TEST REPORT

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TESTING
RvA L 406

Notified Body
NB 0960

Report number	**13.00255**
Date of test	**25 April 2013**
Date report	**08 May 2013**
Applicant	**Reynaers Aluminium NV** **Oude Liersebaan 266** **B-2570 Duffel** **Belgium**
Project number applicant	**TC13_039 Jovis Civic Tower Center Nigeria**
Size report	This report consists of 12 pages (including appendices)
Subject	Determination of the ● Air permeability according EN 12153 ● Watertightness according EN 12155 ● Resistance to wind load according EN 12179 of an aluminium curtain walling with sizes W x H: 2050 x 4110 mm constructed from the profile system: CW50 SC
Inspector	R. de Graaff
Technical manager	J.M. van Diggelen
Conclusion	The curtain walling of Reynaers meets the classification as hereby mentioned:

	Grade	
● Air permeability according EN 12152	**A4**	
● Watertightness according EN 12154	**RE 900**	
● Resistance to wind load according EN 13116	**1600**	**Pa**

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1. PURPOSE OF THE TEST

SKG was ordered by Reynaers - Duffel to perform various tests on a curtain walling, to classify the

- Air permeability
- Watertightness
- Resistance to wind load

according the relevant European Standards.
The test are performed as an Initial Type Testing (ITT) based on EN 13830:2003
SKG is Notified Body (NB 0960) for certifying and testing curtain walling.

2. METHOD OF INVESTIGATION

The construction was deliverd for testing on: **25 April 2013**
SKG has verified all details of the construction with reference to the supplied drawings.
The testobject was placed in the test rig and tested for:

Air permeability
Test according:
EN 12153:2000 Curtain walling - Air permeability - Test method
Classification according:
EN 12152:2002 Curtain walling - Air permeability - Performance requirements and classification

Watertightness
Test according:
EN 12155:2000 Curtain walling - Watertightness - Laboratory test under static pressure
Classification according:
EN 12154:1999 Curtain walling - Watertightness - Performance requirements and classification

Resistance to wind load
Test according:
EN 12179:2000 Curtain walling - Resistance to wind load - Test method
Classification according:
EN 13116:2001 Curtain walling - Resistance to wind load - Performance requirements

The sequence of testing was according EN 13830 par. 5.2.3

a)	Air permeability	for classification
b)	Watertightness	for classification
c)	Resistance to wind load	for serviceability
d)	Air permeability	repeat to confirm wind resistance classification
e)	Watertightness	repeat to confirm wind resistance classification
f)	Resistance to wind load	increased wind resistance test - safety

The test was performed with the measuring equipment and test rig of: **Reynaers**
on the location: **Duffel**
SKG has verified and approved the calibration status of the equipment.
The last calibration date was: **11 July 2012**
The ambient temperature during the test was approx. : **20 ºC**
The air pressure was approx. **1013 hPa**
The air humidity was approx. **51 %**

3. CONSTRUCTION TESTED

The construction was produced with profile system: **CW50 SC**
Drawings of the construction were received and are appended to this report (Appendix 1)

Technical specification:

Construction:			**Article nr.**
Mullion			**034.1506.XX**
Transom			**034.2526.XX**
Leaf Profile			**034.0155.XX**
Inner glazing gasket			**080.9826**
Wet glazing			
Insolation glass		3.3.1 - 15 - 6	
Hardware		friction stays	**021.5650.--**
number of locking points	6		**60.7075.--**

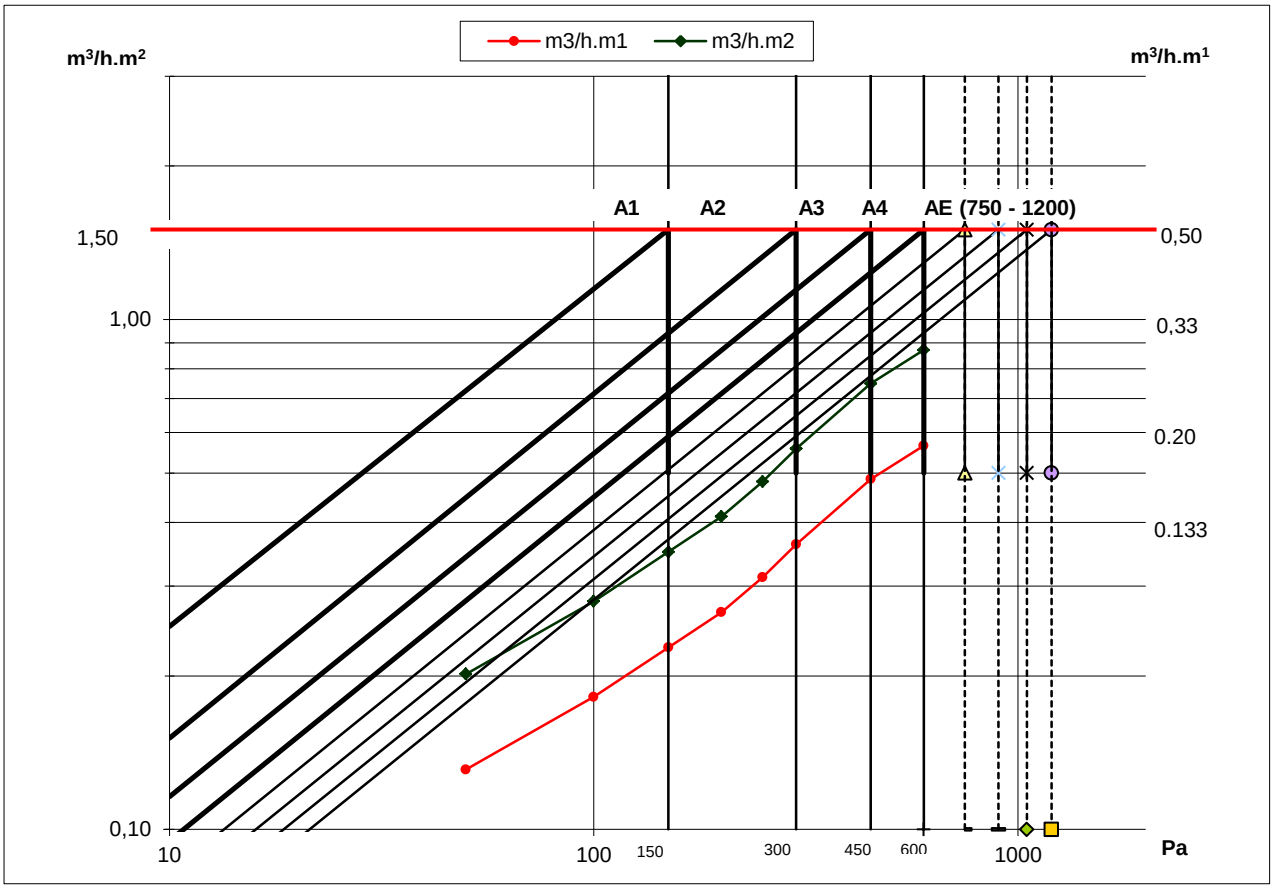
4. OBSERVATIONS AND RESULTS

4.1 Air permeability

The results of the air permeability measurements under positive key pressure in m3/h per m1 joint lenght and per m2 surface are shown in table and graph below.

The joint length Lf of the element was **38,92 m^1**
The surface A of the tested construction was **8,43 m^2**
For the calculation of the normalized air flow the measured value is adjusted by: **1,000**
(according section 8.1 of EN 1026)

Pressure in Pa	Q_f (m^3/h)	Q_f/L_f (m^3/hm^1)	Q_f/A (m^3/hm^2)
50	1,70	0,04	0,20
100	2,36	0,06	0,28
150	2,95	0,08	0,35
200	3,46	0,09	0,41
250	4,05	0,10	0,48
300	4,70	0,12	0,56
450	6,31	0,16	0,75
600	7,34	0,19	0,87
750			
900			
1050			
1200			

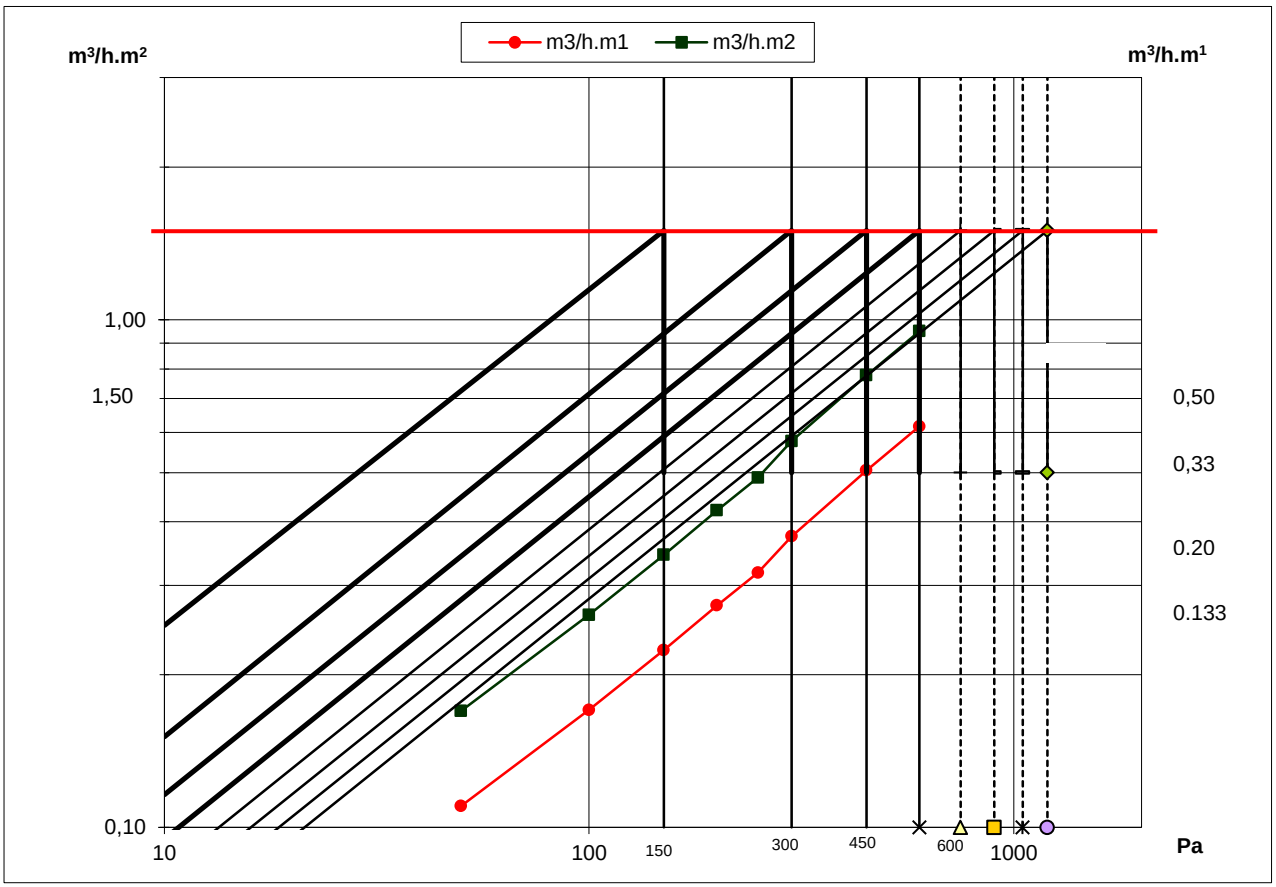


Result: at positive test presure

- Air permeability based on length of joint **Grade A4**
- Air permeability based overall area **Grade A4**

The results of the air permeability measurements under negative key pressure in m3/h per m1 joint lenght and per m2 surface are shown in table and graph below.

Pressure in Pa	Q_f (m^3/h)	Q_f/A (m^3/hm^1)	Q_f/L_f (m^3/hm^2)
-50	1,43	0,04	0,17
-100	2,21	0,06	0,26
-150	2,90	0,07	0,34
-200	3,55	0,09	0,42
-250	4,12	0,11	0,49
-300	4,86	0,12	0,58
-450	6,55	0,17	0,78
-600	8,00	0,21	0,95
-750			
-900			
-1050			
-1200			



4.2 Watertightness

The results of the water tightness test are shown in table below.

Note:
The amount of water in liters / h used for spraying the construction was: **1020 L/h**

Pressure in Pa	t (min).	Water leakage
0	15	no
50	5	no
100	5	no
150	5	no
200	5	no
300	5	no
450	5	no
600	5	no
750	5	no
900	5	no
1050	5	
1200	5	

Result:
The construction was watertight up to a pressure of: **900 Pa**

4.3 Resistance to wind load

4.3.1 Test on bending

Designload: 1600 Pa

The tables show the bending in response to various key pressures

Note:

The position of the displacement devices (V1. V2 en V3) is shown in the elevation drawing of the tested construction (see annex 1).

Mullion 1 L= 4090

Maximum allowable bending f in mm (max.=15): 1/200xL **15,00 mm**

Positive pressure / Negative pressure

Pressure in Pa	V1	V2	V3	f	Pressure in P	V1	V2	V3	f
0					**0**				
400	0,10	2,90	0,10	**2,80**	**-400**	0,20	3,30	0,20	**3,10**
800	0,50	7,00	0,30	**6,60**	**-800**	0,70	7,40	0,40	**6,85**
1200	0,80	11,10	0,50	**10,45**	**-1200**	1,10	11,10	0,70	**10,20**
1600	1,20	15,40	0,70	**14,45**	**-1600**	1,50	15,20	0,90	**14,00**
0					**0**				

Result:

The maximum bending at wind resistance design load is: **14,45** mm

This is less than the maximal allowable bending: **Satisfies the requirement**

Horizontal tr L= 930

Maximum allowable bending f in mm (max.=15): 1/200xL **4,65 mm**

Positive pressure / Negative pressure

Pressure in Pa	V1	V2	V3	f	Pressure in P	V1	V2	V3	f
0					**0**				
400	2,75	1,57	0,40	**0,00**	**-400**	3,00	1,70	0,40	**0,00**
800	6,75	3,93	1,09	**0,01**	**-800**	7,20	4,30	1,40	**0,00**
1200	10,77	6,27	1,74	**0,01**	**-1200**	10,90	6,60	2,30	**0,00**
1600	15,46	9,25	2,93	**0,05**	**-1600**	14,90	9,30	3,40	**0,15**
0					**0**				

Result:

The maximum bending at wind resistance design load is: **0,15** mm

This is less than the maximal allowable bendin **Satisfies the requirement**

4.3.2 Repeated test for Air permeability

to confirm the resistance to wind load

After the tests were performed as described under 4.3.1 above the air permeability test was repeated.

The requirement is that the increase of the air permeability at maximum pressure is not more than 0,3 m3/h per m2 (0,1 m3/h per meter joint length) as found in the classification test for air permeability.

The results of the air permeability measurements under positive key pressure are shown in table below.

Positive pressure 600 Pa	Result:		Increase	
	based on surface			
	Test 1	Test 2		
	0,87		0	< 0,3 Voldoet
	based on joint lenght			
	Test 1	Test 2		
	0,19		0	< 0,1 Voldoet
Negative pressure -600 Pa	Result:		Increase	
	based on surface			
	Test 1	Test 2		
	0,95		0	< 0,3 Voldoet
	based on joint lenght			
	Test 1	Test 2		
	0,21		0	< 0,1 Voldoet

The increase of the air permeability was less than maximum allowed.

4.3.3 Repeated test for Watertightness

to confirm the resistance to wind load

The results of the water tightness test are shown in table below.

The amount of water in liters / h used for spraying the construction was: **1020 L/h**

Pressure in Pa	t (min).	Water leakage
0	15	no
50	5	no
100	5	no
150	5	no
200	5	no
300	5	no
450	5	no
600	5	no
750	5	no
900	5	no
1050	5	
1200	5	

Result:

The construction was watertight up to a pressure of: **900 Pa**

4.3.4 Strength test

The construction was loaded to a positive and a negative key pressure of: **2400 Pa**

It was established that the construction did not show any signs of distortion.

5. CLASSIFICATION

	Grade
Air permeability based on length of joint	**A4**
Air permeability based overall area	**A4**
Air permeability	**A4**
Watertightness	**RE 900**
Resistance to wind load	**1600 Pa**

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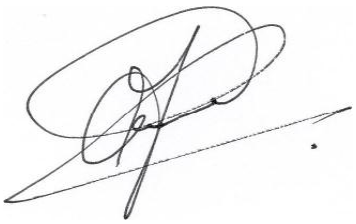
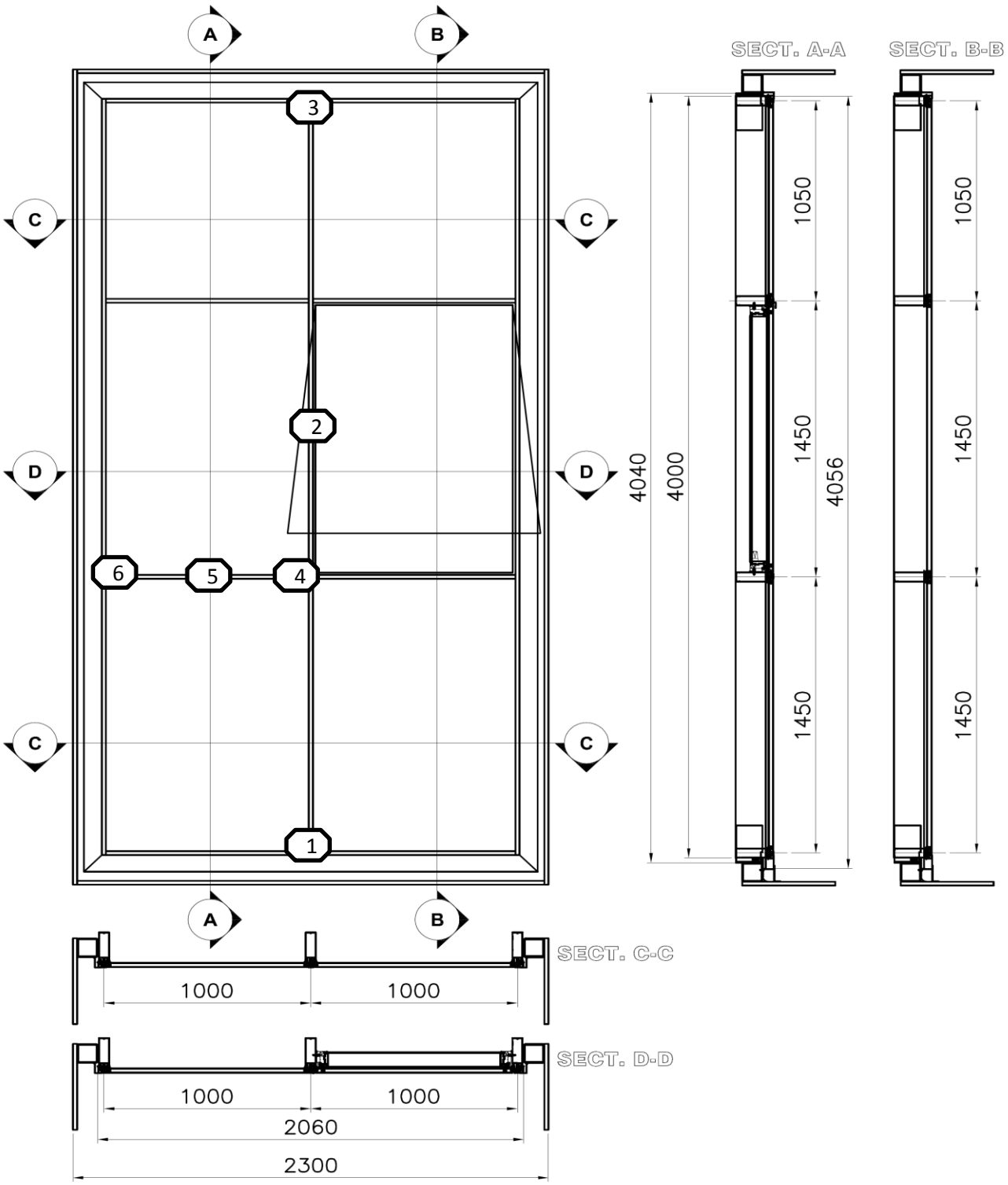
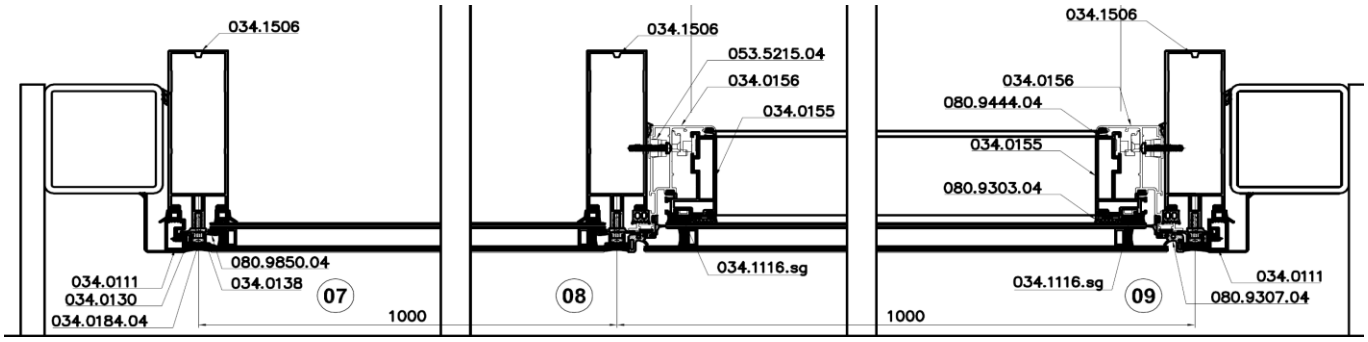
Drawn up at Wageningen on: **08 May 2013**

J.M. van Diggelen
Technical Manager



6.1 APPENDIX 1 Drawings of the tested construction

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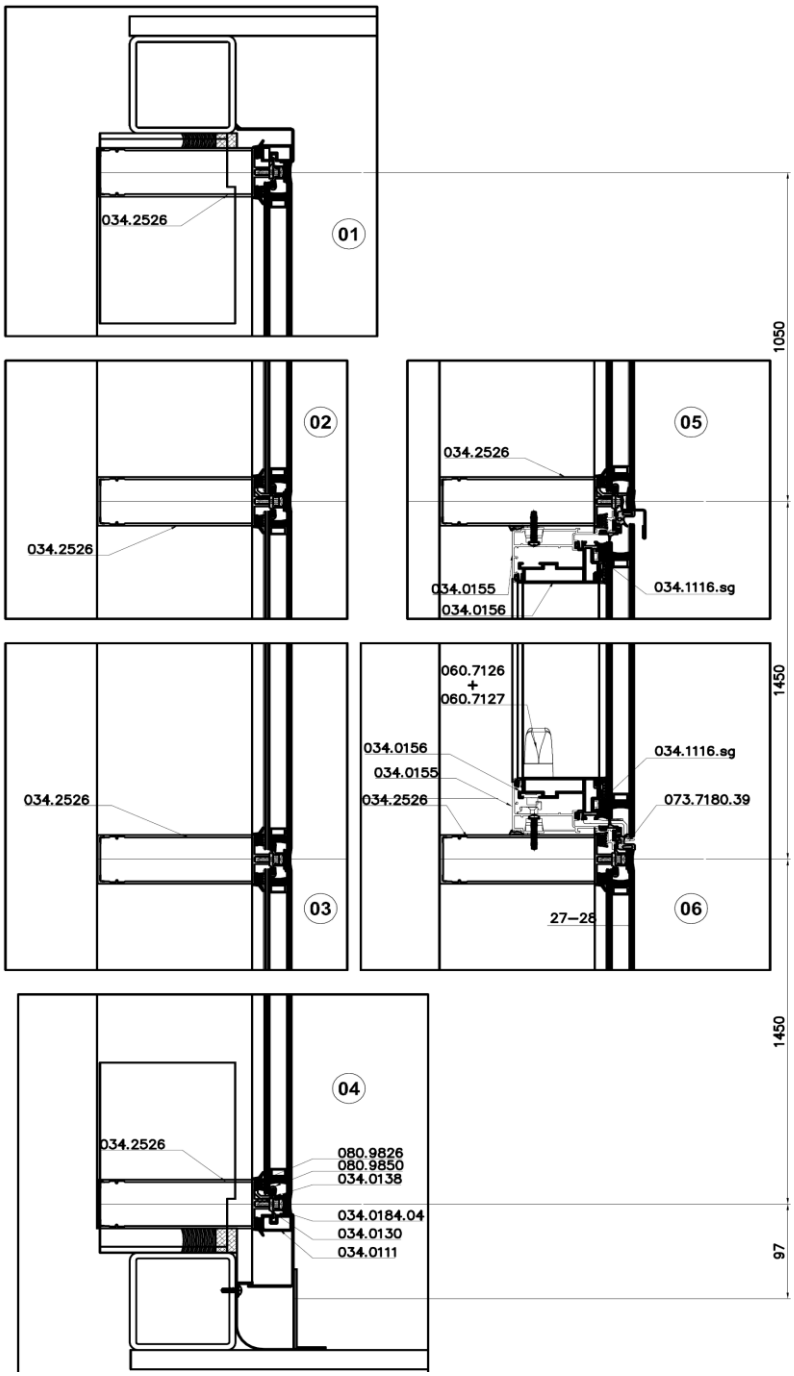
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