NFRC 102-2010 THERMAL PERFORMANCE
TEST REPORT

Rendered to:

COEUR D' ALENE WINDOW CO

SERIES/MODEL: 3000
TYPE: Fixed

Summary of Results			
Standardized Thermal Transmittance (U-Factor)			0.26
Unit Size:		47" x 59-1/8" (1194 mm x 1502 mm) (Model Size)	
Layer 1:	DS	Cardinal 366 (e=0.022*, #2)	
Gap:	0.50"	SS-D: Stainless Steel Spacer	90% Argon*
Layer 2:	DS	Clear	

Reference must be made to Report No. D9209.02-901-46, dated 08/07/14 for complete test specimen description and data.

NFRC 102-2010 THERMAL PERFORMANCE TEST REPORT

Rendered to:

COEUR D' ALENE WINDOW CO
3808 N Sullivan
Spokane Valley, Washington 99216

Report Number:	D9209.02-901-46
Test Date:	07/12/14
Report Date:	08/07/14

Test Sample Identification:

Series/Model: 3000

Type: Fixed

Overall Size: 47" x 59-1/8" (1194 mm x 1502 mm) (Model Size)
NFRC Standard Size: 47.2" x 59.1" (1200 mm wide x 1500 mm high)

Test Sample Submitted by: Client

Test Sample Submitted for: Validation for Initial Certification (Production Line Unit) & Plant Qualification

This report is a reissue of the original Report No. D9209.01-901-46. This report is reissued in the name of Coeur d' Alene Window Co through written authorization of Royal Window and Door Profiles Plant 14.

Test Procedure: U-factor tests were performed in a Guarded Hot Box in accordance with NFRC 102-2010, *Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems* .

Test Results Summary:

Standardized U-factor (U_{st}): 0.26 Btu/hr·ft^2·F (CTS Method)

Test Sample Description:

Frame:

Material:	VY: Vinyl		
Size:	47" x 59-1/8" (Model Size)		
Daylight Opening:	44-1/8" x 56-1/4"	**Glazing Method:**	Exterior
Exterior Color:	White	**Exterior Finish:**	Vinyl
Interior Color:	White	**Interior Finish:**	Vinyl
Corner Joinery:	Mitered / Welds / Unsealed		

Glazing Information:

Layer 1:	DS	Cardinal 366 (e=0.022*, #2)	
Gap:	0.50"	SS-D: Stainless Steel Spacer	90% Argon*
Layer 2:	DS	Clear	
Gas Fill Method:		Evacuated Chamber*	

**Stated per Client/Manufacturer*
N/A Non-Applicable

Test Sample Description: (Continued)

Weatherstripping:

Description	Quantity	Location
No weatherstrip		

Hardware:

Description	Quantity	Location
No hardware		

Drainage:

Drainage Method	Size	Quantity	Location
Weep	1/2" x 1/4"	2	Sill, exterior face
Weep	1/2" x 1/8"	2	Sill, glazing pocket

Thermal Transmittance (U-factor)

Measured Test Data

Heat Flows

1. Total Measured Input into Metering Box (Q_{total})	528.81	Btu/hr
2. Surround Panel Heat Flow (Q_{sp})	149.49	Btu/hr
3. Surround Panel Thickness	4.00	inches
4. Surround Panel Conductance	0.0570	Btu/hr·ft^2·F
5. Metering Box Wall Heat Flow (Q_{mb})	-2.12	Btu/hr
6. EMF vs Heat Flow Equation (equivalent information)	0.0038*EMF + 0.000	
7. Flanking Loss Heat Flow (Q_{fl})	18.23	Btu/hr
8. Net Specimen Heat Loss (Q_s)	363.21	Btu/hr

Areas

1. Test Specimen Projected Area (A_s)	19.30	ft^2
2. Test Specimen Interior Total (3-D) Surface Area (A_h)	21.22	ft^2
3. Test Specimen Exterior Total (3-D) Surface Area (A_c)	20.97	ft^2
4. Metering Box Opening Area (A_{mb})	58.46	ft^2
5. Metering Box Baffle Area (A_{b1})	50.40	ft^2
6. Surround Panel Interior Exposed Area (A_{sp})	39.16	ft^2

Test Conditions

1. Average Metering Room Air Temperature (t_h)	69.80	F
2. Average Cold Side Air Temperature (t_c)	-0.40	F
3. Average Guard/Environmental Air Temperature	70.00	F
4. Metering Room Average Relative Humidity	9.36	%
5. Metering Room Maximum Relative Humidity	9.83	%
6. Metering Room Minimum Relative Humidity	9.12	%
7. Measured Cold Side Wind Velocity (Parallel Flow)	3.30	mph
8. Measured Warm Side Wind Velocity (Parallel Flow)	0.61	mph
9. Measured Static Pressure Difference Across Test Specimen	0.00" ± 0.04"H_2O	

Average Surface Temperatures

1. Metering Room Surround Panel	67.45	F
2. Cold Side Surround Panel	0.48	F

Results

1. Thermal Transmittance of Test Specimen (U_s)	0.27	Btu/hr·ft^2·F
2. Standardized Thermal Transmittance of Test Specimen (U_{st})	0.26	Btu/hr·ft^2·F

Thermal Transmittance (U-factor)

Calculated Test Data

CTS Method

1.	Warm Side Emittance of Glass (e_1)	0.84	
2.	Cold Side Emittance of Glass	0.84	
3.	Warm Side Frame Emittance*	0.90	
4.	Cold Side Frame Emittance*	0.90	
5.	Warm Side Sash/Panel/Vent Emittance*	N/A	
6.	Cold Side Sash/Panel/Vent Emittance*	N/A	
7.	Warm Side Baffle Emittance (e_{b1})	0.92	
8.	Cold Side Baffle Emittance (e_{b2})	0.92	
9.	Equivalent Warm Side Surface Temperature	55.92	F
10.	Equivalent Cold Side Surface Temperature	3.24	F
11.	Warm Side Baffle Surface Temperature	69.06	F
12.	Cold Side Baffle Surface Temperature	0.04	F
13.	Measured Warm Side Surface Conductance (h_h)	1.36	Btu/hr·ft^2·F
14.	Measured Cold Side Surface Conductance (h_c)	5.17	Btu/hr·ft^2·F
15.	Test Specimen Thermal Conductance (C_s)	0.36	Btu/hr·ft^2·F
16.	Convection Coefficient (K_c)	0.33	Btu/(hr·ft^2·F$^{1.25}$)
17.	Radiative Test Specimen Heat Flow (Q_{r1})	193.54	Btu/hr
18.	Conductive Test Specimen Heat Flow (Q_{c1})	169.68	Btu/hr
19.	Radiative Heat Flux of Test Specimen (q_{r1})	10.03	Btu/hr·ft^2·F
20.	Convective Heat Flux of Test Specimen (q_{c1})	8.79	Btu/hr·ft^2·F
21.	Standardized Warm Side Surface Conductance (h_{sth})	1.21	Btu/hr·ft^2·F
22.	Standardized Cold Side Surface Conductance (h_{stc})	5.28	Btu/hr·ft^2·F
23.	Standardized Thermal Transmittance (U_{st})	0.26	Btu/hr·ft^2·F

Test Duration

1. The environmental systems were started at 12:40 hours, 07/11/14.
2. The test parameters were considered stable for two consecutive four hour test periods from 23:15 hours, 07/11/14 to 07:15 hours, 07/12/14.
3. The thermal performance test results were derived from 03:15 hours, 07/12/14 to 07:15 hours, 07/12/14.

The reported Standardized Thermal Transmittance (Ust) was determined using CTS Method, per Section 8.2(A) of NFRC 102.

**Stated per NFRC 101*

Glazing Deflection:

	Frame
Edge Gap Width	0.50"
Estimated center gap width upon receipt of specimen in laboratory (after stabilization)	0.47"
Center gap width at laboratory ambient conditions on day of testing	0.47"
Center gap width at test conditions	0.36"

Glass collapse determined using a digital glass and air space meter

The sample was inspected for the formation of frost or condensation, which may influence the surface temperature measurements. The sample showed no evidence of condensation/frost at the conclusion of the test.

"This test method does not include procedures to determine the heat flow due to either air movement through the specimen or solar radiation effects. As a consequence, the thermal transmittance results obtained do not reflect performances which are expected from field installations due to not accounting for solar radiation, air leakage effects, and the thermal bridge effects that have the potential to occur due to the specific design and construction of the fenestration system opening. The latter can only be determined by in-situ measurements. Therefore, it is important to recognize that the thermal transmittance results obtained from this test method are for ideal laboratory conditions and should only be used for fenestration product comparisons and as input to thermal performance analyses which also include solar, air leakage and thermal bridge effects."

The test sample was installed in a vertical orientation, the exterior of the specimen was exposed to the cold side. The direction of heat transfer was from the interior (warm side) to the exterior (cold side) of the specimen. The ratings were rounded in accordance to NFRC 601, NFRC Unit and Measurement Policy. The data acquisition frequency is 5 minutes.

ANSI/NCSL Z540-2-1997 type B uncertainty for this test was 4.54%.

Required annual calibrations for the Architectural Testing Inc. 'thermal test chamber' (ICN 63449) in Kent, Washington were last conducted in May 2014 in accordance with Architectural Testing Inc. calibration procedure. A Metering Box Wall Transducer and Surround Panel Flanking Loss Characterization was performed May 2014.

This report is a reissue of the original Report No. D9209.01-901-46. This report is reissued in the name of Coeur d' Alene Window Co through written authorization of Royal Window and Door Profiles Plant 14.

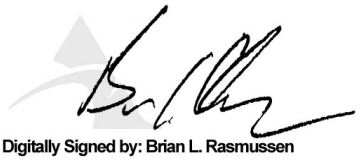
"Ratings included in this report are for submittal to an NFRC licensed IA for certification purposes and are not meant to be used for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) are to be used for labeling purposes."

Architectural Testing, Inc. will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Architectural Testing, Inc. for the entire test record retention period. The test record retention end date for this report is July 12, 2018.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.

Tested By:



Brian L. Rasmussen
Technician
Individual-In-Responsible-Charge

Reviewed By:

Kenny C. White
Laboratory Manager

BLR:ss
D9209.02-901-46

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A:	CTS Calibration Data (1)
Appendix-B:	Surround Panel Wiring Diagram (1)
Appendix-C:	Baffle Wiring Diagram (1)
Appendix-D:	Submittal Form and Drawings (6)

IAS ACCREDITED	Architectural Testing, Inc. is accredited by the International Accreditation Service (IAS) under the specific test methods listed under lab code TL-144, in accordance with the recognized International Standard ISO/IEC 17025:2005. The laboratory's accreditation or test report in no way constitutes or implies product certification, approval, or endorsement by IAS.

Revision Log

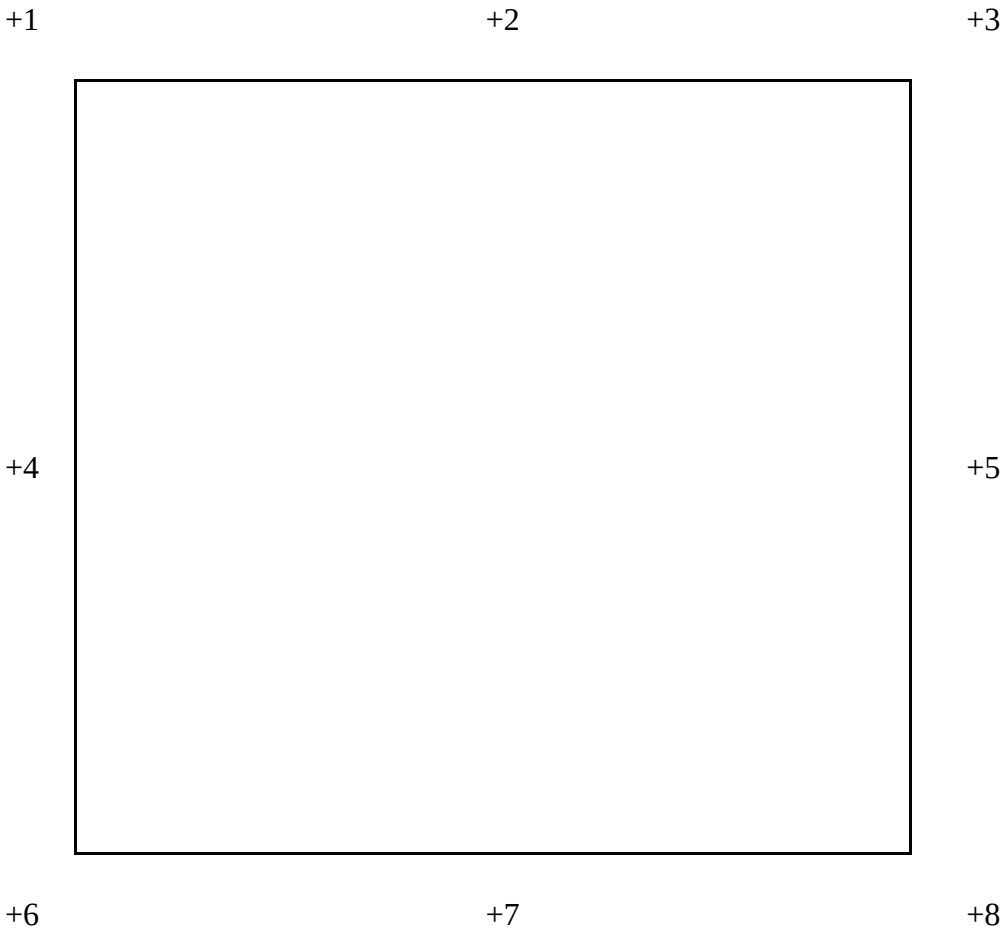
Rev. #	Date	Page(s)	Revision(s)
0	08/07/14	All	Original Report Issue - Reissue of Report No. D9209.01-301-46 in the name of Coeur d' Alene Window Co.

This report produced from controlled document template ATI 00025(a), revised 03/14/2013.

Appendix A: CTS Calibration Data

1.	CTS Test Date	04/12/13	
2.	CTS Size	19.38	ft^2
3.	CTS Glass/Core Conductance	0.40	$Btu/hr \cdot ft^2 \cdot F$
4.	Warm Side Air Temperature	69.80	F
5.	Cold Side Air Temperature	-0.40	F
6.	Warm Side Average Surface Temperature	54.87	F
7.	Cold Side Average Surface Temperature	3.57	F
8.	Convection Coefficient (K_c)	0.33	$Btu/(hr \cdot ft^2 \cdot F^{1.25})$
9.	Measured Cold Side Surface Conductance (h_c)	5.17	$Btu/hr \cdot ft^2 \cdot F$
10.	Measured Thermal Transmittance	0.29	$Btu/hr \cdot ft^2 \cdot F$

Appendix B: Surround Panel Wiring Diagram



Appendix C: Baffle Wiring Diagram

+1	+2	+3	+4	+5	+6
+7	+8	+9	+10	+11	+12
+13	+14	+15	+16	+17	+18
+19	+20	+21	+22	+23	+24
+25	+26	+27	+28	+29	+30

Appendix D: Submittal Form and Drawings

NFRC PRODUCT CERTIFICATION PROGRAM

Submittal Form for Test Samples

For use by manufacturers, lineal suppliers and fabricators

National Fenestration Rating Council®

1. Information on Production of the Test Sample (complete ALL fields):

Manufacturer: Coeur d'Alene Window Co Date of sample manufacture: 6/2/14

Plant Address where manufactured: 3808 N Sullivan, Building 18i

City: Spokane Valley State: WA Zip Code: 99216

Name of IA: NAMI Phone: 509-340-0705 Fax: 509-279-0186

2. Product Information (complete ALL fields):

Product Line ID (CPD) No.: 3000 Product/Operator Type (Table 4-3 of NFRC 100): Picture Window

Series/Model: 3000 SERIES PICTURE WINDOW

3. Test sample is being submitted for (select ONE):

a. ☐ Validation for Initial Certification (prototype only) no plant qualification

b. ☒ Validation for Initial Certification (production line unit) & plant qualification

c. ☐ Validation for Recertification (production line unit) & plant qualification

d. ☐ Plant Qualification Only (production line unit)

I, Pat Collins, as the designated agent for Coeur d'Alene Window Company

do hereby attest that the foregoing information is true to the best of my information, knowledge, and belief. Further, if the unit is identified in Section 3 as a production line unit, I hereby authorize the NFRC-accredited testing laboratory to send a copy of the test report to the IA identified above for plant qualification purposes pursuant to the NFRC Product Certification Program..

Signature: [signature] Date: 7-17-14

FOR LABORATORY USE ONLY

1. Laboratory: Architectural Testing, Inc
2. Date Sample Received: 6/20/14 File number ID: D9209
3. Date Sample Tested: 7/11/14 By: Brian Rasmussen
4. Modifications made: —
5. Reason for non-testing of sample unit: —

[*Note*: If the sample submitted can not be tested due to damage prior to testing, a new sample and new form shall be submitted to the testing laboratory. Both forms shall be submitted to the IA when the testing is completed.]

3300 Series Picture BOM

Part Number	Description	Vendor	Comments
305-D10	Frame	Royal	
305-D11	Frame Block	Royal	Alternate
305-D12	Frame Flush Fin	Royal	Alternate
R1994	Glazing Bead	Royal	
6554	Setting Block Frame	Mikron	
305-D23R	T-Bar	Royal	
VG1216W-FC515	Glazing Tape	Echo Tape	

Architectural Testing

Test sample complies with these details.
Deviations are noted.

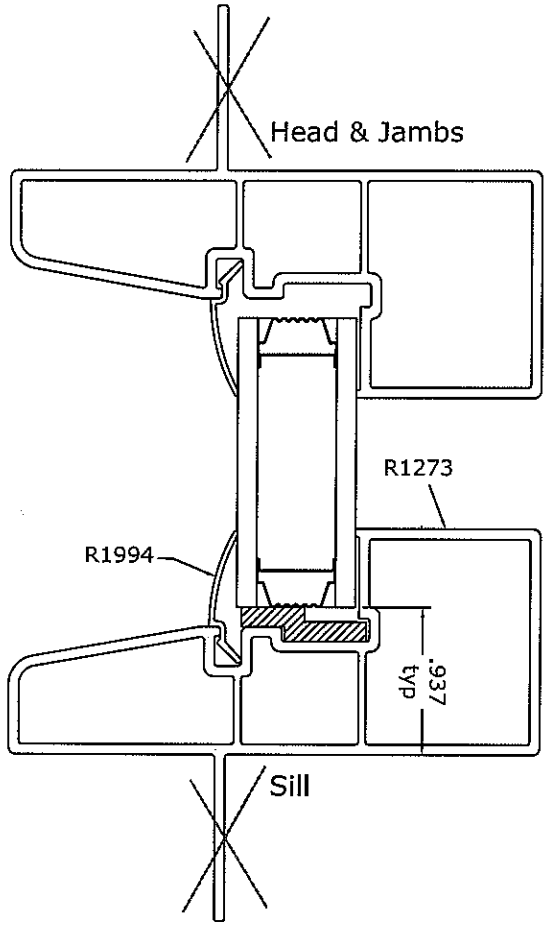
Report# D9209

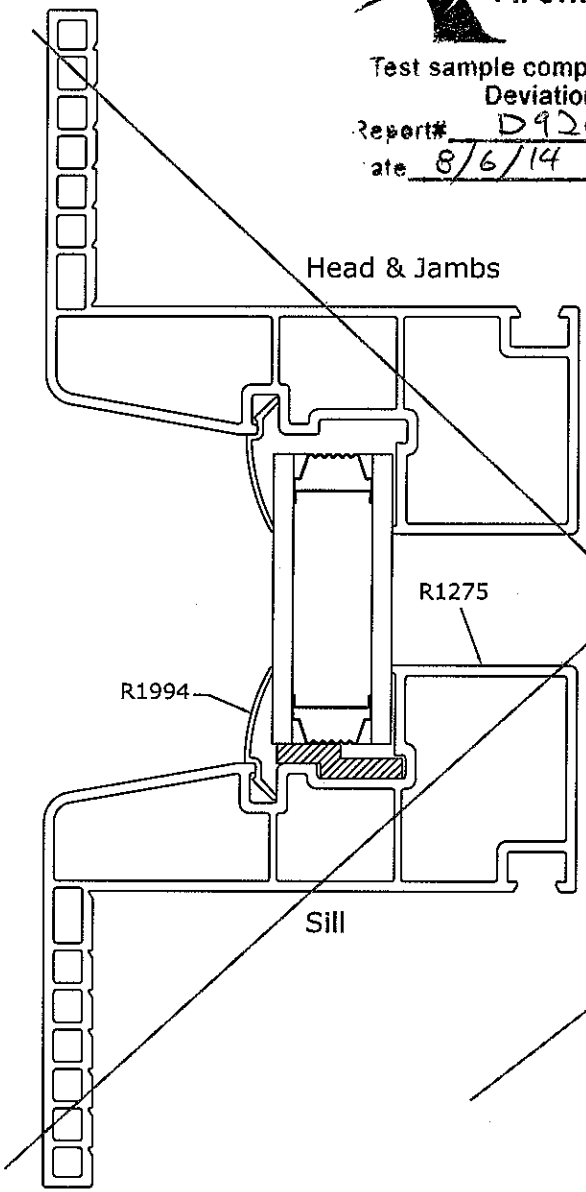
Date 8/6/14 Tech BCR

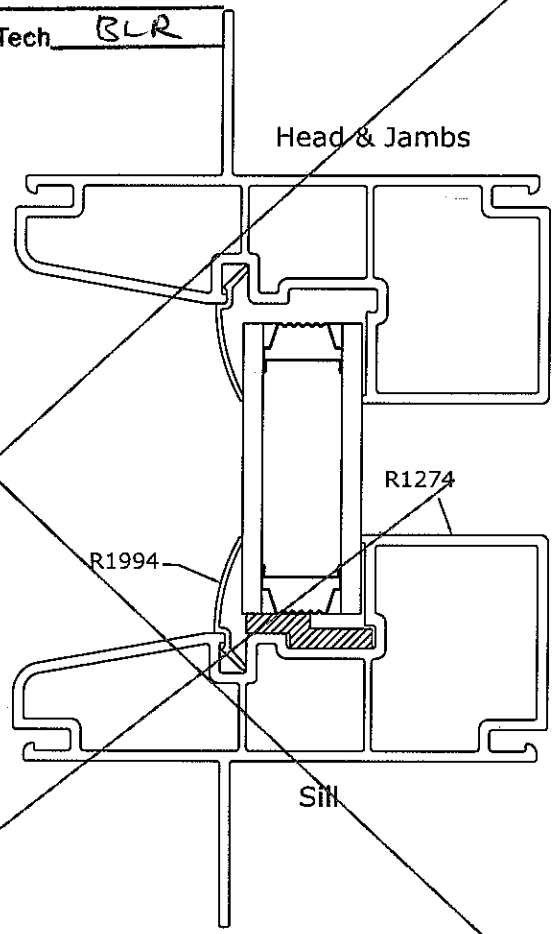
Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# D9209
Date 8/6/14 Tech BLR







ROYAL Building Products

111 Royal Group Crescent
Woodbridge, Ontario
Canada L4H 1X9

Die#

Sys No. 305-L1270-PIC_H_V

Layout Name: PIC_H_V 305_CdA_Sections_all_export_ati_7-21-2014

Drawn by: gmc

SCALE 0.875:1

ACAD#:

CUSTOMER Coeur d'Alene Windows

PROJECT: 305_CdA

AREA .000

WT/FT .000

DATE: July 21, 2014

TITLE *Fixed Window Section Slice*

WALL TOLERANCES:		ANGULAR TOLERANCES:	
0.000–0.099	±0.006	x.x	±1/2°

WALL THICKNESS:		SYMBOL:	
Exterior	.000	SHARP	☒
Interior	.000	FLEX	▨
■	.xxx	CRITICAL	▭
▲	.xxx	EXPOSED	-----

LINEAR TOLERANCES:	
0.000–0.999	±0.010
1.000–1.999	±0.015
2.000–3.999	±0.020

Ref xxx

RADII:	
UNMARKED	0.015
a	
b	
c	
f	FULL
s	SHARP

Architectural Testing

DETAIL A
SCALE: 2:1

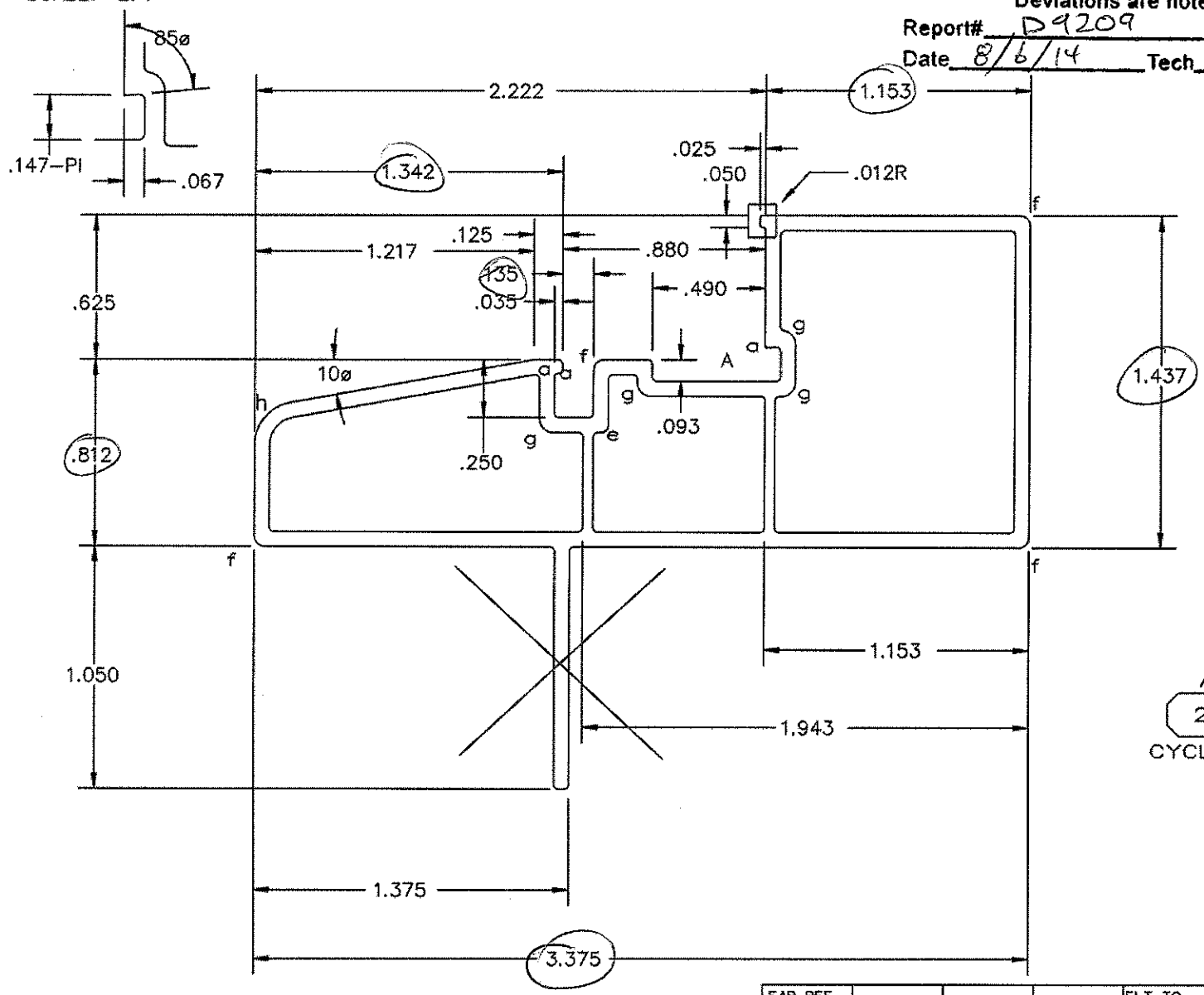
SCALE: 1.5:1

Test sample complies with these details.
Deviations are noted.

Report# D9209

Date 8/6/14 Tech BLR

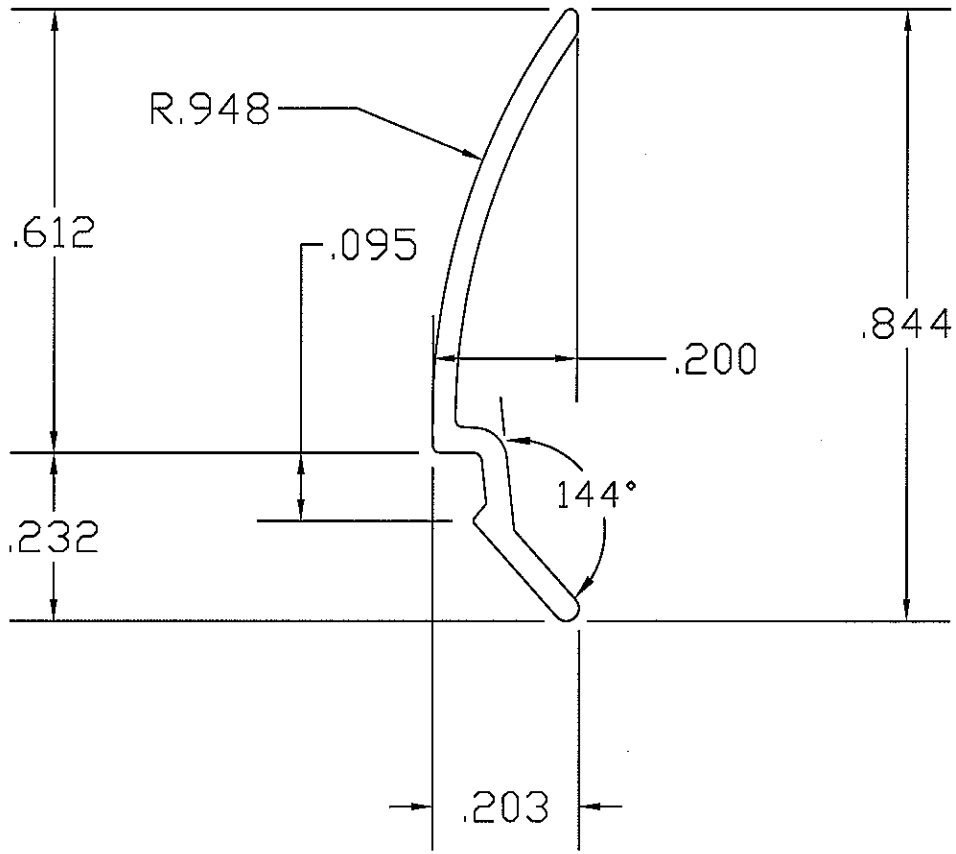
a=0.006R
b=0.012R
c=0.015R
d=0.020R
e=0.030R
f=0.045R
g=0.060R
h=0.187R



APPROVED
23–DEC–97
CYCLOID DESIGNS

FAB REF				FIT TO	305–D49		
305–F5L				305–D35	291–D7		

CYCLOID DESIGNS	DWG: 305–D10	DATE: 18–DEC–97	© 1997 COPYRIGHT ROYAL SIERRA INC SPARKS, NEVADA ALL RIGHTS RESERVED
TITLE: FIXED FRAME W/FIN: 3–3/8"	RS1273		EXTERNAL WALL: 0.065 INTERNAL WALL: 0.045 CORNER TYP: 0.020R WEIGHT: 0.476 LB/FT



Customer Approval
By: _____
Date: _____

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# D9209
Date 8/6/14 Tech BLR

Actual Size

REV #	DATE	REVISION NOTES

External Walls = .065
Internal Walls = ..045

Layout Name: Base
Drawn BY: gmc
SCALE 4:1

DATE: 4-25-08
ACAD#: R1994-373-D26-BDS

100A Royal Group Crescent
Woodbridge, Ontario
Canada L4L 8Z7

CUSTOMER RSE

PROJECT: Sierra Classic SlimLine

TITLE ***Clam Shell Bead***

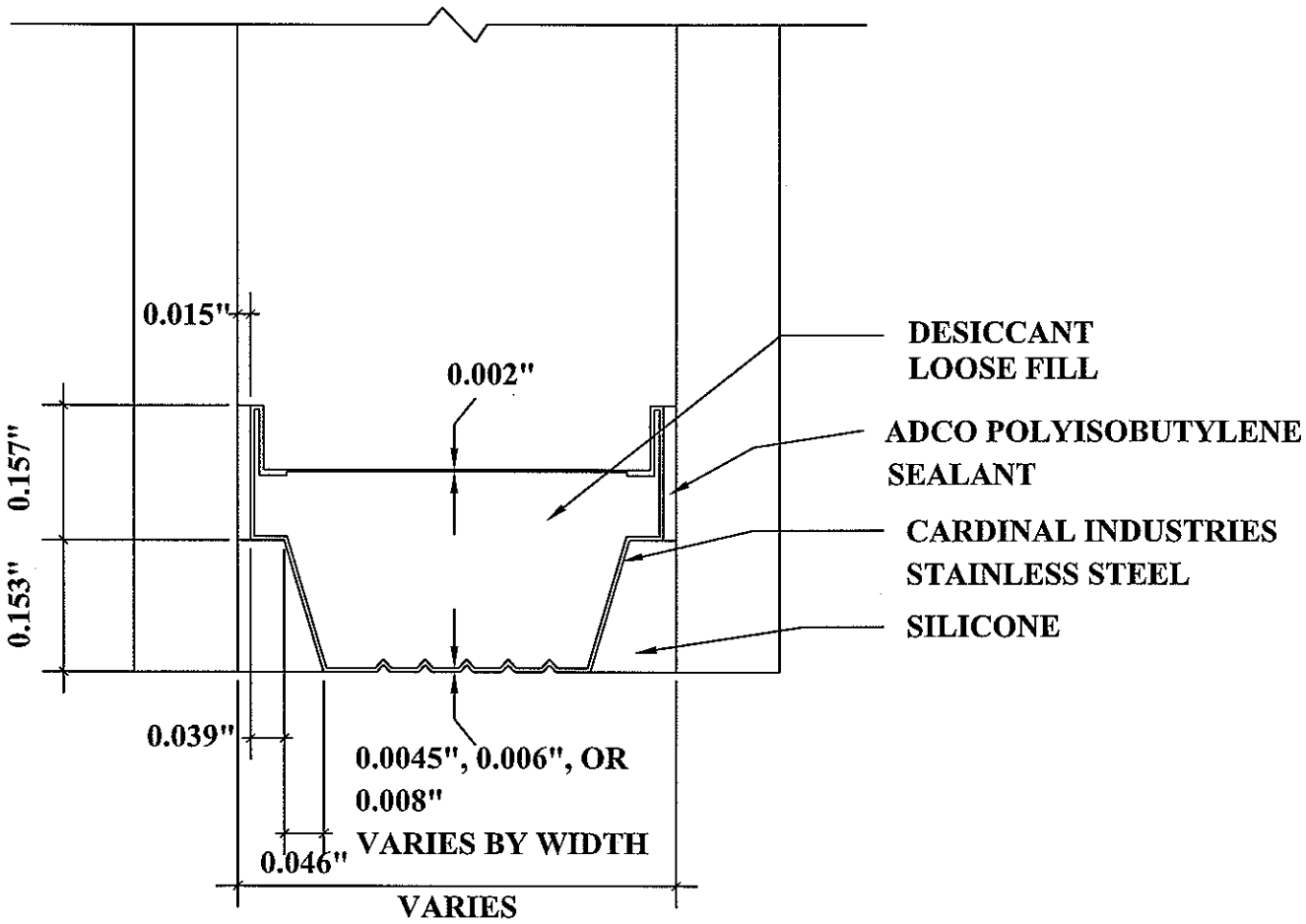
AREA = .0323 | WT/FT = ..020

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# D9709

Date 8/6/14 Tech BCR



DETAIL FOR THERMAL MODELING OF
CARDINAL ENDUR SPACER (SS-D)