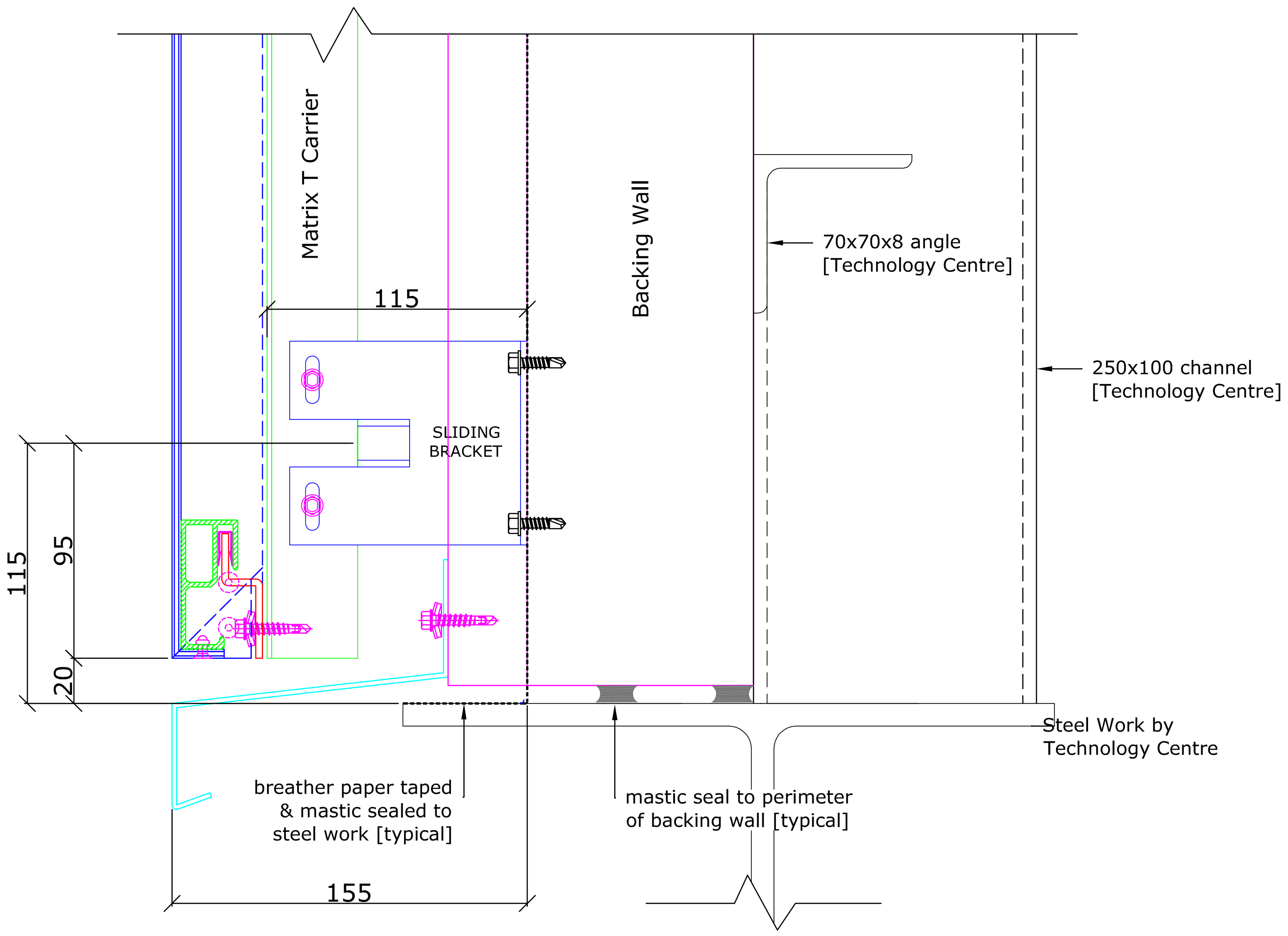


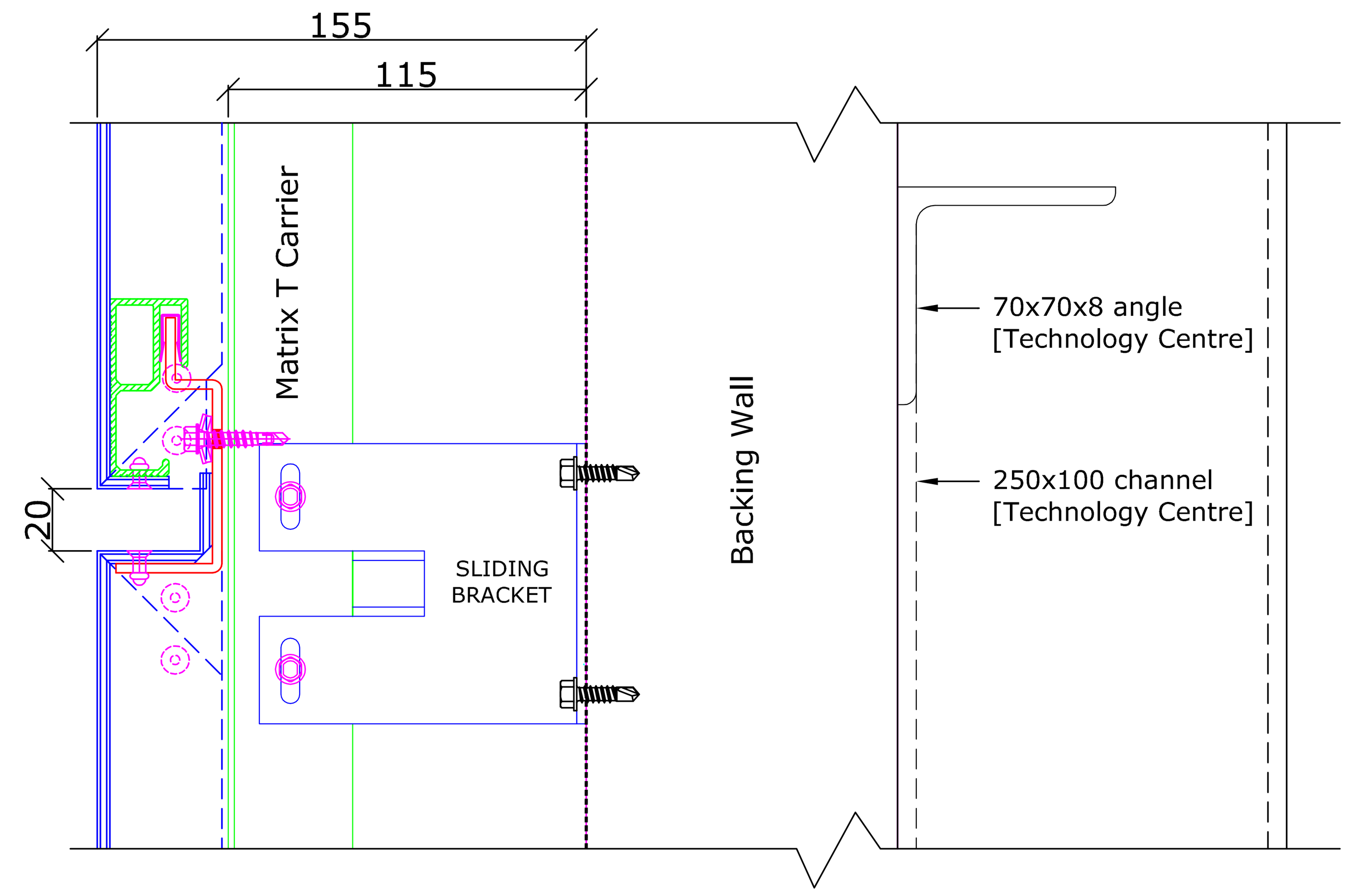
Typical Head & Bracket Detail



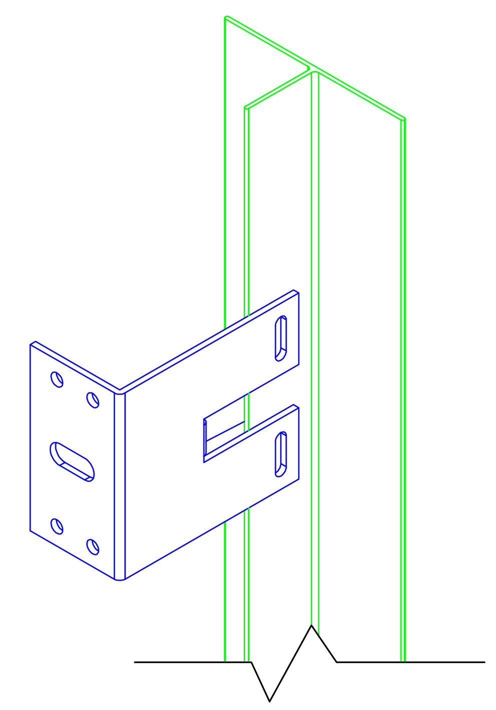
Jamb Detail [VERTICAL Panels]



Typical Cill & Bracket Detail



Typical Horizontal Joint & Sliding Bracket Detail



Typical Bracket & T Carrier Detail

Revision	Date	Details
A	13/06/12	BACKING WALL THICKNESS AMENDED, VERTICAL PANELS AMENDED

Drawn by:- J Burrell | Checked by:- | Date:- 20-04-2012 | Scale:- N.T.S.

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Title:- Matrix 2T & 3T Test Rig

Client:- PSP Architectural

Project:- Vinci Technology Centre

Revision Dates: Original xxxxxx

Drwg. No.:- M2&3T - Details

Latest Revision:- A

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