

## Technical Report

**Report No** R15575

**Product Tested:** Veka Imagine Patio Door

**Test Conducted for:** MI Products  
4020 Siskin Parkway East  
Middlemarch Business Park  
Coventry  
CV3 4SU

**Standard Specified:** PAS 24:2012 – Enhanced security performance requirements for door assemblies

**Project No:** 15575

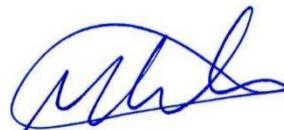
**Date of Test:** 15<sup>th</sup>, 16<sup>th</sup> & 17<sup>th</sup> December 2015

**Test Conducted at:** Wintech Engineering Limited  
Halesfield 2  
Telford  
Shropshire  
TF7 4QH

**Test Conducted by:** A Crutchley Senior Laboratory Engineer  
D Adams Laboratory Engineer

**Report Compiled by:** S Ward  
Laboratory Apprentice

**Authorised by:** M Wass  
Technical Director



This report is copyright and contains 19 numbered pages

**REPRODUCTION OF THIS DOCUMENT IN WHOLE OR ANY PART THEREOF MUST NOT BE MADE WITHOUT PRIOR WRITTEN PERMISSION FROM WINTECH ENGINEERING LTD.**

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.

**Contents**

	Page No.
1. Introduction	3
2. Summary of Test Results	3
3. Description of Test Sample	4
4. Test Arrangement	5
5. Test Procedures	6
6. Test Results	8
7. System Drawings	13

## 1. Introduction

This report describes testing of a door sample conducted at the test laboratory of Wintech Engineering Ltd on behalf of MI Products in order to determine compliance with PAS 24:2012.

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

## 2. Summary of Results

The following summarises the results of testing carried out, in accordance with PAS 24:2012

<b>Test Description</b>	<b>Result</b>
A.3 – Security hardware & cylinder test	<i>Pass</i>
B.4.6 – Manual check test	<i>Pass</i>
B.4.4.3 – Mechanical infill test	<i>Pass</i>
B.4.3 – Manipulation test	<i>Pass</i>
B.4.5 – Mechanical loading test	<i>Pass</i>
B.4.4.2 – Manual infill test	<i>Pass</i>
B.4.4.4 – Manual cutting test	<i>Pass</i>
B.4.8 – Soft body impact test	<i>Pass</i>
B.4.9 – Hard body impact test	<i>Pass</i>
Overall Classification in accordance with PAS 24:2012	<i>DK</i>

More comprehensive details are reported in Section 6.

**Note:** These results are valid only for the conditions under which the test was conducted

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

### 3. Description of Test Sample

<b>Name of System</b>	Veka Halo Imagine Patio Doors with Low Threshold
<b>Manufactured By</b>	VEKA Technical Department
<b>Sample Size</b>	3000x2400
<b>Material Type</b>	PVC Frame and Sashes Aluminium Low Threshold 2002324 Steel Reinforcing's
<b>Joining Method</b>	Mitre and welded top frame and sashes Mechanical joint btm frame to threshold
<b>Locking Points</b>	Mila Fearless 6 point lock to slider 108305 Mila 3 point mush cam espag to interlock 109000 MI Secure 4 Life interlock protectors and corner bolt 2002333/109020
<b>Glass Makeup &amp; Thickness</b>	28mm Clear 4/20/4 toughened glass
<b>Gaskets</b>	Co-extruded seals to all glazing VSW401G aluminium thresh brush seal
<b>Hardware Used</b>	Mila – lock, handle and cylinder (30-30) 108305/108908/4040ETMNF6 MI Products – top corner bolt, aluminium interlock and protectors 109020/2002333 Mila – handle to interlock mechanism 109048
<b>Drainage</b>	2 slots bottom of each sash 5 x 25 1 centre of threshold 30 x 30 1 each end of connecting blocks
<b>Sealants Used</b>	Low modulus sealant around ends of connecting blocks at threshold frame joints
<b>Sub Frame Fixings</b>	5 x 80mm screw fixing for frame 4.3 x 25 screws fixing for threshold
<b>Hardware Fixings</b>	4.3 x 40 gimlet point screws for lock 3.9 x 45 drill point for strikers 3.9 x 32 drill point for interlock protectors

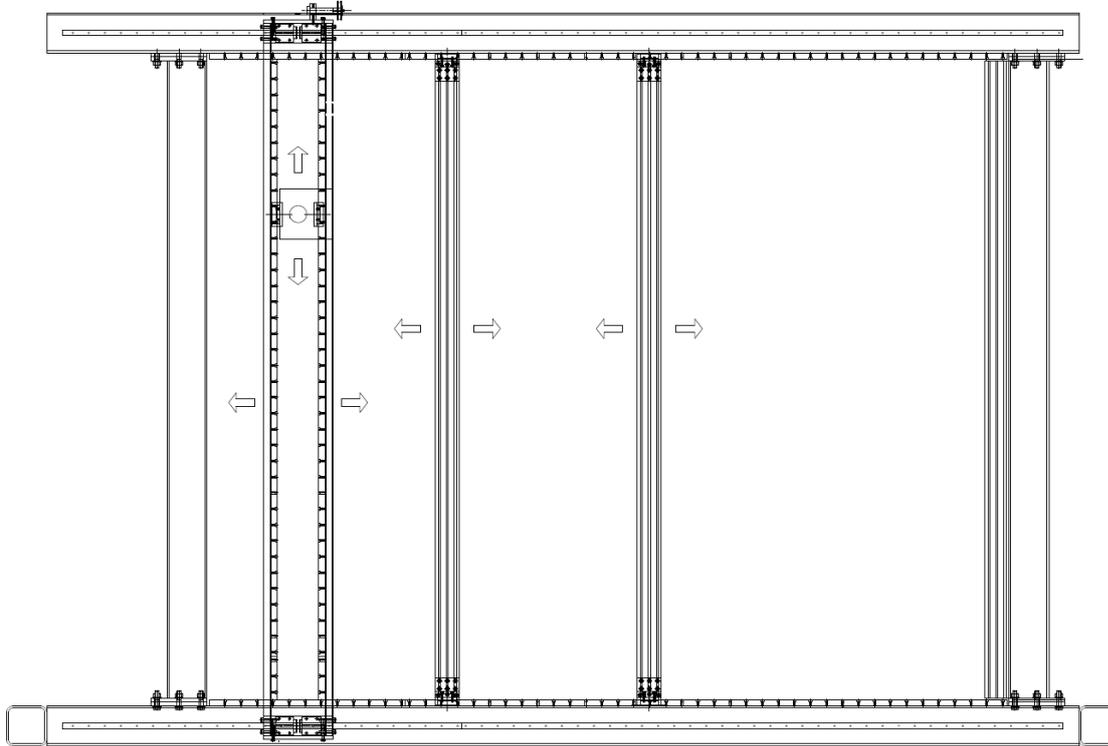
See Section 7 for test sample drawings as supplied by MI Products.

## 4. Test Arrangement

### 4.1 Test Rig

The test sample was supplied mounted in 100 x 75 mm timber sub-frame in accordance with manufacturer's installation requirements. It was fitted into the test rig, shown below which was constructed to meet the requirements of the test specification and was fitted plumb, square and without twist or bends.

Figure 1 – Test rig used for testing



## 5. Test Procedures

### 5.1 B.4.3 – Manipulation test

The objective of this test was to highlight any inherent vulnerability in the design of the door which, from the outside, would permit entry by the hardware being operated, released or disengaged when tested using all of group A tools from Section A.2.1 of PAS 24:2012 and, where applicable, tools specified in A.2.2.3, A.2.2.5 and A.2.2.6 in group B from Section A.2.2 of PAS 24:2012. No single attack technique was used for more than 3 minutes.

### 5.2 B.4.4.3 – Mechanical infill test

The objective of this test was to assess the ability of the infill to withstand a specified sequence of loading without gaining entry through the sample. The loads and loading sequence were in accordance with Section B.4.4.3 of PAS 24:2012.

### 5.3 B.4.4.2 – Manual infill test

The objective of this test was to assess the vulnerabilities of the infill, including gaskets and beading, using the tools described in section A.2.1 & A.2.2 of PAS 24:2012 for a maximum period of 3 minutes.

### 5.4 B.4.4.4 – Manual cutting test

The objective of this test was to cut an aperture in the infill or fabric of the door leaf in order to gain entry using the tools described in section A.2.1.3, A.2.1.4, A.2.2.1 and A.2.2.2 for a maximum period of 3 minutes.

### 5.5 B.4.5 – Mechanical loading test

The objective of this test was to assess the ability of the sample to withstand a specified sequence of loading without gaining entry through the sample. The loads and loading sequence were in accordance with Section B.4.5 of PAS 24:2012.

### 5.6 B.4.6 – Manual check test

The objective of this test was to assess any vulnerabilities of the sample that are not covered by the standard loading cases assessed in the mechanical loading test B.4.5. The tools described in Section B.4.6.2 of PAS 24:2012 were used for a maximum period of 15 minutes in an attempt to gain entry through the sample.

### 5.7 B.4.8 – Soft body impact test

The objective of this test was to assess the ability of the sample to resist impacts using a soft body impactor as shown in Figure B.10 of PAS 24:2012 and at various impact locations specified in Section B.4.8.2 of PAS 24:2012.

### 5.8 B.4.9 – Hard body impact test

The objective of this test was to assess the hardware, infill medium and its retention system to hard body impacts using the impactor as shown in Figure B.11 of PAS 24:2012. Impacts were conducted at various locations specified in Section B.4.9.2 of PAS 24:2012.

### 5.9 A.3 – Security hardware & cylinder test

The objective of this test was to assess the lock and cylinder and its resistance to manual attack when using the tools as described in Section A.2 of PAS 24:2012. The test was broken in to 2 parts as follows:

Part 1 – the hardware was attacked for a total of 3 minutes which consisted of the following activities

- i. Attempts to remove, dislodge or otherwise gain access to the cylinder and lock by attacking any protective item

- ii. Attempts to break or defeat the cylinder by applying a twisting or bending force
- iii. Attempts to operate any accessible mechanism in order to gain entry

Part 2 – the hardware was attacked for a total of 3 minutes which consisted of the following activities

- i. Attempts to remove, dislodge or otherwise gain access to the cylinder and lock by attacking any protective item
- ii. Attempts to screw self-cutting screws in to the exposed part of the cylinder in order to provide a suitable fixing force for activity iii.
- iii. Attempts to break and defeat the cylinder by applying a nominally axial force to the screw using a hooked head crowbar attachment
- iv. Attempts to operate any accessible mechanism in order to gain entry

## 6. Test Results

### 6.1 Lab Temperature

The temperature measured inside the laboratory during the test was: **22.5 °C**

Note The test samples were stored in a non-destructive environment at a temperature of 15 – 30°C and a r.h. of 25 – 75 % for a minimum of 24 hours, testing was also conducted at those conditions. Prior to testing, the door was closed and locked from the outside and any keys were removed.

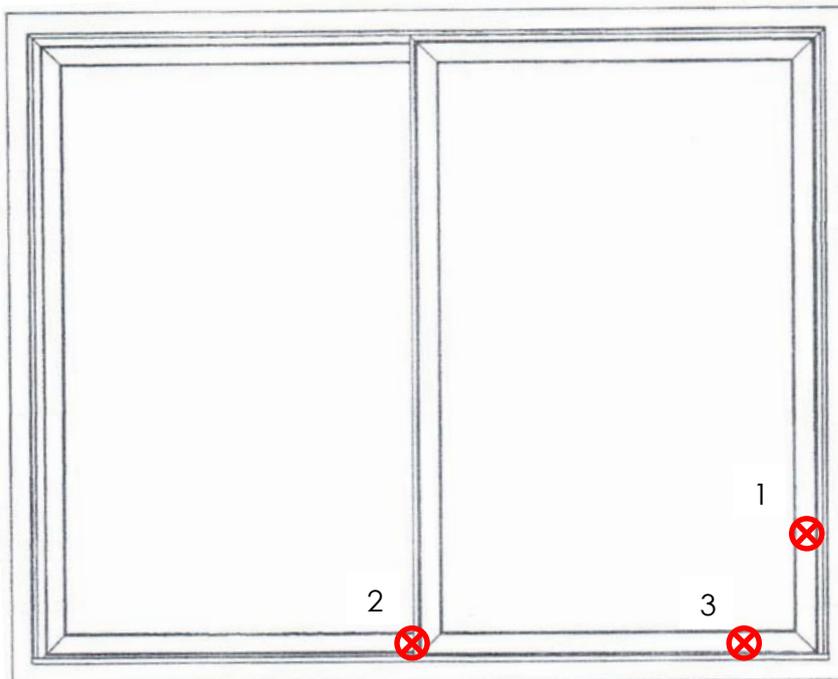
### 6.2 B.4.3 – Manipulation test

Attempts were made from the external face to operate, release and disengage the system hardware in order to gain entry through the sample in accordance with Section B.4.3 of PAS 24:2012. The results are as follows:

Table 1 – Manipulation test

Location	Tools Used	Method	Time
1	Paint Scraper	Used the tools to try and force the sash open by levering the frame.	03:00
2	Paint Scraper	Used the tools to try and force the two sashes apart by levering between them.	03:00
3	Paint Scraper	Used the tools to try and force the sash open by levering of the frame or lifting the rollers out of the track.	03:00

Figure 2 – Attack locations



### 6.3 B.4.4.3 – Mechanical infill test

A series of loads were applied to the external face of the infill as defined in Section B.4.4.3 of PAS 24:2012. A parallel-to-plane load of 2.0kN was applied and held for 8-12 seconds at each corner of the infill.

No entry was gained during loading to the infill and as such the product has passed this part of the test.

## 6.4 B.4.4.2 – Manual infill test

Attempts were made from the external face to remove gaskets and beading in order to gain access to and remove the infill using tools A.2.2.2 & A.2.2.3 in accordance with Section B.4.4.2 of PAS 24:2012.

No entry was gained during this test.

## 6.5 B.4.4.4 – Manual cutting test

Attempts were made from the external face to cut an aperture in the infill or fabric of the door leaf in order to gain access using tools as described in section A.2.1.3, A.2.1.4, A.2.2.1 and A.2.2.2 of PAS 24:2012.

No entry was gained during this test.

## 6.6 B.4.5 – Mechanical loading test

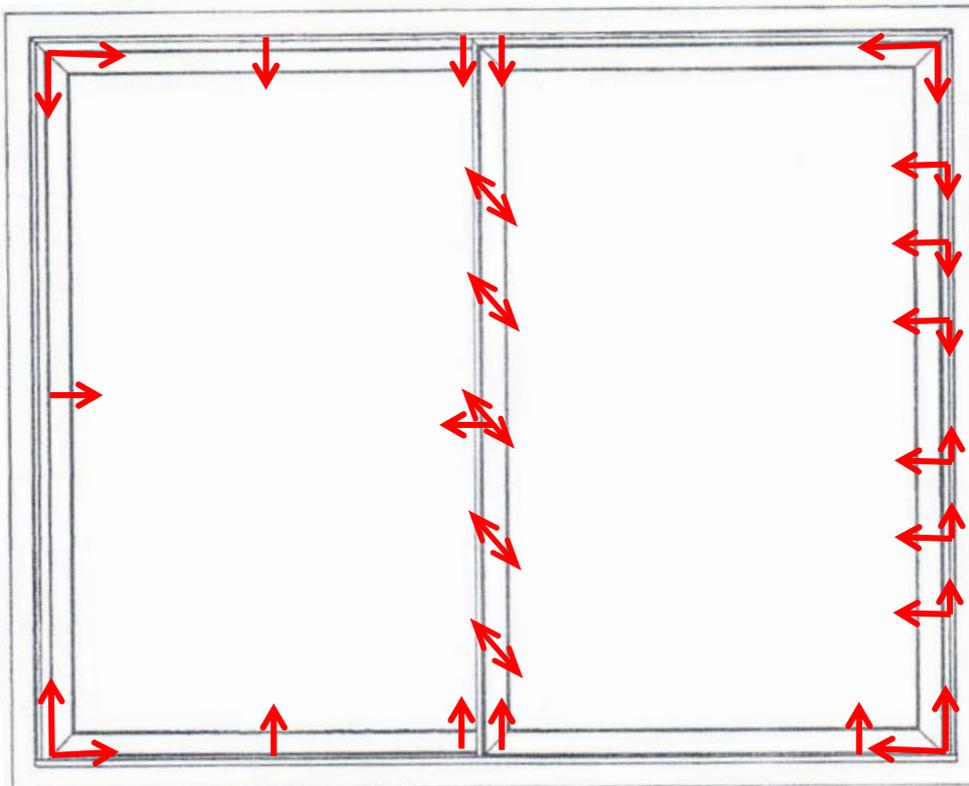
A series of loads were applied to the internal face of the sample as defined in Section B.4.5 of PAS 24:2012. This was conducted at each loading point and the results are as follows:

Table 2 – Mechanical Loading

Loading Point	Parallel-to-plane Load		Perpendicular-to-plane Load		Result
	Load	Direction	Load	Direction	
1) Top Corner / Shootbolt	4.5	←	1.5	N.A	Pass
1) Top Corner / Shootbolt	1.5	↓	4.5	N.A	Pass
1) Top Corner / Shootbolt	1.5	←	4.5	N.A	Pass
2) Hook	1.5	←	4.5	N.A	Pass
2) Hook	1.5	↓	4.5	N.A	Pass
2) Hook	4.5	←	N.A	N.A	Pass
3) Hook	1.5	←	4.5	N.A	Pass
3) Hook	1.5	↓	4.5	N.A	Pass
3) Hook	4.5	←	N.A	N.A	Pass
4) Hook	1.5	←	4.5	N.A	Pass
4) Hook	1.5	↓	4.5	N.A	Pass
4) Hook	4.5	←	N.A	N.A	Pass
5) Hook	1.5	←	4.5	N.A	Pass
5) Hook	1.5	↓	4.5	N.A	Pass
5) Hook	4.5	←	N.A	N.A	Pass
6) Hook	1.5	←	4.5	N.A	Pass
6) Hook	1.5	↓	4.5	N.A	Pass
6) Hook	4.5	←	N.A	N.A	Pass
7) Hook	1.5	←	4.5	N.A	Pass
7) Hook	1.5	↓	4.5	N.A	Pass
7) Hook	4.5	←	N.A	N.A	Pass
8) Bottom Corner	4.5	←	1.5	N.A	Pass
8) Bottom Corner	1.5	↑	4.5	N.A	Pass
9) Roller	4.5	↑	1.5	N.A	Pass
10) Bottom Corner / Roller	4.5	↑	1.5	N.A	Pass
10) Bottom Corner / Roller	1.5	↑	4.5	N.A	Pass
11) Bottom Corner	1.5	↑	4.5	N.A	Pass

12) Interlock	4.5	↓	4.5	↓	Pass
13) 500mm continuous interlock	4.5	↓	4.5	↓	Pass
14) Centre of the fixed pain	1.5	←	4.5	N.A	Pass
15) Interlock	4.5	↓	4.5	↓	Pass
16) 500mm continuous interlock	4.5	↓	4.5	↓	Pass
17) Interlock	4.5	↓	4.5	↓	Pass
18) Top Corner	4.5	↓	4.5	↓	Pass
18) Top Corner	1.5	↓	4.5	N.A	Pass
19) Top Corner	1.5	↓	4.5	N.A	Pass
20) Centre fixed pain	1.5	↓	4.5	N.A	Pass
21) Top Corner	1.5	↓	4.5	N.A	Pass
21) Top Corner	1.5	→	4.5	N.A	Pass
22) Centre fixed pain	1.5	→	4.5	N.A	Pass
23) Bottom Corner	1.5	↑	4.5	N.A	Pass
23) Bottom Corner	1.5	→	4.5	N.A	Pass
24) Centre fixed pain	1.5	↑	4.5	N.A	Pass

Figure 3 – Loading points



## 6.7 B.4.6 – Manual check test

Attempts were made from the external face to gain entry through the sample by attacking those areas that were not tested during the mechanical loading test B.4.5. The overall attack time was limited to 15 minutes with no single attack technique being used for more than 3 minutes.

No entry could be gained during this test.

#### **6.8 A.3 – Security Hardware & Cylinder Test**

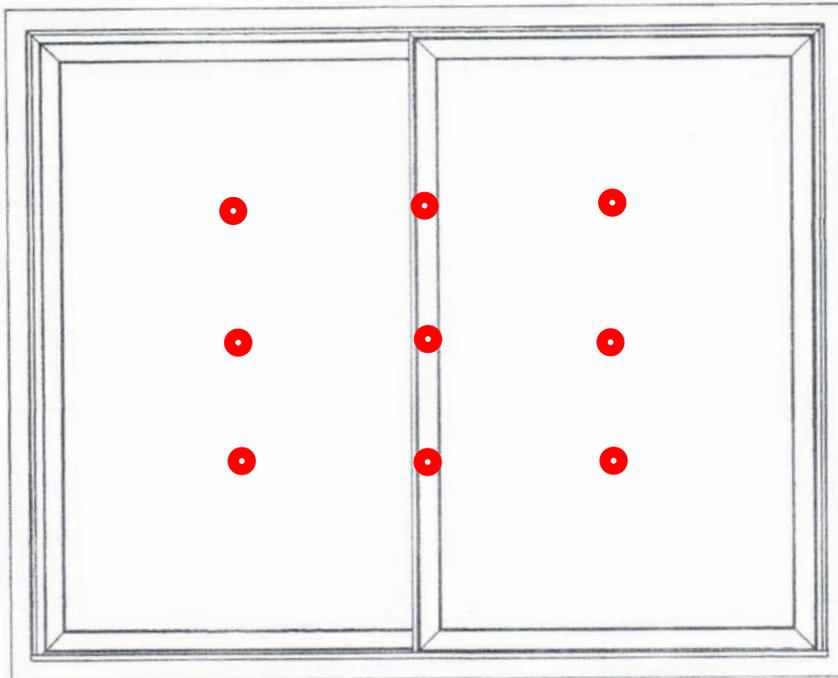
Attempts were made from the external face to operate, release and disengage the system hardware in order to gain entry through the sample in accordance with Section A.3 of PAS 24:2012.

No entry was gained during the attack time, and as such the product has passed this part of the test.

#### **6.9 B.4.8 – Soft body impact test**

The test sample was subject to soft body impacts in 3 locations on the external face as shown in Figure 4. Each of the 3 locations was subject to 3 impacts from a drop height of 800mm, following which no damage was observed.

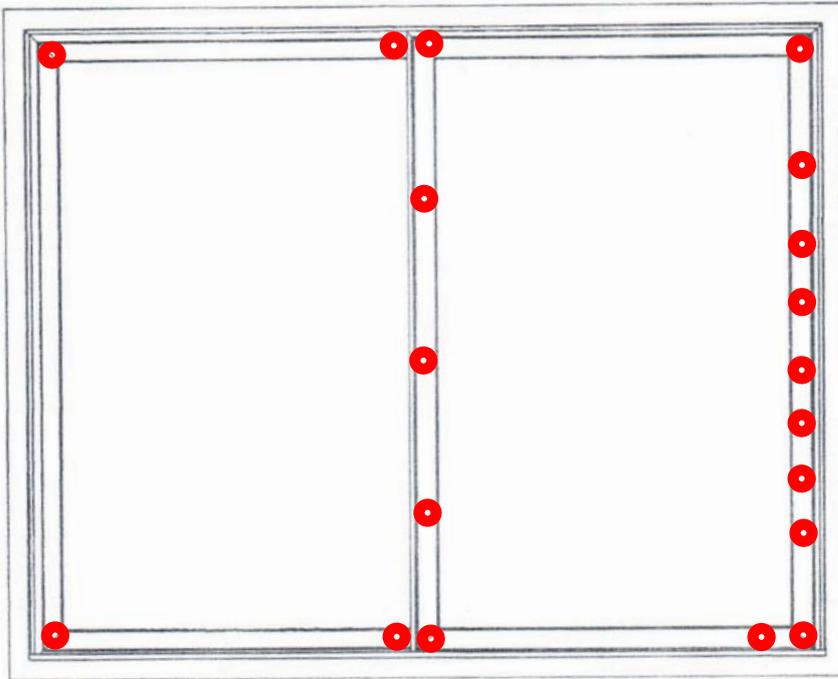
Figure 4 – Impact locations



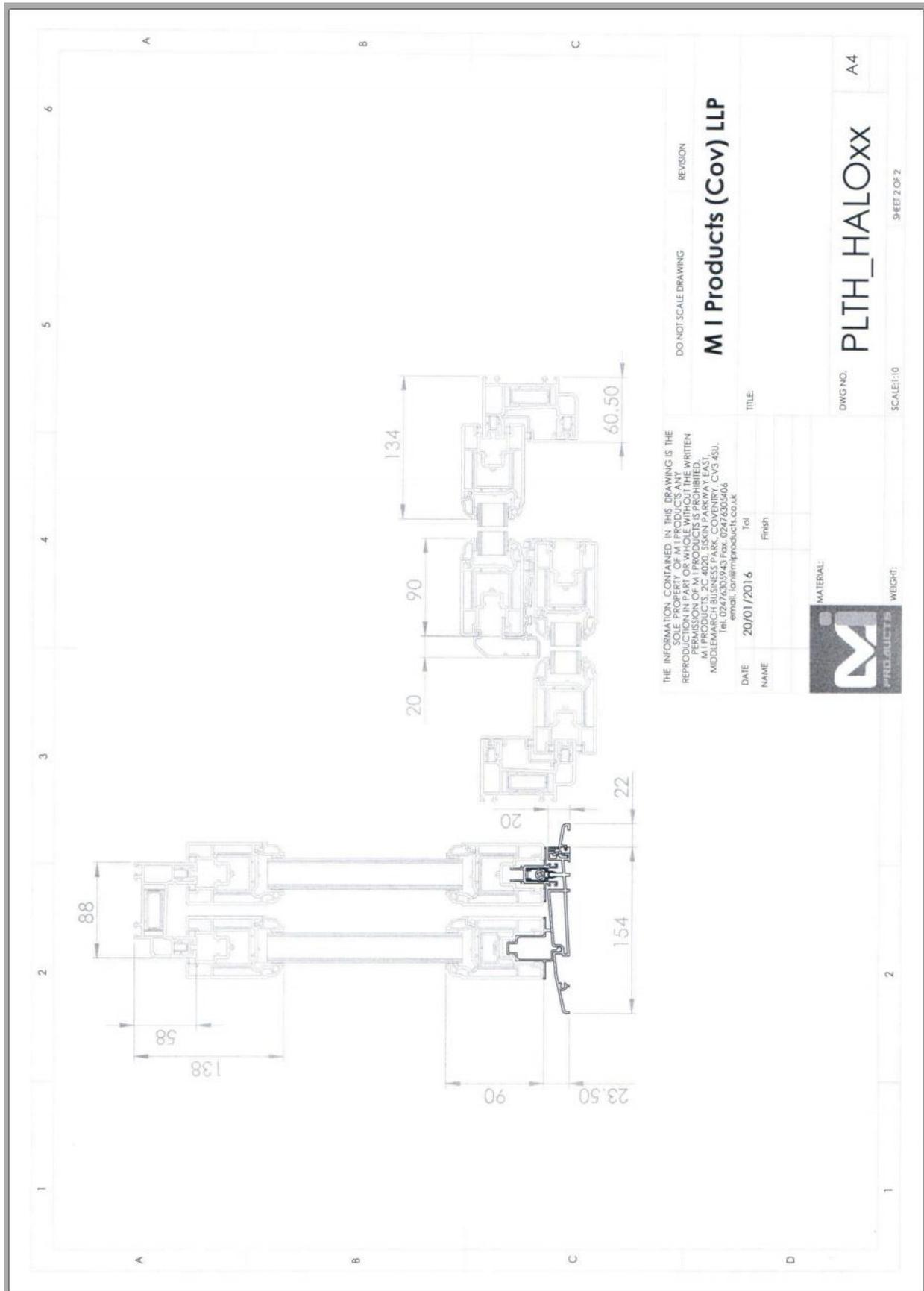
#### **6.10 B.4.9 – Hard body impact test**

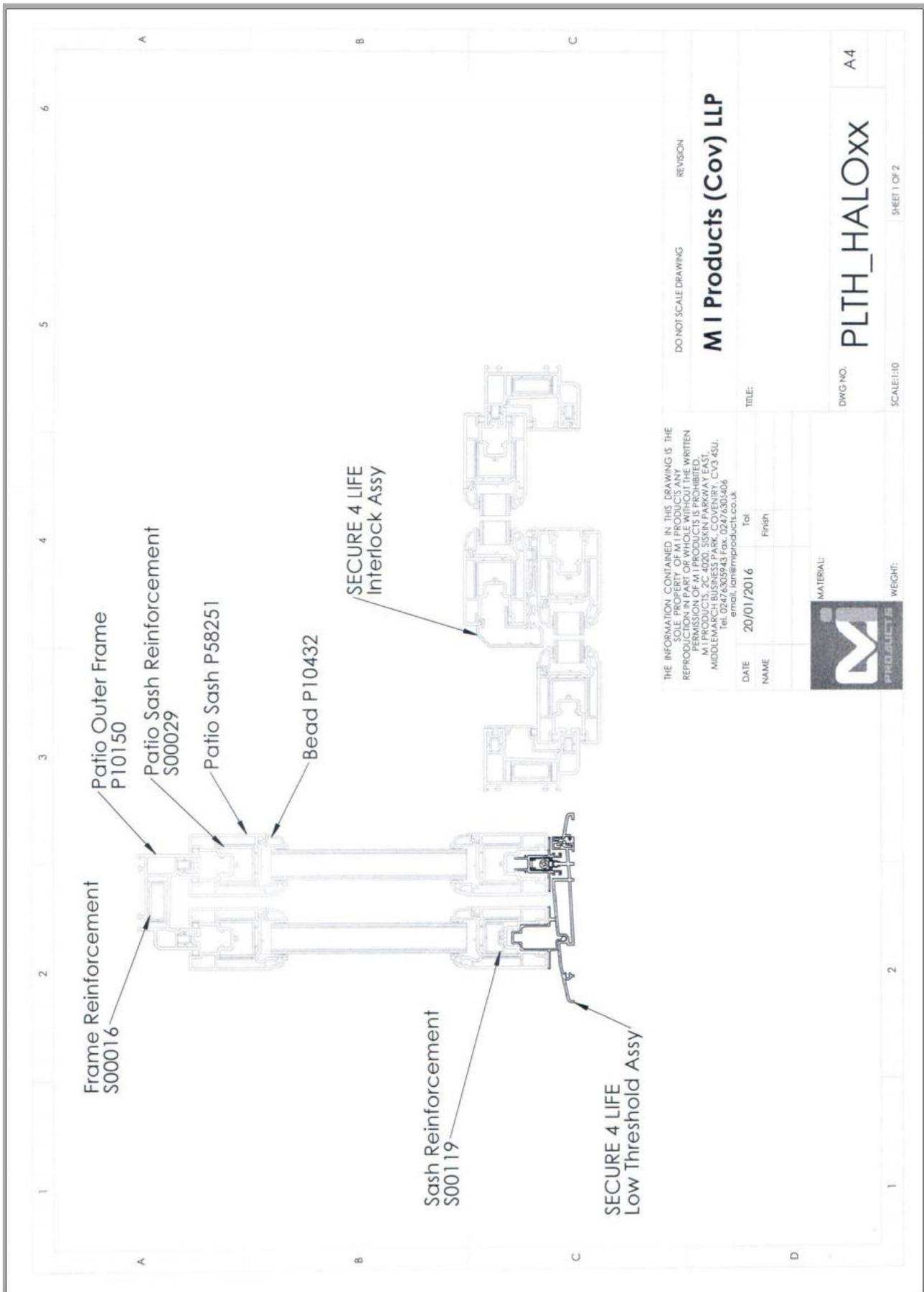
The test sample was subject to hard body impacts on the external face as shown in Figure 5. Each of the impact locations was subject to 3 impacts from a drop height of 165 mm following which no entry was gained through the sample.

Figure 5 – Impact locations



## 7. System Drawings





THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF M I PRODUCTS ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF M I PRODUCTS IS PROHIBITED.  
M I PRODUCTS, 2C, 4000, SISKIN PARKWAY EAST, MIDDLEMARCH BUSINESS PARK, COVENTRY, CV3 4SU.  
Tel: 02476 339931 Fax: 02476 339936 email: iam@miproducts.co.uk

DO NOT SCALE DRAWING  
**M I Products (Cov) LLP**

TITLE:

DATE

20/01/2016

NAME

Tot

Finish

MATERIAL:



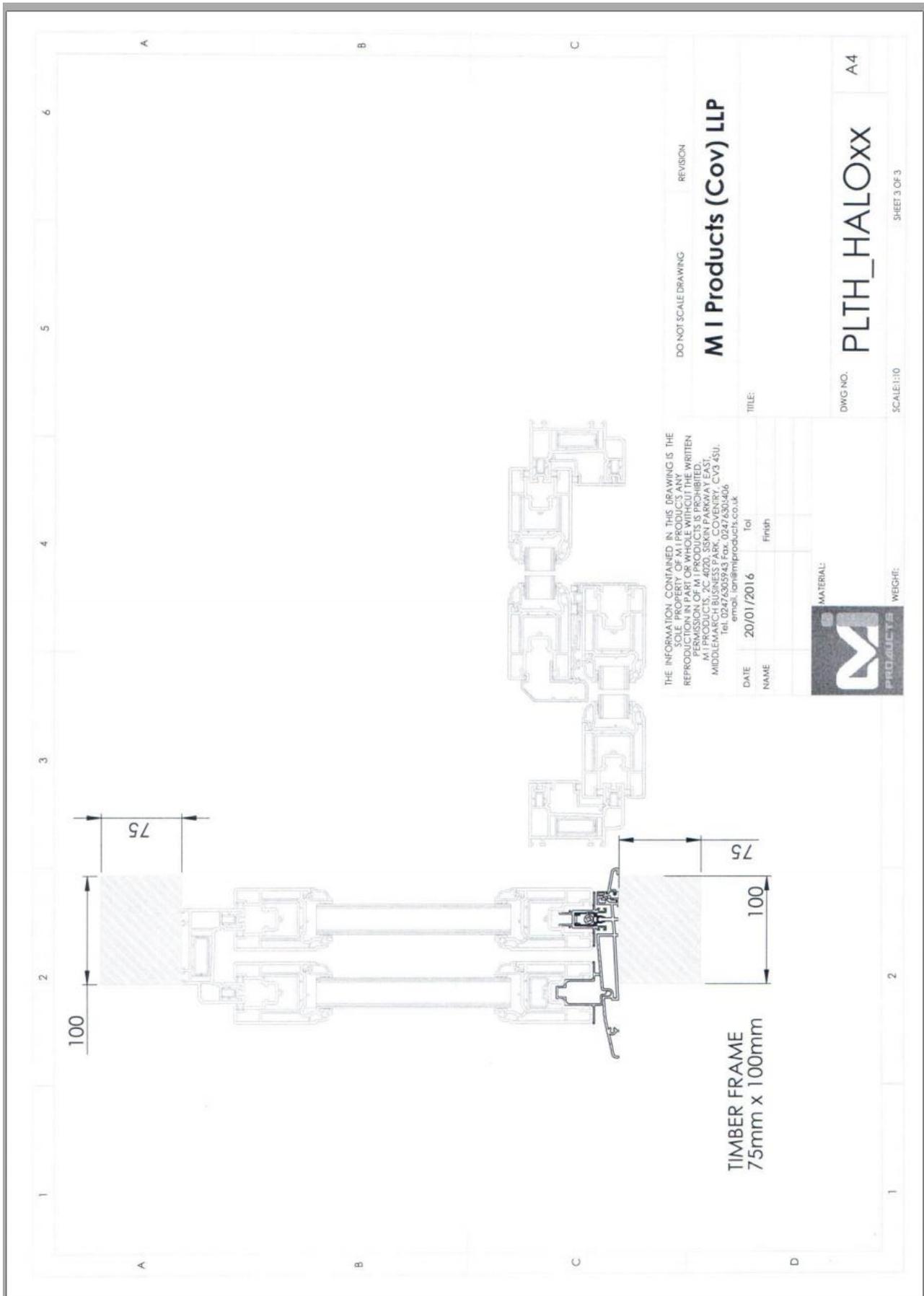
DWG NO. **PLTH\_HALOXX**

A4

SHEET 1 OF 2

SCALE: 1:10

WEIGHT:



THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF M I PRODUCTS ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF M I PRODUCTS IS PROHIBITED.  
M I PRODUCTS, 1500 WILKINS PARKWAY, EAST, MIDDLEMARCH BUSINESS PARK, COV9 4SU.  
Tel: 02476305943 Fax: 02476301406 email: iam@miproducts.co.uk

DATE	20/01/2016	Toi
NAME		Finish

MATERIAL:  WEIGHT:

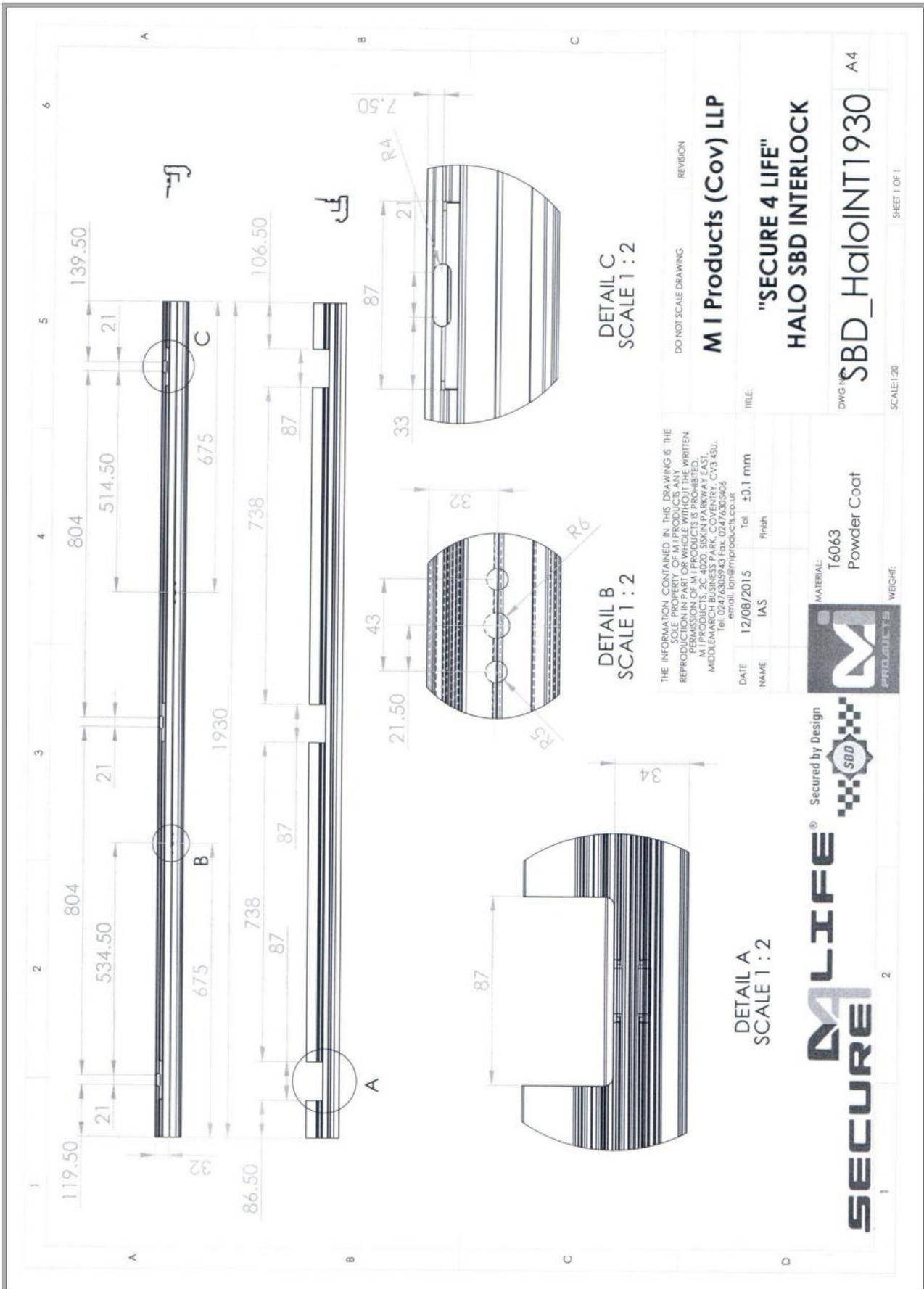
DO NOT SCALE DRAWING REVISION

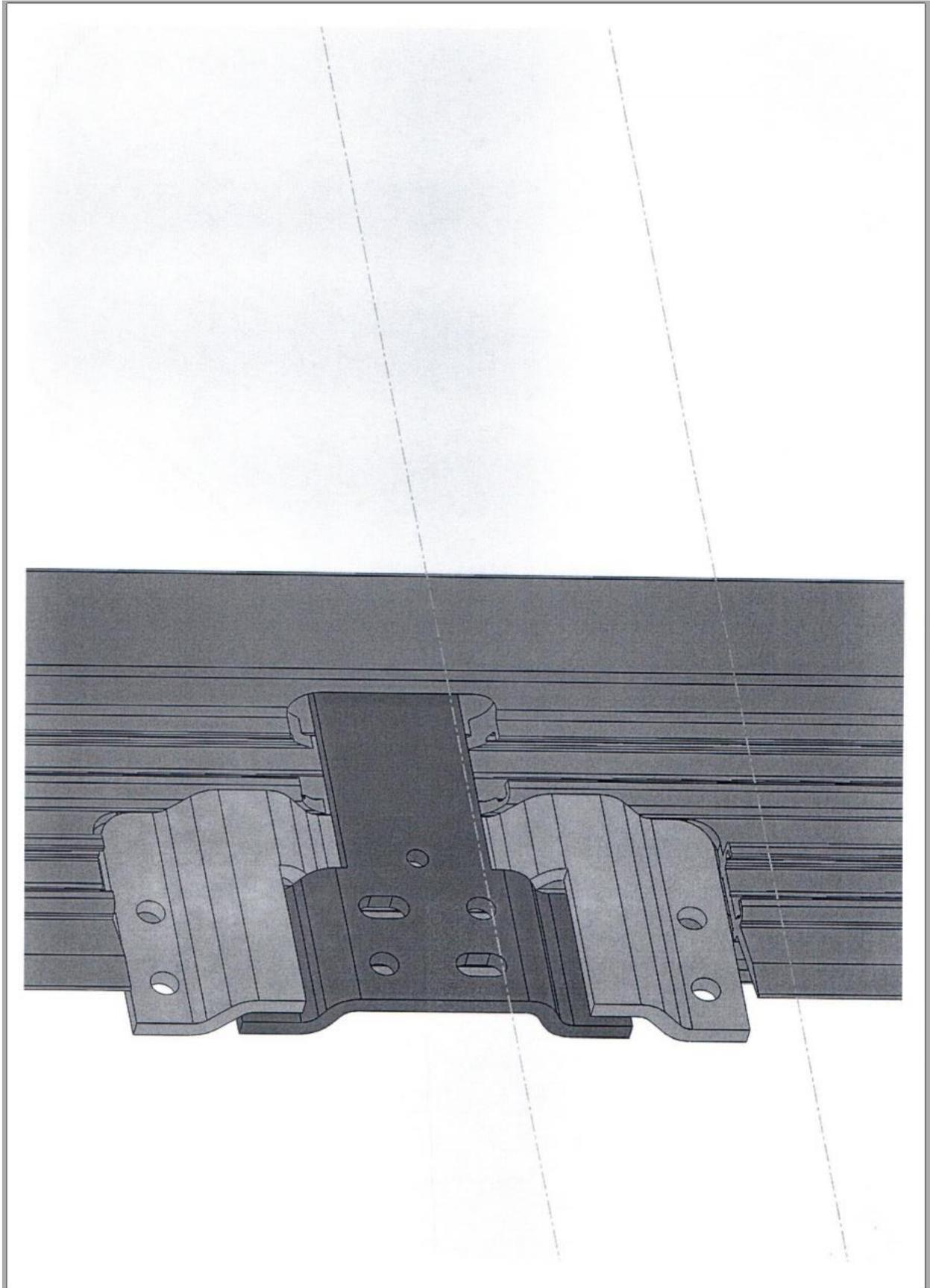
**M I Products (Cov) LLP**

DWG NO. **PLTH\_HALOXX** A4

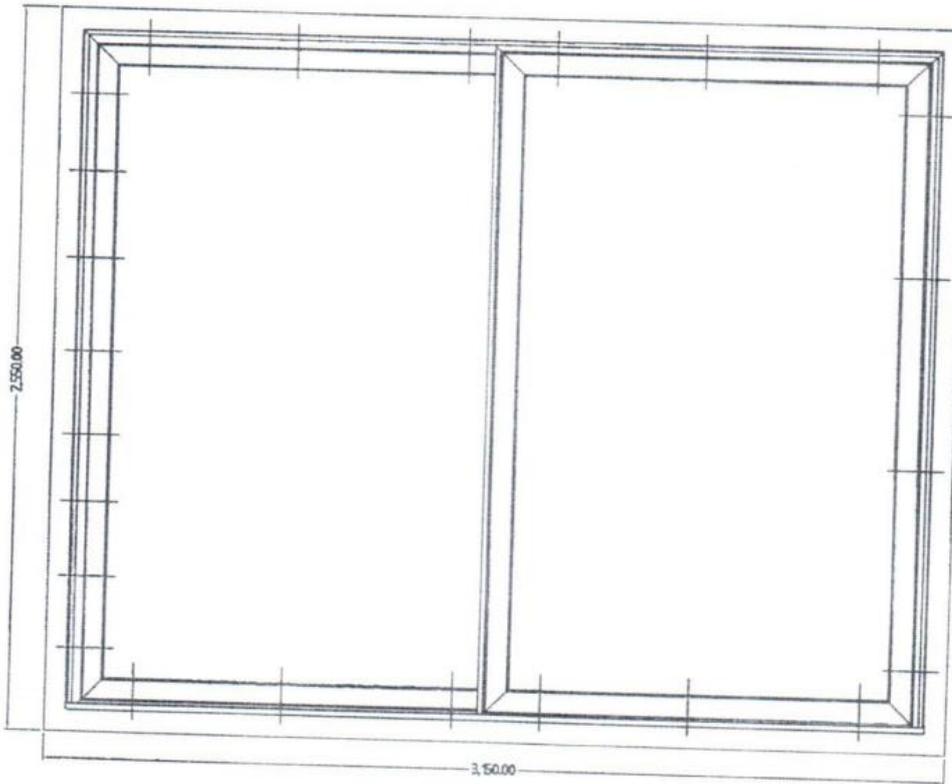
SCALE: 1:10 SHEET 3 OF 3



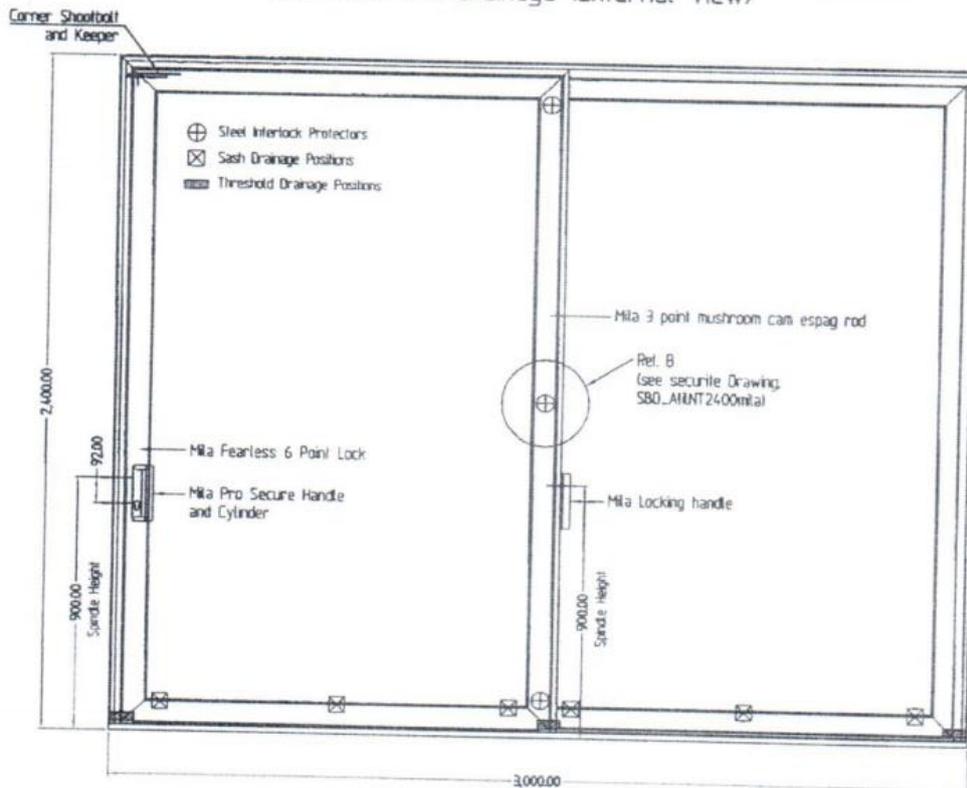




Subframe Fixing (Internal View)



Hardware and drainage (External View)



+++ -- End of Report -- +++