Testing Evaluation Laboratories, Inc.

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TEST RESULTS

Report No: TEL 01990816
Dade Lab Certification Number: 11-1213.01
Test Dates: September 23-27, 2013
Test Notification Number: TEL 13-005
Report Date: October 31, 2013

Issued to:

Fleetwood Windows and Doors
1 Fleetwood Way
Corona, CA 92879

Project Summary: Testing Evaluation Laboratories, Inc. (TEL) was contracted by Fleetwood Windows and Doors to perform tests on the Kona 3800 Casement and Awning Windows at TEL's Plant City, FL test facility.

Test specimen descriptions and results are reported herein.

Test Specifications: **The test specimens were evaluated in accordance with the following:**

High Velocity Hurricane Zone Protocols TAS 202-94, TAS 201-94 and TAS 203-94

Test Specimen Description:

Series / Model:	**Kona 3800 Casement and Awning Windows**
Type:	**Aluminum Casement and Awning Windows**
Overall Size:	**42.00" x 84.00 –Specimens 1, 1a, 1b, 1c, 1e, 2,2a, 5, 5a, 6 and 6a – (X)** **42.00" x 65.00" – Specimens 3 and 3a – (X)** **125.00" x 84.00"– Specimen 4 – (XXX)** **42.00" x 180.00" – Specimen 7 - (X/O/X)** **42.00" x 180.00" – Specimens 8 and 8a - (O/X/O)** **42.00" x 72.00" – Specimens 12 and 12a – (X)**
Daylight Opening:	**33.063"x 75.13"– Specimens 1, 1a, 1b, 1c, 1e, 2,2a, 5, 5a, 6 and 6a – (X)** **33.625" x 56.50" – Specimens 3 and 3a – (X)** **38.88" x 75.06"– Specimen 4 – (XXX) – All Panels** **33.13" x 37.875" – Specimen 7 - Top Active Panel (X)** **39.062" x 81.625"– Specimen 7 - Center Fixed Panel (O)** **33.13" x 41.375"– Specimen 7 - Bottom Active Panel (X)**

Test Specimen Description: Continued

Daylight Opening:	39.062" x 9.312" – Specimens 8 and 8a - Top Fixed Panel (O) 33.13" x 76.062"– Specimens 8 and 8a - Center Active Panel (X) 39.062" x 81.625" – Specimens 8 and 8a - Bottom Fixed Panel (O) 32.88" x 56.06" – Specimens 12 and 12a – (X)
Glazing Detail:	See attached drawing numbers L-7031, L-7032, L-7032A and L-7033 For glazing details.
Frame Material:	Aluminum
Finish:	Mill Finish

For Tested Elevation, Vertical Cross Sections, Horizontal Cross Sections, Components, Frame Anchoring, Glazing Detail and Bill of Materials See Attached Drawing numbers L-7031, L-7032, L-7032A and L-7033.

SEQUENCE OF TESTS PERFORMED:

STRUCTURAL TESTS (TAS 202)

Specimen 1 – 42.0" x 84.0" Aluminum Casement Window (X) – Tested with (4) Hinges

Design Pressure	**Positive 65.0**	**Negative 65.0**

Air Infiltration (ASTM E283-04)	Pressure 1.57 PSF	SCFM/Ft^2 0.065	Result Pass
Air Infiltration (ASTM E283-04)	Pressure 6.24 PSF	SCFM/Ft^2 0.158	Result Pass

Structural Loads (ASTM E330-02)

Range	**Time (sec)**	**Load (psf)**
Half Test Positive	30	32.50
Design Positive	30	65.00
Half Test Negative	30	32.50
Design Negative	30	65.00

Water Infiltration (ASTM E331-00)	Pressure 9.75 PSF	Time 15.0 Min.	Result Pass

Note #1: Water Infiltration performed after Positive and Negative half and design loads.

Structural Loads (ASTM E330-02)

Range	**Time (sec)**	**Load (psf)**	**Location**	**Deflection**	**Set**	**Allowable (Set)**
Half Proof Positive	10	48.75				
Test Positive	30	97.50	1	0.032"	0.010"	0.150"
Half Proof Negative	10	48.75				
Test Negative	30	97.50	1	0.033"	0.004"	0.150"

Deflection Locations:

Location 1 – Center of Top Rail

Forced Entry Passed – No Entry

Conclusion: TEL observed no signs of failure in any area of this test specimen during the Uniform Static Load Test. In addition, specimen met the permanent set requirements. Therefore, this specimen satisfies the uniform static load test requirements of TAS 202-94.

James Hayhurst, Test Technicians

SEQUENCE OF TESTS PERFORMED:

STRUCTURAL TESTS (TAS 202)

Specimen 1 (e) – 42.0" x 84.0" Aluminum Casement Window (X) – Tested with (5) Hinges

Design Pressure **Positive 65.0** **Negative 85.0**

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)
Half Test Positive	30	32.50
Design Positive	30	65.00
Half Test Negative	30	42.50
Design Negative	30	85.00

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)	Location	Deflection	Set	Allowable (Set)
Half Proof Positive	10	48.75				
Test Positive	30	97.50	1	0.036"	0.011"	0.150"
Half Proof Negative	10	63.75				
Test Negative	30	127.50	1	0.095"	0.002"	0.150"

Deflection Locations:

Location 1 – Center of Top Rail

Conclusion: TEL observed no signs of failure in any area of this test specimen during the Uniform Static Load Test. In addition, specimen met the permanent set requirements. Therefore, this specimen satisfies the uniform static load test requirements of TAS 202-94.

James Hayhurst, Test Technicians

SEQUENCE OF TESTS PERFORMED:

STRUCTURAL TESTS (TAS 202)

Specimen 2 – 42.0" x 84.0" Aluminum Casement Window (X)

Design Pressure **Positive 65.0** **Negative 85.0**

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)
Half Test Positive	30	32.50
Design Positive	30	65.00
Half Test Negative	30	42.50
Design Negative	30	85.00

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)	Location	Deflection	Set	Allowable (Set)
Half Proof Positive	10	48.75				
Test Positive	30	97.50	1	0.037"	0.002"	0.150"
Half Proof Negative	10	63.75				
Test Negative	30	127.50	1	0.063"	0.009"	0.150"

Deflection Locations:

Location 1 – Center of Top Rail

Conclusion: TEL observed no signs of failure in any area of this test specimen during the Uniform Static Load Test. In addition, specimen met the permanent set requirements. Therefore, this specimen satisfies the uniform static load test requirements of TAS 202-94.

James Hayhurst, Test Technicians

SEQUENCE OF TESTS PERFORMED:

STRUCTURAL TESTS (TAS 202)

Specimen 3 – 42.0" x 65.0" Aluminum Casement Window (X)

Design Pressure **Positive 65.0** **Negative 85.0**

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)
Half Test Positive	30	32.50
Design Positive	30	65.00
Half Test Negative	30	42.50
Design Negative	30	85.00

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)	Location	Deflection	Set	Allowable (Set)
Half Proof Positive	10	48.75				
Test Positive	30	97.50	1	0.019"	0.005"	0.150"
Half Proof Negative	10	63.75				
Test Negative	30	127.50	1	0.027"	0.008"	0.150"

Deflection Locations:

Location 1 – Center of Top Rail

Conclusion: TEL observed no signs of failure in any area of this test specimen during the Uniform Static Load Test. In addition, specimen met the permanent set requirements. Therefore, this specimen satisfies the uniform static load test requirements of TAS 202-94.

James Hayhurst, Test Technicians

STRUCTURAL TESTS (TAS 202)

Specimen 4 – 125.0" x 84.0" Mulled Aluminum Casement Windows (XXX)

Design Pressure	**Positive 65.0**	**Negative 65.0**

Air Infiltration (ASTM E283-04)	Pressure 1.57 PSF	SCFM/Ft^2 0.018	Result Pass
Air Infiltration (ASTM E283-04)	Pressure 6.24 PSF	SCFM/Ft^2 0.035	Result Pass

Structural Loads (ASTM E330-02)

Range	**Time (sec)**	**Load (psf)**	**Location**	**Deflection**	**Allowable (Def)**
Half Test Positive	30	32.50			
Design Positive	30	65.00	1	0.175"	0.450"
Half Test Negative	30	32.50			
Design Negative	30	65.00	1	0.206"	0.450"

Water Infiltration (ASTM E331-00)	Pressure 9.75 PSF	Time 15.0 Min.	Result Pass

Note #1: Water Infiltration performed after Positive and Negative half and design loads.

Structural Loads (ASTM E330-02)

Range	**Time (sec)**	**Load (psf)**	**Location**	**Deflection**	**Set**	**Allowable (Set)**
Half Proof Positive	10	48.75				
Test Positive	30	97.50	1	0.343"	0.005"	0.324"
Half Proof Negative	10	48.75				
Test Negative	30	97.50	1	0.278"	0.016"	0.324"

Deflection Locations:

Location 1 – Center of Mullion

Forced Entry Passed – No Entry

Conclusion: TEL observed no signs of failure in any area of this test specimen during the Uniform Static Load Test. In addition, specimen met the permanent set requirements. Therefore, this specimen satisfies the uniform static load test requirements of TAS 202-94.

James Hayhurst, Test Technicians

SEQUENCE OF TESTS PERFORMED:

STRUCTURAL TESTS (TAS 202)

Specimen 5 – 42.0" x 84.0" Aluminum Casement Window (X)

Design Pressure **Positive 65.0** **Negative 65.0**

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)
Half Test Positive	30	32.50
Design Positive	30	65.00
Half Test Negative	30	32.50
Design Negative	30	65.00

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)	Location	Deflection	Set	Allowable (Set)
Half Proof Positive	10	48.75				
Test Positive	30	97.50	1	0.012"	0.004"	0.150"
Half Proof Negative	10	48.75				
Test Negative	30	97.50	1	0.018"	0.001"	0.150"

Deflection Locations:

Location 1 – Center of Top Rail

Conclusion: TEL observed no signs of failure in any area of this test specimen during the Uniform Static Load Test. In addition, specimen met the permanent set requirements. Therefore, this specimen satisfies the uniform static load test requirements of TAS 202-94.

James Hayhurst, Test Technicians

SEQUENCE OF TESTS PERFORMED:

STRUCTURAL TESTS (TAS 202)

Specimen 6 – 42.0" x 84.0" Aluminum Casement Window (X)

Design Pressure **Positive 65.0** **Negative 65.0**

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)
Half Test Positive	30	32.50
Design Positive	30	65.00
Half Test Negative	30	32.50
Design Negative	30	65.00

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)	Location	Deflection	Set	Allowable (Set)
Half Proof Positive	10	48.75				
Test Positive	30	97.50	1	0.032"	0.001"	0.150"
Half Proof Negative	10	48.75				
Test Negative	30	97.50	1	0.066"	0.012"	0.150"

Deflection Locations:

Location 1 – Center of Top Rail

Conclusion: TEL observed no signs of failure in any area of this test specimen during the Uniform Static Load Test. In addition, specimen met the permanent set requirements. Therefore, this specimen satisfies the uniform static load test requirements of TAS 202-94.

James Hayhurst, Test Technicians

SEQUENCE OF TESTS PERFORMED:

STRUCTURAL TESTS (TAS 202)

Specimen 7 – 42.0" x 180.0" Stacked Aluminum Awning/Fixed/Awning Window (X/O/X)

Design Pressure **Positive 65.0** **Negative 65.0**

Air Infiltration (ASTM E283-04)	Pressure 1.57 PSF	SCFM/Ft^2 0.0249	Result Pass
Air Infiltration (ASTM E283-04)	Pressure 6.24 PSF	SCFM/Ft^2 0.149	Result Pass

Structural Loads (ASTM E330-02)

Range	**Time (sec)**	**Load (psf)**	**Location**	**Deflection**	**Allowable (Def)**
Half Test Positive	30	32.50			
Design Positive	30	65.00	1	0.012"	0.233"
Half Test Negative	30	32.50			
Design Negative	30	65.00	1	0.014"	0.233"

Water Infiltration (ASTM E331-00)	Pressure 9.75 PSF	Time 15.0 Min.	Result Pass

Note #1: Water Infiltration performed after Positive and Negative half and design loads.

Structural Loads (ASTM E330-02)

Range	**Time (sec)**	**Load (psf)**	**Location**	**Deflection**	**Set**	**Allowable (Set)**
Half Proof Positive	10	48.75				
Test Positive	30	97.50	1	0.021"	0.004"	0.168"
			2	0.011"	0.006"	0.018"
Half Proof Negative	10	48.75				
Test Negative	30	97.50	1	0.034"	0.015"	0.168"
			2	0.019"	0.007"	0.018'

Deflection Locations:

Location 1 – Center of Mullion
Location 2 – Between Anchors on Fixed Unit

Forced Entry Passed – No Entry

Conclusion: TEL observed no signs of failure in any area of this test specimen during the Uniform Static Load Test. In addition, specimen met the permanent set requirements. Therefore, this specimen satisfies the uniform static load test requirements of TAS 202-94.

James Hayhurst, Test Technicians

SEQUENCE OF TESTS PERFORMED:

STRUCTURAL TESTS (TAS 202)

Specimen 8 – 42.0" x 180.0" Stacked Aluminum Fixed/Awning/Fixed Window (O/X/O)

Design Pressure **Positive 65.0** **Negative 65.0**

Air Infiltration (ASTM E283-04)	Pressure 1.57 PSF	SCFM/Ft^2 0.021	Result Pass
Air Infiltration (ASTM E283-04)	Pressure 6.24 PSF	SCFM/Ft^2 0.019	Result Pass

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)	Location	Deflection	Allowable (Def)
Half Test Positive	30	32.50			
Design Positive	30	65.00	1	0.005"	0.233"
Half Test Negative	30	32.50			
Design Negative	30	65.00	1	0.007"	0.233"

Water Infiltration (ASTM E331-00)	Pressure 9.75 PSF	Time 15.0 Min.	Result Pass

Note #1: Water Infiltration performed after Positive and Negative half and design loads.

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)	Location	Deflection	Set	Allowable (Set)
Half Proof Positive	10	48.75				
Test Positive	30	97.50	1	0.020"	0.002"	0.168"
			2	0.018"	0.006"	0.028"
Half Proof Negative	10	48.75				
Test Negative	30	97.50	1	0.044"	0.011"	0.168"
			2	0.015"	0.004"	0.028'

Deflection Locations:

Location 1 – Center of Mullion
Location 2 – Between Anchors on Fixed Unit

Forced Entry Passed – No Entry

Conclusion: TEL observed no signs of failure in any area of this test specimen during the Uniform Static Load Test. In addition, specimen met the permanent set requirements. Therefore, this specimen satisfies the uniform static load test requirements of TAS 202-94.
James Hayhurst, Test Technicians

SEQUENCE OF TESTS PERFORMED:

STRUCTURAL TESTS (TAS 202)

Specimen 12 – 42.0" x 72.0" Aluminum Casement Window (X)

Design Pressure **Positive 65.0** **Negative 65.0**

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)
Half Test Positive	30	32.50
Design Positive	30	65.00
Half Test Negative	30	32.50
Design Negative	30	65.00

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)	Location	Deflection	Set	Allowable (Set)
Half Proof Positive	10	48.75				
Test Positive	30	97.50	1	0.079"	0.049"	0.150"
Half Proof Negative	10	48.75				
Test Negative	30	97.50	1	0.112"	0.063"	0.150"

Deflection Locations:

Location 1 – Center of Top Rail

Conclusion: TEL observed no signs of failure in any area of this test specimen during the Uniform Static Load Test. In addition, specimen met the permanent set requirements. Therefore, this specimen satisfies the uniform static load test requirements of TAS 202-94.

James Hayhurst, Test Technicians

IMPACT AND CYCLING TESTS (TAS 201/203)

Specimen 1A – 42.0" x 84.0" Aluminum Casement Window – (X)

TAS 201 and 203 – Large Missile Impact (2 x 4 Southern Yellow Pine)

Cond. Temp Of Specimen	Missile Level	Missile Weight	Missile Length	Muzzle Distance From Specimen
77°F	D	9.0 lbs, 2 oz	8'-1/4"	17'1"

Impact Location	Results	X - Measurement	Y - Measurement	Speed
1	Pass	21.0"	42.0"	49.9 fps
2	Pass	31.0"	11.0"	49.7 fps
Orientation of Missile at Impact was within +/-5° of horizontal. None of the impacts penetrated the specimens. "X" measurement is from the left edge of test specimen. "Y" measurement is from the bottom edge of test specimen.				

TAS 201 and 203– Fatigue Load Cycling **Design Pressure +65.0 psf / -65.0 psf**

Positive % of Test Load	Positive Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
20% to 50%	13.0 to 32.5	3500	2.54
0% to 60%	0.0 to 39.0	300	2.49
50% to 80%	32.5 to 52.0	600	1.69
30% to 100%*	19.5 to 65.0	100	2.98

Negative % of Test Load	Negative Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
30% to 100%*	19.5 to 65.0	50	2.87
50% to 80%	32.5 to 52.0	1050	1.54
0% to 60%	0.0 to 39.0	50	2.51
20% to 50%	13.0 to 32.5	3350	2.62
*Panel deflected 2.50" from original plane at 100% Positive load and 2.38" from original plane at 100% Negative load. At the completion of cycles the door panel was operable. There were no tears in the film. In our opinion, the tape and film used to seal for air leakage did not influence the results of the test.			

Jarrett Wright and James Hayhurst, Test Technicians Mfg Observers – Joe Zammit

IMPACT AND CYCLING TESTS (TAS 201/203)

Specimen 1B – 42.0" x 84.0" Aluminum Casement Window – (X)

TAS 201 and 203 – Large Missile Impact (2 x 4 Southern Yellow Pine)

Cond. Temp Of Specimen	Missile Level	Missile Weight	Missile Length	Muzzle Distance From Specimen
77°F	D	9.0 lbs, 2 oz	8'-1/4"	17'1"

Impact Location	Results	X - Measurement	Y - Measurement	Speed
1	Pass	20.75"	42.25"	49.9 fps
2	Pass	30.75"	10.75"	49.9 fps
Orientation of Missile at Impact was within +/-5° of horizontal. None of the impacts penetrated the specimens. "X" measurement is from the left edge of test specimen. "Y" measurement is from the bottom edge of test specimen.				

TAS 201 and 203– Fatigue Load Cycling **Design Pressure +65.0 psf / -65.0 psf**

Positive % of Test Load	Positive Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
20% to 50%	13.0 to 32.5	3500	2.13
0% to 60%	0.0 to 39.0	300	2.83
50% to 80%	32.5 to 52.0	600	1.58
30% to 100%*	19.5 to 65.0	100	2.00

Negative % of Test Load	Negative Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
30% to 100%*	19.5 to 65.0	50	2.29
50% to 80%	32.5 to 52.0	1050	1.58
0% to 60%	0.0 to 39.0	50	1.79
20% to 50%	13.0 to 32.5	3350	1.73
*Panel deflected 2.38" from original plane at 100% Positive load and 2.75" from original plane at 100% Negative load. At the completion of cycles the door panel was operable. There were no tears in the film. In our opinion, the tape and film used to seal for air leakage did not influence the results of the test.			

Jarrett Wright and James Hayhurst, Test Technicians Mfg Observers – Joe Zammit

IMPACT AND CYCLING TESTS (TAS 201/203)

Specimen 1C – 42.0" x 84.0" Aluminum Casement Window – (X)

TAS 201 and 203 – Large Missile Impact (2 x 4 Southern Yellow Pine)

Cond. Temp Of Specimen	Missile Level	Missile Weight	Missile Length	Muzzle Distance From Specimen
77°F	D	9.0 lbs, 2 oz	8'-1/4"	17'1"

Impact Location	Results	X - Measurement	Y - Measurement	Speed
1	Pass	21.25"	41.75"	49.9 fps
2	Pass	10.50"	75.00"	50.0 fps
Orientation of Missile at Impact was within +/-5° of horizontal. None of the impacts penetrated the specimens. "X" measurement is from the left edge of test specimen. "Y" measurement is from the bottom edge of test specimen.				

TAS 201 and 203– Fatigue Load Cycling **Design Pressure +65.0 psf / -65.0 psf**

Positive % of Test Load	Positive Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
20% to 50%	13.0 to 32.5	3500	2.79
0% to 60%	0.0 to 39.0	300	2.62
50% to 80%	32.5 to 52.0	600	1.70
30% to 100%*	19.5 to 65.0	100	2.95

Negative % of Test Load	Negative Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
30% to 100%*	19.5 to 65.0	50	2.94
50% to 80%	32.5 to 52.0	1050	1.60
0% to 60%	0.0 to 39.0	50	2.71
20% to 50%	13.0 to 32.5	3350	1.82
*Panel deflected 2.25" from original plane at 100% Positive load and 2.00" from original plane at 100% Negative load. At the completion of cycles the door panel was operable. There were no tears in the film. In our opinion, the tape and film used to seal for air leakage did not influence the results of the test.			

Jarrett Wright and James Hayhurst, Test Technicians Mfg Observers – Joe Zammit

IMPACT AND CYCLING TESTS (TAS 201/203)

Specimen 2A – 42.0" x 84.0" Aluminum Casement Window with Nail Fin – (X)

TAS 201 and 203 – Large Missile Impact (2 x 4 Southern Yellow Pine)

Cond. Temp Of Specimen	Missile Level	Missile Weight	Missile Length	Muzzle Distance From Specimen
77°F	D	9.0 lbs, 2 oz	8'-1/4"	17'1"

Impact Location	Results	X - Measurement	Y - Measurement	Speed
1	Pass	22.00"	43.00"	50.1 fps
2	Pass	32.50"	11.25"	50.0 fps

Orientation of Missile at Impact was within +/-5° of horizontal.
None of the impacts penetrated the specimens.
"X" measurement is from the left edge of test specimen.
"Y" measurement is from the bottom edge of test specimen.

TAS 201 and 203– Fatigue Load Cycling **Design Pressure +65.0 psf / -70.0 psf**

Positive % of Test Load	Positive Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
20% to 50%	13.0 to 32.5	3500	2.31
0% to 60%	0.0 to 39.0	300	2.51
50% to 80%	32.5 to 52.0	600	1.98
30% to 100%*	19.5 to 65.0	100	2.88

Negative % of Test Load	Negative Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
30% to 100%*	21.0 to 70.0	50	2.91
50% to 80%	35.0 to 55.0	1050	2.03
0% to 60%	0.0 to 42.0	50	2.32
20% to 50%	14.0 to 35.0	3350	1.82

*Panel deflected 1.75" from original plane at 100% Positive load and 1.88" from original plane at 100% Negative load. At the completion of cycles the door panel was operable. There were no tears in the film. In our opinion, the tape and film used to seal for air leakage did not influence the results of the test.

Jarrett Wright and James Hayhurst, Test Technicians Mfg Observers – Joe Zammit

IMPACT AND CYCLING TESTS (TAS 201/203)

Specimen 3A – 42.0" x 65.0" Aluminum Casement Window – (X)

TAS 201 and 203 – Large Missile Impact (2 x 4 Southern Yellow Pine)

Cond. Temp Of Specimen	Missile Level	Missile Weight	Missile Length	Muzzle Distance From Specimen
76°F	D	9.0 lbs, 3 oz	8'-0"	17'0"

Impact Location	Results	X - Measurement	Y - Measurement	Speed
1	Pass	21.00"	33.00"	49.8 fps
2	Pass	11.00"	11.00"	49.9 fps
Orientation of Missile at Impact was within +/-5° of horizontal. None of the impacts penetrated the specimens. "X" measurement is from the left edge of test specimen. "Y" measurement is from the bottom edge of test specimen.				

TAS 201 and 203– Fatigue Load Cycling **Design Pressure +65.0 psf / -65.0 psf**

Positive % of Test Load	Positive Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
20% to 50%	13.0 to 32.5	3500	1.50
0% to 60%	0.0 to 39.0	300	2.25
50% to 80%	32.5 to 52.0	600	1.25
30% to 100%*	19.5 to 65.0	100	2.07

Negative % of Test Load	Negative Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
30% to 100%*	19.5 to 65.0	50	2.27
50% to 80%	32.5 to 52.0	1050	1.63
0% to 60%	0.0 to 39.0	50	1.70
20% to 50%	13.0 to 32.5	3350	1.36
*Panel deflected 1.75" from original plane at 100% Positive load and 2.00" from original plane at 100% Negative load. At the completion of cycles the door panel was operable. There were no tears in the film. In our opinion, the tape and film used to seal for air leakage did not influence the results of the test.			

Jarrett Wright and James Hayhurst, Test Technicians Mfg Observers – Joe Zammit

IMPACT AND CYCLING TESTS (TAS 201/203)

Specimen 5A – 42.0" x 84.0" Aluminum Casement Window with Nail Fin – (X)

TAS 201 and 203 – Large Missile Impact (2 x 4 Southern Yellow Pine)

Cond. Temp Of Specimen	Missile Level	Missile Weight	Missile Length	Muzzle Distance From Specimen
76°F	D	9.0 lbs, 2 oz	8'-1/4"	17'1"

Impact Location	Results	X - Measurement	Y - Measurement	Speed
1	Pass	21.00"	42.00"	49.7 fps
2	Pass	11.00"	75.00"	50.0 fps

Orientation of Missile at Impact was within +/-5° of horizontal.
None of the impacts penetrated the specimens.
"X" measurement is from the left edge of test specimen.
"Y" measurement is from the bottom edge of test specimen.

TAS 201 and 203– Fatigue Load Cycling **Design Pressure +65.0 psf / -65.0 psf**

Positive % of Test Load	Positive Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
20% to 50%	13.0 to 32.5	3500	2.08
0% to 60%	0.0 to 39.0	300	1.83
50% to 80%	32.5 to 52.0	600	1.72
30% to 100%*	19.5 to 65.0	100	2.31

Negative % of Test Load	Negative Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
30% to 100%*	19.5 to 65.0	50	2.89
50% to 80%	32.5 to 52.0	1050	2.27
0% to 60%	0.0 to 39.0	50	2.68
20% to 50%	13.0 to 32.5	3350	2.00

*Panel deflected 1.50" from original plane at 100% Positive load and 1.50" from original plane at 100% Negative load. At the completion of cycles the door panel was operable. There were no tears in the film. In our opinion, the tape and film used to seal for air leakage did not influence the results of the test.

Jarrett Wright and James Hayhurst, Test Technicians Mfg Observers – Joe Zammit

IMPACT AND CYCLING TESTS (TAS 201/203)

Specimen 6A – 42.0" x 84.0" Aluminum Casement Window –Direct Mount – (X)

TAS 201 and 203 – Large Missile Impact (2 x 4 Southern Yellow Pine)

Cond. Temp Of Specimen	Missile Level	Missile Weight	Missile Length	Muzzle Distance From Specimen
76°F	D	9.0 lbs, 2 oz	8'-1/4"	17'1"

Impact Location	Results	X - Measurement	Y - Measurement	Speed
1	Pass	20.75"	42.00"	49.9 fps
2	Pass	11.25"	74.75"	50.0 fps
Orientation of Missile at Impact was within +/-5° of horizontal. None of the impacts penetrated the specimens. "X" measurement is from the left edge of test specimen. "Y" measurement is from the bottom edge of test specimen.				

TAS 201 and 203– Fatigue Load Cycling **Design Pressure +65.0 psf / -65.0 psf**

Positive % of Test Load	Positive Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
20% to 50%	13.0 to 32.5	3500	2.41
0% to 60%	0.0 to 39.0	300	2.79
50% to 80%	32.5 to 52.0	600	2.05
30% to 100%*	19.5 to 65.0	100	2.26

Negative % of Test Load	Negative Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
30% to 100%*	19.5 to 65.0	50	2.95
50% to 80%	32.5 to 52.0	1050	1.55
0% to 60%	0.0 to 39.0	50	2.09
20% to 50%	13.0 to 32.5	3350	1.68
*Panel deflected 2.50" from original plane at 100% Positive load and 2.88" from original plane at 100% Negative load. At the completion of cycles the door panel was operable. There were no tears in the film. In our opinion, the tape and film used to seal for air leakage did not influence the results of the test.			

Jarrett Wright and James Hayhurst, Test Technicians Mfg Observers – Joe Zammit

IMPACT AND CYCLING TESTS (TAS 201/203)

Specimen 8A – 42.0" x 180.0" Aluminum Stacked Fixed/Awning/Fixed Window – (O/X/O)

TAS 201 and 203 – Large Missile Impact (2 x 4 Southern Yellow Pine)

Cond. Temp Of Specimen	Missile Level	Missile Weight	Missile Length	Muzzle Distance From Specimen
76°F	D	9.0 lbs, 3 oz	8'-0"	17'0"

Impact Location	Results	X - Measurement	Y - Measurement	Speed
1	Pass	32.00"	11.00"	49.9 fps
2	Pass	21.00"	43.00"	49.7 fps
3	Pass	21.00"	84.00"	49.9 fps
4	Pass	32.00"	94.00"	50.0 fps
5	Pass	21.00"	126.00"	49.8 fps
Orientation of Missile at Impact was within +/-5° of horizontal. None of the impacts penetrated the specimens. "X" measurement is from the left edge of test specimen. "Y" measurement is from the bottom edge of test specimen.				

TAS 201 and 203– Fatigue Load Cycling **Design Pressure +65.0 psf / -65.0 psf**

Positive % of Test Load	Positive Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
20% to 50%	13.0 to 32.5	3500	2.93
0% to 60%	0.0 to 39.0	300	2.81
50% to 80%	32.5 to 52.0	600	1.75
30% to 100%*	19.5 to 65.0	100	2.65

Negative % of Test Load	Negative Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
30% to 100%*	19.5 to 65.0	50	2.81
50% to 80%	32.5 to 52.0	1050	1.65
0% to 60%	0.0 to 39.0	50	2.10
20% to 50%	13.0 to 32.5	3350	2.28
*Panel deflected 2.25" from original plane at 100% Positive load and 2.75" from original plane at 100% Negative load. At the completion of cycles the door panel was operable. There were no tears in the film. In our opinion, the tape and film used to seal for air leakage did not influence the results of the test.			

Jarrett Wright and James Hayhurst, Test Technicians Mfg Observers – Joe Zammit

IMPACT AND CYCLING TESTS (TAS 201/203)

Specimen 12A – 42.0" x 72.0" Aluminum Casement Window – (X)

TAS 201 and 203 – Large Missile Impact (2 x 4 Southern Yellow Pine)

Cond. Temp Of Specimen	Missile Level	Missile Weight	Missile Length	Muzzle Distance From Specimen
76°F	D	9.0 lbs, 2 oz	8'-1/4"	17'1"

Impact Location	Results	X - Measurement	Y - Measurement	Speed
1	Pass	21.00"	36.00"	49.8 fps
2	Pass	9.00"	9.50"	50.1 fps

Orientation of Missile at Impact was within +/-5° of horizontal.
None of the impacts penetrated the specimens.
"X" measurement is from the left edge of test specimen.
"Y" measurement is from the bottom edge of test specimen.

TAS 201 and 203– Fatigue Load Cycling **Design Pressure +65.0 psf / -65.0 psf**

Positive % of Test Load	Positive Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
20% to 50%	13.0 to 32.5	3500	2.12
0% to 60%	0.0 to 39.0	300	1.71
50% to 80%	32.5 to 52.0	600	1.65
30% to 100%*	19.5 to 65.0	100	2.26

Negative % of Test Load	Negative Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
30% to 100%*	19.5 to 65.0	50	2.17
50% to 80%	32.5 to 52.0	1050	1.37
0% to 60%	0.0 to 39.0	50	1.93
20% to 50%	13.0 to 32.5	3350	2.69

*Panel deflected 1.75" from original plane at 100% Positive load and 1.75" from original plane at 100% Negative load. At the completion of cycles the door panel was operable. There were no tears in the film. In our opinion, the tape and film used to seal for air leakage did not influence the results of the test.

Jarrett Wright and James Hayhurst, Test Technicians Mfg Observers – Joe Zammit

Conditions, Terms, and General Notes Regarding These Tests

The product tested **Has Been** compared to the detailed drawing, bill of materials and fabrication information supplied by the client so named herein. Our analysis, which includes dimensional and component description comparisons, indicate the tested product and engineering information supplied by the client **"Are Equivalent".** The report and representative samples will be retained for four years from the date of initial test.

These test results were obtained by employing all requirements of the designated test methods with no Deviations unless explicitly noted in test report. The test results and specimen supplied for testing are in compliance with the reference.

The test results are specific to the product tested by this laboratory and of the sample supplied by the client named herein, and they relate to no other product either manufactured by the client, a fabricator of the client or of the client or of installed field performance.

This test report does not constitute certification of this product, but only that the above test results were obtained using the designated test methods and they indicate compliance with the performance requirements (paragraphs as listed) of the above referenced specifications.

Testing Evaluation Laboratories, Inc. makes no opinions or endorsements regarding this product and its performance. This report may not be reproduced or quoted in partial form without the expressed written approval of Testing Evaluation Laboratories, Inc.

Testing Evaluation Laboratories, Inc.'s letter, reports, its name or insignia or mark are for the exclusive use of the client so named herein and any other use is strictly prohibited. The report, letters and the name of Testing Evaluation Laboratories, Inc., its seal or mark shall not be used in any circumstance to the general public or in any advertising.

Limitation of liability: Due diligence was used in performing the tests and reporting the results. By acceptance of this report, this client agrees to hold harmless and indemnify Testing Evaluation Laboratories, Inc., its employees, sub-contractors, officers and owners against all claims and demands of any kind whatsoever, which arise out of or in any manner connected with the performance of work referred to herein.

Testing Evaluation Laboratories, Inc.

Vivian K. Wright,
President

William Shelton 4/16/2014

William B. Shelton, P.E.
Florida P.E. # 26686

Revision Log

Rev No.	Date	Page(s)	Revision(s)
0	10/21/2013	NA	Original Report Issue

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7031.dwg, L-7031

TABLE OF CONTENTS

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by

RW BUILDING CONSULTANTS, INC.
813.659.9197

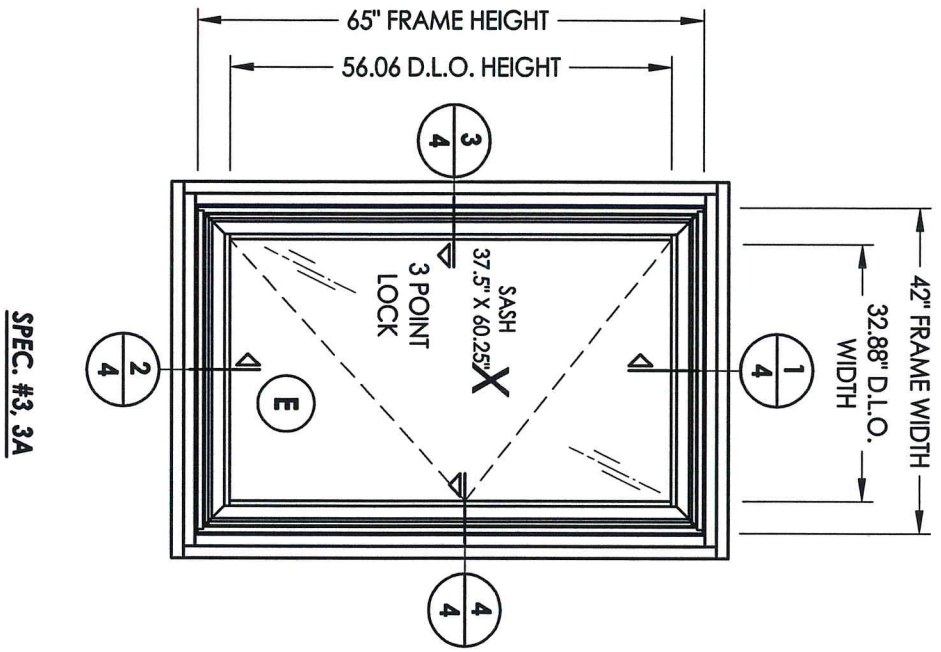
NO.	DATE		BY

REVISIONS

PRODUCT:
FLEETWOOD
KONA 3800
CASEMENT WINDOW

PART OR ASSEMBLY:
TABLE OF CONTENTS

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7031
SHEET 1 OF 13



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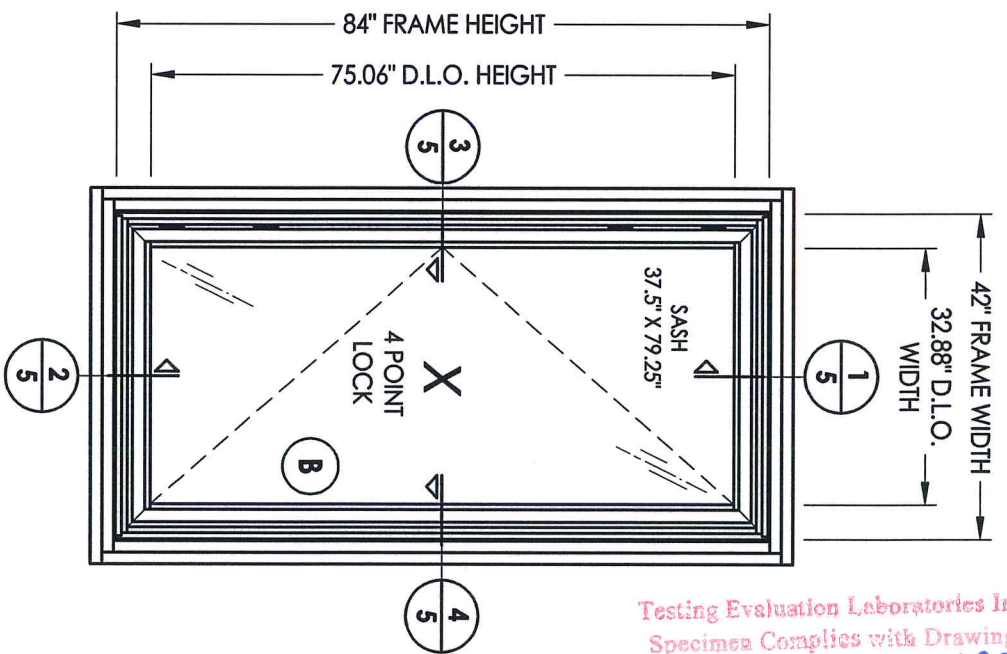

SPEC. #1, 1A, 1B, 1C

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Deviations Noted - TEL # 01990816
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813.659.9197

DATE: 9/25/13
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DRAWING NO.: L-7031
SHEET 2 OF 13

PRODUCT:
FLEETWOOD
KONA 3800
CASEMENT WINDOW

PART OR ASSEMBLY:
TEST ELEVATION

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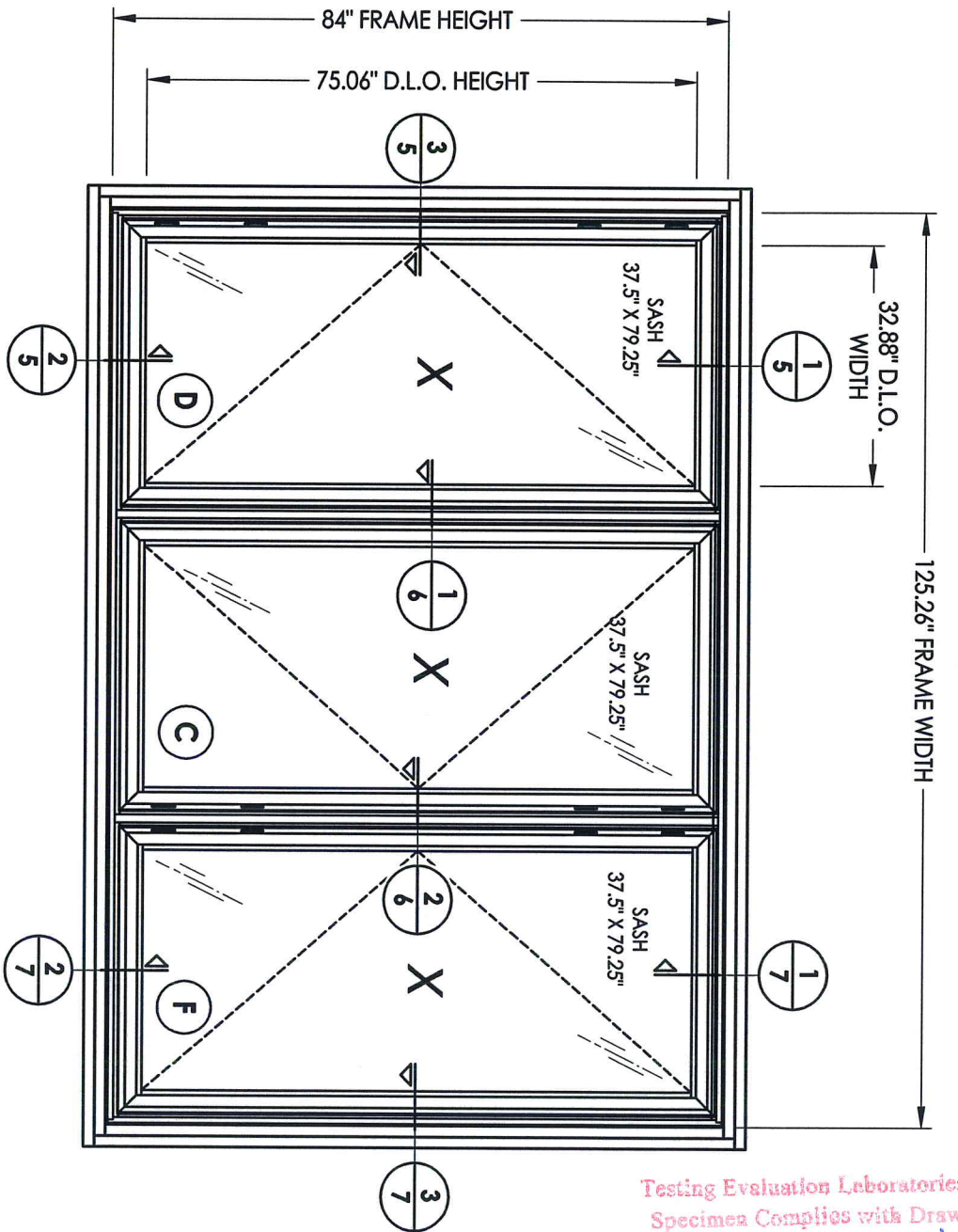

SPEC. #4, 4A

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by WLW

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FLEETWOOD
KONA 3800
CASEMENT WINDOW

PART OR ASSEMBLY:
TEST ELEVATION

DATE: 9/25/13
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DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7031
SHEET 3 OF 13

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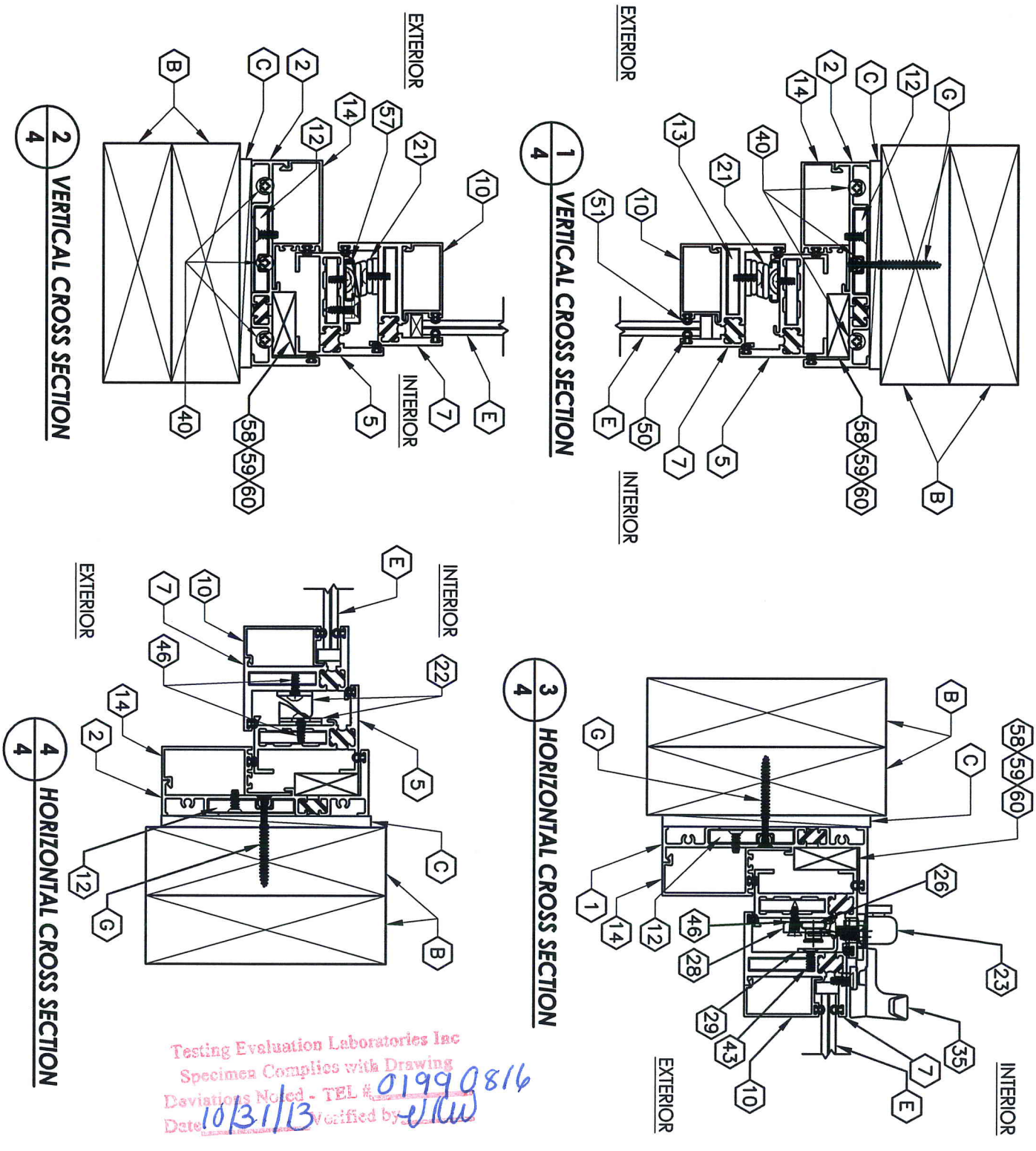

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Specimen Complies with Drawing
Deviations Noted - TEL # 0199 0816
Date 10/31/13 Verified by VTW

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PRODUCT:
FLEETWOOD
KONA 3800
CASEMENT WINDOW

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CROSS SECTIONS

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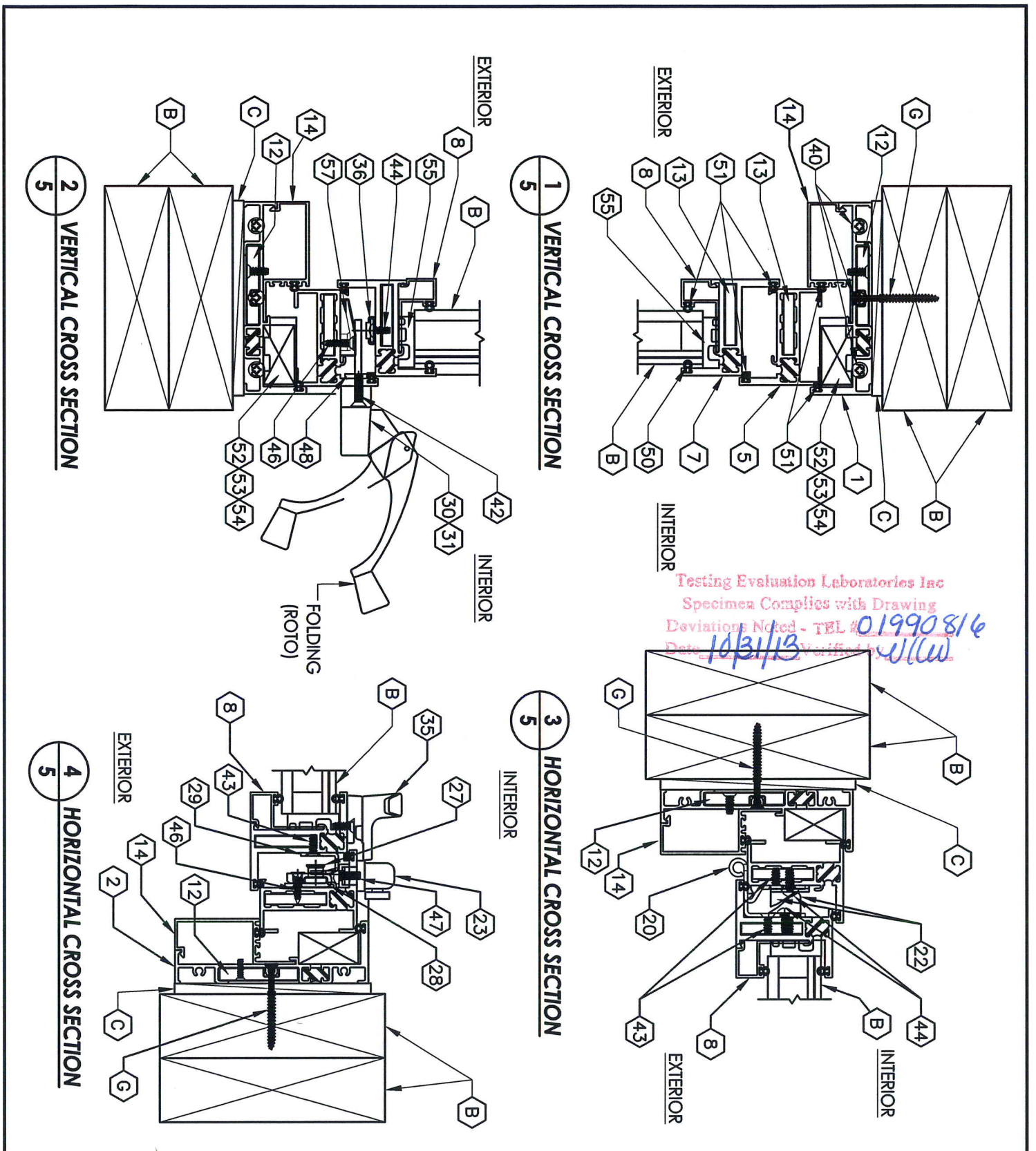
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7031
SHEET 4 OF 13

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7031.dwg, 5



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Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by WLW

NO.	DATE		BY

REVISIONS

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KONA 3800
CASEMENT WINDOW

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DRAWING NO.: L-7031
SHEET 5 OF 13

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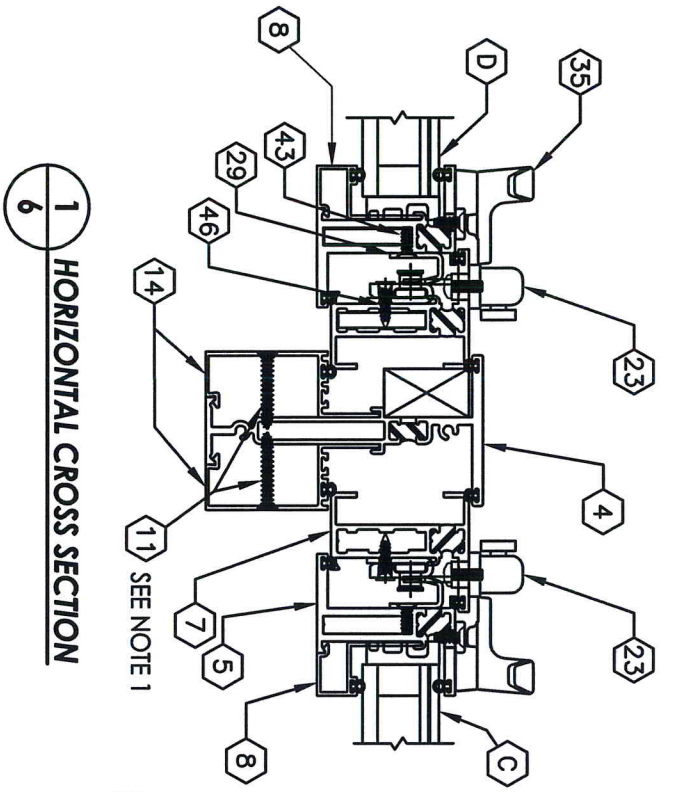
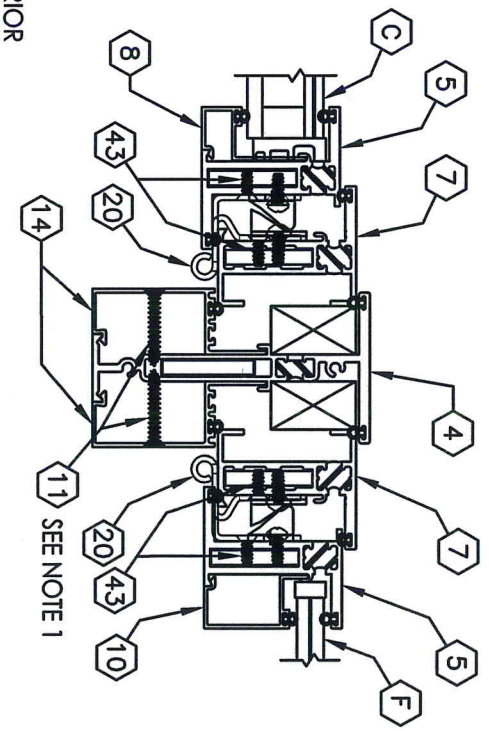


1/6 HORIZONTAL CROSS SECTION



2/6 HORIZONTAL CROSS SECTION

NOTE:
1. Item #11 located 4" from each end then 12" on center for (8) total.

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Specimen Complies with Drawing
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Date 10/31/13 Verified by

NO.	DATE		BY

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KONA 3800
CASEMENT WINDOW

PART OR ASSEMBLY:
HORIZONTAL
CROSS SECTIONS

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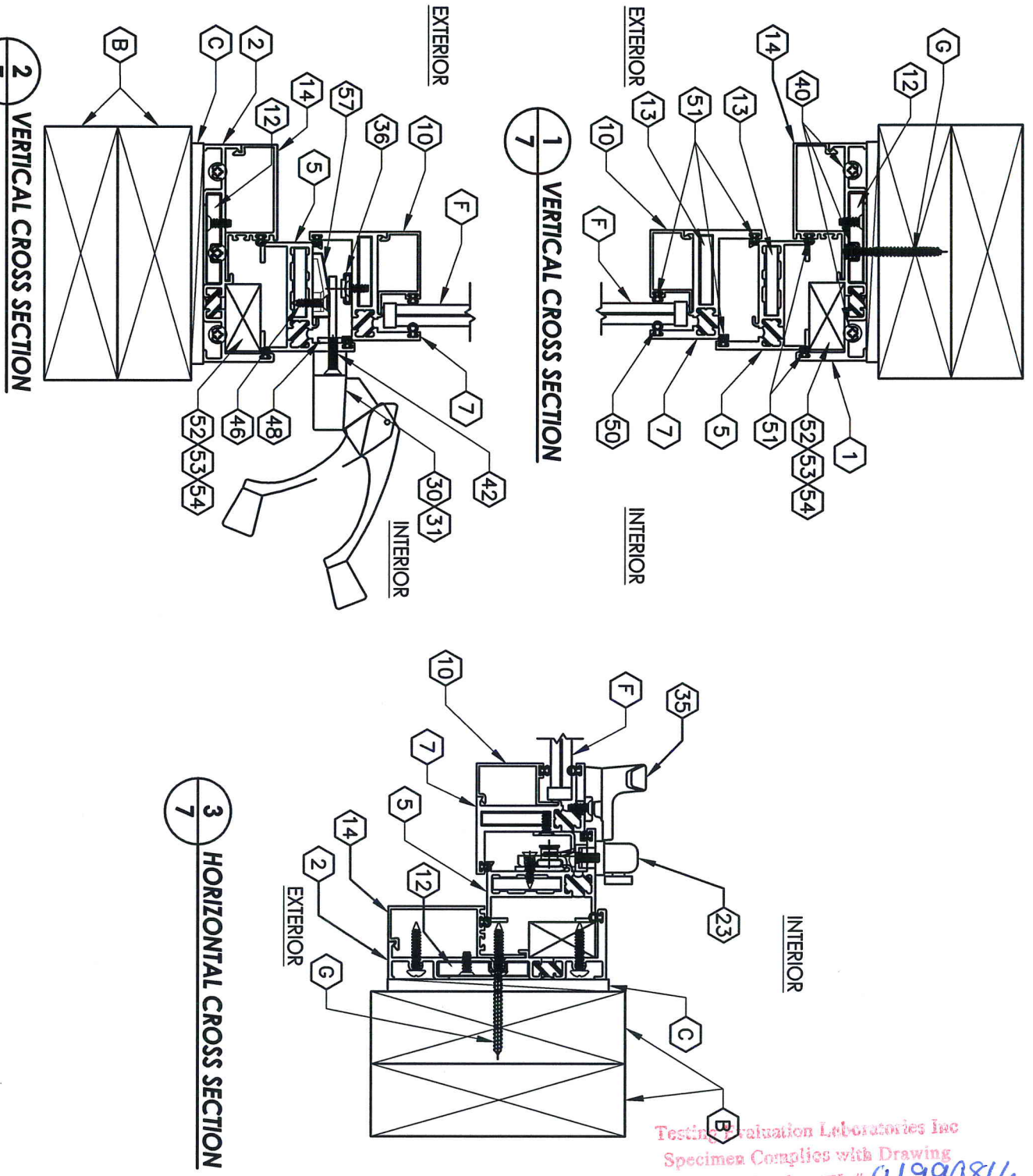
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7031
SHEET 6 OF 13



Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990814
Date 10/31/13 Verified by VRW

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PRODUCT:
FLEETWOOD
KONA 3800
CASEMENT WINDOW

PART OR ASSEMBLY:
HORIZONTAL AND VERTICAL
CROSS SECTIONS

RW BUILDING CONSULTANTS, INC.
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CHK. BY: LFS
DRAWING NO.: L-7031
SHEET 7 OF 13

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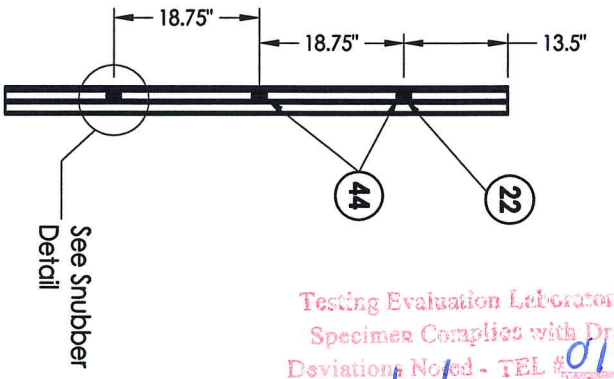
SNUBBERS JAMB



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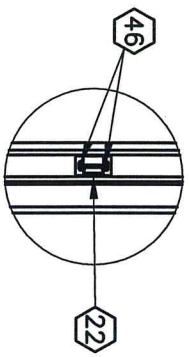
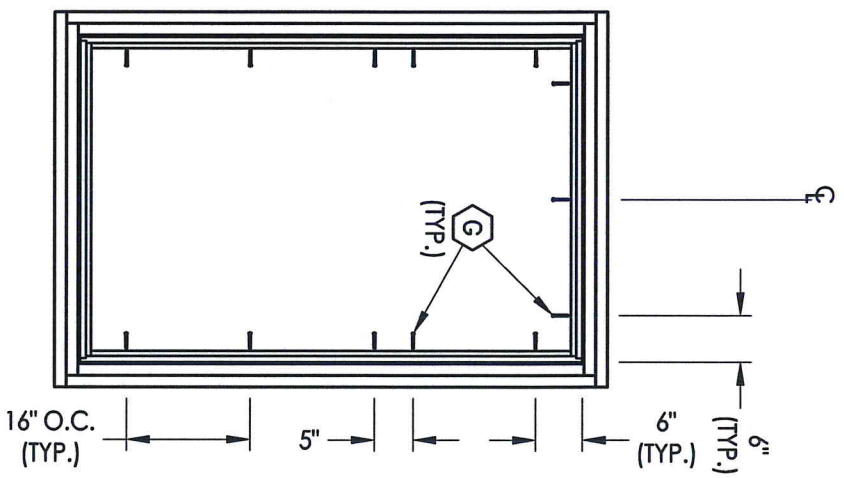


Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL #01990814
Date 10/31/13 Verified by

FRAME ANCHORING
2X buck construction



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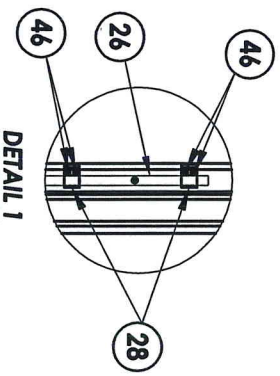

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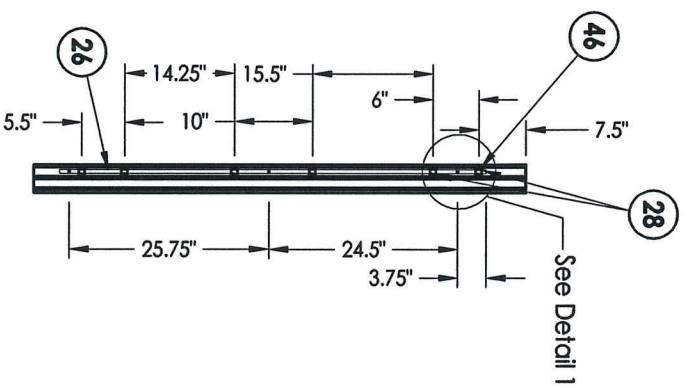

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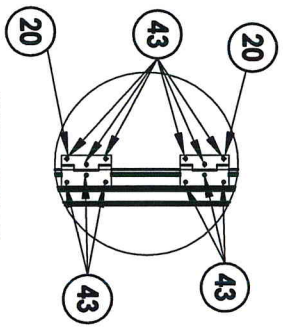
DRAWING NO.: L-7031
SHEET 8 OF 13

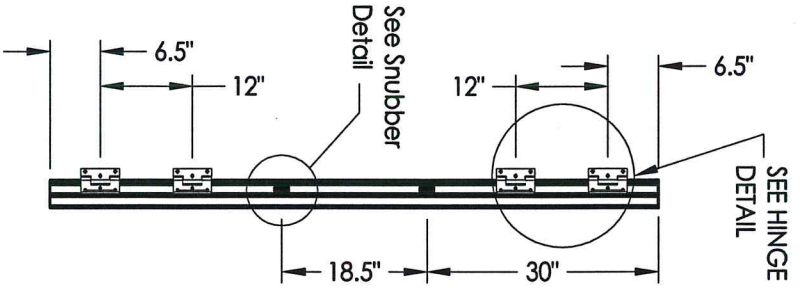
PRODUCT:
FLEETWOOD
KONA 3800
CASEMENT WINDOW

PART OR ASSEMBLY:
FRAME ANCHORING



HINGE DETAIL

HINGE JAMB



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Specimen Complies with Drawing
Deviations Noted - TEL # 01990814
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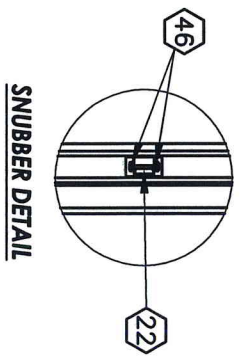
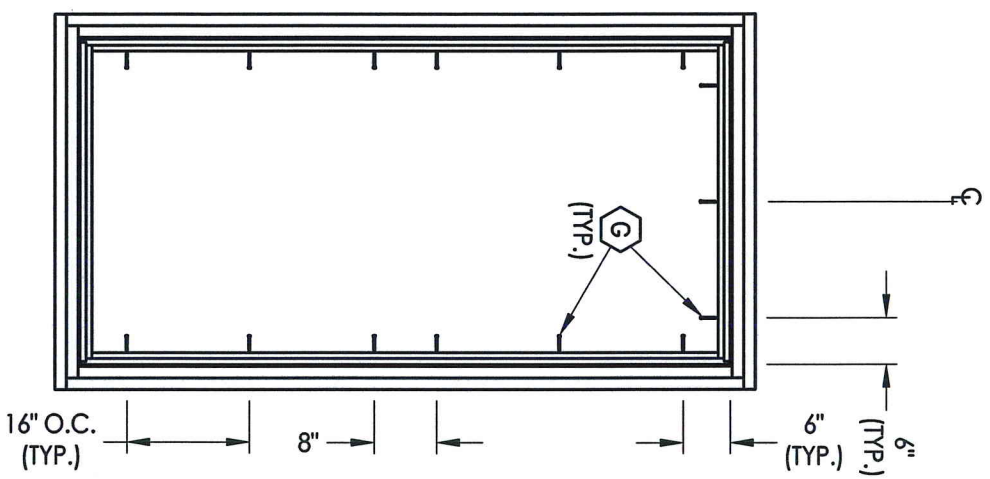
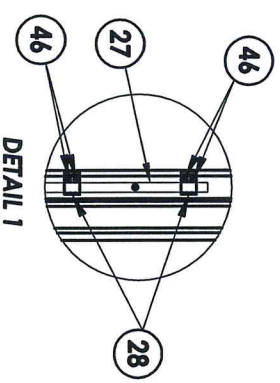


SNUBBER DETAIL

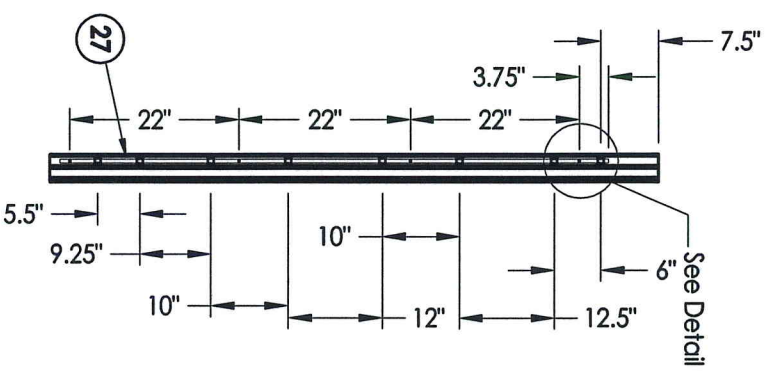
FRAME ANCHORING
2X buck construction





DETAIL 1

LOCK JAMB
Locking Points (4)



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PRODUCT:
FLEETWOOD
KONA 3800
CASEMENT WINDOW

PART OR ASSEMBLY:
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DRAWING NO.: L-7031
SHEET 9 OF 13

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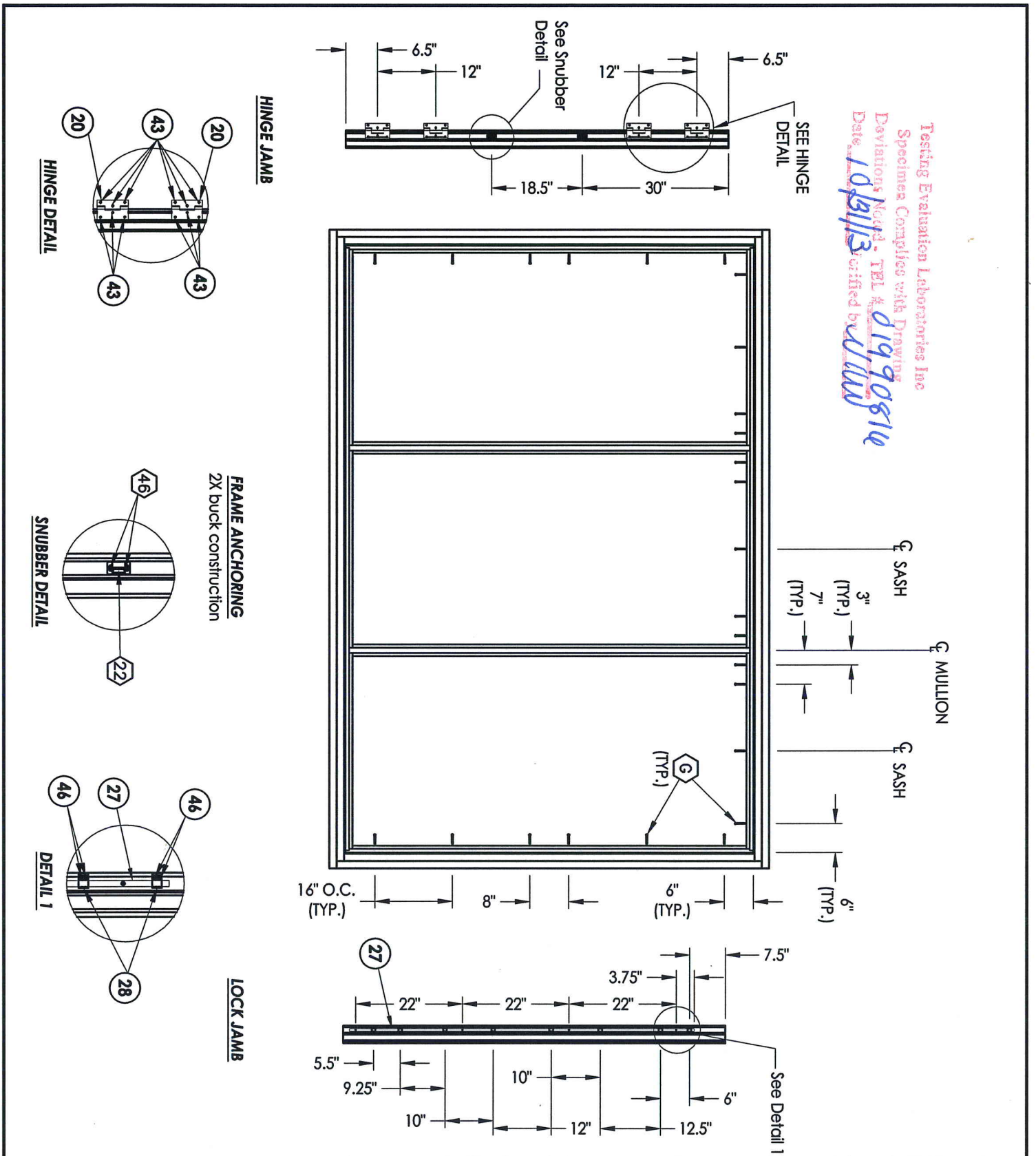
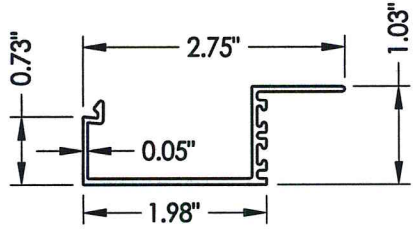


RW BUILDING CONSULTANTS, INC. 813.659.9197	NO.	DATE	BY
	REVISIONS		

PRODUCT:
FLEETWOOD
KONA 3800
CASEMENT WINDOW

PART OR ASSEMBLY:
FRAME ANCHORING

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7031
SHEET 10 OF 13



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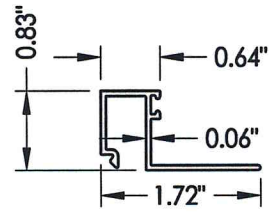

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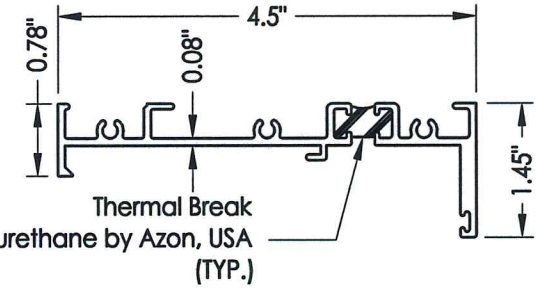

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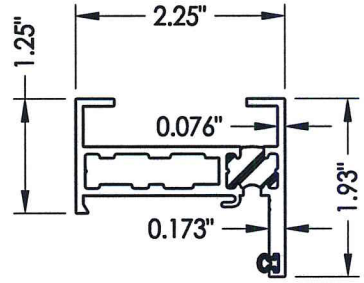

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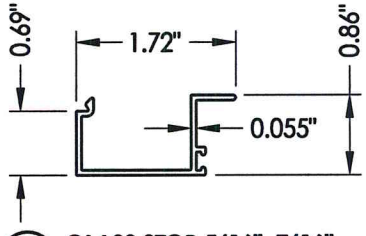
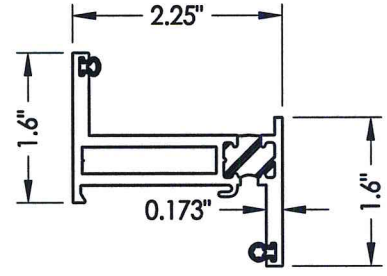
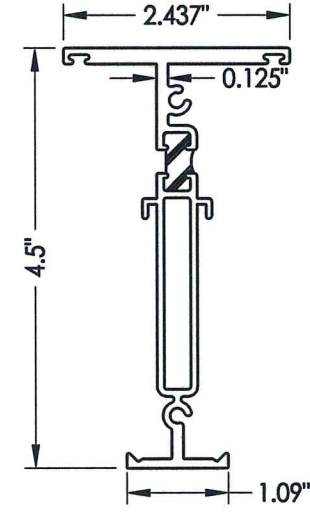


10 GLASS STOP 5/16", 7/16"
007930



7 ZEE BAR (PANEL)
H006733



4 MULLION
H011241

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by DLW

PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW

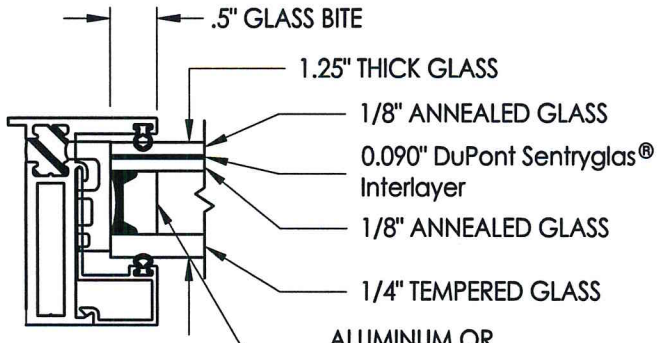
PART OR ASSEMBLY: COMPONENTS

NO.	DATE	BY
REVISIONS		

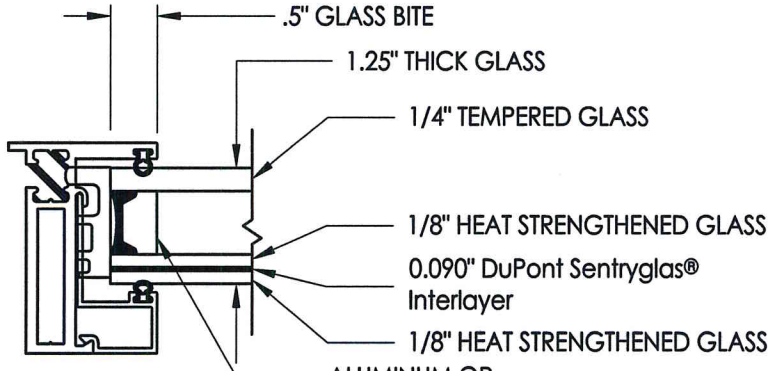
RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7031
SHEET 11 OF 13

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7031.dwg



B **GLAZING DETAIL**



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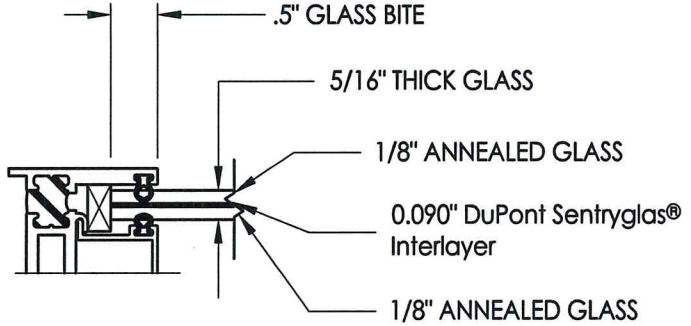

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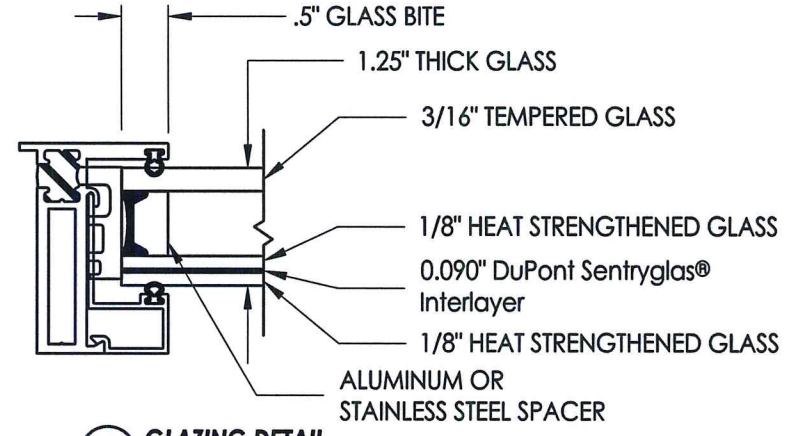

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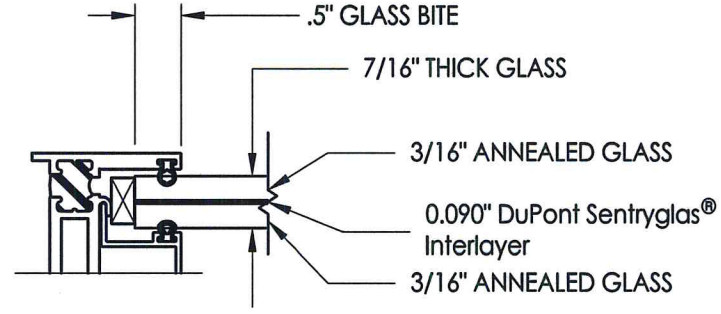

F **GLAZING DETAIL**

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 0199 0816
Date 10/31/13 Verified by VLW

PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY: GLAZING DETAILS

NO.	DATE	BY
REVISIONS		

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7031
SHEET 12 OF 13

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7031.dwg, 12

BILL OF MATERIALS

ITEM #	DESCRIPTION	MATERIAL
B	2X BUCK SG >= 0.55	WOOD
C	1/4" MAX. SHIM SPACE	-
G	#10 x 2" PPH WOOD SCREW	STEEL
2	KONA BLOCK FRAME	6063-T6 ALUM
4	MULLION	6063-T6 ALUM
5	WESTWOOD BLOCK FRAME	6063-T6 ALUM
7	WESTWOOD ZEE BAR (PANEL)	6063-T6 ALUM
8	GLASS STOP (1-1/4")	6063-T6 ALUM
9	GLASS STOP (1/4")	6063-T6 ALUM
10	GLASS STOP (5/16", 7/16")	6063-T6 ALUM
11	#8 x 1-1/2" PFH SMS	STEEL
12	SHEAR BLOCK	ALUM
13	CORNER KEY	ALUM
14	INSERT STOP	6063-T6 ALUM
20	SS. BUTT HINGE	SS
21	4 BAR HINGE	SS
22	SNUBBER-COMMERCIAL PULL-IN BLOCK	SS
23	MULTIPOINT LOCK HANDLE	SS
26	3 POINTS LOCKING BAR	SS
27	4 POINTS LOCKING BAR	SS
28	TIE BAR GUIDE	-
29	KEEPER	SS
30	CASEMENT ROTOR GEAR 13.5"	SS
35	CAM HANDLE / STRIKE PLATE	SS
36	CASEMENT SS. TRACK	SS
40	#10 X 1" PPH SMS	STEEL
42	MACHINE SCREW NO 10-32, FHP .75"	STEEL
43	SCREW NO 10 , UFHP .5"	STEEL
44	SCREW NO 8, PHP, .50"	STEEL
46	SCREW NO 8, FHP, .750"	STEEL
47	MACHINE SCREW NO 10-32, PHP .5"	STEEL
48	BACK UP NUTS	STEEL
50	BULB VINYL (EPDM 70 DUROMETER)-TREMCO	-
51	MINI BULB VINYL(EPDM 70 DUROMETER)-TREMCO	-
52	WOOD BLOCK .750" X 1.250"	-
53	ALUMINUM BLOCK .750" X 1.250"	-
54	PVC BLOCK .750" X 1.250"	-
55	SETTING BLOCK	-
56	SETTING BLOCK 4" x $\frac{1}{4}$" x 1"	-
57	PIVOT SHIM	-
58	WOOD BLOCK .50" X 1.250"	-
59	ALUMINUM BLOCK .50" X 1.250"	-
60	PVC BLOCK .50" X 1.250"	-
61	SETTING BLOCK 4" x 1/8" x 1"	-

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviation Noted - TEL # 0199 0814
Date 10/31/13 Verified by JMW

PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY: BILL OF MATERIALS

NO.	DATE	BY

REVISIONS

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7031
SHEET 13 OF 13

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7031.dwg, 13

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7032.dwg, L-7032

TABLE OF CONTENTS

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by JLW

NO.	DATE		BY

REVISIONS

PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:
TABLE OF CONTENTS

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032
SHEET 1 OF 12

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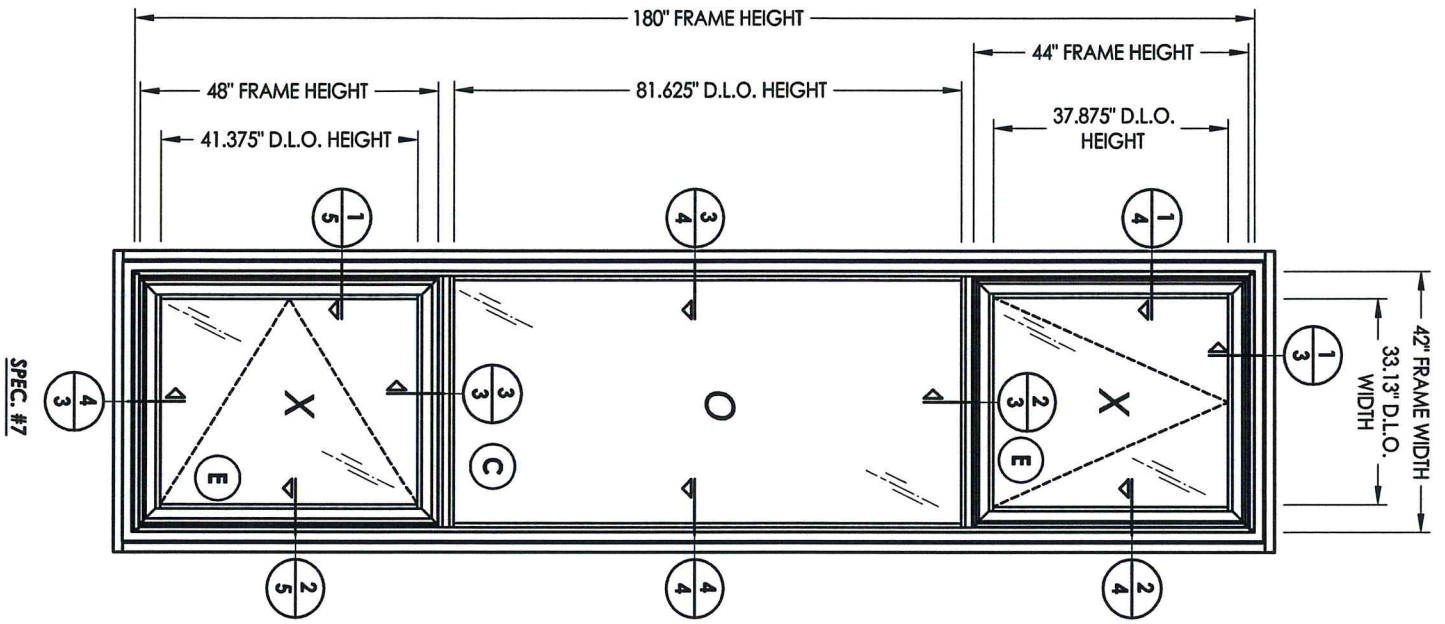

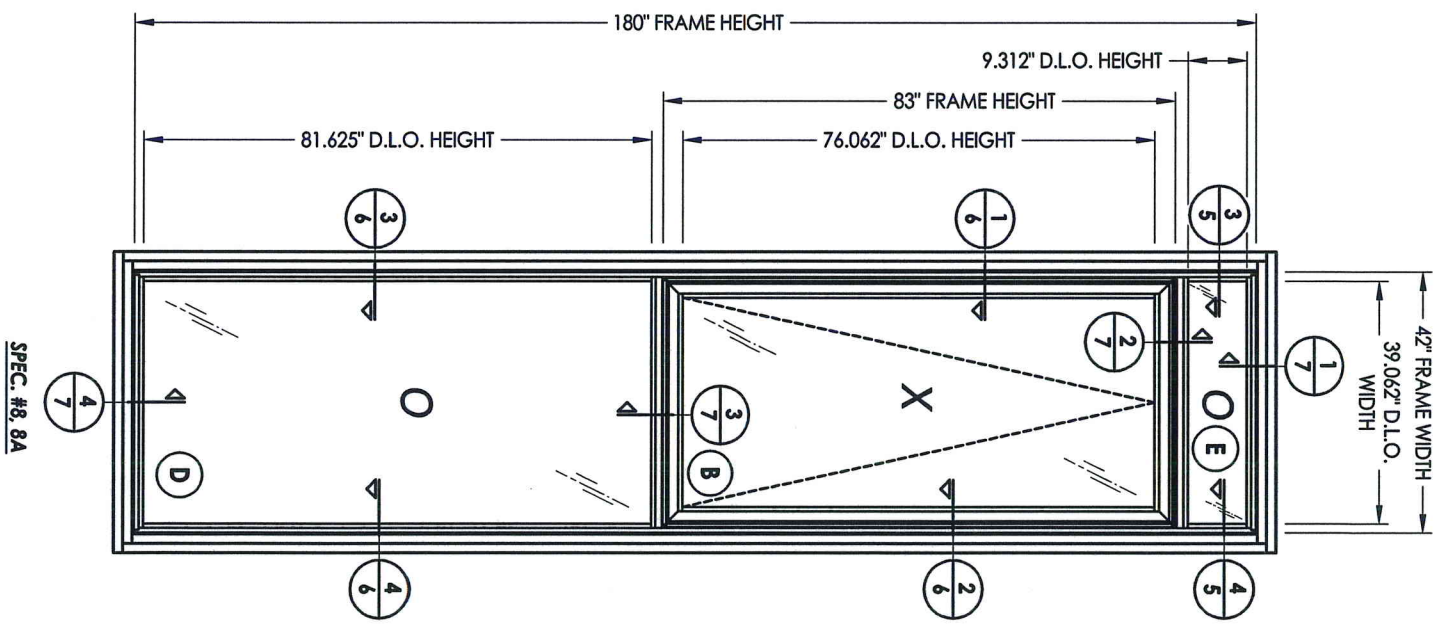

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by VLW

SHEET 2 OF 12	DRAWING NO.: L-7032	CHK. BY: LFS	DWG. BY: JK
SCALE: N.T.S.	DATE: 9/25/13	RW BUILDING CONSULTANTS, INC. 813.659.9197	

NO.	DATE		BY
REVISIONS			

PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:
TEST ELEVATION

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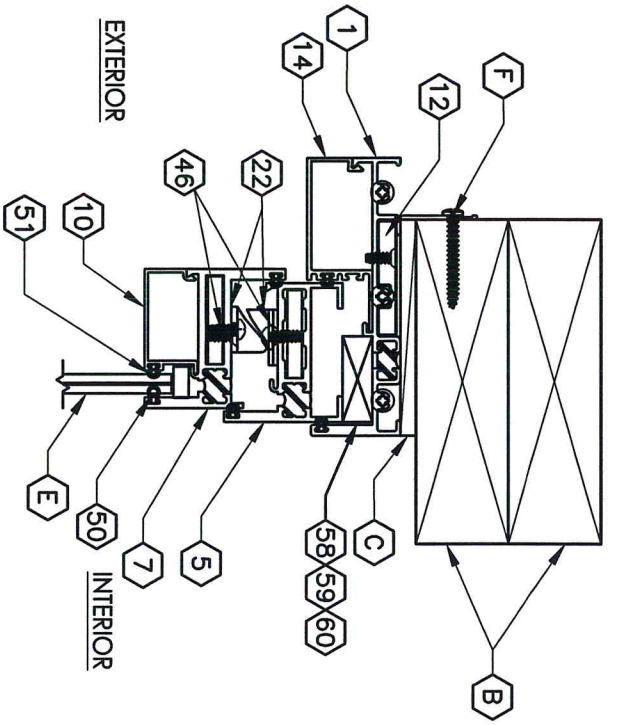
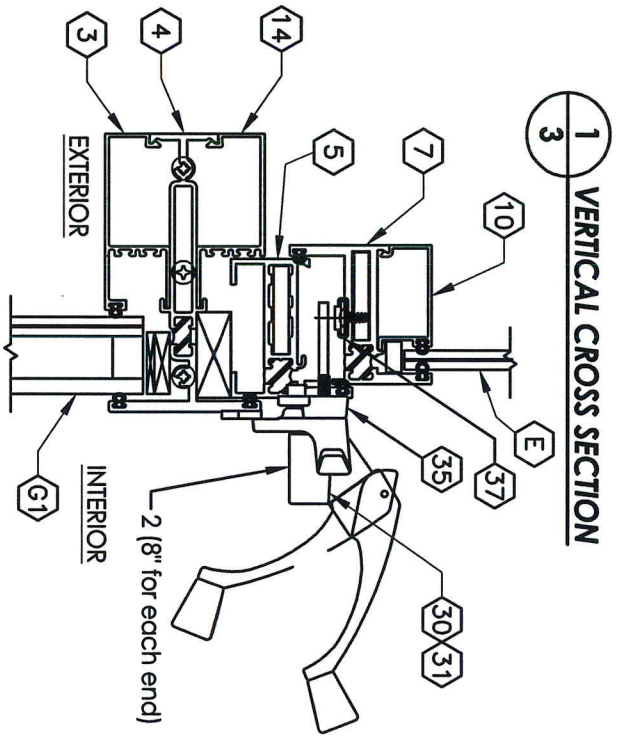


1/3 VERTICAL CROSS SECTION



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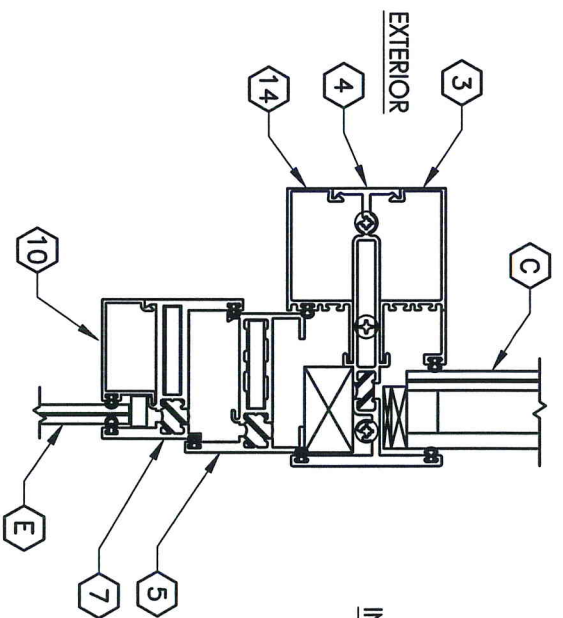

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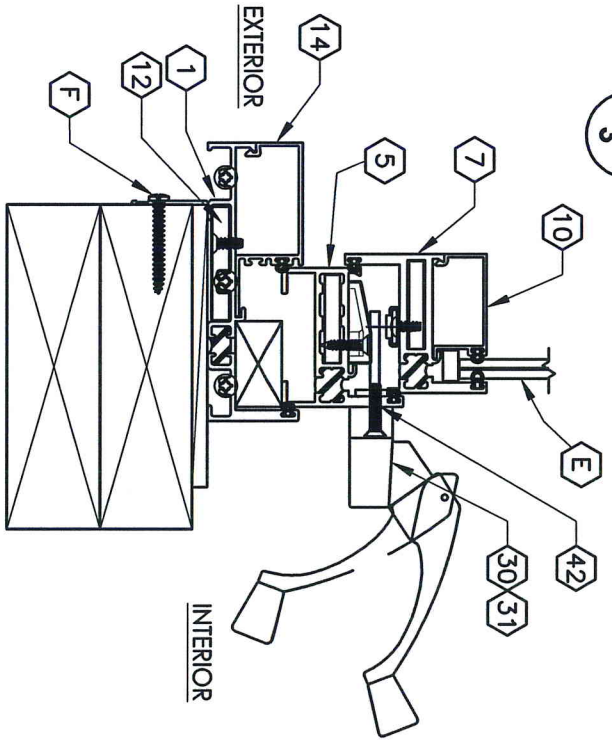


4/3 VERTICAL CROSS SECTION

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by

NO.	DATE		BY

REVISIONS

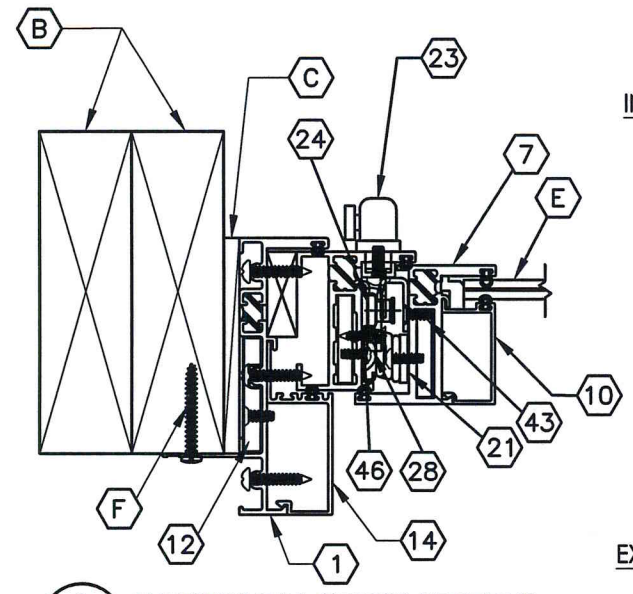
PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:
VERTICAL
CROSS SECTIONS

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032
SHEET 3 OF 12

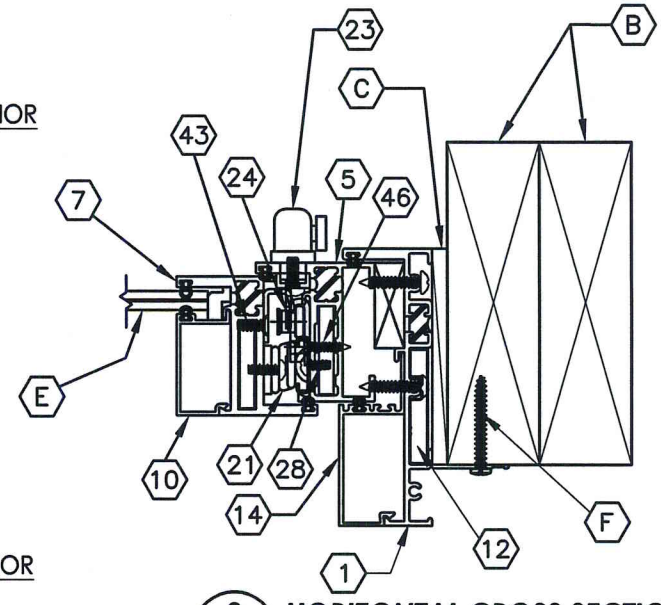
Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by JMW



1/4 HORIZONTAL CROSS SECTION

INTERIOR

EXTERIOR



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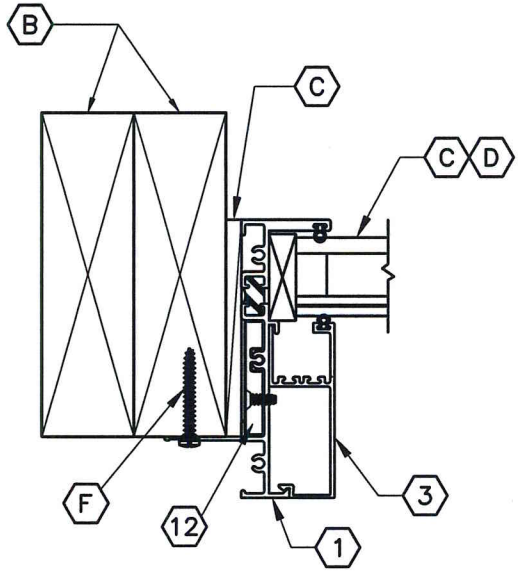

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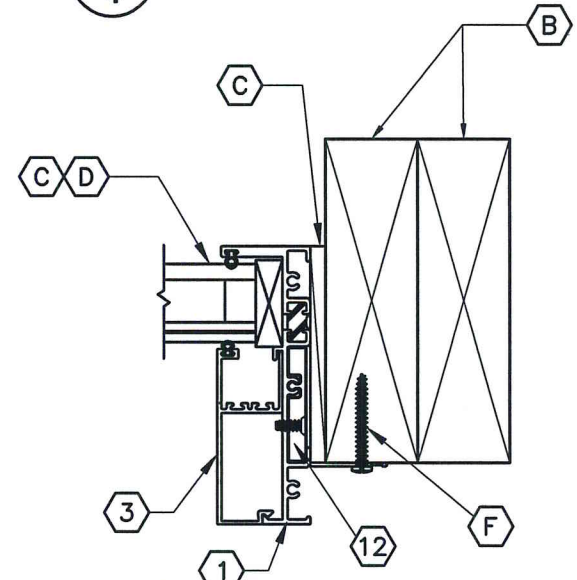
INTERIOR

EXTERIOR



4/4 HORIZONTAL CROSS SECTION

PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY: HORIZONTAL CROSS SECTIONS

NO.	DATE	BY

REVISIONS

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032
SHEET 4 OF 12

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7032.dwg, 4

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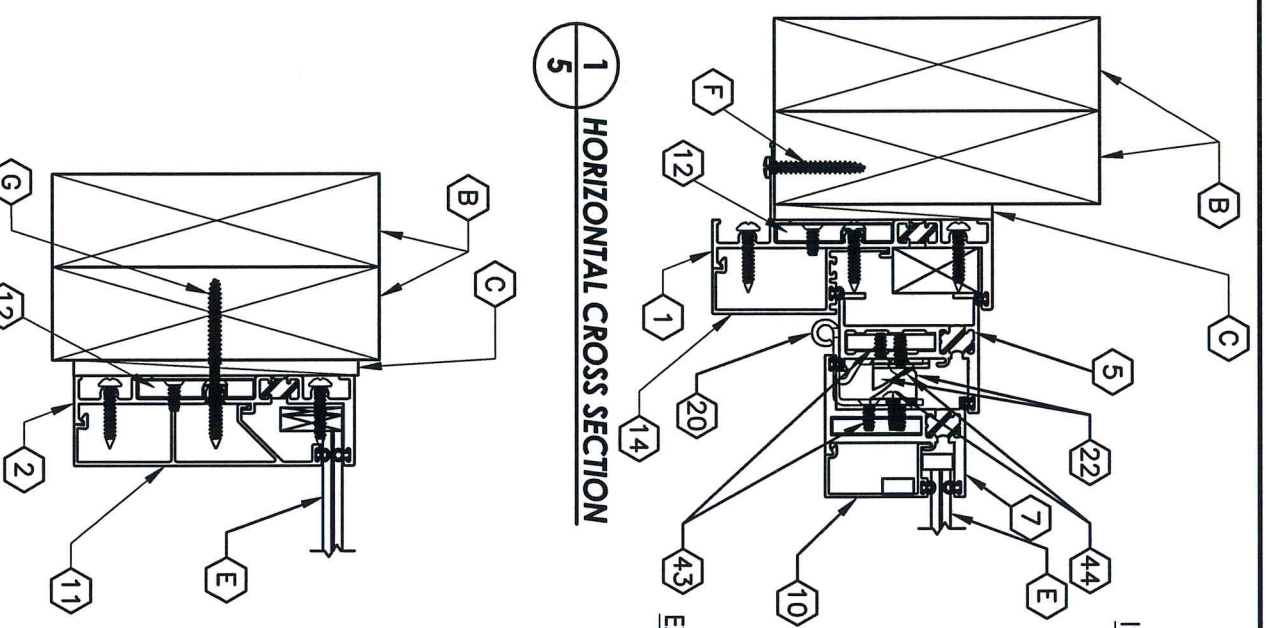
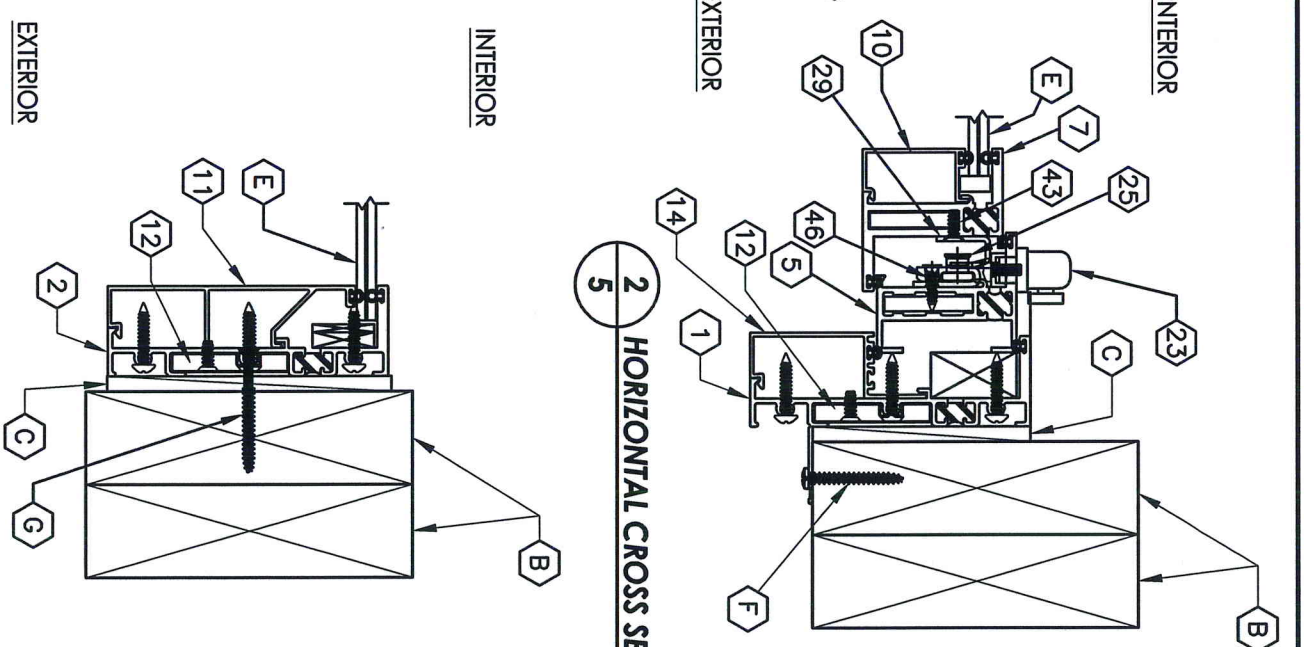




Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Witness DKW

NO.	DATE	REVISIONS	BY

RW BUILDING CONSULTANTS, INC.
813.659.9197

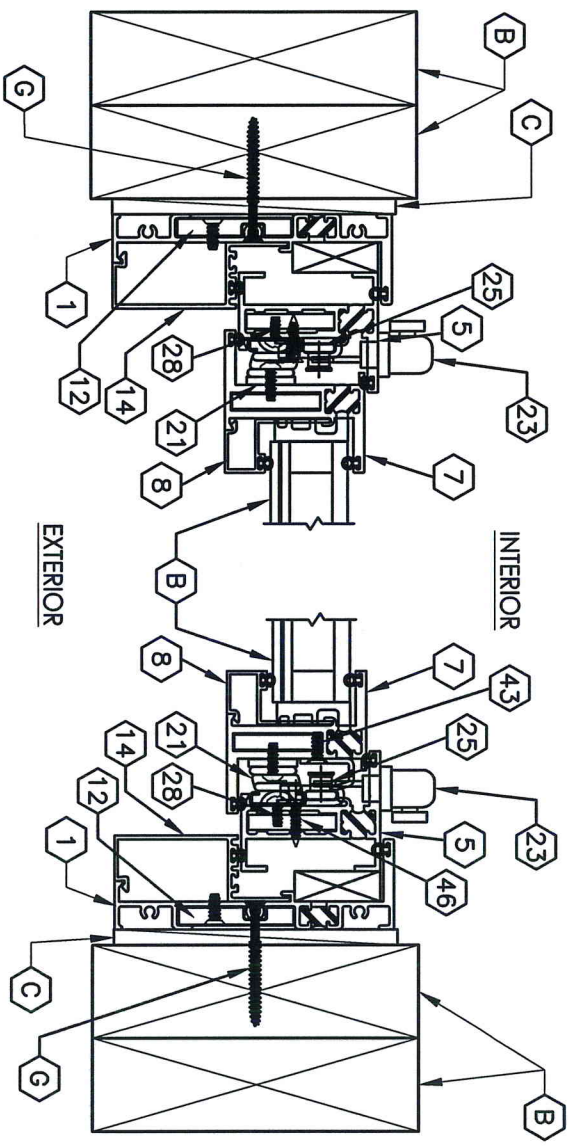
DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032
SHEET 5 OF 12

PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:
HORIZONTAL
CROSS SECTIONS

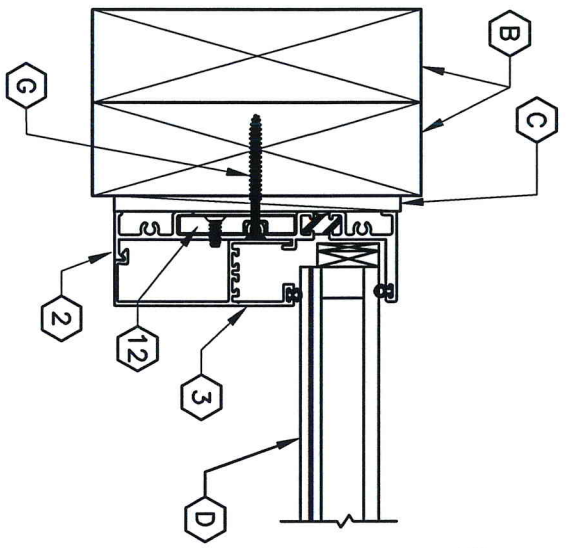
R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7032.dwg, 6

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Certified by VLW

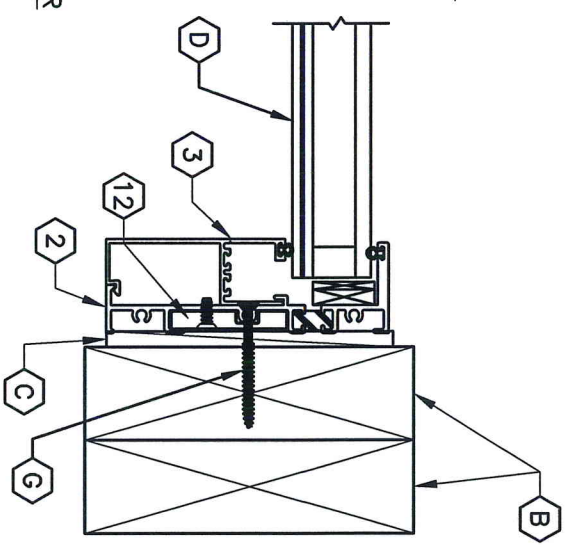


1/6 HORIZONTAL CROSS SECTION

2/6 HORIZONTAL CROSS SECTION



3/6 HORIZONTAL CROSS SECTION

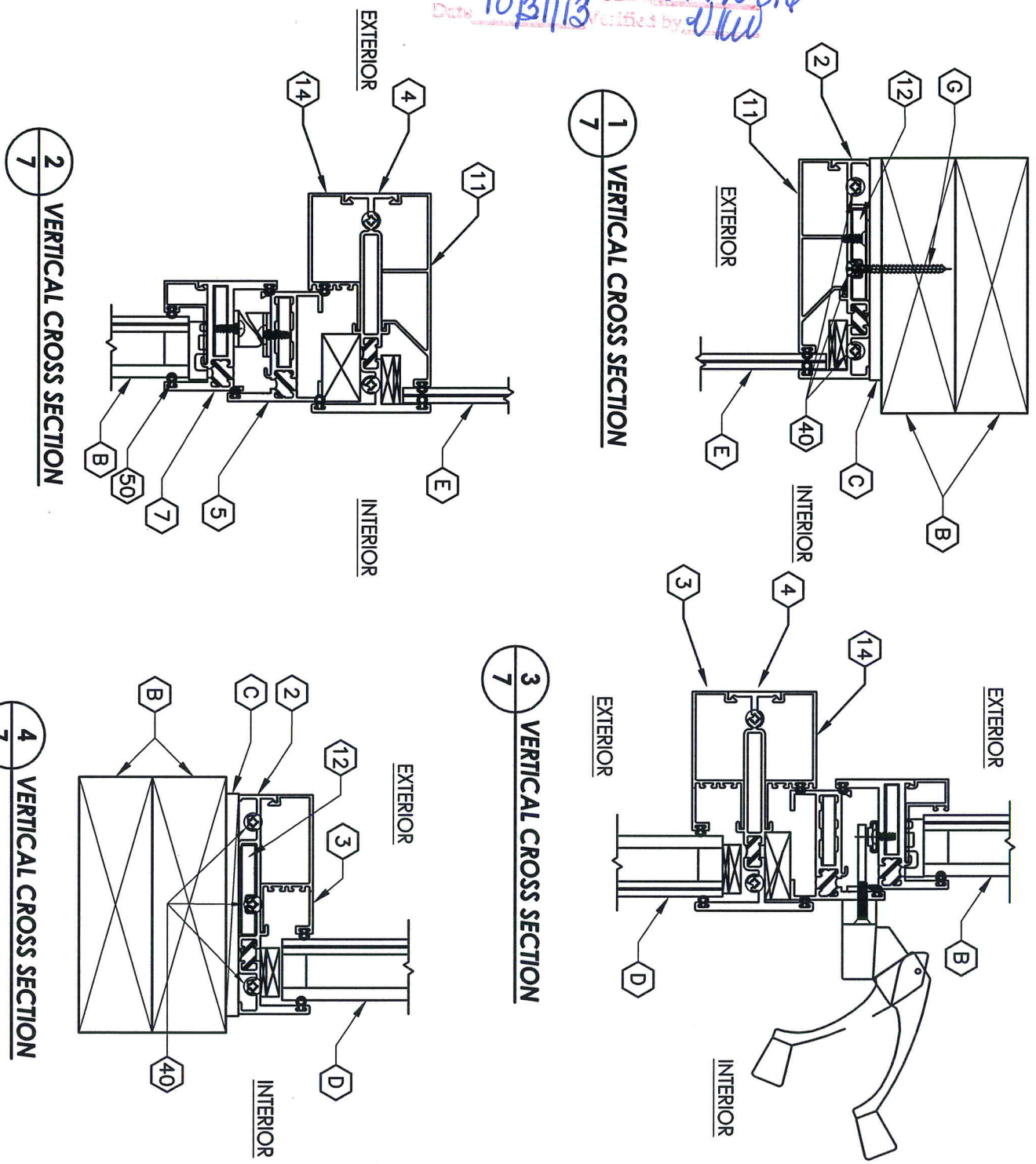


4/6 HORIZONTAL CROSS SECTION

PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW			
PART OR ASSEMBLY: HORIZONTAL CROSS SECTIONS			
REVISIONS			
NO.	DATE		BY
RW BUILDING CONSULTANTS, INC. 813.659.9197			
DATE: 9/25/13			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7032			
SHEET 6 OF 12			

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7032.dwg, 7

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted TEL # 01990814
Date 10/31/13 Verified by VLW



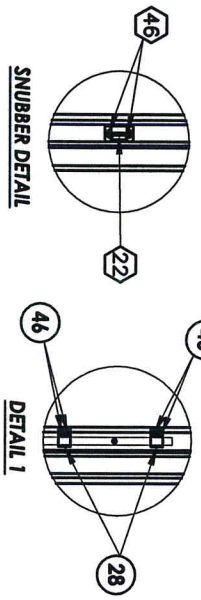
PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW			
PART OR ASSEMBLY: VERTICAL CROSS SECTIONS			
REVISIONS			
NO.	DATE		BY

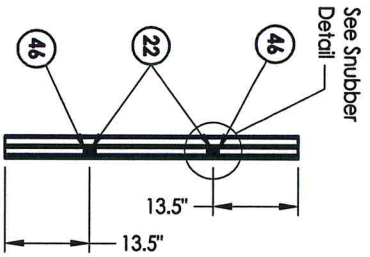
RW BUILDING CONSULTANTS, INC. 813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032
SHEET 7 OF 12

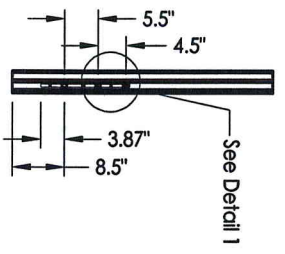
R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7032.dwg, 8

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 0199 8816
Date 10/31/13 Verified by

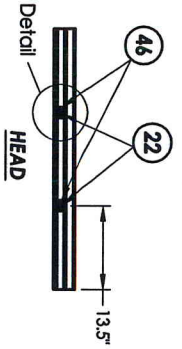


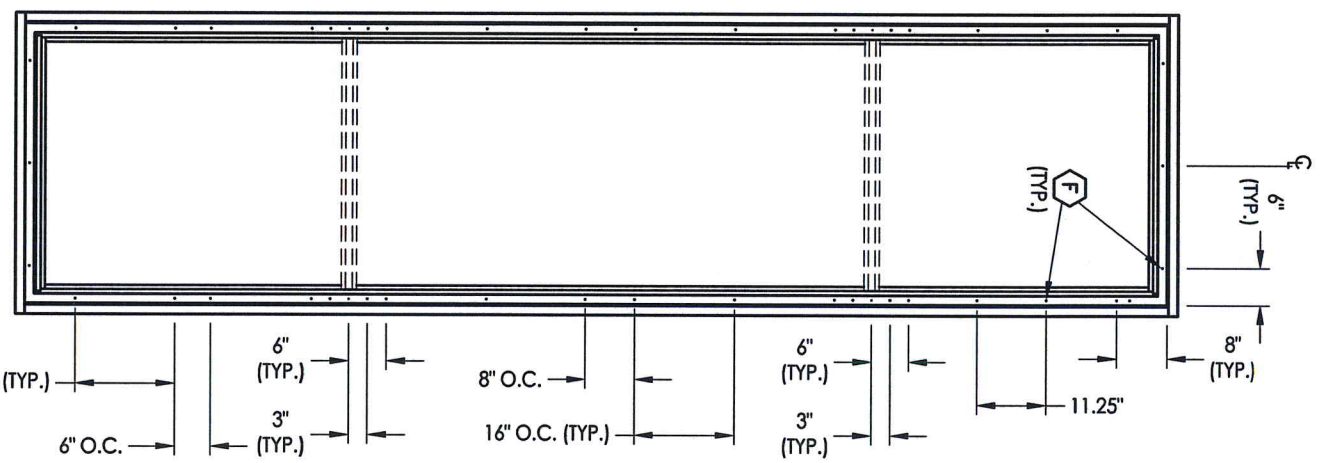


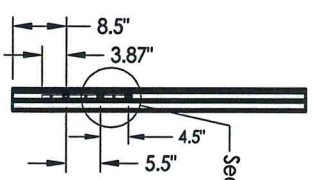
SNUBBER JAMB
(Casement)



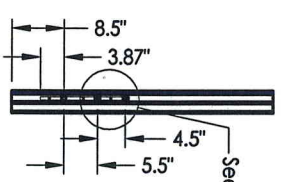
LOCK JAMB
Single Point Lock
(Jamb Sides Horizontal Awning)







LOCK JAMB
Two Point Lock
(Casement)



LOCK JAMB
Single Point Lock
(Jamb Sides Horizontal Awning)

NO.	DATE		BY

REVISIONS

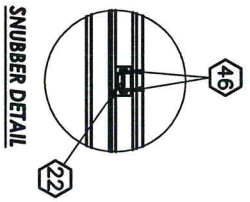
RW BUILDING CONSULTANTS, INC.
813.659.9197

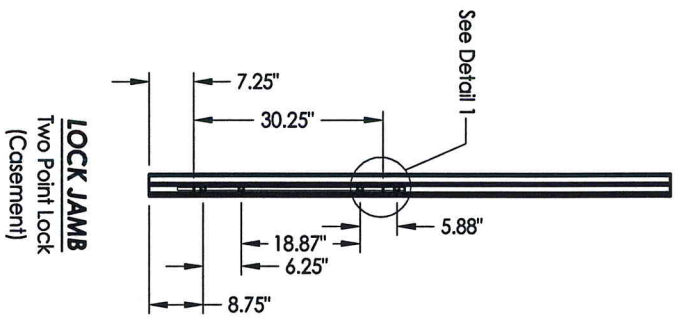
DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032
SHEET 8 OF 12

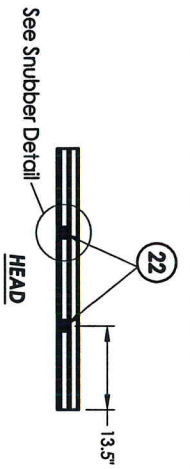
PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

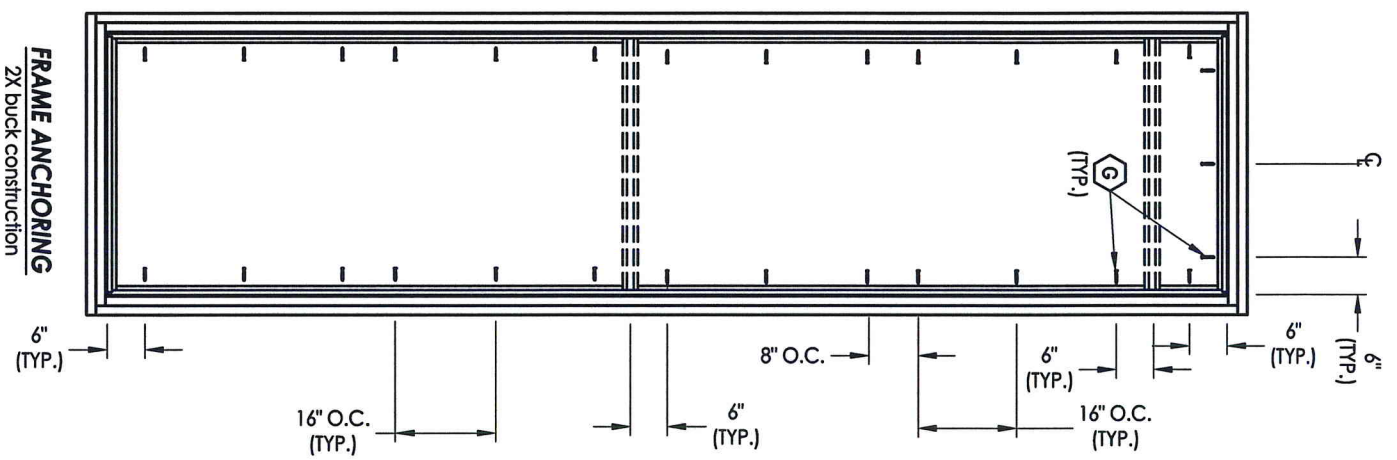
PART OR ASSEMBLY:
FRAME ANCHORING

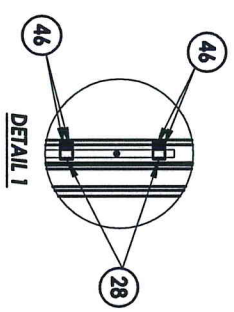
Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990814
Date 10/31/13 Verified by JLW

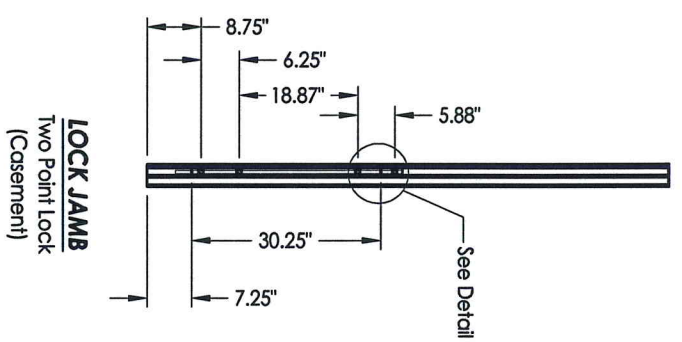










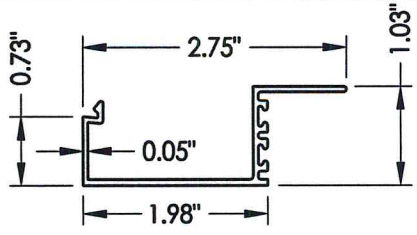


RW BUILDING CONSULTANTS, INC. 813.659.9197	NO.	DATE	BY
		REVISIONS	

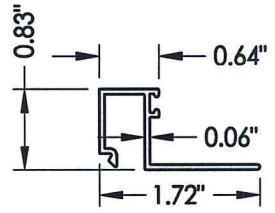
PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:
FRAME ANCHORING

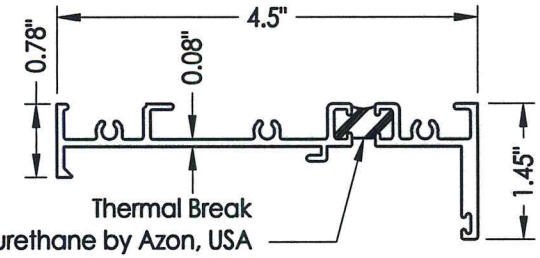
DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032
SHEET 9 OF 12



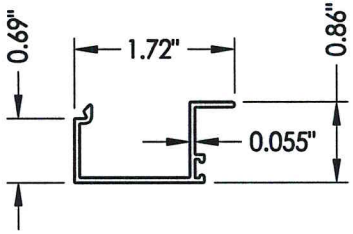
14 **INSERT STOP**
011448



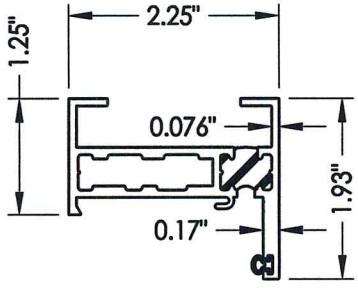
8 **GLASS STOP 1 1/4"**
901487



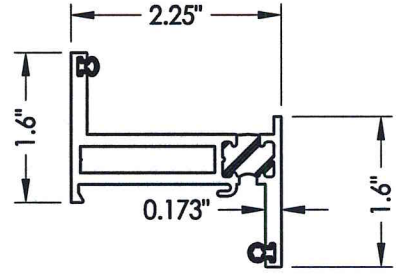
2 **KONA BLOCK FRAME**
011239



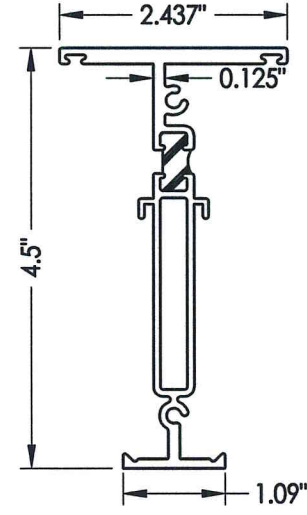
10 **GLASS STOP 5/16"**
007930



5 **BLOCK FRAME**
5278C1

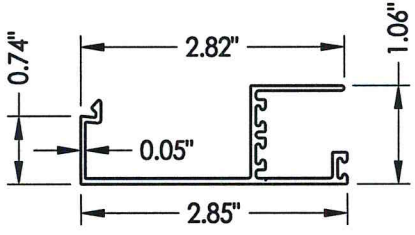


7 **ZEE BAR (PANEL)**
H006733

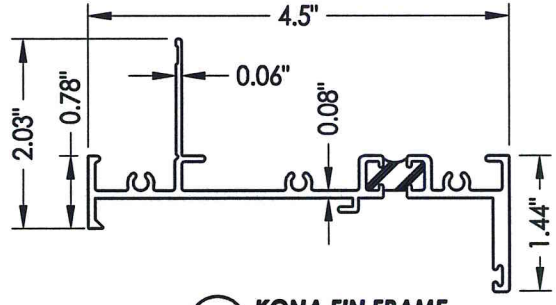


4 **MULLION**
H011241

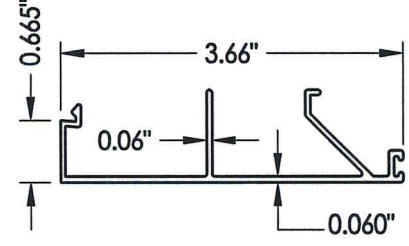
Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by DW



3 **GLASS STOP 1-1/4"**
011448



1 **KONA FIN FRAME**
011239



11 **GLASS STOP 5/16"**
011243

PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW

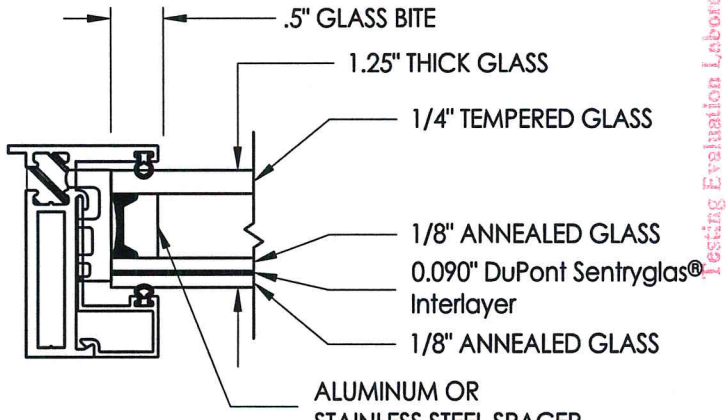
PART OR ASSEMBLY: COMPONENTS

NO.	DATE	BY
REVISIONS		

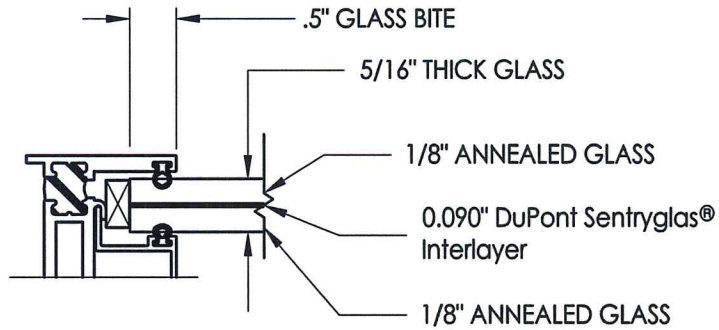
RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032
SHEET 10 OF 12

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7032.dwg



B GLAZING DETAIL



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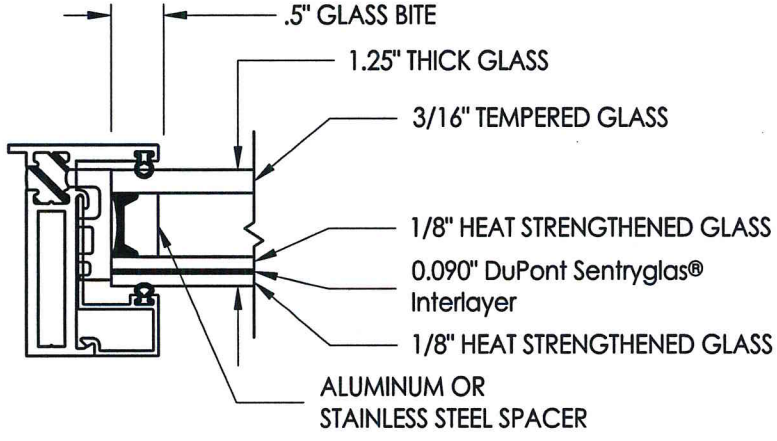
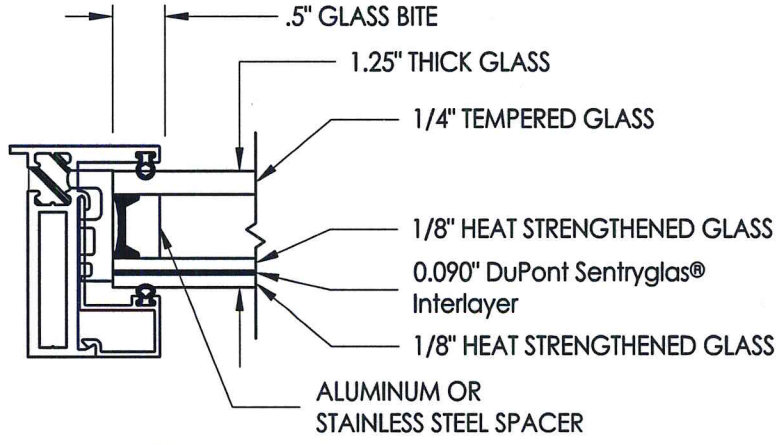


C GLAZING DETAIL



D GLAZING DETAIL

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviation Noted - TEL # 01990814
Date 10/31/13 Verified by JKW

PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY: GLAZING DETAILS

NO.	DATE	BY

REVISIONS

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032
SHEET 11 OF 12

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7032.dwg, 11

BILL OF MATERIALS

ITEM #	DESCRIPTION	MATERIAL
B	2X BUCK SG >= 0.55	WOOD
C	1/4" MAX. SHIM SPACE	-
F	#10 x 1-1/2" PFH WOOD SCREW	STEEL
G	#10 x 2" PFH WOOD SCREW	STEEL
1	KONA FIN FRAME	6063-T6 ALUM
2	KONA BLOCK FRAME	6063-T6 ALUM
3	GLASS STOP 1 1/4"	6063-T6 ALUM
4	MULLION	6063-T6 ALUM
5	WESTWOOD BLOCK FRAME	6063-T6 ALUM
7	WESTWOOD ZEE BAR (PANEL)	6063-T6 ALUM
8	GLASS STOP 1 1/4"	6063-T6 ALUM
10	GLASS STOP 1/2"	6063-T6 ALUM
11	GLASS STOP 5/8"	6063-T6 ALUM
12	SHEAR BLOCK	ALUM
13	CORNER KEY	ALUM
14	INSERT STOP	ALUM
20	SS. BUTT HINGE	SS
21	4 BAR HINGE	SS
22	SNUBBER-COMMERCIAL PULL-IN BLOCK	ZINC ALLOY
23	MULTIPOINT LOCK HANDLE	SS
24	SINGLE POINT LOCKING BAR	SS
25	2 POINTS LOCKING BAR	SS
28	TIE BAR GUIDE	PLASTIC
29	KEEPER	SS
30	CASEMENT ROTOR GEAR 13.5"	SS
35	CAM HANDLE / STRIKE PLATE	SS
36	CASEMENT SS. TRACK	SS
37	AWNING SS. TRACK	SS
40	#10 X 1" PPH SMS	STEEL
42	MACHINE SCREW NO 10-32, FHP .75"	STEEL
43	SCREW NO 10 , UFHP .5"	STEEL
44	SCREW NO 8, PHP, .50"	STEEL
46	SCREW NO 8, FHP, .750"	STEEL
47	MACHINE SCREW NO 10-32, PHP .5"	STEEL
48	BACK UP NUTS	STEEL
50	BULB VINYL (EPDM 70 DUROMETER)-TREMCO	-
51	MINI BULB VINYL(EPDM 70 DUROMETER)-TREMCO	-
52	WOOD BLOCK .750" X 1.250"	-
53	ALUMINUM BLOCK .750" X 1.250"	-
54	PVC BLOCK .750" X 1.250"	-
55	SETTING BLOCK	-
56	SETTING BLOCK 4" x $\frac{1}{4}$" x 1"	-
57	PIVOT SHIM	-
58	WOOD BLOCK .50" X 1.250"	-
59	ALUMINUM BLOCK .50" X 1.250"	-
60	PVC BLOCK .50" X 1.250"	-
61	SETTING BLOCK 4" x 1/8" x 1"	-

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviation Noted - TEL # 01990814
Date 10/31/13 Verified by

PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY: BILL OF MATERIALS

NO.	DATE	BY
REVISIONS		

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032
SHEET 12 OF 12

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7032.dwg, 12

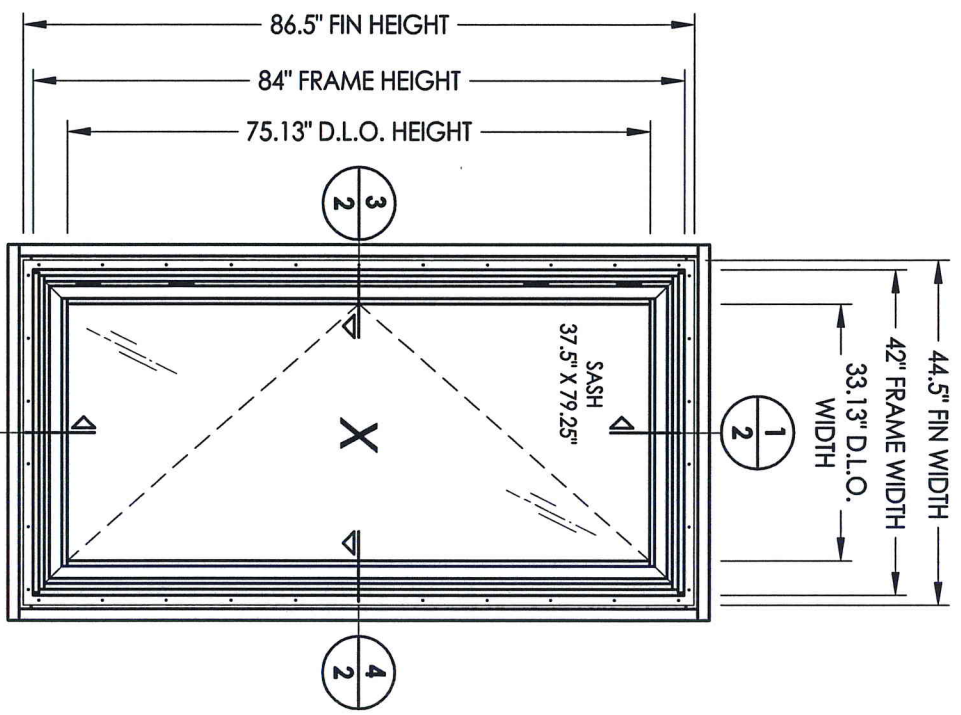
R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7032A.dwg, L-7032A

TABLE OF CONTENTS

SHEET #	DESCRIPTION
1	Table of contents and test elevation
2	Horizontal and vertical cross sections
3	Frame anchoring
4	Components and glazing details
5	Bill of materials

SPEC# 2, 2A GLASS TYPE A

SPEC# 5, 5A GLASS TYPE G



Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by UKW

NO.	DATE		BY

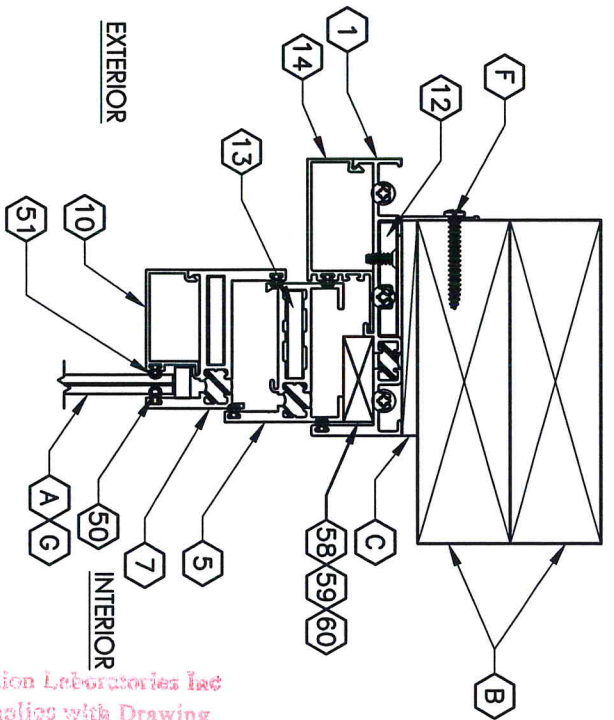
REVISIONS

RW BUILDING CONSULTANTS, INC.
813.659.9197

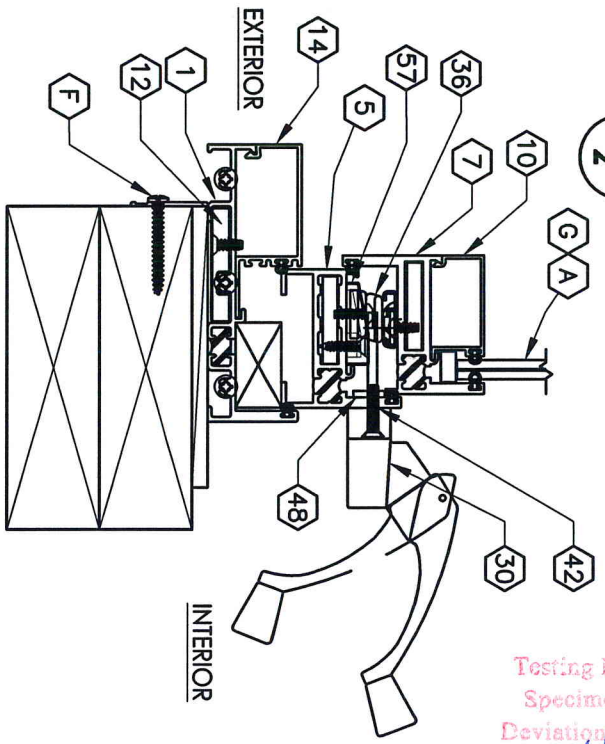
DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032A
SHEET 1 OF 5

PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:
TABLE OF CONTENTS
AND TEST ELEVATION



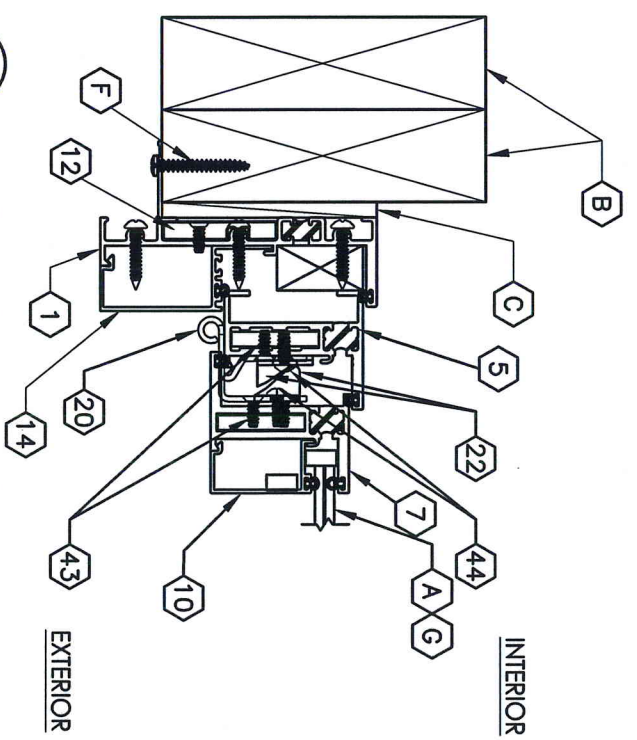
1/2 VERTICAL CROSS SECTION



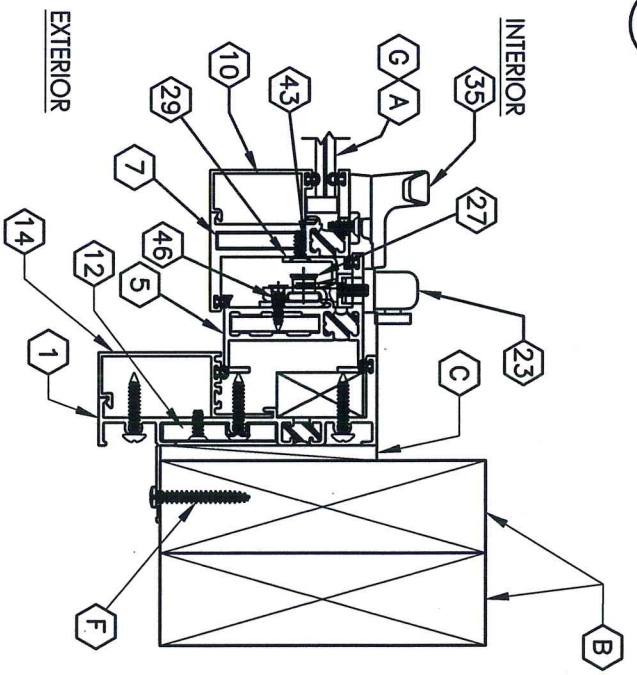
2/2 VERTICAL CROSS SECTION

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by [illegible]

3/2 HORIZONTAL CROSS SECTION



4/2 HORIZONTAL CROSS SECTION



NO.	DATE		BY

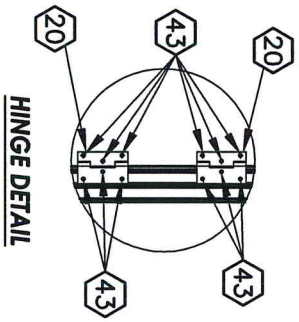
REVISIONS

PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:
HORIZONTAL AND VERTICAL CROSS SECTIONS

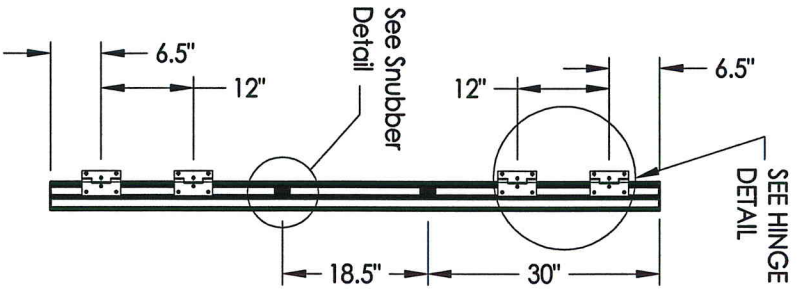
RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032A
SHEET 2 OF 5

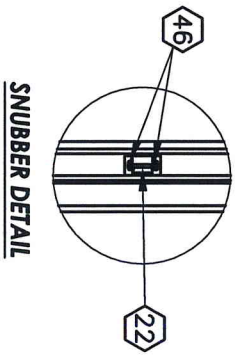


HINGE DETAIL

HINGE JAMB

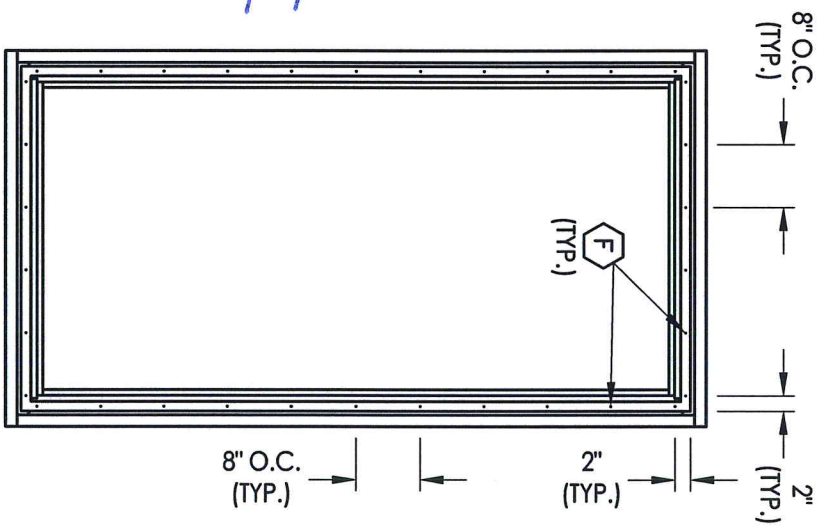


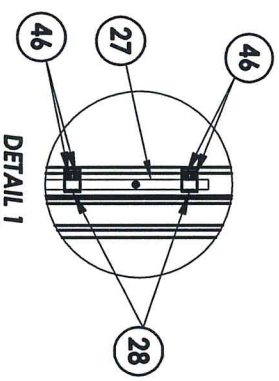
Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by



SNUBBER DETAIL

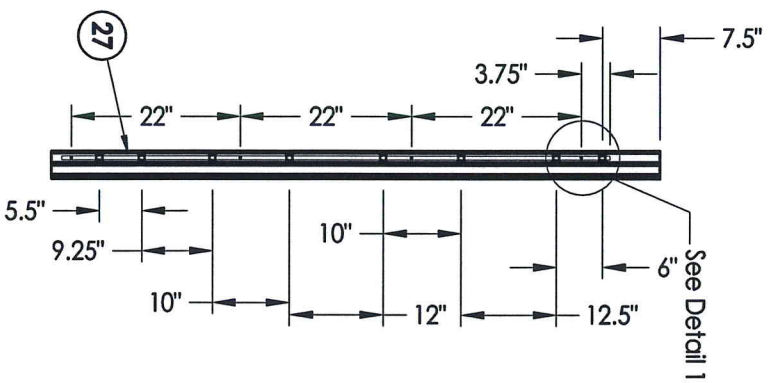
FRAME ANCHORING
2X buck construction





DETAIL 1

LOCK JAMB
Locking Points (4)

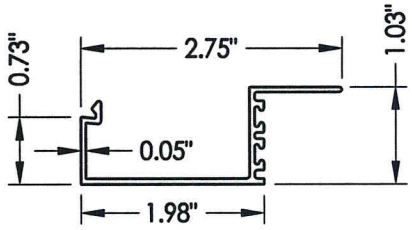


RW BUILDING CONSULTANTS, INC. 813.659.9197	NO.	DATE	BY
		REVISIONS	

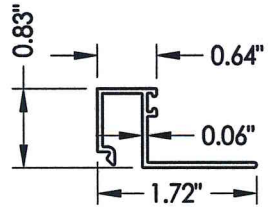
PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:
FRAME ANCHORING

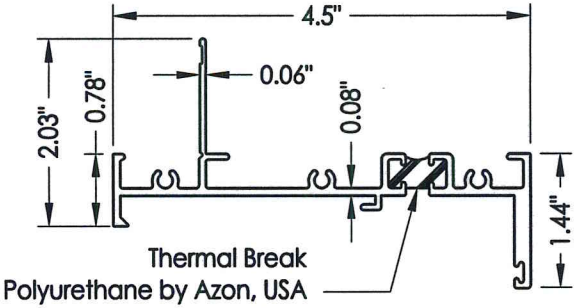
DATE:	9/25/13
SCALE:	N.T.S.
DWG. BY:	JK
CHK. BY:	LFS
DRAWING NO.:	L-7032A
SHEET	3 OF 5



14 INSERT STOP
011448

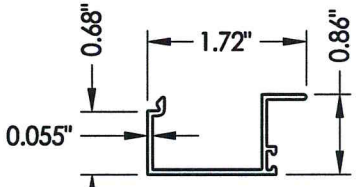


8 GLASS STOP 1-1/4"
901487

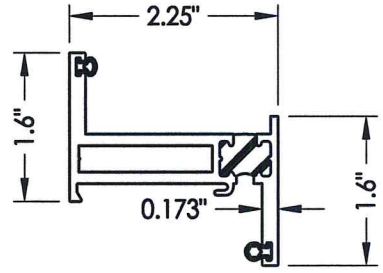


Thermal Break
Liquid Polyurethane by Azon, USA
(TYP.)

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by JKW

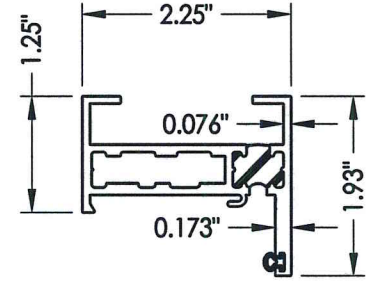


10 GLASS STOP 9/16"
007930



7 ZEE BAR (PANEL)
H006733

1 KONA FIN FRAME
011239



5 BLOCK FRAME
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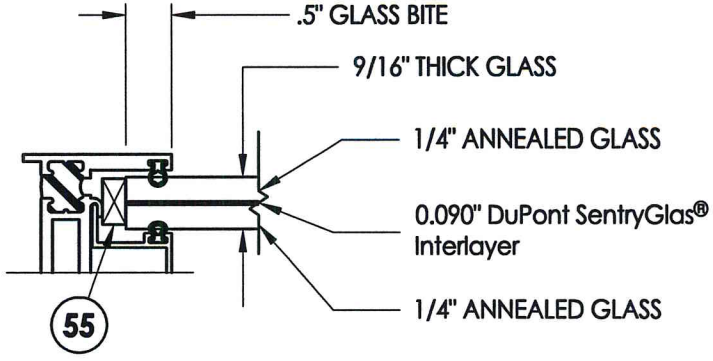
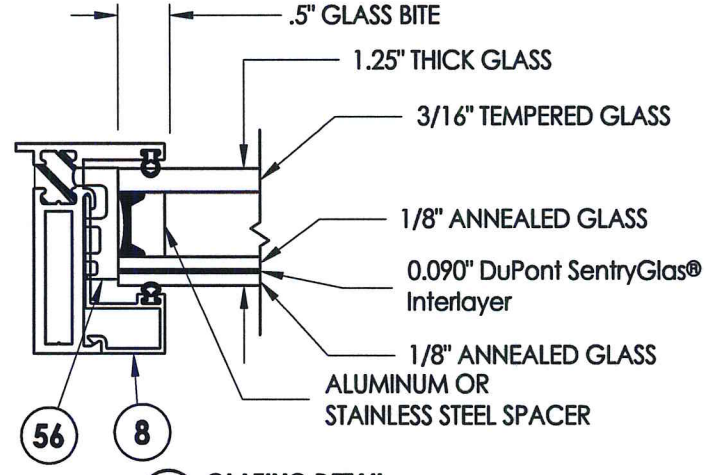


G GLAZING DETAIL
Spec #5, 5A



A GLAZING DETAIL
Spec. #2, 2A

PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY: COMPONENTS AND GLAZING DETAILS

NO.	DATE	BY

REVISIONS

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032A
SHEET 4 OF 5

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7032A.dwg

BILL OF MATERIALS		
ITEM #	DESCRIPTION	MATERIAL
B	2X BUCK SG >= 0.55	WOOD
C	1/4" MAX. SHIM SPACE	-
F	#10 x 1-1/2" PPH WOOD SCREW	STEEL
G	#10 x 2" PFH WOOD SCREW	STEEL
1	KONA FIN FRAME	6063-T6 ALUM
5	WESTWOOD BLOCK FRAME	6063-T6 ALUM
7	WESTWOOD ZEE BAR (PANEL)	6063-T6 ALUM
8	GLASS STOP 1 1/4"	6063-T6 ALUM
10	GLASS STOP 1/2"	6063-T6 ALUM
12	SHEAR BLOCK	ALUM
13	CORNER KEY	ALUM
14	INSERT STOP	ALUM
20	SS. BUTT HINGE	SS
22	SNUBBER-COMMERCIAL PULL-IN BLOCK	SS
23	MULTIPOINT LOCK HANDLE	SS
27	4 POINTS LOCKING BAR	SS
28	TIE BAR GUIDE	PLASTIC
29	KEEPER	SS
30	CASEMENT ROTOR GEAR 13.5"	SS
35	CAM HANDLE / STRIKE PLATE	SS
36	CASEMENT SS. TRACK	SS
42	MACHINE SCREW NO 10-32, FHP .75"	STEEL
43	SCREW NO 10 , UFHP .5"	STEEL
44	SCREW NO 8, PHP, .50"	STEEL
46	SCREW NO 8, FHP, .750"	STEEL
48	BACK UP NUTS	STEEL
50	BULB VINYL (EPDM 70 DUROMETER)-TREMCO	-
51	MINI BULB VINYL(EPDM 70 DUROMETER)-TREMCO	-
55	SETTING BLOCK	-
56	SETTING BLOCK 4" x $\frac{1}{4}$" x 1"	-
57	PIVOT SHIM	-
58	WOOD BLOCK .50" X 1.250"	-
59	ALUMINUM BLOCK .50" X 1.250"	-
60	PVC BLOCK .50" X 1.250"	-

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviation Noted - TEL # 01990816
Date 10/31/13 Verified by

PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY: BILL OF MATERIALS

NO.	DATE	BY
REVISIONS		

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7032A
SHEET 5 OF 5

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7032A.dwg, 5

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7033.dwg, L-7033

TABLE OF CONTENTS

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990814
Date 10/31/13 Verified by [illegible]

NO.	DATE		BY

REVISIONS

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7033
SHEET 1 OF 9

PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:
TABLE OF CONTENTS

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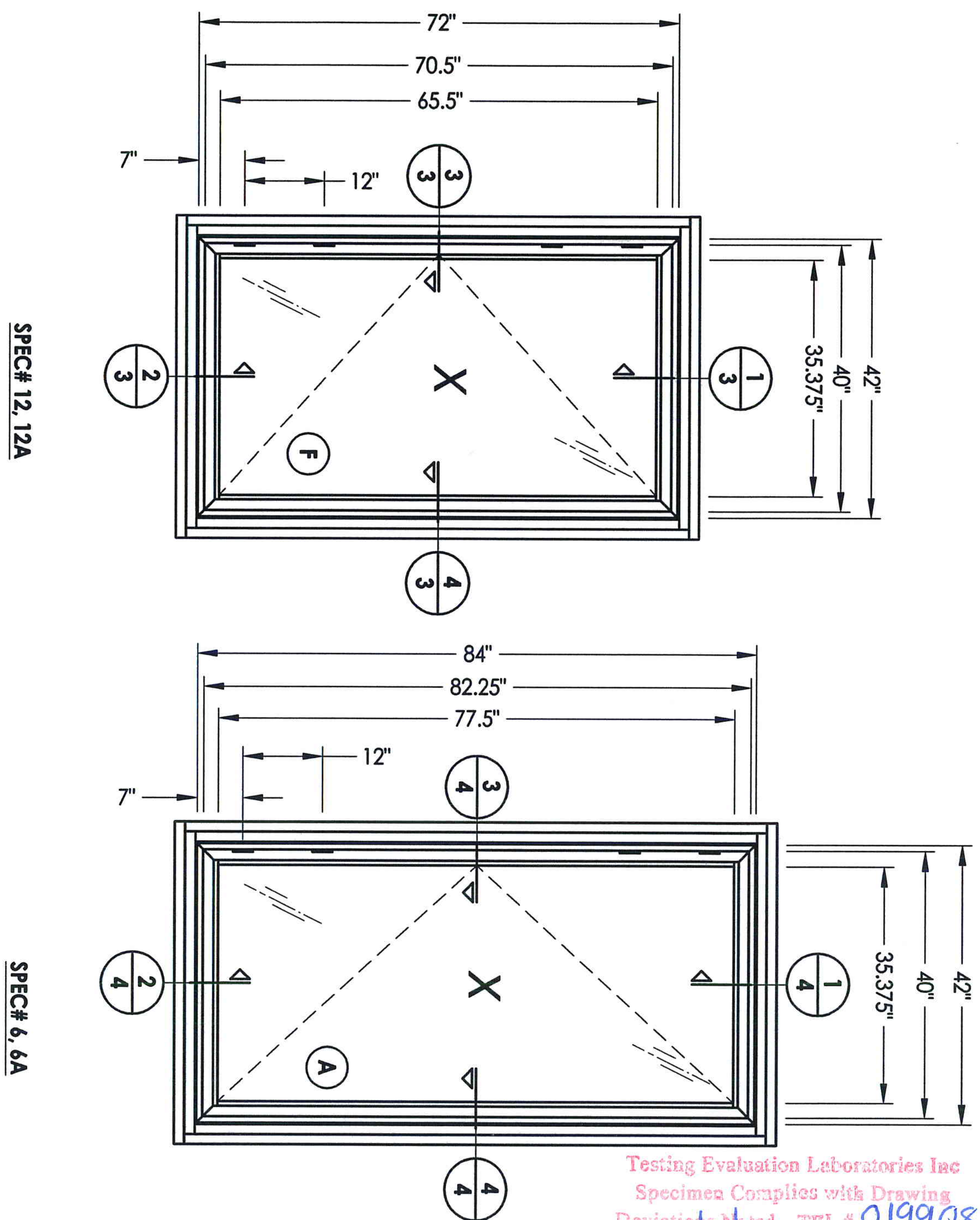
R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\L-7033.dwg, 2



Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by [signature]

NO.	DATE		BY
	REVISIONS		

PRODUCT:

FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:

TEST ELEVATION

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7033
SHEET 2 OF 9

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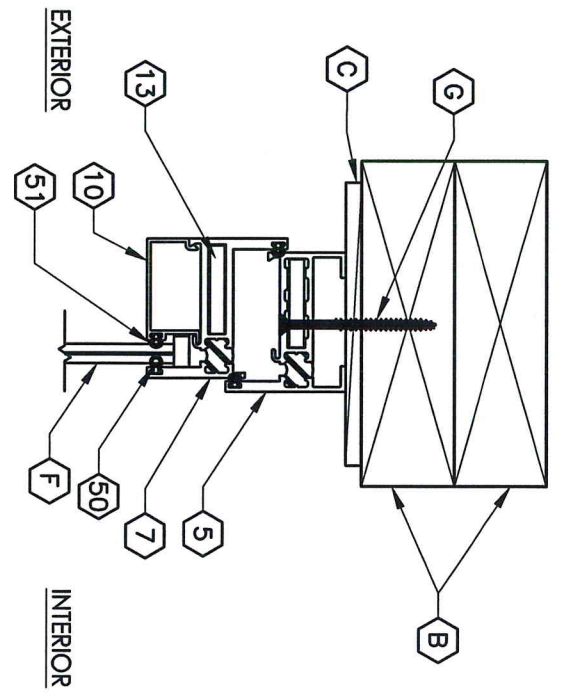
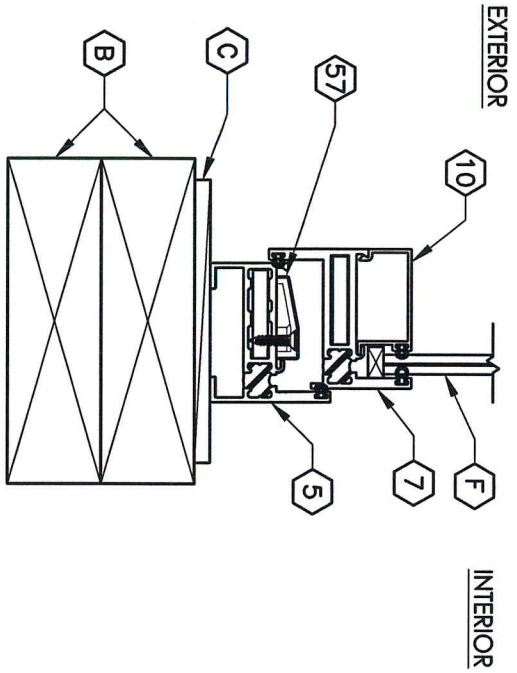


1/3 VERTICAL CROSS SECTION



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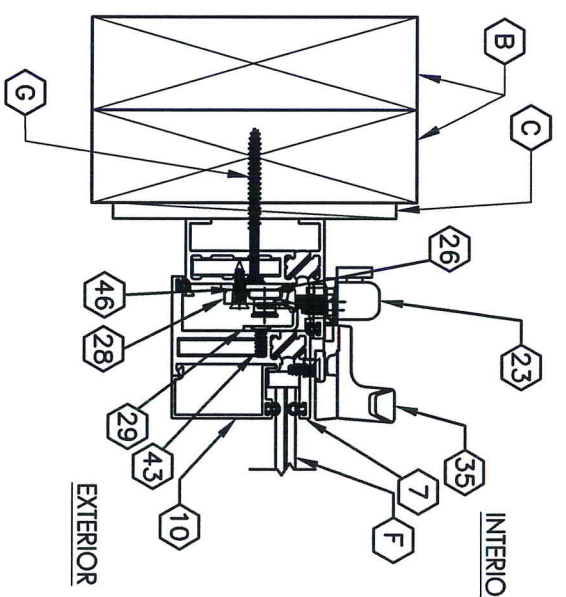

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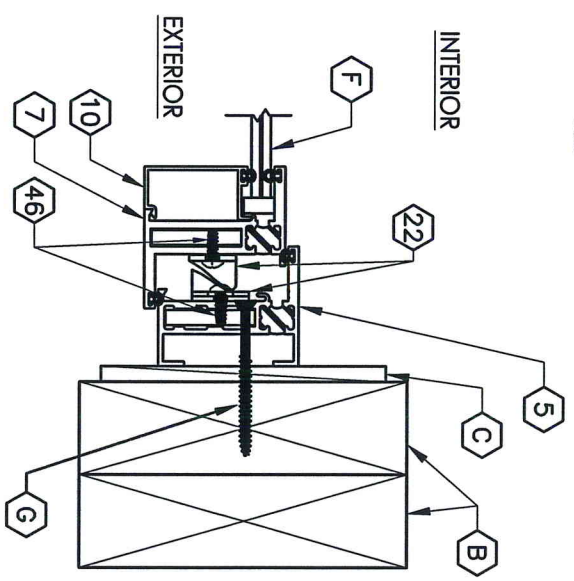

4/3 HORIZONTAL CROSS SECTION

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990814
Date 10/31/13 Verified by

PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW			
PART OR ASSEMBLY: HORIZONTAL AND VERTICAL CROSS SECTIONS			
REVISIONS			
NO.	DATE		BY
RW BUILDING CONSULTANTS, INC. 813.659.9197			
DATE: 9/25/13			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7033			
SHEET 3 OF 9			

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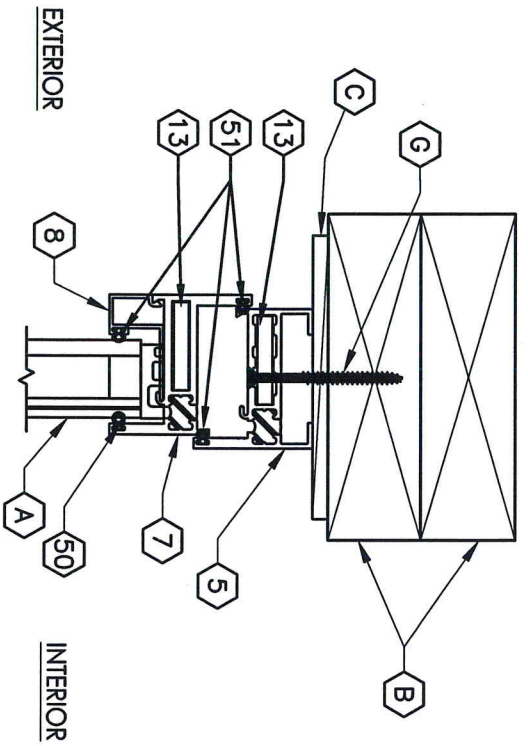
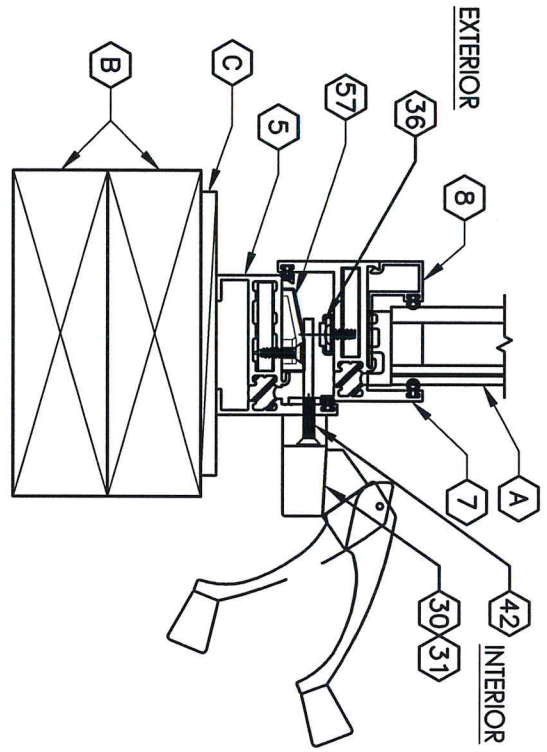


1/4 VERTICAL CROSS SECTION



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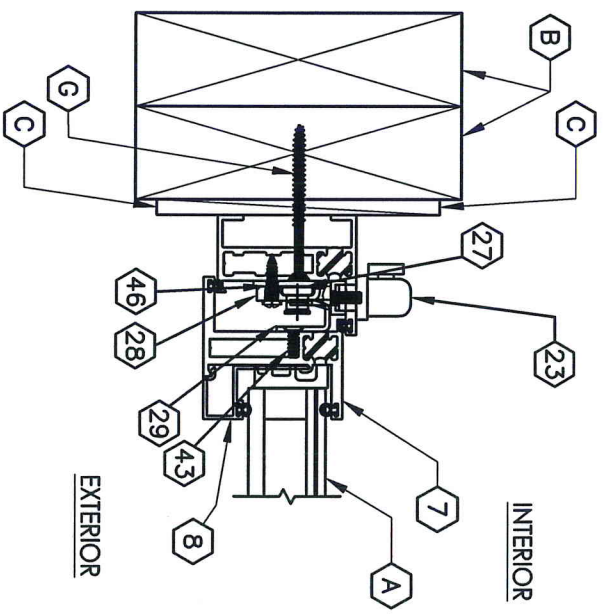

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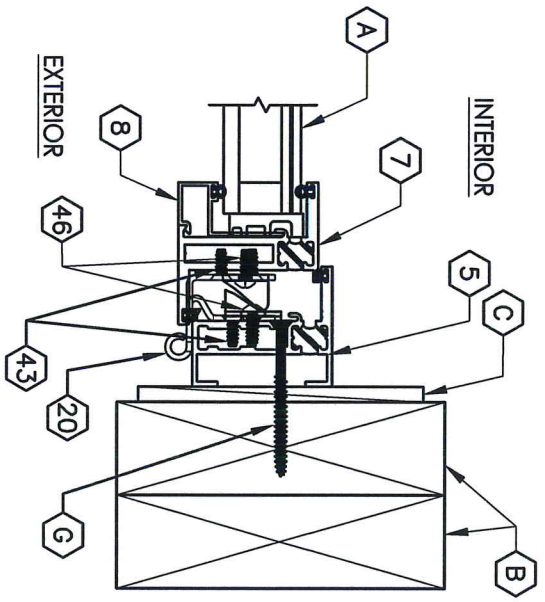

4/4 HORIZONTAL CROSS SECTION

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 0199 0816
Date 10/31/13 Verified by UKW

NO.	DATE		BY

REVISIONS

PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:
HORIZONTAL AND VERTICAL
CROSS SECTIONS

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7033
SHEET 4 OF 9

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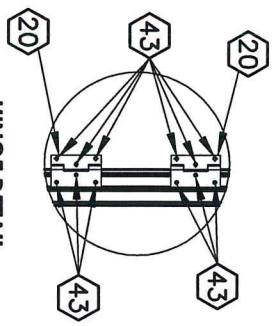
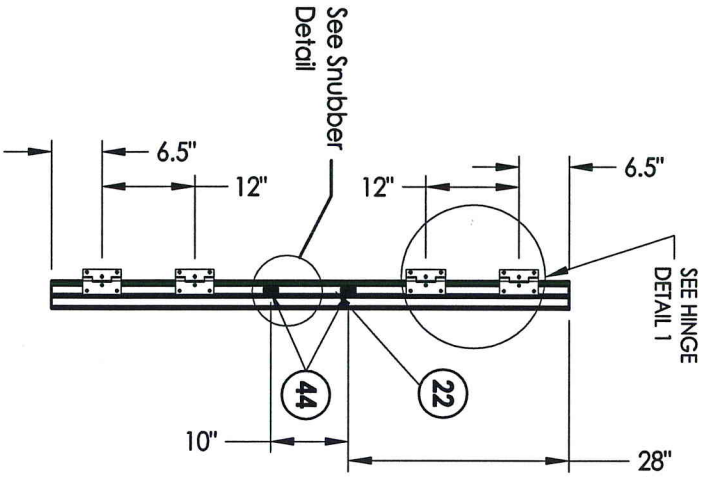
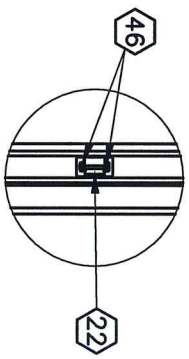


HINGE DETAIL

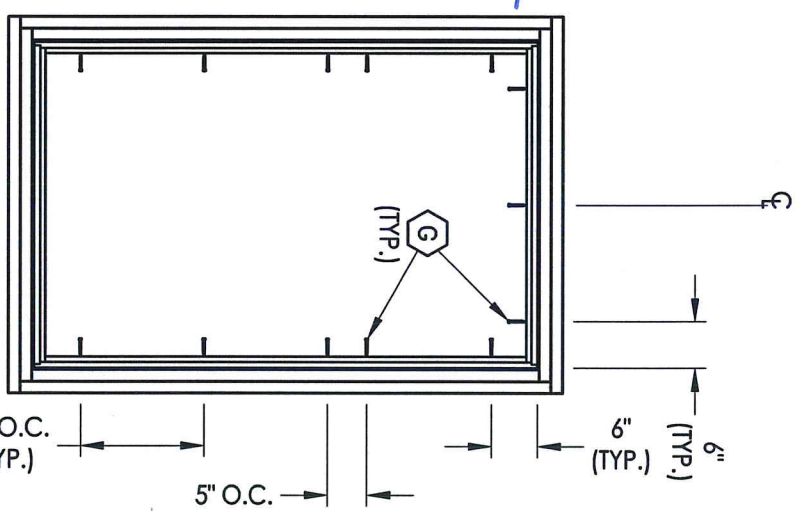


SNUBBER JAMB

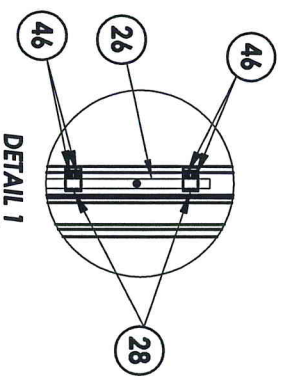


SNUBBER DETAIL

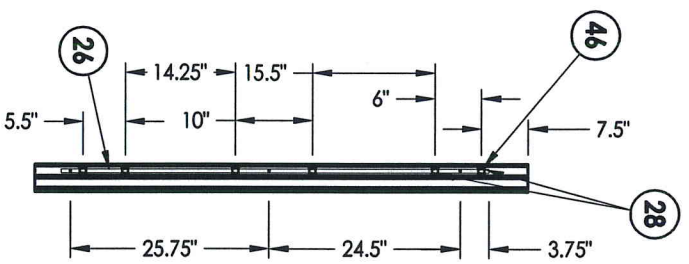
Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990814
Date 10/31/13 Verified by



FRAME ANCHORING
2X buck construction



DETAIL 1



LOCK JAMB
Locking Points (3)

DATE: 9/25/13	RW BUILDING CONSULTANTS, INC. 813.659.9197	NO.	DATE / BY
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7033			
SHEET 5 OF 9			

REVISIONS

PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:
FRAME ANCHORING

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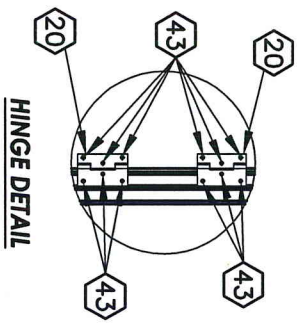
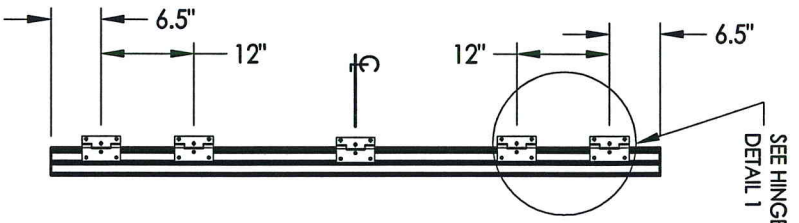
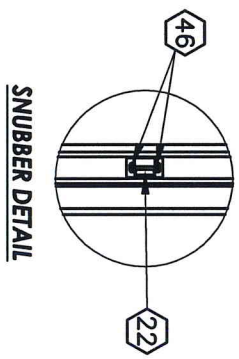


HINGE DETAIL

HINGE JAMB

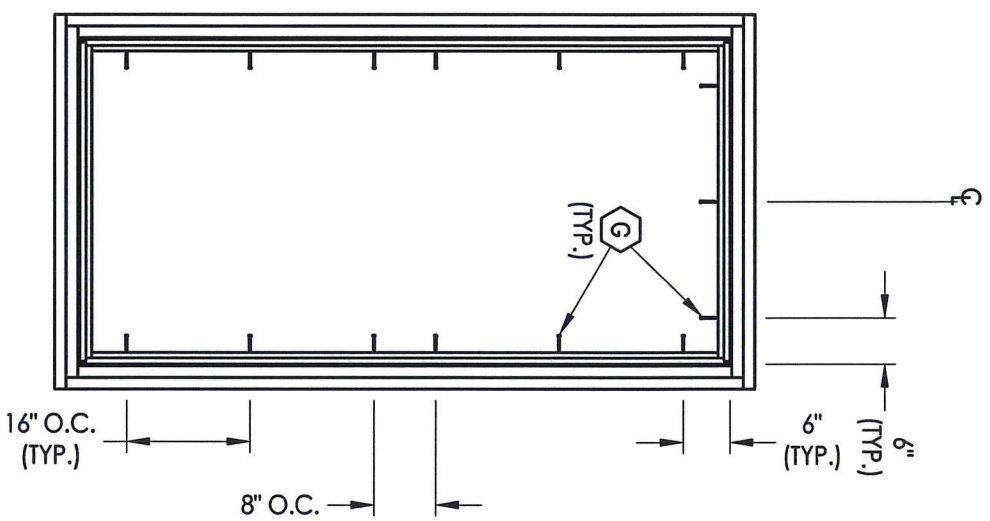


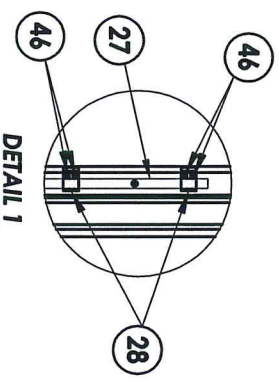
Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990814
Date 10/31/13 Verified by JDW



SNUBBER DETAIL

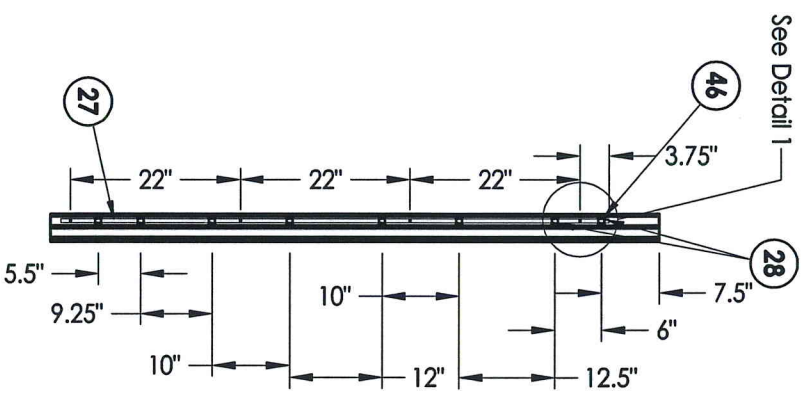
FRAME ANCHORING
2X buck construction





DETAIL 1

LOCK JAMB
Locking Points (4)



NO.	DATE		BY
REVISIONS			

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7033
SHEET 6 OF 9

PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:
FRAME ANCHORING

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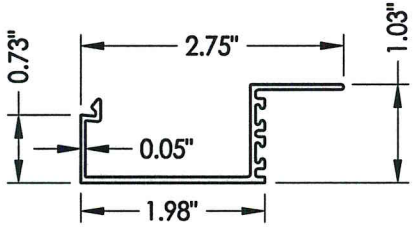
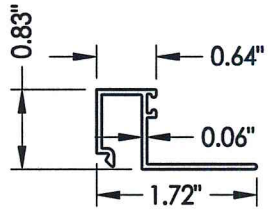
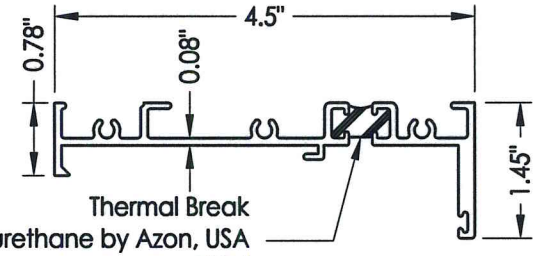


14 INSERT STOP
011448

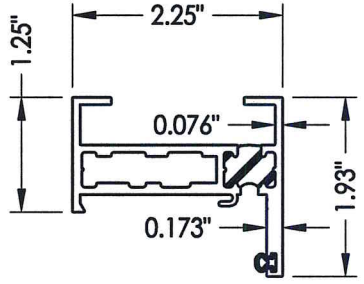


8 GLASS STOP 1-1/4"
901487

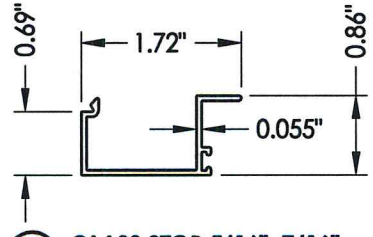


2 KONA BLOCK FRAME
011239

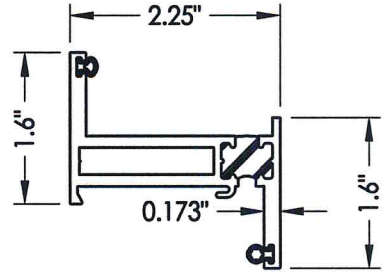
Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by VLW



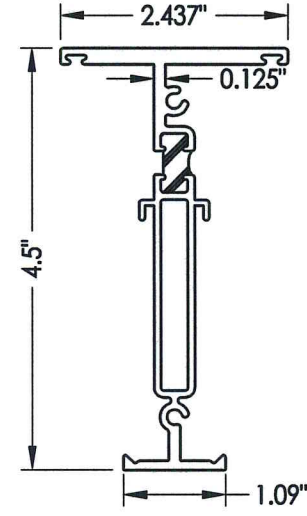
5 BLOCK FRAME
5278C1



10 GLASS STOP 5/16", 7/16"
007930



7 ZEE BAR (PANEL)
H006733



4 MULLION
H011241

PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY: COMPONENTS

NO.	DATE	BY
REVISIONS		

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7033
SHEET 7 OF 9

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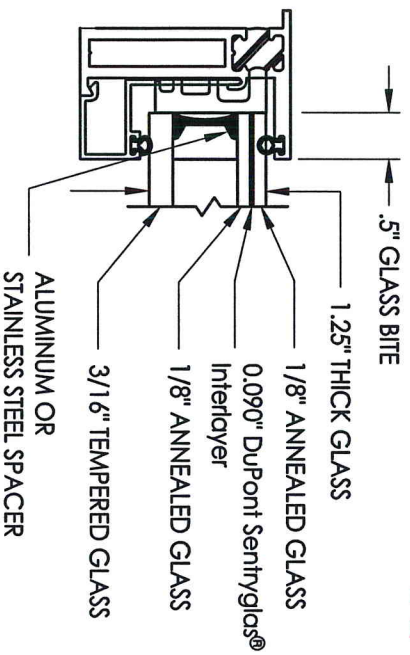
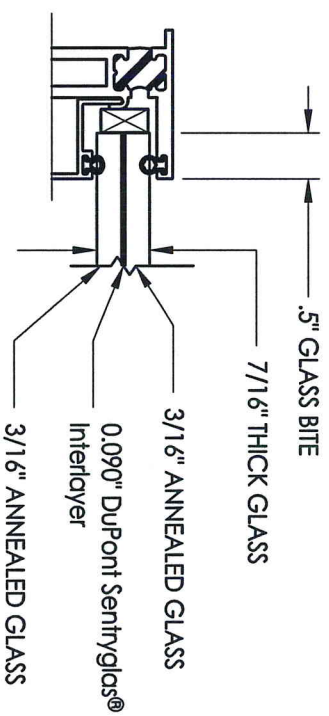


A GLAZING DETAIL

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990814
Date 11/21/13 Verified by JKW



F GLAZING DETAIL

NO.	DATE		BY

REVISIONS

PRODUCT:
FLEETWOOD
KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY:
COMPONENTS AND
GLAZING DETAILS

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
CHK. BY: LFS
DRAWING NO.: L-7033
SHEET 8 OF 9

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BILL OF MATERIALS

ITEM #	DESCRIPTION	MATERIAL
B	2X BUCK SG >= 0.55	WOOD
C	1/4" MAX. SHIM SPACE	-
G	#10 x 2" PFH WOOD SCREW	STEEL
2	KONA BLOCK FRAME	6063-T6 ALUM
4	MULLION	6063-T6 ALUM
5	WESTWOOD BLOCK FRAME	6063-T6 ALUM
7	WESTWOOD ZEE BAR (PANEL)	6063-T6 ALUM
8	GLASS STOP (1-1/4")	6063-T6 ALUM
10	GLASS STOP (7/16")	6063-T6 ALUM
13	CORNER KEY	ALUM
14	INSERT STOP	ALUM
20	SS. BUTT HINGE	SS
21	4 BAR HINGE	SS
22	SNUBBER	ZINC ALLOY
23	MULTIPOINT LOCK HANDLE	SS
26	3 POINTS LOCKING BAR	SS
27	4 POINTS LOCKING BAR	SS
28	TIE BAR GUIDE	PLASTIC
29	KEEPER	SS
30	CASEMENT ROTOR GEAR 13.5"	SS
35	CAM HANDLE / STRIKE PLATE	SS
36	CASEMENT SS. TRACK	SS
40	#10 X 1" PPH SMS	STEEL
42	MACHINE SCREW NO 10-32, FHP .75"	STEEL
43	SCREW NO 10 , UFHP .5"	STEEL
44	SCREW NO 8, PHP, .50"	STEEL
46	SCREW NO 8, FHP, .750"	STEEL
47	MACHINE SCREW NO 10-32, PHP .5"	STEEL
48	BACK UP NUTS	STEEL
50	BULB VINYL (EPDM 70 DUROMETER)-TREMCO	-
51	MINI BULB VINYL(EPDM 70 DUROMETER)-TREMCO	-
52	WOOD BLOCK .750" X 1.250"	-
53	ALUMINUM BLOCK .750" X 1.250"	-
54	PVC BLOCK .750" X 1.250"	-
55	SETTING BLOCK	-
56	SETTING BLOCK 4" x 1/4" x 1"	-
57	PIVOT SHIM	-
58	WOOD BLOCK .50" X 1.250"	-
59	ALUMINUM BLOCK .50" X 1.250"	-
60	PVC BLOCK .50" X 1.250"	-
61	SETTING BLOCK 4" x 1/8" x 1"	-

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990816
Date 10/31/13 Verified by [illegible]

PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW

PART OR ASSEMBLY: BILL OF MATERIALS

NO.	DATE	BY

REVISIONS

RW BUILDING CONSULTANTS, INC.
813.659.9197

DATE: 9/25/13
SCALE: N.T.S.
DWG. BY: JK
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DRAWING NO.: L-7033
SHEET 9 OF 9

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