CNC-11L26709

MOCK-UP TEST REPORT

CANADA GRANDVIEW PROJECT
(GVLS-150)

CNC Testing Laboratory
Curtainwall design & Consulting

CNC *Testing Laboratory*
Curtainwall design & Consulting

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TESTING CERTIFICATE

CNC TESTING LABORATORY
27316 222, Indeung-ro, Chungju-si,
Chungcheong buk-do, Korea
Tel : 043-854-7791 Fax : 043-854-7795

Certificate No. :
CNC-11L26709

1. Client
   - Name : Grandview EA Building Systems Corp
   - ADDRESS : 570-999 West Broadway, Vancouver, BC V5Z 1K5
   - Date of Receipt : 2019-10-08
2. Use of Report : Performance Evaluation
3. Test Sample : CANADA GRANDVIEW PROJECT (GVLS-150)
4. Date of Test : 2019-10-07 / 10-10 ~ 10-11
5. Test method used : (1) Air infiltration test ASTM E 283-04 (2012)
   (2) Water penetration test under static pressure ASTM E 331-00 (2016)
   (3) Structural performance test (Design/Proof load) ASTM E 330 / E330M-14
   (4) Thermal Cycling Test Modified AAMA 501.5
6. Testing Environment
   10-07 Temp. : (15.5 ± 2) ℃ , Humidity : (85.0 ± 3) % R.H. , ATM. : 1 017 hPa
   10-10 Temp. : (14.0 ± 2) ℃ , Humidity : (71.0 ± 3) % R.H. , ATM. : 1 014 hPa
   10-11 Temp. : (14.5 ± 2) ℃ , Humidity : (70.0 ± 3) % R.H. , ATM. : 1 015 hPa
7. Test Results

Test Items	Test Condition	Unit	Test Method	Test Results
Air infiltration	+300 Pa -300 Pa	m^3/h	(1)	See Attachment #1
Water penetration under static pressure	+720 Pa	-	(2)	
Straructural performance (Design load)	+1.44 kPa (Positive) / -1.44 kPa (Negative)	mm	(3)	
Straructural performance (Proof load)	+2.16 kPa (Positive) / -2.16 kPa (Negative)	mm	(3)	
Thermal Cycling	See Attachment		(4)	

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
This Test Report cannot be reproduced, except in full.

Affirmation	Tested by Name : GWAN-YOUNG, CHUNG (Signature)	Technical Manager Name : YI-BOK, CHUNG (Signature)

The above testing certificate is the accredited test result by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

2019. 10. 18.

CNC *Testing Laboratory*
Accredited by KOLAS, Republic of KOREA

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Attachment #1

CNC TESTING LABORATORY 27316 222, Indeung-ro, Chungju-si, Chungcheong buk-do, Korea Tel : 043-854-7791 Fax : 043-854-7795	Certificate No. : CNC-11L26709 Page (2)/(2) Pages

■ TEST Results
○ Test Sample size
3 100 mm (W) × 2 400 mm (H) - HORIZONTAL SLIDING DOOR

2019-10-07 TEST Ⅰ

Test Items	Test Condition	Specification	Test Results		
Air infiltration	+300 Pa	Less than 1.50 L/s·m^2	0.34 L/s·m^2		Pass
	-300 Pa	Less than 1.00 L/s·m^2	0.86 L/s·m^2		Pass
Water penetration under static pressure	+720 Pa	No uncontrolled water leakage is allowed.	No leak		Pass
Straructural performance (Design load)	+1.44 kPa (Positive)	Less than 13.14 mm	MULLION	8.91 mm	Pass
	-1.44 kPa (Negative)	Less than 13.14 mm	MULLION	10.08 mm	Pass
Straructural performance (Proof load)	+2.16 kPa (Positive)	Less than 4.60 mm	MULLION	2.58 mm	Pass
	-2.16 kPa (Negative)	Less than 4.60 mm	MULLION	3.47 mm	Pass

2019-10-10 ~ 11 TEST Ⅱ

Test Items	Test Condition			Specification	Test Results	
Thermal Cycling	1ST~3RD CYCLE	HOT	COLD	The specimen shall be free from defects.	HOT : Pass	Pass
		24℃ 82℃	24℃ -18℃		COLD : Pass	

END.

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CERTIFICATES OF MOCK-UP TESTING LABORATORY

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1. GENERAL

1-1. PROJECT : CANADA GRANDVIEW PROJECT (HORIZONTAL SLIDING DOOR)
1-2. PLACE OF TEST : CNC TESTING LABORATORY
1-3. DATE OF TEST : 2019. 10. 07. 5:00 P.M. ~ 6:30 P.M.
2019. 10. 10. 8:30 A.M. ~ 10. 11. 11:00 A.M.
1-4. DATE OF REPORT : 2019. 10. 18.
1-5. CLIENT : Grandview EA Building Systems Corp

2. WEATHER CONDITION

2.1. DATE :	10. 07.	10. 10.	10. 11.
2-2. WEATHER :	CLEAR	CLEAR	CLEAR
2-3. TEMPERATURE :	15.5 deg.C	14.0 deg.C	14.5 deg.C
2-4. HUMIDITY :	85 %	71 %	70 %
2-5. ATMOSPHERIC PRESSURE :	1017 hPa	1 014 hPa	1 015 hPa

3. PARTICIPANTS

BYOUNG-SUN, YOU (DIRECTOR) : Grandview EA Building Systems Corp
SU-BOK, HAN (PRESIDENT) : E-wha system
GWAN-YOUNG, CHUNG (ASSISTANT MANAGER) : CNC
DONG-JIN, ROH (MANAGER) : CNC
YI-BOK, CHUNG (GENERAL MANAGER) : CNC

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4. INSTALLATION SCHEDULE OF SPECIMEN

4-1. INSTALLATION OF CHAMBER : 2019. 10. 01.
4-2. INSTALLATION OF SPECIMEN : 2019. 10. 04.
4-3. CHAMBER CLOSING : 2019. 10. 04.

5. SPECIMEN DESCRIPTION

5-1. TYPE OF SPECIMENS : AL. HORIZONTAL SLIDING DOOR (AW-PG30-SD) ; GVLS-150

5-2. SPECIMEN DIMENSION : 3 100 mm (W) × 2 400 mm (H)

5-3. GLASS : THK. 24 PAIR GLASS
(6 H/S + 12 AS + 6 H/S)

5-4. GASKET : E.P.D.M

5-5. SEALANT : WEATHER SILICONE - DC 907

5-6. ANCHORING, WEATHERSTRIPPING, DRAINAGE, HARDWARE AND INSTALLATION ETC.
: SEE P-14 ~ P-17 MOCK-UP DWG.

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6. TEST SPECIFICATION / METHOD

※ AAMA/WDMA/CSA101/I.S.2/A440-17

- North American Fenetration Standard/Specification for Windows, Doors, and Skylights

6-1. STATIC AIR INFILTRATION TEST

: ASTM E 283
Standard Test Method For Determining Rate Of Air Leakage Through Exterior Windows, Curtain Walls, And Doors Under Specified Pressure Differences Across The Specimen

6-2. WATER PENETRATION TEST

: ASTM E 331
Standard Test Method For Water Penetration Of Exterior Windows, Skylight, Doors and Curtain Walls By Uniform Static Air Pressure Difference

6-3. STRUCTURAL PERFORMANCE TEST

: ASTM E 330
Standard Test Method For Structural Performance Of Exterior Windows, Doors, Skylight and Curtain Walls By Uniform Static Air Pressure Difference

6-4. THERMAL CYCLING TEST

: AAMA 501.5
Thermal Cycling of Exterior Walls

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7. METHOD & RESULT OF TEST I

2019-10-07 TEST (HORIZONTAL SLIDING DOOR ; AW-PG30-SD)

7- 1. STATIC AIR INFILTRATION & EXFILTRATION TEST (ASTM E 283)

AT POSITIVE +300 Pa (+6.24 psf) & NEGATIVE -300 Pa (-6.24 psf) STATIC PRESSURE

7-1-1 : SLIDING DOOR (+300 Pa)	
FILM ON (TARE)	8.20 L/s (17.38 cfm)
FILM OFF (TOTAL)	10.79 L/s (22.86 cfm)
=> AIR LEAKAGE AT SPECIMEN (NET)	**2.59 L/s (5.48 cfm)**
SPECIFICATION : LESS THAN 1.5 L/s·m^2 (0.3 cfm/ft^2) FOR SLIDING DOOR	
ALLOWABLE : 7.44 m^2 × 1.5 L/s·m^2 = **11.16 L/s**	

7-1-2 : SLIDING DOOR (-300 Pa)	
FILM ON (TARE)	8.90 L/s (18.86 cfm)
FILM OFF (TOTAL)	15.35 L/s (32.53 cfm)
=> AIR LEAKAGE AT SPECIMEN (NET)	**6.45 L/s (13.67 cfm)**
SPECIFICATION : LESS THAN 1.0 L/s·m^2 (0.2 cfm/ft^2) FOR SLIDING DOOR	
ALLOWABLE : 7.44 m^2 × 1.0 L/s·m^2 = **7.44 L/s**	

TEST RESULT WAS SATISFACTORY.

7- 2. WATER PENETRATION TEST UNDER STATIC PRESSURE : ASTM E 331

AT +720 Pa (+15 psf) STATIC PRESSURE WITH A WATER SPRAY RATE OF 3.4 ℓ/min·m^2 (5 gallons/hr·ft^2) FOR FIFTEEN(15) MINUTES.

AT +1 000 Pa (+20.9 psf) STATIC PRESSURE WITH A WATER SPRAY RATE OF 3.4 ℓ/min·m^2 (5 gallons/hr·ft^2) FOR FIFTEEN(15) MINUTES.

SPECIFICATION : NO UNCONTROLLED WATER LEAKAGE IS ALLOWED.

TEST RESULT WAS SATISFACTORY.

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7- 3. STRUCTURAL PERFORMANCE (DESIGN LOAD) BY STATIC PRESSURE : ASTM E 330

HELD FOR TEN(10) SECONDS FOR LOADS.

DEFLECTIONS AND PERMANENT SET WILL BE MEASURED WITH DIGITAL INDICATORS.

+0.72 kPa (+15.04 psf) (50% POSITIVE DESIGN LOAD)
+1.44 kPa (+30.08 psf) (100% POSITIVE DESIGN LOAD)
-0.72 kPa (-15.04 psf) (50% NEGATIVE DESIGN LOAD)
-1.44 kPa (-30.08 psf) (100% NEGATIVE DESIGN LOAD)

SPECIFICATION :

- FRAMING MEMBER : LESS THAN THE MIN. OF L/175 FOR SPAN LENGTH

THE ALLOWABLE

1. MULLION : L = 2300 mm L/175 = 13.14 mm

TEST RESULTS AT DESIGN LOAD

1. MULLION

NET DEFLECTION AT POSITIVE PRESSURE	8.91 mm 〈 13.14 mm
NET DEFLECTION AT NEGATIVE PRESSURE	10.08 mm 〈 13.14 mm

TEST RESULTS WERE SATISFACTORY.

REF. : TABLE 7-3-1, 7-3-2, 7-3-3, 7-3-4.

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TABLE 7-3-1

TEST PRESSURE = +0.72 kPa (+15.04 psf) 50% POSITIVE UNIT: mm

NO.	INDICATOR LOCATION	POS	△/PS	NET△	△allow	SPAN
1	MULLION	TOP	1.34 / 0.01			
2	MULLION	CENTER	5.96 / 0.20	4.56		2300
3	MULLION	BOTTOM	1.46 / 0.02			

TABLE 7-3-2

TEST PRESSURE = +1.44 kPa (+30.08 psf) 100% POSITIVE UNIT: mm

NO.	INDICATOR LOCATION	POS	△/PS	NET△	△allow	SPAN
1	MULLION	TOP	2.76 /-0.25			
2	MULLION	CENTER	11.84 / 0.16	8.91	13.14	2300
3	MULLION	BOTTOM	3.10 / 0.06			

TABLE 7-3-3

TEST PRESSURE = -0.72 kPa (-15.04 psf) 50% NEGATIVE UNIT: mm

NO.	INDICATOR LOCATION	POS	△/PS	NET△	△allow	SPAN
1	MULLION	TOP	2.05 / 0.77			
2	MULLION	CENTER	7.87 / 1.82	5.92		2300
3	MULLION	BOTTOM	1.85 / 0.49			

TABLE 7-3-4

TEST PRESSURE = -1.44 kPa (-30.08 psf) 100% NEGATIVE UNIT: mm

NO.	INDICATOR LOCATION	POS	△/PS	NET△	△allow	SPAN
1	MULLION	TOP	2.80 / 0.11			
2	MULLION	CENTER	13.01 / 0.67	10.08	13.14	2300
3	MULLION	BOTTOM	3.06 / 0.14			

△/PS : DEFLECTION/PERMANENT SET

* : NET DEFLECTION

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7- 4. STRUCTURAL PERFORMANCE (PROOF LOAD) BY STATIC PRESSURE (ASTM E 330)

HELD FOR TEN(10) SECONDS FOR LOADS.

DEFLECTIONS AND PERMANENT SET WILL BE MEASURED WITH DIGITAL INDICATORS.

+1.08 kPa	(+22.56 psf)	(50% POSITIVE DESIGN LOAD)
+2.16 kPa	(+45.12 psf)	(100% POSITIVE DESIGN LOAD)
-1.08 kPa	(-22.56 psf)	(50% NEGATIVE DESIGN LOAD)
-2.16 kPa	(-45.12 psf)	(100% NEGATIVE DESIGN LOAD)

SPECIFICATION :

- FRAMING MEMBER : LESS THAN THE MIN. OF 2L/1000 FOR SPAN LENGTH

THE ALLOWABLE

1. MULLION : L = 2300 mm 2L/1000 = 4.60 mm

TEST RESULTS AT DESIGN LOAD

1. MULLION

NET PERMANENT SET AT POSITIVE PRESSURE	2.58 mm 〈 4.60 mm
NET PERMANENT SET AT NEGATIVE PRESSURE	3.47 mm 〈 4.60 mm

TEST RESULTS WERE SATISFACTORY.

REF. : TABLE 7-4-1, 7-4-2, 7-4-3, 7-4-4

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TABLE 7-4-1

TEST PRESSURE = +1.08 kPa (+22.56 psf) 75% POSITIVE UNIT: mm

NO.	INDICATOR LOCATION	POS	△/PS	NET PS	PS allow	SPAN
1	MULLION	TOP	2.86 / 0.57			
2	MULLION	CENTER	11.10 / 1.94	1.38		2300
3	MULLION	BOTTOM	3.00 / 0.56			

TABLE 7-4-2

TEST PRESSURE = +2.16 kPa (+45.12 psf) 150% POSITIVE UNIT: mm

NO.	INDICATOR LOCATION	POS	△/PS	NET PS	PS allow	SPAN
1	MULLION	TOP	4.71 / 0.35			
2	MULLION	CENTER	21.39 / 2.86	2.58	4.60	2300
3	MULLION	BOTTOM	5.12 / 0.20			

TABLE 7-4-3

TEST PRESSURE = -1.08 kPa (-22.56 psf) 75% NEGATIVE UNIT: mm

NO.	INDICATOR LOCATION	POS	△/PS	NET PS	PS allow	SPAN
1	MULLION	TOP	2.65 / 0.63			
2	MULLION	CENTER	12.44 / 3.42	2.79		2300
3	MULLION	BOTTOM	2.78 / 0.63			

TABLE 7-4-4

TEST PRESSURE = -2.16 kPa (-45.12 psf) 150% NEGATIVE UNIT: mm

NO.	INDICATOR LOCATION	POS	△/PS	NET PS	PS allow	SPAN
1	MULLION	TOP	4.46 / 0.49			
2	MULLION	CENTER	23.47 / 3.96	3.47	4.60	2300
3	MULLION	BOTTOM	5.20 / 0.47			

△/PS : DEFLECTION/PERMANENT SET

* : NET DEFLECTION

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8. METHOD & RESULT OF TEST II

2019-10-10, 11 TEST (HORIZONTAL SLIDING DOOR ; AW-PG30-SD)

8-1. THERMAL CYCLING TEST

1ST CYCLE ~ 3RD CYCLE

- HOT CONDITION FOR 2 HOURS
  * INDOOR CHAMBER CONDITION : 24 deg.C ± 2 deg.C
  * THERMAL CHAMBER : 82 deg.C ± 2 deg.C AT AIR

- COLD CONDITION FOR 2 HOURS
  * INDOOR CHAMBER CONDITION : 24 deg.C ± 2 deg.C
  * THERMAL CHAMBER : -18 deg.C ± 2 deg.C AT AIR

* MEASURE INDOOR AND OUTDOOR SURFACE TEMPERATURES WITH ELECTRONIC THERMOCOUPLES, AND RECORD TEMPERATURES AT EVERY 15 MINUTES.

REF. : TABLE 8-1-1, 8-1-2, 8-1-3, 8-1-4, 8-1-5, 8-1-6

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TABLE 8-1-1

1ST HOT CONDITION

UNIT : deg.C

T.C NO. / TIME (min.)	SILL	RAIL 1	RAIL 2	JAMB	MUL.	GLA. 1	GLA. 2		AIR	
	IN	IN	IN	IN	IN	IN	IN	OUT	IN	OUT
	0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
0	40	48	40	42	38	42	40	72	24.6	82
15	41	48	41	43	39	42	40	72	24.8	82
30	41	48	41	43	39	43	40	72	24.9	82
45	41	49	41	43	40	43	40	72	24.8	83
60(1 hr)	42	50	41	43	41	44	41	72	24.7	82
75	42	49	41	43	41	44	40	72	24.6	82
90	42	50	42	43	40	44	40	72	24.5	82
105	43	50	42	43	40	44	40	72	24.8	82
120(2 hr)	43	51	43	44	41	44	42	72	24.5	82
AVG. (deg.C)	41.7	49.2	41.3	43.0	39.9	43.3	40.3	72.0	24.7	82.1
GIVEN CONDITION									24±2 deg.C	82±2 deg.C

T.C NO. : THERMOCOUPLE NUMBER
RH : RELATIVE HUMIDITY

SEE PAGE 18 FOR T.C NO.

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TABLE 8-1-2

1ST COLD CONDITION

UNIT : deg.C

T.C NO. / TIME (min.)	SILL	RAIL 1	RAIL 2	JAMB	MUL.	GLA. 1	GLA. 2		AIR	
	IN	IN	IN	IN	IN	IN	IN	OUT	IN	OUT
	0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
0	11	2	10	11	14	7	10	-13	24.0	-18
15	10	1	10	10	13	6	9	-13	24.3	-18
30	10	1	10	10	13	6	9	-13	24.0	-18
45	10	1	10	11	13	6	9	-13	23.8	-18
60(1 hr)	10	1	10	11	13	6	9	-13	24.2	-18
75	10	1	10	11	13	6	9	-13	23.9	-18
90	10	1	10	11	13	6	9	-13	24.4	-18
105	10	1	10	11	13	6	9	-13	23.7	-18
120(2 hr)	10	1	10	10	13	5	9	-13	23.9	-18
AVG. (deg.C)	10.1	1.1	10.0	10.7	13.1	6.0	9.1	-13.0	24.0	-18.0
GIVEN CONDITION									24±2 deg.C	-18±2 deg.C

T.C NO. : THERMOCOUPLE NUMBER
RH : RELATIVE HUMIDITY

SEE PAGE 18 FOR T.C NO.

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TABLE 8-1-3

2ND HOT CONDITION

UNIT : deg.C

T.C NO. / TIME (min.)	SILL	RAIL 1	RAIL 2	JAMB	MUL.	GLA. 1	GLA. 2		AIR	
	IN	IN	IN	IN	IN	IN	IN	OUT	IN	OUT
	0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
0	40	48	41	44	39	42	42	71	24.1	82
15	41	48	42	45	39	42	42	71	24.8	82
30	41	47	42	44	39	41	42	71	24.6	82
45	42	48	42	45	39	41	43	71	24.6	82
60(1 hr)	43	48	43	45	40	42	43	71	25.1	82
75	43	49	43	45	40	42	43	71	24.7	82
90	43	49	43	45	40	42	43	71	25.2	82
105	43	50	43	46	40	43	43	71	25.0	82
120(2 hr)	43	49	43	45	39	42	43	71	24.5	82
AVG. (deg.C)	42.1	48.4	42.4	44.9	39.4	41.9	42.7	71.0	24.7	82.0
GIVEN CONDITION									24±2 deg.C	82±2 deg.C

T.C NO. : THERMOCOUPLE NUMBER
RH : RELATIVE HUMIDITY

SEE PAGE 18 FOR T.C NO.

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TABLE 8-1-4

2ND COLD CONDITION

UNIT : deg.C

T.C NO. / TIME (min.)	SILL	RAIL 1	RAIL 2	JAMB	MUL.	GLA. 1	GLA. 2		AIR	
	IN	IN	IN	IN	IN	IN	IN	OUT	IN	OUT
	0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
0	11	4	11	11	14	8	10	-13	24.0	-18
15	11	4	11	11	14	8	10	-13	23.8	-18
30	11	4	11	12	14	8	10	-13	23.5	-18
45	11	4	11	12	14	8	11	-12	24.1	-18
60(1 hr)	11	4	11	12	14	7	10	-12	24.0	-18
75	11	3	11	12	14	8	10	-13	23.8	-18
90	11	4	11	12	14	7	10	-13	24.1	-18
105	11	4	11	12	14	7	10	-13	24.1	-18
120(2 hr)	10	3	10	11	13	7	10	-13	24.2	-18
AVG. (deg.C)	10.9	3.8	10.9	11.7	13.9	7.6	10.1	-12.8	24.0	-18.0
GIVEN CONDITION									24±2 deg.C	-18±2 deg.C

T.C NO. : THERMOCOUPLE NUMBER
RH : RELATIVE HUMIDITY

SEE PAGE 18 FOR T.C NO.

10, BAMGOGAE-RO 1-GIL, GANGNAM-GU, SEOUL, KOREA
SEOUL OFFICE TEL:82-2-2040-7791/ FAX :2040-7795
CHUNGJU LAB. TEL:82-43-854-7791/ FAX : 854-7795

TABLE 8-1-5

3RD HOT CONDITION

UNIT : deg.C

T.C NO. / TIME (min.)	SILL	RAIL 1	RAIL 2	JAMB	MUL.	GLA. 1	GLA. 2		AIR	
	IN	IN	IN	IN	IN	IN	IN	OUT	IN	OUT
	0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
0	41	46	42	44	39	42	43	71	24.5	82
15	41	46	42	44	40	42	43	71	25.1	82
30	42	47	43	45	40	42	43	71	25.0	82
45	43	48	43	45	40	43	44	72	25.5	82
60(1 hr)	43	48	43	45	40	43	44	72	25.4	82
75	43	48	44	45	40	43	44	72	25.3	82
90	43	48	44	45	41	43	44	72	25.2	82
105	43	48	44	45	41	43	44	72	25.5	82
120(2 hr)	44	48	44	45	41	43	44	72	25.5	82
AVG. (deg.C)	42.6	47.4	43.2	44.8	40.2	42.7	43.7	71.7	25.2	82.0
GIVEN CONDITION									24±2 deg.C	82±2 deg.C

T.C NO. : THERMOCOUPLE NUMBER
RH : RELATIVE HUMIDITY

SEE PAGE 18 FOR T.C NO.

10, BAMGOGAE-RO 1-GIL, GANGNAM-GU, SEOUL, KOREA
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TABLE 8-1-6

3RD COLD CONDITION

UNIT : deg.C

T.C NO. / TIME (min.)	SILL	RAIL 1	RAIL 2	JAMB	MUL.	GLA. 1	GLA. 2		AIR	
	IN	IN	IN	IN	IN	IN	IN	OUT	IN	OUT
	0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
0	11	4	10	11	13	7	10	-12	23.5	-18
15	11	3	10	11	13	7	10	-12	23.8	-18
30	11	3	10	11	13	6	9	-12	23.8	-18
45	11	3	10	11	13	6	9	-12	23.9	-18
60(1 hr)	11	3	10	11	13	6	10	-12	24.1	-18
75	11	3	10	11	13	6	10	-12	23.9	-18
90	11	3	10	11	13	6	9	-12	24.0	-18
105	11	3	10	11	13	6	10	-12	23.6	-18
120(2 hr)	11	3	10	11	13	6	10	-12	24.3	-18
AVG. (deg.C)	11.0	3.1	10.0	11.0	13.0	6.2	9.7	-12.0	23.9	-18.0
GIVEN CONDITION									24±2 deg.C	-18±2 deg.C

T.C NO. : THERMOCOUPLE NUMBER
RH : RELATIVE HUMIDITY

SEE PAGE 18 FOR T.C NO.

10, BAMGOGAE-RO 1-GIL, GANGNAM-GU, SEOUL, KOREA
SEOUL OFFICE TEL:82-2-2040-7791/ FAX :2040-7795
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9. SUMMARY

THE RESULTS OF PERFORMANCE MOCK-UP TEST FOR CANADA GRANDVIEW PROJECT ARE AS FOLLOWS

1. TEST Ⅰ

1) THE RESULTS OF AIR INFILTRATION & EXFILTRATION, STATIC WATER PENETRATION, STRUCTURAL PERFORMANCE TEST AT DESIGN AND PROOF LOAD WERE WITHIN THE ALLOWABLE.

2. TEST Ⅱ

1) THERMAL CYCLING TEST
THERE WERE NO NOTABLE PROBLEMS ON THE SPECIMEN DURING REPEATED 3 CYCLES OF HOT & COLD CONDITIONS.

PLEASE DO NOT HESITATE TO ASK TO LABORATORY WHEN YOU HAVE QUESTIONS ABOUT THIS TEST OR TEST REPORT.

CNC
Testing Laboratory

CHUNG, JINSE
PRESIDENT

10, BAMGOGAE-RO 1-GIL, GANGNAM-GU, SEOUL, KOREA
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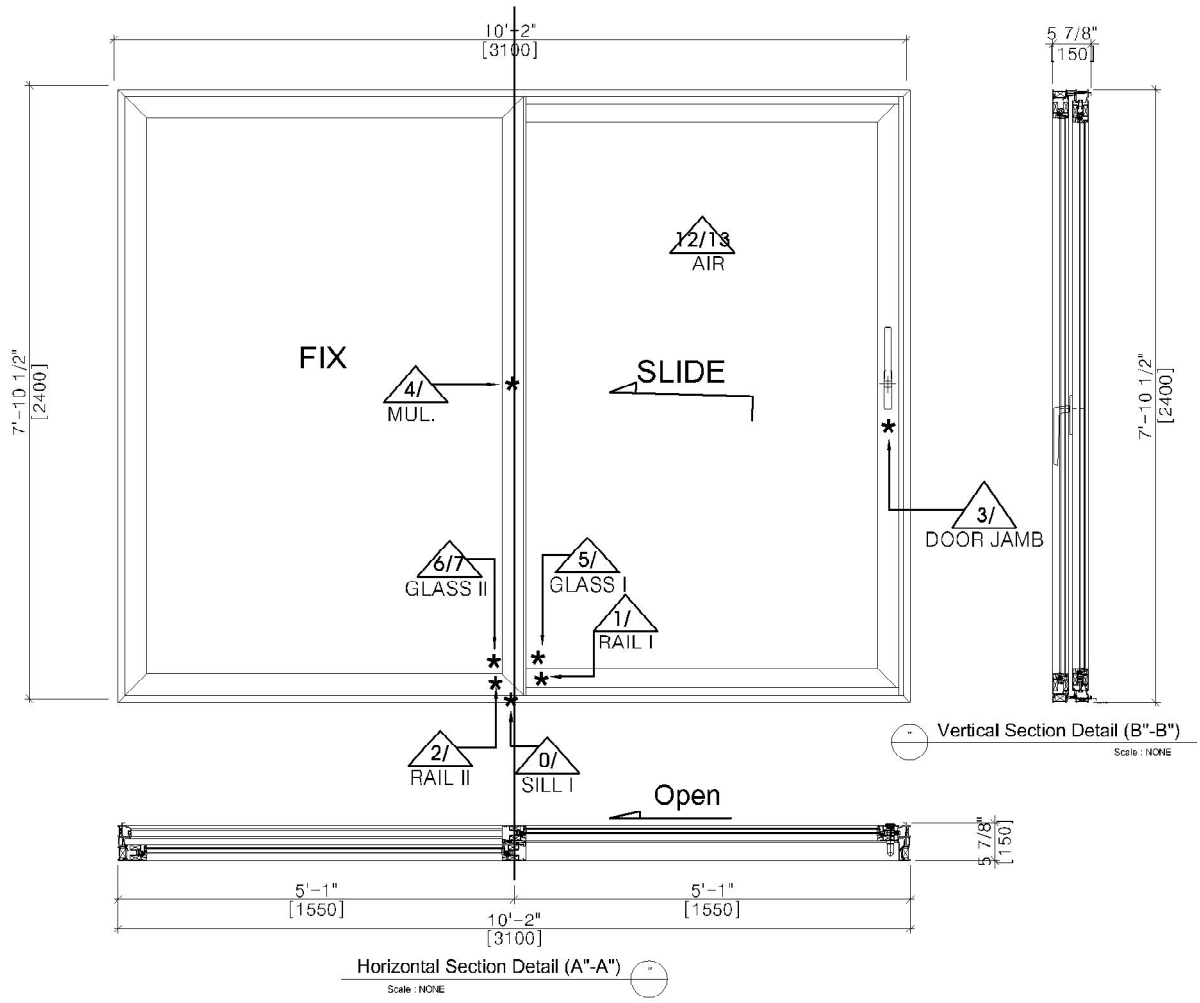
CHUNGJU LAB. TEL:82-43-854-7791/ FAX : 854-7795

10. ELEVATION OF THERMOCOUPLE LOCATION



THERMOCOUPLE LOCATION FOR TEST MOCK-UP

ASSUMED INTERIOR VIEW

10, BAMGOGAE-RO 1-GIL, GANGNAM-GU, SEOUL, KOREA
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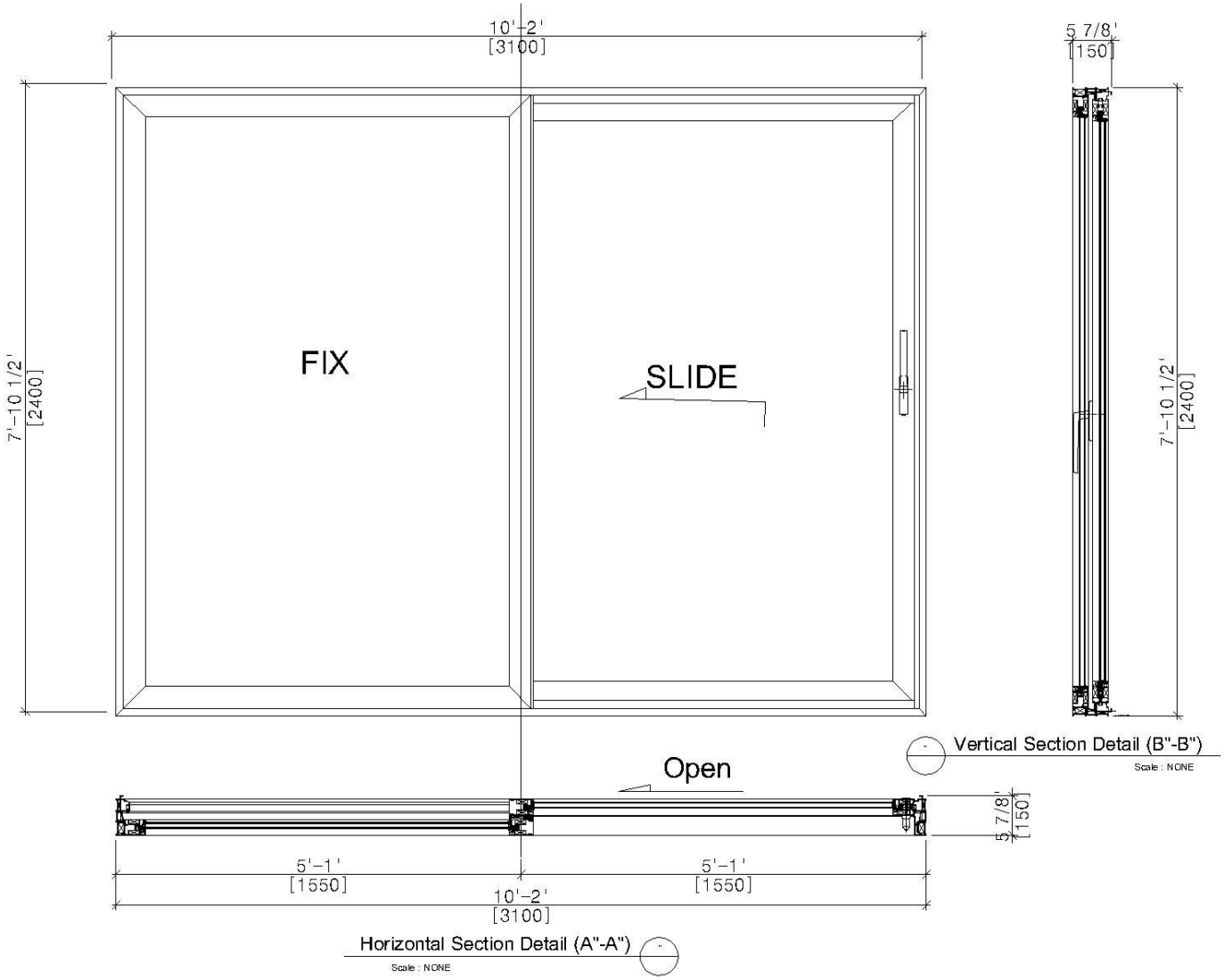
11. MOCK-UP DWG.

* REFER TO ADDITIONAL DETAIL OF MOCK-UP DWG.

10- 1. ELEVATION / SECTION (INTERIOR VIEW)



10, BAMGOGAE-RO 1-GIL, GANGNAM-GU, SEOUL, KOREA
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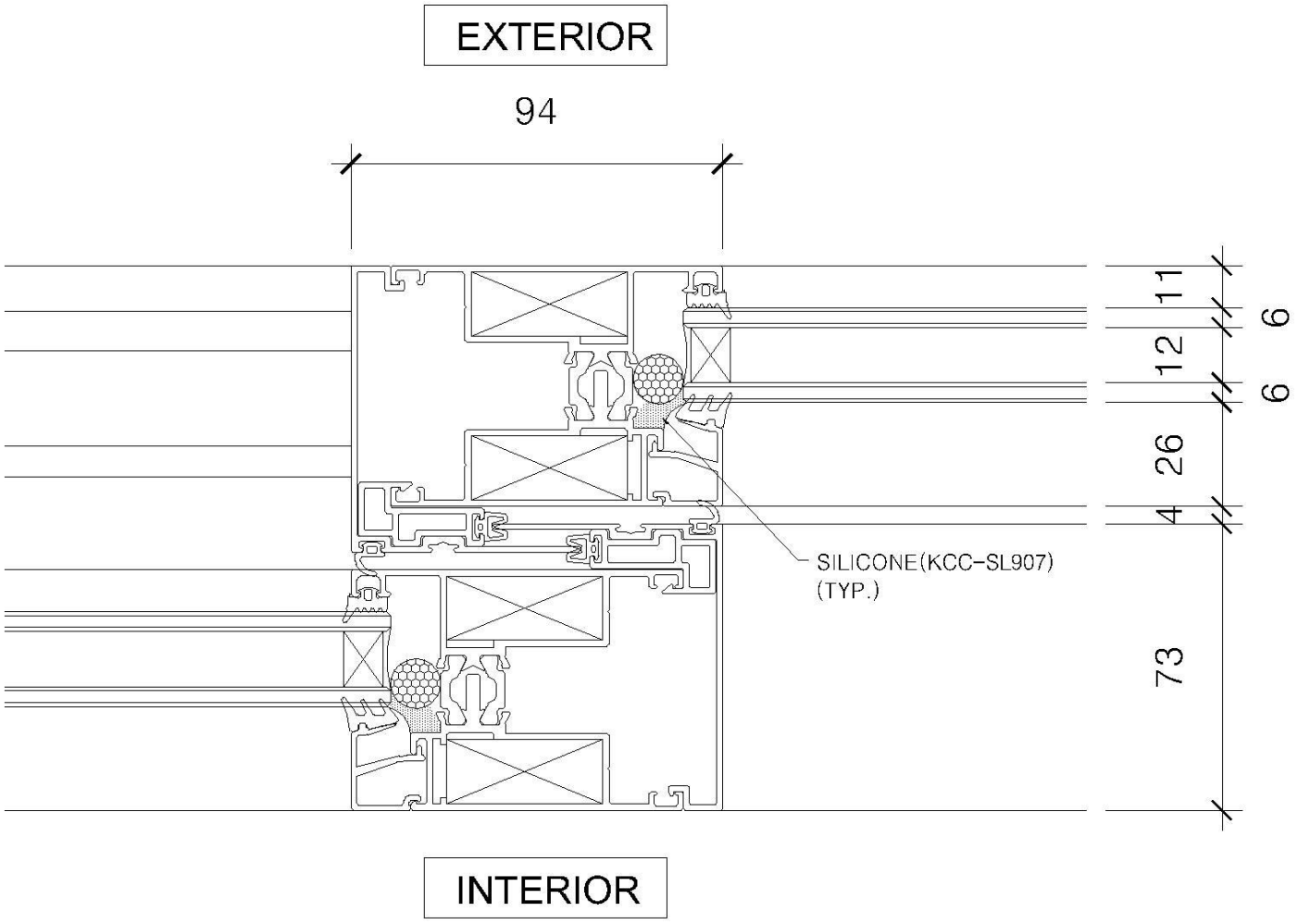
10- 2. HORIZONTAL SECTION DETAIL FOR MULLION & MEETING STILE



10, BAMGOGAE-RO 1-GIL, GANGNAM-GU, SEOUL, KOREA
SEOUL OFFICE TEL:82-2-2040-7791/ FAX :2040-7795
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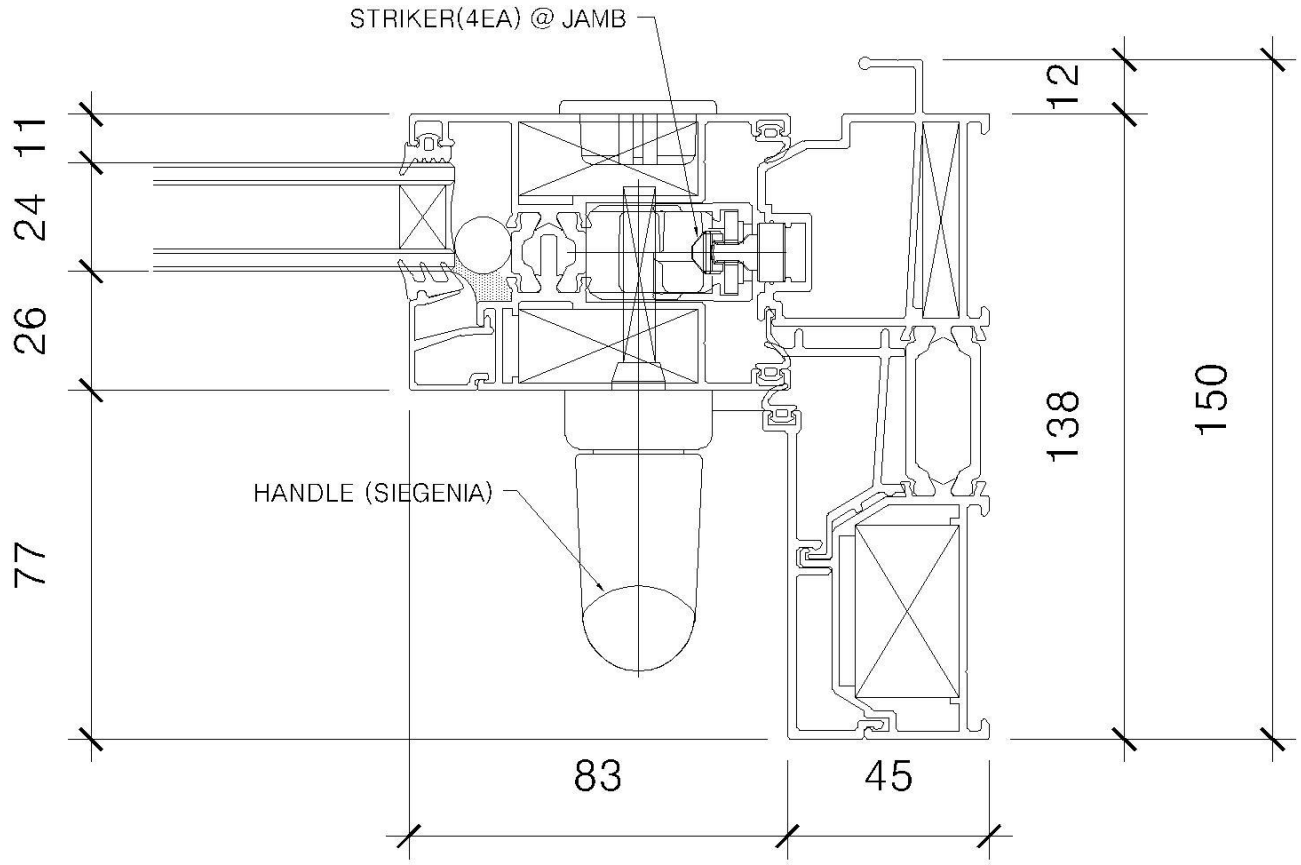
10- 3. HORIZONTAL SECTION DETAIL FOR JAMB & LOCKING STILE



10, BAMGOGAE-RO 1-GIL, GANGNAM-GU, SEOUL, KOREA
SEOUL OFFICE TEL:82-2-2040-7791/ FAX :2040-7795
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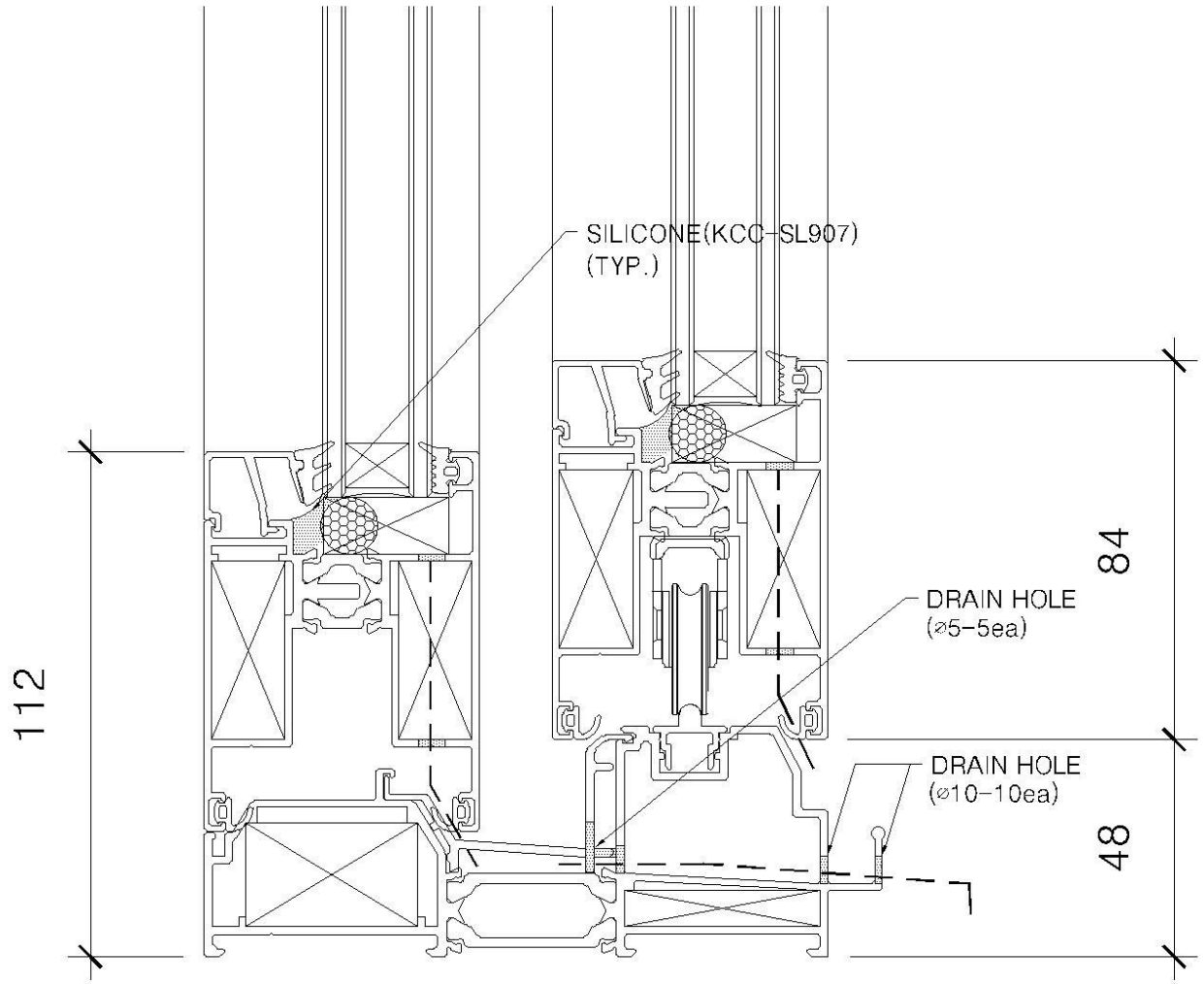
10- 4. VERTICAL SECTION DETAIL FOR SILL & BOTTOM RAIL



10, BAMGOGAE-RO 1-GIL, GANGNAM-GU, SEOUL, KOREA
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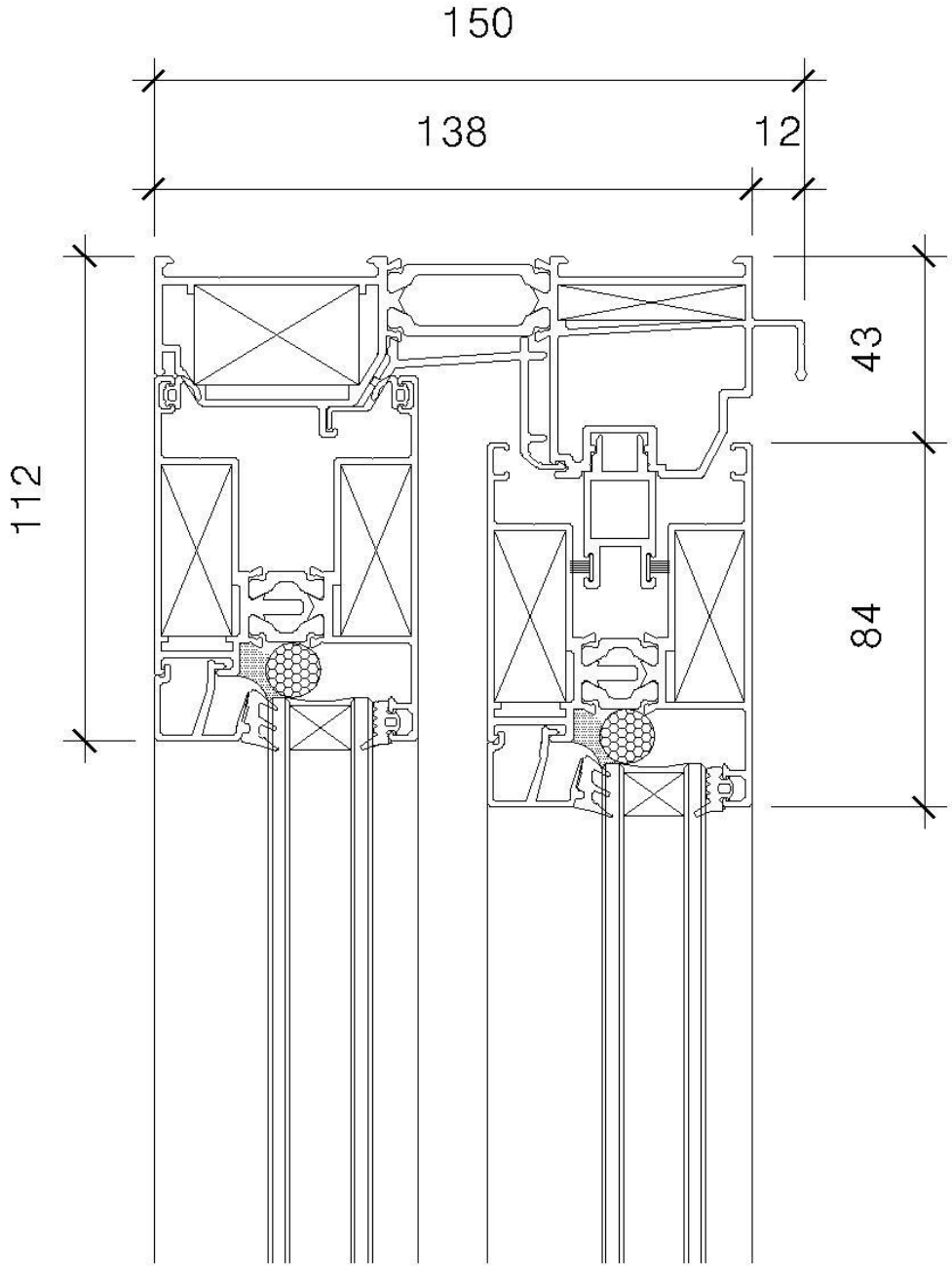
10- 5. VERTICAL SECTION DETAIL FOR HEAD & TOP RAIL



10, BAMGOGAE-RO 1-GIL, GANGNAM-GU, SEOUL, KOREA
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PHOTOS OF MOCK-UP TEST

1. PHOTOS OF SPECIMEN

10, BAMGOGAE-RO 1-GIL, GANGNAM-GU, SEOUL, KOREA
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2. WATER PENETRATION TEST UNDER STATIC PRESSURE ; ASTM E 331

10, BAMGOGAE-RO 1-GIL, GANGNAM-GU, SEOUL, KOREA
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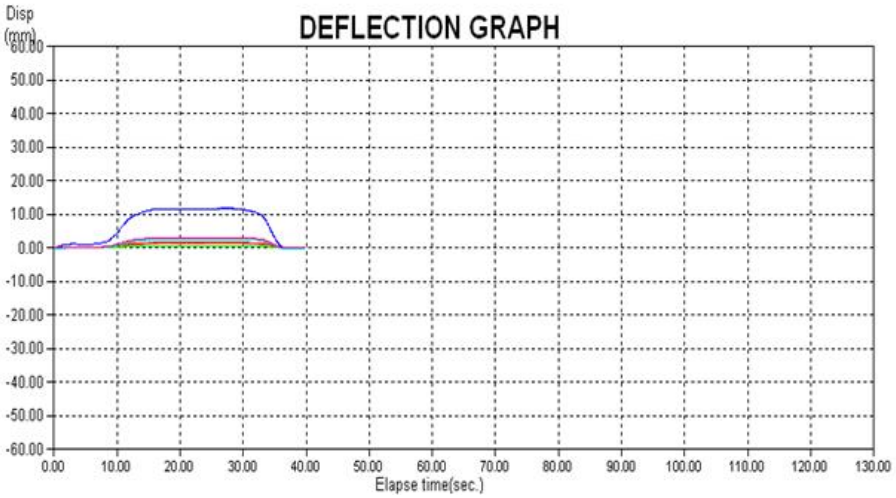
CHUNGJU LAB. TEL:82-43-854-7791/ FAX : 854-7795

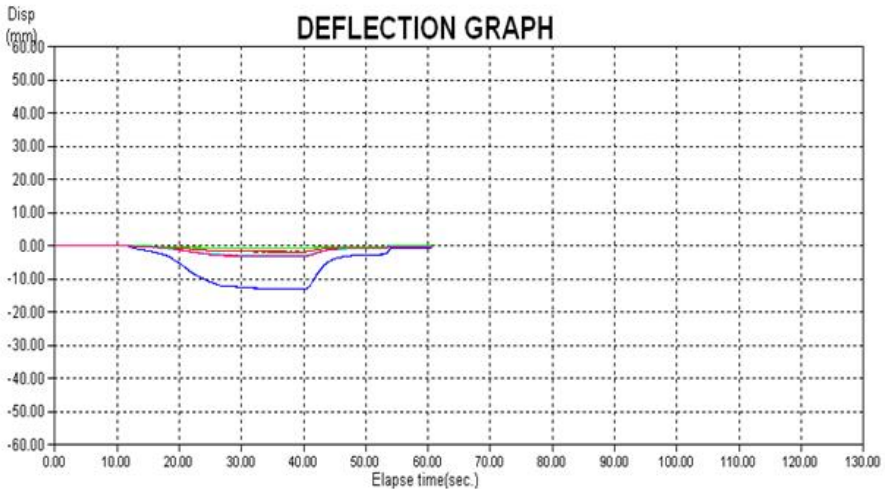
3. STRUCTURAL PERFORMANCE TEST BY STATIC PRESSURE (DESIGN LOAD) ; ASTM E 330

.



△ MAX. DEFLECTION AND PERMANENT SET @ +100% DESIGN LOAD

§. ±100% DESIGN LOAD
±1.44 kPa (±30.08 psf)



△ MAX. DEFLECTION AND PERMANENT SET @ -100% DESIGN LOAD

10, BAMGOGAE-RO 1-GIL, GANGNAM-GU, SEOUL, KOREA
SEOUL OFFICE TEL:82-2-2040-7791/ FAX :2040-7795
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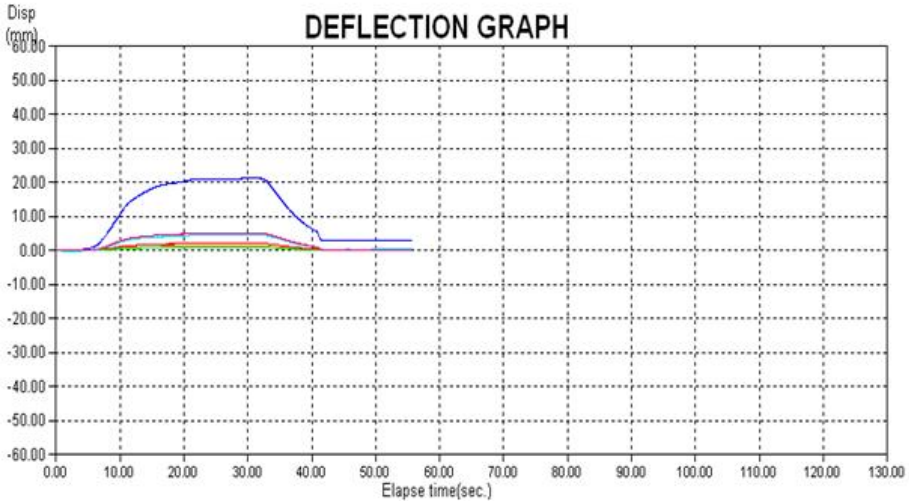
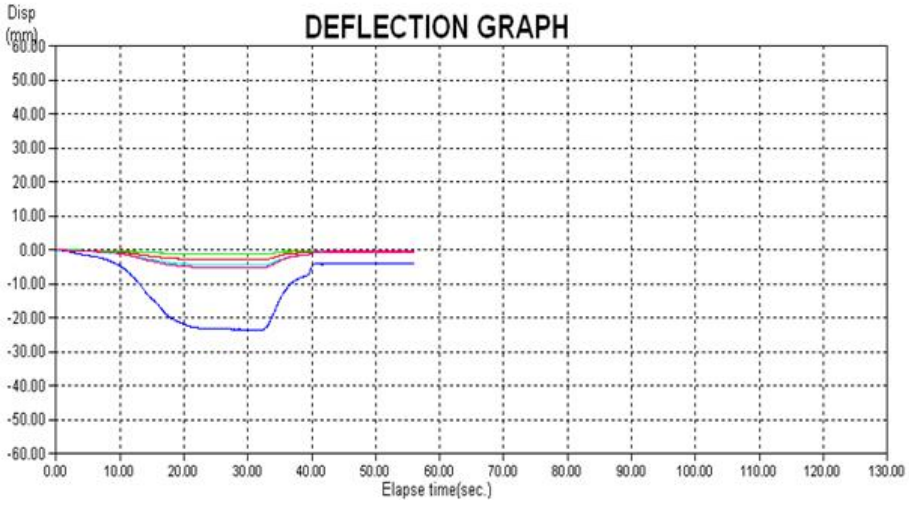
4. STRUCTURAL PERFORMANCE TEST BY STATIC PRESSURE (PROOF LOAD) ; ASTM E 330



△ MAX. DEFLECTION AND PERMANENT SET @ +150% DESIGN LOAD

§. ±150% DESIGN LOAD
±2.16 kPa (±45.12 psf)



△ MAX. DEFLECTION AND PERMANENT SET @ -150% DESIGN LOAD

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5. PHOTOS (THERMOCOUPLE)

△ JAMB

△ MULLION

△ SILL

△ RAIL & GLASS

Korea Laboratory Accreditation Scheme

CERTIFICATE OF ACCREDITATION

CNC R&D Center

Accreditation No. : KT638

Corporation Registration No. : 134611-0020185

Address of Laboratory : 222, Indeung-ro, Sancheok-myeon, Chunggu-si, Chungcheongbuk-do, Korea

date of Initial Accreditation : October 7, 2014

Duration : November 20, 2018 ~ November 19, 2022

Scope of Accreditation : Attached Annex

Date of issue : November 20, 2018

This testing laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025 : 2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated 8 January 2009).

KOREA LABORATORY ACCREDITATION SCHEME KOLAS

LEE Seung Woo

Administrator
Korea Laboratory Accreditation Scheme