

FUZHOU ROPO BUILDING MATERIALS CO., LTD

MIAMI-DADE TEST REPORT

SCOPE OF WORK

TAS 201, TAS 202, AND TAS 203 TESTING ON ALUMINUM CASEMENT WINDOW

REPORT NUMBER

211217011SHF-001

TEST DATE(S)

2021-12-20 – 2021-12-21

ISSUE DATE

2022-04-19

RECORD RETENTION END DATE

2031-12-21

LABORATORY CERTIFICATION NO.

20-0831.16

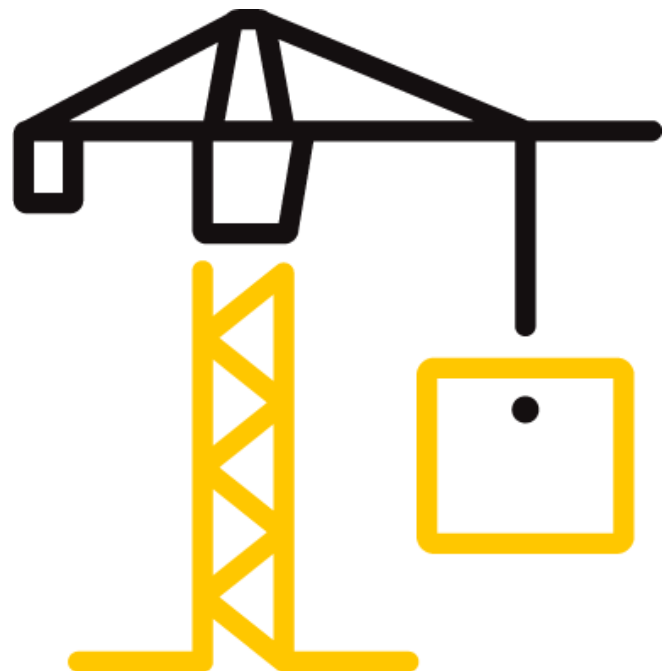
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28

DOCUMENT CONTROL NUMBER

LFT-APAC-SHF-OP-10p (May 1, 2020)

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TEST REPORT

Issue Date: 2022-04-19

Intertek Report No.: 211217011SHF-001

REPORT ISSUED TO

Fuzhou Ropo Building Materials Co., Ltd
Tieling Industrial Zone, Minhou, Fuzhou, Fujian, China

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Fuzhou Ropo Building Materials Co., Ltd. to perform TAS 201, TAS 202, and TAS 203 testing in accordance with Miami-Dade County requirements on their Aluminum Casement window, Model of ROPO100CW. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at the Intertek B&C test facility in No. 6958 Daye Road, Fengxian District, Shanghai, China. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. Unless differently required, Intertek reports apply the "Simple Acceptance" rule, also called "Shared Risk approach," of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.

SECTION 2

SUMMARY OF TEST RESULTS

The specimen(s) tested met the performance requirements set forth in the protocols.

Product Type: Aluminum Casement Window

Series/Model: ROPO100CW

SPEC.	TEST PROTOCOL	DESIGN PRESSURE
#3	TAS 202	+60.0 / -60.0 psf
	TAS 201/203 (Large Missile)	+60.0 / -60.0 psf
#1, #2	TAS 201/203 (Large Missile)	+60.0 / -60.0 psf

For INTERTEK B&C:

COMPLETED BY:	Fred Bao	REVIEWED BY:	Vinu Abraham
TITLE:	Assistant Technical Manager – Intertek B&C	TITLE:	Vice President - Products
SIGNATURE:		SIGNATURE:	
DATE:	2022-04-19	DATE:	2022-04-19

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SECTION 3 TEST METHOD(S)

The specimens were evaluated in accordance with the following:

TAS 201-94, *Impact Test Procedures*

TAS 202-94, *Criteria for Testing Impact & Nonimpact Resistant Building Envelope Components Using Uniform Static Air Pressure*

TAS 203-94, *Criteria for Testing Products Subject to Cyclic Wind Pressure Loading*

SECTION 4 MATERIAL SOURCE/INSTALLATION

Test specimen(s) were provided by the client. Representative samples of the test specimen(s) will be retained by Intertek B&C for a minimum of ten years from the test completion date.

Then specimen was installed into a steel test buck. The rough opening allowed for a 1/4" shim space. The exterior perimeter of the door was sealed with sealant. Installation of the tested product was performed by the client.

LOCATION	ANCHOR DESCRIPTION	ANCHOR LOCATION
Head, Jamb, Sill	4.5 mm x 60 mm Anchor Screw	Anchor 5-29/32" from ends and 1' 3-3/4" gap between two anchors.

SECTION 5 EQUIPMENT

Cannon: Constructed from steel piping utilizing compressed air to propel the missile

Missile: 2x4 Southern Pine

Timing Device: Electronic beam type

Cycling Mechanism: Computer controlled centrifugal blower with electronic pressure measuring device

Deflection Measuring Device: Linear transducers

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SECTION 6**LIST OF OFFICIAL OBSERVERS**

NAME	COMPANY
Benson Deng	Fuzhou Ropo Building Materials Co., Ltd
Shengwei Wu	Fuzhou Ropo Building Materials Co., Ltd
Vinu Abraham	Intertek B&C
Fred Bao	Intertek B&C
Zac Zhang	Intertek B&C
Gio Liu	Intertek B&C
Ron Liu	Intertek B&C

SECTION 7**TEST SPECIMEN DESCRIPTION****Product Type:** Aluminum Casement Window**Series/Model:** ROPO100CW**Product Size(s): Specimen #1, #2 and #3**

OVERALL AREA:	WIDTH	HEIGHT
11.30 ft ²	inches	inches
Overall Size	2' 3-35/64	4' 11-3/64"
Exterior Sash	2' 27/32"	4' 8-11/32"

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Frame Construction:

FRAME MEMBER	MATERIAL	DESCRIPTION
Head, sill and jambs GY40321	6063-T5 Extruded Aluminum	3-15/16" Wide by 2-29/64" High 45° Mitre-Cut
	JOINERY TYPE	DETAIL
All frame Corners	Mechanically fastened	Frame members were in Mitre-cut with 45 degrees, butted and sealed with WEISS COSMOPUR 818C assembly glue, assembled with corner brace by 2 NLJP12 corner screws.

Reinforcement: *No reinforcement was utilized.*

Door Leaf/Sash/Vent/Panel Construction:

SASH Member	PART #	MATERIAL	DESCRIPTION
Window Sash Head, sill & jambs	GY40330	6063-T5 Extruded Aluminum	1-31/32" Wide by 3-19/64" High, 45° Mitre-Cut
	Joinery Type	Detail	
All Corners	Mechanically fastened	Sash members were Mitre-Cut, butted and sealed with WEISS COSMOPUR 818C Assembly Glue, Assembly with Corner Bracket	

Drainage: *No drainage was utilized.*

Weatherstripping:

DESCRIPTION	QUANTITY	LOCATION
11/32" wide by 1/2" HIGH Gasket: 112.254	EPDM 4 Rows	Between the Window Frame and Sash

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Glazing:

GLASS TYPE	OVERALL THICKNESS	GLASS MAKEUP	GLAZING METHOD
Laminated Glass	23/32"	5/16" tempered glass 3/32" (PVB interlayer) 5/16" tempered glass	Glazed by assembling the frame members around the glass and sealed on the interior and exterior with 1/8" wide by 3/4" deep DOW CONING SJ168 silicon seal

LOCATION	QUANTITY	DAYLIGHT OPENING inches	GLASS BITE
Sash	1	1' 5-31/64" x 4' 1"	5/8"

Hardware:

DESCRIPTION	QUANTITY	LOCATION	MANUFACTURER	MODEL NUMBER
Lock Box	1	Sash	ROTO	487491
Handle	1	Sash	ROTO	571164
Lock Point	6	Sash	ROTO	328732
Lock Seat	2	Frame	ROTO	771212
Steering Angles	2	Sash	ROTO	347543
Lock Seat	4	Frame	ROTO	212633
Invisible Hinge	4	Frame	HOPO	ALP15.00.021
Friction Hinge	2	Frame	ROTO	501144

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SECTION 8 TEST RESULTS

Protocol TAS 202-94, *Static Air Pressure*

Test Date(s): 12/10/2021 through 12/10/2021

The temperature during testing was 17°C (62.6°F). The results are tabulated as follows:

Test Specimen #3: Air Leakage per TAS 202

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Air Leakage Infiltration per TAS 202 at 1.57 psf (25 mph)	0.06 L/s/m ² (0.01 cfm/ft ²)	1.0 L/s/m ² (0.20 cfm/ft ²) max.	1
Air Leakage Infiltration per TAS 202 at 6.24 psf (50 mph)	0.11 L/s/m ² (0.02 cfm/ft ²)	1.5 L/s/m ² (0.30 cfm/ft ²) max.	

Note 1: Test Date 12/10/21 / Time: 9:30 AM (Air Note Only)

Test Specimen #3: Preload and Design Load per TAS 202

LOAD (psf)	INDICATOR LOCATION	DEFLECTION (in.)		PERMANENT SET (in.)	
		MEASURED	ALLOWED	MEASURED	ALLOWED
+45.0 50% of Test Pressure	2	0.01	NA	<0.01	NA
	5	<0.01	NA	<0.01	NA
	8	<0.01	NA	<0.01	NA
+60.0 Design Pressure	2	0.02	0.26	<0.01	NA
	5	<0.01	0.10	<0.01	NA
	8	<0.01	0.09	<0.01	NA

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Test Specimen #3: Preload and Design Load per TAS 202

LOAD (psf)	INDICATOR LOCATION	DEFLECTION (in.)		PERMANENT SET (in.)	
		MEASURED	ALLOWED	MEASURED	ALLOWED
-45.0 50% of Test Pressure	2	0.05	NA	<0.01	NA
	5	<0.01	NA	<0.01	NA
	8	<0.01	NA	<0.01	NA
-60.0 Design Pressure	2	0.06	0.26	<0.01	NA
	5	<0.01	0.10	<0.01	NA
	8	<0.01	0.09	<0.01	NA

Test Specimen #3: Water Infiltration per TAS 202

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Water Penetration, per TAS 202 15% of Positive Design Pressure at 440 Pa (9 psf)	PASSED	No leakage	NA

Test Specimen #3: Structural Overload Load per TAS 202

LOAD (psf)	INDICATOR LOCATION	DEFLECTION (in.)		PERMANENT SET (in.)	
		MEASURED	ALLOWED	MEASURED	ALLOWED
+90.0 Test Pressure	2	0.04	NA	0.01	0.09
	5	<0.01	NA	<0.01	0.04
	8	<0.01	NA	<0.01	0.03
-90.0 Test Pressure	2	0.08	NA	<0.01	0.09
	5	<0.01	NA	<0.01	0.04
	8	<0.01	NA	<0.01	0.03

Note 2: Positive and negative uniform static load test loads were held for 30 seconds.

Note 3: Tape and film were not used to seal against air leakage during structural testing.

Note 4: See Sketch No. 1 for indicator locations. Deflection/permanent set reported is the overall deflection between three points (longest unsupported span) which accounts for support movement.

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Test Specimen #3: Forced Entry Resistance per TAS 202

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Forced Entry Resistance, per ASTM F588 Grade 10	PASSED	No entry	NA

Protocol TAS 201-94, Large Missile Impact Procedures

Test Date(s): 12/20/2021 through 12/20/2021

The temperature during testing was 18.8°C (65.8°F). The results are tabulated as follows:

Test Specimen #1

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
1	9.3	94	49.5
2			49.5

Test Specimen #2

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
3	9.3	94	49.9
4			49.5

Test Specimen #3

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
5	9.3	94	49.5
6			49.5

Note 5: See Sketch #2, #3 and #4 for impact locations.

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Protocol TAS 203-94, *Cyclic Wind Pressure Loading*

Test Date(s): 12/20/2021 through 12/21/2021

The temperature during testing was 18.8°C (65.8°F). The results are tabulated as follows:

Test Specimen #1, #2 & #3: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	STAGE			
+60.0 / -60.0 psf	1	2	3	4
POSITIVE PRESSURE RANGE (psf)	12.0 – 30.0	0 – 36.0	30.0 – 48.0	18.0 – 60.0
AVERAGE CYCLE TIME (sec.)	2	3	3	3
NUMBER OF CYCLES	3500	300	600	100
	5	6	7	8
NEGATIVE PRESSURE RANGE (psf)	-18.0 – -60.0	-30.0 – -48.0	0 – -36.0	-12.0 – -30.0
AVERAGE CYCLE TIME (sec.)	3	3	3	2
NUMBER OF CYCLES	50	1050	50	3350

Test Specimens #1, #2, and #3 were cycled in a common chamber.

SECTION 9

CONCLUSIONS

The large missiles impacted each intended target. Each impact location was carefully inspected. No signs of penetration, rupture, or opening after the large missile impact test were observed; as such, each test specimen satisfies the large missile requirements of TAS 201. Upon completion of testing, specimens tested for TAS 201-94 met the requirements of Section 1626 of the Florida Building Code, Building.

No signs of failure were observed in any area of the test specimen during the TAS 202 testing; as such, the test specimen satisfies the requirements of TAS 202. Upon completion of testing, specimens tested for TAS 202-94 met the requirements of Section 1620 of the Florida Building Code, Building.

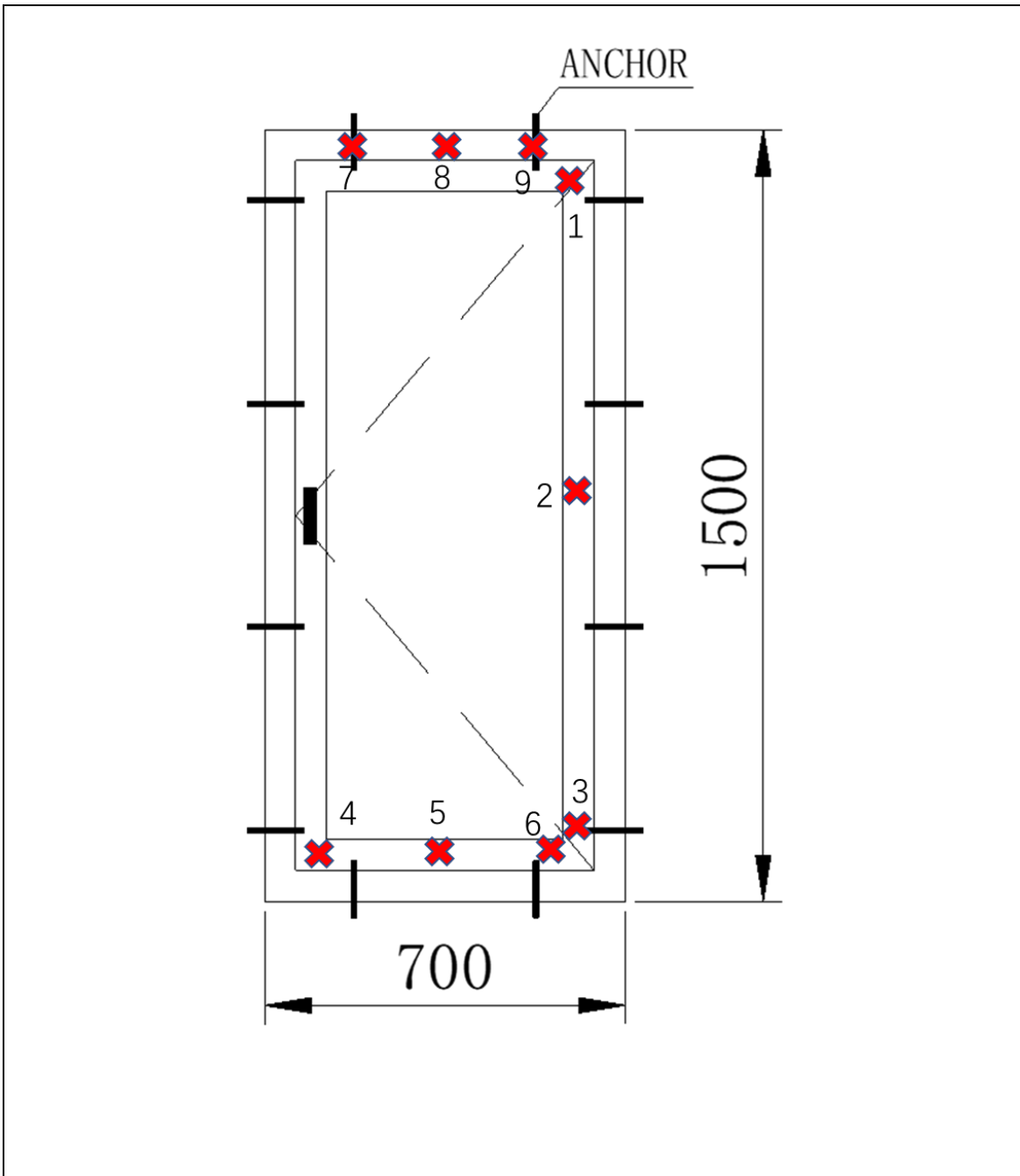
No signs of failure were observed in any area of the test specimens during the cyclic load test; as such, the test specimens satisfy the cyclic load requirements of TAS 203. Upon completion of testing, specimens tested for TAS 203-94 met the requirements of Section 1626 of the Florida Building Code, Building.

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SECTION 10 SKETCH(ES)

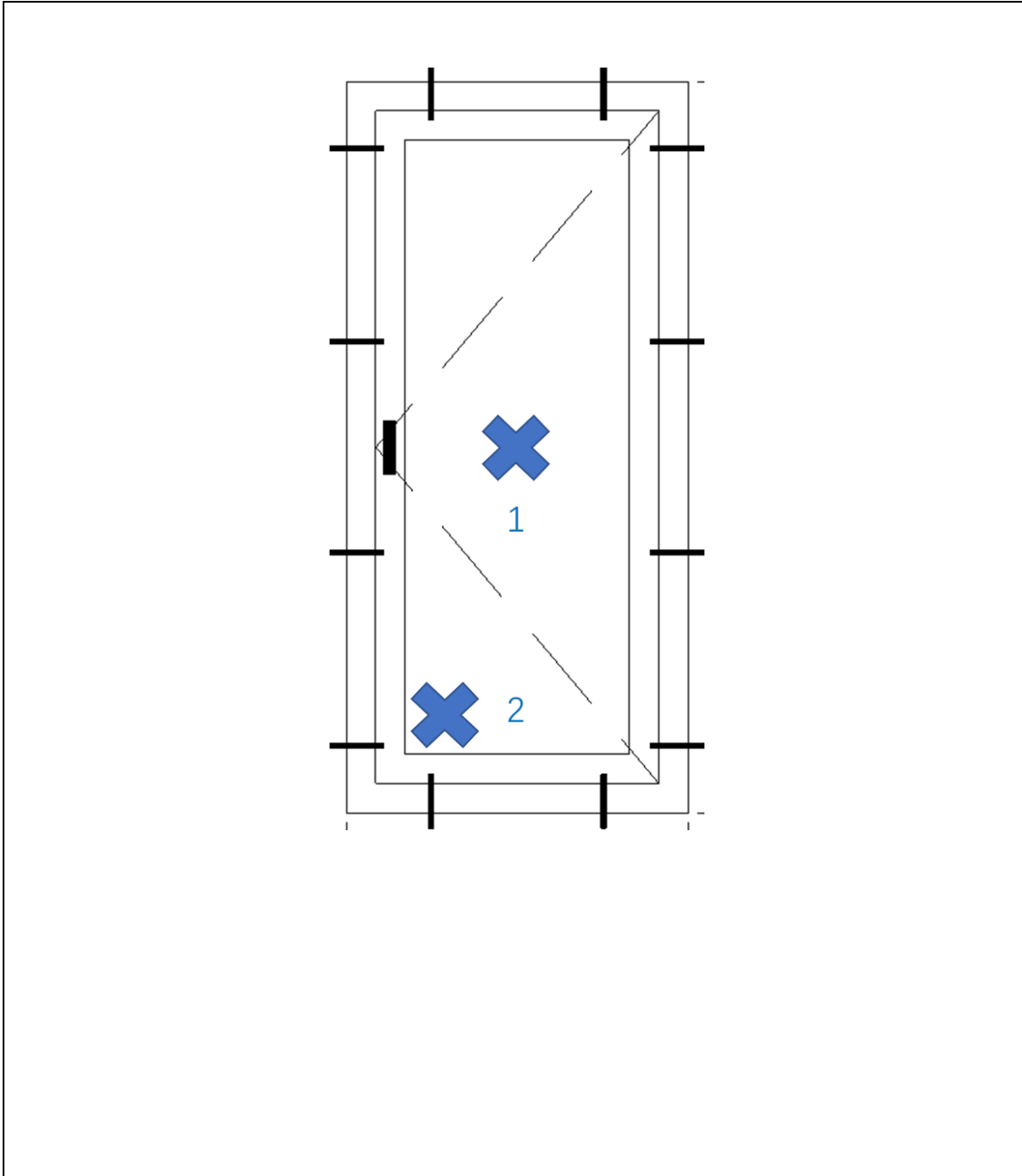


Sketch No. 1
TAS 202 Indicator Locations of specimen #1

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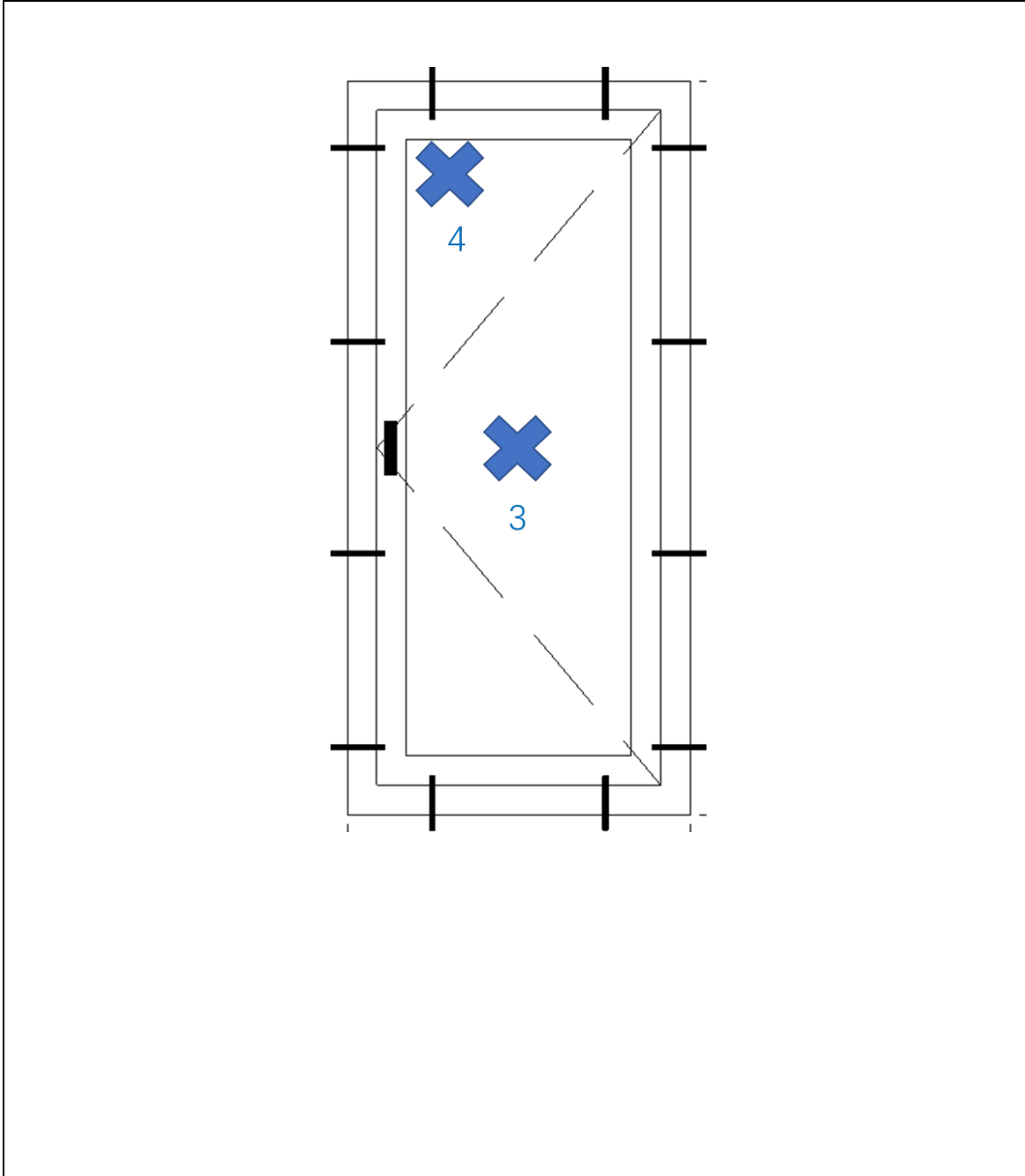


Sketch No. 2
TAS 201 Impact Locations of specimen #1

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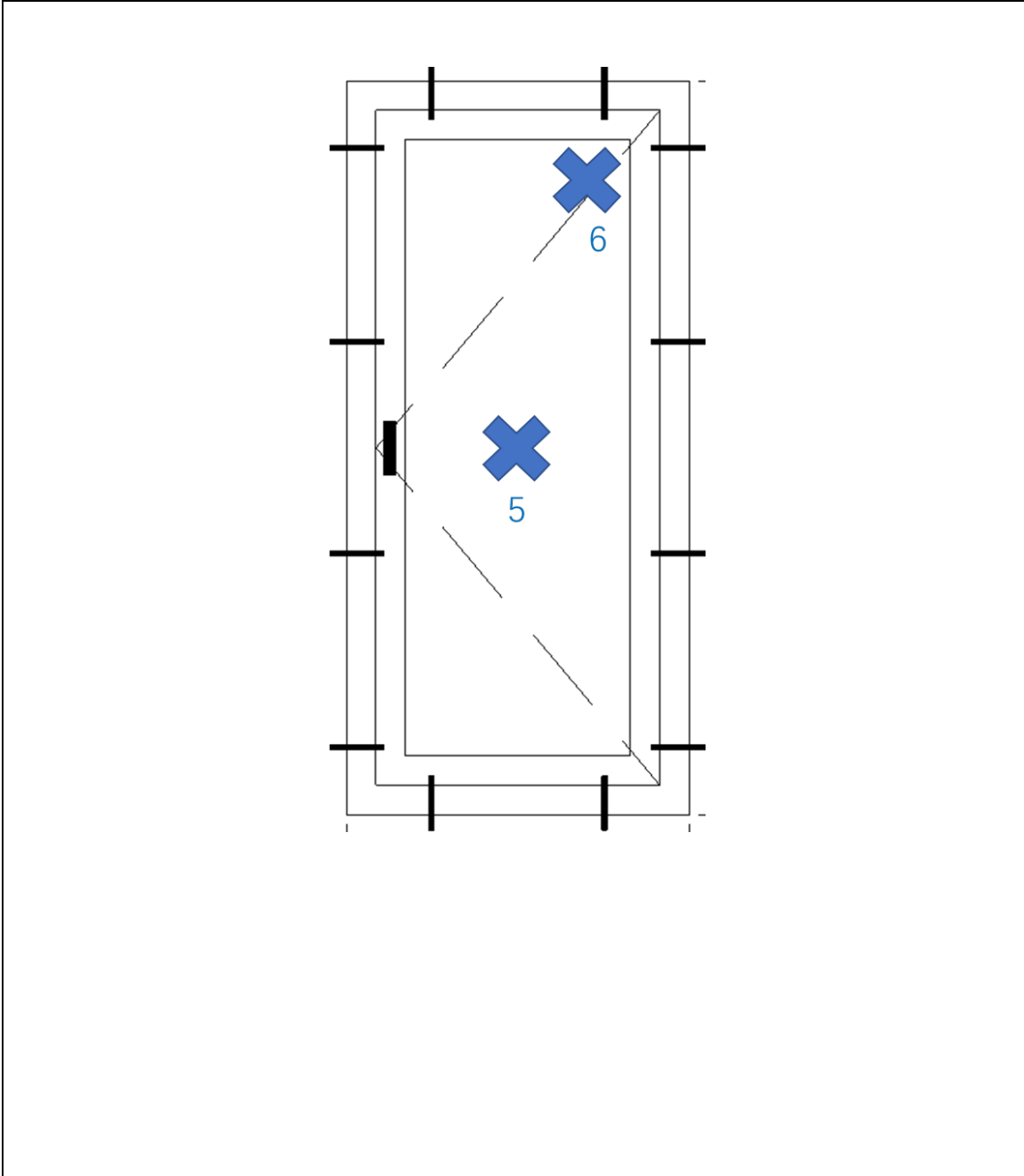


Sketch No. 3
TAS 201 Impact Locations of specimen #2

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Sketch No. 4
TAS 201 Impact Locations of specimen #3

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SECTION 11 PHOTOGRAPHS



Photo No. 1

Specimens #1, #2 and #3 before impact test (Testing on December 20, 2021)



Photo No. 2

Specimens #1, #2 and #3 after impact test (Testing on December 20, 2021)

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Photo No.3

Specimens #1 after cyclic test (Testing on December 21, 2021)



Photo No.4

Specimen #2 after cyclic test (Testing on December 21, 2021)

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Photo No.5
Specimen #3 after cyclic test (Testing on December 21, 2021)

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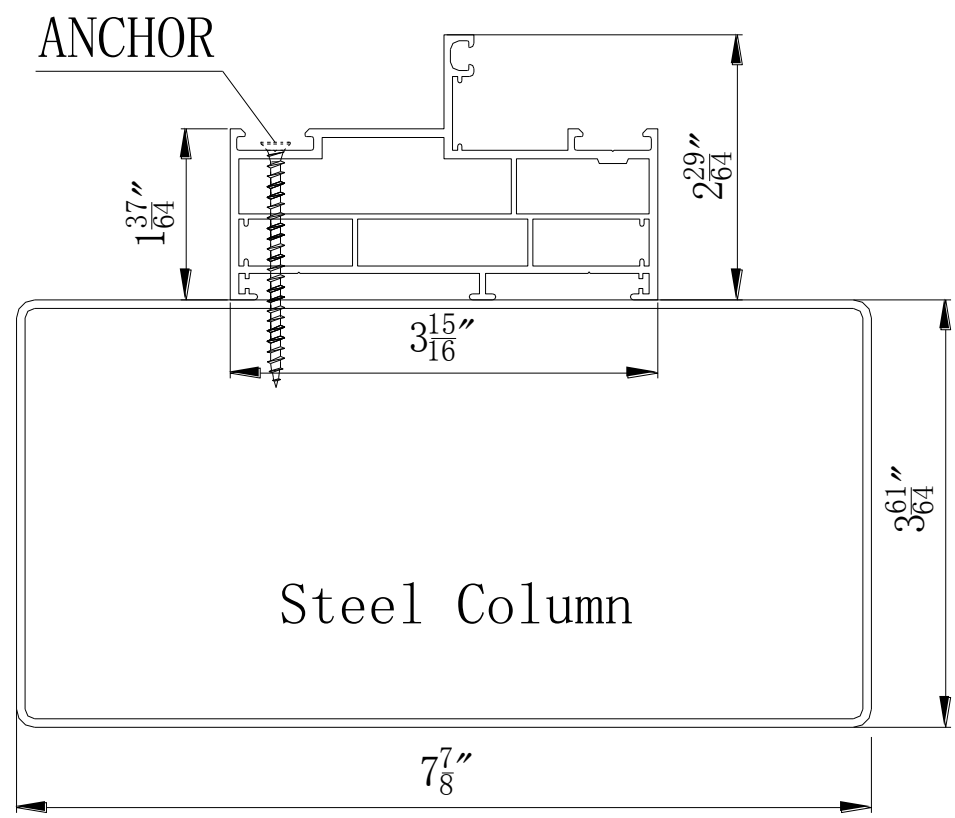
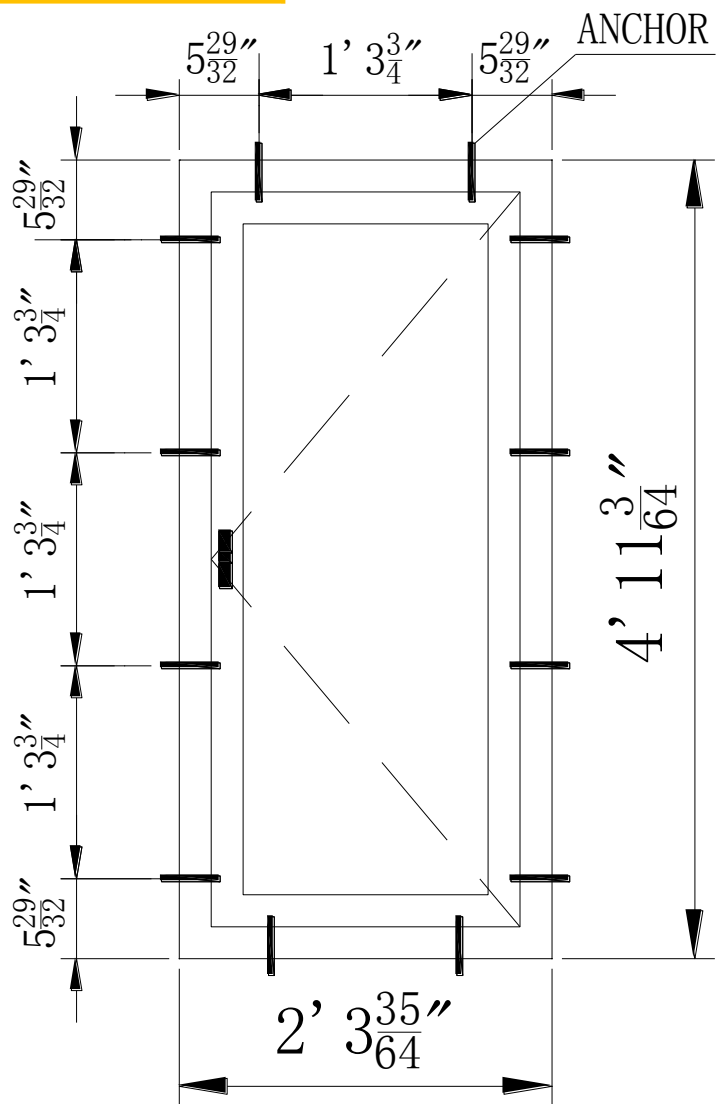
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SECTION 12 DRAWINGS

The test specimen drawings have been reviewed by Intertek B&C and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.

Note: *Complete drawings packet on file with Intertek B&C.*



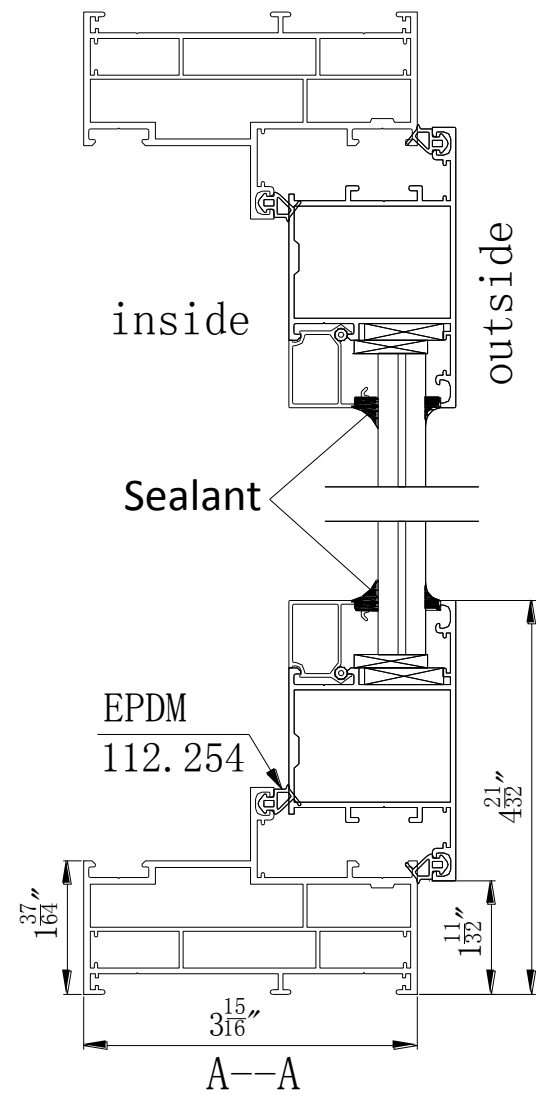
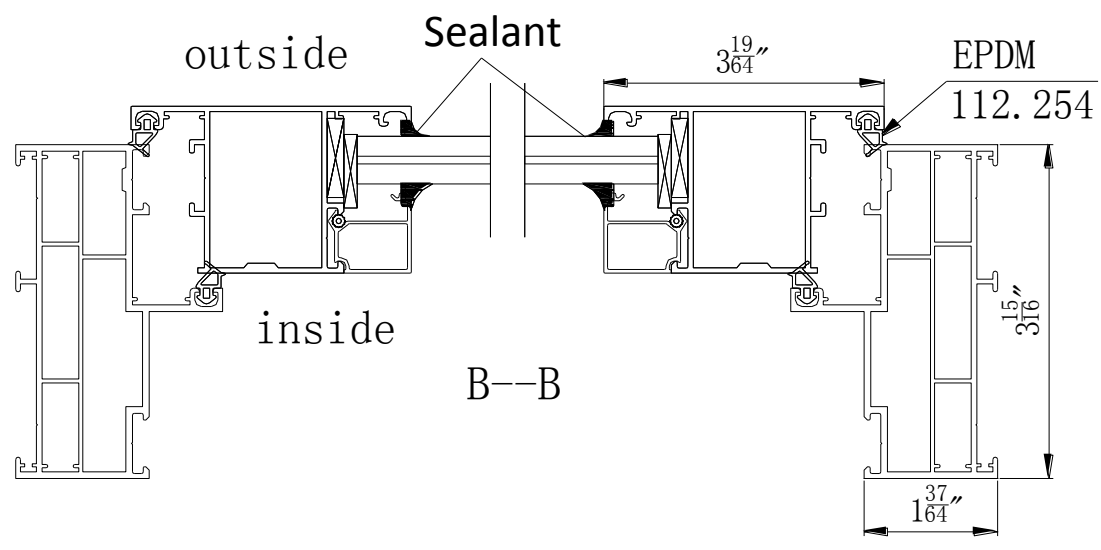
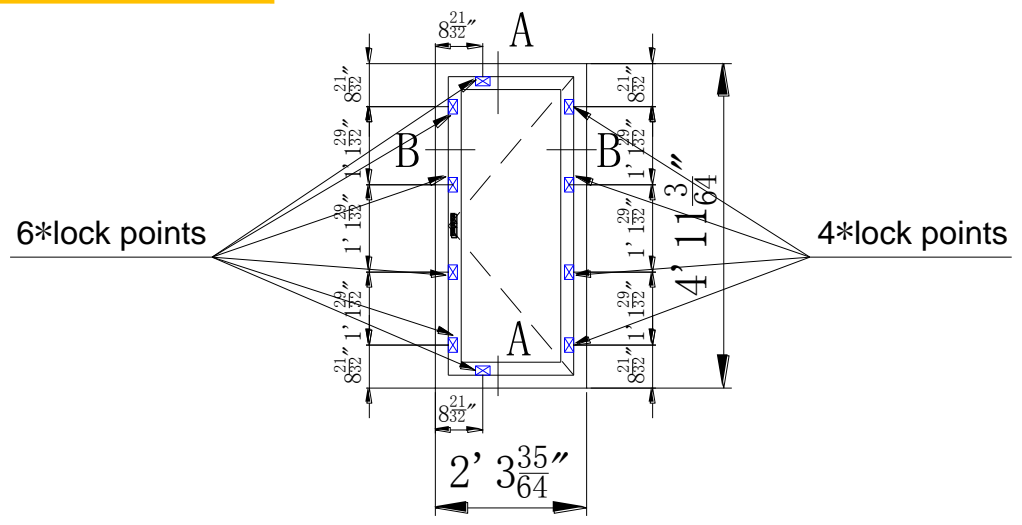
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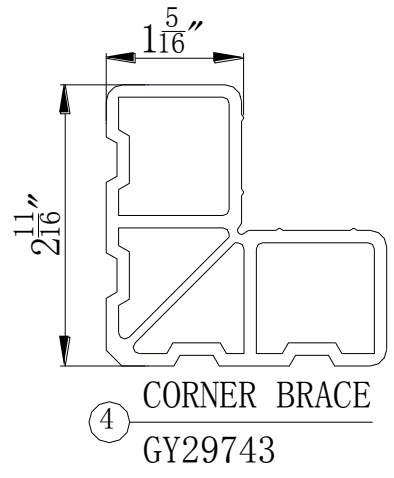
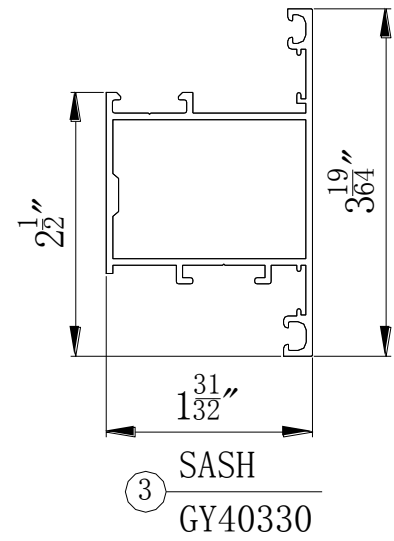
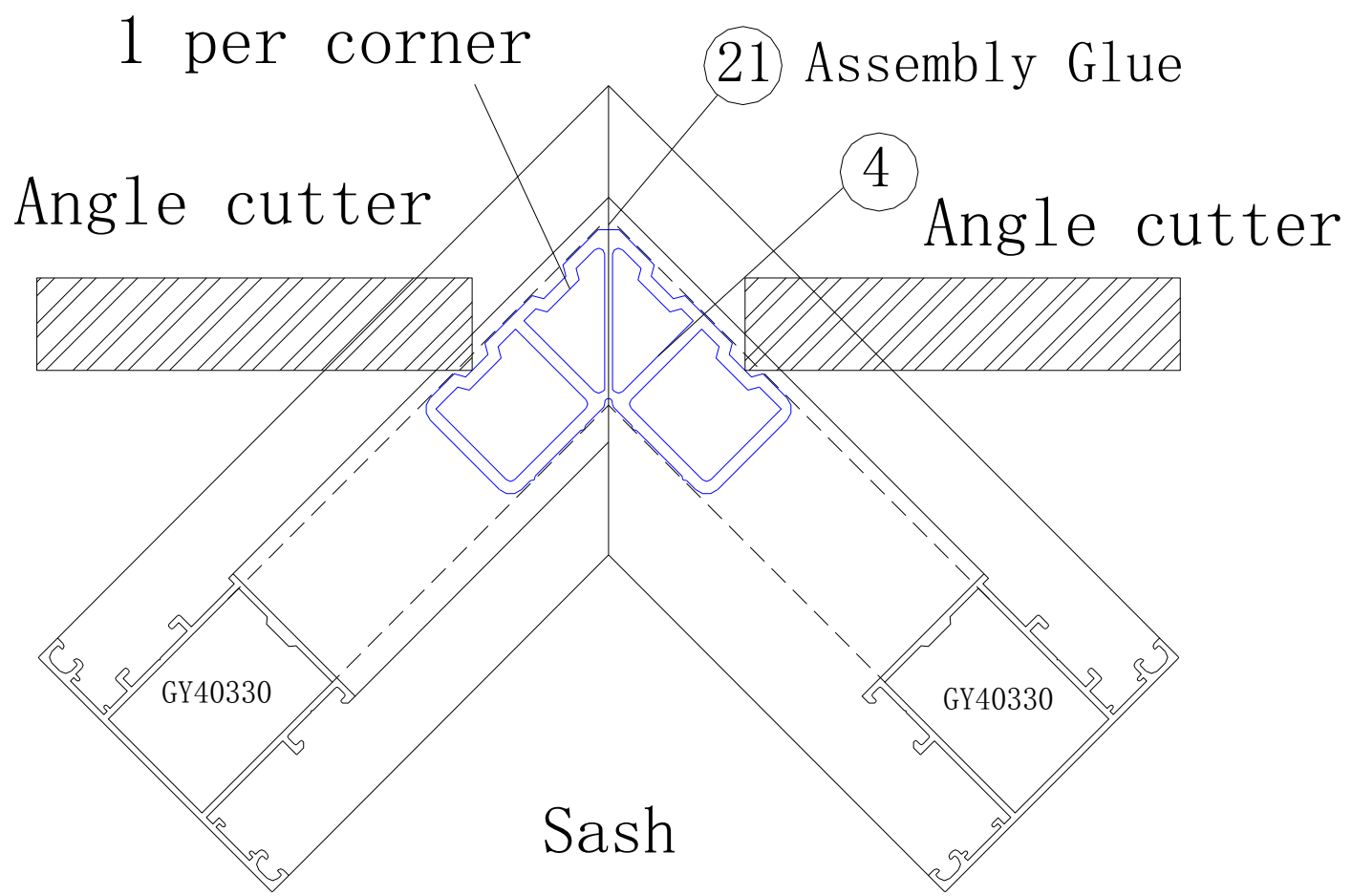
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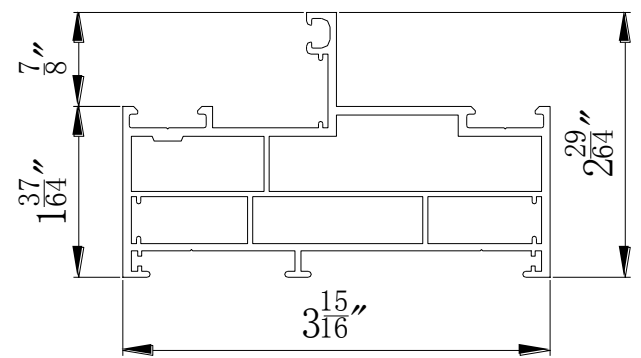
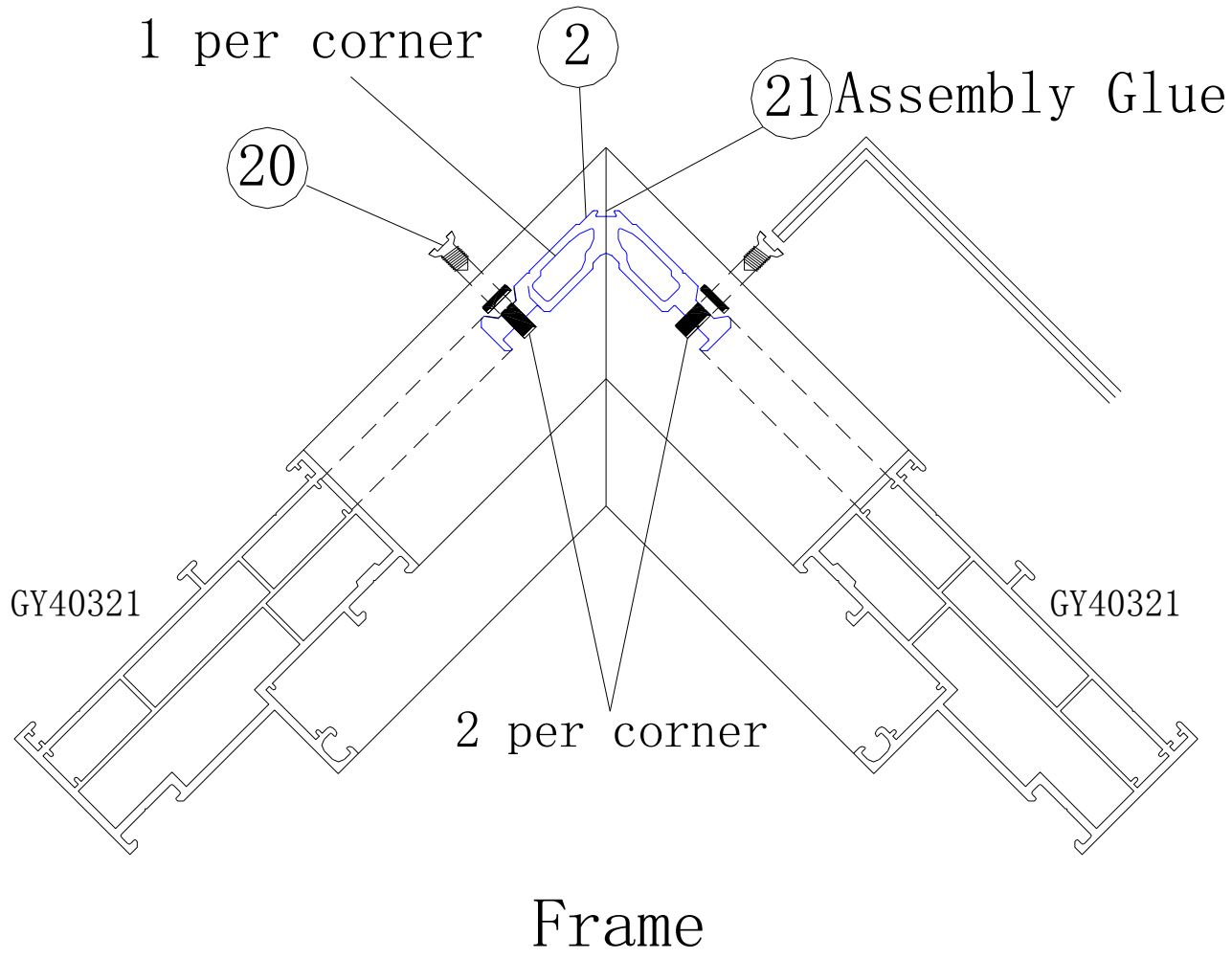
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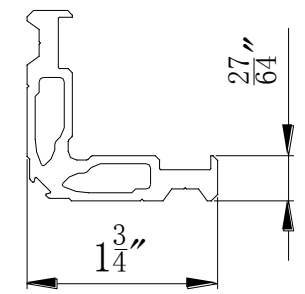
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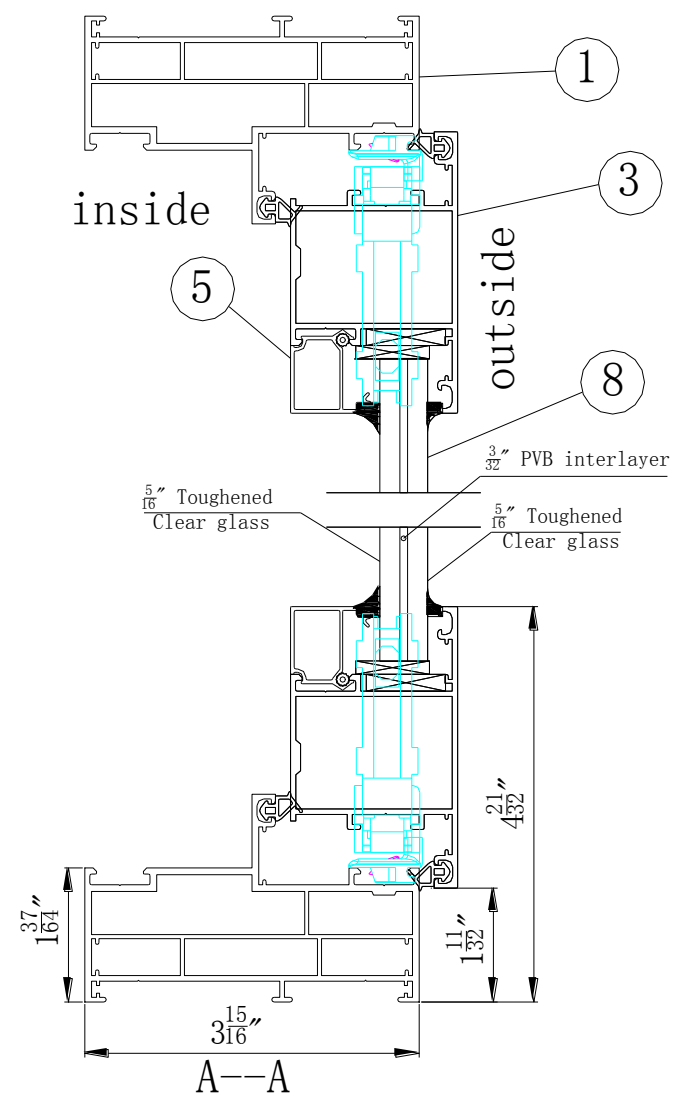
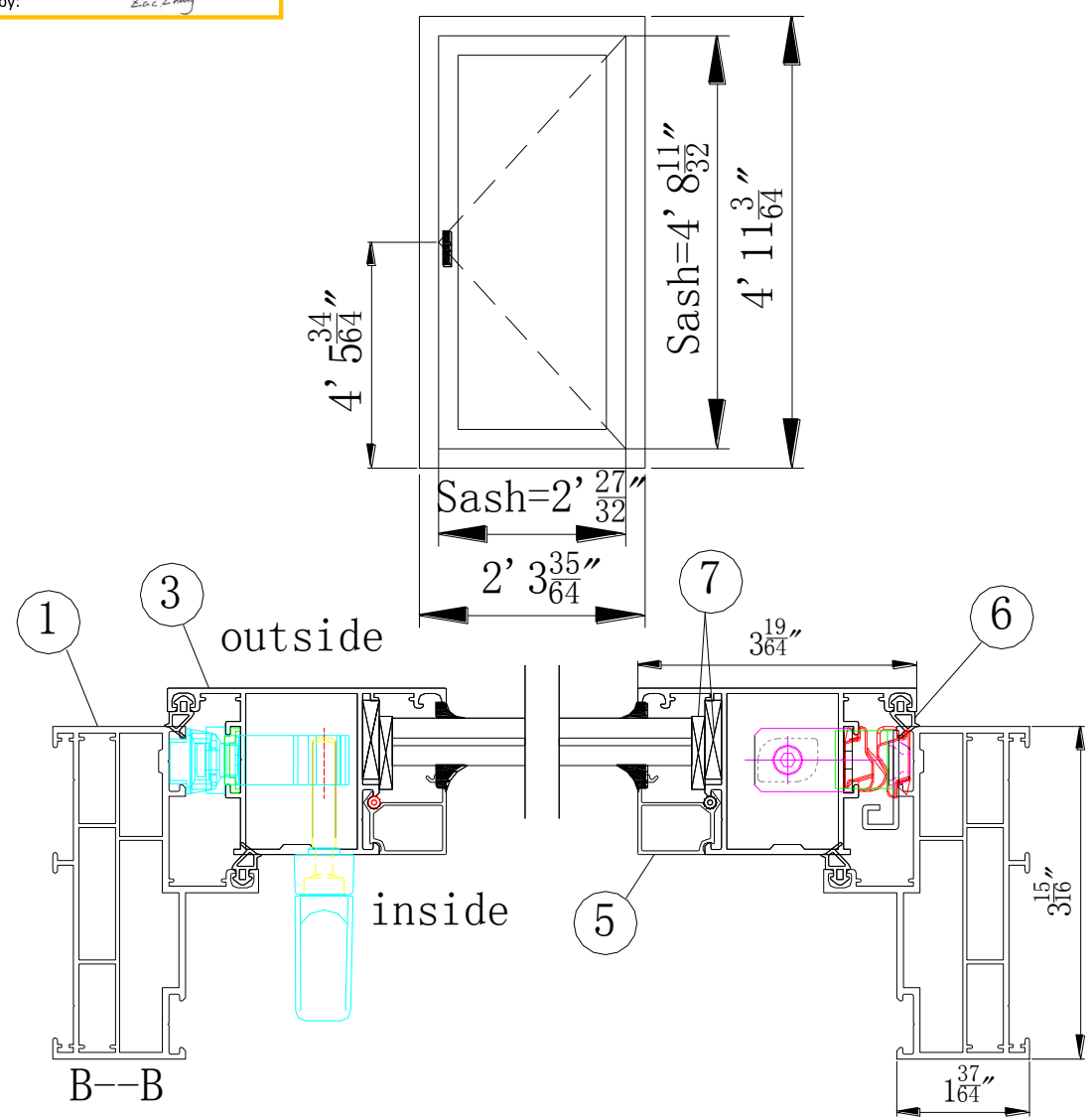
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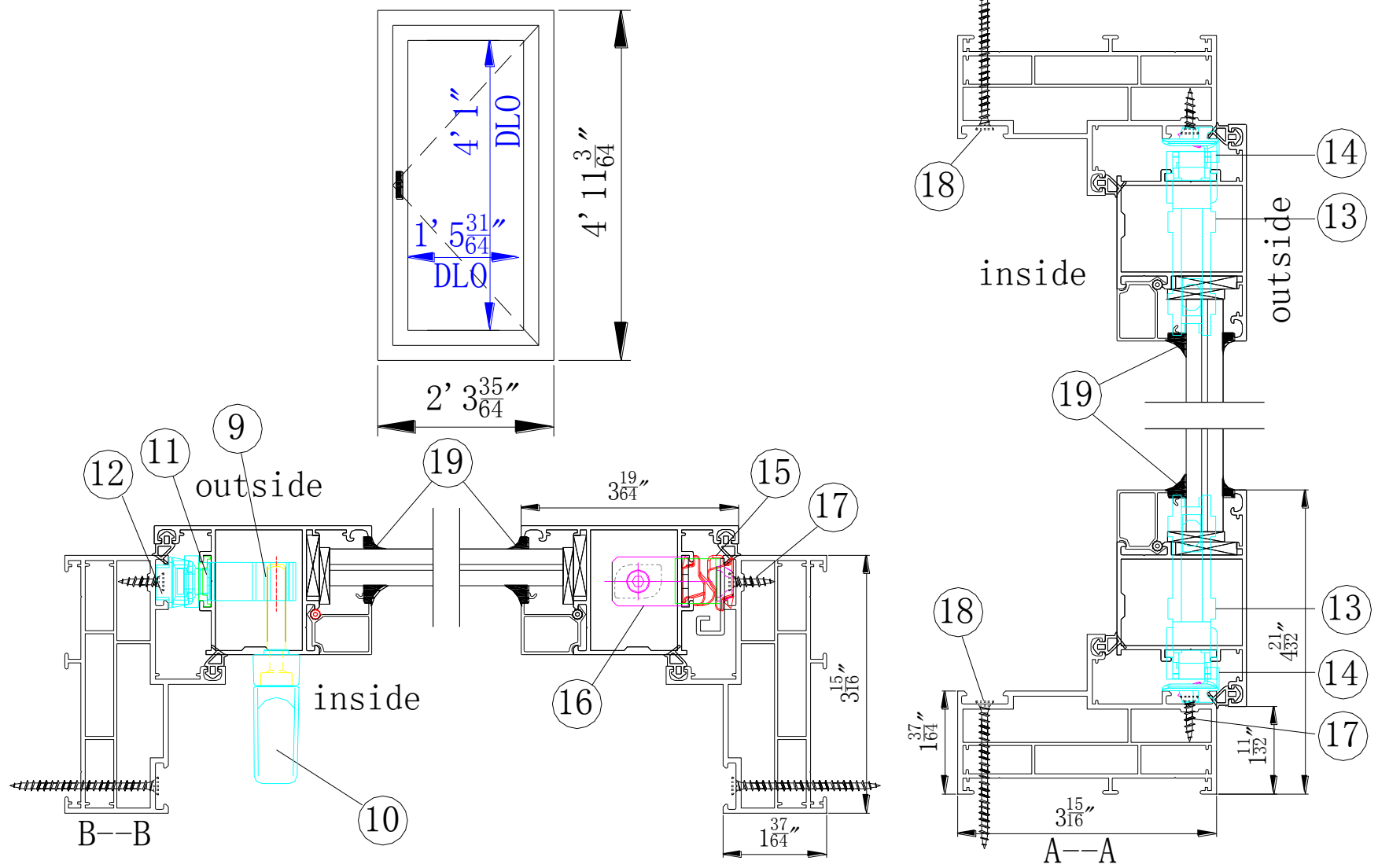
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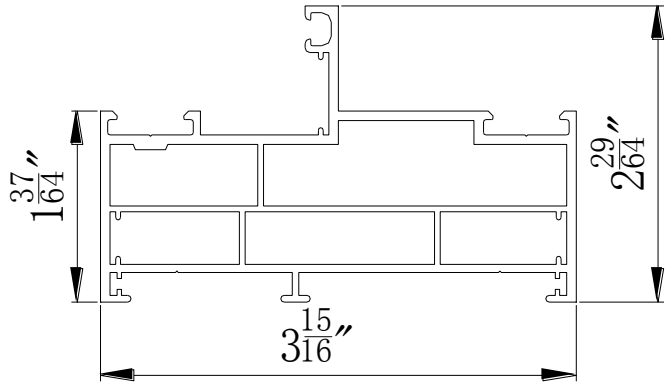
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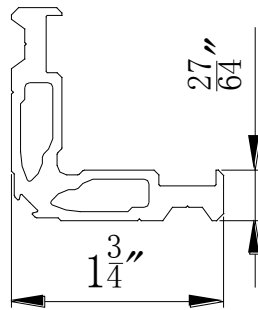
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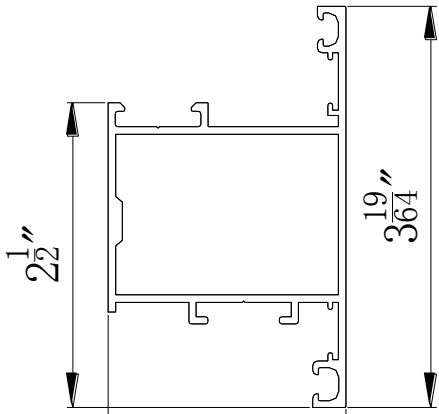
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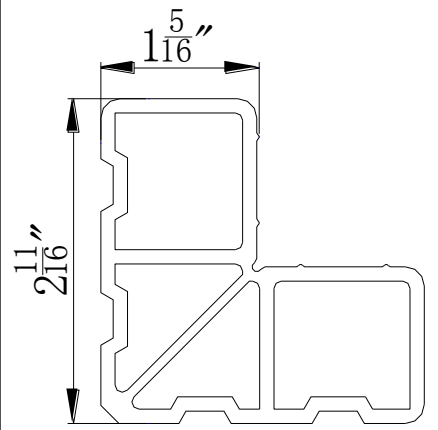
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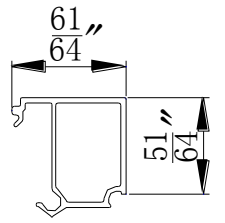
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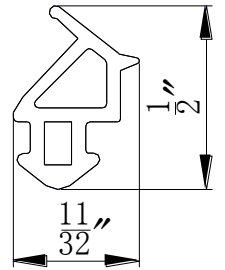
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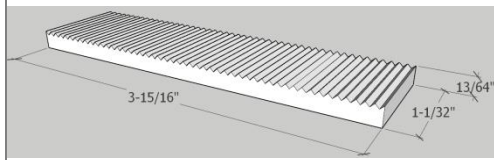
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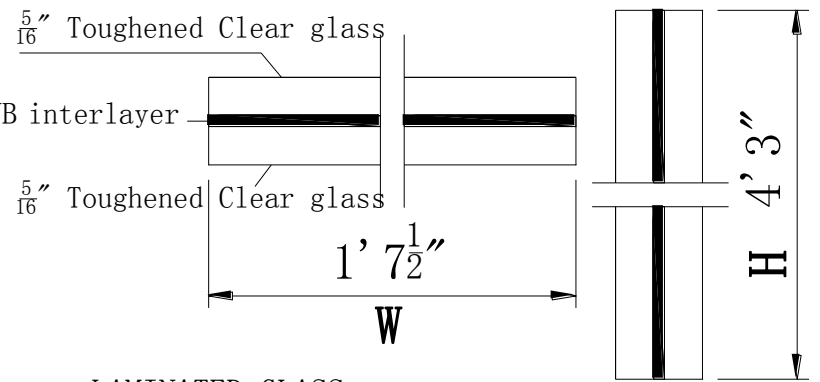
⑤ GLAZING BEAD
GY40325



⑥ EPDM GASKET
112.254



⑦ GLASS BLOCK
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⑧ LAMINATED GLASS
 $\frac{5}{16}'' + \frac{3}{32}'' \text{PVB interlayer} + \frac{5}{16}''$



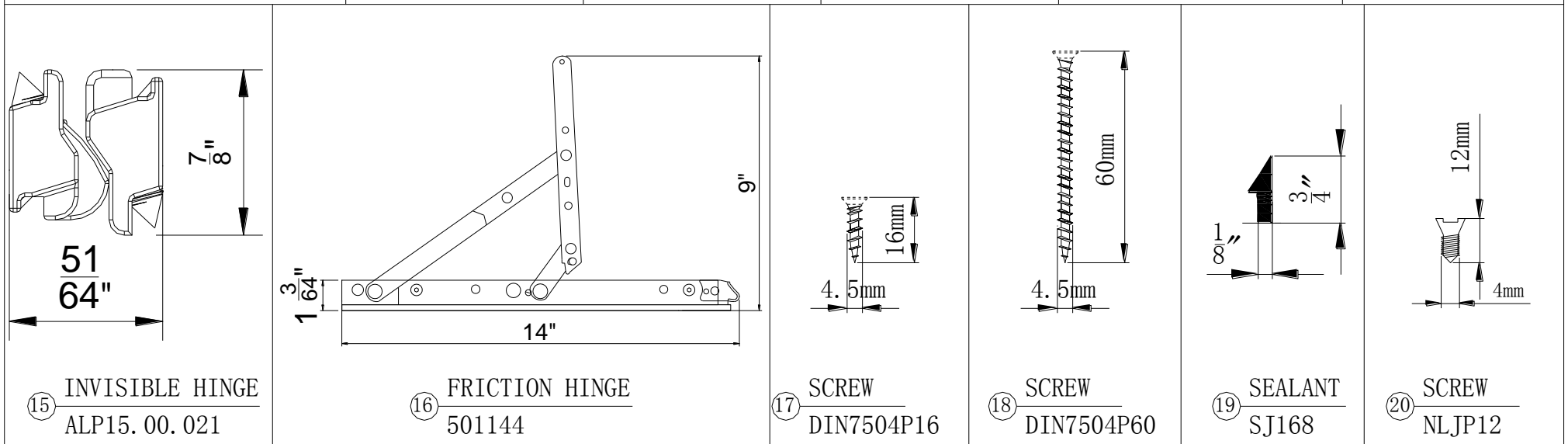
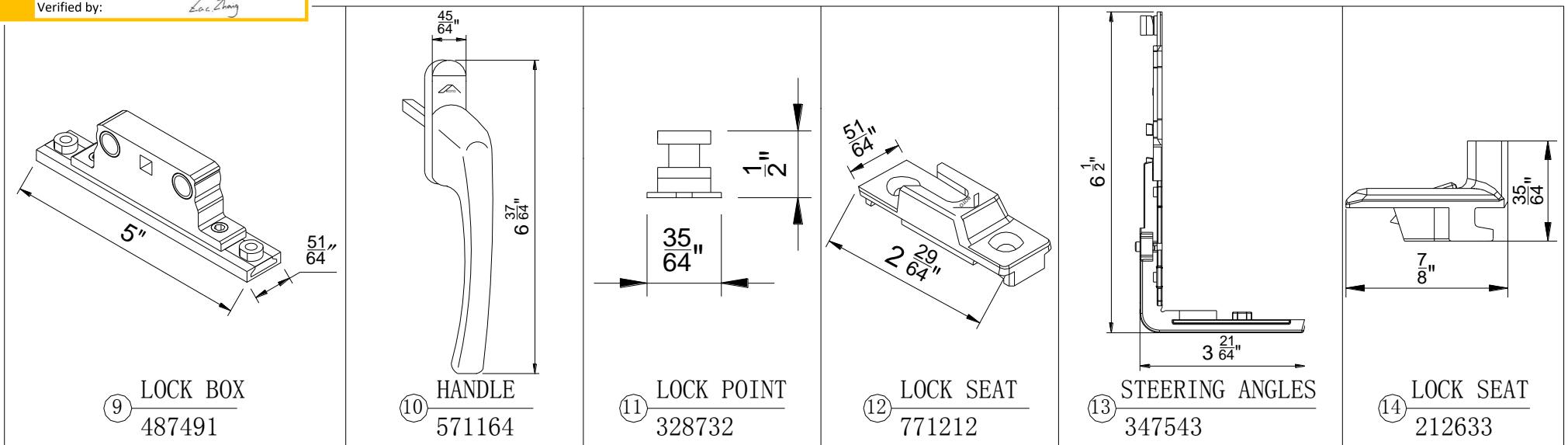
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BILL OF MATERIALS

ITEM	PROFILE CODE	DESCRIPTION	MATERIAL	MANUFACTURER/REMARKS
1	GY40321	WINDOW FRAME	ALUMINIUM ALLOY	6063-T5
2	GY29748	CORNER BRACE	ALUMINIUM ALLOY	6063-T5
3	GY40330	SASH	ALUMINIUM ALLOY	6063-T5
4	GY29743	CORNER BRACE	ALUMINIUM ALLOY	6063-T5
5	GY40325	GLAZING BEAD	ALUMINIUM ALLOY	6063-T5
6	112. 254	EPDM GASKET	EPDM	-
7	DP-948	GLASS BLOCK	PLASTIC	-
8	63/200"+9/100"PVB+63/200"	LAMINATED GLASS	GLASS	-
9	487491	LOCK BOX	STEEL	ROTO
10	571164	HANDLE	STEEL	ROTO
11	328732	LOCK POINT	STEEL	ROTO
12	771212	LOCK SEAT	STEEL	ROTO
13	347543	STEERING ANGLES	STEEL	ROTO
14	212633	LOCK SEAT	STEEL	ROTO
15	ALP15. 00. 021	INVISIBLE HINGE	STEEL	HOPO
16	501144	FRICTION HINGE	STAINLESS STEEL	ROTO
17	DIN7504P16	SCREW	STAINLESS STEEL	Screw Diameter=4.5mm, Screw Length=16mm
18	DIN7504P60	SCREW	STAINLESS STEEL	Screw Diameter=4.5mm, Screw Length=60mm
19	SJ168	SEALANT	SILICONE	DOW CORNING
20	NLJP12	SCREW	STAINLESS STEEL	Screw Diameter=4mm, Screw Length=12mm
21	COSMOPUR 818C	Assembly Glue	Polyurethane	WEISS
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TEST REPORT

Issue Date: 2022-04-19

Intertek Report No.: 211217011SHF-001

SECTION 13 REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	2022-04-19	N/A	Original Report Issue