



Test Report No: WTH2104#1-2

Date: 14/01/2021

Testing of: Single top hung projecting casement window

Tested to: BS 6375-1:2015+A1:2016

Prepared for: Nico Manufacturing Ltd

This report shall not be reproduced except in full, (and then only as permitted by copyright laws), without written approval from The Window Test House.

Signatures used in this report are held on file.



**CONTENTS**

	Page No.
Authorisation	3
Test requested by	4
Details of test	5
Details of samples	6
Conclusion of tests	7
Test window drawing	8
Air permeability tables (first test)	9
Air permeability graphs (both tests)	10
Watertightness	11
Resistance to wind load	12
Air permeability tables (second test)	13
Deflection & leakage diagrams	14
Picture of test window	15

Test Report No. WTH2104#1-2	Page 3 of 15
Testing of Single top hung projecting casement window	
Testing to BS 6375-1:2015+A1:2016	



**AUTHORISATION**

Test completed by: D.Kury  
 Assisted by: M.Currie  
 Test witnessed by:

Report produced by: D.Kury Position: Senior Test Engineer

Signature: 

Date: 17/02/2021

For and on behalf of Nico Manufacturing Ltd Test Laboratory

Report authorised by: M. Franklin Position: Laboratory Manager

Signature: 

Date: 02/03/2021

For and on behalf of Nico Manufacturing Ltd Test Laboratory

Date of issue of report 02/03/2021

**Nico Manufacturing Ltd. Test Laboratory**

Oxford Road

Clacton-on-Sea

ESSEX

CO15 3TJ

Telephone +44 (0) 1255 422333

Fax +44 (0) 1255 432909



9458

Test Report No. WTH2104#1-2	Page 4 of 15
Testing of	Single top hung projecting casement window
Testing to	BS 6375-1:2015+A1:2016



**TEST REQUESTED BY**

**Origin of test request**

Company Name	Nico Manufacturing Ltd
Company Address	109 Oxford Road Clacton on Sea Essex CO15 3TJ
Contact	Ian Harrison
Contact position	Sales Director

**Quotation Details**

Quotation No.	WTH2104
Dated:	05/01/2021



**DETAILS OF TEST**

Description	Single top hung
Model / type	Projecting casement window
Make / Brand	Veka
Any special requirements	

Test Specification	BS 6375-1:2015+A1:2016 Performance of windows & doors. Classification for operation and strength characteristics
Date sample received	20/08/2020
Date testing started	14/01/2021
Date testing finished	15/01/2021
Job No.	WTH2104
Any special requirements	

**Air permeability tests in accordance with BS EN 1026: 2016** - A series of positive and negative pressures was applied to the test sample and the air leakage through the sample was measured at each pressure step. Pressure steps applied are defined on the air permeability test sheets in this report.

**Watertightness test in accordance with BS EN 1027: 2016** - A specified volume of water was constantly sprayed over the external face of the test sample while a positive pressure was applied, the positive pressure was increased at regular intervals. The test pressure, time and location of any water penetration was recorded. Pressure steps applied are defined on the watertightness test sheet in this report.

**Resistance to wind load test in accordance with BS EN 12211: 2016** - Positive and negative pressures P1, were applied to the test sample and the deflection under load was measured, a series of 50 cycles of positive and negative pressure P2 were applied and any damage caused was noted and a safety test consisting of a single cycle of positive and negative pressures P3 was applied and any damage caused was noted  
 $P2 = 0.5P1$ ,  $P3 = 1.5P1$ .  
 Values of these loads are defined on the Resistance to wind load test sheet in this report.

**Test specimen details**

Details of the samples construction and hardware components is based on information supplied by the test client, while these details have been checked and verified where possible WTH accepts no responsibility for the accuracy of details supplied.

Note : The test specimens were kept in the test laboratory for at least 12 hours at environmental conditions of between 10°C to 30°C, and 25% RH to 75% RH before each test was undertaken

The sample was mounted in a timber sub frame (nominal 100mm x 50mm in section) and sealed to the sub frame. The sample was mounted in the test rig without any twists or bends that might influence the test result.

**DETAILS OF SAMPLE**

Sample number	WTH2104A
Sample details	Single top hung projecting casement window
Fabricator	Consort Ltd
Material:	PVC-U Veka part nos;- 56mm Frame, part no 101160 75mm sculptured sash, part no 103264
Finish	White gloss
Lock & keeps	Lock - Nico Espag 750mm, part no 98820 Keeps - Nico cast zinc keeps, part no 9003
Hinges & protectors	Hinges - Nico standard 24" Hinge, part no 7940
Handle	Winlock, white, inline non-locking
Fixings	Hinges - 4.8 x 25mm pan head pierce point to sash and frame Lock - 4.3 x 25mm c'sk head pierce point Keeps - 4.3 x 25mm c'sk head pierce point Cavity wedges - 4.3 x 25mm c'sk head pierce point
Weather sealing	Co-extruded gaskets
Glass (or infill)	28mm Double glazed unit. 4-20-4mm.
Glazing system	Internally bead glazed with co-extruded gaskets. Shaped 28mm bead, part no 107.155
Sample dimensions	900mm (W) x 900mm (H)
Additional information	Cavity wedges - Veka part no 9898 & 9905



**CONCLUSIONS OF TEST**

Standard	Test Description	Test result
BS EN 1026: 2016	Air permeability of test sample (first test)	Class 4
BS EN 1027: 2016	Watertightness test	Class 9A
BS EN 12211: 2016	7.2 Deflection test	Class C4
BS EN 12211: 2016	7.3 Repeated pressure test	Pass
BS EN 1026: 2016	Air permeability of test sample (second test)	Class 4
BS EN 12211: 2016	Safety test	Pass

WTH are accredited to BS 6375-1:2015 Performance of windows and doors, part 1 Classification for weathertightness and guidance on selection and specification.

This standard refers to a dated version of BS EN 1027:2000, however WTH are accredited to the dated version BS EN 1027:2016

The purpose of the revision of this european standard is to clarify the test method, the changes relate to definitions and descriptions, they do not affect the methodology of the test or the results obtained.

Due to the minimal leakage from the test sample it was not possible to comply with BS EN 1026:2016 section 7.2.3 which states that "In no case shall the air permeability of the test chamber exceed 30% of the overall air permeability of the test specimen and the test chamber"

Exposure category classification in accordance with BS 6375-1:2015+a1:2016 (clauses 6, 7 & 8)

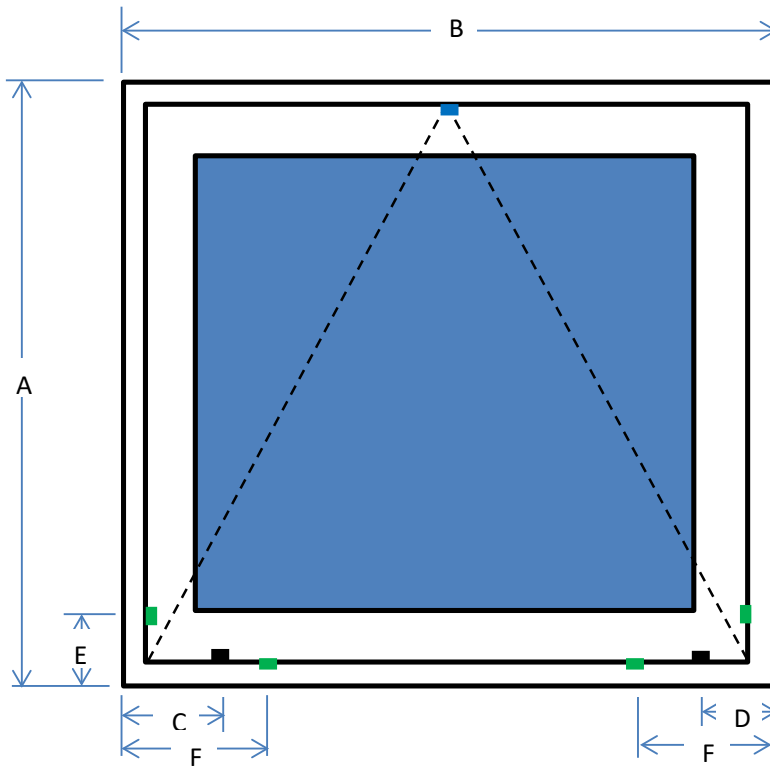
**Classification achieved:**

UK exposure category	Air permeability		Watertightness		Resistance to wind load			
	Class	Maximum test pressure (Pa)	Class	Maximum test pressure	Class	P1	P2	P3
1600	4	600	9A	600	C4	1600	800	2400

The results contained in this test report relate only to the particular sample/s tested as received and to the specific tests carried out as detailed within this report.



**TEST WINDOW DRAWING**



- Run up block
- Cavity wedge

- A = 900 mm
- B = 900 mm
- C = 125 mm
- D = 105 mm
- E = 100 mm
- F = 200 mm





**AIR PERMEABILITY: BS EN 1206: 2016**

Closing condition of window	Latched
Window surfaces clean and dry	Yes
Window opened and closed before applying pressure pulses	Yes
Three positive pressure pulses applied	Yes

Sample No	WTH2104A	Temperature	20°C	Humidity	34%RH	Date	14/01/2021
-----------	----------	-------------	------	----------	-------	------	------------

Table 1 - Air permeability with positive pressure (adjusted for laboratory conditions)

Pressure differential Pa	Air flow through test sample m <sup>3</sup> /h	Air flow per unit area of test sample m <sup>3</sup> /h/m <sup>2</sup>	Air flow per metre of opening joints m <sup>3</sup> /h/m
50	0.00	0.00	0.00
100	0.00	0.00	0.00
150	0.88	1.08	0.26
200	0.22	0.27	0.07
250	0.42	0.52	0.13
300	0.50	0.62	0.15
450	0.55	0.68	0.17
600	0.43	0.54	0.13

Window opened and closed before applying pressure pulses	Yes
Three negative pressure pulses applied	Yes

Table 2 - Air permeability with negative pressure (adjusted for laboratory conditions)

Pressure differential Pa	Air flow through test sample m <sup>3</sup> /h	Air flow per unit area of test sample m <sup>3</sup> /h/m <sup>2</sup>	Air flow per metre of opening joints m <sup>3</sup> /h/m
50	0.00	0.00	0.00
100	0.00	0.00	0.00
150	0.77	0.95	0.23
200	0.34	0.42	0.10
250	0.39	0.49	0.12
300	0.23	0.29	0.07
450	0.65	0.80	0.19
600	0.70	0.86	0.21

Table 3 - Air permeability averages with positive and negative pressures

Pressure differential Pa	Air flow per average unit area of test sample m <sup>3</sup> /h/m <sup>2</sup>	Air flow average per metre of opening joints m <sup>3</sup> /h/m
50	0.00	0.00
100	0.00	0.00
150	1.01	0.24
200	0.35	0.08
250	0.50	0.12
300	0.45	0.11
450	0.74	0.18
600	0.70	0.17

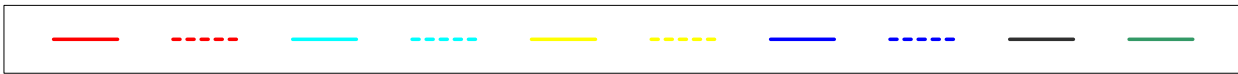
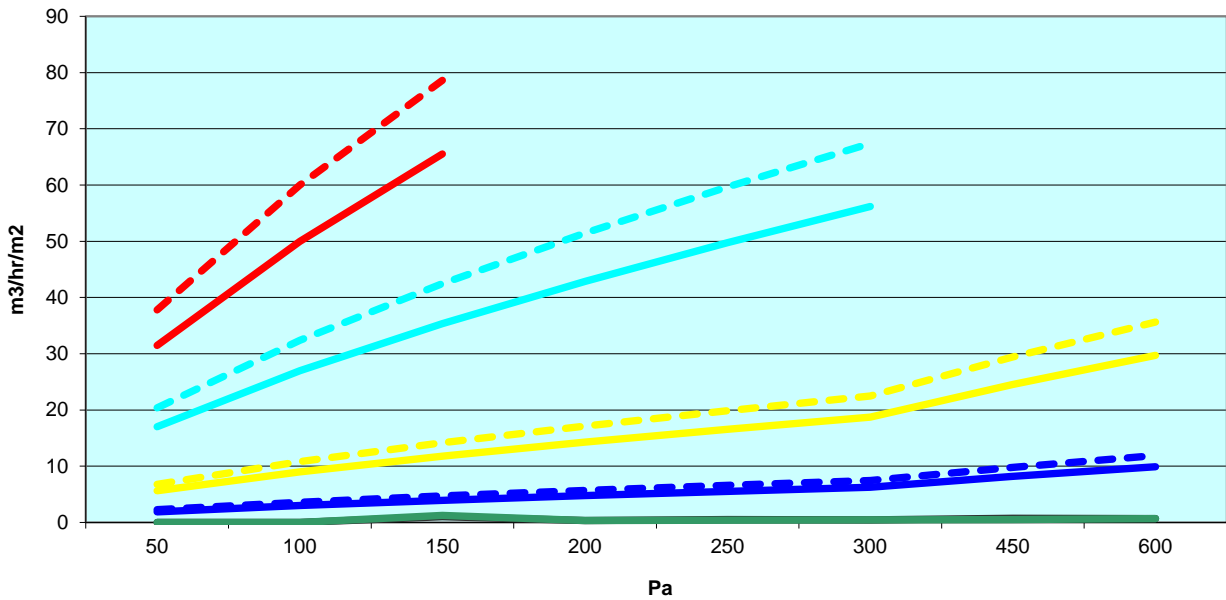
Total surface area of test sample (m <sup>2</sup> )
0.81

Total length of opening joints (m)
3.36

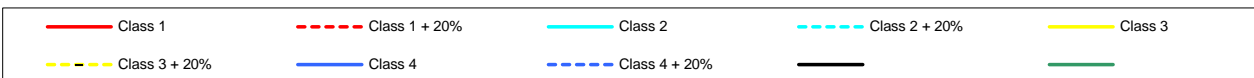
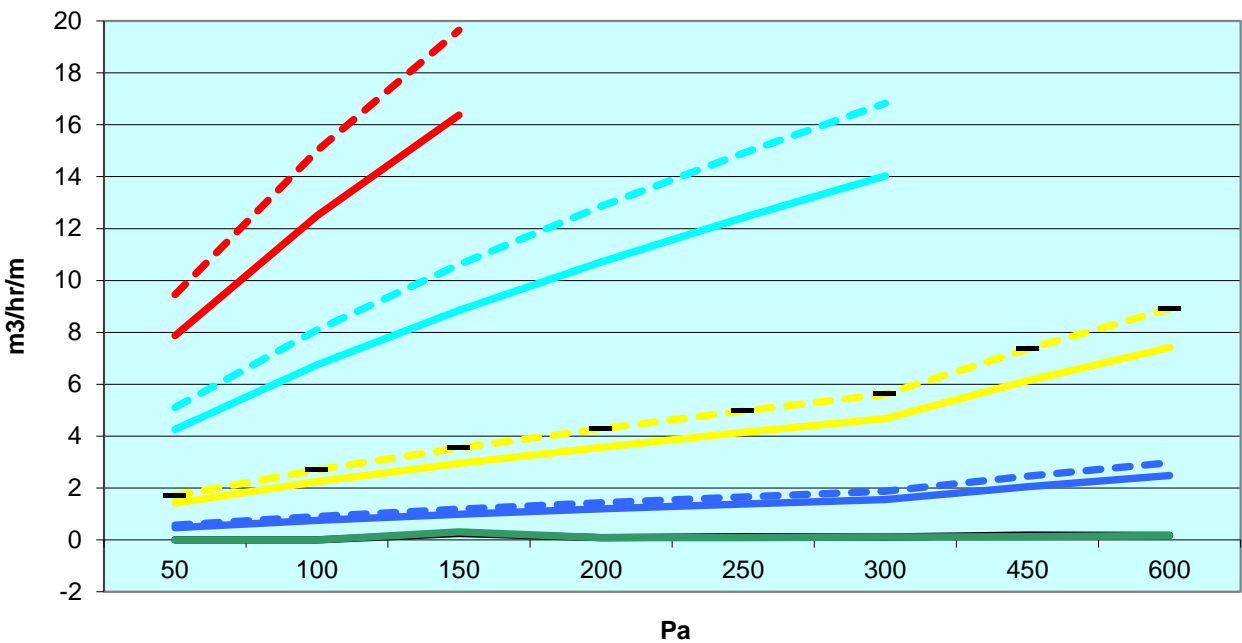


**AIR PERMEABILITY GRAPHS**

**Air permeability in relation to overall area  
(Average of positive & negative)**



**Air permeability in relation to opening lengths  
(Average of positive & negative)**



Test Report No. WTH2104#1-2	Page 11 of 15
Testing of Single top hung projecting casement window	
Testing to BS 6375-1:2015+A1:2016	



Sample No	WTH2104A	Temperature	21°C	Humidity	34%RH	Date	14/01/2021
-----------	----------	-------------	------	----------	-------	------	------------

**WATERTIGHTNESS: BS EN 1027: 2016**

**Watertightness data** (Test method 1A)

Maximum test pressure	600
Pressure pulses	660

(Pressure pulses should be maximum test pressure + 10% or 500Pa whichever is the greater)

Closing condition of window	Latched
Window surfaces clean and dry	Yes
Window opened and closed before applying pressure pulses	Yes
Three positive pressure pulses applied	Yes

Required air pressure (Pa)	Recorded air pressure	Required Spray duration (mins)	Recorded spray duration	Water Leaks	Position of leak (See also leakage diagram)	Time of leak min:sec
0	0	15 +1/-0	15 min	None		
50 +/-5%	51	5 +1/-0	5 min	None		
100 +/-5%	100	5 +1/-0	5 min	None		
150 +/-5%	151	5 +1/-0	5 min	None		
200 +/-5%	200	5 +1/-0	5 min	None		
250 +/-5%	250	5 +1/-0	5 min	None		
300 +/-5%	300	5 +1/-0	5 min	None		
450 +/-5%	450	5 +1/-0	5 min	None		
600 +/-5%	600	5 +1/-0	5 min	None		

**Laboratory Conditions**

Air pressure (mbar)	1018
Laboratory air temp. (°C)	21
Relative humidity (%)	34

Number of spray nozzles	3
Total flow rate (LPM)	6

**Classification**

Test pressure (Pa)	Classification		Spec.
	Test method A	Test method B	
0	1A	1B	15 min
50	2A	2B	C1+5 min
100	3A	3B	C2+5 min
150	4A	4B	C3+5 min
200	5A	5B	C4+5 min
250	6A	6B	C5+5 min
300	7A	7B	C6+5 min
450	8A	8B	C7+5 min
600	9A	9B	C8+5 min

Test Report No. WTH2104#1-2	Page 12 of 15
Testing of Single top hung projecting casement window	
Testing to BS 6375-1:2015+A1:2016	

Sample No	WTH2104A	Temperature	19°C	Humidity	36%RH	Date	15/01/2021
-----------	----------	-------------	------	----------	-------	------	------------

**RESISTANCE TO WIND LOAD: BS EN 12211: 2016**

Closing condition of window	Latched
Window surfaces clean and dry	Yes
Window opened and closed before applying pressure pulses	Yes
Three positive pressure pulses applied	Yes

**Deflection test: Positive pressure**

P1= 1600 Pa

Section being measured: Hinge side of sash	Deflection gauge readings (mm)				Measured Length	Relative deflection
	1	2	3	Net deflection		
3 pulses of 1760						
Pre-test reading	20.0	20.0	20.0	0.8	782	1/ 1040
Max reading	20.4	21.2	20.5			
Net deflection under load	0.4	1.2	0.5			
Residual reading	20.1	20.1	20.0			

**Deflection test: Negative pressure**

P1= 1600 Pa

Section being measured: Hinge side of sash	Deflection gauge readings (mm)				Measured Length	Relative deflection
	1	2	3	Net deflection		
3 pulses of 1760						
Pre-test reading	20.0	20.0	20.0	-0.8	782	1/ -920
Max reading	19.4	18.6	19.5			
Net deflection under load	-0.6	-1.4	-0.5			
Residual reading	20.0	20.0	20.0			

<b>Test conclusion:</b>	Worst case deflection	1/ -920	Classification	C
-------------------------	-----------------------	---------	----------------	---

**Cyclic repeated pressure test**

P2= 800 Pa

50 cycles +/- at 800 Pa	No damage or functioning defects	<b>Pass</b>
-------------------------	----------------------------------	-------------

**Safety test**

P3= 2400 Pa

1 cycle +/- at 2400 Pa	Sample remained closed with no parts becoming detached	<b>Pass</b>
------------------------	--	-------------

**Laboratory Conditions**

Air pressure	1031.0	mbar
Air temperature	19.0	°C
Relative humidity	36.0	%

**Classifications**

Wind load			
Class	P1	P2	P3
0	Not tested		
1	400	200	600
2	800	400	1200
3	1200	600	1800
4	1600	800	2400
5	2000	1000	3000

Deflection	
Class	Relative frontal deflection
A	≤ 1/150
B	≤ 1/200
C	≤ 1/300

Resistance to wind load			
Wind load class	Relative frontal deflection		
	A	B	C
1	A1	B1	C1
2	A2	B2	C2
3	A3	B3	C3
4	A4	B4	C4
5	A5	B5	C5



Sample No	WTH2104A	Temperature	19°C	Humidity	36%RH	Date	15/01/2021
-----------	----------	-------------	------	----------	-------	------	------------

**AIR PERMEABILITY: BS EN 1206: 2016**

Closing condition of window	Latched
Window surfaces clean and dry	Yes
Window opened and closed before applying pressure pulses	Yes
Three positive pressure pulses applied	Yes

Table 1 - Air permeability with positive pressure (adjusted for laboratory conditions)

Pressure differential Pa	Air flow through test sample m <sup>3</sup> /h	Air flow per unit area of test sample m <sup>3</sup> /h/m <sup>2</sup>	Air flow per metre of opening joints m <sup>3</sup> /h/m
50	0.00	0.00	0.00
100	0.00	0.00	0.00
150	1.27	1.56	0.38
200	0.17	0.21	0.05
250	0.17	0.21	0.05
300	0.24	0.29	0.07
450	0.14	0.18	0.04
600	0.40	0.49	0.12

Window opened and closed before applying pressure pulses	Yes
Three negative pressure pulses applied	Yes

Table 2 - Air permeability with negative pressure (adjusted for laboratory conditions)

Pressure differential Pa	Air flow through test sample m <sup>3</sup> /h	Air flow per unit area of test sample m <sup>3</sup> /h/m <sup>2</sup>	Air flow per metre of opening joints m <sup>3</sup> /h/m
50	0.00	0.00	0.00
100	0.00	0.00	0.00
150	0.77	0.95	0.23
200	0.42	0.52	0.12
250	0.44	0.54	0.13
300	0.49	0.61	0.15
450	0.67	0.83	0.20
600	0.73	0.90	0.22

Table 3 - Air permeability averages with positive and negative pressures

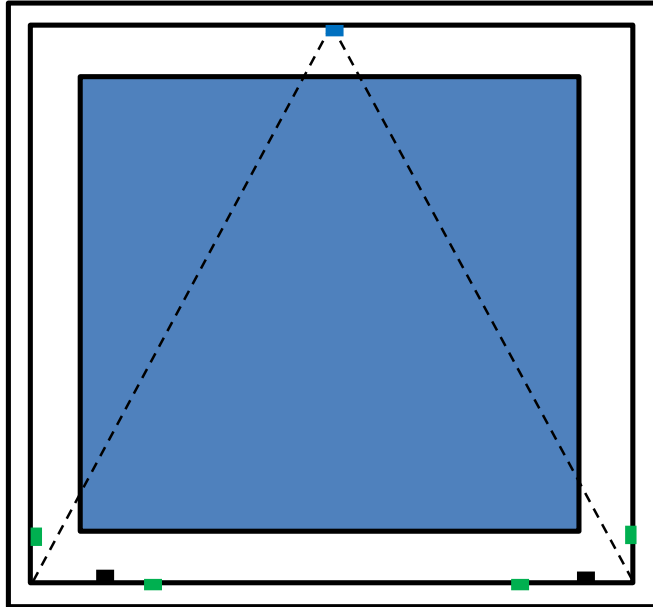
Pressure differential Pa	Air flow per average unit area of test sample m <sup>3</sup> /h/m <sup>2</sup>	Air flow average per metre of opening joints m <sup>3</sup> /h/m
50	0.00	0.00
100	0.00	0.00
150	1.26	0.30
200	0.37	0.09
250	0.38	0.09
300	0.45	0.11
450	0.50	0.12
600	0.69	0.17

Total surface area of test sample (m <sup>2</sup> )
0.81

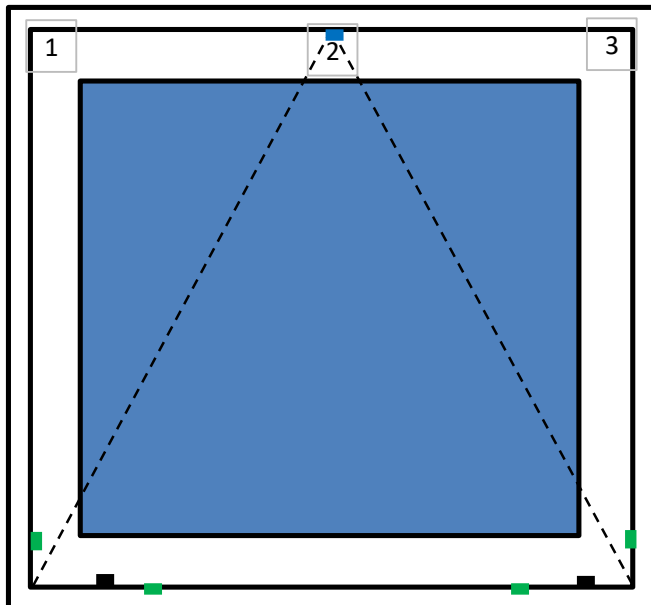
Total length of opening joints (m)
3.36



**Positions of water leakage and significant air leakage**



**Position of deflection measurement**



Test Report No. WTH2104#1-2	Page 15 of 15
Testing of Single top hung projecting casement window	
Testing to BS 6375-1:2015+A1:2016	



**PICTURE OF TEST WINDOW**



**END OF REPORT**