

R W Building Consultants, Inc.

Consulting and Engineering Services for the Building Industry

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Florida Board of Professional Engineers Certificate of Authorization No. 9813

June 25, 2014

Joseph Zammit
Fleetwood Window and Doors
1 Fleetwood Way
Corona, CA 92879

REF: Non-Impact Glazing Comparative Analysis for Fleetwood WESTWOOD 250 Awning/Casement Windows & KONA 3800 Awning Windows
(Corresponding Test Reports: TEL 01991028, TEL 01991056, TEL 01991058, TEL 01991059 & TEL 01991060)

Joseph,

Attached is the non-impact glazing comparative analysis for the above mentioned products.

Included are:

1. A summary chart identifying the tested glazing details, the corresponding non-impact comparable glazing and the ASTM E1300 calculated load resistance. For the windows, the non-impact glazing considered were 1/4" annealed, 3/16" heat strengthened and 3/16" tempered insulated glass.
2. A drawing identifying the tested impact glazing and the comparable non-impact glazing details. For example, if the tested impact unit is the "A" glazing, then the 3 non-impact units are "A1", "A2" & "A3".
3. The ASTM E1300 calculations for each tested impact glazing and the comparable non-impact glazing details.

Please contact me if any additional information is required.

Sincerely,

A handwritten signature in black ink, appearing to read 'LFS', is written over a light blue horizontal line.

Lyndon F. Schmidt, P.E.
Florida PE No. 43409
V.P. Engineering
R.W. Building Consultants, Inc.

FLEETWOOD GLAZING COMPARATIVE ANALYSIS

Westwood 250 Awning/Casement Windows

KONA 3800 Awning Windows

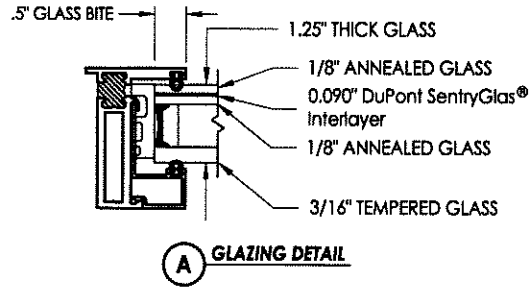
Test Reports: TEL 01991028, TEL 01991056, TEL 01991058
 TEL 01991059, TEL 01991060

		DLO (in.)	ASTM E1300 LOAD RESISTANCE (psf)
TESTED GLAZING	A (Casement)	33.5 x 76.1	104
	B (Awning)	57 x 34	83.1
COMPARABLE GLAZING	A1	33.5 x 60.5	105
	B1	34 x 57	111
	A2, B2	34 x 76.1	125
	A3, B3	34 x 76.1	209

R:\A - Projects\Project Folders\Proj 1701 - 1800\PF 1731\D. RWBC Drawings\GLAZING ASTM E1300.dwg, GLAZING 3

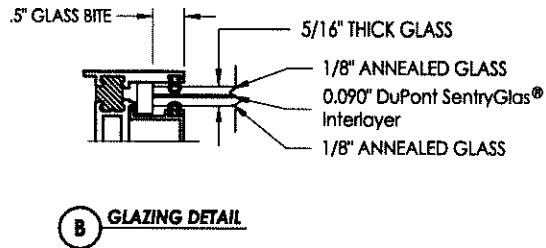
TESTED IMPACT GLAZING

TEST REPORT: TEL 01991056, TEL 01991060



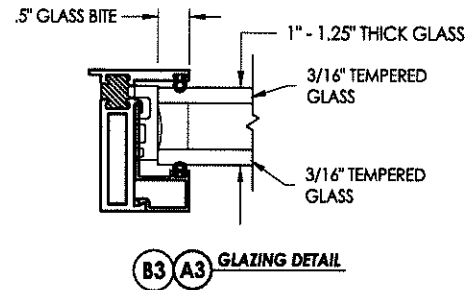
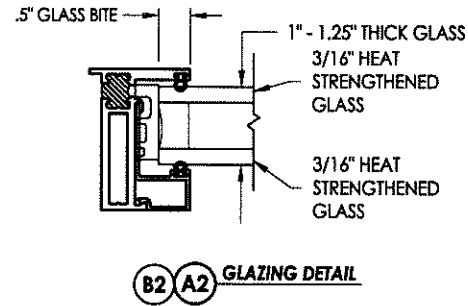
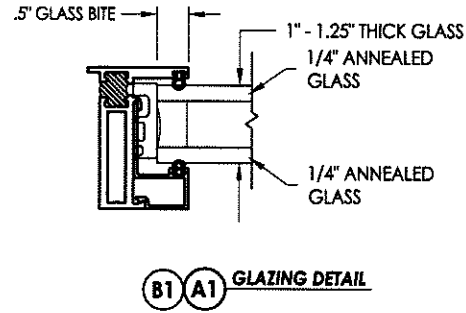
TESTED IMPACT GLAZING

TEST REPORTS: TEL 01991028, TEL 01991058, TEL 01991059



NON-IMPACT GLAZING

VERIFIED PER ASTM E1300



PRODUCT: FLEETWOOD KONA (w/ WESTWOOD)		PART OR ASSEMBLY: GLAZING DETAILS	
NO.	DATE	REVISIONS	BY
 RW BUILDING CONSULTANTS, INC. 813.659.9197			
DATE: 6-11-14			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: NA			
SHEET 1 OF 1			

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Glass Load Resistance Report -- FLEETWOOD NON-IMPACT GLASS COMPARISON

Glazing Information

Edge Supports: 4 Sides
Glazing Angle: 90°
Lite Dimensions:
Width: 33.5 in.
Height: 76.1 in.

Project Details

Project Name: FLEETWOOD NON-IMPACT GLASS COMPARISON
Location: PF 1731
Comments: TESTED IMPACT GLASS
"A" GLAZING

Glass Construction (Rectangular)

Double Glazed Insulating Unit	Air Space: 0.5 in.
Outboard Lite: { Fully Tempered }	Inboard Lite: { Annealed }
Nominal Thickness: 3/16 in.	Interlayer Type: SentryGlas® Plus
	Outboard Ply Thickness: 1/8 in.
	Interlayer Thickness: 0.09 in.
	Inboard Ply Thickness: 1/8 in.
	Nominal Thickness: 1/4 in.

Short Load Duration, Resistance, and Deflection Data

Load (~ 3 sec.):	65.0 psf
Load Resistance:	104 psf
Approximate center of glass deflection:	0.37 in.

Conclusion

Based on your design information, the load resistance is greater than or equal to the specified loading.

Statement of Compliance

Procedures followed in determining the resistance of this window glass are in accordance with ASTM E1300-04.

This analysis uses theoretical load share factors different from ASTM E1300-04.

Disclaimer:

This software can be used to determine the load resistance of specified glass types exposed to uniform lateral loads of short or long duration subject to the following conditions:

- The glass is free of edge and surface damage and has been properly glazed in the opening in conformance with the manufacturer's recommendations.
- Procedures exist to determine load resistance for rectangular glass assemblies that are:
 - a. Continuously supported along all four edges,
 - b. Continuously supported along three edges,
 - c. Continuously supported along two parallel edges, and
 - d. Continuously supported along one edge.
- The software user has the responsibility of selecting the correct procedures for the required application from the software.
- The stiffness of members supporting any glass edge shall be sufficient that under design load, edge deflections shall not exceed $L/175$, where L denotes that length of the supported edge.
- The manufacturer states that the Safety Plus II 0.090 Polyurethane Large Missile Resistant interlayer is comparable to the PVB interlayer.
- The non-factored load values for laminated glass are representative of test data and calculations performed for an interlayer at a temperature of 50° C (122° F).

For other limiting conditions that may apply, refer to Section 5 of ASTM E1300 and local building codes.

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Prepared by:  on 6/25/2014
LFS

Glass Load Resistance Report -- FLEETWOOD NON-IMPACT GLASS COMPARISON

Glazing Information

Edge Supports: 4 Sides
Glazing Angle: 90°
Lite Dimensions:
Width: 57.0 in.
Height: 34.0 in.

Project Details

Project Name: FLEETWOOD NON-IMPACT GLASS COMPARISON
Location: PF 1731
Comments: TESTED IMPACT GLASS
"B" GLAZING

Glass Construction (Rectangular)

Single Glazed Lite { Annealed }
Interlayer Type: SentryGlas® Plus
Outboard Ply Thickness: 1/8 in.
Interlayer Thickness: 0.09 in.
Inboard Ply Thickness: 1/8 in.
Nominal Thickness: 1/4 in.

Short Load Duration, Resistance, and Deflection Data

Load (~ 3 sec.): 65.0 psf
Load Resistance: 83.1 psf
Approximate center of glass deflection: 0.34 in.

Conclusion

Based on your design information, the load resistance is greater than or equal to the specified loading.

Statement of Compliance

Procedures followed in determining the resistance of this window glass are in accordance with ASTM E1300-04.

This analysis uses theoretical load share factors different from ASTM E1300-04.

Disclaimer:

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- The glass is free of edge and surface damage and has been properly glazed in the opening in conformance with the manufacturer's recommendations.
- Procedures exist to determine load resistance for rectangular glass assemblies that are:
 - a. Continuously supported along all four edges,
 - b. Continuously supported along three edges,
 - c. Continuously supported along two parallel edges, and
 - d. Continuously supported along one edge.
- The software user has the responsibility of selecting the correct procedures for the required application from the software.
- The stiffness of members supporting any glass edge shall be sufficient that under design load, edge deflections shall not exceed $L/175$, where L denotes that length of the supported edge.
- The manufacturer states that the Safety Plus II 0.090 Polyurethane Large Missile Resistant interlayer is comparable to the PVB interlayer.
- The non-factored load values for laminated glass are representative of test data and calculations performed for an interlayer at a temperature of 50° C (122° F).

For other limiting conditions that may apply, refer to Section 5 of ASTM E1300 and local building codes.

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Prepared by:  on 6/17/2014
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Glass Load Resistance Report -- FLEETWOOD NON-IMPACT GLASS COMPARISON

Glazing Information

Edge Supports: 4 Sides
Glazing Angle: 90°
Lite Dimensions:
Width: 33.5 in.
Height: 60.5 in.

Project Details

Project Name: FLEETWOOD NON-IMPACT GLASS COMPARISON
Location: PF 1731
Comments: NON-IMPACT COMPARABLE GLASS
1/4" ANNEALED "A1" GLAZING

Glass Construction (Rectangular)

Double Glazed Insulating Unit Air Space: 0.5 in.
Outboard Lite: { Annealed } Inboard Lite: { Annealed }
Nominal Thickness: 1/4 in. Nominal Thickness: 1/4 in.

Short Load Duration, Resistance, and Deflection Data

Load (~ 3 sec.): 65.0 psf
Load Resistance: 105 psf
Approximate center of glass deflection: 0.25 in.

Conclusion

Based on your design information, the load resistance is greater than or equal to the specified loading.

Statement of Compliance

Procedures followed in determining the resistance of this window glass are in accordance with ASTM E1300-04.

Disclaimer:

This software can be used to determine the load resistance of specified glass types exposed to uniform lateral loads of short or long duration subject to the following conditions:

- The glass is free of edge and surface damage and has been properly glazed in the opening in conformance with the manufacturer's recommendations.
- Procedures exist to determine load resistance for rectangular glass assemblies that are:
 - a. Continuously supported along all four edges,
 - b. Continuously supported along three edges,
 - c. Continuously supported along two parallel edges, and
 - d. Continuously supported along one edge.
- The software user has the responsibility of selecting the correct procedures for the required application from the software.
- The stiffness of members supporting any glass edge shall be sufficient that under design load, edge deflections shall not exceed $L/175$, where L denotes that length of the supported edge.
- The manufacturer states that the Safety Plus II 0.090 Polyurethane Large Missile Resistant interlayer is comparable to the PVB interlayer.

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LFS

Glass Load Resistance Report -- FLEETWOOD NON-IMPACT GLASS COMPARISON

Glazing Information

Edge Supports: 4 Sides
Glazing Angle: 90°
Lite Dimensions:
Width: 34.0 in.
Height: 57.0 in.

Project Details

Project Name: FLEETWOOD NON-IMPACT GLASS COMPARISON
Location: PF 1731
Comments: NON-IMPACT COMPARABLE GLASS
1/4" ANNEALED "B1" GLAZING

Glass Construction (Rectangular)

Double Glazed Insulating Unit	Air Space: 0.5 in.
Outboard Lite: { Annealed }	Inboard Lite: { Annealed }
Nominal Thickness: 1/4 in.	Nominal Thickness: 1/4 in.

Short Load Duration, Resistance, and Deflection Data

Load (~ 3 sec.):	65.0 psf
Load Resistance:	111 psf
Approximate center of glass deflection:	0.24 in.

Conclusion

Based on your design information, the load resistance is greater than or equal to the specified loading.

Statement of Compliance

Procedures followed in determining the resistance of this window glass are in accordance with ASTM E1300-04.

Disclaimer:

This software can be used to determine the load resistance of specified glass types exposed to uniform lateral loads of short or long duration subject to the following conditions:

- The glass is free of edge and surface damage and has been properly glazed in the opening in conformance with the manufacturer's recommendations.
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 - a. Continuously supported along all four edges,
 - b. Continuously supported along three edges,
 - c. Continuously supported along two parallel edges, and
 - d. Continuously supported along one edge.
- The software user has the responsibility of selecting the correct procedures for the required application from the software.
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Glass Load Resistance Report -- FLEETWOOD NON-IMPACT GLASS COMPARISON

Glazing Information

Edge Supports: 4 Sides
Glazing Angle: 90°
Lite Dimensions:
Width: 34.0 in.
Height: 76.1 in.

Project Details

Project Name: FLEETWOOD NON-IMPACT GLASS COMPARISON
Location: PF 1731
Comments: NON-IMPACT COMPARABLE GLASS
3/16" HEAT STRENGTHENED "A2" GLAZING

Glass Construction (Rectangular)

Double Glazed Insulating Unit	Air Space: 0.5 in.
Outboard Lite: { Heat Strengthened }	Inboard Lite: { Heat Strengthened }
Nominal Thickness: 3/16 in.	Nominal Thickness: 3/16 in.

Short Load Duration, Resistance, and Deflection Data

Load (~ 3 sec.):	65.0 psf
Load Resistance:	125 psf
Approximate center of glass deflection:	0.46 in.

Conclusion

Based on your design information, the load resistance is greater than or equal to the specified loading.

Statement of Compliance

Procedures followed in determining the resistance of this window glass are in accordance with ASTM E1300-04.

Disclaimer:

This software can be used to determine the load resistance of specified glass types exposed to uniform lateral loads of short or long duration subject to the following conditions:

- The glass is free of edge and surface damage and has been properly glazed in the opening in conformance with the manufacturer's recommendations.
- Procedures exist to determine load resistance for rectangular glass assemblies that are:
 - a. Continuously supported along all four edges,
 - b. Continuously supported along three edges,
 - c. Continuously supported along two parallel edges, and
 - d. Continuously supported along one edge.
- The software user has the responsibility of selecting the correct procedures for the required application from the software.
- The stiffness of members supporting any glass edge shall be sufficient that under design load, edge deflections shall not exceed $L/175$, where L denotes that length of the supported edge.
- The manufacturer states that the Safety Plus II 0.090 Polyurethane Large Missile Resistant interlayer is comparable to the PVB interlayer.

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Glass Load Resistance Report -- FLEETWOOD NON-IMPACT GLASS COMPARISON

Glazing Information

Edge Supports: 4 Sides
Glazing Angle: 90°
Lite Dimensions:
Width: 34.0 in.
Height: 76.1 in.

Project Details

Project Name: FLEETWOOD NON-IMPACT GLASS COMPARISON
Location: PF 1731
Comments: NON-IMPACT COMPARABLE GLASS
3/16" TEMPERED "A3" GLAZING

Glass Construction (Rectangular)

Double Glazed Insulating Unit	Air Space: 0.5 in.
Outboard Lite: { Fully Tempered }	Inboard Lite: { Fully Tempered }
Nominal Thickness: 3/16 in.	Nominal Thickness: 3/16 in.

Short Load Duration, Resistance, and Deflection Data

Load (~ 3 sec.):	65.0 psf
Load Resistance:	> 209 psf
Approximate center of glass deflection:	0.46 in.

Conclusion

Based on your design information, the load resistance is greater than or equal to the specified loading.

Statement of Compliance

Procedures followed in determining the resistance of this window glass are in accordance with ASTM E1300-04.

Disclaimer:

This software can be used to determine the load resistance of specified glass types exposed to uniform lateral loads of short or long duration subject to the following conditions:

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 - a. Continuously supported along all four edges,
 - b. Continuously supported along three edges,
 - c. Continuously supported along two parallel edges, and
 - d. Continuously supported along one edge.
- The software user has the responsibility of selecting the correct procedures for the required application from the software.
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