Test Report

AZUMA

WIND AND WATER TEST TO THE REQUIREMENTS OF AS2047

CLIENT – CIVRO Building Technology (Guangdong) Co., Ltd

PRODUCT – XW80IN Inwards Tilt-Turn Window

TESTED AT – AZUMA JIANGMEN BRANCH LABORATORY

REPORTED BY – AZUMA TESTING LIMITED

REPORT NO. – AZHK251206

Issue Date: 30th December 2025

ilac-MRA NATA WORLD RECOGNISED ACCREDITATION

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1 Customer Requirements

Customer requires all applicable tests to the performance requirements of AS2047, using the test procedures from AS/NZS 4420.1.

2 Reference Standard

- AS2047 – 2014 Windows and External Glazed Doors in Buildings
- AS/NZS 4420.1 – 2016 Windows external glazed timber and composite doors - Methods of test - Test sequence, sampling and test methods

3 General Information

Test Lab/ Site No.	Azuma (Jiangmen) Testing Limited/ 26054
Address	Room 101, Building 4, 80 Longxi Road, Jianghai District, Jiangmen City, China
Date(s) of Test	27th November 2025
Test Job Number	AZJM251129
Report Issuing Lab	Azuma Testing Limited
Test Report Number	AZHK251206

3.1 Customer & Sample Information

Customer	CIVRO Building Technology (Guangdong) Co., Ltd
Customer's Address	No. 3, Guandi Area, Fanhu, Leping, Sanshui Central Technology Park, Sanshui District, Foshan City.
Window/Door Type	Aluminum Inwards Tilt-Turn Window
Model	XW80IN
Test Sample Description	Aluminum Inwards Tilt-Turn Window
Number of Sample Testing	1 nos
Manufacturer (s)	CIVRO Building Technology (Guangdong) Co., Ltd
Manufacturer's Address	No. 3, Guandi Area, Fanhu, Leping, Sanshui Central Technology Park, Sanshui District, Foshan City.

The above information is provided by the client. Azuma does not take liability to the accuracy of this information

4 Test Result Summary

Test Method per AS/NZS 4420.1	Figures Recorded	Result for compliance with AS2047
Deflection Test	Positive – 2700 Pa	Pass
	Negative – 2700 Pa	Pass
Operating Force Test	160 N/ 80N (Turn Direction)	Pass
	160 N/ 80N (Tilt Direction)	Pass
Air Infiltration Test	Low	Pass
Water Penetration Resistance Test	700 Pa	Pass
Ultimate Strength Test	Positive – 2800 Pa	Pass
	Negative – 2800 Pa	Pass

* N/A: Not Applicable

** N/T : Not Tested

5 Test Sample Description

Product Name	XW80IN Inwards Tilt-Turn Window
Model	XW80IN
Dimension of Frame	2600 mm (Height) x 2800 mm (Width) x 80mm (Thickness)
Dimension of Sashes	Operable Sash: 2535 mm (Height) x 738 mm (Width) Fixed Panel: 2535 mm (Height) x 1997 mm (Width)
Glazing – Size/Type	Operable Sash: 2419mm (Height) x 738mm (Width) Glass Thickness: (6mm /19A/6mm) Glass Type: Toughened Insulating Glass Unit (IGU) Supplier: SUNGLAS TECHNICS CO., LTD. Fixed Panel: 2510mm (Height) x 1829 mm (Width) Glass Thickness: (8mm /15A/8mm) Glass Type: Toughened Insulating Glass Unit (IGU) Supplier: SUNGLAS TECHNICS CO., LTD.
Hardware	Name: Transmission box Model No.: C722032 Quantity: 1 pc Supplier: Sobinco Name: Corner Transmission Model No.: C722031 Quantity: 2 pcs Supplier: Sobinco

Name: Lock bracket
Model No.: C742075
Quantity: 8 pcs
Supplier: Sobinco

Name: Anti-Misoperation device
Model No.: C754055
Quantity: 1 pc
Supplier: Sobinco

Name: Pin lock point
Model No.: C742072
Quantity: 2pcs
Supplier: Sobinco

Name: Slanted tensioning arm of the frame
Model No.: C731041-R
Quantity: 2pcs
Supplier: Sobinco

Name: Slanted tensioning arm of the fan
Model No.: C731038
Quantity: 1 pc
Supplier: Sobinco

Name: Handle
Model No.: C710134
Quantity: 1pc
Supplier: CIVRO

Name: Lower hinge kit of window sash
Model No.: C731043-R
Quantity: 1 pc
Supplier: Sobinco

Name: Lower hinge of the frame
Model No.: C731044-R
Quantity: 1 pc
Supplier: Sobinco

Name: Window sash support bracket
Model No.: C754057
Quantity: 1 pc
Supplier: Sobinco

	Name: Frame support bracket Model No.: C754058 Quantity: 1pc Supplier: Sobinco Name: Tilt-turn lock bracket Model No.: C742073 Quantity: 1pc Supplier: Sobinco Name: Adjustable connecting rodModel No.: C723022 Quantity: 2 pcs Supplier: Sobinco
Drawing Identification	C2, JD-04, J01, C01, D01, D02, D03, H02, H03, H11, I04, I06, I02
Profile Section	Model: 6060T6 Manufacturer: FOSHAN YINGHUI ALUMINUM PROFILES CO., LTD. See Drawings for Details
Frame Corner Construction Details	See Drawings for Details
Drain holes	Size (Width x Height): 34x4 mm Quantity: 6ea Size (Width x Height): 30x2.5 mm Spacing: 120mm/ 50mm Quantity: 4ea
Weep holes	None
Gasket/Seals/Hairs	None
Weather Strip	Model No.: C353015 Material: EPDM & Foam Supplier: CIVRO Model No.: C355001 Material: EPDM & Foam Supplier: CIVRO Model No.: C355002 Material: EPDM & Foam Supplier: CIVRO Model No.: C358016 Material: EPDM Supplier: CIVRO

	Model No.: C358017 Material: EPDM Supplier: CIVRO Model No.: C358012 Material: EPDM Supplier: CIVRO Model No.: C358013 Material: EPDM Supplier: CIVRO Model No.: C358014 Material: EPDM Supplier: CIVRO Model No.: C358010 Material: EPDM & Foam Supplier: CIVRO Model No.: C355010 Material: EPDM & Foam Supplier: CIVRO Model No.: C355062 Material: EPDM Supplier: CIVRO
Glass Retention	None
Thermal Break	Yes Model No.: C424601 Model No.: C424602 Model No.: C423901 Model No.: C423900 Supplier: Technoform
Sub Head and Sub Sill Used	None
Reinforcement	None
Installation	The exterior perimeter of the test specimen was sealed with silicon sealant
Support Fixings	The test specimen and frame were fixed securely onto the test rig using screws.

6 Procedures

6.1 Deflection Test

1. The test sample shall be operative and pre-loaded as described in AS 4420.1.

2. The pre-load pressure shall be removed and the zero position of the displacement measuring devices recorded.

3. Differential pressures in the same direction shall then be applied across the test sample in not less than four approximately equal increments until the test pressure is reached. The pressure shall be held for at least 1 min at each pressure increment, and the readings of the displacement measuring devices recorded before the pressure is increased.

4. The differential pressure shall be removed and after 2 min the zero displacement readings shall be taken.

5. The direction of the air pump or test sample shall be reversed and Steps (1) to (4) shall be repeated using the opposite test loading.

6.2 Operating Force Test

1. With the window closed, but unlocked, an operating force shall be applied, without shock, in the plane and direction of the sash operation.

2. For both directions of sash travel, the following forces shall be noted and recorded:

(a) That capable of setting the sash in motion.

(b) That capable of maintaining the motion after the sash frame is clear of the perimeter frame of the test sample.

3. Each sliding sash of the test sample is tested separately.

4. For horizontally sliding sashes, the force shall be applied either at the position of a fixed handle, or at one-third of the height of the pull stile above the sill for continuous or adjustable handgrips.

5. For vertically sliding sashes, the force shall be applied at the sash pulls or at the midpoint of the bottom rail, or at the position nominated by the manufacturer.

6.3 Air Infiltration Test

1. Operation and pre-loading as described in AS 4420.1.

2. The face of the test sample shall then be sealed airtight by covering it with an impervious film. If this is not practicable, all joints, weep holes, and glazing or sealant lines of the test sample shall be sealed with impervious adhesive tape.

3. Positive and negative test pressures shall then be applied, and the base air infiltration rates through the test apparatus shall be determined by air flow meter.

4. The sealing film or tape shall be removed from the test sample and the air infiltration rates determined. The air infiltration through the test sample shall be the difference between the base and total readings.

6.4 Water Penetration Resistance Test

1. The test sample shall be subjected to water sprayed uniformly and continuously over the exterior face of the test sample at a rate not less than 0.05 L/m^{2}s. At the start of the test, the water sprays shall operate for 5 min with zero air pressure differential on the test sample.

2. The test pressure shall be applied and maintained for 15 min with the water sprays still operating. The visible internal surfaces of the test sample shall be inspected throughout the water spray operation.

3. Any water appearing on the inside surfaces of the test sample shall be noted and recorded, with the extent and, if possible, the source of penetration of uncontrolled water. Uncontrolled water shall be as defined in AS 2047.

4. The pressure and water sprays shall then be removed from the test sample.

6.5 Ultimate Strength Test

1. The test sample shall be subjected to a smoothly increasing differential pressure up to the test pressure determined in Clause 6.1, conducted individually in both positive and negative directions.

2. The time taken to reach the structural test pressure shall be approximately 1 min. Test pressure shall be maintained on the test sample for a period of 10 s.

3. If a sponsor requires incremental tests, each increment shall represent a separate test requiring 10 s duration.

4. At the conclusion of the test at each loading, the test sample shall be inspected and any signs of deformity or damage or collapse of the test sample noted and recorded.

7 Results

7.1 Test for Operation

☑ The test specimen has been opened and closed for 5 times and operates well.

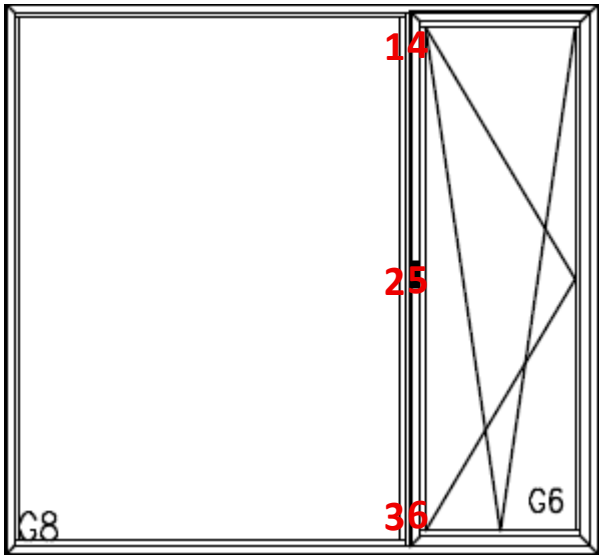

Figure 1 Transducer Locations

7.2 Deflection Test

Setup 1				
Structural Member	Mullion 1, 2, 3			
Span Length	2440 mm			
Transducers Used	1, 2, 3			
Maximum Allowable Deflection	9.76 mm			
Test Defection Ratio of Sample	**1 (mm)**	**2 (mm)**	**3 (mm)**	**Net Deflection (mm)**
Positive 300 Pa	0.78	1.40	0.66	0.68
Negative 300 Pa	-0.90	-1.59	-0.77	0.76
Positive 600 Pa	1.64	2.84	1.37	1.34
Negative 600 Pa	-1.76	-3.12	-1.52	1.48
Positive 900 Pa	2.59	4.46	2.21	2.06
Negative 900 Pa	-2.66	-4.87	-2.29	2.40
Positive 1200 Pa	3.77	6.46	3.37	2.89

Negative 1200 Pa	-3.52	-6.60	-3.02	3.33
Positive 1500 Pa	4.71	8.08	4.28	3.59
Negative 1500 Pa	-4.51	-8.66	-3.81	4.50
Positive 1800 Pa	5.50	9.51	5.05	4.24
Negative 1800 Pa	-5.34	-10.45	-4.70	5.43
Positive 2100 Pa	6.32	11.06	5.85	4.98
Negative 2100 Pa	-6.18	-12.38	-4.95	6.82
Positive 2400 Pa	7.25	12.93	6.77	5.92
Negative 2400 Pa	-7.08	-14.57	-5.47	8.30
Positive 2700 Pa	8.15	14.84	7.69	6.92
Negative 2700 Pa	-7.97	-16.39	-5.92	9.45
Span Ratio	Positive – 353			
	Negative – 258			
Result	Positive – Pass			
	Negative – Pass			

Setup 2				
Structural Member	Lock Stile 4, 5, 6			
Span Length	1195 mm			
Transducers Used	4, 5, 6			
Maximum Allowable Deflection	4.78 mm			
Test Defection Ratio of Sample	**4 (mm)**	**5 (mm)**	**6 (mm)**	**Net Deflection (mm)**
Positive 300 Pa	0.75	1.15	1.30	0.28
Negative 300 Pa	-0.82	-1.20	-1.38	0.28
Positive 600 Pa	1.80	2.73	3.08	0.64
Negative 600 Pa	-1.84	-2.62	-2.99	0.58
Positive 900 Pa	3.15	4.95	5.68	1.27
Negative 900 Pa	-3.00	-4.25	-4.83	0.92
Positive 1200 Pa	4.28	7.11	8.41	2.07

Negative 1200 Pa	-4.27	-6.06	-6.85	1.29
Positive 1500 Pa	5.22	8.62	10.19	2.49
Negative 1500 Pa	-5.23	-7.56	-8.64	1.71
Positive 1800 Pa	6.39	10.52	12.41	3.01
Negative 1800 Pa	-6.09	-8.98	-10.33	2.12
Positive 2100 Pa	7.42	12.18	14.37	3.48
Negative 2100 Pa	-6.98	-10.58	-12.28	2.65
Positive 2400 Pa	8.38	13.82	16.34	3.98
Negative 2400 Pa	-7.81	-11.95	-13.89	3.04
Positive 2700 Pa	9.33	15.46	18.25	4.46
Negative 2700 Pa	-8.71	-13.41	-15.57	3.43
Span Ratio	Positive – 268			
	Negative – 348			
Result	Positive – Pass			
	Negative – Pass			

7.3 Operating Force Test

Movement Type	Sash	Opening Force (N)	Closing Force (N)	Allowable (N)	Result
Initiating	1***	8.7	9.2	≤ 160	Pass
Maintain	1***	8.3	9.3	≤ 80	Pass
Initiating	2****	22.2	30.5	≤ 160	Pass
Maintain	2****	17.5	15.2	≤ 80	Pass

*** Operation force measured in Turn Direction
**** Operation force measured in Tilt Direction

7.4 Air Infiltration Test

Barometric Pressure	102730 Pa
Air Temperature	24.6 °C
Overall Area	7.28 m^2

Pressure	**Sealed**	**Unsealed**	**Net Leakage**
Positive - 75 Pa	26.40 Ls^{-1}	27.79 Ls^{-1}	1.39 Ls^{-1}
Negative - 75 Pa	24.09 Ls^{-1}	26.34 Ls^{-1}	2.25 Ls^{-1}

Air Infiltration Level	**Direction**	**Allowable**	**Actual**	**Result**
Low	Positive Negative	≤ 1 $Ls^{-1}m^{-2}$	0.19 $Ls^{-1}m^{-2}$ 0.31 $Ls^{-1}m^{-2}$	Pass
High	Positive Only	≤ 5 $Ls^{-1}m^{-2}$	0.19 $Ls^{-1}m^{-2}$	Pass

7.5 Water Penetration Resistance Test

Wet Down Complete – 5 minutes	Yes
Maximum Pressure Applied to Sample	700 Pa
Time Pressure Held for	15 minutes
Leakages Observed	Nil
Observations	No Observable Water Leakage Transparent Sealant applied on site on exterior and interior surfaces of Window Assembly (See Figures 4, 5, 6, 7, 8, 9 & 18)

7.6 Ultimate Strength Test

Maximum Pressure Applied to Sample	Positive – 2800 Pa Negative – 2800 Pa
Time Pressure Held for	60 seconds
Compliant with AS2047 Clause 2.3.1.7	Yes
Observations	No Observable Damage

7.7 Photos

Figure 2 Photo of the test specimen Before testing

Figure 3 Photo of the test specimen After testing

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Figure 4 Connection Detail Between Interlock Stile and Two Panels 1 (Showing White Traces Left by Transparent Waterproof Coating on Surface)

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Figure 5 Connection Detail Between Interlock Stile and Two Panels 2 (Showing White Traces Left by Transparent Waterproof Coating on Surface)

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Figure 6 Connection Detail of Right-Side Jamb, Head Jamb, and Operable Sash (Showing White Traces Left by Transparent Waterproof Coating on Surface)

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Figure 7 Connection Detail of Left Side Jamb, Head Jamb, and Fixed Panel (Showing White Traces Left by Transparent Waterproof Coating on Surface)

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Figure 8 Connection Detail Between Left Side Jamb and Bottom Rail (Showing White Traces Left by Transparent Waterproof Coating on Surface)

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Figure 9 Connection Detail Between Right Side Jamb and Bottom Rail (Showing White Traces Left by Transparent Waterproof Coating on Surface)

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Figure 10 Photo of Hardware (Handle)

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Figure 11 Photo of Hardware (Handle and Blot)

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Figure 12 Photo of Upper Section of Lock Stile

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Figure 13 Photo of Lower Section of Lock Stile

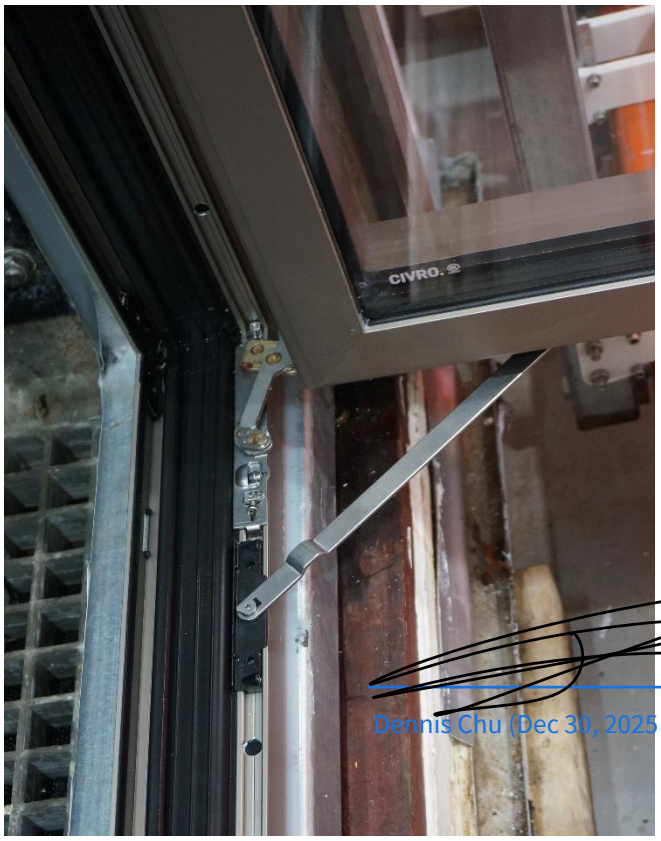

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Figure 14 Photo of Hinges

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Figure 15 Photo of Hinges (Zoom in)

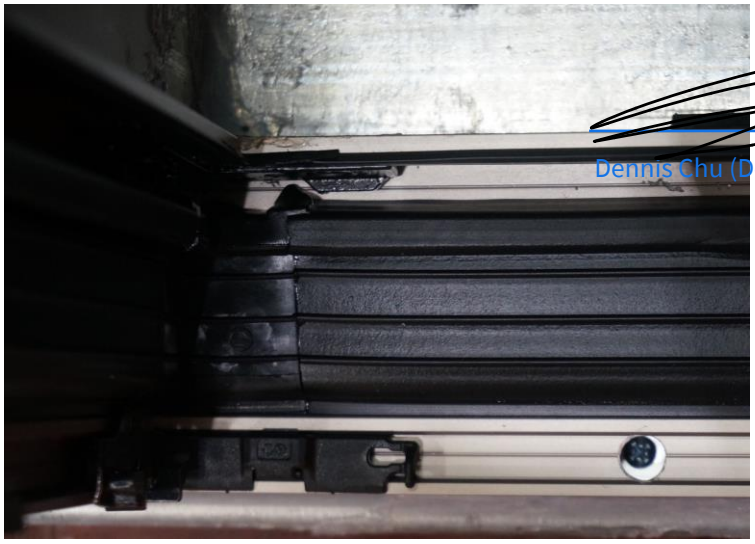

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Figure 16 Photo of Tilt-turn Lock bracket and Support Base

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Figure 17 Photo of Tilt-turn Lock bracket and Support Base (Zoom in)

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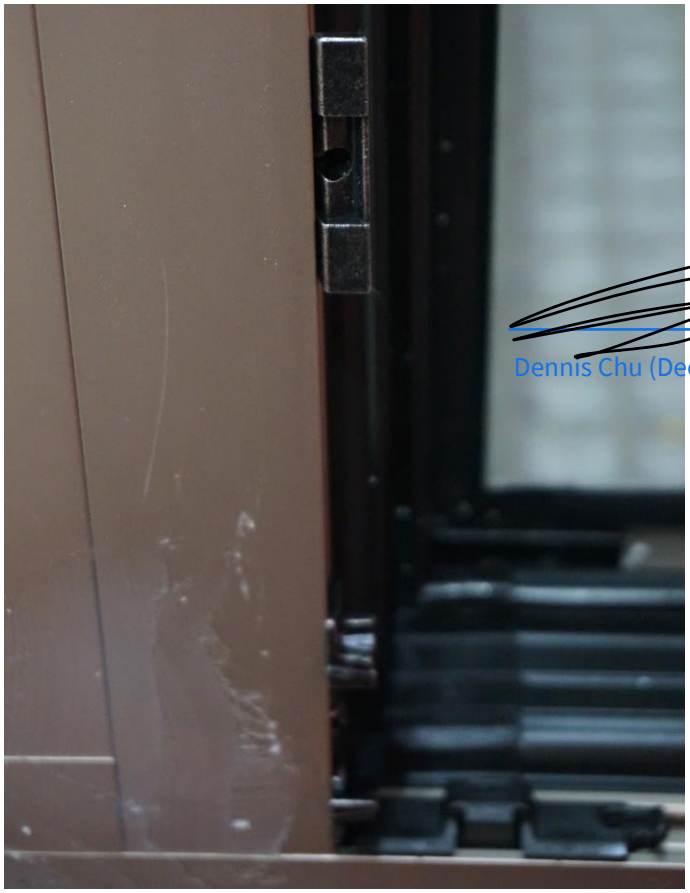

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Figure 18 Photo of Standard Lock bracket

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Figure 19 Photo of Inwards Tilt-Turn Window (View from Exterior)

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Figure 20 Photo of Fixed Panel – Upper Section (View from Exterior)

Figure 21 Photo of Fixed Panel – Lower Section (View from Exterior)

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Figure 22 Photo of Outer Frame Bottom Left Corner (View from Exterior)

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Figure 23 Photo of Outer Frame Bottom Right Corner (View from Exterior)

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Figure 24 Connection of Mullion and Bottom Rail (View from Exterior)

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Figure 25 Photo of Outer Frame Top Left Corner (View from Exterior)

Figure 26 Connection of Mullion and Head 1 (View from Exterior)

Figure 27 Connection of Mullion and Head 2(View from Exterior)

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Figure 28 Photo of Outer Frame Top Right Corner (View from Exterior)

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Figure 29 Photo of Outer Frame Top Right Corner (View from Exterior)

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8 Signatories

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Date:	12/30/2025
Checked By:	**George Cheung**
Signature:	Cheung George (Dec 30, 2025 21:45:33 GMT+8)
Date:	12/30/2025

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9 Appendix (Drawings supplied by customer)

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Figure 30 Drawing of XW80IN Scheme Drawing

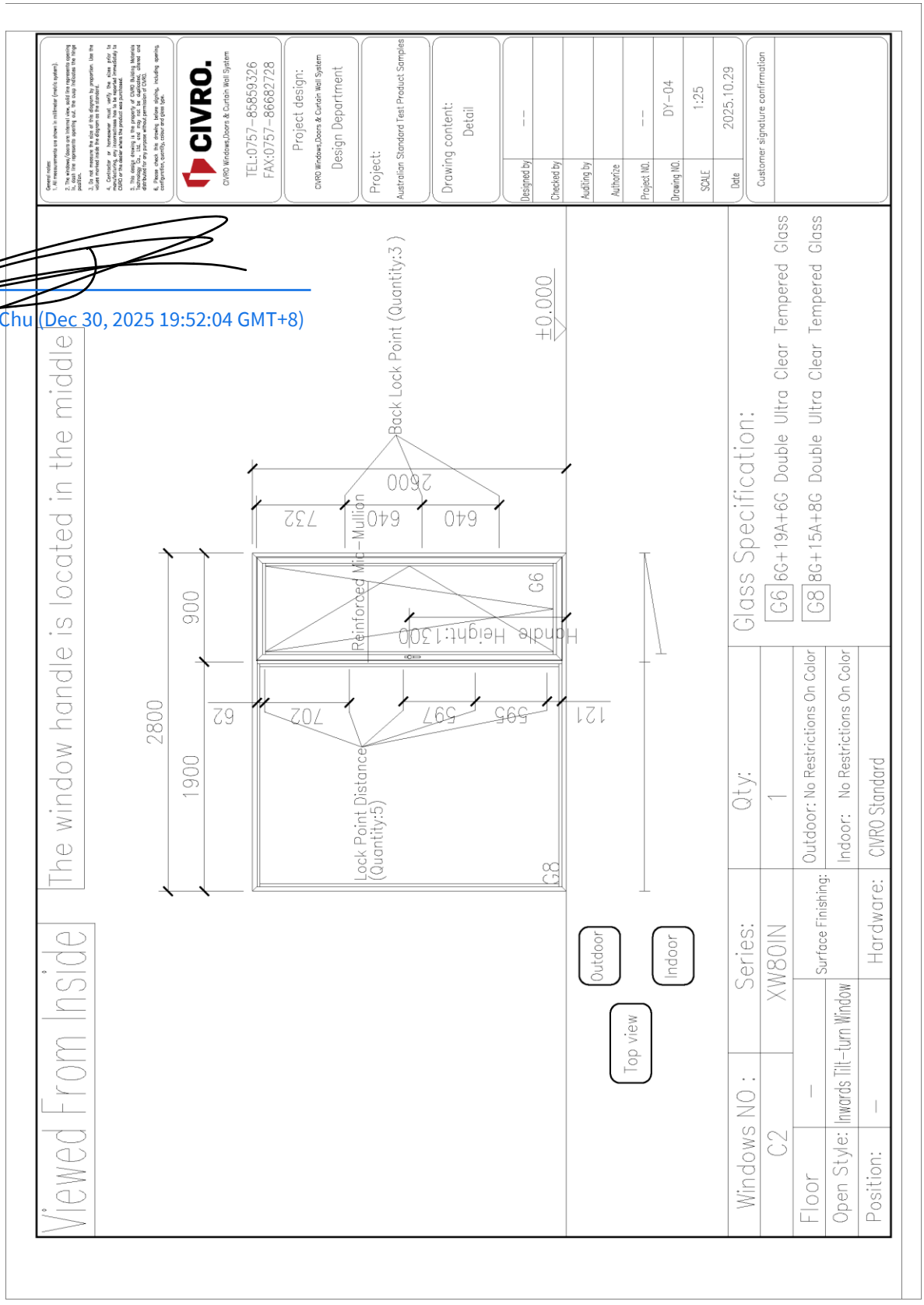

Figure 31 Drawing of Interior View – Location of Hardware

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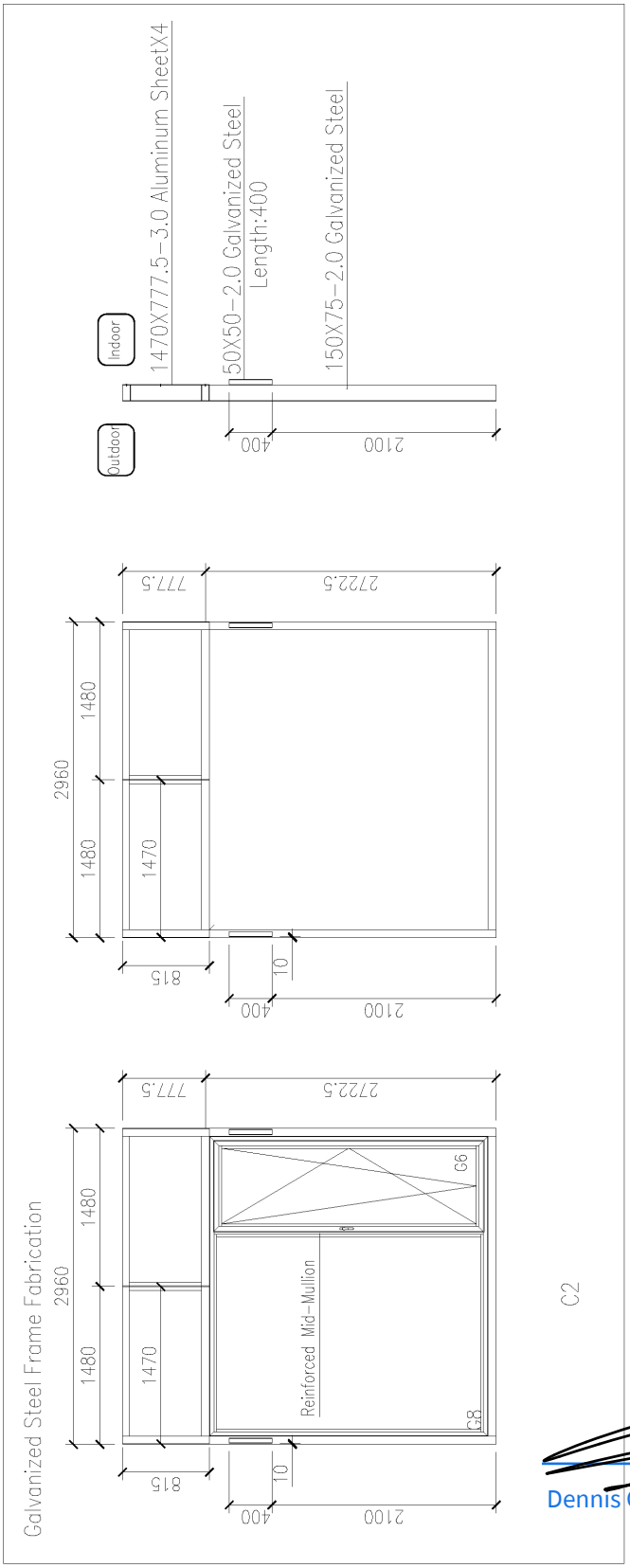

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Figure 32 Drawing of Test Frame Fabrication

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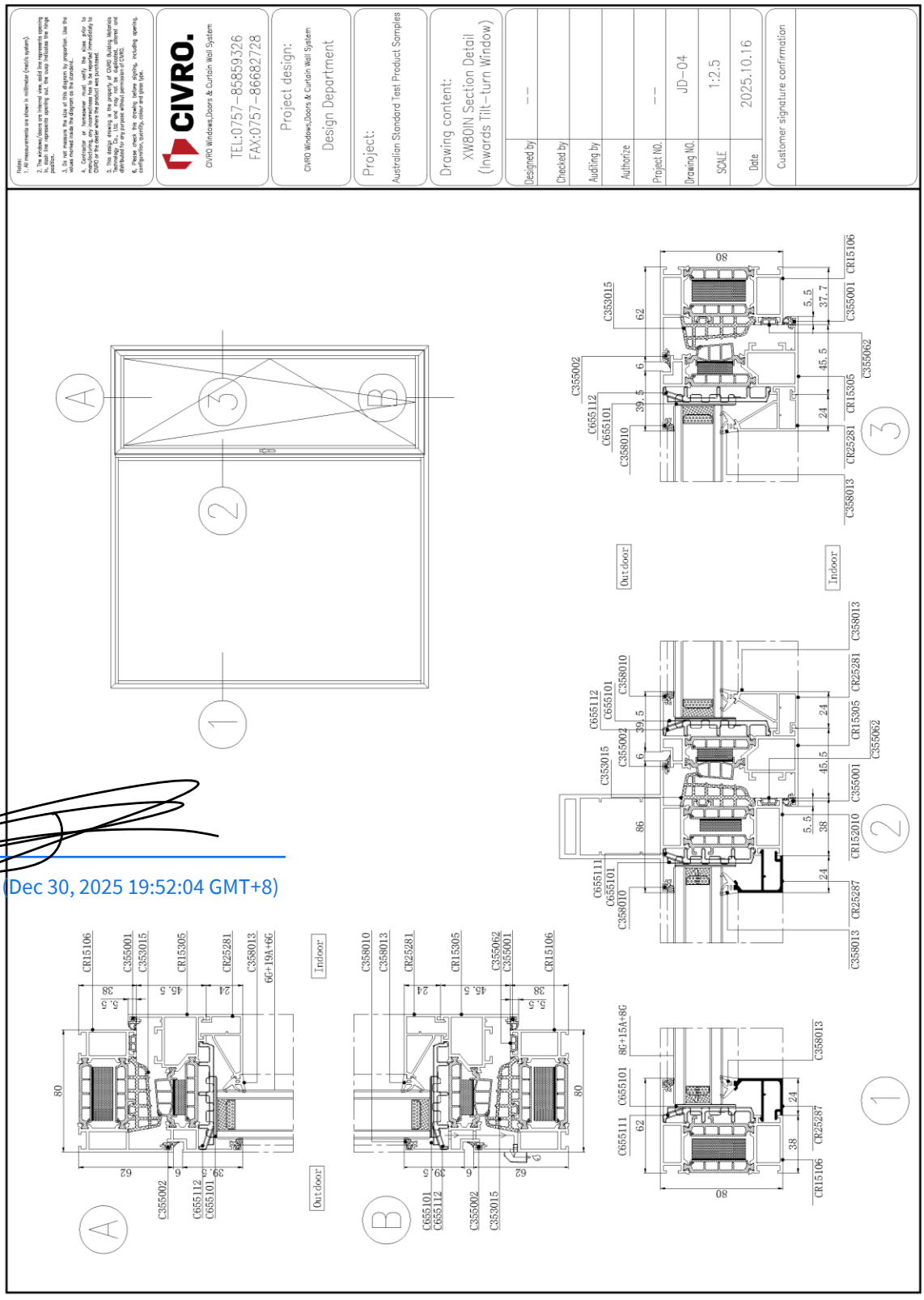

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Figure 33 Drawing of the Representative Sample (view from Interior)

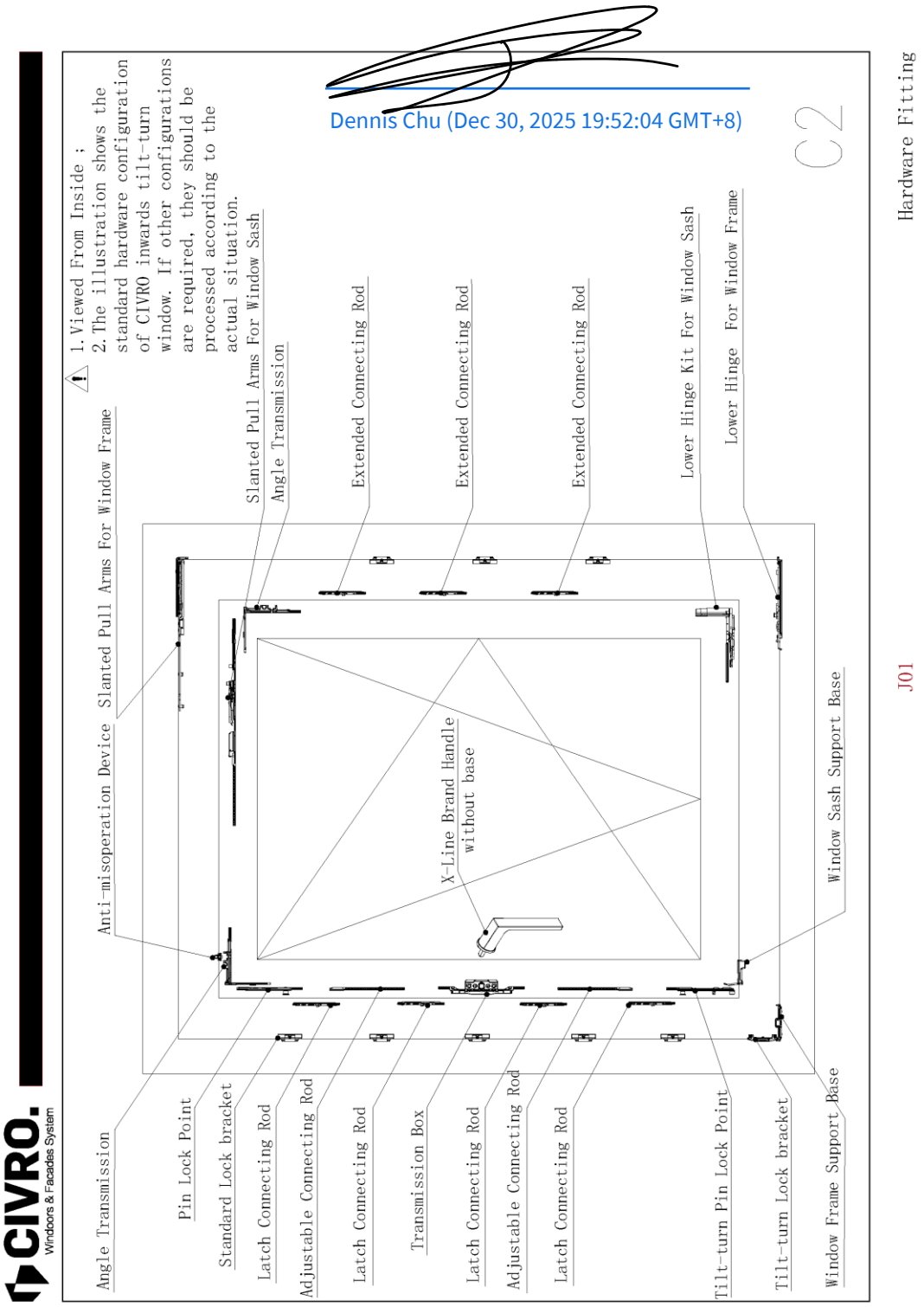

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Figure 34 Hardware Configuration and Positions on the Window Assembly

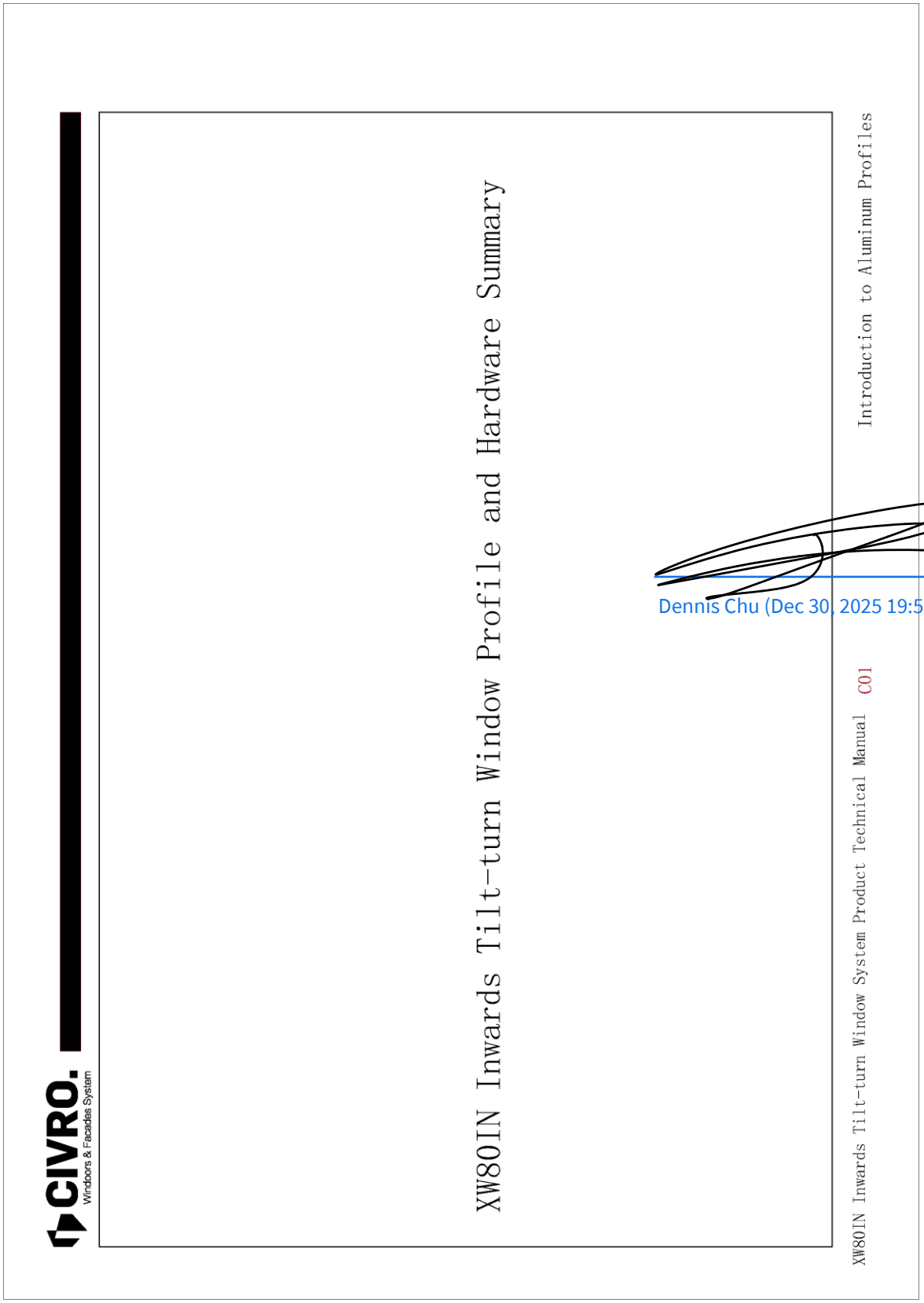

Figure 35 Drawing of XW80IN Inwards Tilt-turn Window Profile and Hardware Summary

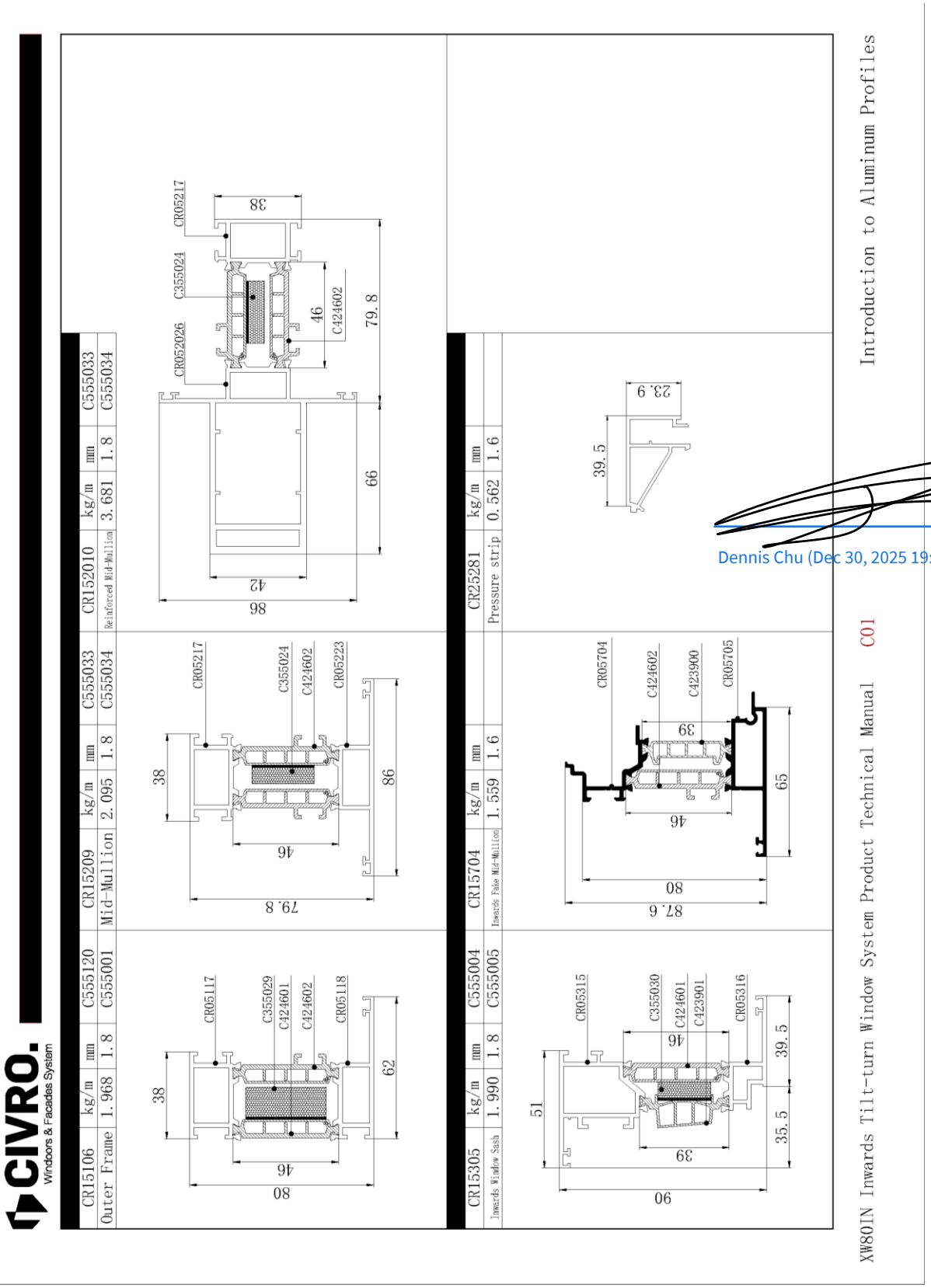

Figure 36 Drawing of Profile Section Details

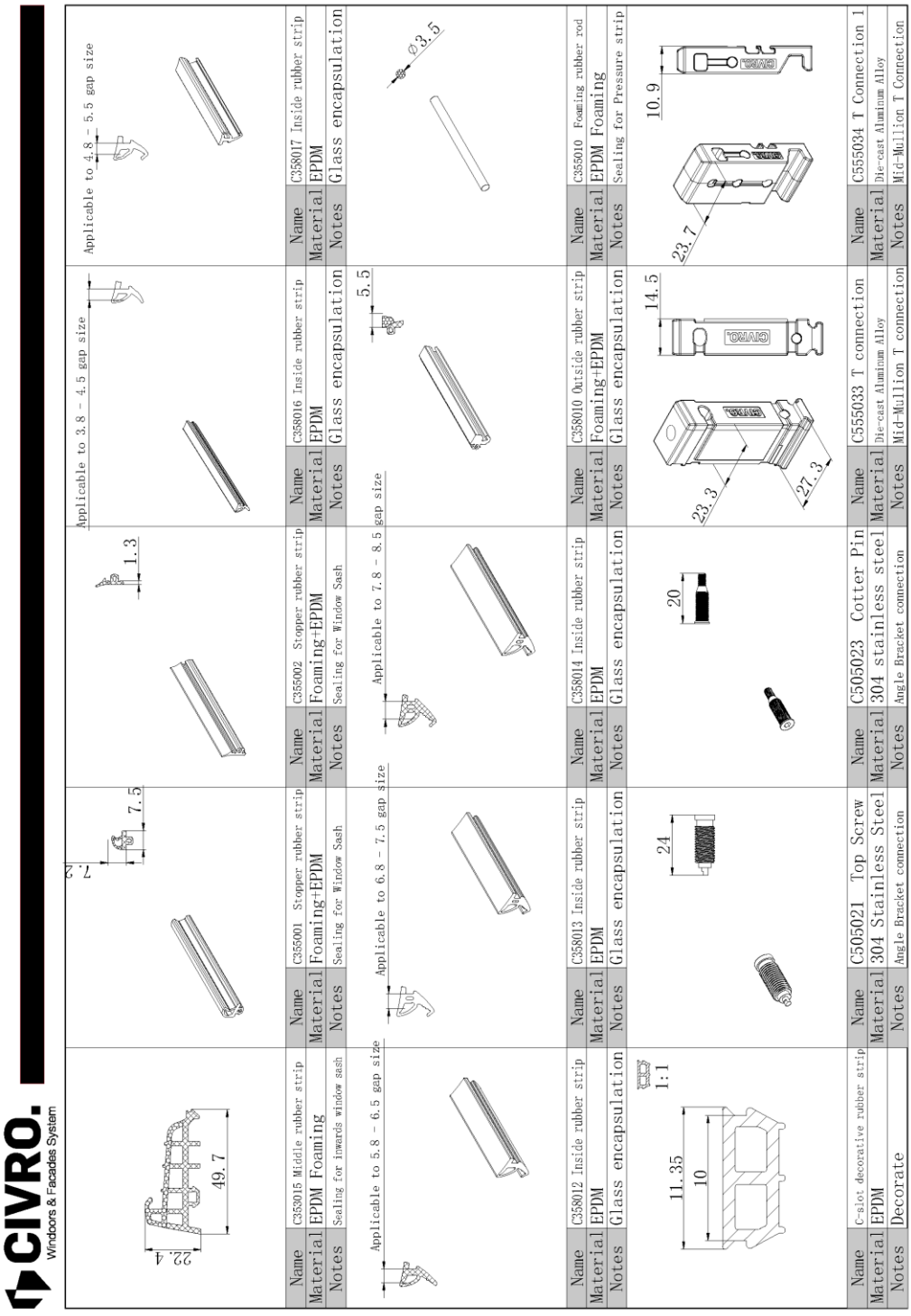

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Figure 37 Drawing of Accessory Components 1 (Details of Gasket &Hardware))

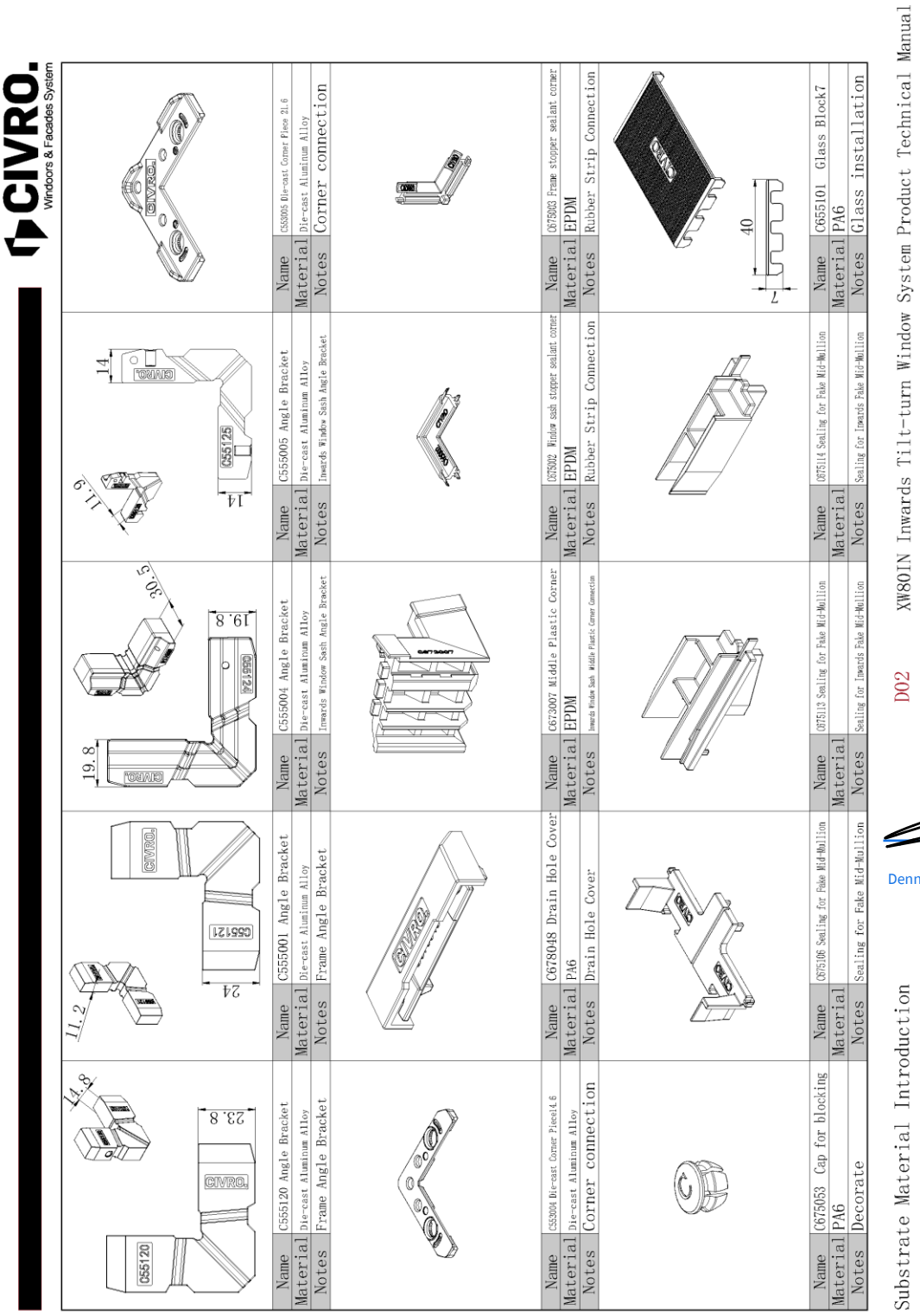

Figure 38 Drawing of Accessory Components 2 (Details of Hardware & Others)

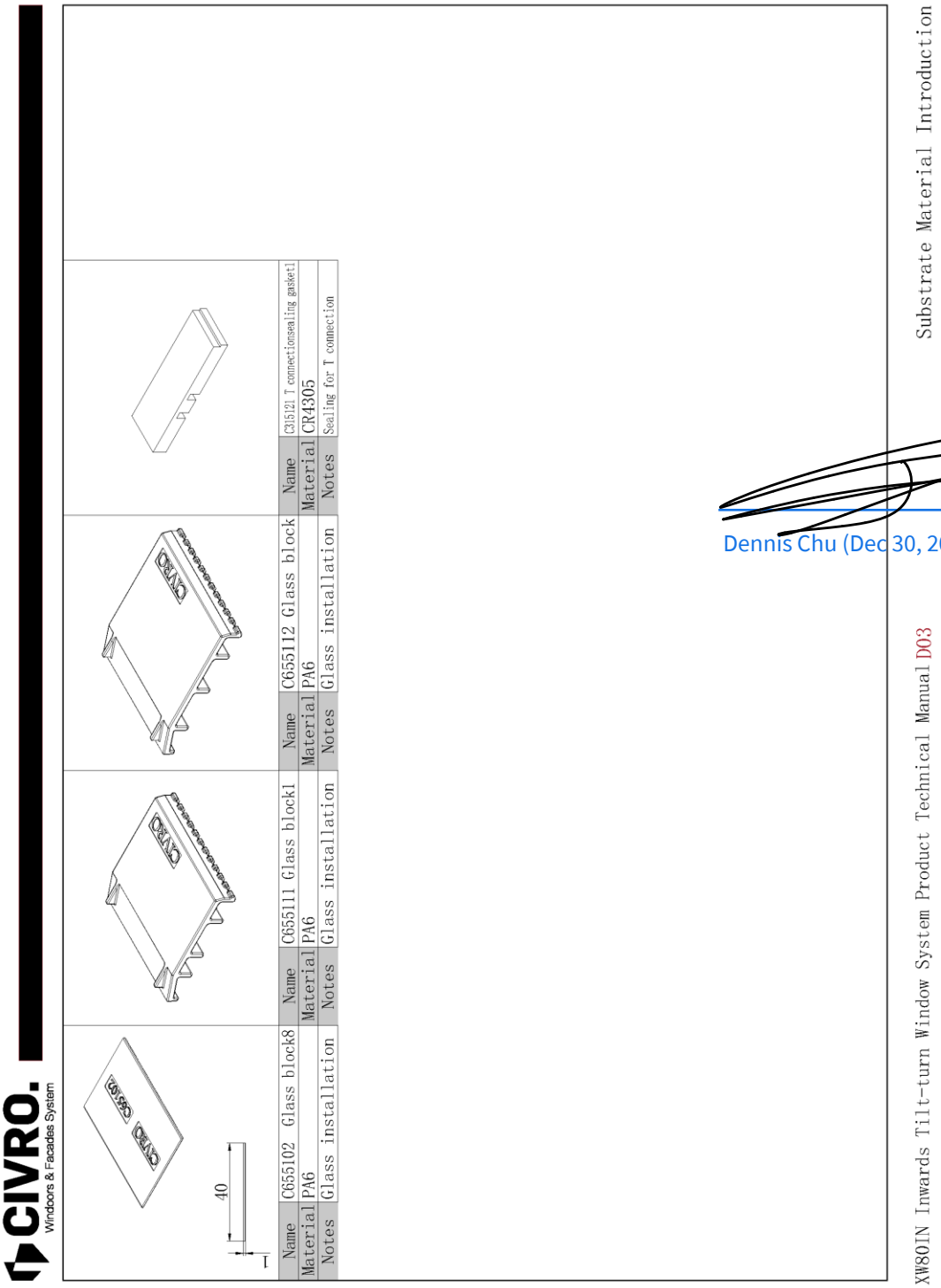

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Figure 39 Drawing of Accessory Components 3 (Details of Glass Block & Others)

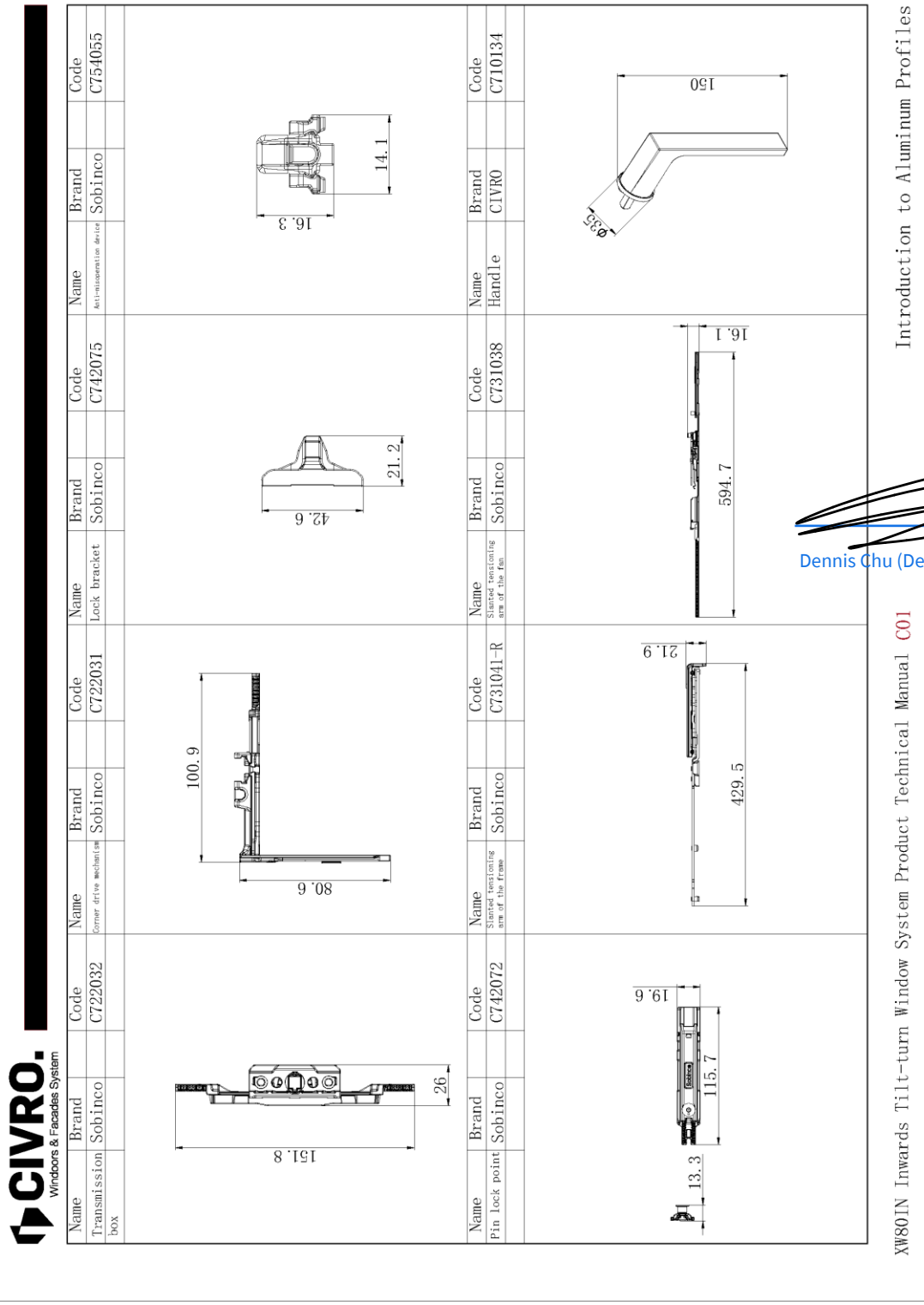

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Figure 40 Drawing of Hardware 1

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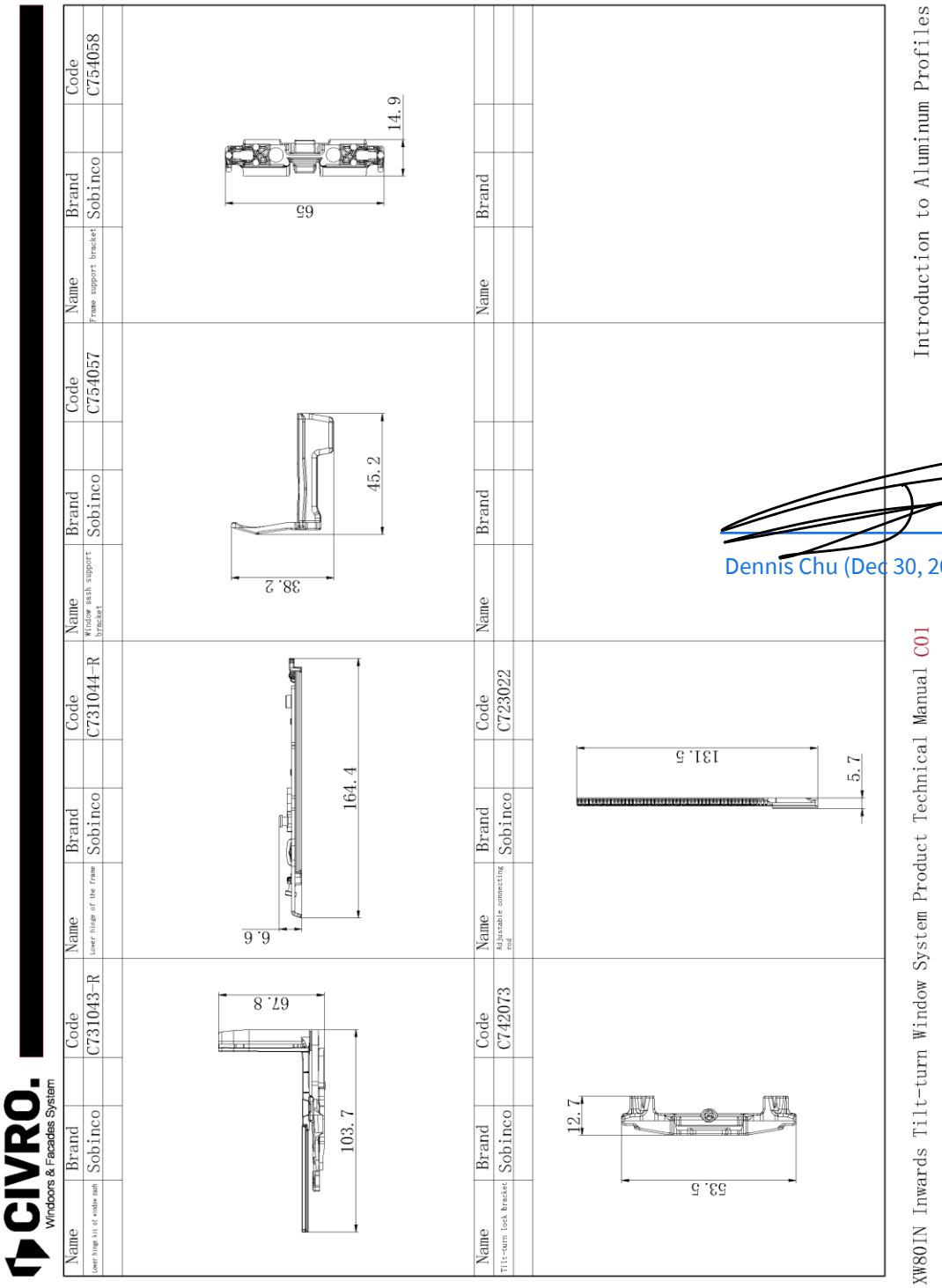

Figure 41 Drawing of Hardware 2

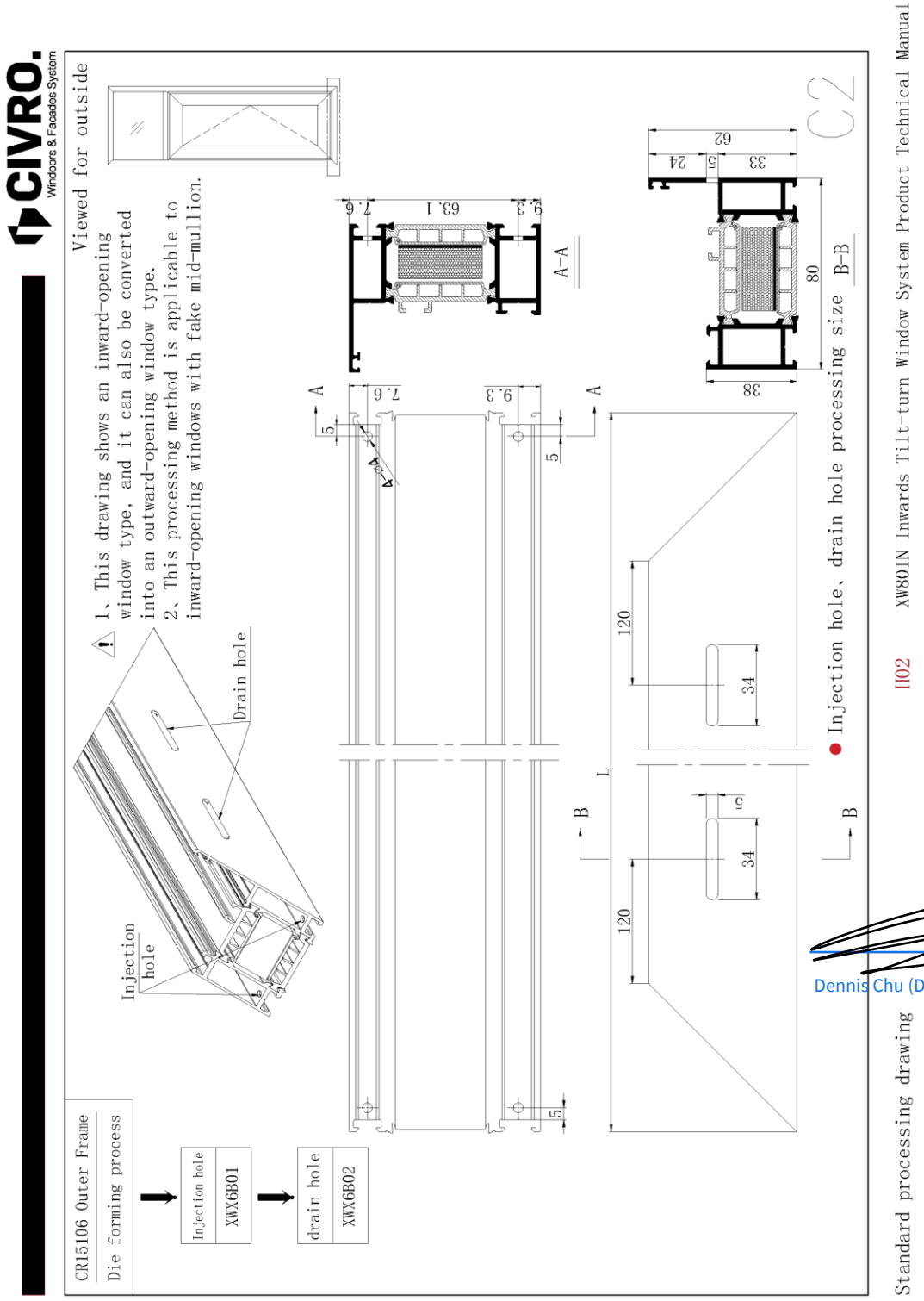

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Figure 42 Cross-Section of Sill (Operable Window) with Drainage System Details

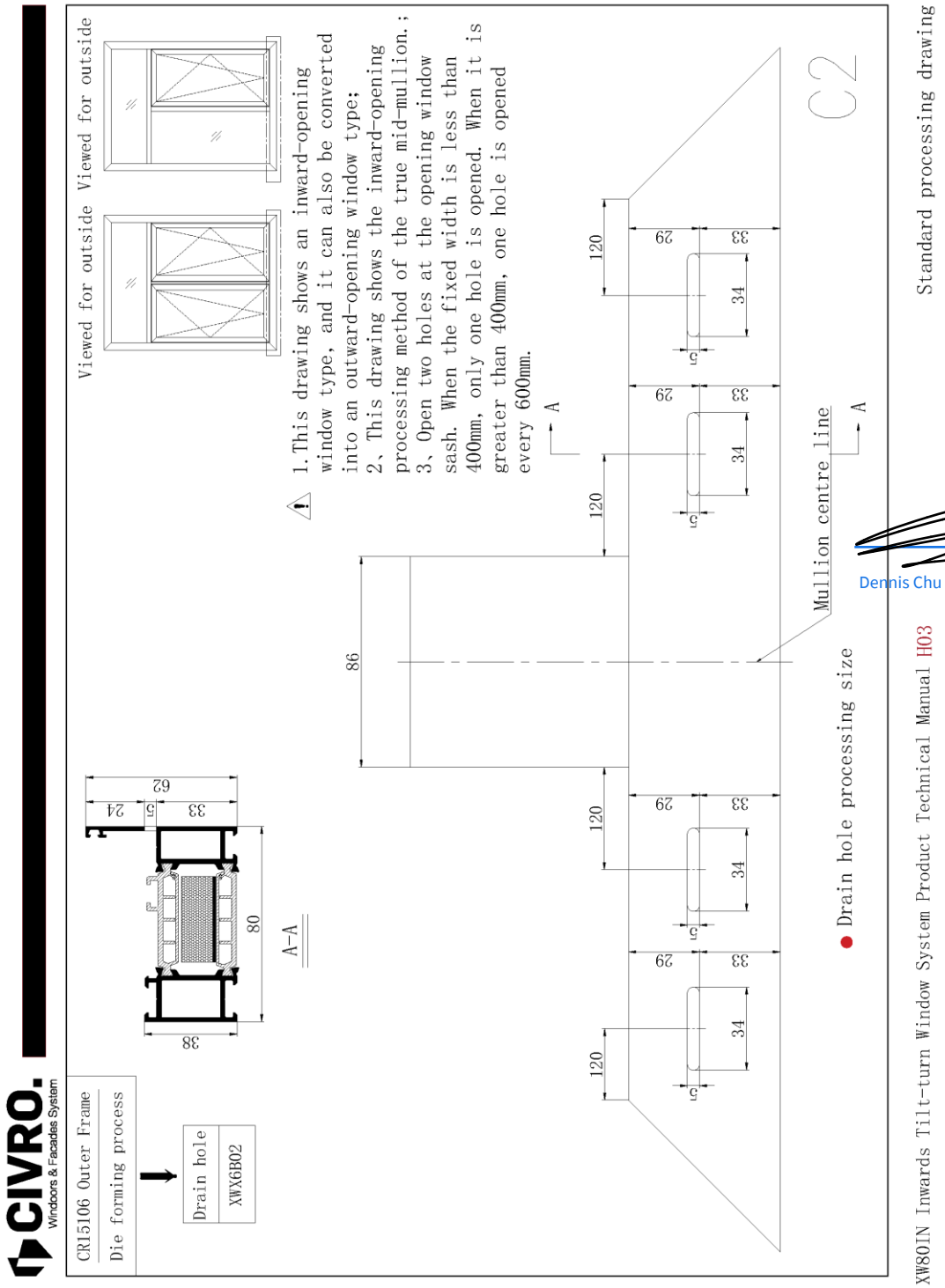

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Figure 43 Cross-Section of Sill (Fixed Panel) with Drainage System Details

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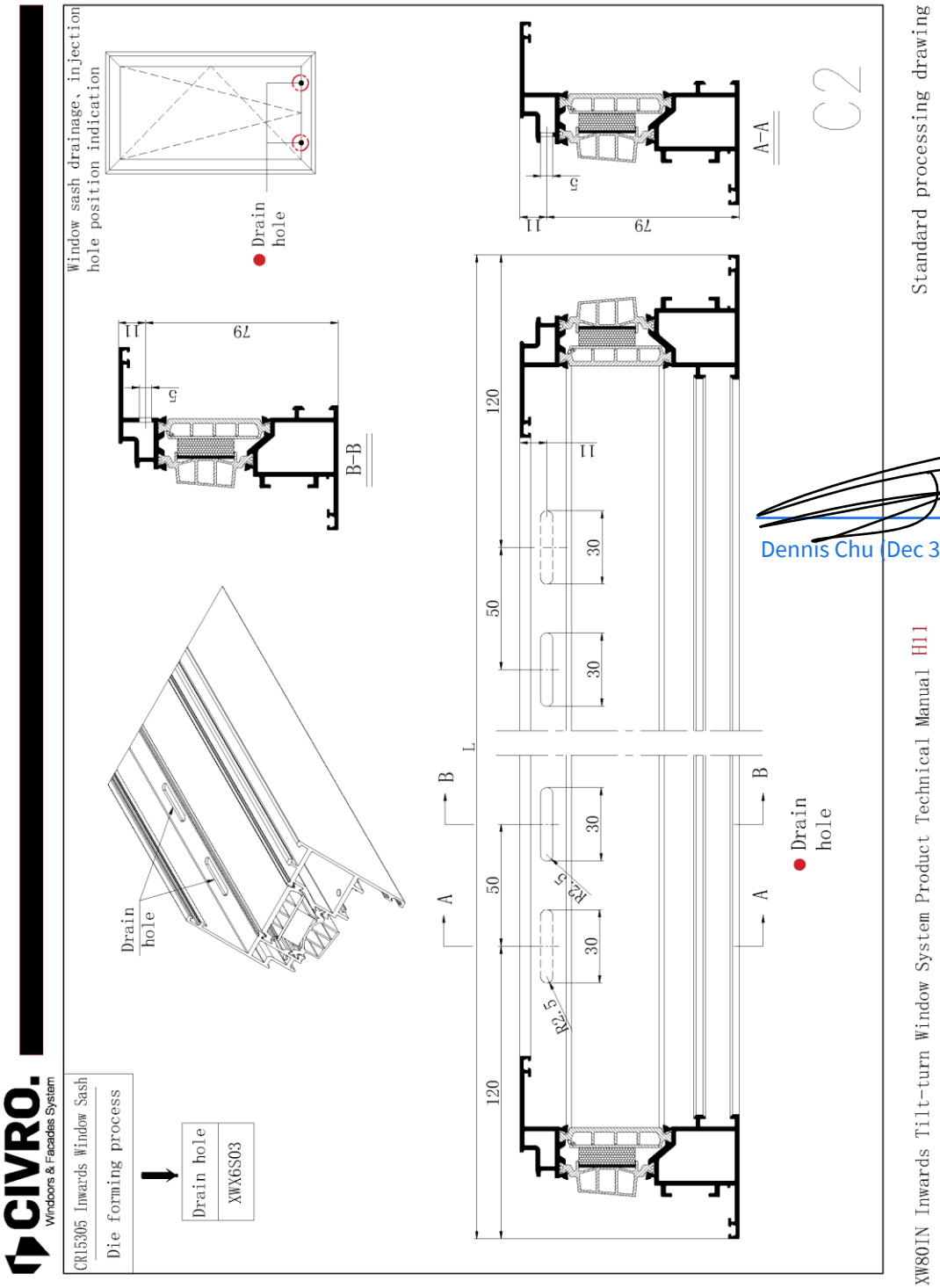

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Figure 44 Cross-Section of Bottom Rail(with Drainage System Details

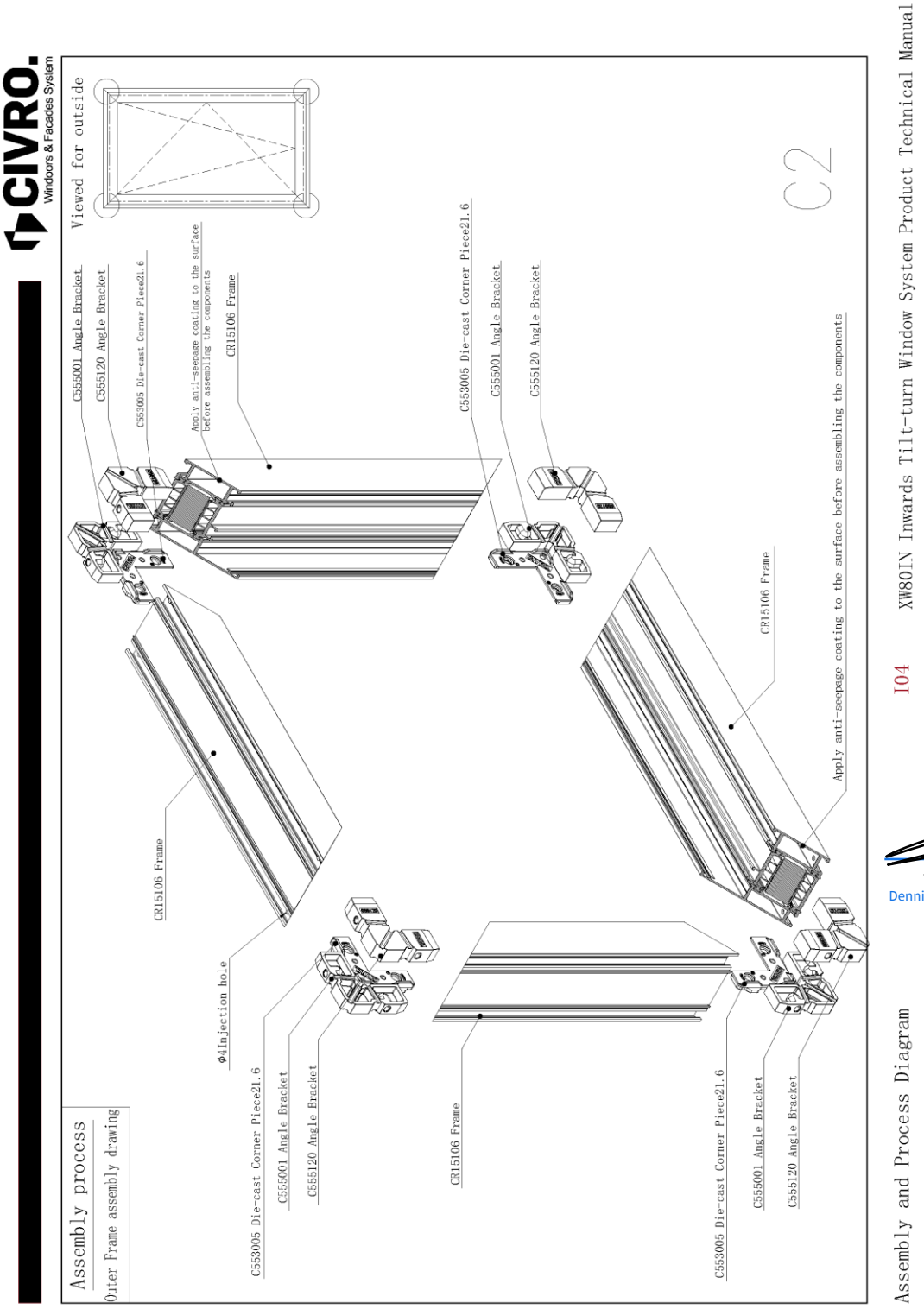

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Figure 45 Drawing of Frame Concern Construction of Fixed Panel

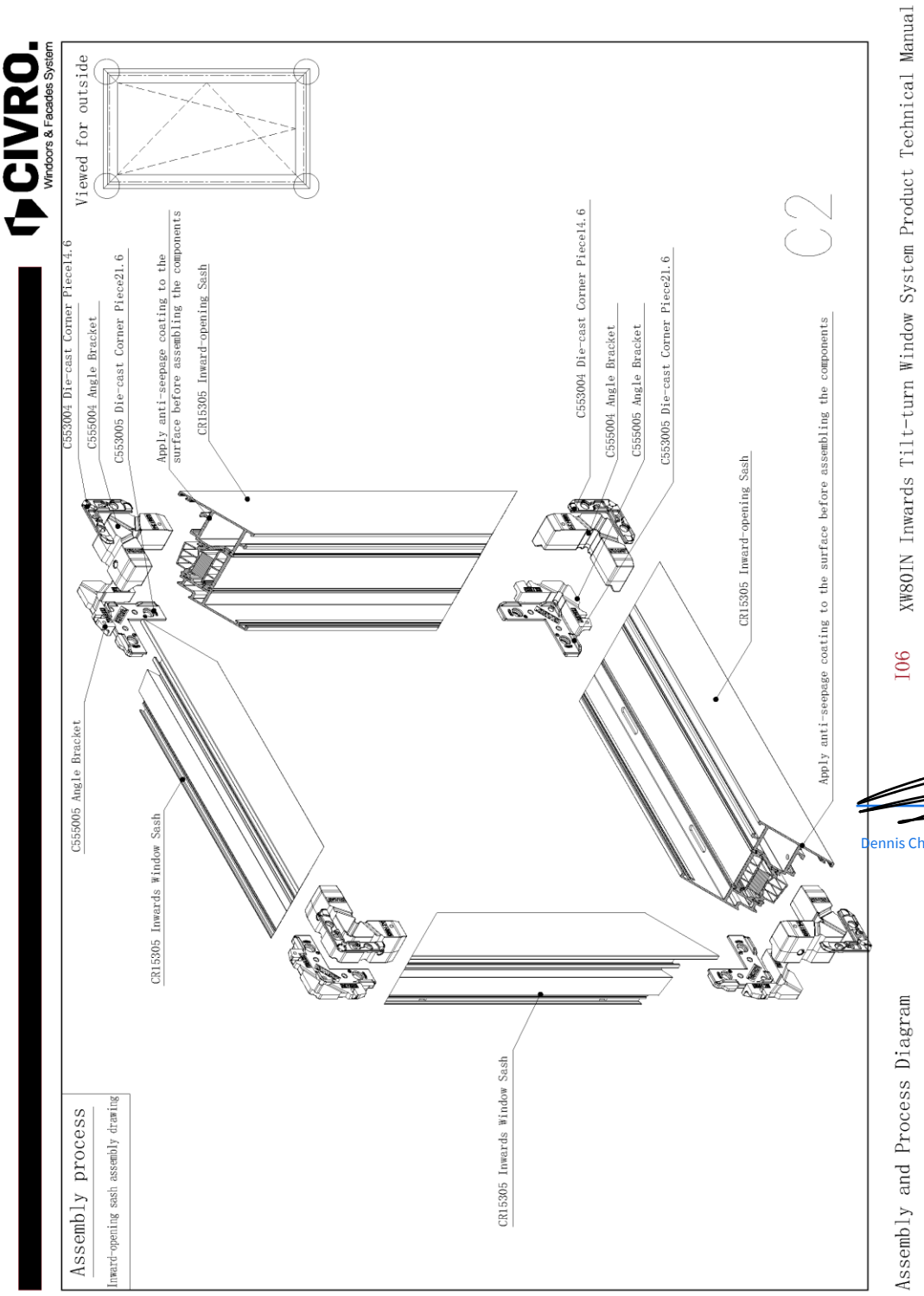

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Figure 46 Drawing of Frame Concern Construction of Opening Panel

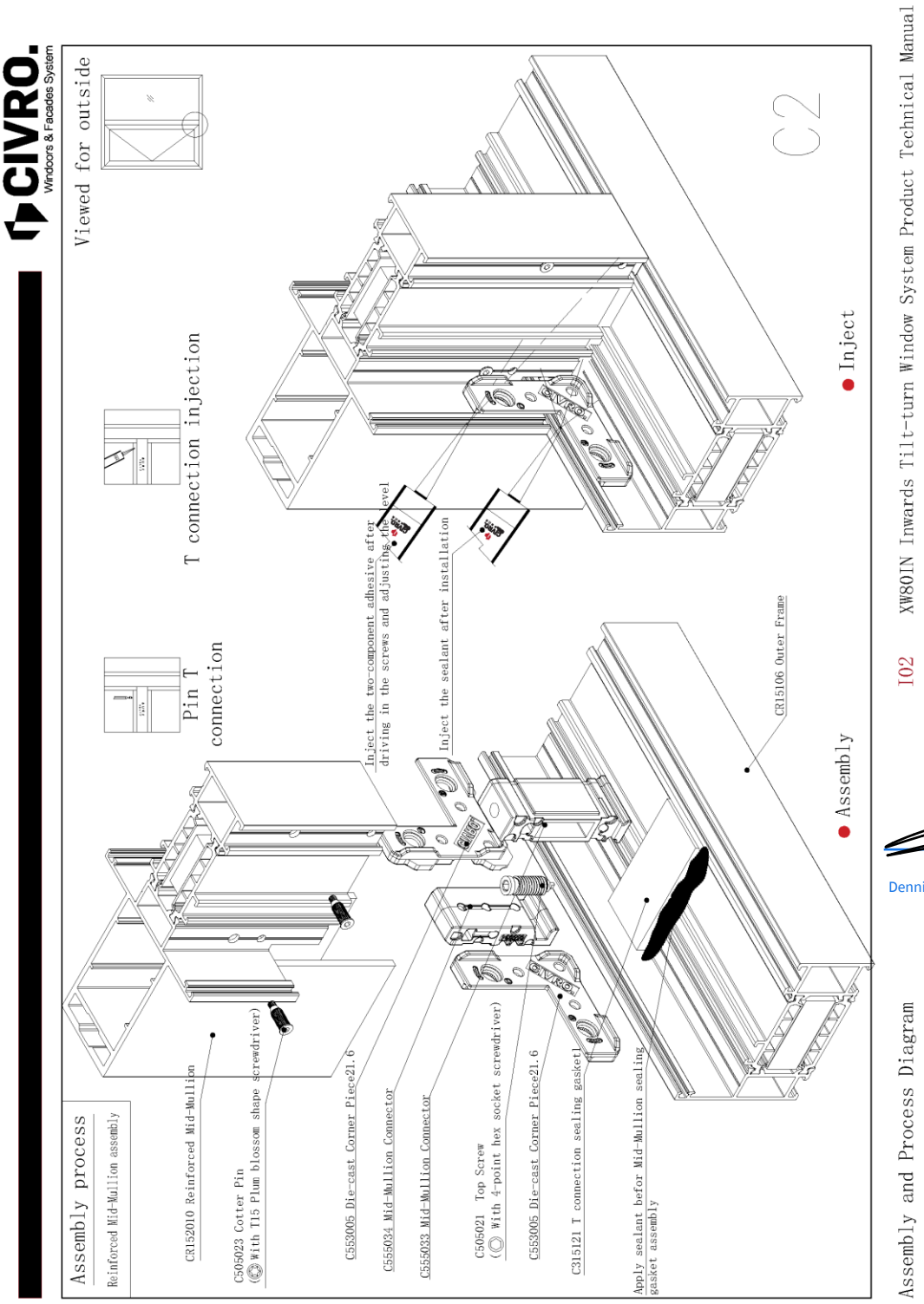

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Figure 47 Drawing of Frame Concern Construction of Main Frame (Mullion Connection Detail)

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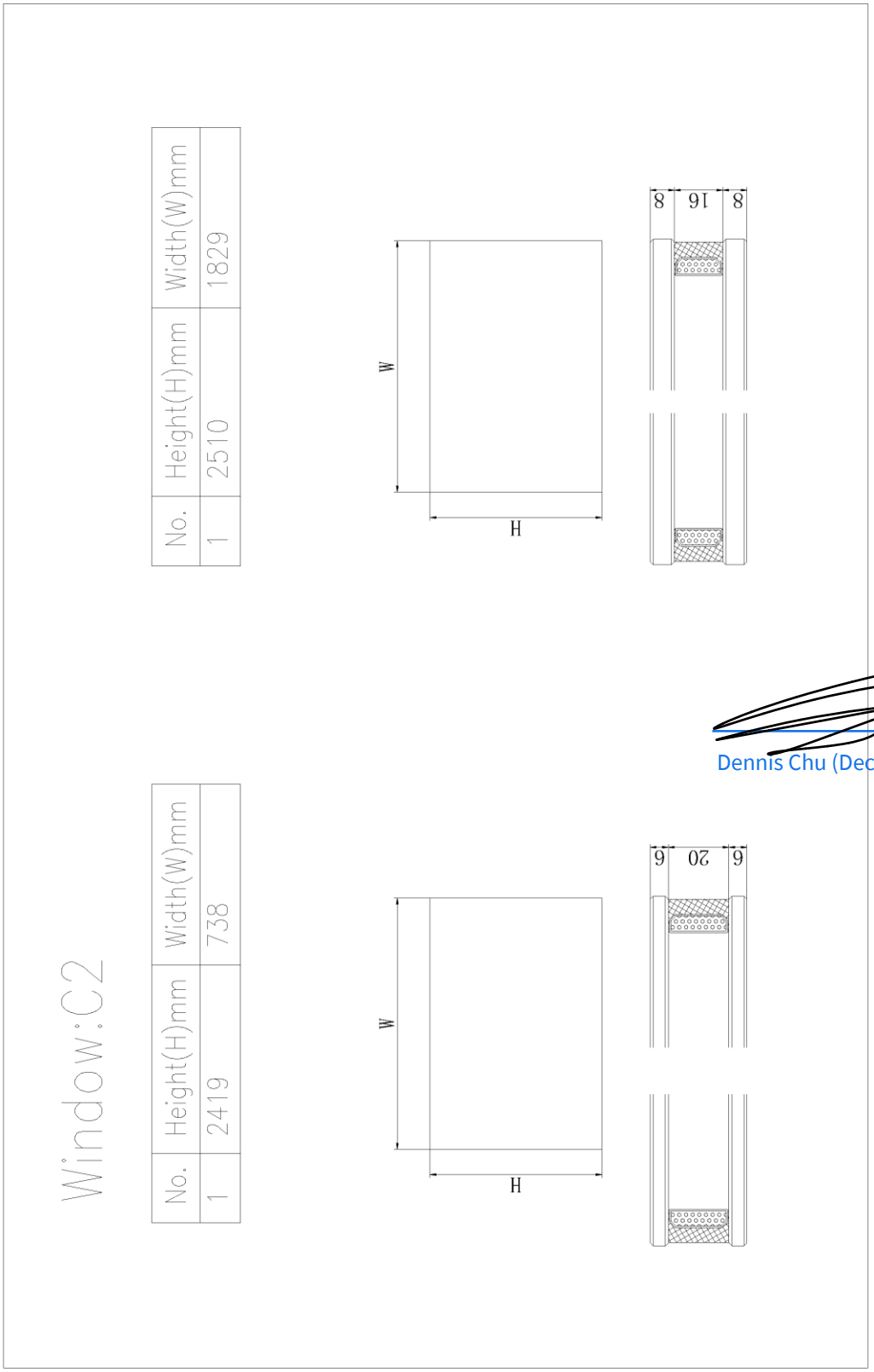

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Figure 48 Drawing of Glazing

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