WINTECH
WINDOW AND CLADDING TESTING & LABORATORY SERVICES

Technical Report

Report No: R14425

UKAS TESTING
2223

Stonel Oy
Ahlmaninkatu 2 E
FI - 40100 Jyväskylä
Finland

Project

Stofix Brick Cladding

CWCT Test Sequence
&
Seismic Test - AAMA 501.4:2000

Project Ref: 14425

5th January 2015

Rev 1 – this report has been amended by updating the address and it replaces previous report No. DPP/R14425 dated 5th January 2015.

This report and the results shown within are based upon the information, drawings, samples and tests referred to in the report. The results obtained do not necessarily relate to samples from the production line of the above named company and in no way constitute any form of representation or warranty as to the performance or quality of any products supplied or to be supplied by them. Wintech Engineering Ltd or its employees accept no liability for any damages, charges, cost or expenses in respect of or in relation to any damage to any property or other loss whatsoever arising either directly or indirectly from the use of the report.

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Testing Conducted by:	Wintech Engineering Ltd Halesfield 2 Telford Shropshire TF7 4QH
Test Conducted at:	Above Address
Test Conducted for:	Stonel Oy
Standards Specified:	CWCT Test Methods for Building Envelopes – Dec 2005; Sections 5, 6, 7, 11, 12, TN 76 & AAMA 501.4:2000

The Test Sequence was Witnessed Wholly or in Part by:

A Juola	Stonel Oy
R Huusko	Stonel Oy
C Everett	Europa Façade Consultants

Project No:	14425
Dates of Final Test Sequence:	1st & 3rd December 2014
Product/System Tested:	Stofix Brickslip System
Tests Performed:	As Listed in Section 5 – Test Procedures

Final Test Sequence Conducted by:

D Reynolds	Wintech Engineering Ltd
D Price	Wintech Engineering Ltd
D Potts	Wintech Engineering Ltd

Report Compiled by: D Price
Senior Test Engineer

Testing Supervised by: M Cox
Works Director

Technical Approval: M Wass
(Authorising Signatory) Technical Director

Contents

1. INTRODUCTION

This report describes tests conducted at the test site of Wintech Engineering Ltd on a Brick Slip Panel System, on behalf of Stonel Oy.

The following test sequence was conducted on the 1st & 3rd December 2014 in order to determine the weather tightness of the sample with respect to air leakage, water penetration, wind and impact resistance. The test methods were in accordance with the following standards, and testing was conducted at the request of Stonel Oy.

CWCT Standard Test Methods for Building Envelopes - December 2005

Air Leakage (Infiltration & Exfiltration)	CWCT Section 5
Water Penetration – Static	CWCT Section 6
Water Penetration – Dynamic Aero Engine	CWCT Section 7
Wind Resistance – Serviceability	CWCT Section 11
Wind Resistance – Safety	CWCT Section 12
Impact Testing	CWCT TN 76
Structural Movement – Seismic Test	AAMA 501.4:2000

Wintech Engineering Ltd is accredited by the United Kingdom Accreditation Service as UKAS Testing Laboratory No. 2223.

The test sample was supplied and erected on to the test chamber by Stonel Oy.

2. SUMMARY OF TEST RESULTS

The following summarises the results of tests carried out. The sample was tested in the following sequence and the associated results are as follows;

	Peak Test Pressure	Result	Date of test	Classification
Test 1 – Air Leakage (Infiltration)	600 Pa	Pass	01.12.14	A4
Test 2 – Air Leakage (Exfiltration)	100 Pa	(See note1)	01.12.14	
Test 3 – Water Penetration (Static Pressure)	600 Pa	Pass	01.02.14	R7
Test 4 – Water Penetration (Dynamic Aero Engine)	600 Pa	Pass	01.02.14	
Test 5 – Wind Resistance (Serviceability)	2400 Pa	Pass	03.12.14	
Test 6 – Repeat Air Leakage (Infiltration)	600 Pa	Pass	03.12.14	
Test 7 – Repeat Air Leakage (Exfiltration)	100 Pa	(See note1)	03.12.14	
Test 8 – Water Penetration (Static Pressure)	600 Pa	Pass	03.12.14	R7
Test 9 – Water Penetration (Dynamic Aero Engine)	600 Pa	Pass	03.12.14	
Test 10 – Wind Resistance (Safety)	3600 Pa	Pass	03.12.14	
Test 11 – Impact Resistance (Retention of Performance)	N/A	Pass	03.12.14	Cat B*
Test 12 – Impact Resistance (Safety to Persons)	N/A	Pass	03.12.14	Cat B*
Test 13 – Structural Movement – Seismic Testing	N/A	(See note2)	03.12.14	

Note1 : There is no classification or performance requirement for exfiltration testing in CWCT Standard for Systemised Building Envelopes – Section 5.

Note2 : Seismic testing was conducted for information purposes only as per the client's request and had no pass/fail criteria.

Following the seismic test an inspection was conducted of the sample and no damage was found.

***The system achieved a Class 3 during serviceability impacting and a 'Negligible Risk' class during the safety impacting in accordance with CWCT TN 76.**

The test sample successfully passed all of the above CWCT test requirements and all tests are either equal to or in excess of the requirements for current BS EN Standards for Curtain Walling.

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

3. DESCRIPTION OF TEST SAMPLE

Manufactured By:	Stonel Oy
Sample Size:	5835 mm wide 5985 mm high
Rainscreen Type:	Stofix Brickslip system
Framing Material/Rail System:	Stofix Galvanised steel wall mounting brackets, vertical insulation track and horizontal installation J bar track
Vapour Barrier :	1000 MNs/gm polythene.
Finish:	Natural finish Brick slip
Gaskets:	Illbruck TP605 Compriband super expanding foam tape. Illbruck 1.5mm thick EPDM Illbruck SP520
Panel Types:	Stofix 1200 wide x 600mm high x 21mm thick Brickslip panel
Insulation Type:	120mm thick foil faced PIR insulation board
Drainage and Ventilation:	38mm drained and ventilated cavity
Fixing Bracket Details:	Stofix - Galvanised steel brackets. Fixings are 5.5mm diameter hex head fixings with EPDM washers.

Further details of the test sample and façade system can be found in Appendix A – Sample Drawings.

Test Sample During Testing

Photograph No. 1

4. TEST ARRANGEMENT

4.1 TEST CHAMBER

A rainscreen specimen, supplied for testing in accordance with CWCT requirements, was mounted on to a rigid test chamber constructed from steel, timber and plywood sheeting.

The pressure within the chamber was controlled by means of a centrifugal fan and a system of ducting and valves. The static pressure difference between the outside and inside of the chamber was measured by means of a differential pressure transmitter.

4.2 INSTRUMENTATION

4.2.1 Static Pressure

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

4.2.2 Air Flow

A Laminar flow element, mounted in the air system ducting, was used along with differential pressure transducers to measure the airflow required to obtain pressures within the test chamber and has the capability of measuring airflow through the sample to an accuracy within 2%.

4.2.3 Water Flow

An in-line flowmeter, mounted in the spray frame water supply system, was used to measure water flow to the test sample to an accuracy of ± 5%.

4.2.4 Deflection

Digital linear measurement devices with an accuracy of +/- 0.1 mm were used to measure deflection of principle framing members.

4.2.5 Temperature & Humidity

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

4.2.6 Atmospheric Pressure

A digital barometer was used to take atmospheric pressure readings with an accuracy of ± 1Kpa.

4.2.7 General

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

4.3 PRESSURE GENERATION

Note: References are made to both positive and negative pressures in this document, it should be noted that in these instances, positive pressure is when pressure on the weather face of the sample is greater than that on the inside face and vice versa.

4.3.1 Static Air Pressure

The air supply system comprised of a centrifugal fan assembly and associated ducting and control valves which were used to create both positive and negative static pressure differentials. The fan provided a constant airflow at the required pressure and period required for the tests.

4.3.2 Dynamic Aero Engine

A wind generator was mounted adjacent to the external face of the test sample and used to create positive pressure differential during dynamic testing.

4.4 WATER SPRAY

4.4.1 Spray frame arrangement

A water spray system was used which comprised of nozzles spaced on a uniform grid, not more that 700 mm apart and mounted approximately 400 mm from the face of the sample. The nozzles provided a full cone pattern, as per the requirements outlined by CWCT. The system delivered water uniformly to the entire surface of the test sample at a rate of not less than 3.4 lt/m^2/min.

4.5 IMPACTORS

4.5.1 Soft (S1) Body Impactor

A spherical/conical, glass bead filled impactor with a mass of 50 Kg.

4.5.2 Hard (H1) Body Impactor

A steel ball with a diameter of 50 mm and a mass of 0.605 Kg, modified to allow it to swing from a nylon cord, rather than being dropped onto the sample as required in CWCT TN 76, was released from the height, calculated to result in the required impact energies and allowed to fall under gravity until it impacted the designated test zone of the sample.

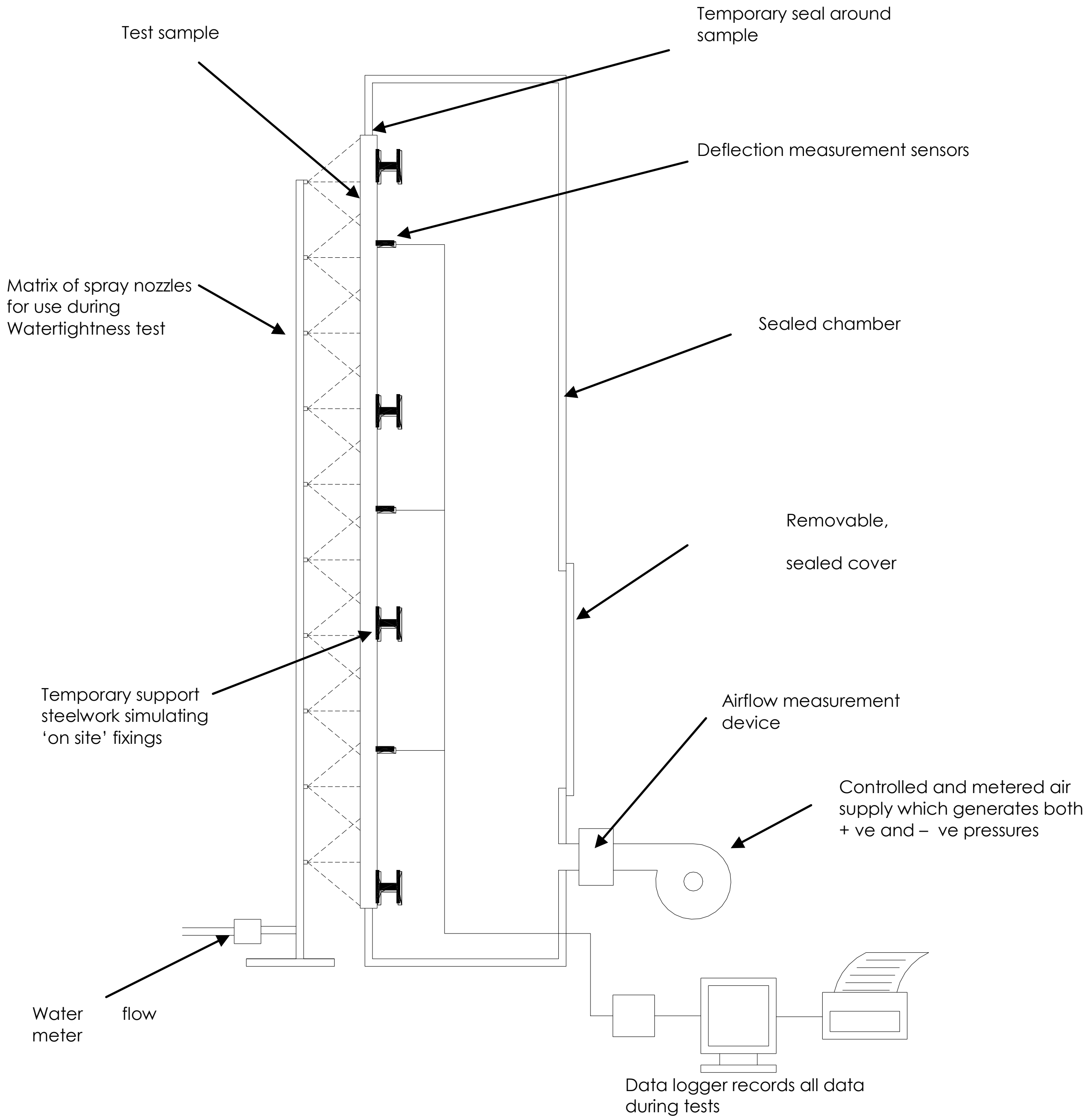
4.5.3 Hard (H2) Body Impactor

A steel ball with a diameter of 62.5 mm and a mass of 1.135 kg, modified to allow it to swing from a nylon cord, rather than being dropped onto the sample as required in CWCT TN 76, was released from the specified height and allowed to fall under gravity until it impacts the designated test zone of the sample.

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

Figure 1

General Arrangement of a Typical Test Assembly



5. TEST PROCEDURES

5.1 SEQUENCE OF TESTING

1. Air Leakage – Infiltration
2. Air Leakage – Exfiltration
3. Water Penetration – Static Pressure
4. Water Penetration – Dynamic Aero Engine
5. Wind Resistance – Serviceability
6. Repeat Air Leakage – Infiltration
7. Repeat Air Leakage – Exfiltration
8. Water Penetration – Static Pressure
9. Water Penetration – Dynamic Aero Engine
10. Wind Resistance – Safety
11. Impact Resistance – CWCT TN 76
12. Structural Movement – Seismic Test - AAMA 501.4:2000

5.2 AIR LEAKAGE

5.2.1 Infiltration

Three (3) preparatory pulses of **660 Pa (110% of peak test pressure)** positive pressure were applied to the test sample. An airtight seal comprising of plastic sheeting and adhesive tape was then attached to the face of the test sample.

Leakage through the test chamber and joints between the chamber and test sample was determined by measuring the air flow at the following positive pressures; **50, 100, 150, 200, 250, 300, 450 and 600 Pa** each step being held for at least 10 seconds.

Test results for the sample were determined by repeating the above sequence with the sample unsealed. The difference between the readings being the air leakage through the sample.

A check for concentrated air leakage was conducted following the above sequence.

5.2.2 Exfiltration

Three (3) preparatory pulses of **500 Pa** negative pressure were applied to the test sample. An airtight seal comprising of plastic sheeting and adhesive tape was then attached to the face of the test sample.

Leakage through the test chamber and joints between the chamber and test sample was determined by measuring the air flow at the following negative pressure; **50 & 100 Pa**, this step being held for at least 10 seconds.

Test results for the sample were determined by repeating the above sequence with the sample unsealed. The difference between the readings being the air leakage through the sample.

5.3 WATER PENETRATION

5.3.1 Water Penetration – Dynamic Aero Engine

Water was sprayed on to the sample as described in section 4.4.1.

The sample was subjected to airflow from the wind generator, as described in 4.3.2, which achieved average deflections equal to those produced at a static pressure differential of **600 Pa** and these conditions were met for the specified 15 minutes.

The interior face of the sample was continuously monitored for water ingress throughout the test.

5.4 WIND RESISTANCE

5.4.1 Wind Resistance – Serviceability

Three (3) preparatory pulses of **1200 Pa (50% of design wind load)** positive pressure were applied to the test sample. Upon returning to 0 Pa, any opening parts of the test specimen were opened and closed five (5) times, secured in the closed position and finally sealed with tape. All deflection sensors were then zeroed.

The sample was then subjected to positive pressure stages of **600, 1200, 1800 and 2400 Pa (25%, 50%, 75% and 100% of design wind load)** and held at each step for 15 seconds (± 5 secs).

The deformation status of the sample was recorded at each step at characteristic points as stated in the standard, following which the pressure was reduced to 0 Pa and any residual deformations recorded within 1 hour of the test.

The above test sequence was then repeated, including the preparation pulses, at a negative pressure differential. All sensors other than those used for recording the movement of framing members adjacent to their fixings to building structure were zeroed following preparation pulses.

Following each of the above tests, the sample was inspected for permanent deformation or damage.

5.4.2 Wind Resistance – Safety

Three preparatory positive air pressure pulses of **1200 Pa (50% of design wind load)** positive pressure were applied to the test sample, and the deflection sensors were zeroed.

The sample was subjected to a positive pressure pulse of **3600 Pa (2400 Pa x 150%)**. The pressure was applied as rapidly as possible but in not less than 1 second and was maintained for 15 seconds (± 5 secs).

Following this pressure pulse and upon returning to zero (0) pressure, residual deformations were recorded and any change in the condition of the specimen was noted.

After the above sequence, a visual inspection was conducted, any moving parts were operated and any damage or functional defects noted.

The above test sequence was then repeated, including the preparation pulses, with negative pressure. The deflection sensors were zeroed following the preparation pulses.

Following each of the above tests, the sample was inspected for any permanent deformation or damage.

5.5 IMPACT - SAFETY

5.5.1 Impact Test Procedure – Retention of performance

The test sample was tested using a drop height which corresponded with the required performance level.

The Impactors, as described in section 4.5, were suspended on a wire/Nylon cord and allowed to swing freely, without initial velocity, in a pendulum motion until they hit the sample normal to its face. Only one impact was performed at any single position during the hard body impacting and three times at each position during the soft body impacting.

Tests were conducted at the required impact energies as shown in section 6.4.1 to the selected impact points.

Drop heights were set to an accuracy of ± 10 mm.

5.5.2 Impact Test Procedure – Safety to persons

The test sample was tested using a drop height which corresponded with the required performance level.

The Impactors, as described in section 4.5, were suspended on a wire/Nylon cord and allowed to swing freely, without initial velocity, in a pendulum motion until they hit the sample normal to its face. Only one impact was performed at any single position.

Tests were conducted at the required impact energies as shown in section 6.3.2 to the selected impact points and the impactors were not allowed to strike the sample more than once.

Drop heights were set to an accuracy of ± 10 mm.

5.6 Seismic Test

A hydraulic powered winch, with associated power pack and wire rope were used to apply force to the test sample in order to achieve the movements required according to the calculated design displacements.

Testing consisted of three (3) cycles as detailed below.

First cycle – Horizontal displacement of 6 mm.

Second cycle – Horizontal displacement of 10 mm.

A cycle consisted of movement in one direction, the sample was then returned to the original position and then moved in the opposite direction before being returned back to the original position - this was counted as 1 cycle and was repeated three (3) times.

6. TEST RESULTS

6.1 AIR LEAKAGE

6.1.1 Calculated Permissible Air Infiltration of Test Sample

Permissible air infiltration rate as CWCT standard test methods for building envelopes – section 5:
Fixed glazing = 1.5 $m^3/hr/m^2$

The permissible air infiltration rate at intermediate test pressures was determined as specified by CWCT standard test methods for building envelopes – section 5.

Air permeability measured at maximum test pressure in the 2nd test should not increase by more than 0.3 $m^3/hr/m^2$ for fixed glazing above those recorded in the 1st test, as required in CWCT standard for systemised building envelopes: section 3 & BS EN 13116: 2001.

Measured area of test sample = **35.4 m^2**

6.1.2 Air Leakage – Classification

Classification according to CWCT & BS EN 12152: 2002

Test 1 – Infiltration – Fixed glazing	A4

Note: There is no classification requirement for exfiltration testing in CWCT standard for systemised building envelopes – section 5. However, Approved Document L2 requires a maximum air leakage rate of 10 $m^3/hr/m^2$ @ 50 Pa for a completed building envelope.

6.1.3 Fixed Glazing

Pressure Differential Pa	Maximum Air Permeability Rate –Infiltration m³/hr/m²				Maximum Air Permeability Rate – Exfiltration m³/hr/m²			
	Test No. 1		Test No. 5		Test No. 2		Test No. 6	
	Ambient ° C	6.0	Ambient ° C	0.0	Ambient ° C	6.0	Ambient ° C	0.0
50	0.01		0.01		0.01		0.01	
100	0.02		0.02		0.03		0.04	
150	0.03		0.04					
200	0.04		0.04					
250	0.04		0.05					
300	0.04		0.07					
450	0.05		0.09					
600	0.09		0.10					

Observations
No areas of concentrated leakage were found during testing.

Note: The standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95%, for the above measurements is ± 5.33 % of the reading

Figure 2

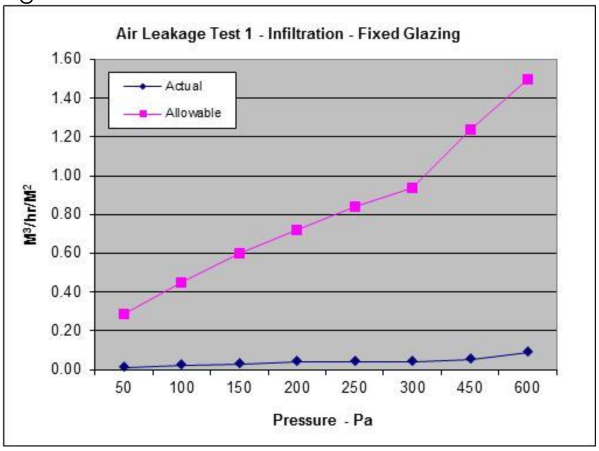


Figure 3

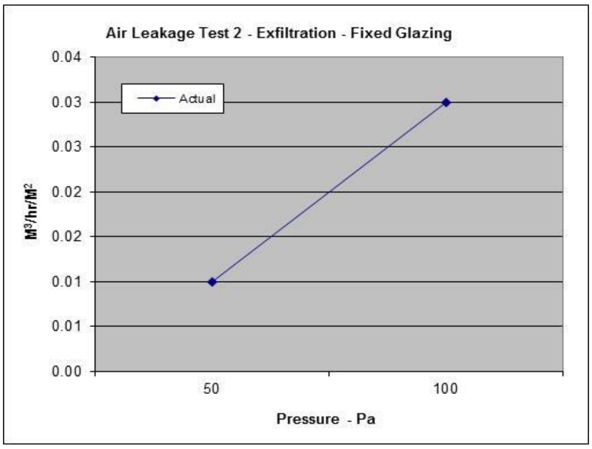


Figure 4

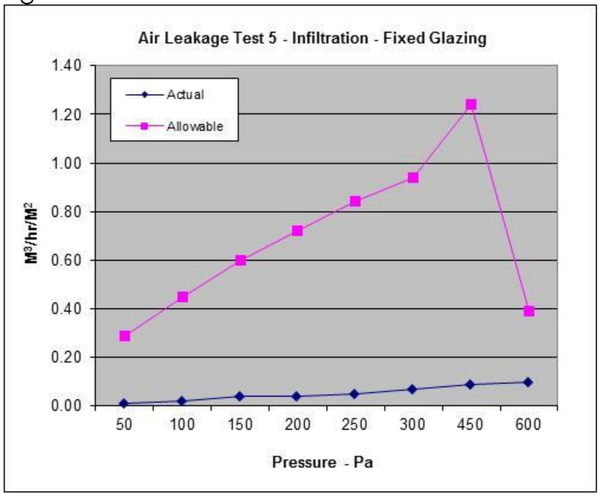
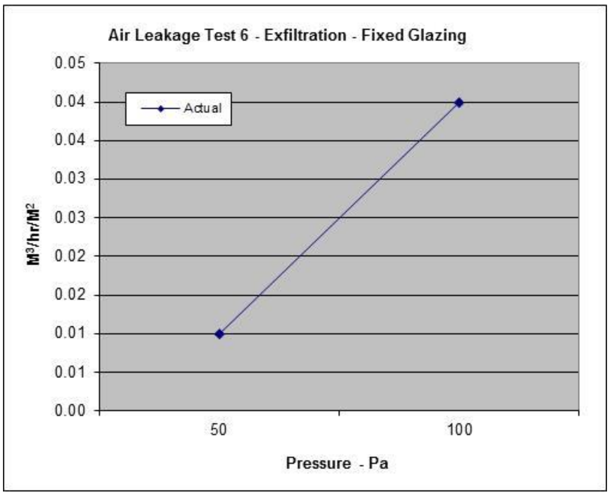


Figure 5



6.2 WATER PENETRATION

6.2.1 Water Penetration – Classification

Classification according to CWCT & BS EN 12154: 2000

Test 3 – Water Penetration – Static	R7

6.2.2 Test 3 – Water Penetration – Static

Temperatures (°C)

Water	8.0
Ambient	9.0

AIR PRESSURE Pa	COMMENTS
0 x 15 minutes	No Leakage
50 x 5 minutes	No Leakage
100 x 5 minutes	No Leakage
150 x 5 minutes	No Leakage
200 x 5 minutes	No Leakage
300 x 5 minutes	No Leakage
450 x 5 minutes	No Leakage
600 x 5 minutes	No Leakage

<u>Observations</u>
There was no water leakage observed during the water spray.

6.2.3 Test 8 – Repeat Water Penetration – Static

Temperatures (°C)

Water	8.5
Ambient	0.0

AIR PRESSURE Pa	COMMENTS
0 X 15 minutes	No Leakage
50 x 5 minutes	No Leakage
100 x 5 minutes	No Leakage
150 x 5 minutes	No Leakage
200 x 5 minutes	No Leakage
300 x 5 minutes	No Leakage
450 x 5 minutes	No Leakage
600 x 5 minutes	No Leakage

<u>Observations</u>
There was no water leakage observed during the water spray.

Note: The static water test was conducted on the interface from the vent to the backing structure only.

6.2.4 Test 4 – Water Penetration – Dynamic Aero Engine

Temperatures (°C)

Water	8.0
Ambient	9.0

<u>Observations</u>
The sample was subjected to testing as described in section 5.3.2, for a period of not less than 15 minutes, during which no water leakage was observed through the sample.

6.2.5 Test 9 – Water Penetration – Dynamic Aero Engine

Temperatures (°C)		
	Water	8.5
	Ambient	0.0

Observations

The sample was subjected to testing as described in section 5.3.2, for a period of not less than 15 minutes, during which no water leakage was observed through the sample.

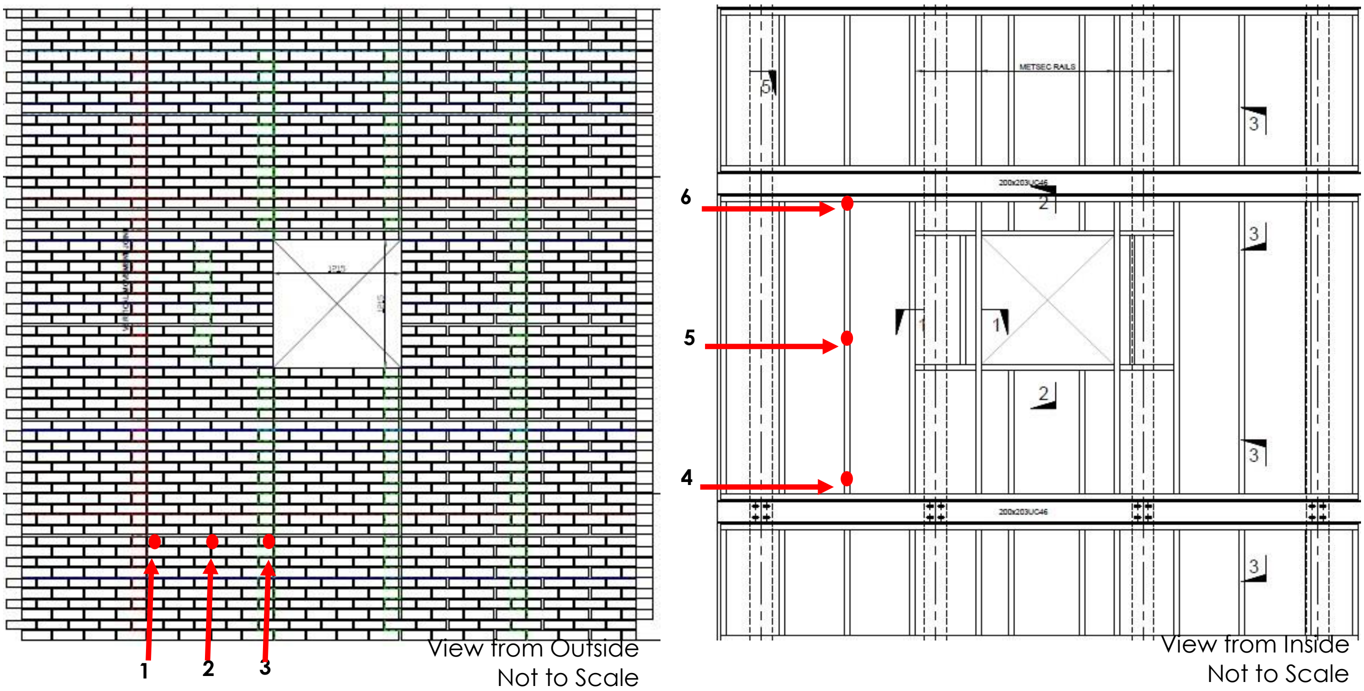
6.3 WIND RESISTANCE TESTING

	Calculation of deflection
Group A comprised of probes 1, 2 & 3	= Probe 2 – ((Probe 1 + Probe 3)/2)
Group B comprised of probes 4, 5, & 6	= Probe 5 – ((Probe 4 + Probe 6)/2)

An inspection carried out following tests 5 and 10, after both positive and negative pressure testing, showed no evidence of any permanent deformation or damage to the test sample.

Positions of Deflection Measurement Probes

Figure 7



● - Deflection probe position

6.3.1 Test 5 - Wind Resistance, Serviceability

Temperatures (°C)		
	Ambient	0.0

Measured Length of Framing Member (mm)		Allowable Deflection	
		Ratio	Calculated (mm)
Group A	1152	L/90	12.8
Group B	2680	L/300	13.9

Frontal deflection shall recover by either 95%, or 1mm, whichever the greater.

6.3.1.1 Wind Resistance, Serviceability - Positive Pressure

Positive Pressure Pa	Results	
	Group A	Group B
0	0.0	0.0
600	0.1	0.3
1200	0.2	0.6
1800	0.2	1.5
2400	0.3	2.4
Residuals Immediately following test	0.1	0.8

6.3.1.2 Wind Resistance, Serviceability - Negative Pressure

Negative Pressure Pa	Results	
	Group A	Group B
0	0.0	0.0
600	0.2	0.9
1200	0.3	1.7
1800	0.4	2.7
2400	0.6	3.7
Residuals Immediately following test	0.0	0.5

6.3.2 Test 10 - Wind Resistance, Safety

Temperatures (°C)	Ambient	21

Measured Length of Framing Member (mm)		Allowable Residual Deformation	
		Ratio	Calculated (mm)
Group A	1152	L/500	2.3
Group B	2680	L/500	5.4

6.3.2.1 Wind Resistance, Safety - Positive Pressure

Positive Pressure Pa	Results	
	Group A	Group B
0	0.0	0.1
3600	0.1	5.0
Residuals Immediately following test	0.0	0.5

6.3.2.2 Wind Resistance, Safety - Negative Pressure

Positive Pressure Pa	Results	
	Group A	Group B
0	0.0	0.1
3600	2.1	6.5
Residuals Immediately following test	0.0	0.7

Note: The standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95%, for the above measurements is ± 2.4 % of the reading

6.4 IMPACT TESTING

6.4.1 Test 11a – Impact – Retention of performance (Hard Body)

Temperatures (°C)	Ambient	2.0
Humidity (%RH)	83	

Impact Reference	Impactor Type	Impact Energy Nm	Test Category	Drop Height (mm)	Observations	Result
E1	Soft Body (S1)	120	B	245	No Damage	Pass
E2	Soft Body (S1)	120	B	245	No Damage	Pass
E3	Soft Body (S1)	120	B	245	No Damage	Pass
E4	Soft Body (S1)	120	B	245	No Damage	Pass
E5	Soft Body (S1)	120	B	245	No Damage	Pass

NOTE: During the impacting the system tested achieved a Class 3 on serviceability.

6.4.2 Test 11b – Impact – Safety (Soft Body)

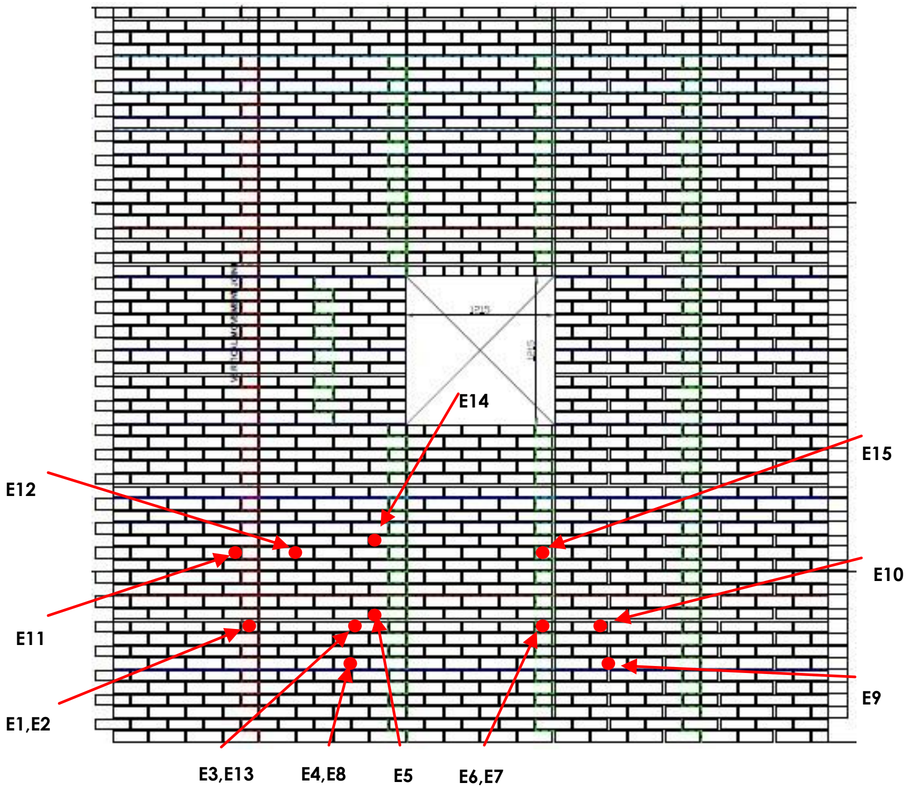
Temperatures (°C)	Ambient	2.0
Humidity (%RH)	83	

Impact Reference	Impactor Type	Impact Energy Nm	Test Category	Drop Height (mm)	Observations	Result
E6	Soft Body (S1)	500	B	1020	Various cracks – safely retained	Pass
E7	Soft Body (S1)	500	B	1020	Various cracks – safely retained	Pass
E8	Soft Body (S1)	500	B	1020	Various cracks – safely retained	Pass
E9	Soft Body (S1)	500	B	1020	No Damage	Pass
E10	Soft Body (S1)	500	B	1020	No Damage	Pass
E11	Hard Body (H2)	10	B	898	Piece broke – safely retained	Pass
E12	Hard Body (H2)	10	B	898	No Damage	Pass
E13	Hard Body (H2)	10	B	898	No Damage	Pass
E14	Hard Body (H2)	10	B	898	No Damage	Pass
E15	Hard Body (H2)	10	B	898	No Damage	Pass

NOTE: During the Safety impacting the system tested achieved a negligible risk Class.

6.4.3 Impact Positions

Figure 8



View from Outside

Not to Scale

APPENDIX A

System Drawings

Drawing Number Drawing Title

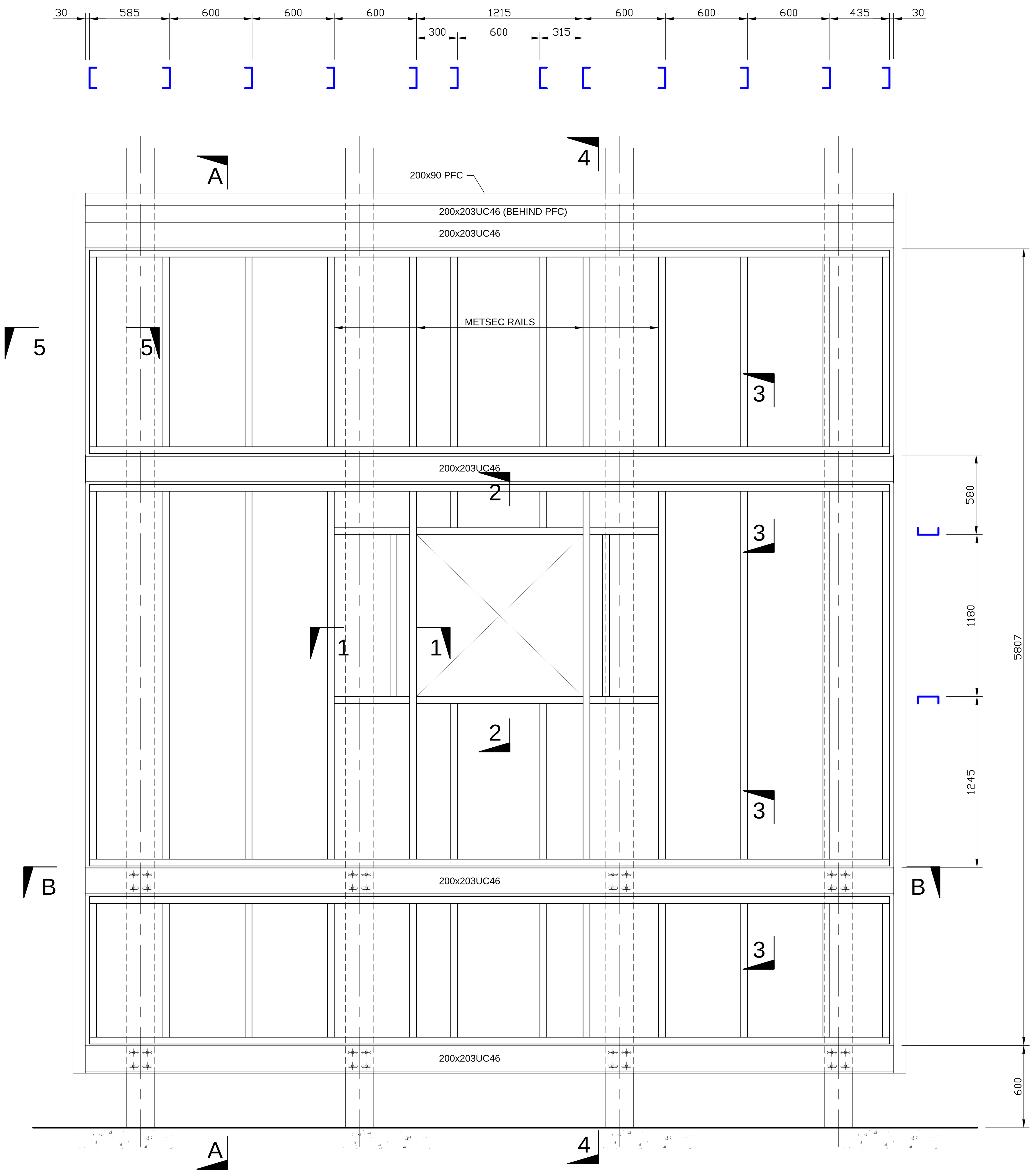
(4 drawings on 4 un-numbered pages)

01 Rev A
02 Rev B
03 Rev B
04 Rev B

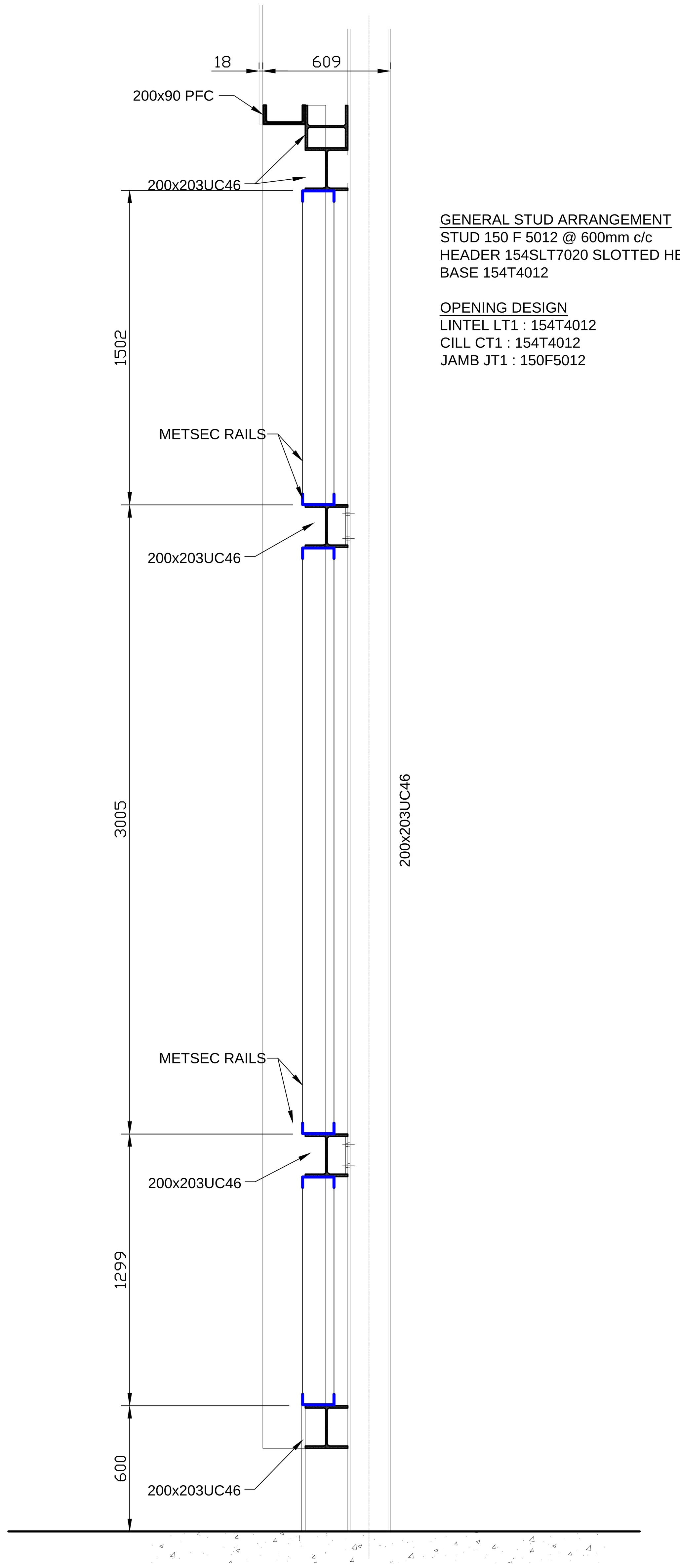
DO NOT SCALE THIS DRAWING, PRINT, PLOT OR DISK.

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS ENGINEERS SERVICES AND SPECIALIST DRAWINGS AND THE SPECIFICATION.
2. ANY DISCREPANCIES IN DIMENSIONS OR DETAILS ON OR BETWEEN THESE DRAWINGS SHOULD BE DRAWN TO THE ATTENTION OF THE ARCHITECT AND OR THE ENGINEER IN WRITING FOR CLARIFICATION.



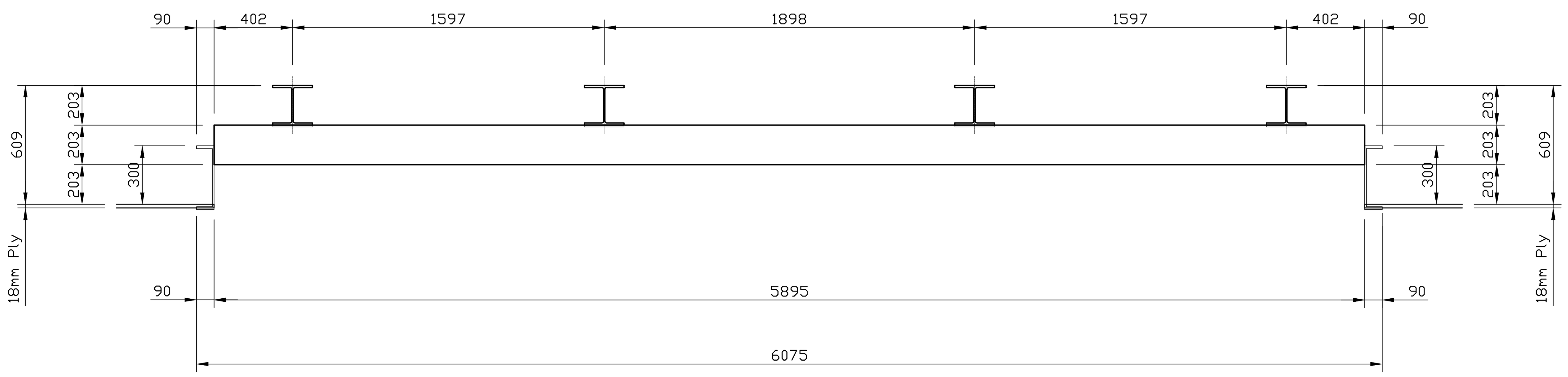
LIGHT GAUGE STEEL STRUCTURAL FRAMING LAYOUT



SECTION A-A

GENERAL STUD ARRANGEMENT
STUD 150 F 5012 @ 600mm c/c
HEADER 154SLT7020 SLOTTED HEAD TRACK
BASE 154T4012

OPENING DESIGN
LINTEL LT1 : 154T4012
CILL CT1 : 154T4012
JAMB JT1 : 150F5012



SECTION B-B

WINTECH
BUILDING ENVELOPE TESTING
Drawing as supplied to WEL

Revision	Suff	App	Date
DRAWING UPDATED	A	CE	10.12.14

STONEL
Brick Rain Screen Solutions
Remodeling or New Construction

STOFIX

Client: Stonel Oy

Project: Stofix Brick slip Product test Wintech test Facility

Drawing Title: LAYOUTS AND DETAILS Sheet 1

Drawn by	CE	Date	NOV 14
Scale	1:20	Checked	CE
Drawing Number	01	Rev	A

A1

DO NOT SCALE THIS DRAWING, PRINT, PLOT OR DISK.

NOTES

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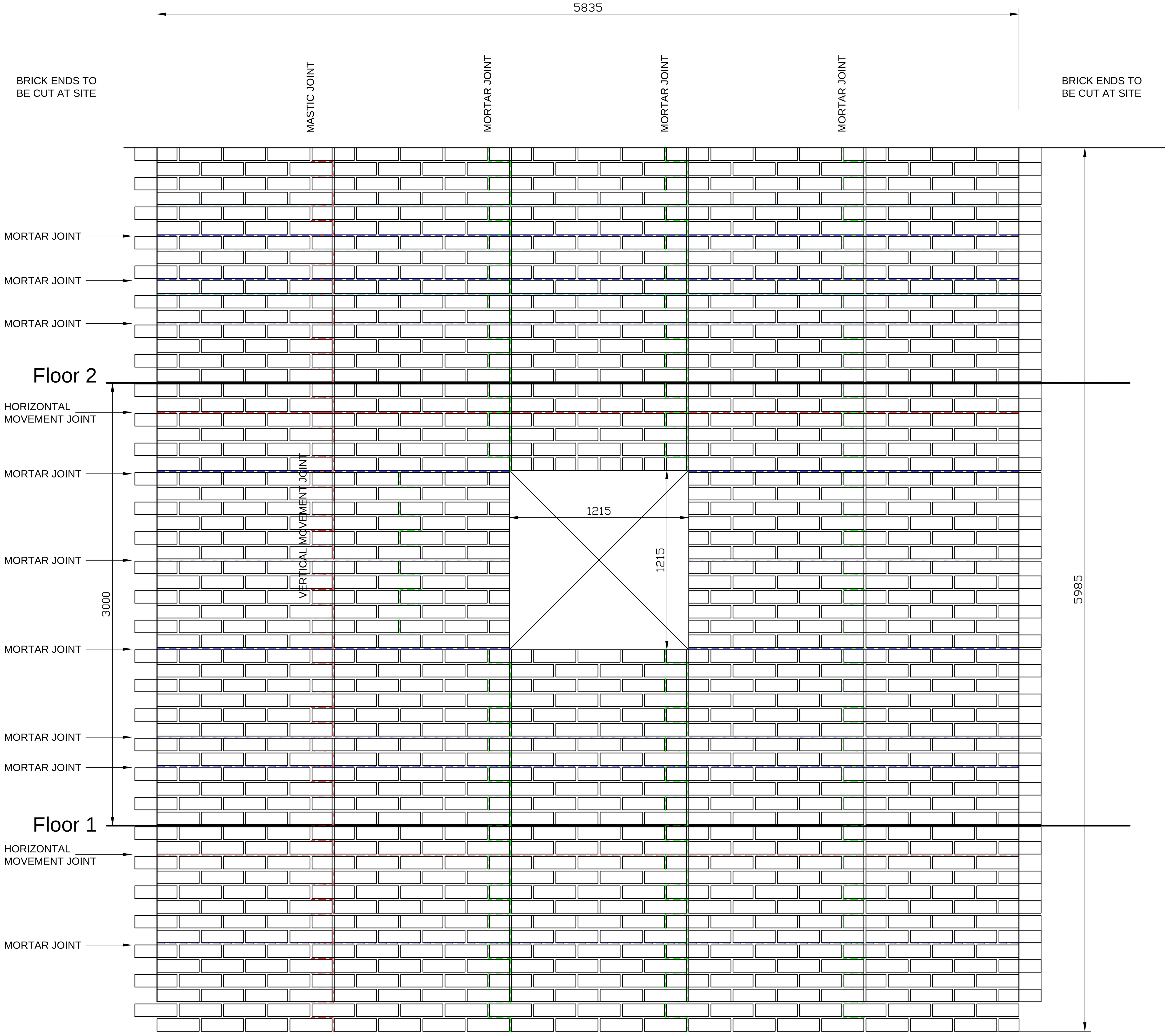
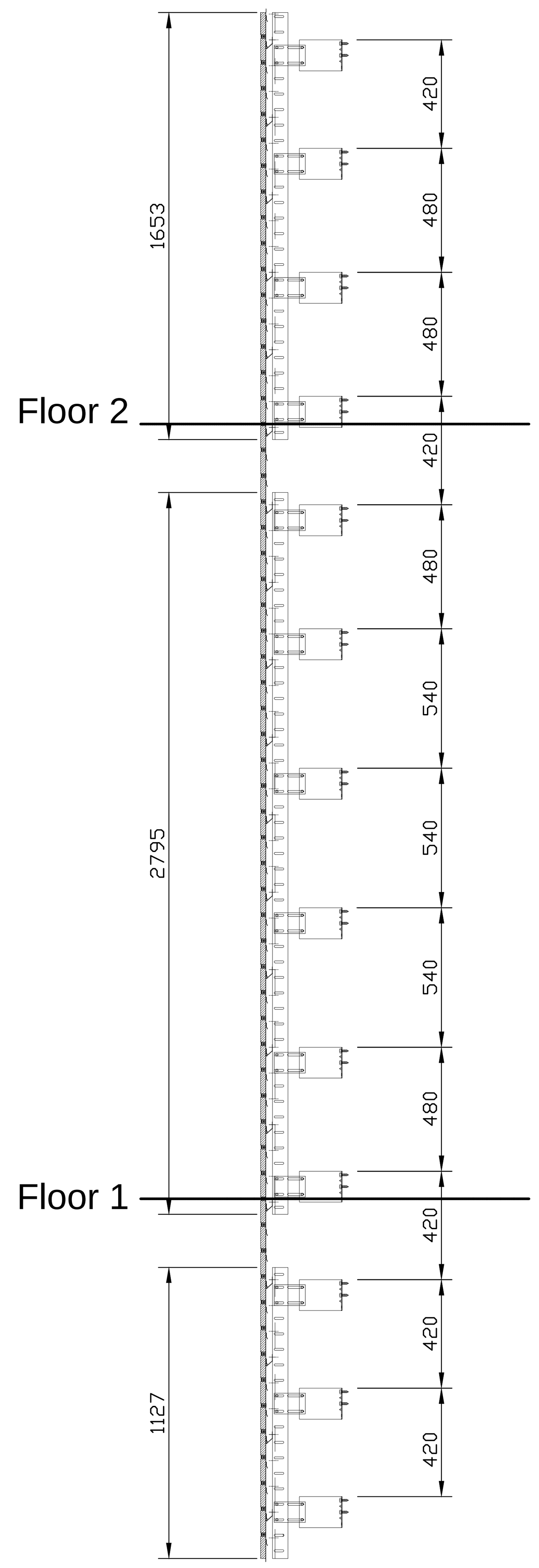
2. ANY DISCREPANCIES IN DIMENSIONS OR DETAILS ON OR BETWEEN THESE DRAWINGS SHOULD BE DRAWN TO THE ATTENTION OF THE ARCHITECT AND OR THE ENGINEER IN WRITING FOR CLARIFICATION.



BRICK SLIP LAYOUT



SECTION A-A

Revision	Suff	App	Date
DRAWING UPDATED	B	CE	24.12.14
DRAWING UPDATED	A	CE	10.12.14

STONEL Brick Rain Screen Solutions Remodeling or New Construction

STOFIX

Client
Stonel Oy

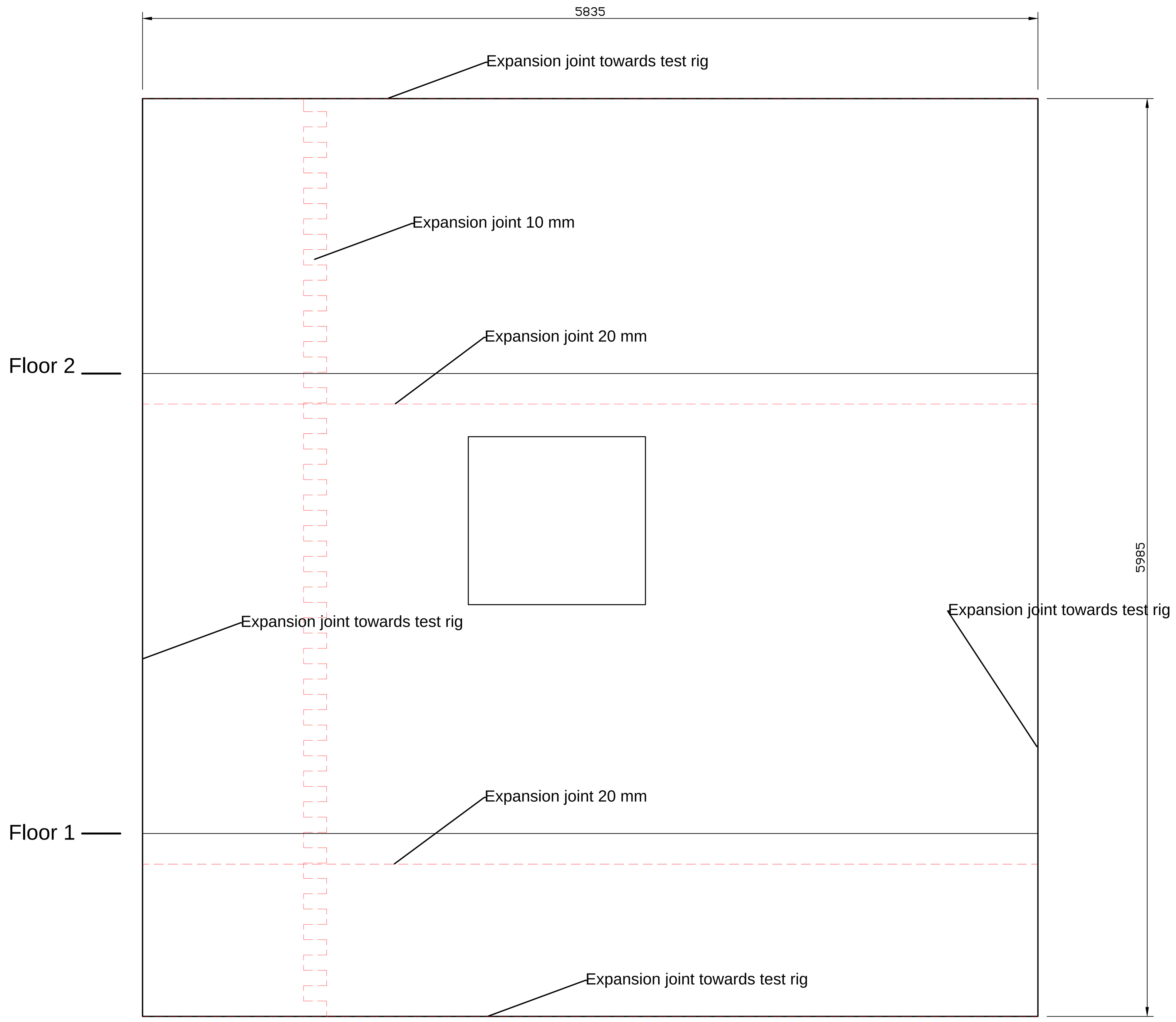
Project
Stofix Brick slip
Product test
Wintech test Facility

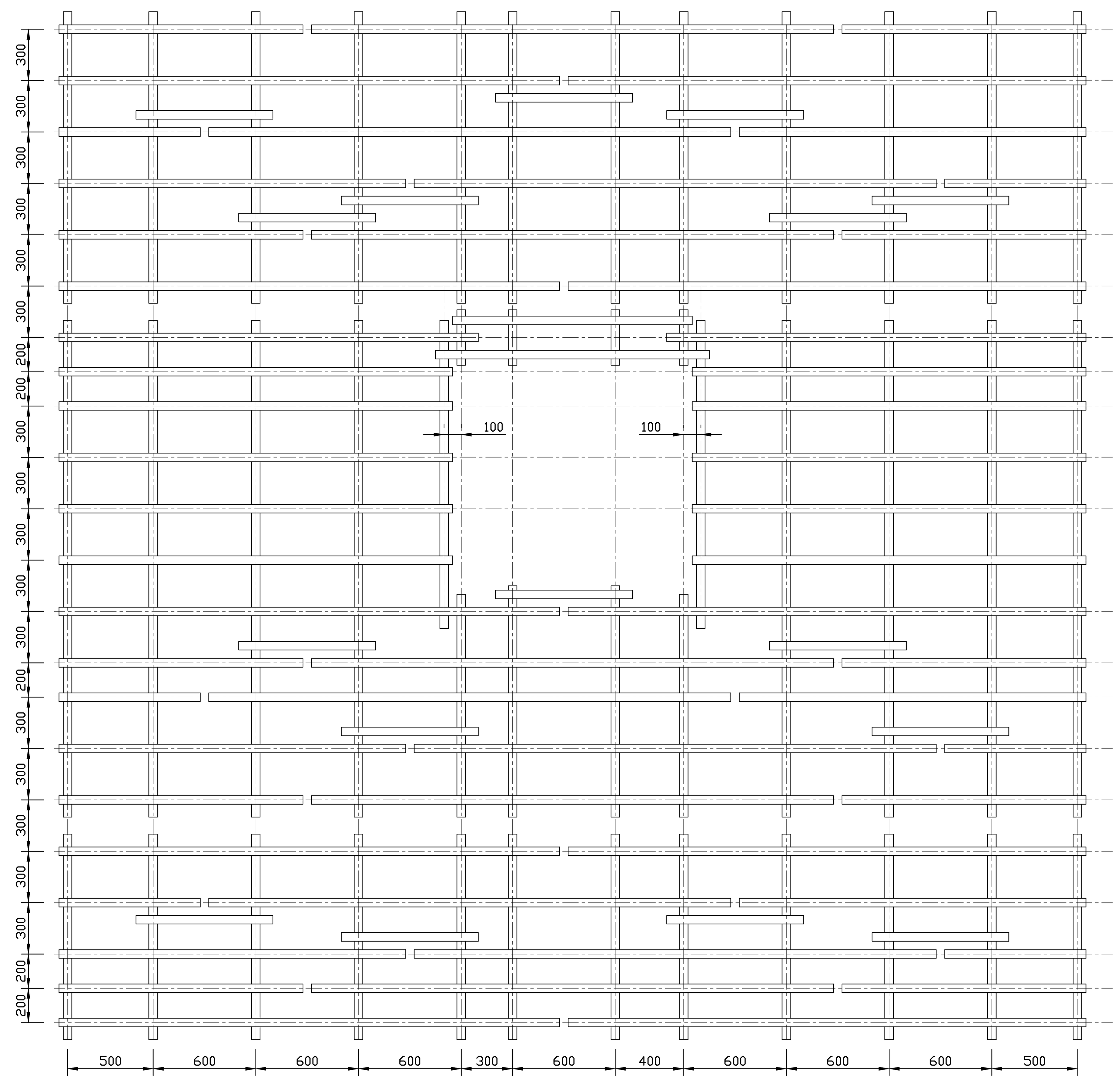
Drawing Title
LAYOUTS AND DETAILS
Sheet 2

Drawn by	CE	Date	NOV 14
Scale	1:20	Checked	CE
Drawing Number	02	Rev	B

WINTECH BUILDING ENVELOPE TESTING
Drawing as supplied to WEL

A1





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Revision	Suff	App	Date
DRAWING UPDATED	B	CE	24.12.14
DRAWING UPDATED	A	CE	10.12.14

STONEL
Brick Rain Screen Solutions
Remodeling or New Construction

STOFIX

Client
Stonel Oy

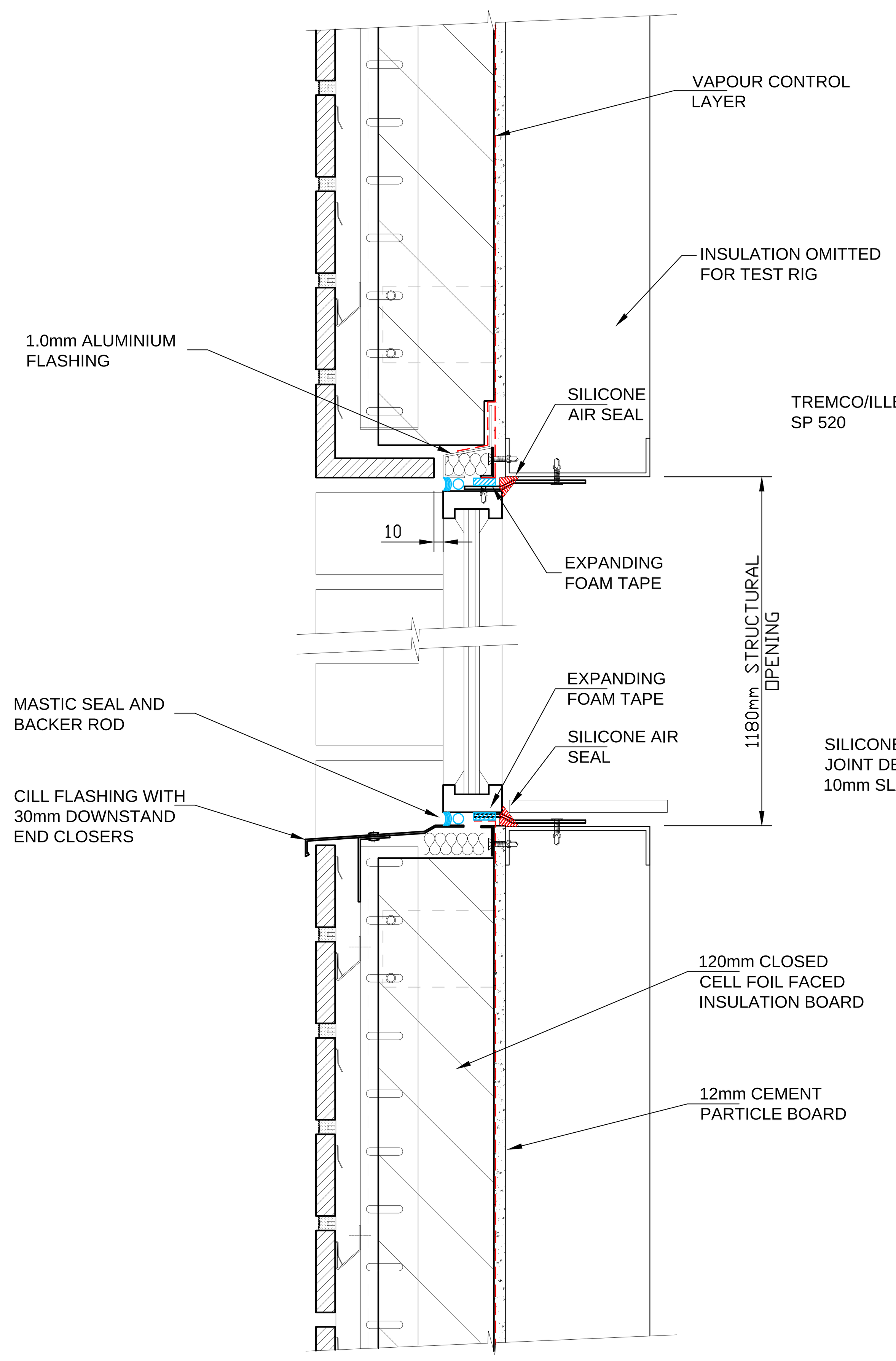
Project
Stofix Brick slip
Product test
Wintech test Facility

Drawing Title
LAYOUTS AND DETAILS
Sheet 3

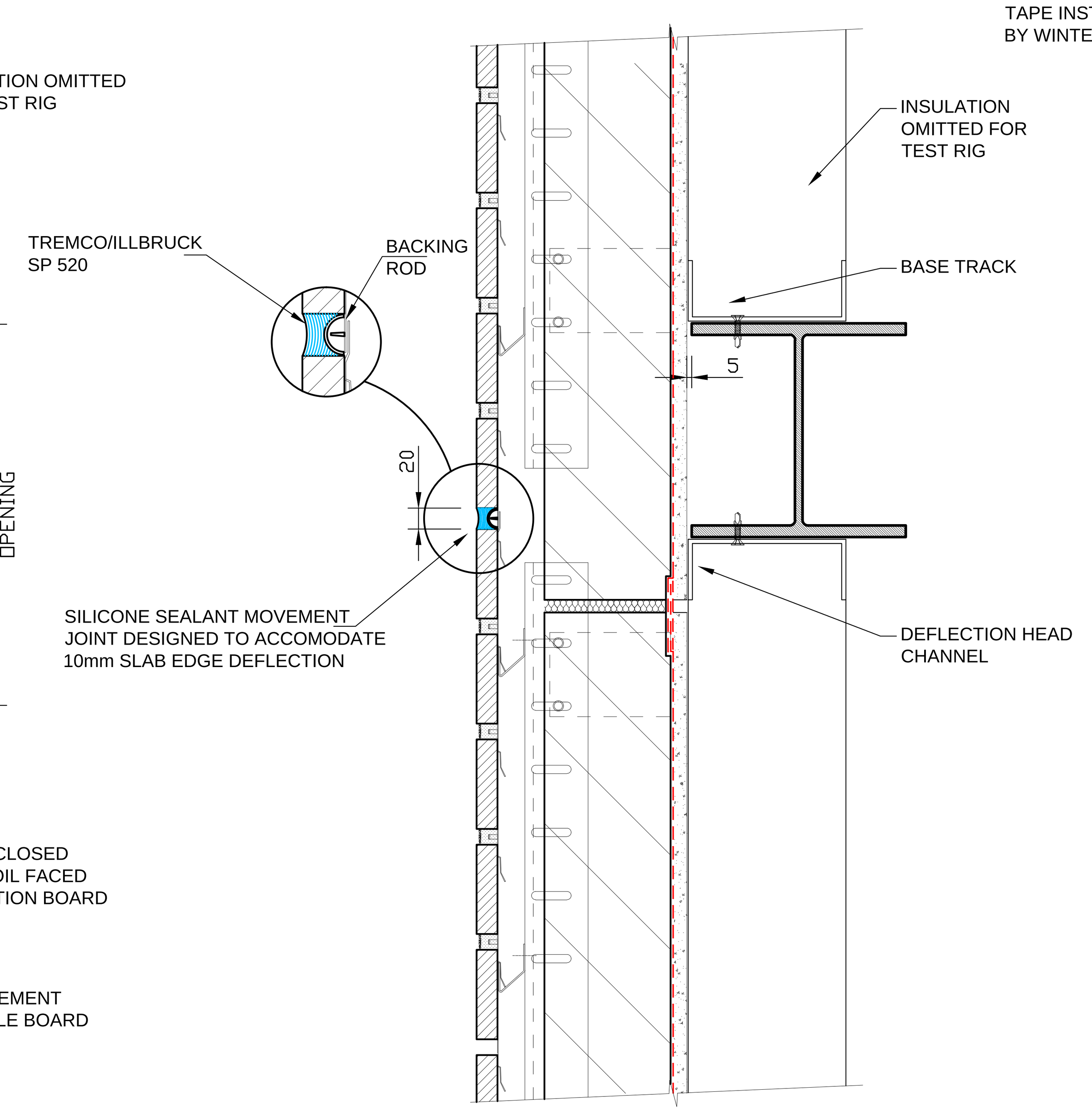
Drawn by	CE	Date	NOV 14
Scale	1:25	Checked	CE
Drawing Number	03	Rev	B

WINTECH
BUILDING ENVELOPE TESTING
Drawing as supplied to WEL

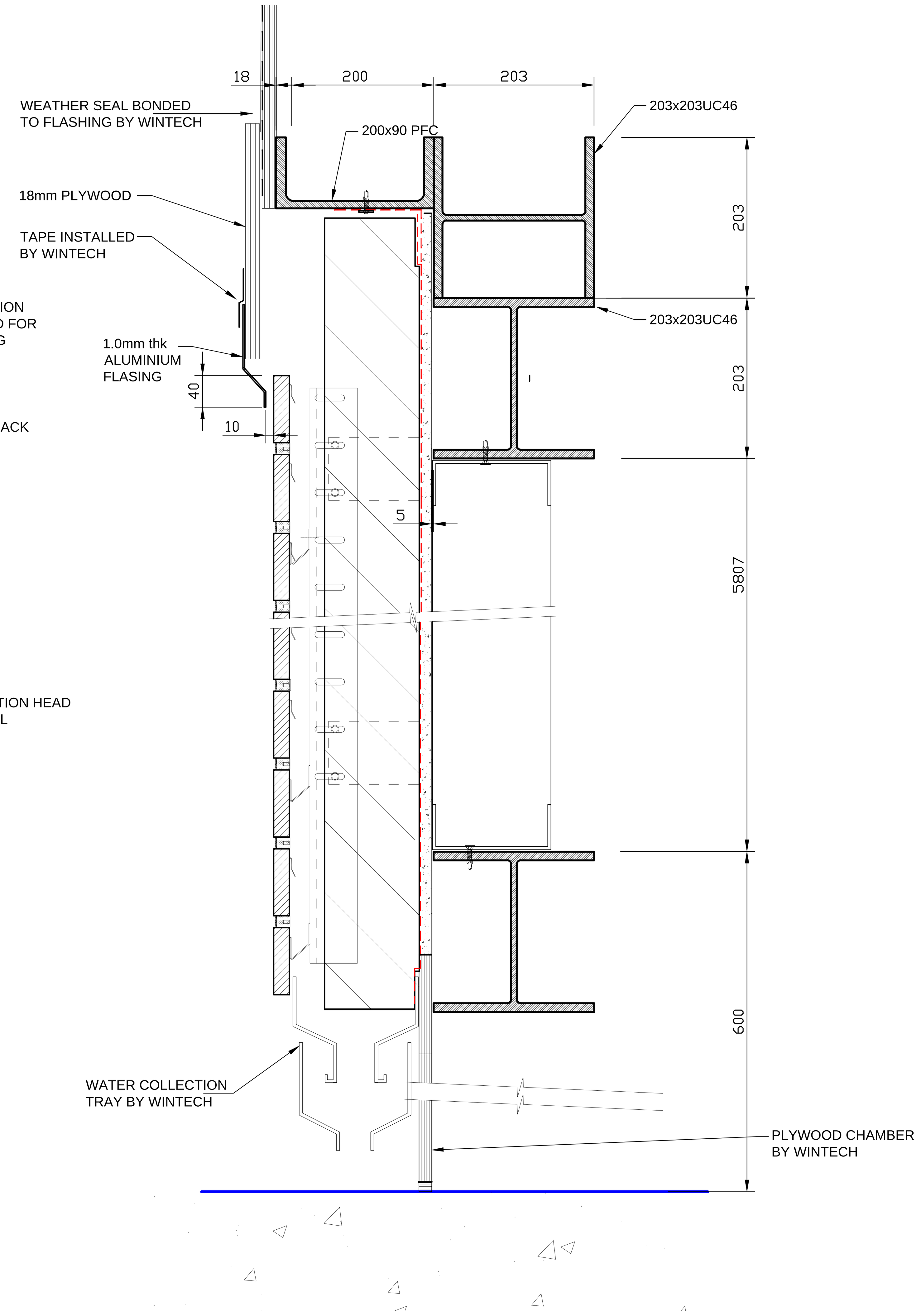
A1



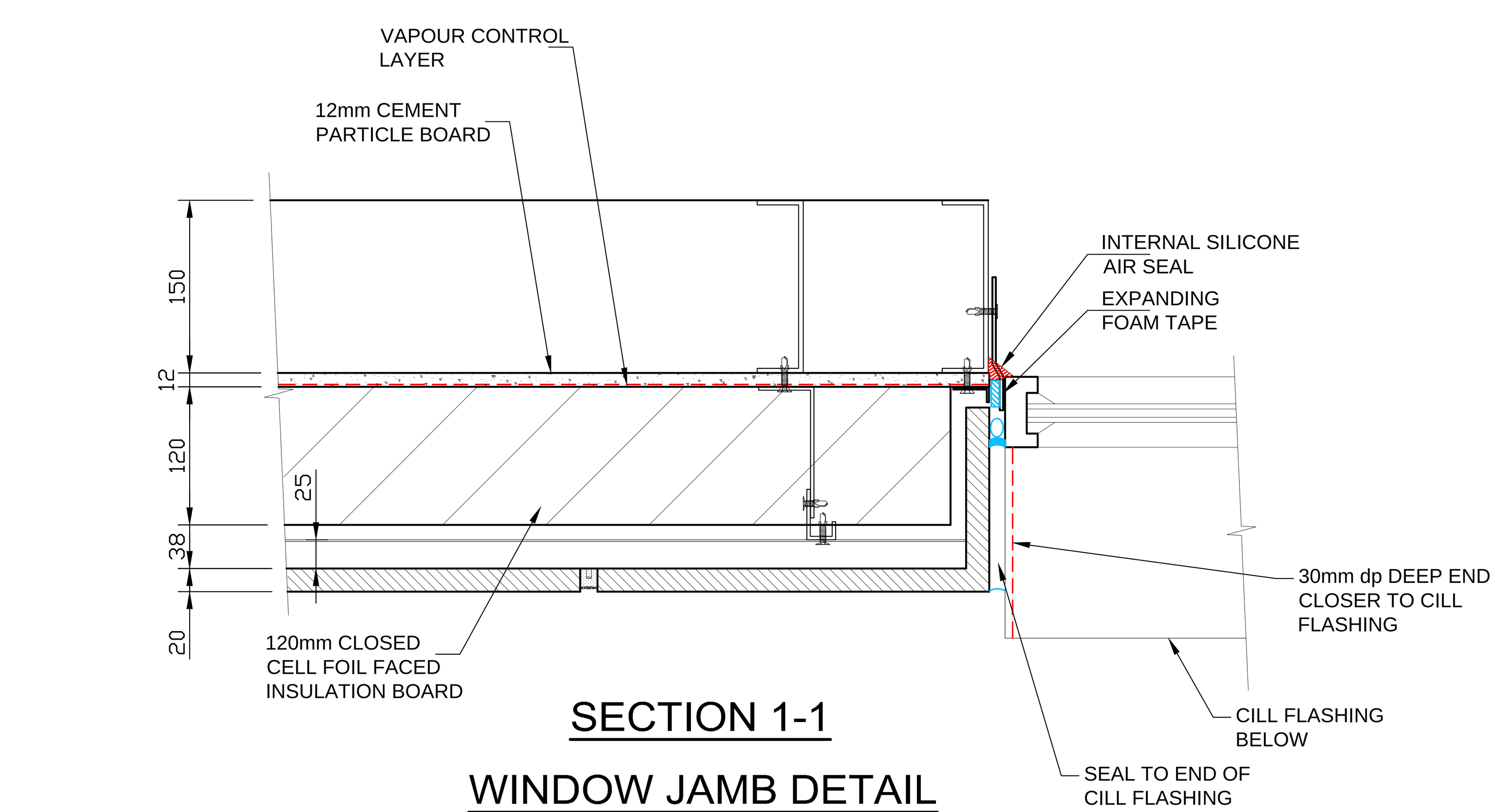
SECTION 2-2



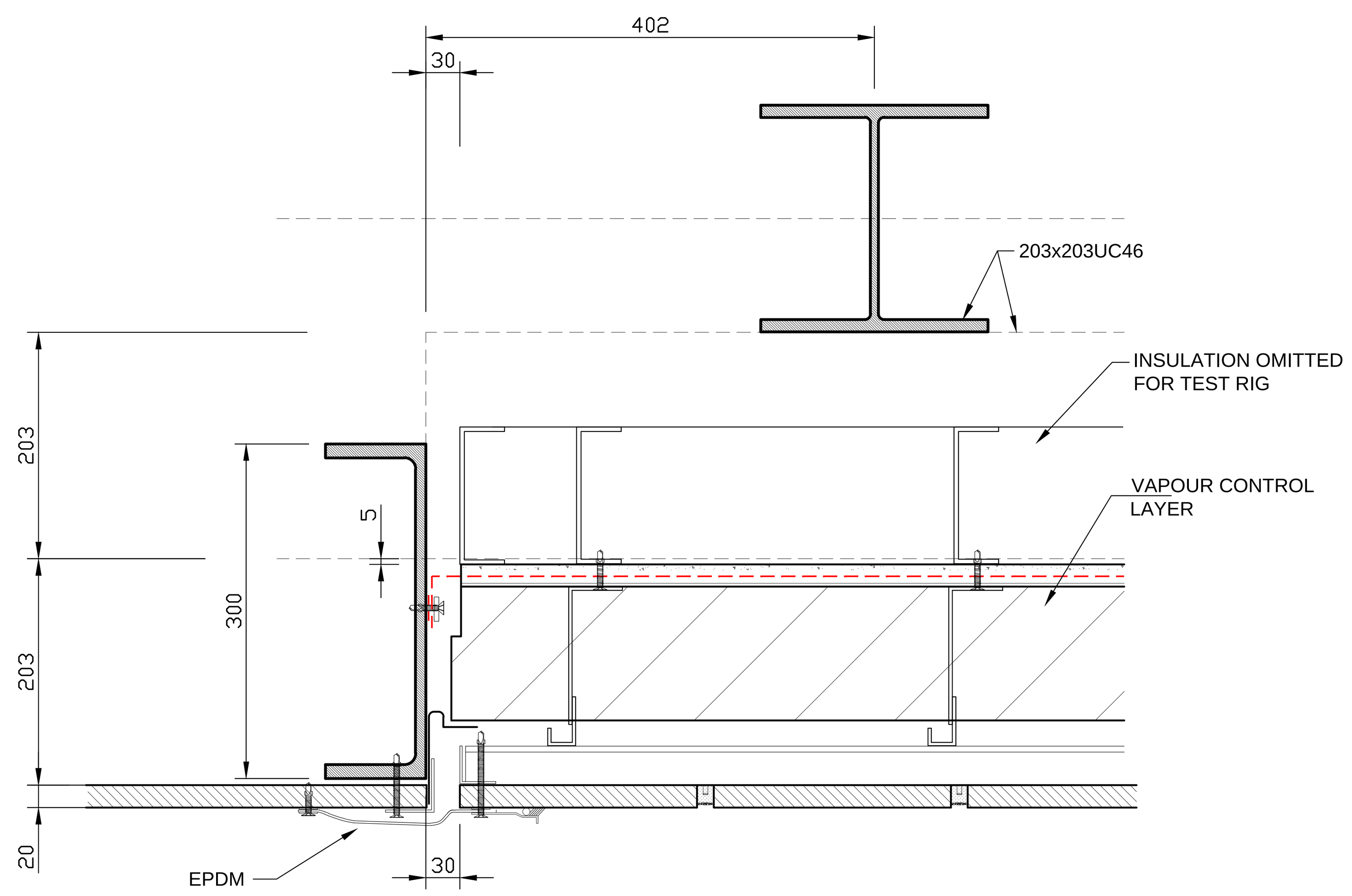
SECTION 3-3
FLOOR SLAB AND MOVEMENT JOINT DETAIL FLOOR LEVELS 1 AND 2



SECTION 4-4
TEST SCREEN HEAD AND BASE DETAIL



SECTION 1-1
WINDOW JAMB DETAIL



SECTION 5-5
TEST RIG JAMB DETAIL

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NOTES

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Revision	Suff	App	Date
DRAWING UPDATED	B	CE	24.12.14
DRAWING UPDATED	A	CE	10.12.14

STONEL Brick Rain Screen Solutions Remodeling or New Construction

STOFIX

Client: Stonel Oy

Project: Stofix Brick slip Product test Wintech test Facility

Drawing Title: LAYOUTS AND DETAILS Sheet 4

Drawn by: CE	Date: NOV 14
Scale: 1:5	Checked: CE
Drawing Number: 04	Rev: B

WINTECH Drawing as supplied to WEL BUILDING ENVELOPE TESTING

A1

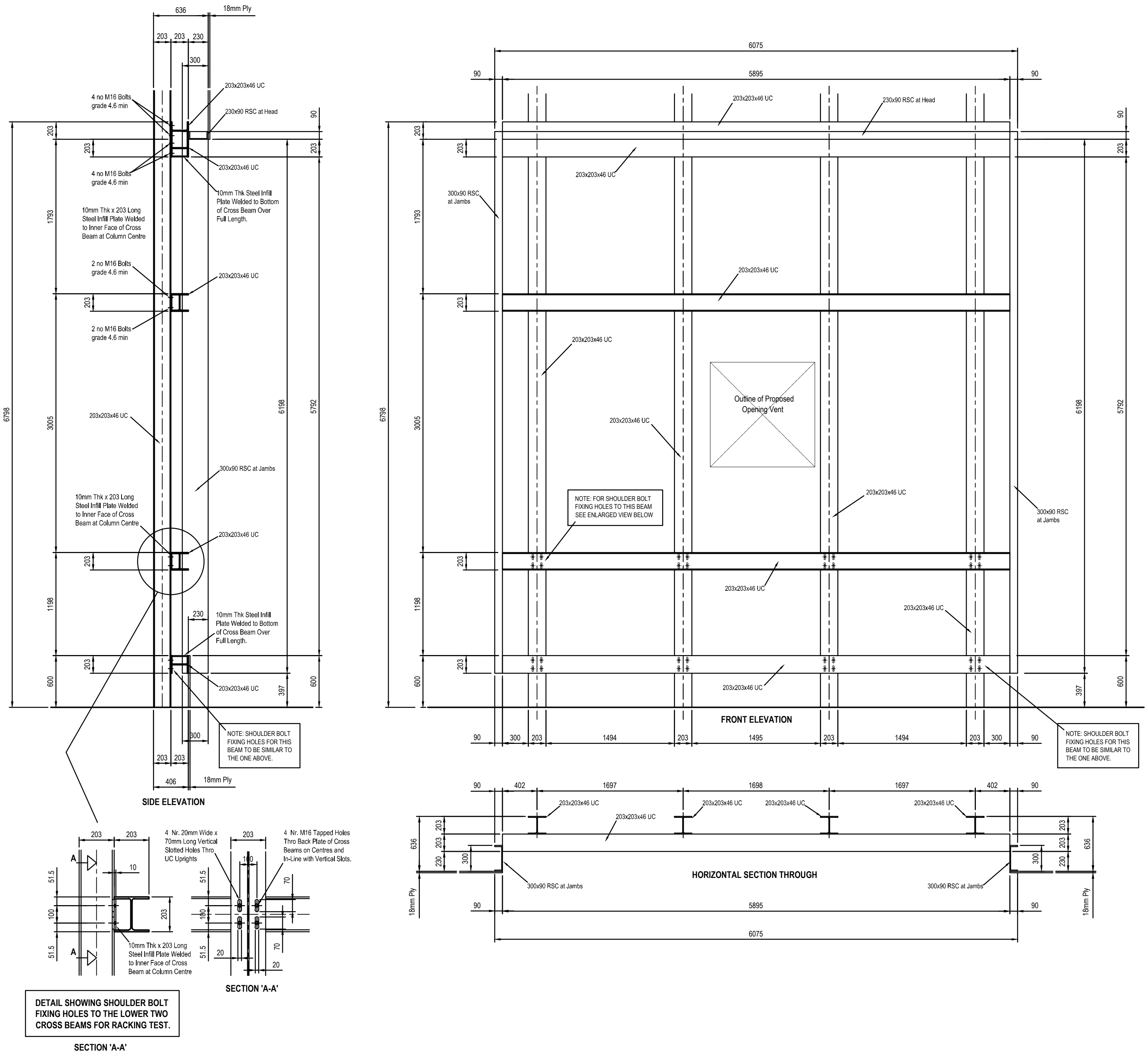
APPENDIX B

Support Steelwork Drawings

Drawing Number Drawing Title

(1 drawing on an un-numbered page)

WEL/14/246



NOTES

1. NO DIMENSIONS ARE TO BE SCALED FROM THIS DRAWING – IF IN DOUBT ASK
2. THIS DRAWING MUST NOT BE ALTERED BY HAND
3. DISCREPANCIES IN SITE DIMENSIONS TO BE REPORTED TO WINTECH.
4. ALL DIMENSIONS IN MILLIMETRES
5. ALL LEVELS IN METRES

Rev	Date	Description	By

WINTECH

WINDOW AND CLADDING
TESTING AND LABORATORY SERVICES

WINTECH ENGINEERING LTD, HALESFIELD 2, TELFORD, SHROPSHIRE, TF7 4QH.
TEL: 01952 586580 FAX: 01952 586585
E-MAIL ADDRESS: testing@wintech-group.co.uk

Project : STOFIX - BRICK CLADDING TEST FACADE

Main Contractor : N/A

Architect : N/A

Drawing Title : STEEL SUPPORT FRAME ASSEMBLY

Scale :	1:45	Contract No :	14425
Date :	21.10.14	Drawing No :	WEL/14/246
Drawn By :	HGD	Latest Revision No :	-
Checked By :	-		

APPENDIX C

Dismantling

C1. DISMANTLING

The dismantling was conducted on 4th December 2014 by representatives of Stonel Oy and was witnessed by D Price of Wintech Engineering Ltd.

There was no water evident in the system in parts designed not to be wetted, and it was found that the system fully complied with the system drawings in Appendix A provided by Stonel Oy at the time of the dismantle.

~~~~~~~~~~~~~~~~~~~~ END OF REPORT ~~~~~~~~~~~~~~~~~~~~