

SECTION 7

Thermal Frame Windows:

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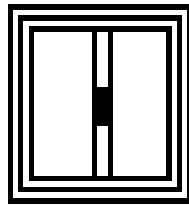
Horizontal Slider Window Performance Test Results

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Glass Performance Data

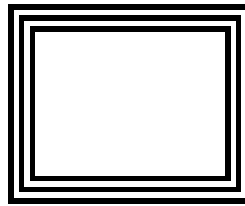
Specifications

Thermal Frame Windows Standard Sizes and Styles



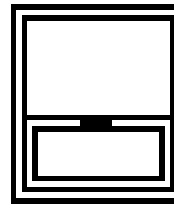
Horizontal Sliding

Sizes:
3030 5040
4030 6030
4040 6040



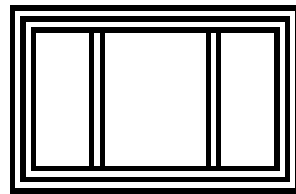
Fixed Picture

Sizes:
2060 4030
2070 4040
3030 6030



Fixed/Project-In

Sizes:
2060
3040



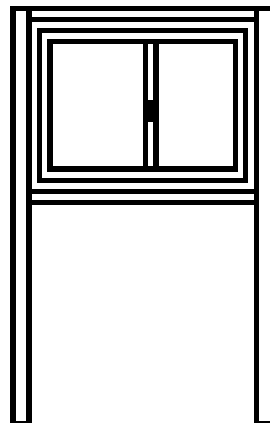
Slider-Fixed-Slider

Sizes:
6030
6040

Colors: White and Bronze

Self-Framing windows must be installed on 12" centers.

Windows can be combined and mulled together either horizontally or vertically.



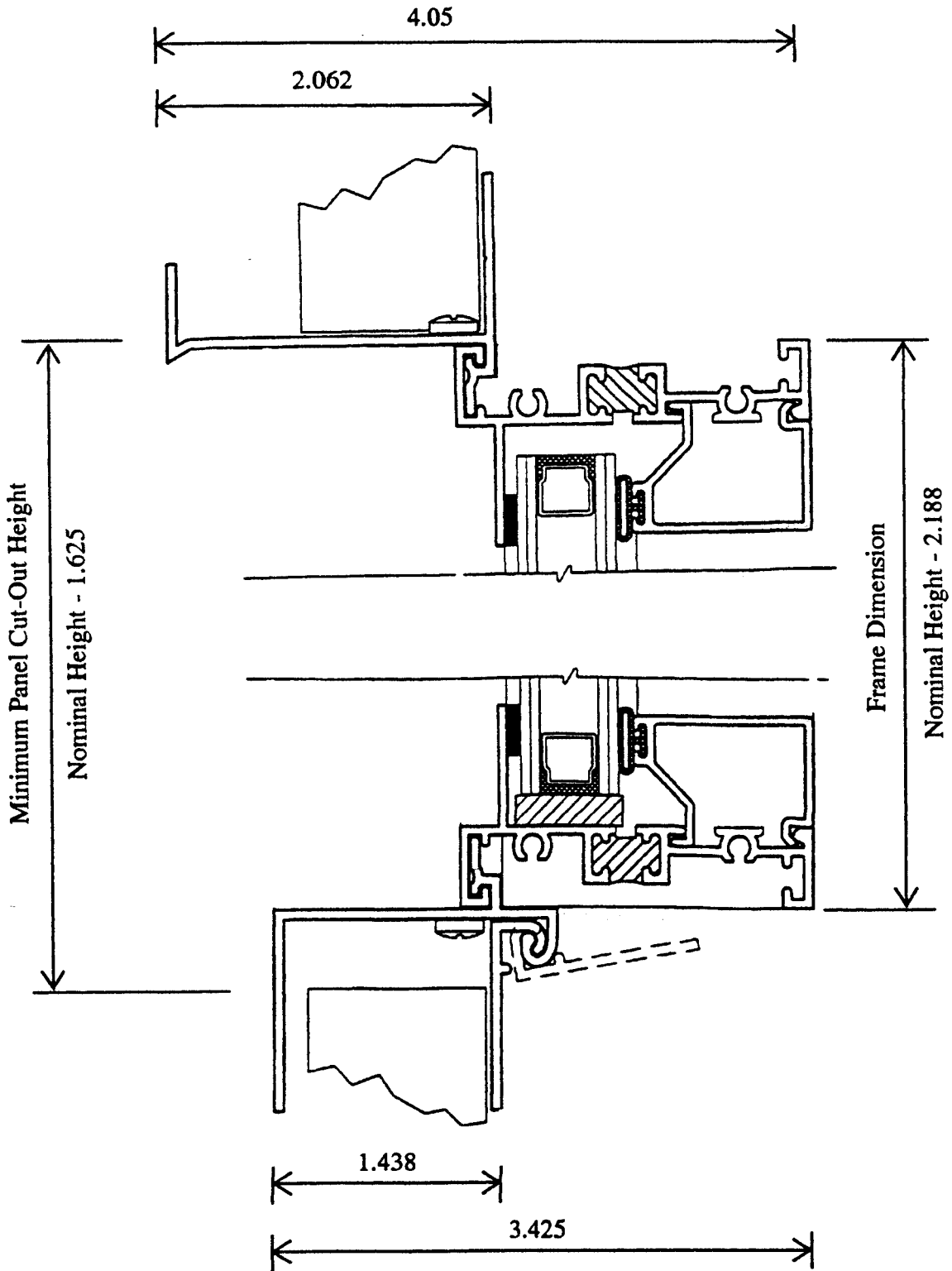
Optional Subframing System

All windows can be factory mounted inside a 16 gauge, galvanized subframe system to provide for a solid installation.

Similar to doors, the installation process can be completed in 20 – 30 minutes.

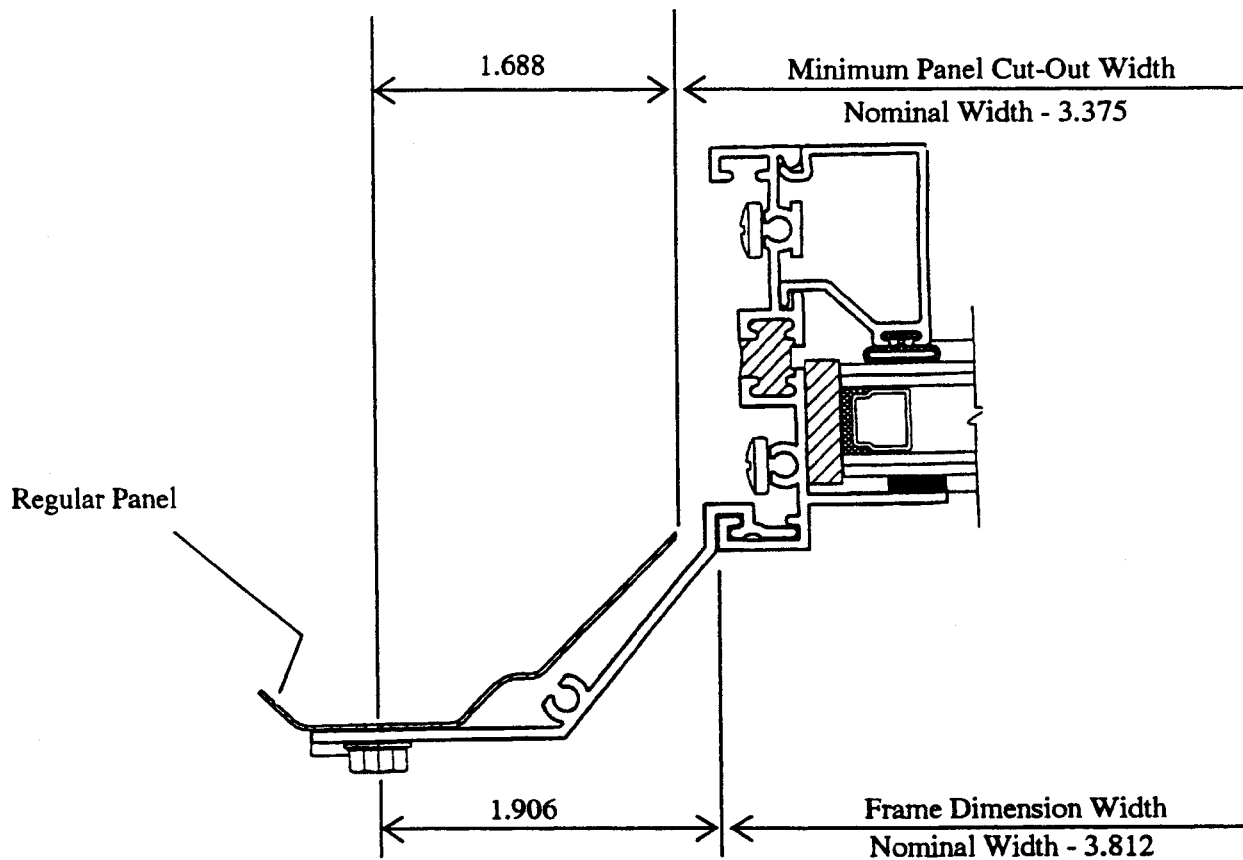
The subframe also allows for a nice surface to work with for interior liner panels.

Window Profile – Head/Sill



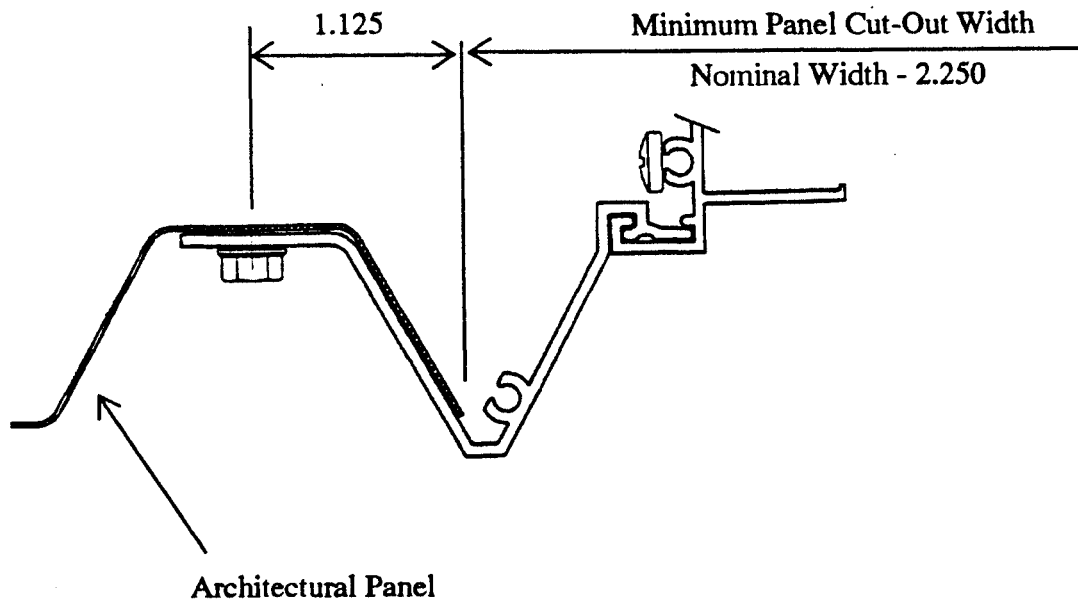
Jamb Profile – Regular Panel

The windows with regular jamb fins match the profile of the “regular” panel. Therefore it is necessary that the panel be cut in the exact location specified, always on 12” centers.



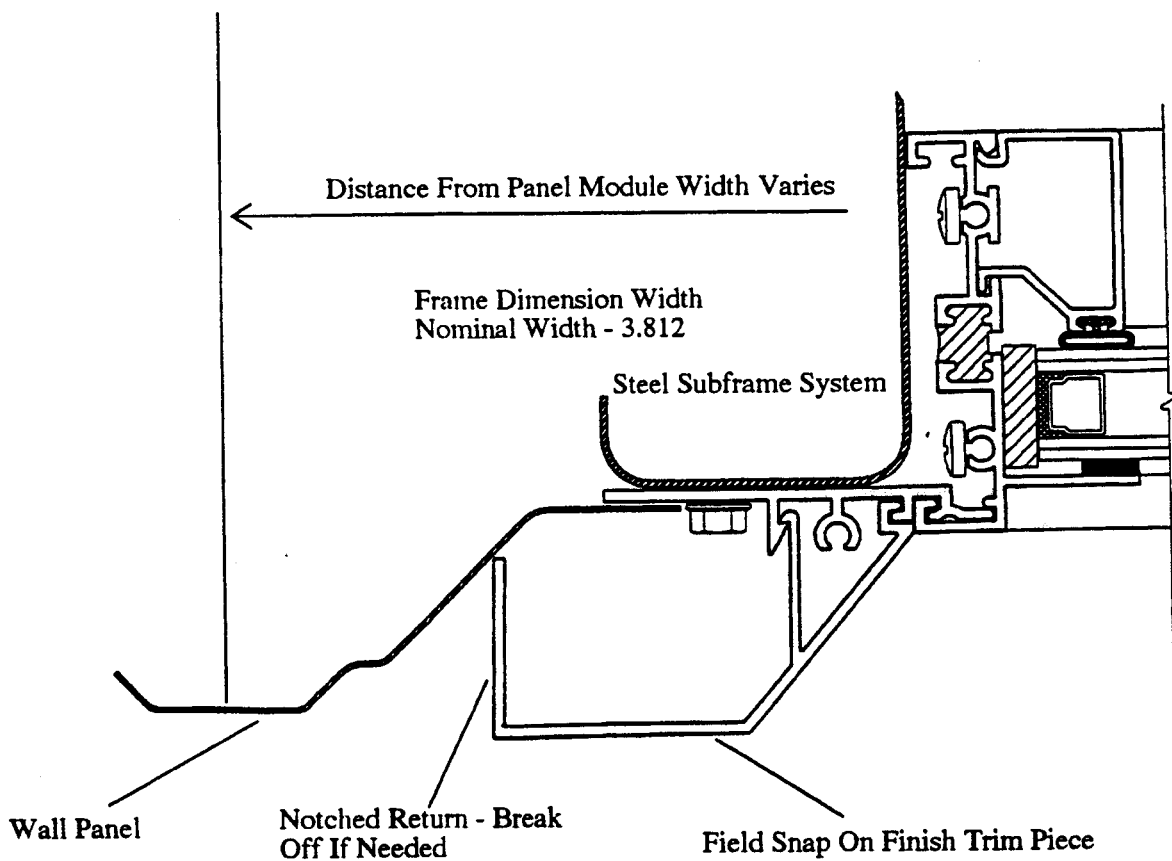
Jamb Profile – Architectural Panel

The windows with the architectural jamb fins match the profile of the architectural panel. Therefore it is necessary that the panel be cut in the exact location specified, always on 12" centers.

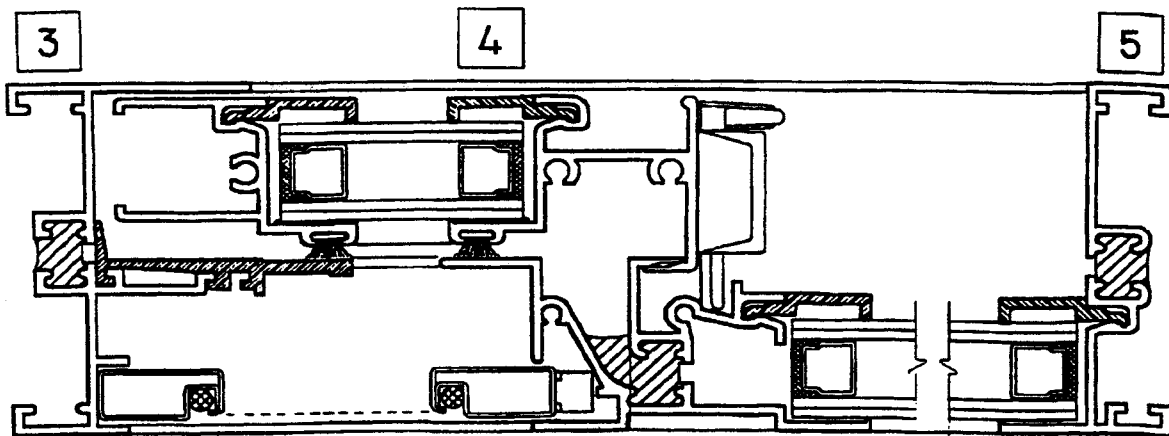
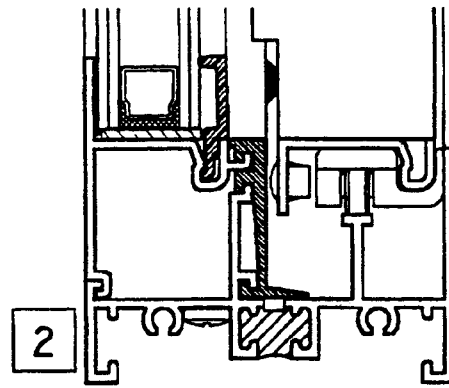
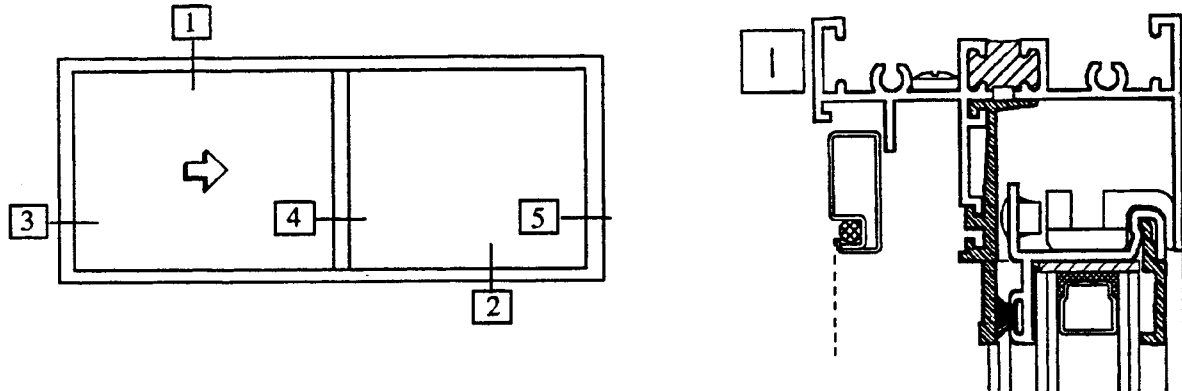


Jamb Profile – Universal Fin

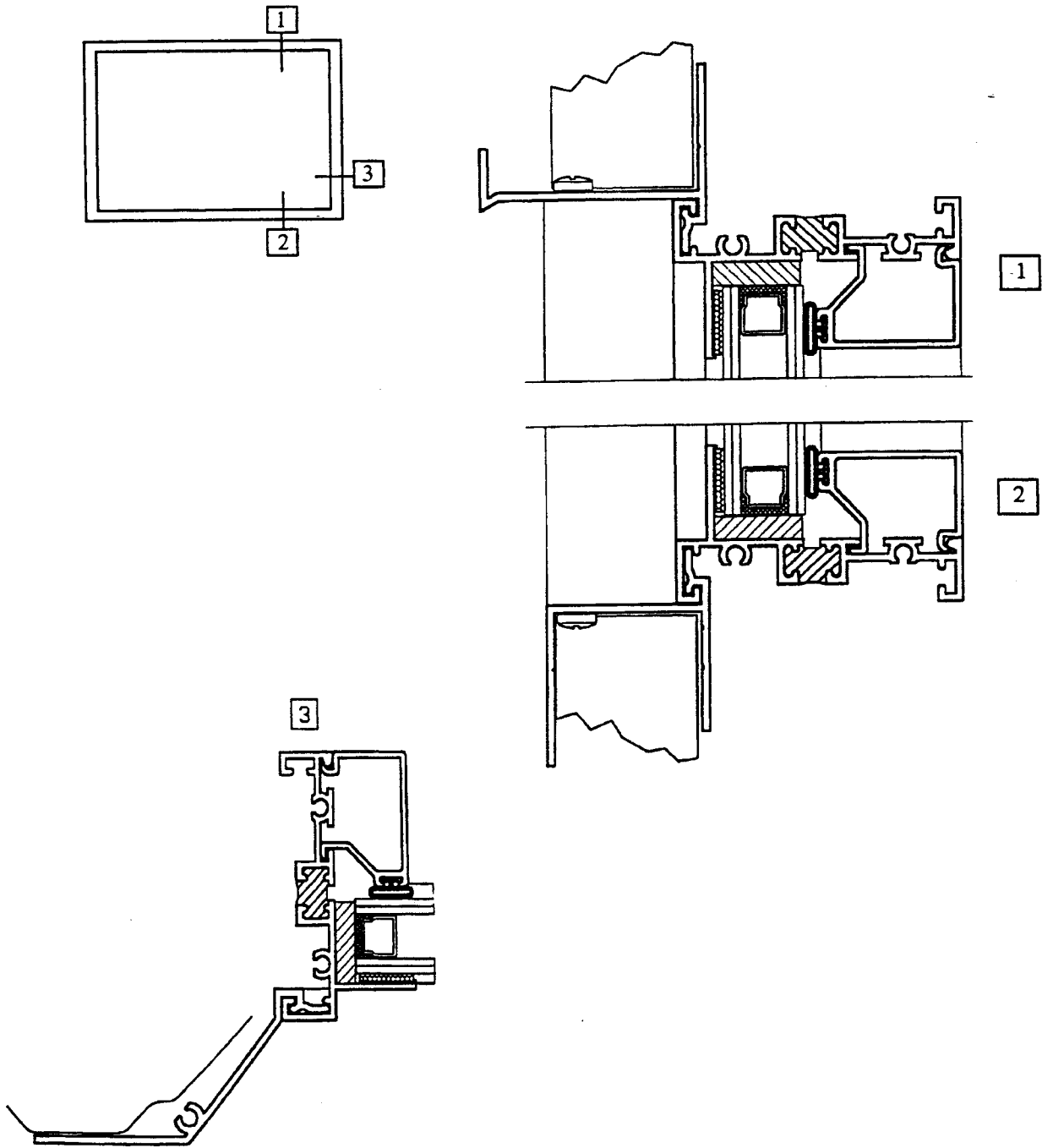
The universal fin is designed specifically for use with the steel subframe system. The pre-assembled window, in this instance, is installed prior to the wall panels and therefore it cannot be determined what section of the wall panel configuration will fall in relation to the window itself. The universal fin has the flexibility to trim itself out no matter where the window falls in relation to the wall panel. The field applied finish trim piece has a notched return that can be removed if needed.



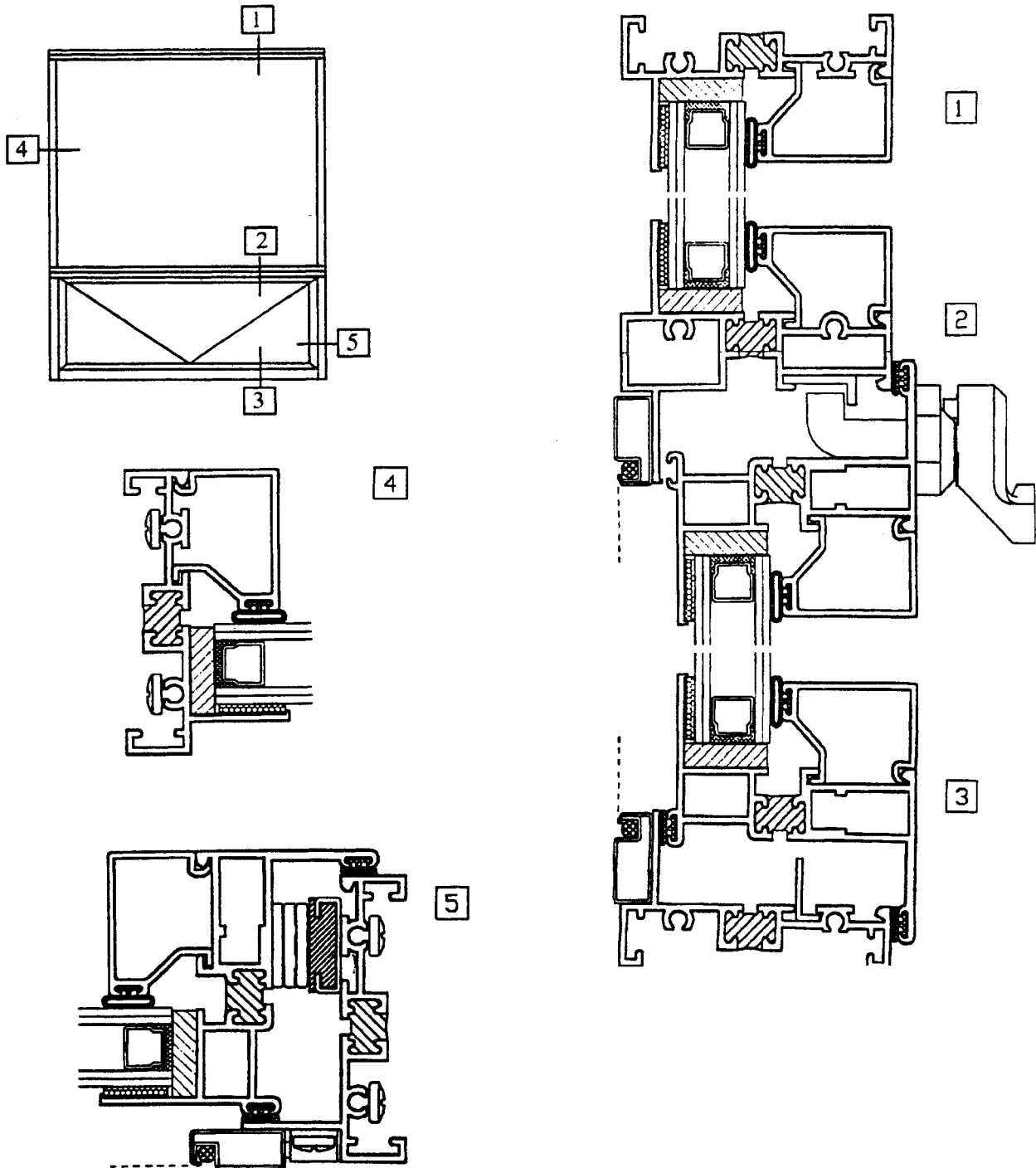
Horizontal Slider Window Detail



Fixed Window Detail

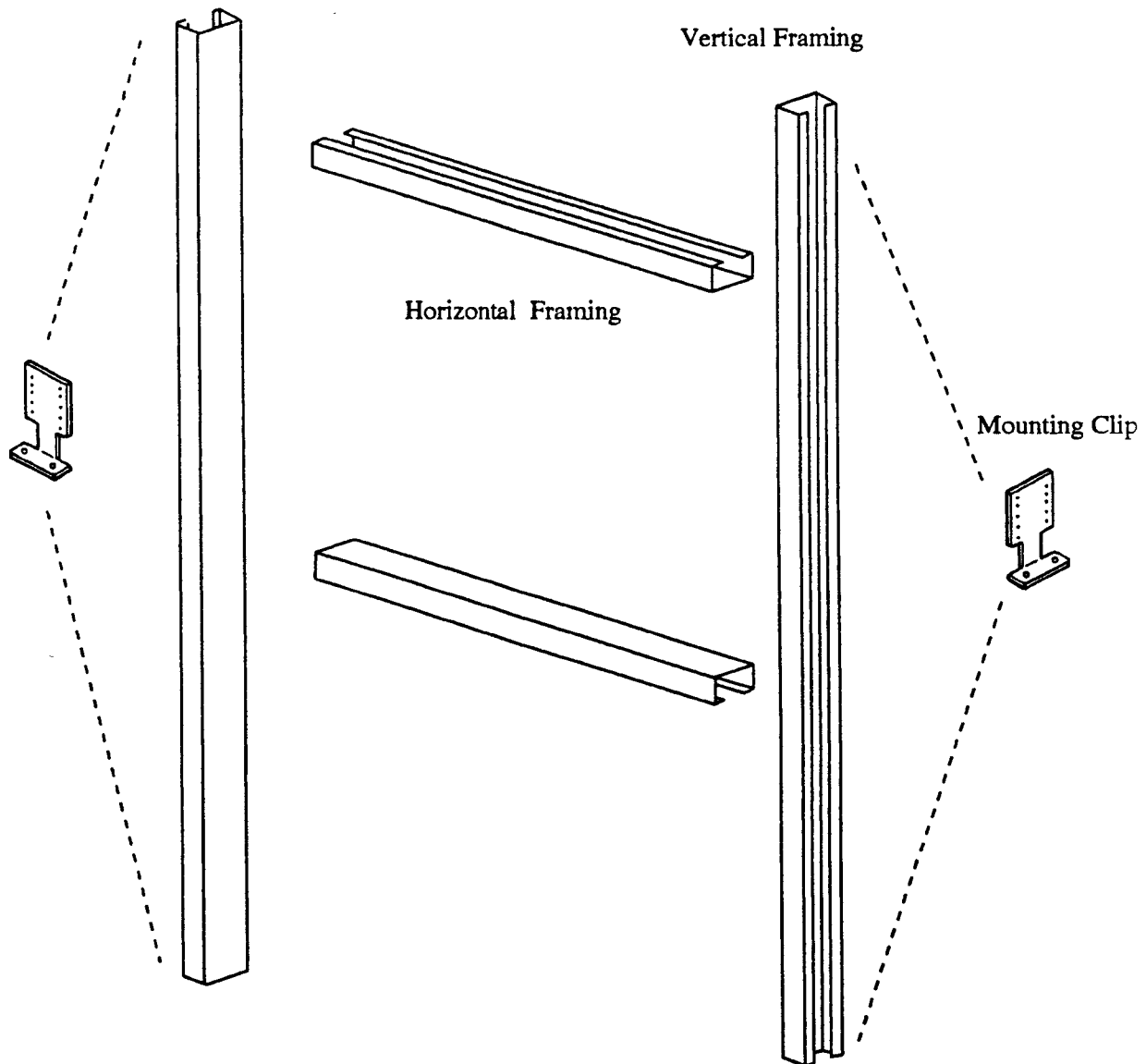


Fixed/Project-In Window Detail



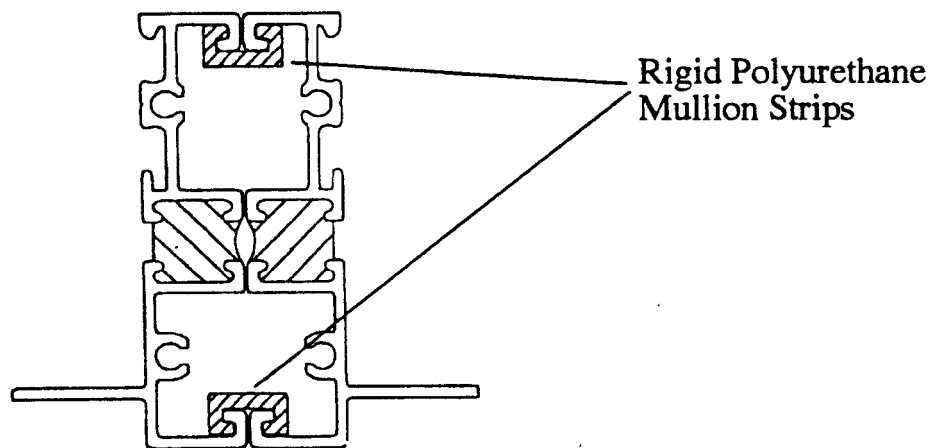
Optional Subframe (Framed Opening) Detail

Each subframe piece is made of 16 gauge, galvanized steel. The subframe system consists of (2) vertical frames and (2) horizontal frames fastened together. The window is factory-mounted to the subframe system. Each subframe unit includes top and bottom mounting clips and all fasteners and anchor bolts needed to complete the installation process. The universal trim fin must be used with the steel subframe system. Standard subframe sizes are 6 ½", 8", 8 ½", 9 ½".



Windows Mullered Together Detail

The two window frame sides are butted up against each other (no fins) and two rigid polyurethane mullion strips (one each side) are slid into place. No sealant is necessary once the strips are in place. Windows can be mulled together either horizontally or stacked vertically.

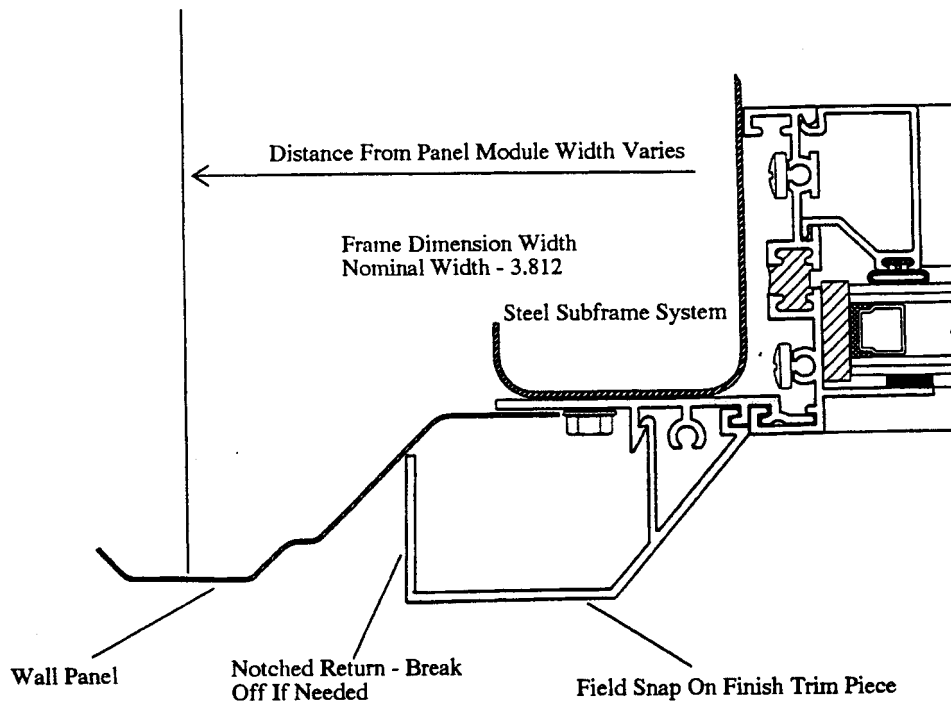


Window Installation Instructions – With Steel Subframe System

With Steel Subframe System:

Note: Windows with a steel subframe system have a “universal” jamb trim that allows the window to fall at any location along the wall panel.

1. Installation of the window can be accomplished prior to or after the wall panels are in place. (It is recommended that the installation take place prior to the wall panels as it simplifies the process.)
2. Stand the window in the location desired.
3. Secure both sides of the base through the tow holes on the base clips with the masonry anchors provided.
4. Raise the adjustable clip at the top of both subjambes to the bottom of the girt. Plumb the window and attach these clips to the girt and subjambes.
5. When sheeting, cut the panels as needed round the window. Make the cuts as close as possible to the window perimeter. The actual rough opening size would be $2 \frac{3}{4}$ " less than the stated window width and $1 \frac{5}{8}$ " less than the stated window height. Example: 3040 window would have a rough opening of $33 \frac{1}{4}$ " wide by $46 \frac{3}{8}$ " high.
6. Field apply the finished snap-on trim on both window jambs.
7. Run a continuous bead of caulk at the head to form a watertight seal.



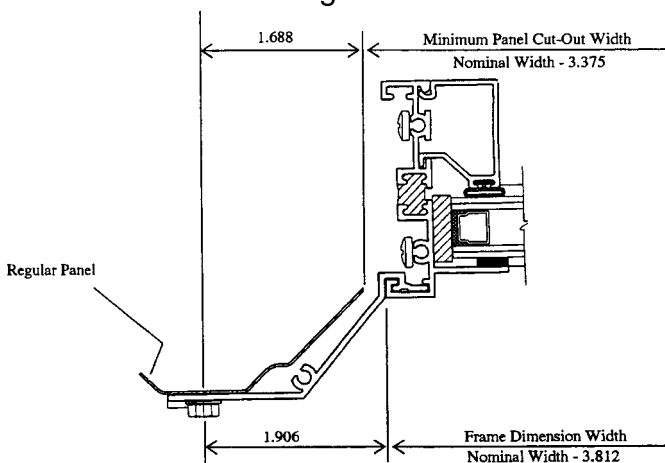
Window Installation Instructions – No Steel Subframe System

Without Steel Subframes

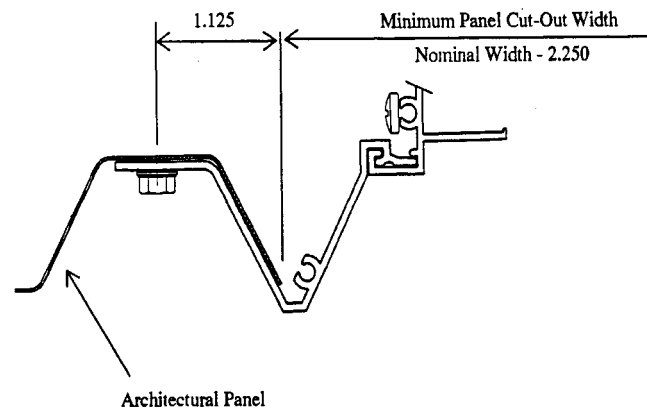
Note: Windows without a steel subframe system have jamb fins that are designed to correspond with the flats on the wall panels. Therefore, rough opening locations must be 12" centers.

1. Sheet the wall.
2. Measure and cut the rough opening to the appropriate size. Check the diagrams below for the width needed. The height is the same as the stated size.
3. Insert the window unit into the location as cut. If the cut is slightly larger in height than needed, raise the window when fastening so the gap is lessened at the head. The bottom sill has a hinged plate that is raised during the mounting stage. This allows for the rough opening to be cut to the smallest tolerance possible. Pull the plate back down when in place.
4. Level the window and use the predrilled holes on the jamb fins to attach the window directly to the flats of the wall panels.
5. Fasten the back sill plate to the wall panels from the interior.
6. Once the window is secured, apply a continuous bead of caulk the entire length of the head, through the corners to form a watertight seal.

Regular Panel



Architectural Panel





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421-1400

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ANALYTICAL AND RESEARCH CHEMISTS —
CHEMICAL ENGINEERS — PETROLEUM ENGINEERS

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Submitted By: Window Technology, Inc.
201 Industrial Drive
Monett, MO 65708

Date: February 8, 1996

Attn: Mr. Robert E. Berger

Report No. 23721

REPORT

Product Type: Aluminum Horizontal Sliding Window

Specification: ANSI/AAMA 101-93; HS-C25

Series Model: 2255

Frame Size: 13'0" x 5'4"

Sash Size: 3'10-1/8" x 5'2"

Configuration: XOX

PRODUCT DESCRIPTION

Weatherstripping: One line of (0.250" thickness) pile weatherstrip with integral plastic fin on exterior face, full perimeter of each sash.

Hardware: One metallic lock at mid-point of each sash, at interlock stile. Plastic roller housing with integral spacer button (interior face) at each end of top and bottom of sash rails; one metallic roller at each end of sash bottom rail. Four spacer buttons on exterior face of top and bottom rails, on 16" max. spacing.

Glass: 1/4" tempered.

Glazing: Interior with silicone backbedding and vinyl snap-in glazing bead.

Weep Arrangement: One 1"x1/8" weep slot through exterior leg of frame sill, approximately 3" from each operable vent jamb. Screen leg of frame sill removed, from jamb to fixed interlock stile of each operable sash opening.

Sealant: Narrow joint sealant at frame sill, frame jamb, fixed interlock stile, and frame head joints and at screw heads.

Other Features: Frame corner construction by two (2) #8x5/8" screws. Sash corner construction by one (1) #8x5/8" screw at jamb stiles and two (2) #8x5/8" screws at interlock stiles. Fixed interlock stiles attached to frame head and frame sill by two (2) #6x5/8" screws. Rigid vinyl parting strip at center leg of frame head, frame sill, and frame jamb. Frame head, frame sill, frame jamb, and fixed interlock stile are thermally broken.



THE DALLAS LABORATORIES, INC.

Window Technology, Inc.
Feb. 8, 1996
Page 2 - Report #23721

Date Testing Started: February 1, 1996

Date Testing Completed: February 1, 1996

Tests Performed At: Efco Corporation testing facility in Monett, Missouri.

PERFORMANCE TEST RESULTS

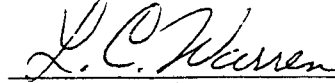
<u>SPECIFICATION PARAGRAPH NO.</u>	<u>TITLE OF TEST</u>	<u>TEST METHOD</u>	<u>MEASURED</u>	<u>ALLOWED</u>
2.2.4.5.1	Operation Force - Open - Close		16 lbs 14 lbs	25 lbs 25 lbs
2.1.2	Air Infiltration @ 1.57 psf	ASTM E 283-91	0.13 CFM/Ft of crack	0.37 CFM/Ft of crack
2.1.3	Water Resistance @ 3.00 psf	ASTM E 547-93	No Leakage	No Leakage
3.3	Water Resistance @ 3.75 psf	ASTM E 547-93	No Leakage	No Leakage
2.1.4.2	Uniform Load Structural - Exterior - Interior - Permanent Set	ASTM E 330-90	30.0 PSF* 30.0 PSF* Negligible	30.0 PSF* 30.0 PSF* 0.216"
3.4.2	Uniform Load Structural - Exterior - Interior - Permanent Set	ASTM E 330-90	37.5 PSF* 37.5 PSF* 0.063"	37.5 PSF* 37.5 PSF* 0.216"
2.2.4.5.2	Deglazing - Interlock stile - Bottom rail - Jamb stile - Top rail	ASTM E 987-88	0.055" - 15.8% 0.003" - 0.7% 0.010" - 2.9% 0.018" - 6.4%	0.348" 0.408" 0.346" 0.282"

* No glass breakage, permanent deformation, or other damage causing the unit to be inoperable.

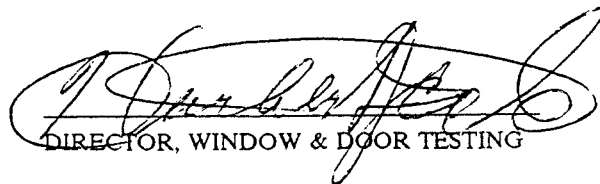
Detailed extrusion and assembly drawings indicating measured wall thickness, corner construction, and hardware application are on file and have been compared to the test sample submitted. Test sample will be retained at the testing laboratory.

The above results were secured by using the designated test methods and they indicate compliance with the performance requirements of the above referenced specifications.

DALLAS LABORATORIES, INC.
TESTING LABORATORY



TECHNICIAN
LCW:td



DIRECTOR, WINDOW & DOOR TESTING



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AMERICAN SOCIETY FOR QUALITY CONTROL

Submitted by: Window Technology, Inc.
201 Industrial Drive
Monett, MO 65708

Date: April 10, 1996

Attn: Mr. Robert E. Berger

Report No.: 23718

REPORT

Product Type: Aluminum Thermally Broken Fixed Window

Specification: ANSI/AAMA 101-93; F-HC40

Series Model: 2250

Frame Size: 6'0" x 6'0"

Configuration: O

PRODUCT DESCRIPTION

Weatherstripping: None.

Hardware: None.

Glass: 1/4" tempered.

Glazing: Interior glazed with silicone and snap-in glazing bead.

Weep Arrangement: None.

Sealant: All frame corners sealed with narrow joint seam sealer.

Other Features: Frame corner construction by two (2) #6x5/8" screws. Frame members are thermally broken.

Date Testing Started: January 31, 1996

Date Testing Completed: January 31, 1996

Tests Performed At: Efco Corp. testing facility in Monett, Missouri.

PERFORMANCE TEST RESULTS

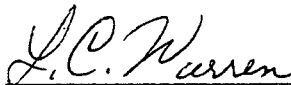
<u>SPECIFICATION PARAGRAPH NO.</u>	<u>TITLE OF TEST</u>	<u>TEST METHOD</u>	<u>MEASURED</u>	<u>ALLOWED</u>
2.1.2	Air Infiltration @ 6.24 psf	ASTM E 283-91	<0.01 CFM/Ft ²	0.15 CFM/Ft ²
2.1.3	Water Resistance @ 6.00 psf	ASTM E 547-93	No Leakage	No Leakage
2.1.3	Water Resistance @ 6.00 psf	ASTM E 331-93	No Leakage	No Leakage
3.3	Water Resistance @ 15.0 psf	ASTM E 547-93	No Leakage	No Leakage
3.3	Water Resistance @ 15.0 psf	ASTM E 331-93	No Leakage	No Leakage
2.1.4.2	Uniform Load Structural - Exterior - Interior - Permanent Set	ASTM E 330-90	60.0 PSF * 60.0 PSF * Negligible	60.0 PSF * 60.0 PSF * 0.288*

* No glass breakage, permanent deformation, or other damage causing the unit to be inoperable.

Detailed extrusion and assembly drawings indicating measured wall thickness, corner construction, and hardware application are on file and have been compared to the test sample submitted. Test sample will be retained at the testing laboratory.

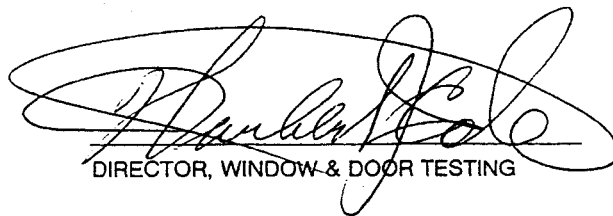
The above results were secured by using the designated test methods and they indicate compliance with the performance requirements of the above referenced specifications.

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TESTING LABORATORY



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DIRECTOR, WINDOW & DOOR TESTING

THERMAL WINDOW PERFORMANCE DATA

Insulating Glass Performance Data – Clear and Tinted Glass

(I.G. units constructed of equal glass thickness with 1/2" airspace; interior lites clear)

PRODUCT	NOMINAL THICKNESS		TRANSMITTANCE AVERAGE			REFLECTANCE AVERAGE		NORTH AMERICA U-VALUE (C)		(D) SHADING CO-EFFICIENT	(E) SOLAR HEAT GAIN CO-EFFICIENT	(F) RELATIVE HEAT GAIN
			DAYLIGHT %	SOLAR %	(B) UV %	DAYLIGHT %	SOLAR %	SUMMER	WINTER			
	IN.	MM										
Clear	1/8	3	82	73	69	14	12	0.55	0.49	0.91	0.79	189
	3/16	5	81	68	64	14	11	0.55	0.49	0.87	0.75	182
	1/4	6	80	65	62	14	11	0.55	0.48	0.85	0.74	179
Gray	1/8	3	56	54	47	9	9	0.56	0.49	0.72	0.62	151
	3/16	5	45	43	38	8	8	0.57	0.49	0.62	0.54	131
	1/4	6	41	39	34	7	7	0.56	0.48	0.57	0.49	123
Bronze	1/8	3	62	56	42	10	9	0.56	0.49	0.73	0.63	154
	3/16	5	53	45	32	9	8	0.57	0.49	0.64	0.55	135
	1/4	6	49	41	28	8	7	0.57	0.48	0.59	0.51	127

Insulating Glass for Residential Glazing: Low E Glass (1)

(I.G. units constructed of clear and tint glass of equal glass thickness with 1/2" airspace unless otherwise stated)

OUTBOARD LITE	GLASS THICKNESS		TRANSMITTANCE AVERAGE			REFLECTANCE AVERAGE		(C) WINTER U-VALUES						(D) SHADING CO-EFFICIENT COATED SURFACE	
			DAYLIGHT %	SOLAR %	(B) UV %	DAYLIGHT %	SOLAR %	AIR-FILLED			ARGON-FILLED			#3	#2
	IN	MM						3/8"	1/2"	3/4"	3/8"	1/2"	3/4"		
Clear	3/32	2.5	76	66	58	18	15	0.38	0.35	0.36	0.32	0.30	0.31	0.88	0.82
	1/8	3.0	75	64	55	18	14	0.38	0.35	0.36	0.32	0.30	0.31	0.87	0.81
	5/32	4.0	75	61	53	18	14	0.38	0.35	0.36	0.32	0.30	0.31	0.85	0.78
	3/16	5.0	73	58	52	18	14	0.38	0.35	0.36	0.32	0.30	0.31	0.83	0.76
1/4	6.0	73	55	50	17	13	0.38	0.35	0.36	0.32	0.30	0.31	0.81	0.74	
Gray	1/8	3.0	51	47	37	11	10	0.38	0.35	0.36	0.32	0.30	0.31	0.67	N/A
Bronze	1/8	3.0	56	48	34	12	11	0.38	0.35	0.36	0.32	0.30	0.31	0.69	N/A

(1) Based on LOF Low-E

THERMAL FRAME WINDOW SPECIFICATION

The Series 2255 MBS (Metal Building System) Thermal Fin is a 2 ¼" window family designed specifically for metal siding applications. Horizontal slider, project-in hopper and fixed window configurations are available with a poured-in-place polyurethane thermal barrier. The windows and the head/sill channel and jamb fins can be installed as the metal siding is erected or retrofitted by cutting holes in the siding at a later time. Extremely narrow metal site lines maximize the glass day lite opening and sash ventilation. Jamb fins installed on the rib are available for regular and architectural metal siding panels. A universal fin allows installation off the rib of the metal panel. Windows may also be used without the head/sill channels and jamb fins for traditional installations in masonry or wood/metal stud conditions.

SECTION 08520 ALUMINUM WINDOWS

PART 1 – GENERAL

1.01. Work Included

- A. Furnish and install aluminum windows complete with hardware, fins and related components as shown on drawings and/or specified in this section.
- B. All windows shall be Series 2255 MBS Thermal Fin (state configuration: horizontal slider, fixed, fixed over project-in hopper vent or single project-in hopper vent).
- C. Glass and Glazing: All windows shall be factory glazed.

1.02. Testing and Performance

- A. Air, water and structural test unit sizes and configurations shall be in general conformance to requirements set forth in ANSI/AAMA 101-93.
- B. Windows shall conform to HS-C25 (horizontal slider), P-C30 (project-in vent) and F-HC40 (fixed).

1.03. Quality Assurance

- A. Provide test reports from AAMA accredited laboratory certifying the performance as specified in 1.02.
- B. Test reports shall be accompanied by the window manufacturer's letter of certification stating that the tested window meets or exceeds the referenced criteria for the appropriate ANSI/AAMA 101-93 window type.

1.04. Submittals

- A. Contractor shall submit section details; finish sample, test reports and warranties as required.

1.05. Warranty

- A. The window manufacturer's shall assume full responsibility and warrant for one (1) year (five [5] years for insulated glass seal only) the satisfactory performance of the factory fabricated window unit including sash operation hardware and glazing as it relates to air, water and structural adequacy.
- B. The metal building erector shall be responsible for the window and fin anchorage, flashing and sealing.

PART 2 – PRODUCTS

2.01. Materials

- A. Extruded aluminum shall be 6063-T5 alloy and temper
- B. Hardware
 1. Horizontal slider shall have a painted zinc die cast sweep latch, which mechanically retains the frame meeting rail. Spring-loaded latches shall not be permitted.
 2. Projected vents shall have a cam handle with a concealed pawl painted to match the window finish and a steal strike
 3. Projected windows shall have Bronze Craft Defender Series stainless steel operating arms. Aluminum or carbon steel arms shall not be permitted.
 4. Horizontal slider roller system shall consist of an injection-molded nylon housing with brass tire on a stainless steel axle. Nylon or one-piece brass roller/axle assemblies shall not be permitted.
- C. Weatherstrip
 1. Horizontal slider shall be weather-stripped with Amesbury WINDO-FIN GLIDEFIT medium density polypropylene pile with Mylar fin or equal.
 2. Projected vent weatherstripping shall be a co-extruded Santoprene bulb with a polypropylene backer or equal.
- D. Glass and Glazing
 1. Glass shall be SSB (2mm) or DSB (3mm) clear, tinted, obscure and/or tempered as required.

2. Insulated glass shall have an "A" level rating with a five (5) year warranty against seal failure. Glass sealant shall be polysulfide. Glass unit overall thickness shall not be less than 5/8". 1" also available for fixed and projected lites.
- E. Thermal Barrier
1. All aluminum exposed to the exterior shall be thermally separated from aluminum on the interior by either a poured-in-place polyurethane thermal barrier or a rigid PVC extrusion.
 2. Thermal short circuits shall not be permitted in the design of the perimeter frame, sash and glazing components.
- 2.02. Fabrication**
- A. General
1. Window head/sill and jamb extrusions shall have specially designed aluminum raceways to accept the head/sill channel and the jamb fins. Sheet metal screws at each corner shall keep the channel and fins from sliding once installed in the window and to maintain corner alignment.
 2. Head/sill channel and jamb fin system shall permit window installation either as the metal siding is being erected or as a retrofit (cutting a hole after the fact in the siding).
 3. Depth of frame shall not be less than 2 1/4". Horizontal slider sash shall not be less than 7/8", and projected vents shall not be less than 1 7/8" in depth.
 4. All aluminum frame and sash extrusions shall have a minimum wall thickness of not less than .055".
 5. The head/sill channels and the jamb fins shall have a minimum wall thickness of .062".
- B. Frame components shall be square cut and mechanically fastened with zinc plated sheet metal screws.
- C. Sash
1. Horizontal slider sash shall be square cut and mechanically fastened with zinc plated sheet metal screws. A specially designed pull rail shall be recessed into the sash lock rail. No pull of any sort shall protrude beyond the interior plane of the window. Rollers shall ride on a raised extruded track.
 2. Projected vents and frame meeting rail shall be hollow extrusions. Vents shall be mitered and mechanically staked with two solid aluminum keys per corner. Each vent shall have two (2) rows of a co-extruded Santoprene bulb on a polypropylene backer.
- D. Screens
1. Frames shall be painted, roll-form aluminum. Mesh shall be 18 x 16 fiberglass.
 2. Horizontal Slider: Totally concealed leaf springs shall secure the screen. Two (2) nylon pulls per screen shall be provided to aid in screen removal and installation. The screen shall be retained entirely within the 2 1/4" frame dimension and not protrude beyond the exterior of the window plane.
 3. Projected: "Z" clips shall be factory attached to the window frame. Spring loaded plungers and post pins attached to the insect screen shall make for easy removal of the screen from the building interior.
- E. Glazing
1. All glass shall be inside glazed and have a minimum glazing rabbet of 3/8" (horizontal slider) and 1/2" (fixed/projected).
 2. Horizontal slider glass sizes (fixed and operating) shall be the same size to simplify field re-glazing and equal the glass day lite openings.
 3. Horizontal slider glass lites shall be glazed with a neutral cure liquid silicone back bedding compound. Film thickness shall not be less than .040"
 4. Fixed and project-in glass lites shall be glazed with PVC foam tape and cap sealed with silicone.
 5. Glazing beads shall be rigid extruded PVC (horizontal slider) and snap-in aluminum (fixed/projected). Color to match the aluminum finish.
 6. Finish all exposed areas of aluminum windows and fins with bronze baked enamel, which meets or exceeds AAMA 603.8. Color to match ALENCO #A111. White paint, other custom paint colors and anodized finishes are also available.

PART 3 – EXECUTION

- 3.01. Plumb and align windows. Adequately anchor to metal siding to maintain position permanently when subjected to normal thermal and building movement and specified window loads.**
- 3.02. Adjust windows for proper operation after installation.**
- 3.03. Furnish and apply sealants to provide a weather tight installation at all joints and intersections of the metal siding, fins and windows. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.**