

Technical Report – R4790916075 CWCT – Standard for systemised building envelopes – 2005

Fairview Europe Ltd t/a Valcan

VitraDual Planking System





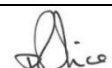
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1. Introduction

This report describes tests carried in order to determine the weather tightness of the sample with respect to wind and impact resistance on sample supplied as follow:

Test Details	
Customer:	Fairview Europe Ltd t/a Valcan Dunball House Unit N Woodlands Court Business Park Bristol Road Bridgwater Somerset TA6 4FJ
Product Tested	VitraDual Planking System
Date of Test:	24 th October 2024 7 th , 21 st and 25 th November 2024 12 th & 13 th February 2025
Test Conducted at:	UL International (UK) Limited Halesfield 2 Telford Shropshire TF7 4QH
Test Conducted by:	C Niven Laboratory Assistant P Seymour Laboratory Technician J Dove Laboratory Technician
Test Supervised by:	M Witkowska Laboratory Manager 
Test Witnessed by:	M Hopkins Fairview Europe Ltd t/a Valcan G Besley Fairview Europe Ltd t/a Valcan

Report Authorisation	
Report Compiled by:	R Cooper Project Handler 
Authorised by:	D Price Senior Engineering Associate 

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2. Summary of Results

2.1 The test methods

The performance of the sample tested has been assessed against the criteria described in below standards.

CWCT Standard Test Methods for Building Envelopes - December 2005	
Dynamic Aero Engine	CWCT Section 7
Wind Resistance – Serviceability	CWCT Section 11
Wind Resistance – Safety	CWCT Section 12
Impact – Retention to Performance & Safety to Persons	CWCT TN 76

2.2 Decision Rule

Classifications reported in Section 5 indicate that the product conforms with the relevant accuracy requirements of the testing standards (as summarised below) and the expanded measurement uncertainty ($k=2$ for approximately 95% coverage probability) is no greater in magnitude than the accuracy requirements defined in Section 2 of CWCT Standard Test methods for Building Envelopes. If the measured value is on the limit, the result is defined as a pass. This means that the risk of a false positive is 50%. For further information regarding risk assessment refer to ILAC G8: 2019.

2.3 Measurement Uncertainty

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a level of confidence of approximately 95%, and for wind resistance measurements is $\pm 3.16\%$, for the mass of the dislodge fragments is $\pm 0.02\%$ and for the size of the dislodge fragments is $\pm 0.06\%$.

2.4 Summary of Results

The following summarises the results of testing carried out, in accordance with the relevant testing and classification standards.

Test Type	Peak Test Pressure	Result	Classification
Test 1 - Wind Resistance – Serviceability – Backing Wall	2400 Pa	N/A	-
Test 2 - Dynamic Aero Engine – Excluding Water	600 Pa	Pass	-
Test 3 - Wind Resistance – Serviceability – Cavity	2400 Pa	Pass	-
Test 4 - Wind Resistance – Safety – Backing Wall	3600 Pa	N/A	-
Test 5 - Wind Resistance – Safety – Cavity	3600 Pa	Pass	-
Test 6 - Impact Resistance – Retention of Performance	Cat B	Class 2	-
Test 7 - Impact Resistance – Safety to Persons	Cat B	Negligible Risk	-
Dismantle, Inspect & Report	Pass		

More comprehensive details are reported in Section 6.

These results are valid only for the conditions under which the test was conducted.

Note: The backing wall included in the test sample was to facilitate testing of the rainscreen sample only and did not form part of the tested system.

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

3. Description of Test Sample

The description of the test sample in this section has been supplied by Fairview Europe Ltd t/a Valcan and has not been verified by UL International (UK) Limited.

See Section 7 for test sample drawings as supplied by Fairview Europe Ltd t/a Valcan.

Product Description

Full product name:	VitraDual Planking System
Product type:	Aluminium Facade
Product description:	Interlocking Plank Profiles
Manufactured by:	Fairview Europe Ltd t/a Valcan

Support Framing and Bracketry

Material:	As below
Finish:	Mill Finish
Vertical rail Ref:	Vitrafix VF1 50x50 L Rail - Ali
Horizontal rail Ref:	Vitrafix VF2 U Rail – 2mm Galv
Fixing method (horizontal rail to backing wall):	Vitrafix Self Drill 5.5x38mm, A4 Grade, 8mm Hex head w/washer
Fixing Ref:	VFSD5.538/A4
Fixing method (Bracket to horizontal rail):	Vitrafix Self Drill 5.5x38mm, A4 Grade, 8mm Hex head w/washer
Fixing Ref:	VFSD5.538/A4
Fixing method (vertical rail to bracket):	Vitrafix Self Drill 4.8x25mm, A4 Grade, 8mm Hex head
Fixing Ref:	VFSD4.825/A4
Max Span between vertical rails:	600mm
Max Span between horizontal rails:	500mm
Brackets ref:	VF1
Construction tolerance allowed between fixings, rails and brackets (+/-)	+/- 1mm per 1000mm

Panels/Tiles/Bricks/Slip

Material:	VitraDual 5754 A1
Material ref (source, spec):	Fairview Europe Ltd t/a Valcan
Finish:	PVDF
Thickness:	2/3mm
Reinforcing:	If required
Max height of panel:	3980mm
Max width of panel:	500mm
Max size of panel by area (m2):	1.99 m ²
Fixing method:	Vitrafix Self Drill 4.8x25mm, A4 Grade, 8mm Hex head
Screws/fixings ref:	VFSD4.825/A4

Interface Details (curtain wall to window/door inserts)

Window interface detail:	As per drawing
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Backing Wall

Watertight membrane:	Certifix
Particle board detail:	ProcellaPro
Fixings ref:	Vitrafix Self Drill Fixing for ProcellaPro, 4.8x42mm, Bi Metallic Fixing
Construction tolerance allowed between SFS (+/-)	+/- 1mm per 1000mm

Drainage

Drainage type (pressure equalised etc.):	Pressure Equalised
Drainage specification and weep holes etc.	Weep Holes

Drawings

Drawing/s must be provided covering the below; -Full drawing of sample including front elevation -Cross Sections (Panels/Rails Etc.) -Hardware Locations -Fixings -Drainage Points Note: drawings are required to show all relevant dimensions	As detailed in Section 7
Test sample size:	As detailed in Section 7

Confirmation

Customer is to confirm that the samples provided for testing are representative of standard production. Please note: the details given above, as well as the drawings supplied by the customer as confirmed as typical of normal production are not verified by UL International (UK) Limited.	
Company:	Fairview Europe Ltd t/a Valcan
Name:	Martin Hopkins
Position:	Facade Systems Manager
Date:	26 th March 2025

Sample during testing

Photograph No. 1 – Dynamic Engine



4. Test Arrangement

4.1 Test Chamber

A 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 Deflection

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

4.2.3 Temperature & Humidity

A digital data logger capable of measuring temperature with an accuracy of $\pm 1^{\circ}\text{C}$ and humidity with an accuracy of $\pm 5\% \text{Rh}$ was used.

4.2.4 Barometric Pressure

A digital barometer capable of measuring barometric pressure with an accuracy of $\pm 1 \text{ kPa}$ was used.

4.2.5 General

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

4.3 Pressure Generation

4.3.1 Static Air Pressure

The air supply system comprised of a centrifugal fan assembly and associated ducting and control valves and was 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.

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.*

4.3.2 Dynamic 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 Impactors

4.4.1 Soft (S1) Body Impactor

A spherical/conical, glass bead filled impactor with a mass of 50 Kg, as required in CWCT TN76

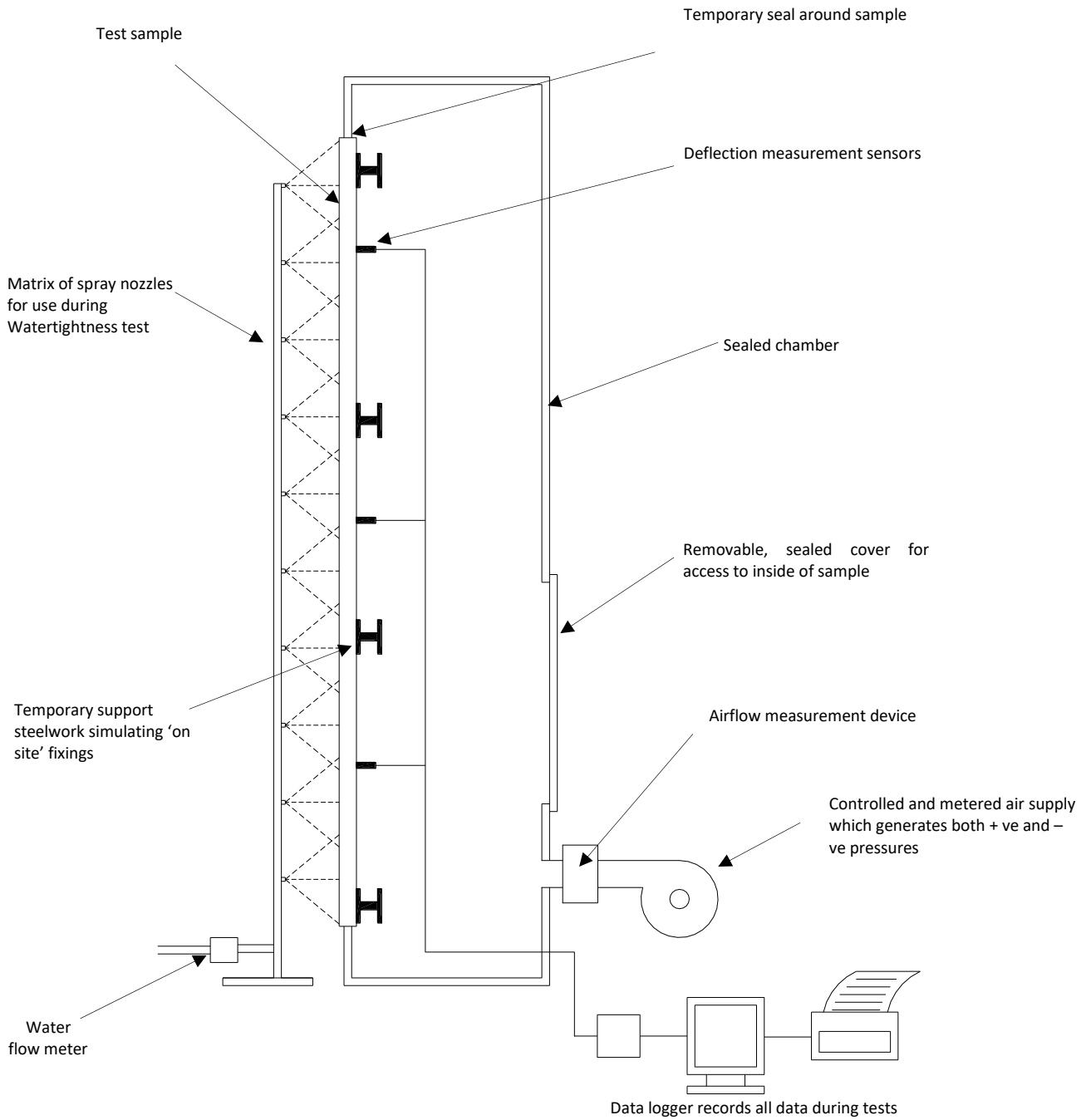
4.4.2 Hard (H2) Body Impactor

A steel ball with a diameter of 62.5 mm and a mass of 1.135 Kg, 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.

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

Figure 1 – Test arrangement

General Arrangement of a Typical Test Assembly



5. Test Procedures

5.1 Sequence of Testing

Test 1 - Wind Resistance – Serviceability – Backing Wall
Test 2 - Dynamic Aero Engine – Excluding Water
Test 3 - Wind Resistance – Serviceability – Cavity
Test 4 - Wind Resistance – Safety – Backing Wall
Test 5 - Wind Resistance – Safety – Cavity
Test 6 - Impact Resistance – Retention of Performance
Test 7 - Impact Resistance – Safety to Persons

5.2 Dynamic Engine – Excluding Water

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.

5.3 Wind Resistance

5.3.1 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. 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 deformation recorded within 1 hour of the test.

The above test sequence was then repeated, including preparation pulses, at a negative pressure differential.

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

5.3.2 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 preparation pulses, at a negative pressure differential. 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.

5.4 Impact Resistance

5.4.1 Impact Test Procedure – Retention of Performance – CWCT TN 76

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

The Impactors, as described in section 4.4.1 and 4.4.2, 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 and 6.4.2 to the selected impact points. Drop heights were set to an accuracy of ± 10 mm.

5.4.2 Impact Test Procedure – Safety to Persons – CWCT TN 76

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

The Impactors, as described in section 4.4.1 and 4.4.2 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 6.4.1 and 6.4.2 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.

6. Test Results

6.1 Test 2 – Dynamic Aero Engine – Excluding Water

Temperatures (°C)	Ambient	10.3
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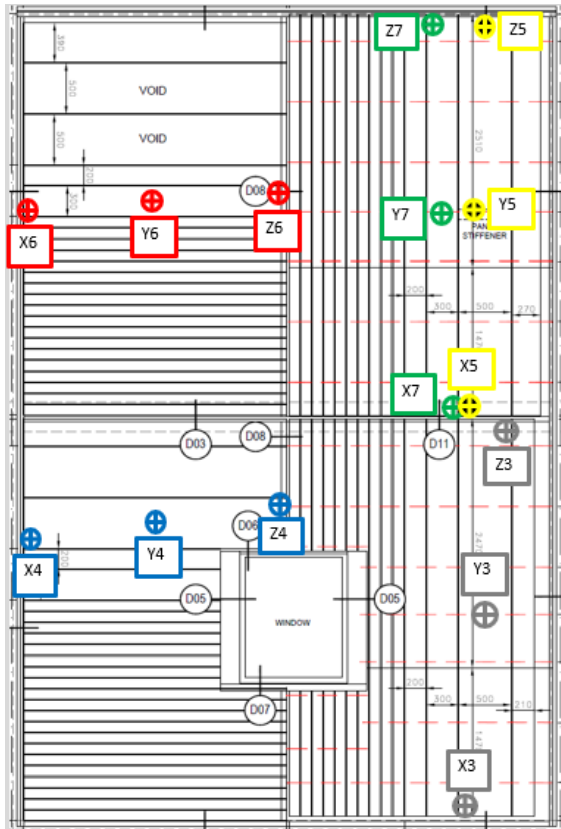
The sample was subjected to testing as described in section 5.2, for a period of not less than 15 minutes. Following the test, the sample was checked, and no damage was found.

6.2 Wind Resistance

Probe Group Identification	Calculation of deflection
Group A comprised of probes X3, Y3 & Z3	= Probe Y3 – ((Probe X3 + Probe Z3)/2)
Group B comprised of probes X4, Y4 & Z4	= Probe Y4 – ((Probe X4 + Probe Z4)/2)
Group C comprised of probes X5, Y5 & Z5	= Probe Y5 – ((Probe X5 + Probe Z5)/2)
Group D comprised of probes X6, Y6 & Z6	= Probe Y6 – ((Probe X6 + Probe Z6)/2)
Group E comprised of probes X7, Y7 & Z7	= Probe Y7 – ((Probe X7 + Probe Z7)/2)

An inspection carried out following tests 1, 3, 4 and 5, after both positive and negative pressure testing, showed no evidence of any permanent deformation or damage to the test sample.

Figure 2 - Positions of Deflection Measurement Probes



Test 3 – Wind Resistance, Serviceability

Ambient Temperature (°C)	3.1
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Measured Length of Framing Member (mm)	Allowable Deflection		
	Ratio	Calculated (mm)	
Group A	3834	L/90	42.6
Group B	2420	L/90	26.9
Group C	3800	L/90	42.2
Group D	2340	L/90	26.0
Group E	3902	L/90	43.4

6.2.1.1 Wind Resistance, Serviceability – Positive Pressure

Positive Pressure Pa	Results (mm)				
	Group A	Group B	Group C	Group D	Group E
0	0.0	0.0	0.0	0.0	0.0
600	3.5	4.9	2.1	1.4	4.9
1200	6.7	8.6	3.8	2.6	8.7
1800	10.1	12.5	5.6	3.8	12.9
2400	13.7	16.2	7.5	5.3	17.4
Residuals Immediately following test	0.2	0.3	0.5	0.2	0.5

6.2.1.2 Wind Resistance, Serviceability – Negative Pressure

Negative Pressure Pa	Results (mm)				
	Group A	Group B	Group C	Group D	Group E
0	0.0	0.0	0.0	0.0	0.0
600	3.9	4.2	1.9	2.0	3.9
1200	7.8	9.8	3.8	3.6	7.8
1800	11.4	14.4	6.1	5.5	11.4
2400	15.3	19.7	8.6	7.2	15.3
Residuals Immediately following test	0.7	1.0	0.2	0.2	0.7

6.3 Test 5 – Wind Resistance, Safety

Ambient Temperature (°C)	5.1
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Measured Length of Framing Member (mm)	Allowable Residual Deformation		
	Ratio	Calculated (mm)	
Group C	3800	L/500	7.6

Note: Deflection readings were recorded for information purposes only, as requested by Fairview Europe Ltd t/a Valcan.

6.3.1 Wind Resistance, Safety – Positive Pressure

Positive Pressure Pa	Results (mm)
	Group C
0	0.0
3600	10.5
Residuals Immediately following test	0.7

6.3.1.1 Wind Resistance, Safety – Negative Pressure

Negative Pressure Pa	Results (mm)
	Group C
0	0.0
3600	14.4
Residuals Immediately following test	0.6

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

6.4 Impacting

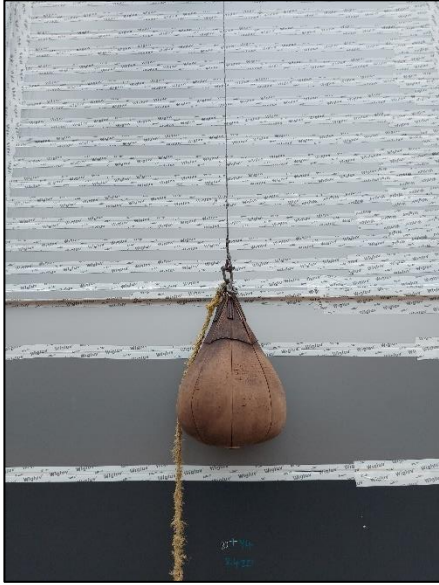
6.4.1 Tests 6 & 7 – Impact – Soft Body

Ambient Temperatures (°C)	4.9
Humidity (%RH)	71

Red Zone				
Impact Reference	Test Classification	Impact Energy (J)	Observations	Result
A1	Cat B	120 x 3 500 x 1	No Damage No Damage	Class 1 Negligible Risk
B1	Cat B	120 x 3 500 x 1	No Damage No Damage	Class 1 Negligible Risk
C1	Cat B	120 x 3 500 x 1	No Damage No Damage	Class 1 Negligible Risk
D1	Cat B	120 x 3 500 x 1	No Damage No Damage	Class 1 Negligible Risk
E1	Cat B	120 x 3 500 x 1	No Damage No Damage	Class 1 Negligible Risk

Class Achieved	Class 1 Negligible Risk
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Photograph No. 2 - During the test, no damage was observed



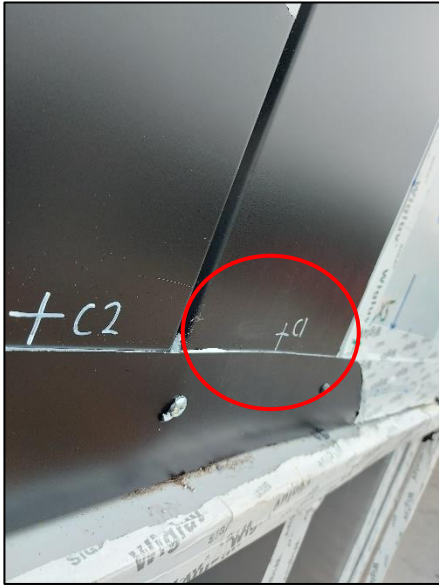
Blue Zone				
Impact Reference	Test Classification	Impact Energy (J)	Observations	Result
A1	Cat B	120 x 3 500 x 1	No Damage Slight Dent	Class 1 Negligible Risk
B1	Cat B	120 x 3 500 x 1	No Damage No Damage	Class 1 Negligible Risk
C1	Cat B	120 x 3 500 x 1	No Damage Slightly concaved panel	Class 1 Negligible Risk
D1	Cat B	120 x 3 500 x 1	No Damage No Damage	Class 1 Negligible Risk
E1	Cat B	120 x 3 500 x 1	No Damage No Damage	Class 1 Negligible Risk
F1	Cat B	120 x 3 500 x 1	No Damage No Damage	Class 1 Negligible Risk

Class Achieved	Class 1 Negligible Risk
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Photograph No. 3 – Damage caused following impact ref A1



Photograph No. 4 – Damage caused following impact ref C1



6.4.2 Tests 6 & 7 – Impact – Hard Body H2

Ambient Temperatures (°C)	4.9
Humidity (%RH)	71

Red Zone				
Impact Reference	Test Classification	Impact Energy (J)	Observations	Result
A2	Cat B	10 x 1	No Damage	Class 1 Negligible Risk
B2	Cat B	10 x 1	No Damage	Class 1 Negligible Risk
C2	Cat B	10 x 1	No Damage	Class 1 Negligible Risk
D2	Cat B	10 x 1	No Damage	Class 1 Negligible Risk
E2	Cat B	10 x 1	No Damage	Class 1 Negligible Risk

Class Achieved	Class 1 Negligible Risk
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Photograph No. 5 - During the test, no damage was observed



Blue Zone				
Impact Reference	Test Classification	Impact Energy (J)	Observations	Result
A2	Cat B	10 x 1	Dent	Class 2 Negligible Risk
B2	Cat B	10 x 1	No Damage	Class 1 Negligible Risk
C2	Cat B	10 x 1	Dent	Class 2 Negligible Risk
D2	Cat B	10 x 1	No Damage	Class 1 Negligible Risk
E2	Cat B	10 x 1	No Damage	Class 1 Negligible Risk
F1	Cat B	10 x 1	Dent	Class 2 Negligible Risk

Class Achieved	Class 2 Negligible Risk
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Photograph No. 6 – Damage caused following impact ref A2



Photograph No. 7 – Damage caused following impact ref C2

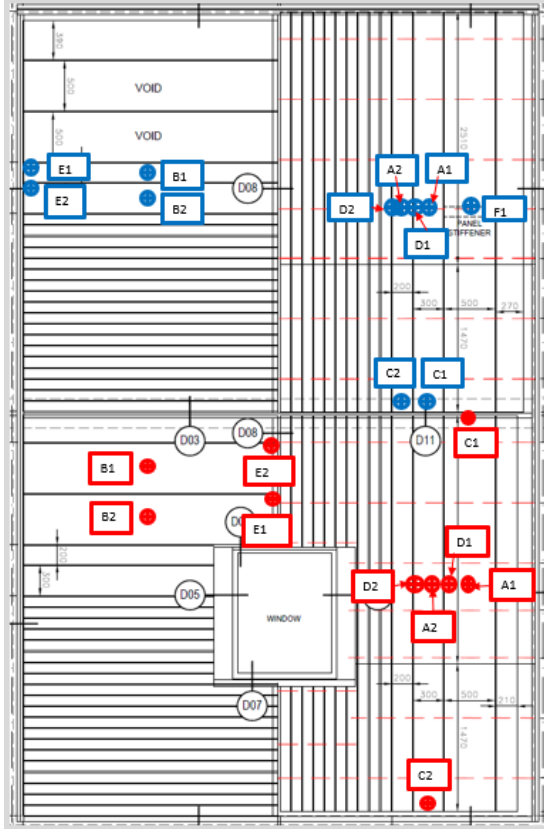


Photograph No. 8 – Damaged caused following impact ref F1



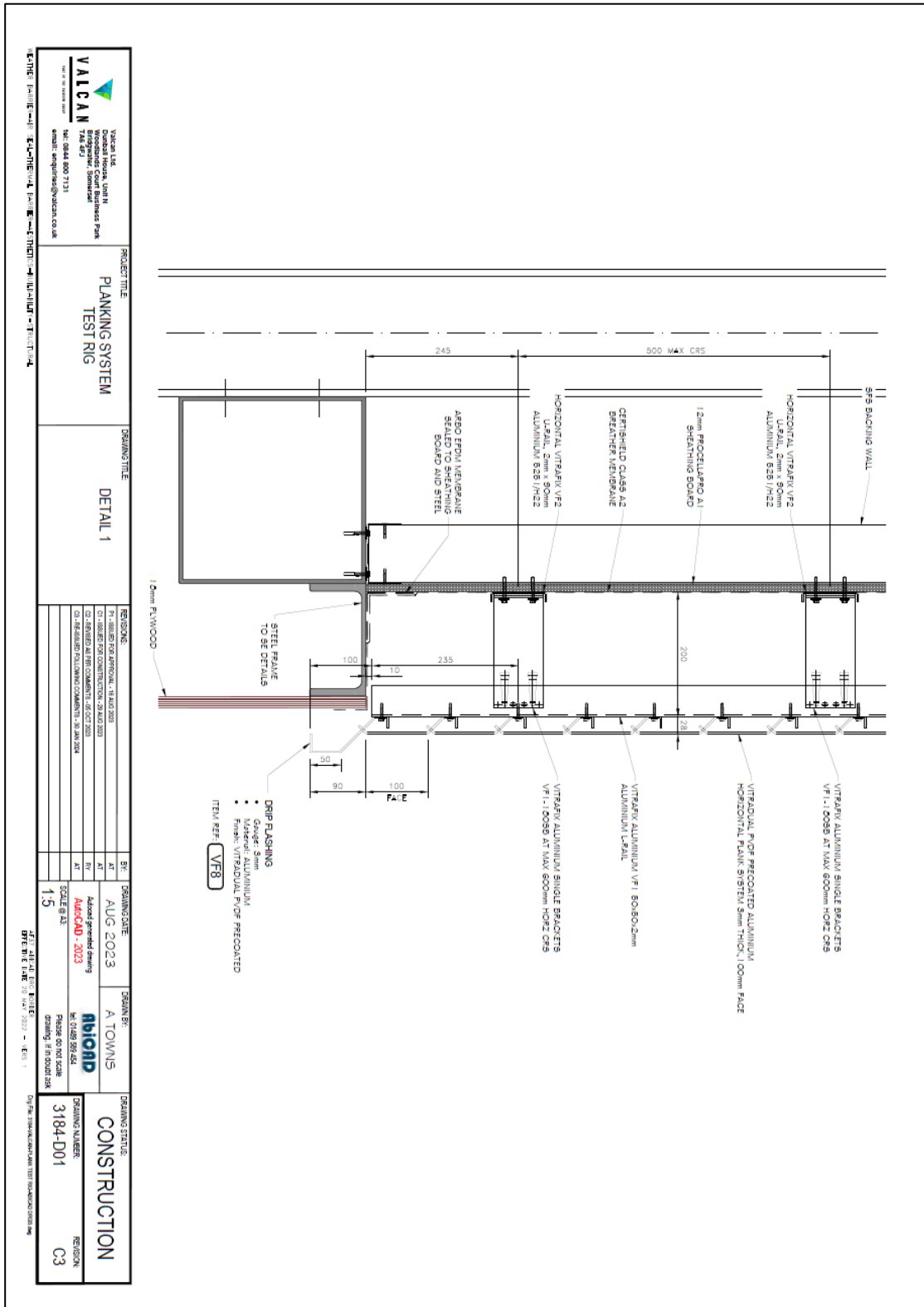
6.4.3 Impact Locations

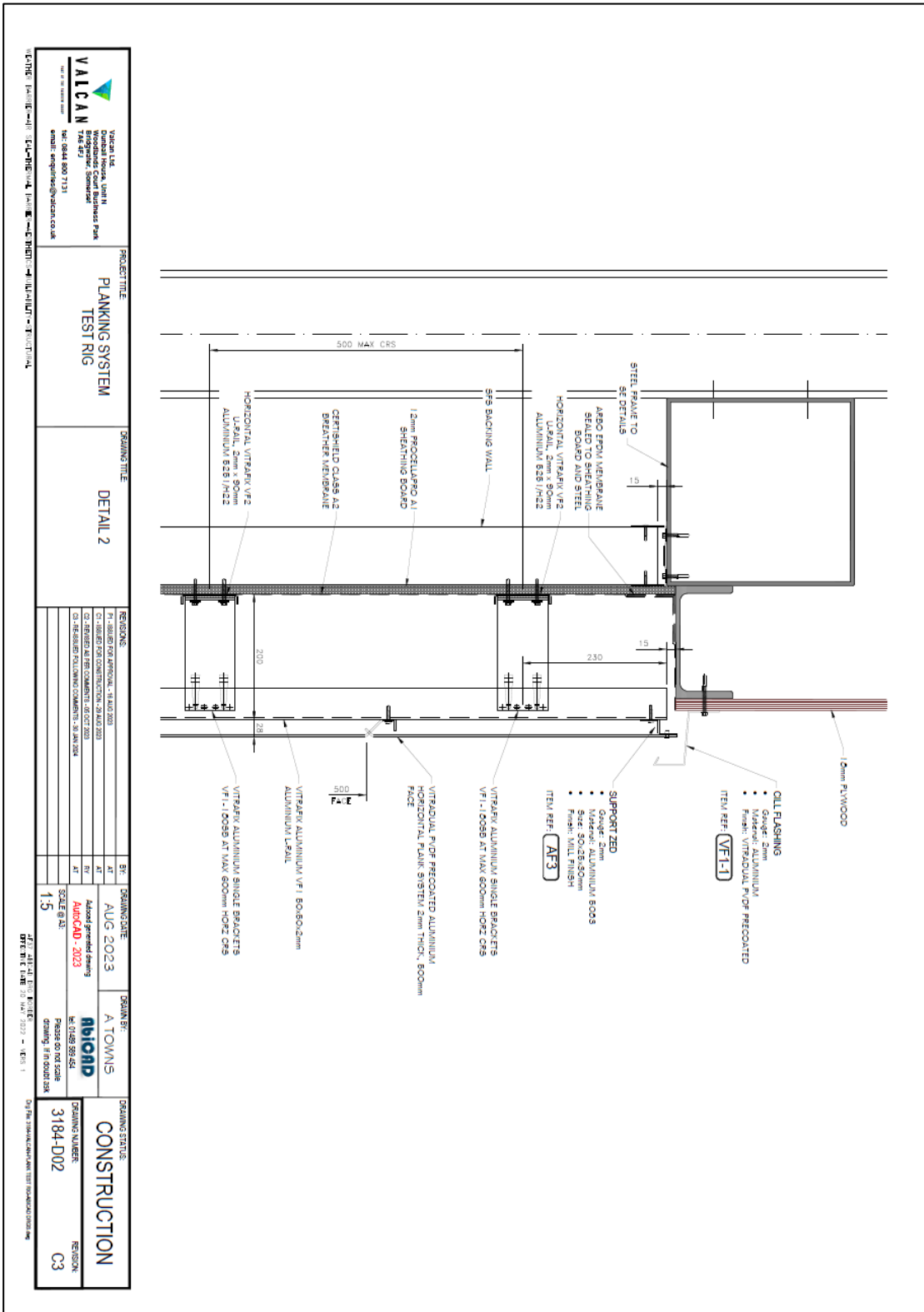
Figure 3



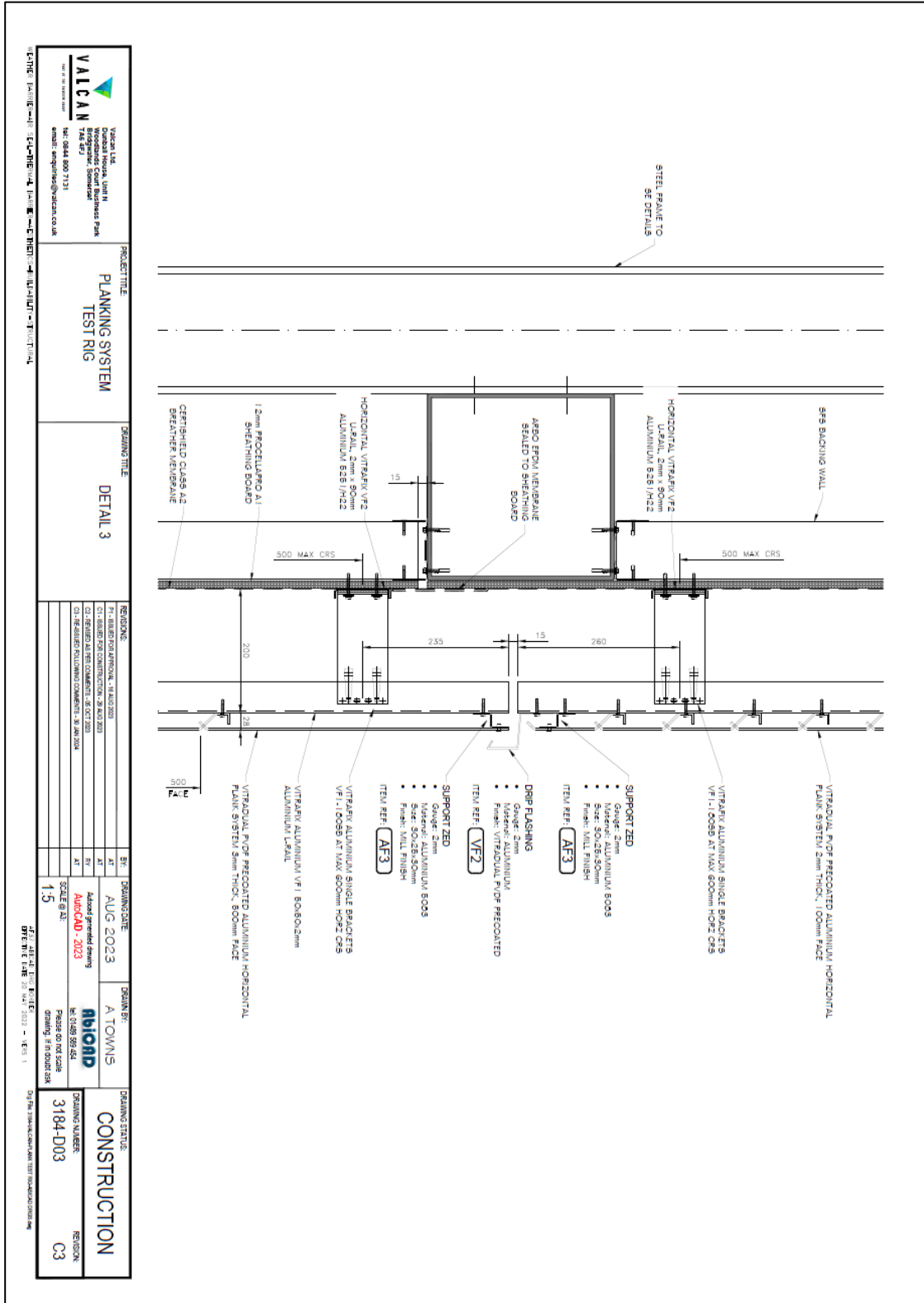
Impact Location	Description
A	Centre of panel V
B	Centre of panel H
C	Unsupported edge
D	Supported edge
E	Corner
F	On a stiffener

7. System Drawings

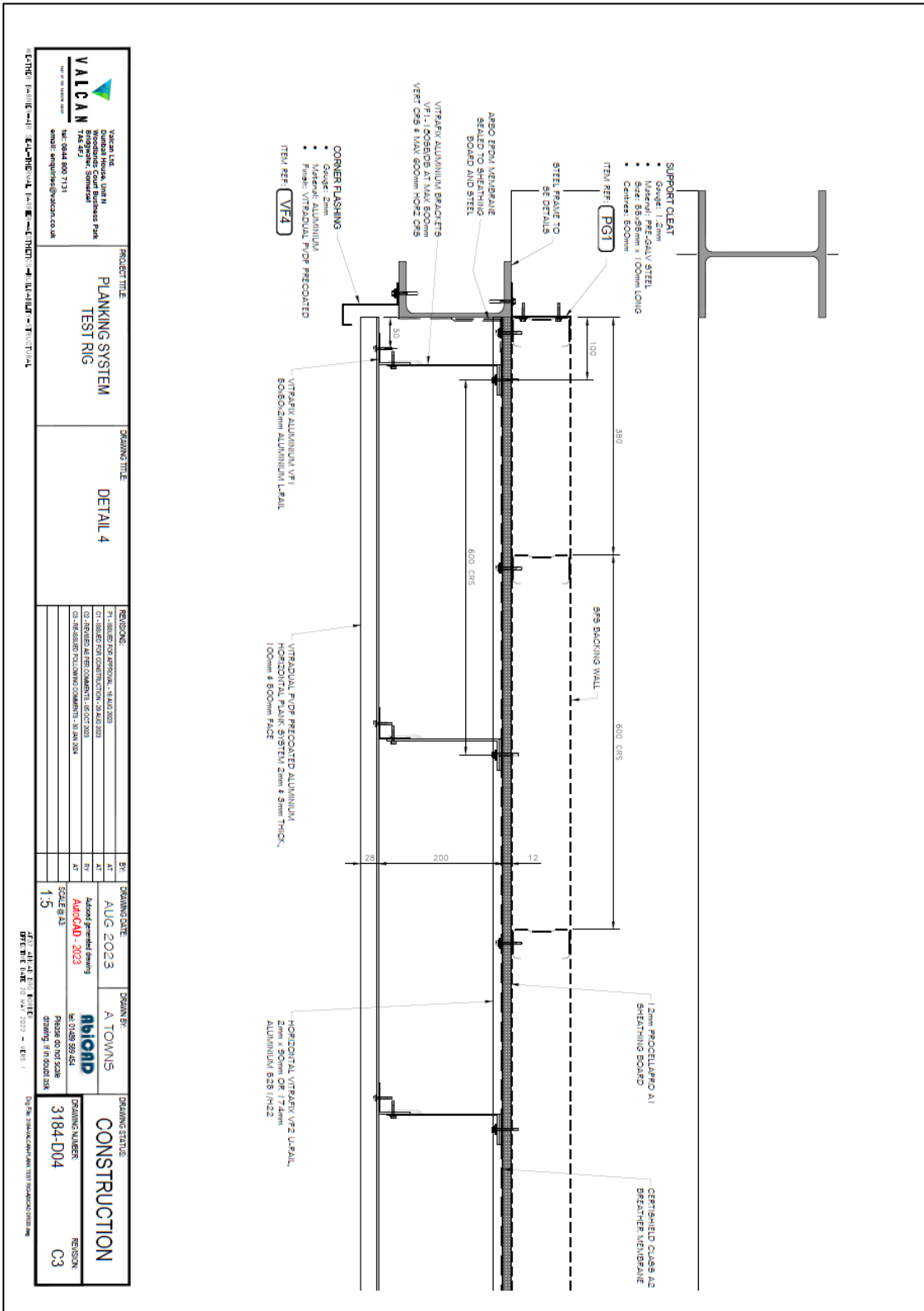


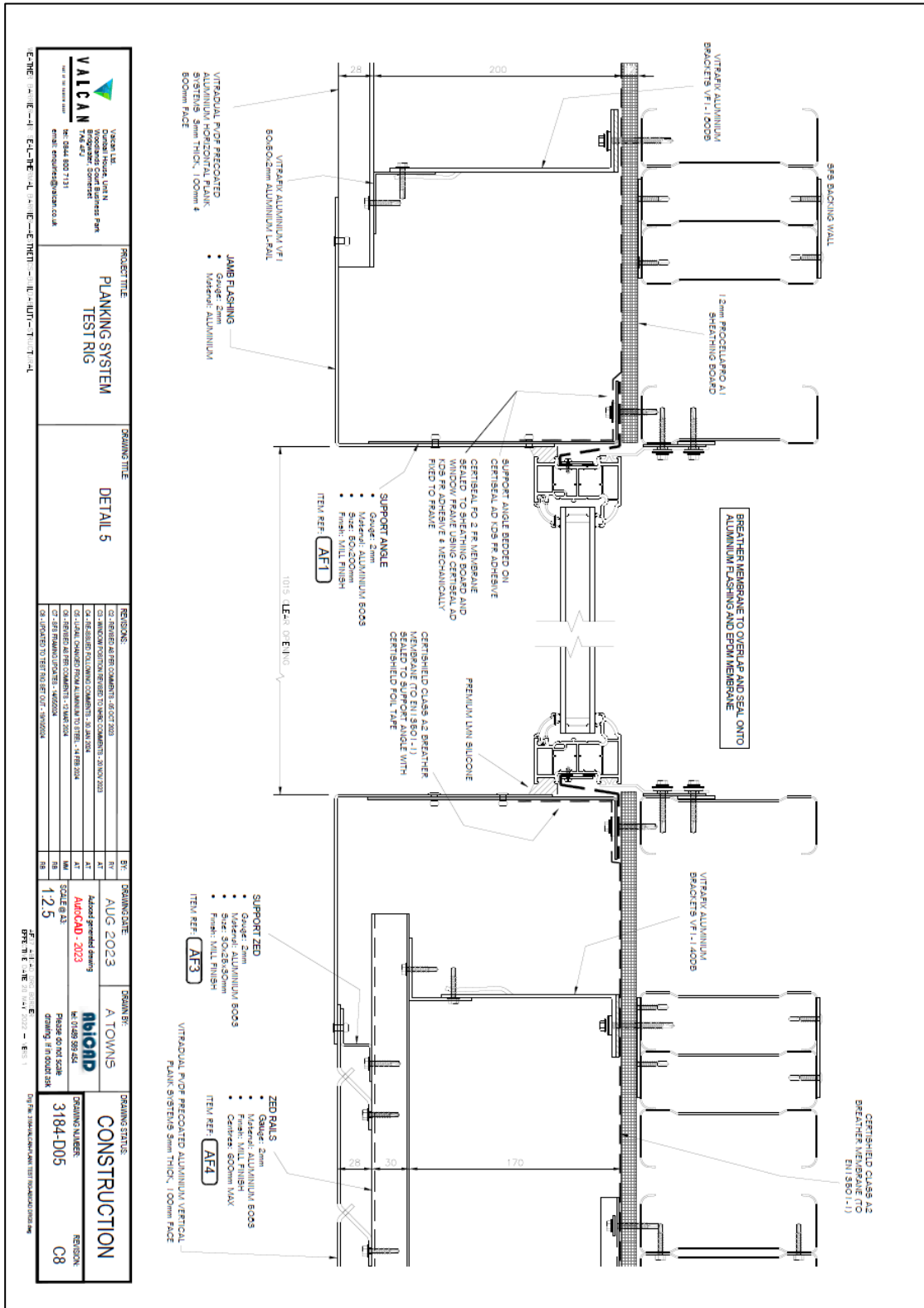


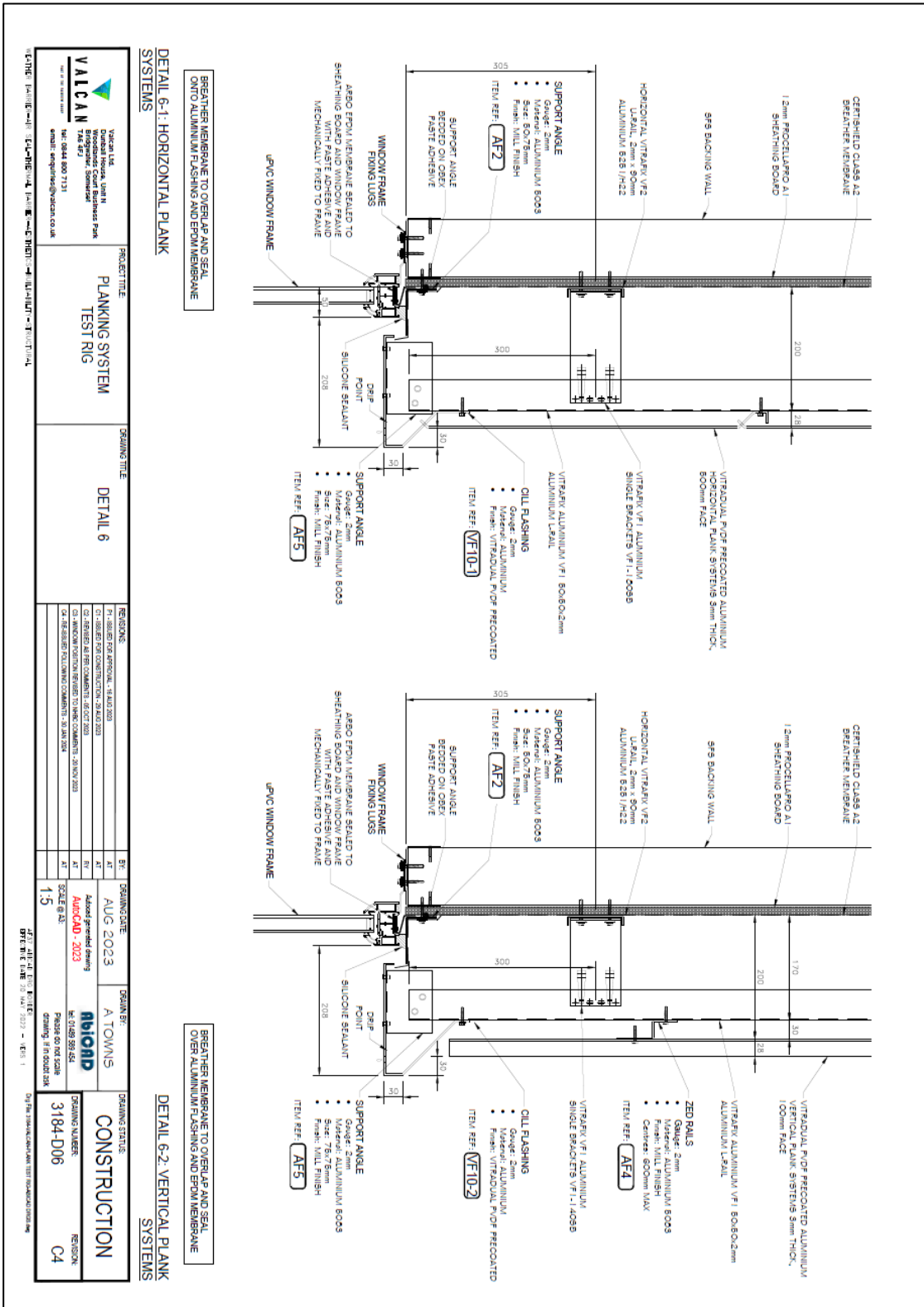
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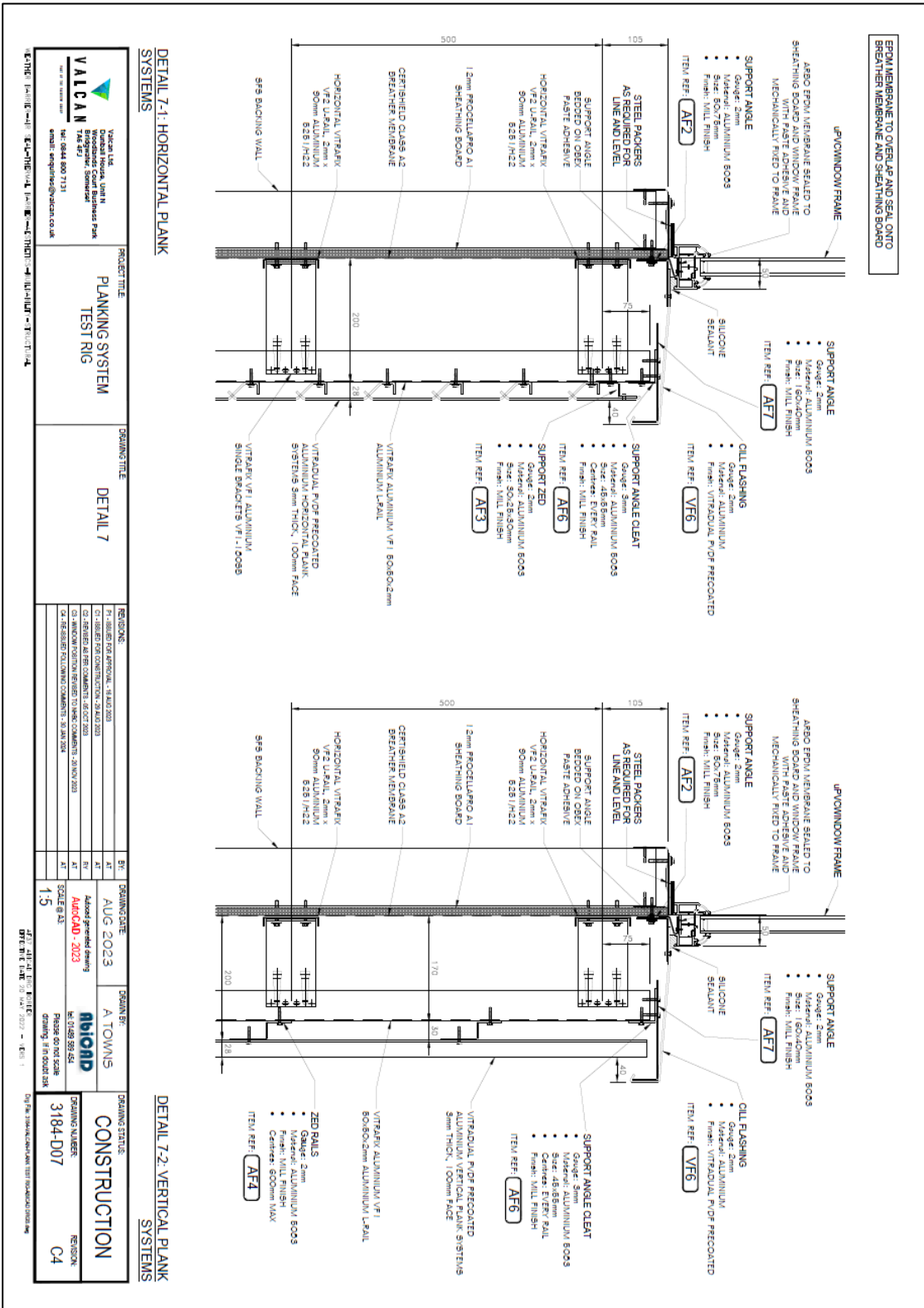


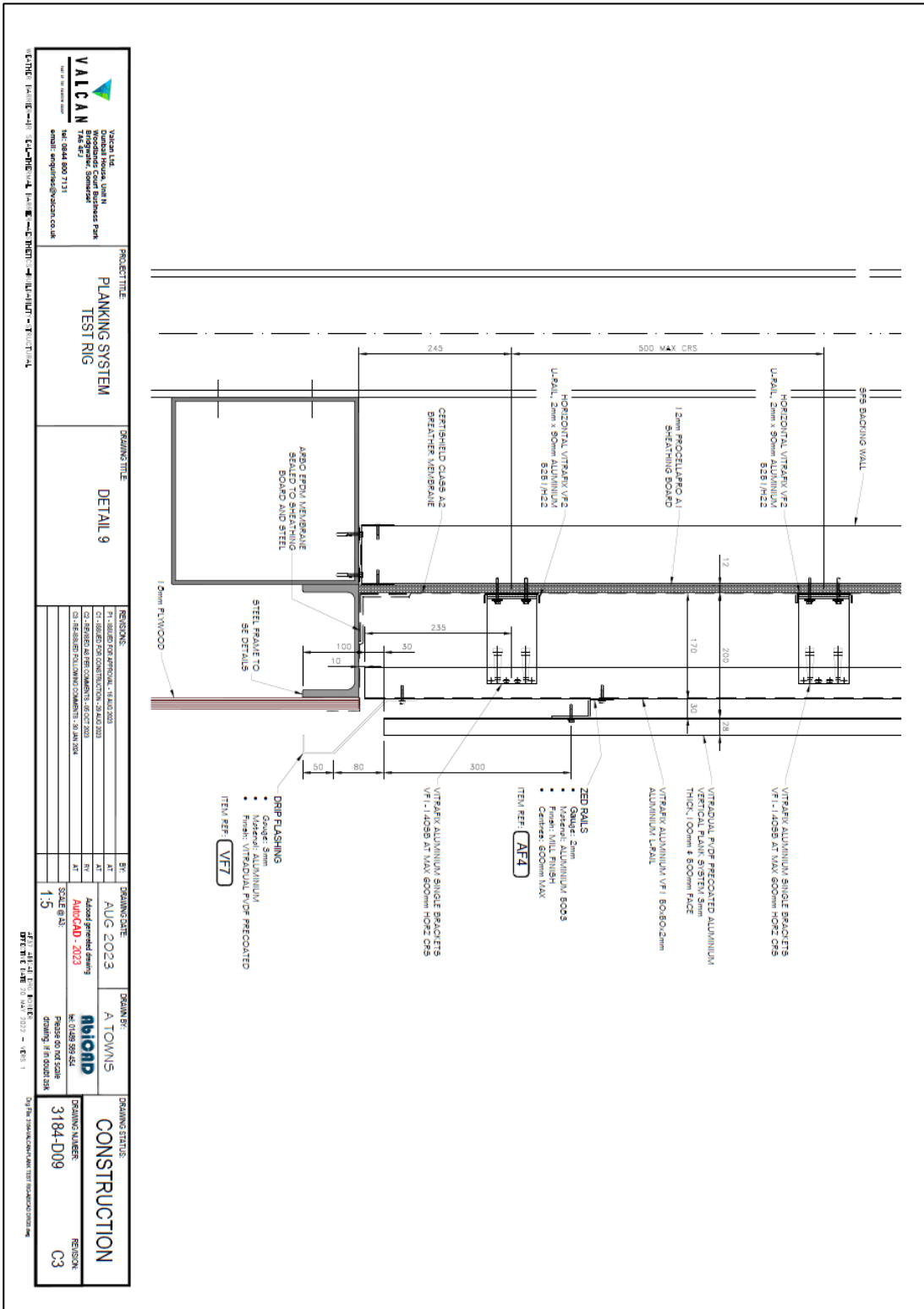
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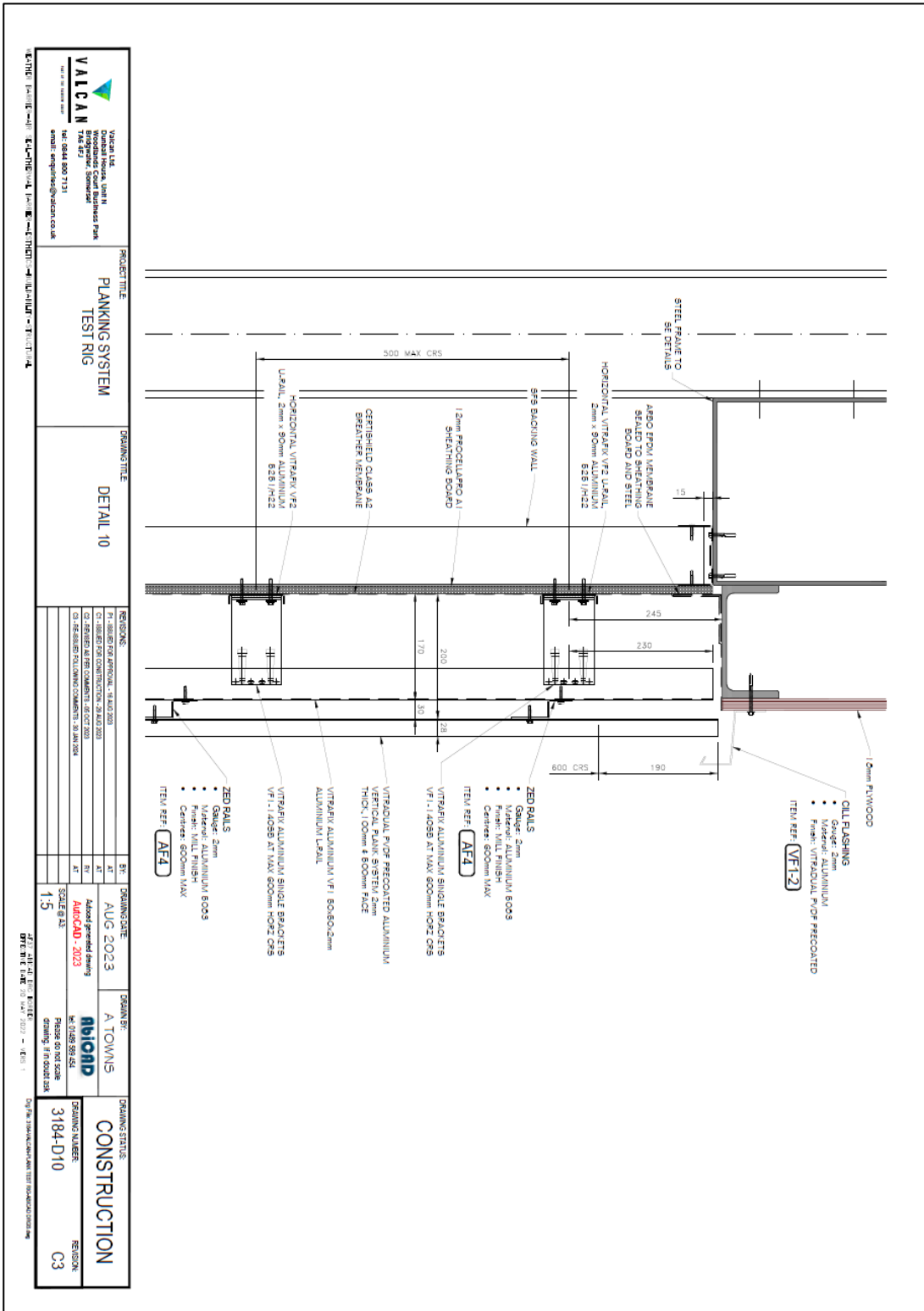


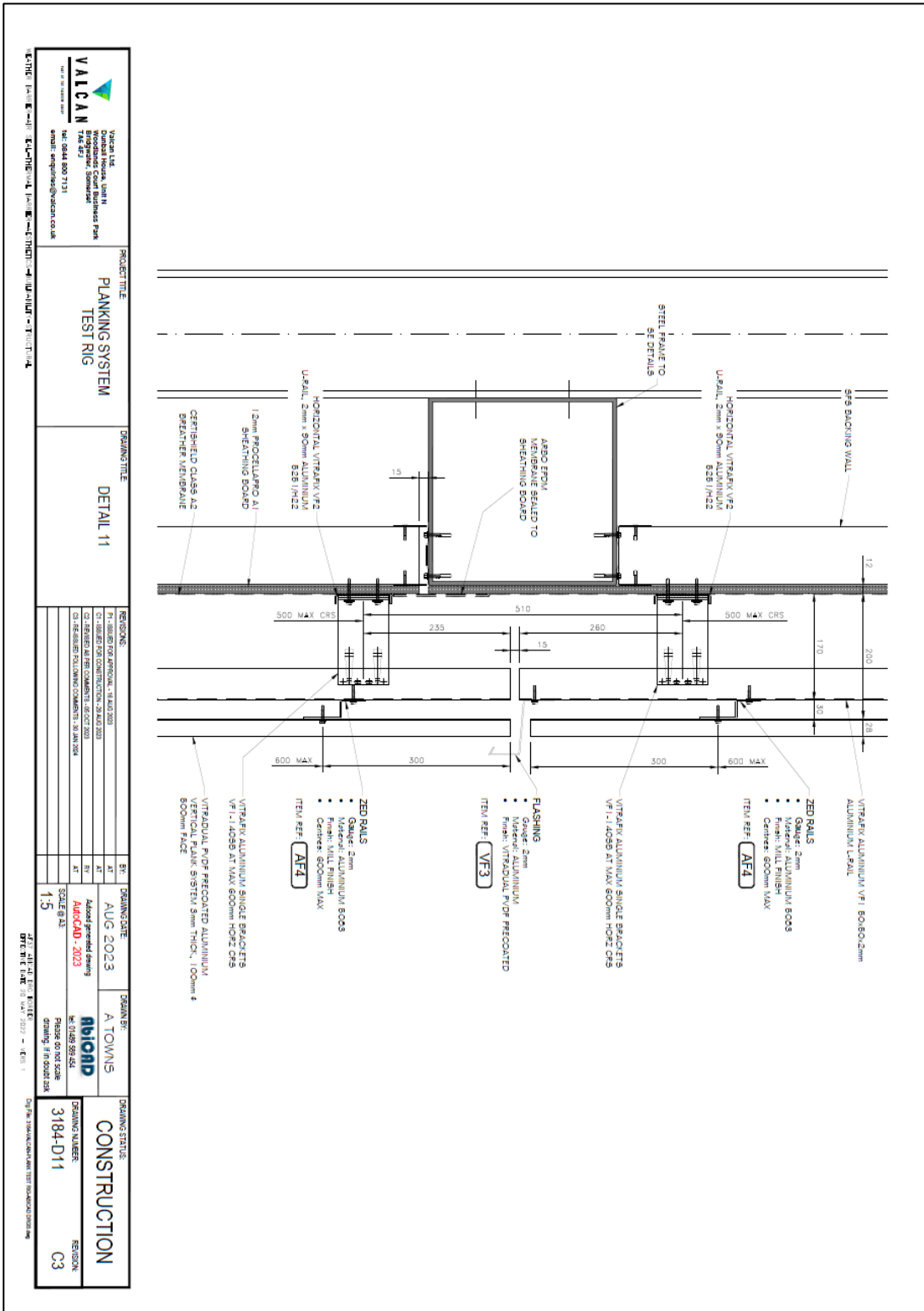








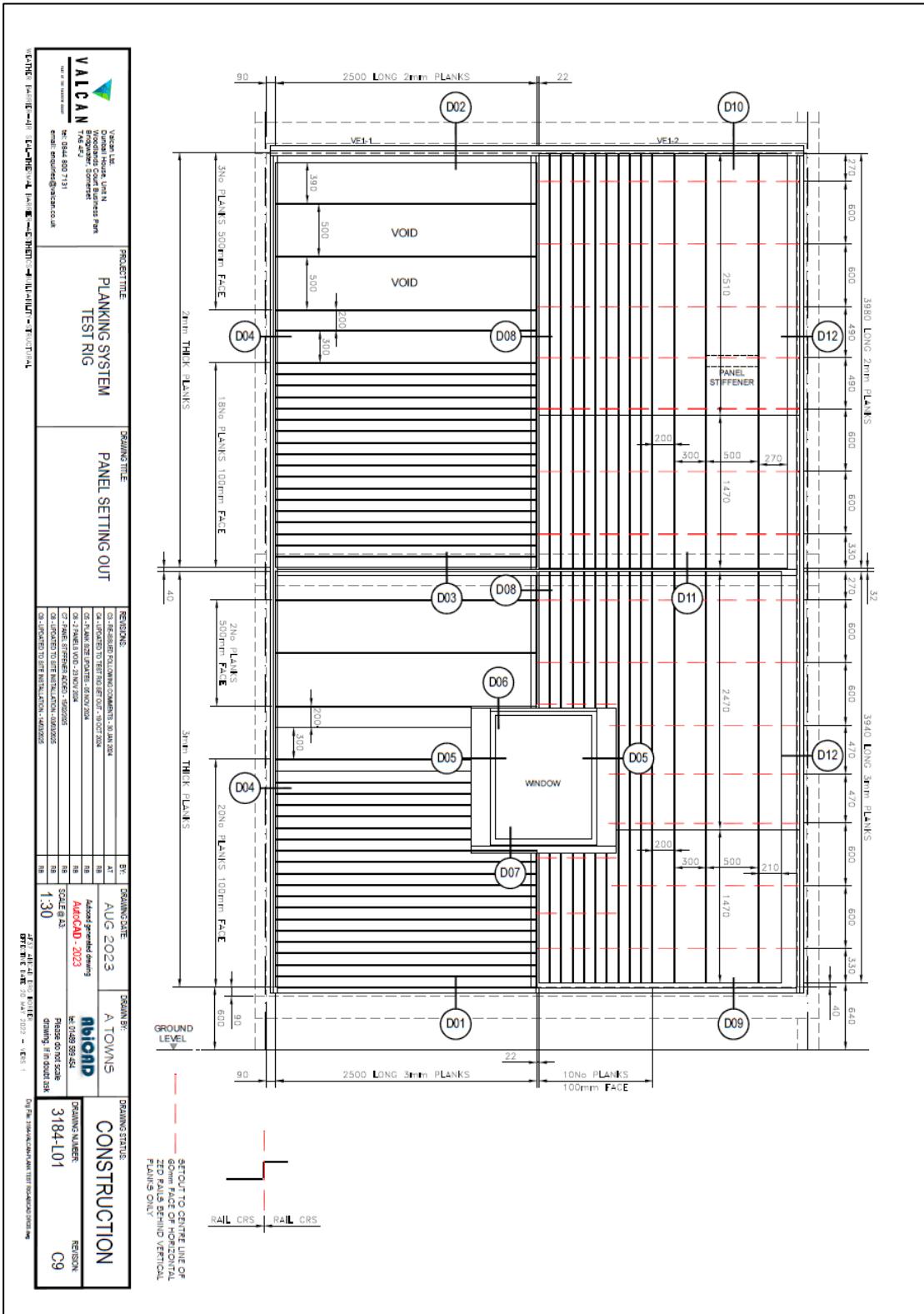


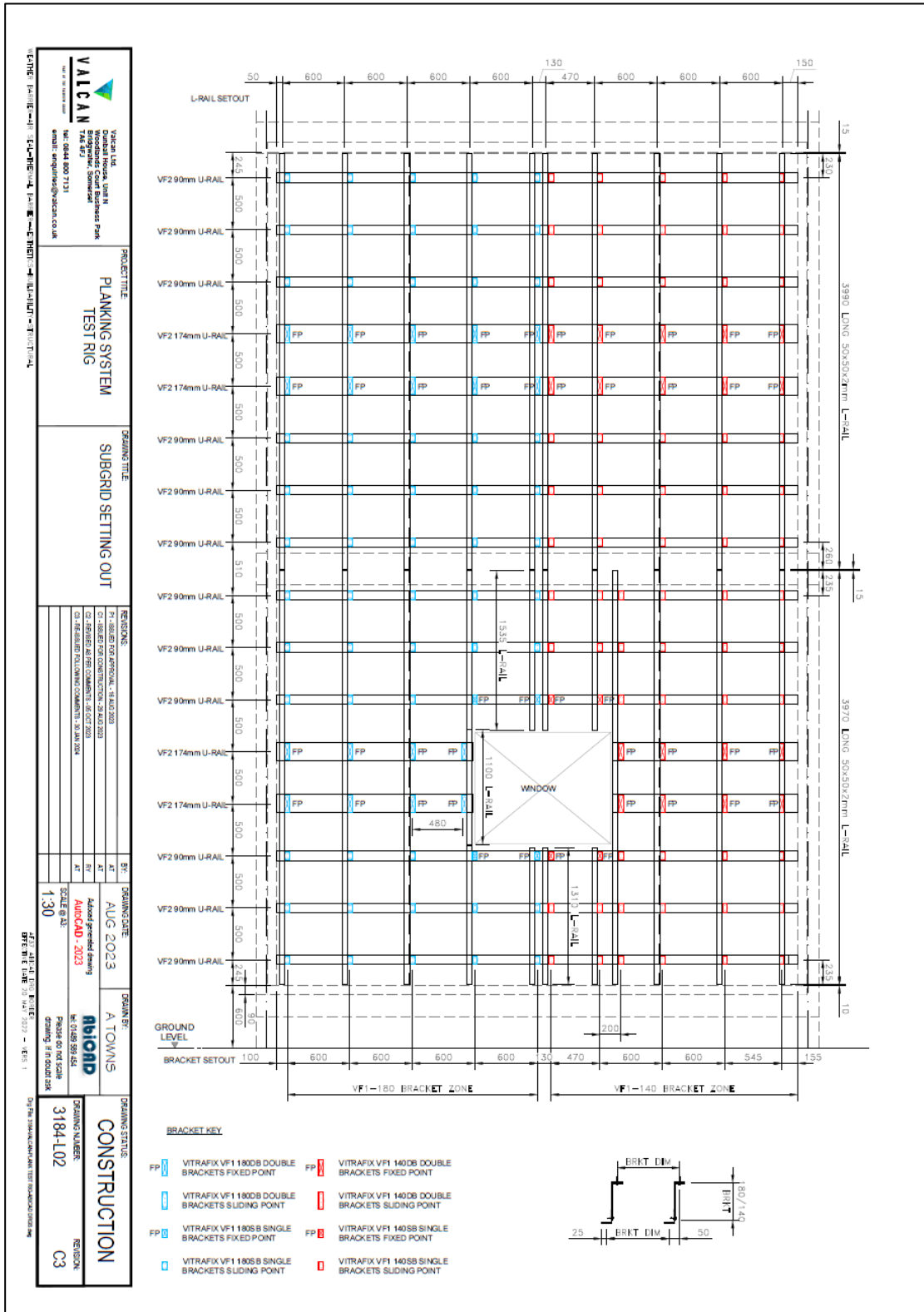


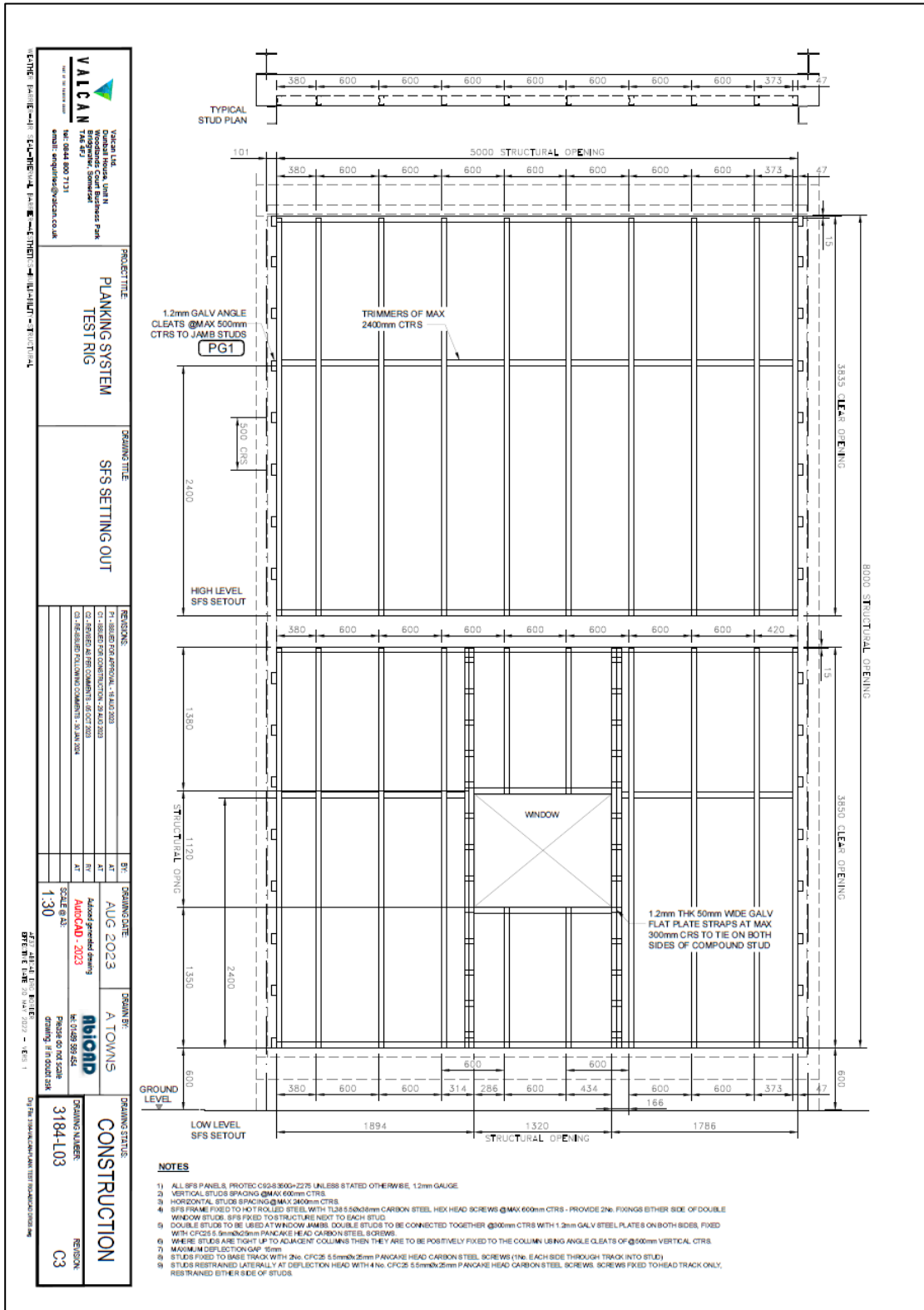


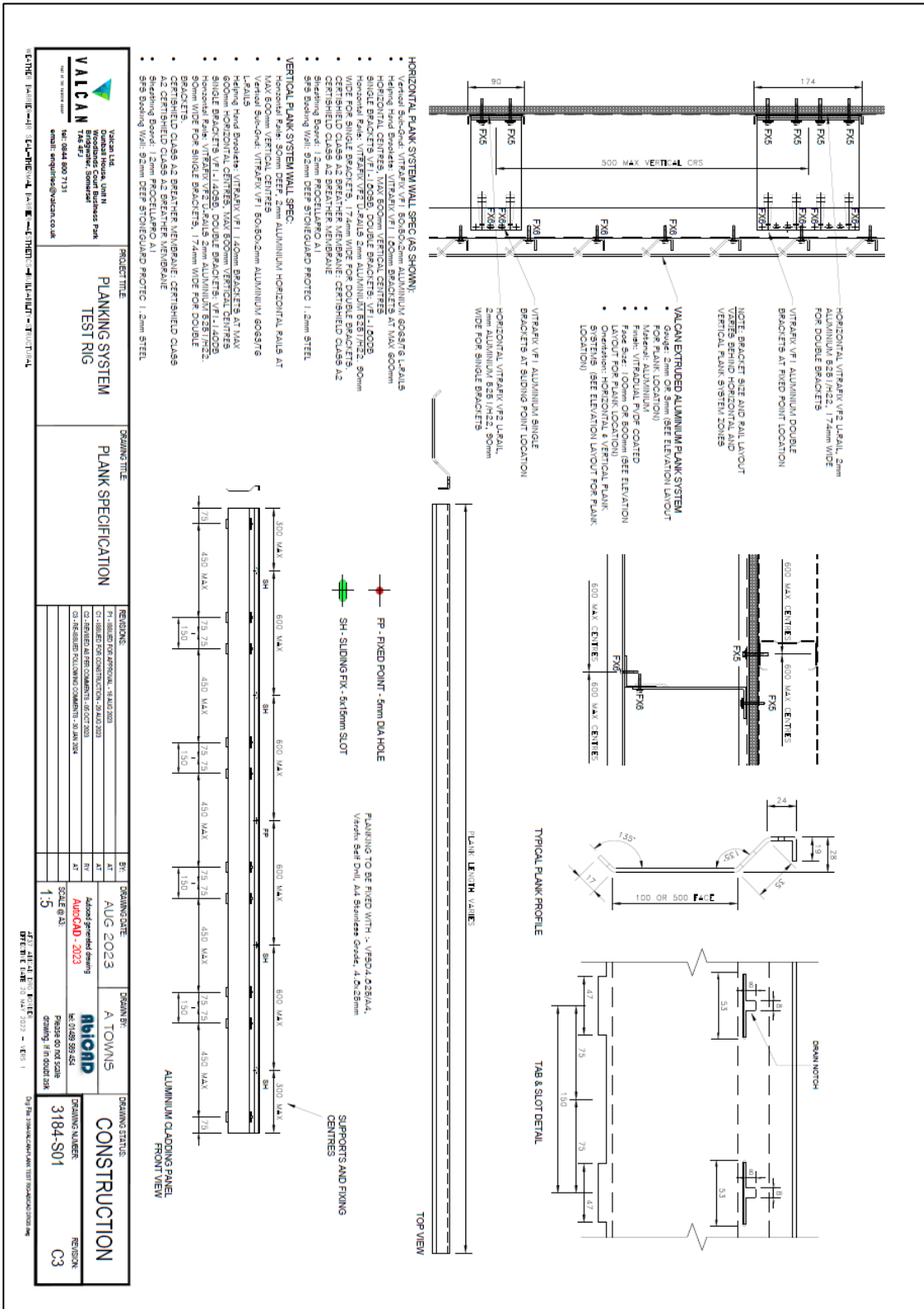
		PROJECT TITLE		DRAWING TITLE		REVISIONS		BY		DATE		DRAWING STATUS			
Valcan Ltd. Oxford House, Unit 14 Basingstoke Business Park Basingstoke, Hampshire RG24 8AH Tel: 01484 800 7131 Email: enquiries@valcan.co.uk		PLANKING SYSTEM TEST RIG		FIXING TABLE		TO: REVISIONS FOLLOWING COMMENTS - 29 JAN 2024		AT:		AUG 2023		A TOWN'S REVISED Please do not scale drawing in hard copy		CONSTRUCTION DRAWING NUMBER: 3184-F01 REVISION: C1	
REF	SUPPLIER	CODE	COLOUR	MATERIAL	DESCRIPTION	COMMON USE									
FX1	STONEGUARD	TL38 5.5x38	N/A	CARBON	5.5x38mm DIA SELF-DRILLING SCREWS (DRILLING CAPACITY 3-12mm STEEL)	SFS TO HOT ROLLED STEEL									
FX2	STONEGUARD	CFQ25 5.5x25	N/A	CARBON	5.5x25mm DIA SELF-DRILLING SCREWS (DRILLING CAPACITY 0.9-4mm STEEL)	SFS STUDS CONNECTIONS									
FX3	STONEGUARD	TL50 5.5x50	N/A	CARBON	5.5x50mm DIA SELF-DRILLING SCREWS (DRILLING CAPACITY 3-12mm STEEL)	FLASHINGS TO HOT ROLLED STEEL									
FX4	VALCAN	VFSDDP 4.838/WT	N/A	A2 S/STEEL	4.8x38mm DIA COUNTERSUNK SELF-DRILLING SCREWS	SHEATHING BOARD TO SFS									
FX5	VALCAN	VFSD 5.538/A4	N/A	A4 S/STEEL	5.5x38mm DIA SELF-DRILLING BL-MET SCREWS C/W 8mm HEX HEAD & WASHER	TO FIX BRACKETS AND CHANNEL RAILS TO SFS WALL									
FX6	VALCAN	VFSD 4.825/A4	N/A	A4 S/STEEL	4.8x25mm DIA SELF-DRILLING BL-MET SCREWS C/W 8mm HEX HEAD (NO WASHER)	L/T RAIL TO BRKTS & PLANKS TO RAILS									
FX7	VALCAN	VFR 4.820A4C	N/A	A4 S/STEEL	4.8mm DIA x 20mm LARGE FLANGE RIVET 16mm HEAD RIVET (5-13mm GR)	TO FIX VITRADUAL FLASHINGS									
FX8															
FX9															
FX10															



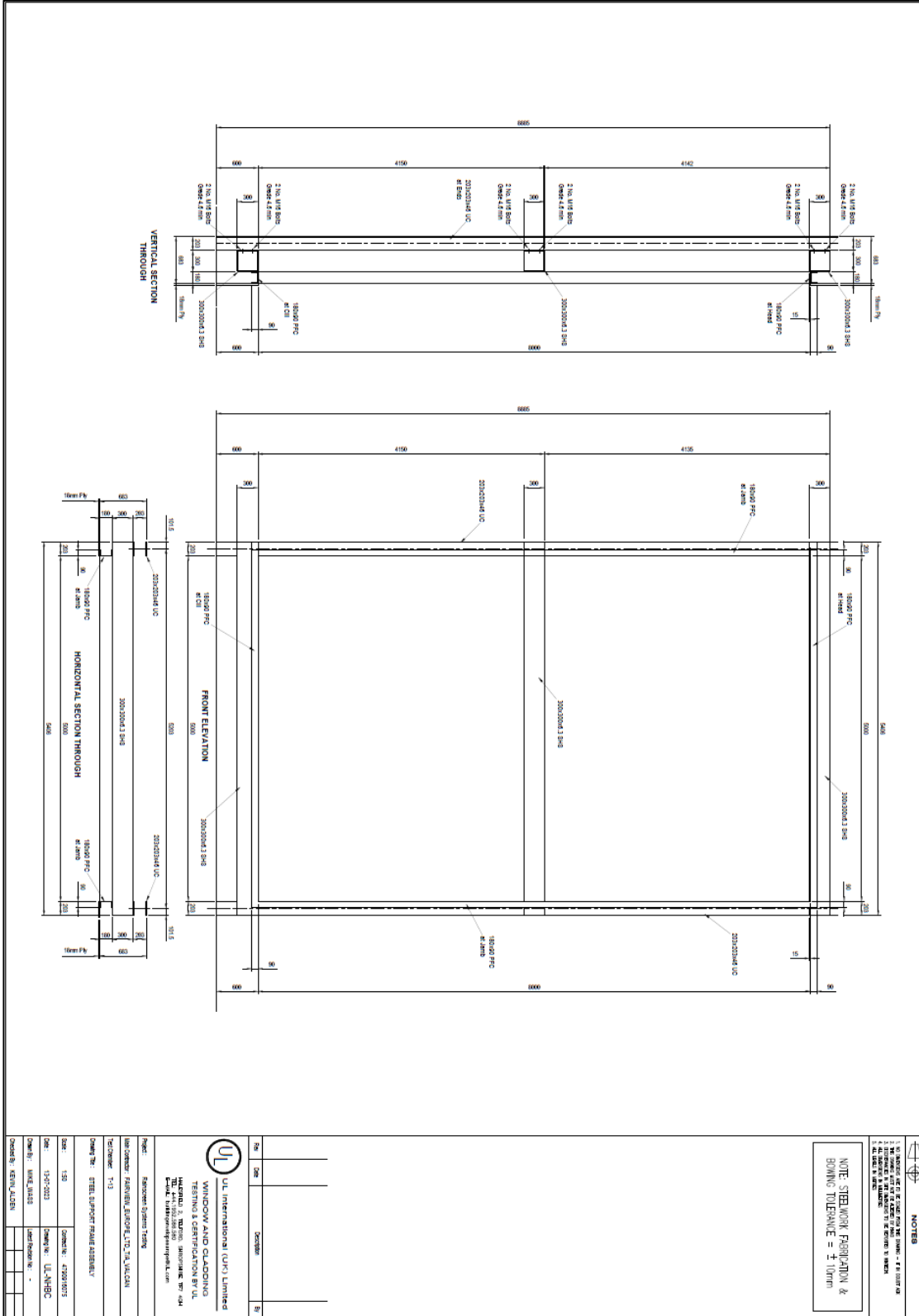








8. Support Steelwork Drawing



9. Dismantling

The dismantling was conducted on 24th, 25th and 26th February 2025 by representatives of Fairview Europe Ltd t/a Valcan and was witnessed by representatives of UL International (UK) Limited.

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 Section 7 provided by Fairview Europe Ltd t/a Valcan at the time of the dismantle.

Photograph No. 9 - Sample prior to dismantle



Photograph No. 10 - Lower level SFS



Photograph No. 11 - Window interface internal



Photograph No. 12 - Window interface external



Photograph No. 13 - Upper Level SFS



Photograph No. 14 - Bottom right hand corner panels



Photograph No. 15 - Top right hand corner panels



Photograph No. 16 - Top half of panels removed



Photograph No. 17 - Panels removed



Photograph No. 18 - Window Pod Removed



Photograph No. 19 - Panels removed from sample



Photograph No. 20 - Rails



Photograph No. 21 - Top hats and rails



Photograph No. 22 - Perimeter detail to UL Steelwork



Photograph No. 23 - Bracket



Photograph No. 24 - Double bracket



Photograph No. 25 - Edge of sample with panels removed



Photograph No. 26 - Perimeter flashing top section



Photograph No. 27 - Connection between bottom and top half of panels



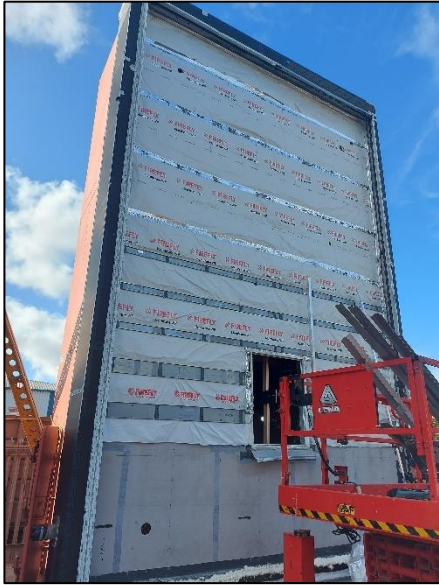
Photograph No. 28 - Perimeter detail to UL Steelwork



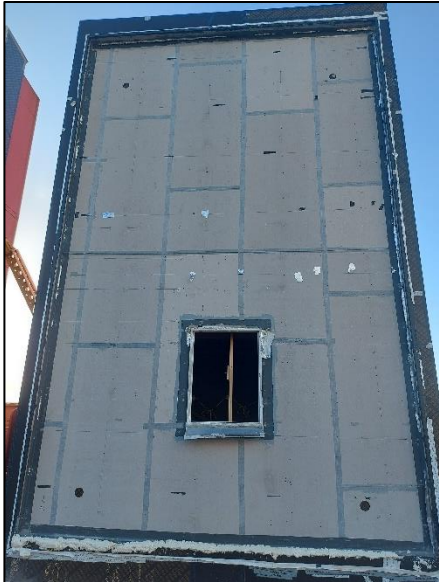
Photograph No. 29 - Window interface



Photograph No. 30 - Rails completely removed from sample



Photograph No. 31 - Rails and Firefly Membrane removed



Photograph No. 32 - Showing SFS with sheathing boards removed



----- END OF REPORT -----



Facade Testing



Onsite Testing




UL Mark Certification



Window & Door Testing

UL International (UK) Limited is an independent UKAS accredited testing laboratory and certification body. We provide a comprehensive range of services to the building and construction industries, either onsite or at our own state-of-the-art test laboratory in Telford, Shropshire, in the heart of industrial England.

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