Test Method: **CSA A440-00 Windows**

Manufacturer/Client: Oasis Windows Ltd.	Manufacturer/Client Address: 109-12889 84th Street Surrey, British Columbia Canada
Job Number: W410-6	

Sample Number: 307 Series Horizontal Sliding Window	Description: Width: 63 5/8", Height: 39 5/8" See report for details.
Date Received: July 2006	

Test Technician(s): Adam Perczyk	Testing Performed at: Quality Auditing Institute Ltd 2825 Murray Street Port Moody, BC Canada, V3H 1X3
	Date(s) of Testing: July 28, 2006

REPORT NUMBER W410-6

Edition 1: August 28, 2006
Contents: Pages 1-15, A1-A10

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List of Tables

Sampling Plan/Procedures:

One unused, glazed 307 Series Horizontal Sliding Window complete with all hardware, was provided by the client and examined at the QAI laboratory, then tested on July 28, 2006 as being a typical sample of the model covered in this report.

Test Equipment:

Table 1: Test Equipment

Equipment Used:	QAI Laboratory Code:	Calibration Due:
Omega FL910G (0-2.7 cfm) Air Flow Meter	FLOW3	October 2006
Omega FL911G (0-10.2 cfm) Air Flow Meter	FLOW4	October 2006
Dwyer Manometer (0-250 kPa)	MANOMETER1	Adjusted to zero before test
Dwyer Manometer (0-1500 kPa)	MANOMETER2	Adjusted to zero before test
Dwyer Manometer (0-6000 kPa)	MANOMETER3	Adjusted to zero before test
Tuf-E-Nuf Measuring Tape	LENGTH1	October 2008
Spray Rack	SPRAYRACK1	Verified using test procedure described in ASTM Standard E547.
Mititoyo Calipers	CALIPER1	Verified with gauge block before use
Gauge block (0.125", 0.25", 0.5")	GAUGEBLOCK1 GAUGEBLOCK2 GAUGEBLOCK3	May 2007
Dial Barometer	BAROMETER1	August 2007
Thermocouple	TC-1	June 2007

Test Conditions:

Quality Auditing Institute Ltd. (QAI) was retained by Oasis Windows Ltd. to perform testing in accordance with the test requirements of CSA A440-00 "Windows" on a representative sample of 307 Series Horizontal Sliding Window.

This report includes the tests performed on a specimen of specific dimensions. Actual product performance may be affected by variations in the windows dimensions, assembly details and installation method. The drawings supplied by Oasis Windows were verified by QAI for the window unit tested and are shown in Appendix A.

As directed by the manufacturer, the window specimen was installed in a test buck using #8 x 1 ½" screws 8" spacing along the jambs and sill. A bead of Window and Door silicone sealant was applied to the side of the window flange mating with the surface of the wooden test buck. One full tube (750ml) of silicone was used for each installation.

The wooden test buck consisted of a 84" x 84" square, ¾" plywood surface reinforced with nominal 2" x 6" stud backing. The center of the buck was built with a rough opening fitted to the size of the test specimen in length and width, framed in by nominal 2" x 6" members to facilitate mounting of the test specimen. For each test conducted, the test specimen was leveled and set plumb in the wooden test buck.

Table 2: Test Sequence and Alterations

Test Number	Test Clause	Test	Alterations
1	10.9	Ease of Operation	None
2	10.2	Air Leakage	None
3	10.3	Water Penetration	None
4	10.4	Wind Load Resistance	None

Summary of Results:

Table 3: Test Results (Window Ratings)

Clause	Test Name	Rating
10.2	Air Tightness	A3
10.3	Water Tightness	B3
10.4	Wind Load Resistance	C3
10.5	Safety Drop	-
10.6	Blocked Operation	-
10.7	Sash Strength and Stiffness, Casement	-
10.8	Sash Strength and Stiffness, Projecting	-
10.9	Ease of Operation	PASS
10.10	Screen Strength	-
10.11	Sash Pull-Off	-
10.12	Condensation Resistance	-
10.13	Resistance to Forced Entry	-

Note: "-" indicates test was not performed

Window Components:

307 Series Horizontal Sliding Window		
Frame:	Size:	Width: 63 5/8", Height: 39 5/8" Vinyl. Part number BX307. See appendix A for drawing.
	Joints:	Mitered. Thermally welded. Corners cleaned.
Sash:	Size:	Width: 38 ½", Height: 31 ½" Vinyl. Part number BX303. See appendix A for drawing.
	Joints:	Mitered. Thermally welded. Corners cleaned.
Interlock:	Mullion:	Vinyl. Part number BX305. See appendix A for drawing. Fastened with 2 - #8 x 3" screws per end, caulked in place.
	Sash Interlock:	Vinyl. Part number BX323. Part number BX324 is equivalent except pull handle is located in a different location. See appendix A for both drawings.
	Reinforcement:	Steel U-Channel (0.060" thick x 0.75" wide x 0.70" high) placed in both sash interlock and mullion. Helton Industries part #U-340030 Steel bar fastened to vinyl member with 10 – ¾" self taping screws. Screws caulked in place.
Glazing Method:	Glazing Tape	Venture #VG116W-L819 (1/16" x 3/8") double sided foam glazing tape applied in one continuous piece with ends butted together with bead of silicone sealant.
	Glazing Bead	Vinyl. Snap on. Part number BX309.
	Setting Blocks	Dimensions: 25mm x 24mm x 3mm Poly Chlor made from 85 durometer flexible PVC 2 located under each insulated glazing unit approximately 50mm from corner of glazing
Glazing:	Overall Thickness	¾" thick (19mm) 2 glass lites – each 3mm clear annealed
	Spacer:	12.7mm (1/2") Bayform thermally broken, desiccant filled aluminum bar with polysulfide seal.
Weather-stripping	Sash:	Primary Seal (face of sash): 'Amesbury Group' part #22018745WHGF
Drainage:	Frame / Sash:	See drawing in appendix A.
Hardware:	Lock:	1 – "Full Max" cam lock #V1L10LWH Fastened with four #6 x ¾" screws
	Night Lock:	1 – "Full Max" night lock #V1L22WH fastened to left side of sash meeting rail using 2 – 5/32" aluminum tri-fold rivets #USMAD58ABSC from BC Fasteners
	Wheels:	2 sets of wheels located beneath operable sash "Full Max" part #V1R10 fastened with 4 #8 x 7/16" screws
	Sill Track	Vinyl. Part number BX357. See drawing in appendix A.
	Anti-lift Block	Vinyl. Part number BX316. See drawing in appendix A.
	Insect Screen	Not supplied with test sample

See appendix A for cross section, assembly, and dimensional specifications.

Test Specifications:

Air Tightness Test: CSA A440-00, Clause 10.2, Test Method: ASTM E283

	Laboratory Conditions	Standard Conditions
Temperature	24.0 C	20.8 C
Pressure	101.7 kPa	101.3 kPa
Air Density	1.193 kg/m^3	1.202 kg/m^3
Air Density Ratio = 0.996		

CL_{op} = Crack length of operable portion = 3.458m
CL_f = Crack length of fixed portion = 3.194m
CL_t = $Cl_{op} + CL_f$ = 6.652m

$Q_{op/A3}$ = Maximum air leakage of operable portion for A3 rating = 0.55 (m3/h)/m
Q_f = Maximum air leakage of fixed portion for fixed rating = 0.25 (m^3/h)/m
Q_c = Maximum air leakage rate for the slider to obtain A3 Rating

$$= \frac{Q_{op} \times Cl_{op} + Q_f \times CL_f}{CL_t} = 0.406 \text{ (m}^3\text{/h)/m}$$

Infiltration Results (positive pressure) @ 75 Pa

Adjusted Metered Air Flow @ 75 Pa[1]	0.356m^3/h
Crack Length	6.652 m
Air Infiltration @ 75 Pa[1] (1.57 psf)	**0.053 (m^3/h)/m**

Exfiltration Results (negative pressure) @ -75 Pa

Adjusted Metered Air Flow @ 75 Pa[1]	2.641 m^3/h
Crack Length	6.652 m
Air Exfiltration @ 75 Pa[1] (1.57 psf)	**0.397 (m^3/h)/m**

Window Air Rating Average

Air Infiltration Rate	0.053 (m^3/h)/m
Air Exfiltration Rate	0.397 (m^3/h)/m
Average Rate	**0.225 (m^3/h)/m**
Rating	**A3**

Notes: [1] +/- 2.5 Pa Instrument Precision

Alterations during Testing:

None

Water Tightness Test: CSA A440-00, Clause 10.3, Test Method: ASTM E547

Testing performed in accordance with ASTM E547 – 00. Window installed according to the manufacturers instructions for field installation in the test chamber with all operable lites in the closed and latched position. Insect screens were not supplied with the sample.

Test Results:

Pressure Differential	Time	Comments	Rating
300 Pa	5 minutes with pressure 1 minute no pressure	No water leakage	
300 Pa	5 minutes with pressure 1 minute no pressure	No water leakage	
300 Pa	5 minutes with pressure 1 minute no pressure	No water leakage	
300 Pa	5 minutes with pressure 1 minute no pressure	No water leakage	PASS B3
400 Pa	5 minutes with pressure 1 minute no pressure	No water leakage	
400 Pa	5 minutes with pressure 1 minute no pressure	No water leakage	
400 Pa	4 minutes, 25 seconds	Water leakage over sill onto interior surface	FAIL B4

Alterations during Test:

None

The test specimen obtained a B3 Rating

Wind Load Resistance Test: CSA A440-00, Clause 10.4, Test Method: ASTM E330

Testing was performed in accordance with the procedure outlined in ASTM E330 – 02. No conclusions of any kind regarding the adequacy or inadequacy of the glass in the test specimen are to be drawn from this test. Ambient conditions in the lab were 23 degrees Celsius, 102 kPa. Deflection measurements were taken at the center position of the sash interlock as well as 18" to the top and bottom of the center position. All measurements are in inches.

Try for C3 Rating:
Deflection Test: 1200 Pa (inward direction)

Dial Position	Initial Reading	Pressurized Deflection	Final Reading	Deflection
Top	0.141	0.230	-	0.089
Middle	0.491	0.724	-	0.233
Bottom	0.304	0.444	-	0.140

Deflection Test: -1200 Pa (outward direction)

Dial Position	Initial Reading	Pressurized Deflection	Final Reading	Deflection
Top	0.131	0.041	-	0.090
Middle	0.465	0.191	-	0.274
Bottom	0.280	0.083	-	0.197

Maximum allowable deflection = L/125 = 0.288"

Blow-Out Test:

Pressure (Pa)	Time (s)
1500	60
0	60
3000	10
0	60
-1500	60
0	60
-3000	10

After pressure was released, window showed no signs of breakage, permanent deformation or operational malfunction.

Alterations during Test:

None

The test specimen obtained a C3 Rating

Try for C4 Rating:
Deflection Test: 1600 Pa (inward direction)

Dial Position	Initial Reading	Pressurized Deflection	Final Reading	Deflection
Top	0.141	0.261	-	0.120
Middle	0.486	0.824	-	0.338
Bottom	0.297	0.510	-	0.213

Deflection Test: -1600 Pa (outward direction)

Dial Position	Initial Reading	Pressurized Deflection	Final Reading	Deflection
Left	0.130	0.013	-	0.117
Middle	0.467	0.095	-	0.372
Right	0.285	0.003	-	0.282

Maximum allowable deflection = L/125 = 0.288"

Blow-Out Test:

Pressure (Pa)	Time (s)
2000	60
0	60
4000	-

Glazing of the operable sash failed with static pressure at 4000 (Pa) in the inward direction.

Alterations during Test:

None

The test specimen did not obtain a C4 Rating.

Safety Drop – Vertical Sliding Windows: CSA A440-00, Clause 10.5:

Not Applicable

Blocked Operation Test: CSA A440-00, Clause 10.6:

307 Series Horizontal Slider has identical sash and components as Oasis Windows 300 Series Horizontal Slider. See QAI test report #W410-5 for 300 series horizontal slider test results.

Sash Strength and Stiffness: CSA A440-00, Clause 10.7:

Not Applicable

Sash Strength and Stiffness: CSA A440-00, Clause 10.8:

Not Applicable

Ease of Operation Test: CSA A440-00, Clause 10.9:

The window was mounted in a test frame and the operable lite was moved from the fully closed to the fully open position and back three times to ensure that the lite was operating freely. See Table 9 of CSA A440-00 for test requirements.

Opening Direction:
Force to Initiate Motion = 10.5 lb
Force to Maintain Motion = 7.5 lb

Closing Direction:
Force to Initiate Motion = 4.5 lb
Force to Maintain Motion = 7.8 lb

Force to operate handles = 4.1 lb

Alterations during Testing:

None

The test specimen PASSED the Ease of Operation Test

Insect Screen Strength CSA A440-00, Clause 10.10:

Insect screens were not supplied with the test specimen.

Sash Pull-Off CSA A440-00, Clause 10.11:

307 Series Horizontal Slider has identical sash and glazing method as Oasis Windows 300 Series Horizontal Slider. See QAI test report #W410-5 for 300 series horizontal slider test results.

Condensation Resistance: CSA A440-00, Clause 10.12

This test was not performed at the request of the manufacturer.

Resistance to Forced Entry: CSA A440-00, Clause 10.13:

307 Series Horizontal Slider has identical sash, hardware and reinforcement as Oasis Windows 300 Series Horizontal Slider. See QAI test report #W410-5 for 300 series horizontal slider test results.

Deadload Deflection: CSA A440-00, Clause 10.14

Not applicable.

Energy Rating: CSA A440-00, Clause 10.15

This test was not performed at the request of the manufacturer.

Window Ratings – Tables of Minimum Requirements from CSA-A440-00 Windows

Table 1: Air Tightness

Window Rating	Maximum Air Leakage Rate (m^3/h)/m
Storm	8.35 (max)
	5.00 (min)
A1	2.79
A2	1.65
A3	0.55
Fixed	0.25

Table 2: Water Tightness

Window Rating		
For use in small buildings	**For use in other buildings**	**Pressure Differential (Pa)**
Storm	--	0
B1	B1	150
B2	B2	200
B3	B3	300
	B4	400
	B5	500
	B6	600
	B7	700

Table 3: Wind Load Resistance

Window Rating		Pressure Differential, Pa	
For use in small buildings	**For use in other buildings**	**Deflection**	**Blowout**
		Sash (L/125)	
Storm	--	--	750
C1	C1	500	1500
C2	C2	750	2000
C3	C3	1200	3000
	C4	1600	4000
	C5	2000	5000

Comments/Conclusion: (Include tests subcontracted, variances from test methods, statement of compliance, statement of estimated uncertainty, opinions and interpretations used and their basis. Attach extra pages as necessary: No of pages attached _____)

Quality Auditing Institute Ltd., with lab facilities located in Port Moody, British Columbia, performed testing in accordance with CSA A440-00 on a representative sample of Oasis Windows 307 Series Horizontal Sliding Window.

Test results in this report may not be reproducible in the field. Test results relate only to those products tested.

See Table 3 for a summary of the test results and window ratings.

Person(s) Authorizing Report:

Name (Signature)	KENT ADAMSON Name (Printed)	MANAGER Title	12/09/06 (dd/mm/yy)

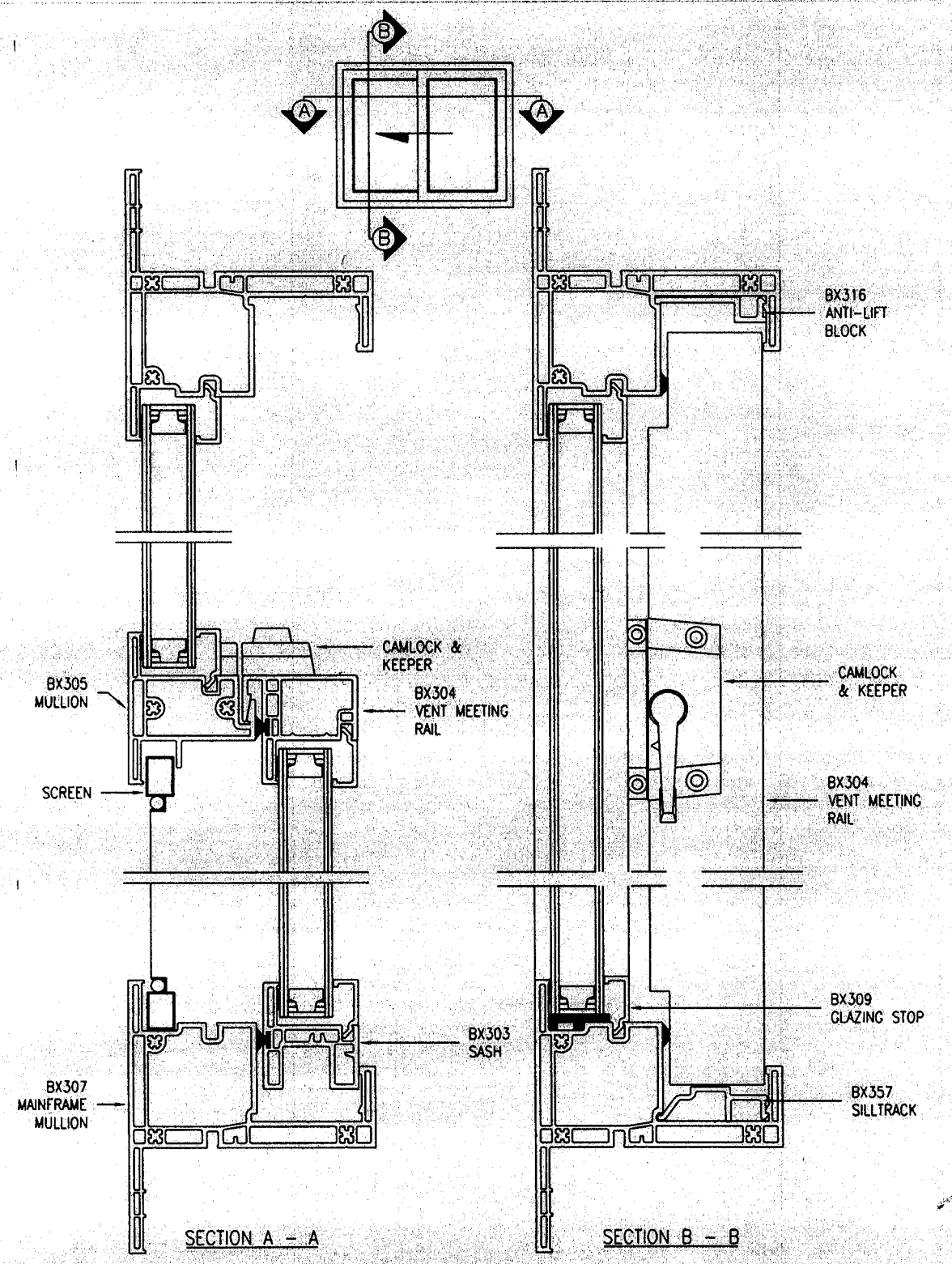
Reviewed by:

Name (Signature)	BEN BARKER Name (Printed)	MANAGER Title	12/09/06 (dd/mm/yy)

APPENDIX A

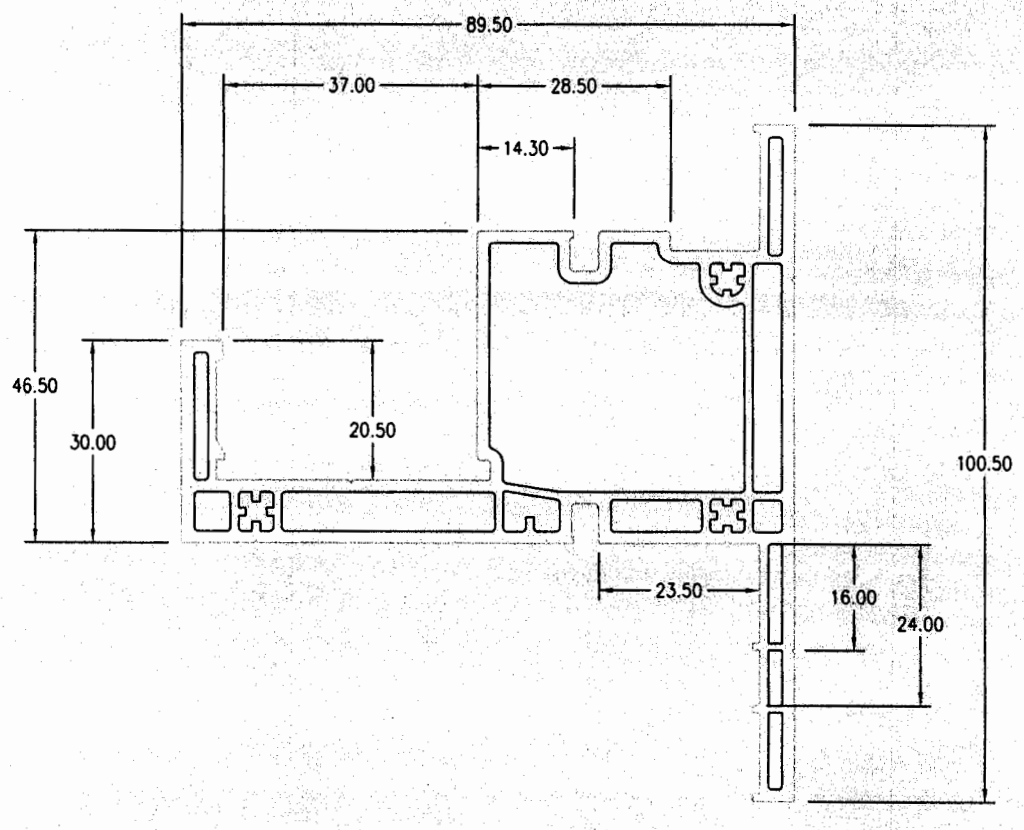
Window Specifications
307 Series Horizontal Slider

Page	Title
A1	307 Series Single Slider Window
A2	BX307 Mainframe
A3	BX305 Tilt Mullion
A4	BX303 Sash
A5	BX324 Sash w/ Interlock and Handle
A6	BX323 Sash w/ Interlock
A7	BX309 ¾" Glazing Bead
A8	BX357 Sill Track
A9	BX316 Anti-Lift Block
A10	Drainage

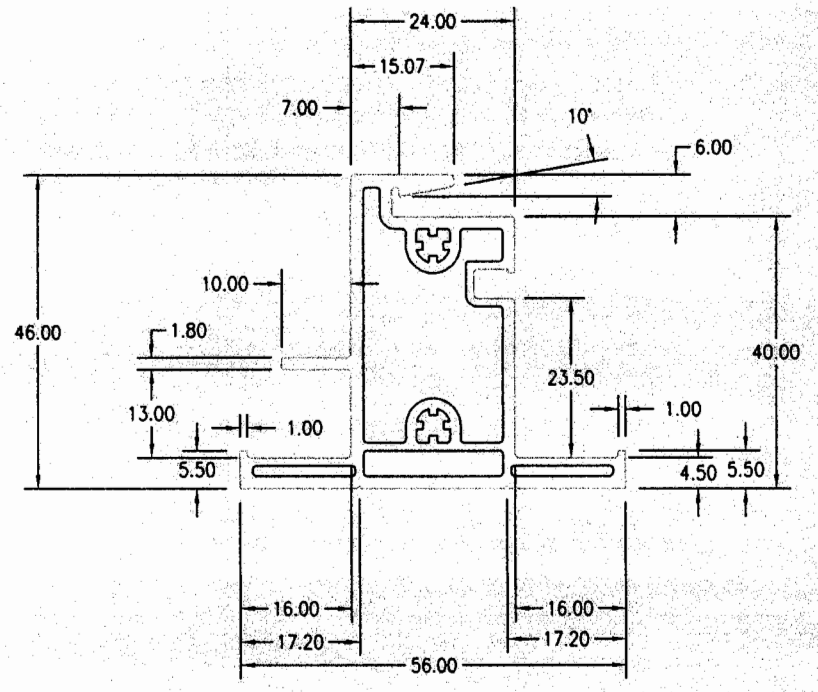


BERLINEX
4350 - 68 AVENUE
EDMONTON, ALBERTA T6B 2P3
CANADA

Part Number:	-
Description:	300 Series Single Slider Window (BX307)
Dwg No./Dwn By:	300 Series Single Slider BX307 / D.Feil
Date / Revision:	May 18/2006/01
Drawing Size:	Scale: NTS



Berlinex Inc. 4350 – 68 Avenue Edmonton, Alberta T6B 2P3 Canada	Approved for:	Part Number:	BX307
	Function:	Description:	MAINFRAME MULLION
		Dwg No./Dwn By:	BX307rev6 / D.Feil
	Dimension:	Date / Revision:	October 12/2004/06
		Drawing Size:	SCALE 1:1
	Viability:	Ext. Wall Thks.:	1.8 mm
		Int. Wall Thks.:	1.2 mm
		Not Spec. Radii:	0.5 mm
	Date:	Area:	
		Weight:	

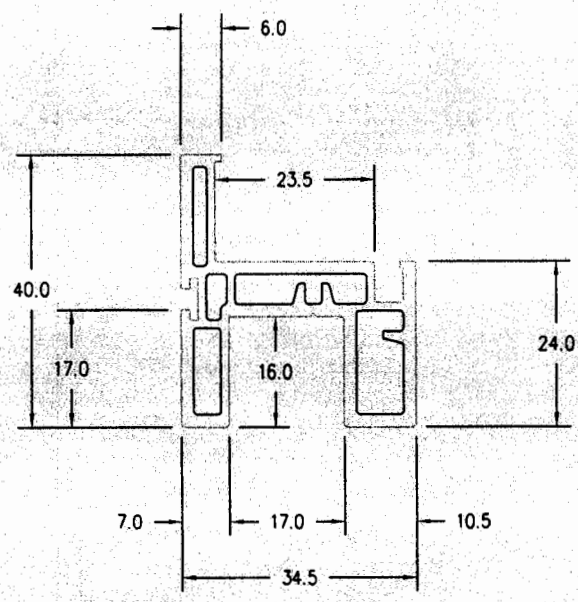


Ext. Wall Thks.:	1.8 mm
Int. Wall Thks.:	1.5 mm
Not Spec. Radii:	0.5 mm
Overall Area:	
Overall Weight:	
Rigid Weight:	–
Flex Weight:	–

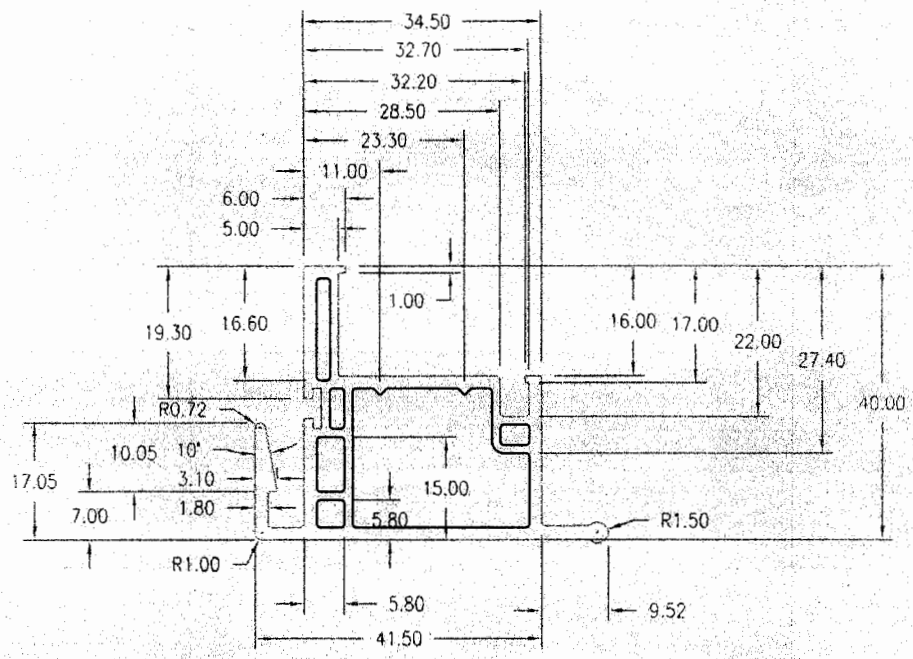
	REVISIONS	DATE

BERLINEX
4350 - 68 AVENUE
EDMONTON, ALBERTA T6B 2P3
CANADA

Part Number:	BX305
Description:	TILT MULLION
Dwg No./Dwn By:	BX305rev8
Date / Revision:	May 25/2004/08
Drawing Size:	SCALE 1:1



Berlinex Inc. 4350 – 68 Avenue Edmonton, Alberta T6B 2P3 Canada	Approved for:	Part Number:	BX303
	Function:	Description:	SASH
		Dwg No./Dwn By:	BX303rev6 / D.Feil
	Dimension:	Date / Revision:	October 12/2004/06
		Drawing Size:	SCALE 1:1
		Ext. Wall Thks.:	1.8 mm
	Viability:	Int. Wall Thks.:	1.2 mm
		Not Spec. Radii:	0.5 mm
		Area:	
	Date:	Weight:	

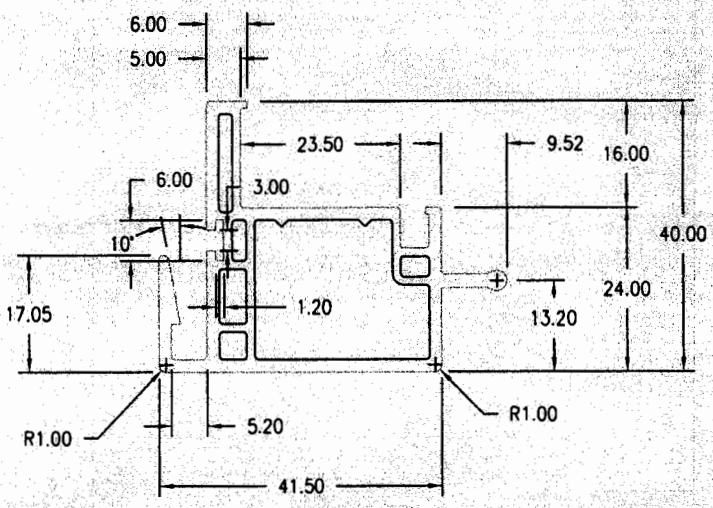


Ext. Wall Thks.:	1.8 mm
Int. Wall Thks.:	1.2 mm
Not Spec. Radii:	0.5 mm
Overall Area:	
Overall Weight:	
Rigid Weight:	–
Flex Weight:	–

	REVISIONS	DATE

VEKA CANADA
4350 – 68 AVENUE
EDMONTON, ALBERTA T6B 2P3
CANADA

Part Number:	BX324
Description:	SASH w/ INTERLOCK & HANDLE
Dwg No./Dwn By:	BX324
Date / Revision:	March 14/2006
Drawing Size:	SCALE 1:1

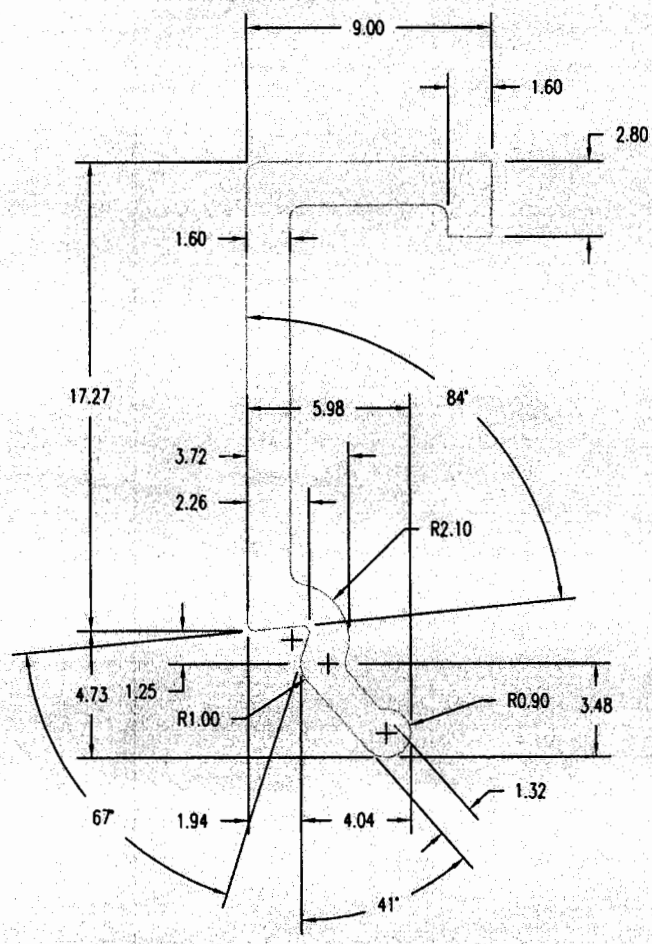


Ext. Wall Thks.:	1.8 mm
Int. Wall Thks.:	1.2 mm
Not Spec. Radii:	0.5 mm
Overall Area:	
Overall Weight:	
Rigid Weight:	-
Flex Weight:	-

	REVISIONS	DATE

BERLINEX
4350 - 68 AVENUE
EDMONTON, ALBERTA T6B 2P3
CANADA

Part Number:	BX323
Description:	SASH w/ INTERLOCK (CO-EX PULL HANDLE)
Dwg No./Dwn By:	BX323
Date / Revision:	November 08/2004/02
Drawing Size:	SCALE 1:1



Scale 1:1

Berlinex Inc. 4350 - 68 Avenue Edmonton, Alberta T6B 2P3 Canada	Approved for:	Part Number:	BX309
	Function:	Description:	3/4" Glazing Bead
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	Dimension:	Date / Revision:	October 09/2001/02
		Drawing Size:	SCALE 4:1 unless otherwise specified
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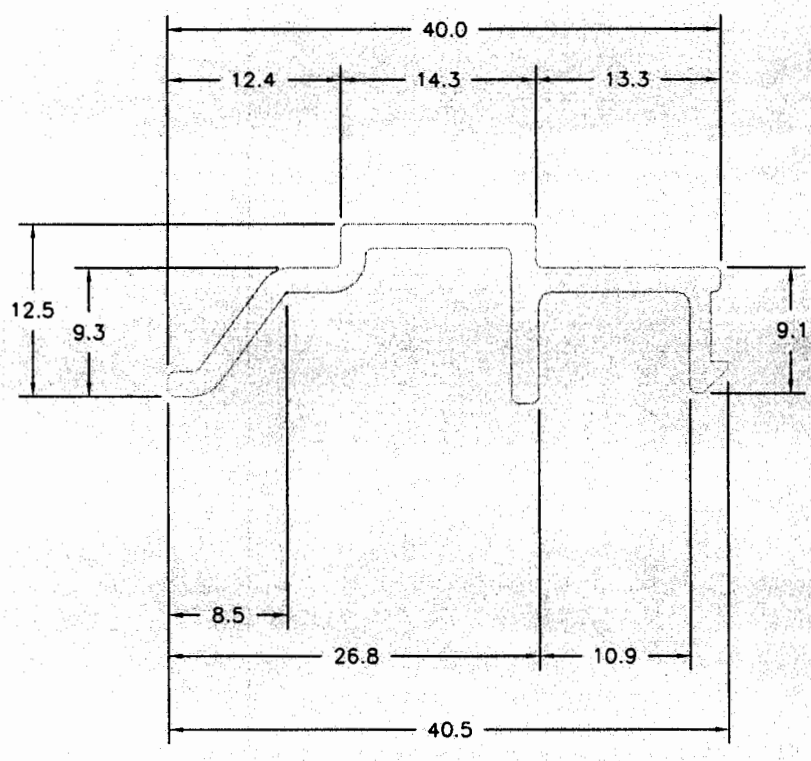
	Viability:	Int. Wall Thks.:	
		Not Spec. Radii:	
		Area:	
	Date:	Weight:	



SCALE 1:1

Berlinex Inc. 4350 – 68 Avenue Edmonton, Alberta T6B 2P3 Canada	Approved for:	Part Number:	BX357
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		Dwg No./Dwn By:	BX357 / D.Feil
	Dimension:	Date / Revision:	October 17/2001/02
		Drawing Size:	SCALE 2:1 unless specified otherwise
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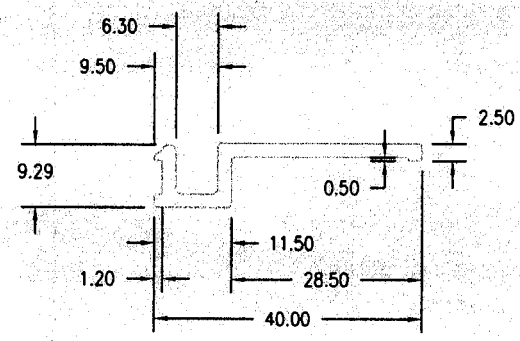
		Weight:	



Berlinex Inc. 4350 – 68 Avenue Edmonton, Alberta T6B 2P3 Canada	Approved for:	Part Number:	BX316
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	Dimension:	Date / Revision:	October 09/2001/03
		Drawing Size:	SCALE 1:1
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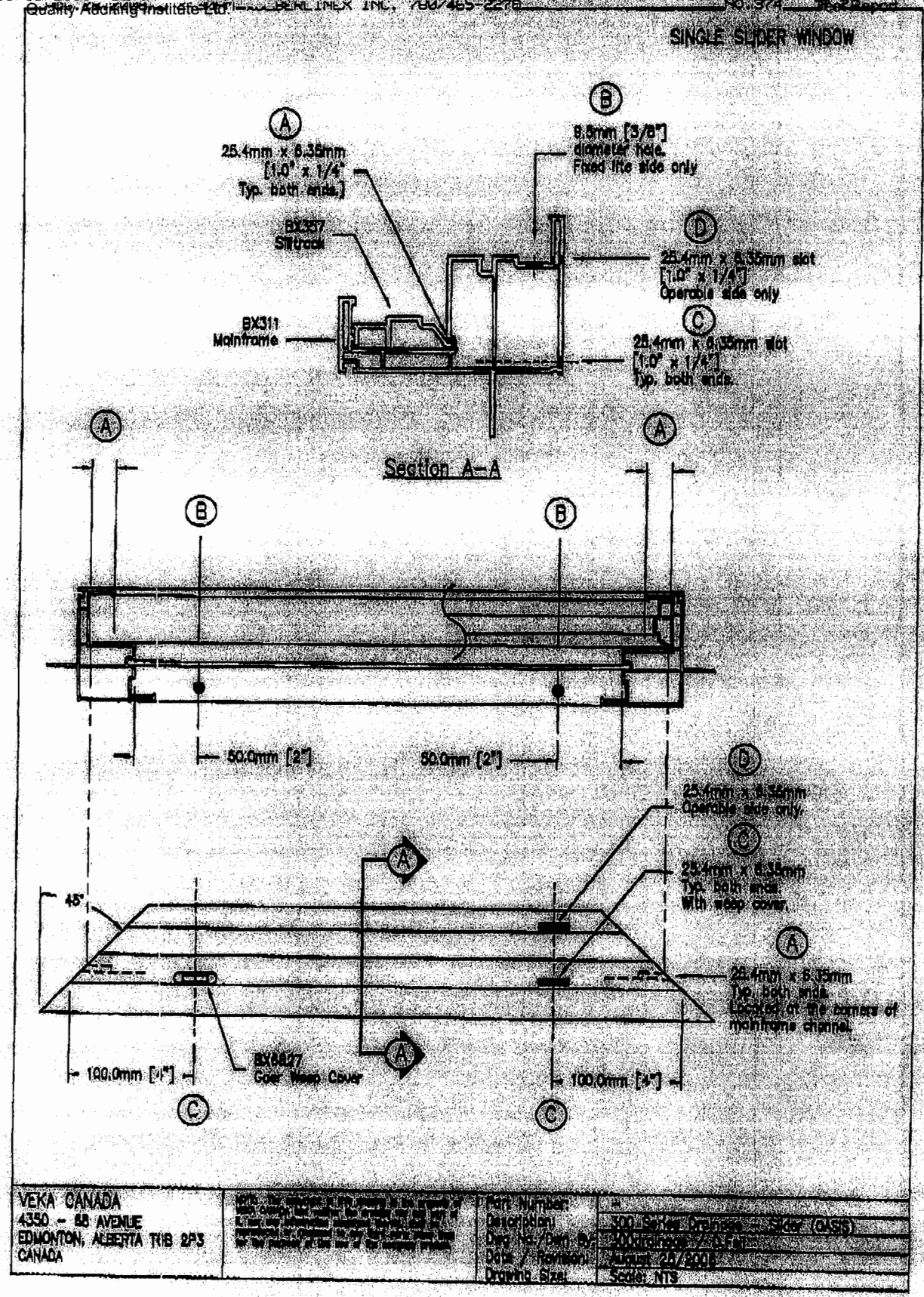
		Weight:	



VEKA CANADA 4350 - 88 AVENUE EDMONTON, ALBERTA T6B 2P3 CANADA		Part Number: Description: Dwg No./Dwn By: Date / Revision: Drawing Size:	300 Series Premium - Slider (OASIS) August 28/2006 Scale: NTS