TEST REPORT

REPORT NUMBER: 101589353COQ-001A
ORIGINAL ISSUE DATE: August 5, 2015

EVALUATION CENTER
Intertek Testing Services NA Ltd.
1500 Brigantine Drive
Coquitlam, BC V3K 7C1
Canada

Product Manufacturer:	**Builders Door & Window**
Product Type:	**Eclipse 4-Panel Wood Folding Door System**
Product Series:	**Eclipse**
Specification:	**AAMA/WDMA/CSA 101/I.S.2/A440-08** **AAMA/WDMA/CSA 101/I.S.2/A440-11**
Primary Designator:	**NAFS-08** **SP – PG25 – Size Tested 4030 x 3120 mm (159.0 x 123.0 in)** **NAFS-11** **SP – PG25 – Size Tested 4030 x 3120 mm (159.0 x 123.0 in)**
Secondary Designator:	**Positive Design Pressure = 1200 Pa (25.1 psf)** **Negative Design Pressure = 1200 Pa (25.1 psf)** **Water Penetration Resistance = 330 Pa (6.89 psf)** **Canadian Air Leakage Resistance = A3**
Test Completion Date:	**February 19, 2015**

.

1 Table of Contents

2 Summary of Results

2.1. NAFS-08 SUMMARY

A summary of results for AAMA/WDMA/CSA 101/I.S.2/A440-08 *"Standard/Specification for windows, doors, and unit skylights"*, are as indicated in the table below:

Evaluation Property	Result
Air Leakage Resistance @ 75 Pa (1.6 psf)	A3
Water Penetration Resistance	330 Pa (6.89 psf) **Locking hardware was removed from evaluation*
Uniform Load – Deflection	1200 Pa (25.1 psf)
Uniform Load – Structural	1800 Pa (37.6 psf)

Details of the tested results can be found in Section 7 of this report.

Primary and Secondary Designations are as indicated below:

Primary Designation

SP – PG25 – Size Tested 4030 x 3120 mm (159.0 x 123.0 in)

Secondary Designation

Positive Design Pressure = 1200 Pa (25.1 psf)
Negative Design Pressure = 1200 Pa (25.1 psf)
Water Penetration Resistance = 330 Pa (6.89 psf) **Locking hardware was removed from evaluation*
Canadian Air Leakage Resistance = A3

2.2. NAFS-11 SUMMARY

A summary of results for AAMA/WDMA/CSA 101/I.S.2/ A440-11 *"Standard/Specification for windows, doors, and unit skylights"*, are as indicated in the table below:

Evaluation Property	Result
Air Leakage Resistance @ 75 Pa (1.6 psf)	A3
Water Penetration Resistance	330 Pa (6.89 psf) **Locking hardware was removed from evaluation*
Uniform Load – Deflection	1200 Pa (25.1 psf)
Uniform Load – Structural	1800 Pa (37.6 psf)

Details of the tested results can be found in Section 7 of this report.

Primary and Secondary Designations are as indicated below:

Primary Designation

SP – PG25 – Size Tested 4030 x 3120 mm (159.0 x 123.0 in)

Secondary Designation

Positive Design Pressure = 1200 Pa (25.1 psf)
Negative Design Pressure = 1200 Pa (25.1 psf)
Water Penetration Resistance = 330 Pa (6.89 psf) **Locking hardware was removed from evaluation*
Canadian Air Leakage Resistance = A3

3 Introduction

Intertek Testing Services NA Ltd. (Intertek) has conducted testing on a 4030 mm x 3120 mm (159.0" x 123.0") Eclipse 4-Panel Wood Folding Door system in accordance with:

- AAMA/WDMA/CSA 101/I.S.2/ A440-08 *"Standard/Specification for windows, doors, and unit skylights"* (NAFS-08)
- AAMA/WDMA/CSA 101/I.S.2/ A440-11 *"Standard/Specification for windows, doors, and unit skylights"* (NAFS-11)
- A440S1-09 *"Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440, NAFS – North American Fenestration Standard/Specification for windows, doors, and skylights"* (A440S1)

This evaluation began on September 24, 2014 and completed on February 19, 2015.

4 Test Samples

4.1. SAMPLE AND ASSEMBLY DESCRIPTION

Type (general)	• Wood Folding Door System • Outswing Operation
Series	• Eclipse
Configuration	• 3L/1R as viewed from exterior • Panel 1 – Bi-fold panel; Panel 2 – Blank Panel; Panel 3 – Active Panel • Panel 4 – Passive Panel.
Frame	• Wood Frame: Secured to test buck at the jambs and sill with #8 – 3 ½" flat head screws. Secured at the Top Track KT 75 with ¼" x 3"pan head screws. • Aluminum Sill track KT 795 integrated into wood sill frame. • Frame corners: Butt jointed and secured with 2x #8 – 3" Flat head screws at the top corners and secured with 4x #8 – 3" flat head screws at the bottom corners.
Test Fixture	• The test buck was constructed of butt jointed 1-3/4" x 12" LVL engineered wood for the side jambs and 9-5/8" x 7" for the header and sill. Corners secured with 4x 3/8" x3" lag bolts. • The test specimen was sealed to the test buck with a single bead of sealant applied between the frame and the buck on the interior and exterior side.
Overall Size	• Perimeter frame width: 4030 mm (159.0") • Perimeter frame height: 3120 mm (123.0")
Panel Sizes	• Panel 1-4: 990mm x 2998mm (39.0 x 118.0 in.)

Panel Assembly		• Panel frames: assembled using ½" x 3" Dowels at each corner
Hardware	**Panel 1**	• Jamb stile: Pivot sets (KTE3CPS) inserted into the Top Track KT 75 and the Sill track KT 795. Top Pivot set secured to the track with a steel cover plate by 4x 8# 1" flat head screws. Sill Pivot set secured by 2x #8 1" flat head screws. • Jamb stile:3x Wall Pivots (KTE3WPS) secured to panel with 4x #8 1½" flat head screws, secured to frame with 2x #8 1½" flat head screws. • Bi-fold Stile: five hinges (KTE3HHS) secured by 3x #8 1½' flat head screws. Middle hinge has handle set attached. • One 36" Flushbolt at the top portion of the panel slots directly into the Top Track (KT 75), secured to the interior face of the panel by 9x #8 1 ¼" Flat head screws • One 8" Flushbolt at the sill secured to the interior face of the panel with 5x #8 1 ¼" flat head screws. Aluminum Flushbolt keepers secured to sill with 2x #8 3" Flat head screws.
	Panel 2	• Bi-fold stile (panel 1-2): five hinges (KTE3HHS) secured by 4x #8 1½' flat head screws. Middle hinge has handle set attached. • Roller stile: Carrier set (KTE3CICS) at the top and bottom of the panel secured by 4x # 8 1 ½" Flat head screws. • Roller stile: 3x hinges (KTE3HHS) secured by 4x # 8 1 ½" Flat head screws.
	Panel 3	• Roller stile: Carrier set (KTE3CICS) at the top and bottom of the panel secured by 3x # 8 1 ½" Flat head screws. • Roller stile: 3x hinges (KTE3HHS) secured by 3x # 8 1 ½" Flat head screws. • Lock stile: 4 corresponding keepers for the multi point lock and deadbolt system, secured to panel with 2 #8 3" Flat head screws • One 36" Flushbolt at the top portion of the panel slots directly into the Top Track (KT 75), secured to the interior face of the panel by 9x #8 1 ¼" Flat head screws • One 8" Flushbolt at the sill secured to the interior face of the panel with 5x #8 1 ¼" flat head screws. Aluminum Flushbolt keepers secured to sill with 2x #8 3" Flat head screws. • Astragal: Attached to the interior face of the panel with 14x 2" finishing nails.
	Panel 4 (Swing Door)	• Jamb stile: Pivot sets (KTE3CPS) inserted into the Top Track KT 75 and the Sill track KT 795. Top Pivot set secured to the track with a steel cover plate by 4x 8# 1" flat head screws. Sill Pivot set secured by 2x #8 1" flat head screws • Jamb stile:3x Wall Pivots (KTE3WPS) secured to panel with 4x #8 1½" flat head screws, secured to frame with 2x #8 1½" flat head screws. • Four point multi-lock bar and deadbolt set secured to panel with #8 1" Flat head screws, Lock points located at 14", 60 ½", 83" and 110" from the bottom corner. • Astragal: Attached to the exterior face of the panel with 14x 2" finishing nails.

Drainage	• Exterior sill face: 27x 6.5mm holes aprrox. 6” apart. • Exterior most facing section of the slider track has a PVC Black Insert (KT23BLVE) with 60mm slots approx every 12” apart and 6mm holes approx every 12” apart. • 6mm holes through the middle portion of the aluminium sill track approx every 12” apart.
Gaskets and Weatherstrips	• Main frame: Inner most portion has gasket DS421 kerf inserted around the perimeter of the frame. • Panel 1: Exterior most side of the hinge stile has a kerf inserted DS419BL • Panel 2: Exterior and Interior most sections of the hinge stile have a kerf inserted gasket DS419BL • Panel 4: Exterior most side of the hinge stile has a kerf inserted gasket • Top Track (KT75): Pile weatherstrip (DS7145-270BL) along the middle of the track. • Panel 4 Astragal has wedge pads (DS2626) at the top and bottom. • Panel 3 Astragal has gasket (DS421) kerf inserted and wedge pads (DS2626) at the top and bottom.
Glass Description	• 4mm /4mm clear tempered glass, 10mm aluminium spacer with black butyl back.
Glazing Method (all 4 Panels)	• Exterior glazed on top of a closed cell double sided foam tape on top of a perimeter heal bead of silicone. • Wood Glazing stops secured with 1” finishing nails
Drawings	• A drawing package supplied by AK Draft Seal is included in Appendix A

5 Testing and Evaluation Methods

5.1. AIR LEAKAGE RESISTANCE

The Air Leakage Resistance test was performed in accordance with ASTM E283-04(2012), *"Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen"*. Air infiltration and exfiltration tests were performed using test pressures of 75 Pa (1.57 psf). The maximum air leakage rate was calculated and compared to the allowable air leakage.

5.2. WATER PENETRATION RESISTANCE

A four-cycle Water Penetration Resistance test was performed in accordance with ASTM E547-00(2009) *"Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference"* (ASTM E547). The test was performed using the specified pressure differential and a water spray rate of at least 204 L/m^2 per hour (5.0 U.S. gal/ft^2 per hour). Each cycle consisted of five minutes with the pressure applied and one minute with the pressure released, during which the water spray was continuously applied.

5.3. UNIFORM LOAD DEFLECTION

The Uniform Load Deflection tests were conducted in accordance with ASTM E330-02(2010) *"Standard Test Method for Structural Performance of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference"* (ASTM E330), Procedure A. The tests were performed in both the positive and negative directions. After a 10 second preload (50% of the test load), followed by 1 minute with the pressure released, the tests were conducted at the specified test pressure for a period of 10 seconds. Deflections were measured at the mid-span and at the ends. The end deflections were averaged and subtracted from the mid-span deflection (to eliminate deflections caused by movement at the ends of the structural supporting members). Polyethylene film was used during the positive wind pressure sequences

5.4. UNIFORM LOAD STRUCTURAL

The Uniform Load Structural tests were conducted in accordance with ASTM E330-02(2010) *"Standard Test Method for Structural Performance of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference"* (ASTM E330), Procedure A. After a 10 second preload (50% of test load), followed by 1 minute with the pressure released, the sample was subjected to a Uniform Load Structural test using a specified test pressure for a time of 10 seconds. The test was performed in both the positive and negative directions. After the test loads were released, the permanent deflections were recorded and the specimen was inspected for failure or permanent deformation of any part of the system that would cause any operational malfunction. Polyethylene film was used during the positive wind pressure sequences.

6 Test Apparatus

Equipment used during testing is listed as follows:

Test	Equipment	Intertek ID#
Air Leakage Resistance, Water Penetration Resistance, and Uniform Load Deflection / Structural	Fenestration Testing Control Unit	60650
	Water spray assembly	60651
		60652
		60653

7 Testing and Evaluation Results

7.1. AIR LEAKAGE RESISTANCE

Air test data is indicated in the following table:

Area:	12.20 m^2 (131.32 ft^2)
Infiltration rate:	0.007 L/s*m^2, 0.001 cfm/ft^2
Exfiltration rate:	0.008 L/s*m^2, 0.002 cfm/ft^2
Maximum allowable air leakage (US):	1.5 L/s*m^2, 0.3 cfm/ft^2
Canadian air infiltration/exfiltration level A3	0.5 L/s*m^2, 0.1 cfm/ft^2

The overall system **met** the US performance requirements as well as the **A3** Canadian infiltration/exfiltration level when evaluated under NAFS-08 and NAFS-11.

7.2. WATER PENETRATION RESISTANCE

**Note – Locking hardware was removed from evaluation*

During 24-minute test period, using a pressure differential of 330 Pa (6.89 psf), there was no water leakage observed. The system **met** the Water Penetration Resistance performance requirements when evaluated to NAFS-08 as well as to A440S1-09, the Canadian Supplement to NAFS.

7.3. UNIFORM LOAD DEFLECTION

Uniform Load Deflection data: Hinge stile (Panel #2–3 with gauges on Panel #3)

Test Pressure, Pa (psf)	Deflection Measurements, mm (in.)				Compliance
	Positive		Negative		
	Deflection	***Residual***	***Deflection***	***Residual***	
1200 (25.1)	44.18 (1.7)	0.09 (0.00)	45.96 (1.81)	0.25 (0.01)	Pass **DP25**
Span, L = 2930 mm (115.4")			Deflection limit, L/175 = N/A		

Uniform Load Deflection data: Active Panel Astragal

Test Pressure, Pa (psf)	Deflection Measurements, mm (in.)				Compliance
	Positive		Negative		
	Deflection	*Residual*	*Deflection*	*Residual*	
1200 (25.1)	25.25 (0.99)	0.42 (0.02)	22.63 (0.89)	0.19 (0.01)	Pass **DP25**
Span, L = 2930 mm (115.4")			Deflection limit, L/175 = N/A		

After the test loads were released, the specimen was inspected and there was found to be no failure or permanent deformation of any part of the window system that would cause any operational malfunction. The system **met** the **DP25** Uniform Load Deflection performance requirements when evaluated under NAFS-08 and NAFS-11.

7.4. UNIFORM LOAD STRUCTURAL

Uniform Load Structural test data: Hinge stile (Panel #2–3 with gauges on Panel #3)

Test Pressure, Pa (psf)	Residual Deflection Measurements, mm (in.)		Compliance
	Positive	Negative	
1800 (37.6)	0.45 (0.02)	0.11 (0.00)	Pass **DP25**
Span, L = 2930 mm (115.4")		Residual deflection limit, L*0.4% = 11.72 mm (0.46")	

Uniform Load Deflection data: Active Panel Astragal

Test Pressure, Pa (psf)	Residual Deflection Measurements, mm (in.)		Compliance
	Positive	Negative	
1800 (37.6)	0.52 (0.02)	0.80 (0.03)	Pass **DP25**
Span, L = 2667 mm (115.4")		Residual deflection limit, L*0.4% = 11.72 mm (0.46")	

Note 1 – The residual deflection limit for Uniform Load – Structural was based on the L*0.4% limit.

After the test loads were released, the specimen was inspected and there was found to be no failure or permanent deformation of any part of the window system that would cause any operational malfunction. The system **met** the overall **DP25** Uniform Load performance requirements when evaluated under NAFS-08 and NAFS-11.

8 Conclusion

The Eclipse 4 Panel Wood Folding Door system tested and described herein achieved the overall Performance Grade requirements of PG25 for Air Leakage Resistance, Water Penetration Resistance and Uniform Load when evaluated in accordance with NAFS-08 and NAFS-11.

INTERTEK TESTING SERVICES NA LTD.

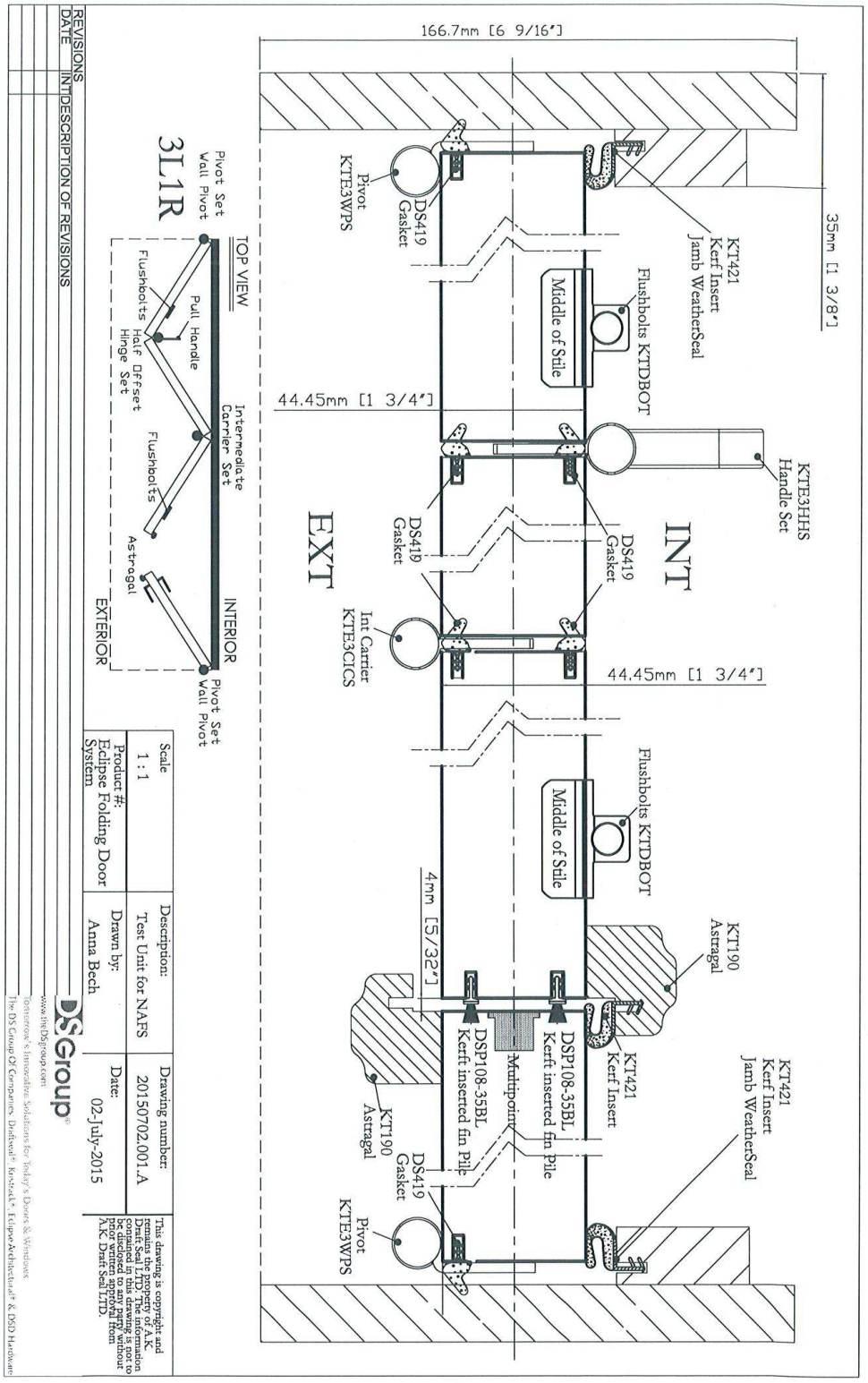
Tested by: _____
Blair Hendry
Technician – Building Products

Reported by: _____
Frank Gadea-Lopez
Technician – Building Products

Reviewed by: _____
Riccardo DeSantis
Manager – Building Products

APPENDIX A

Drawings – 7 Pages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35mm [1 3/8"]
KT421
Kerf Insert
Jamb WeatherSeal
Pivot
KTE3WPS
DS419
Gasket
Flushbolts KTDBOT
Middle of Stile
44.45mm [1 3/4"]
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Hinge Set
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Flushbolts
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Wall Pivot
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Drawing number:
20150702.001.A
Product #:
Eclipse Folding Door System
Drawn by:
Anna Bech
Date:
02-July-2015
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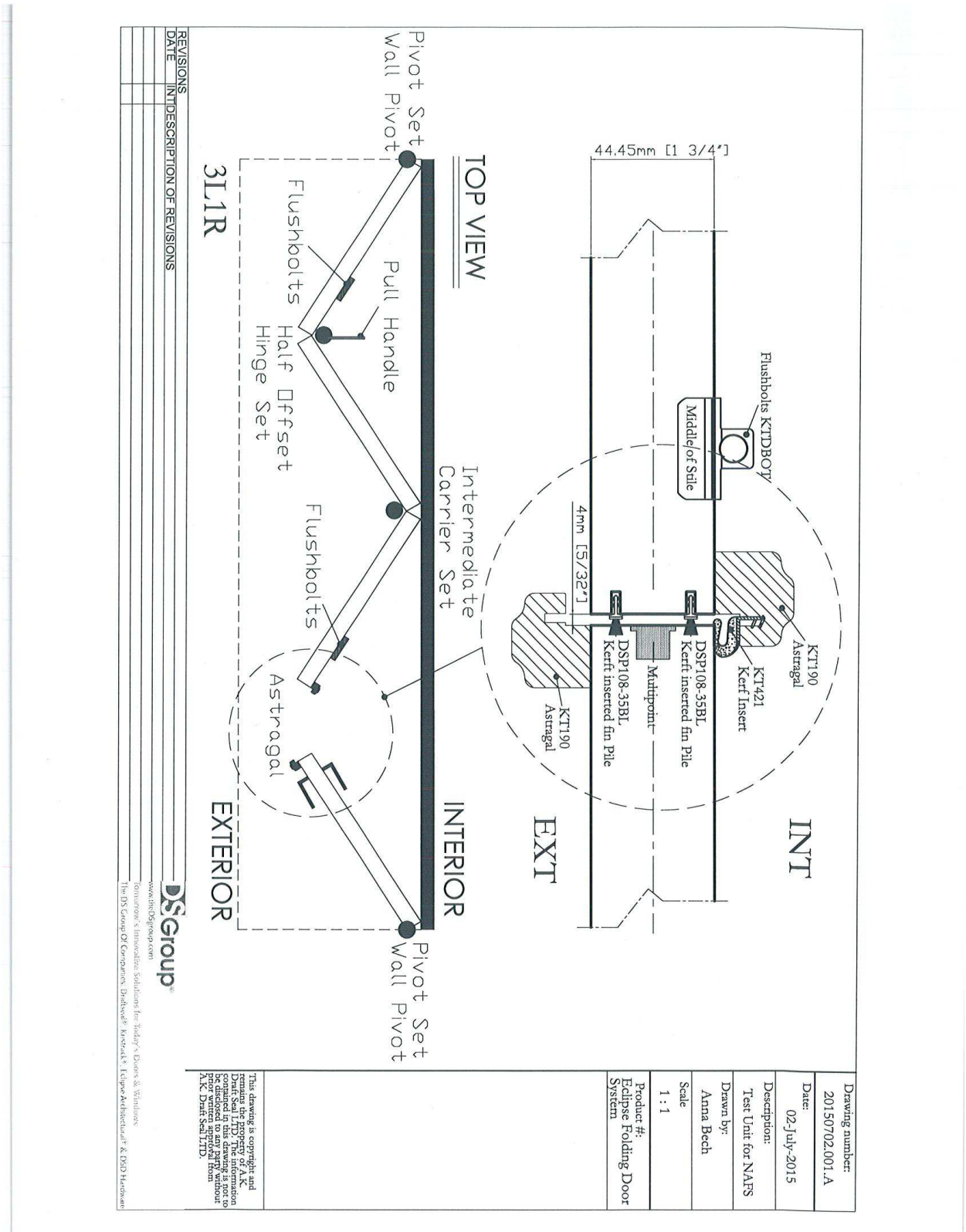
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02-July-2015
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Drawn by:
Anna Beech
Scale
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Product #:
Eclipse Folding Door System
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Flushbolts
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Hinge Set
Intermediate
Carrier Set
Flushbolts
Astragal
3L1R
INTERIOR
EXTERIOR
Pivot Set
Wall Pivot
44.45mm [1 3/4"]
Flushbolts KTDBOT
Middle of Stile
4mm [5/32"]
KT190
Astragal
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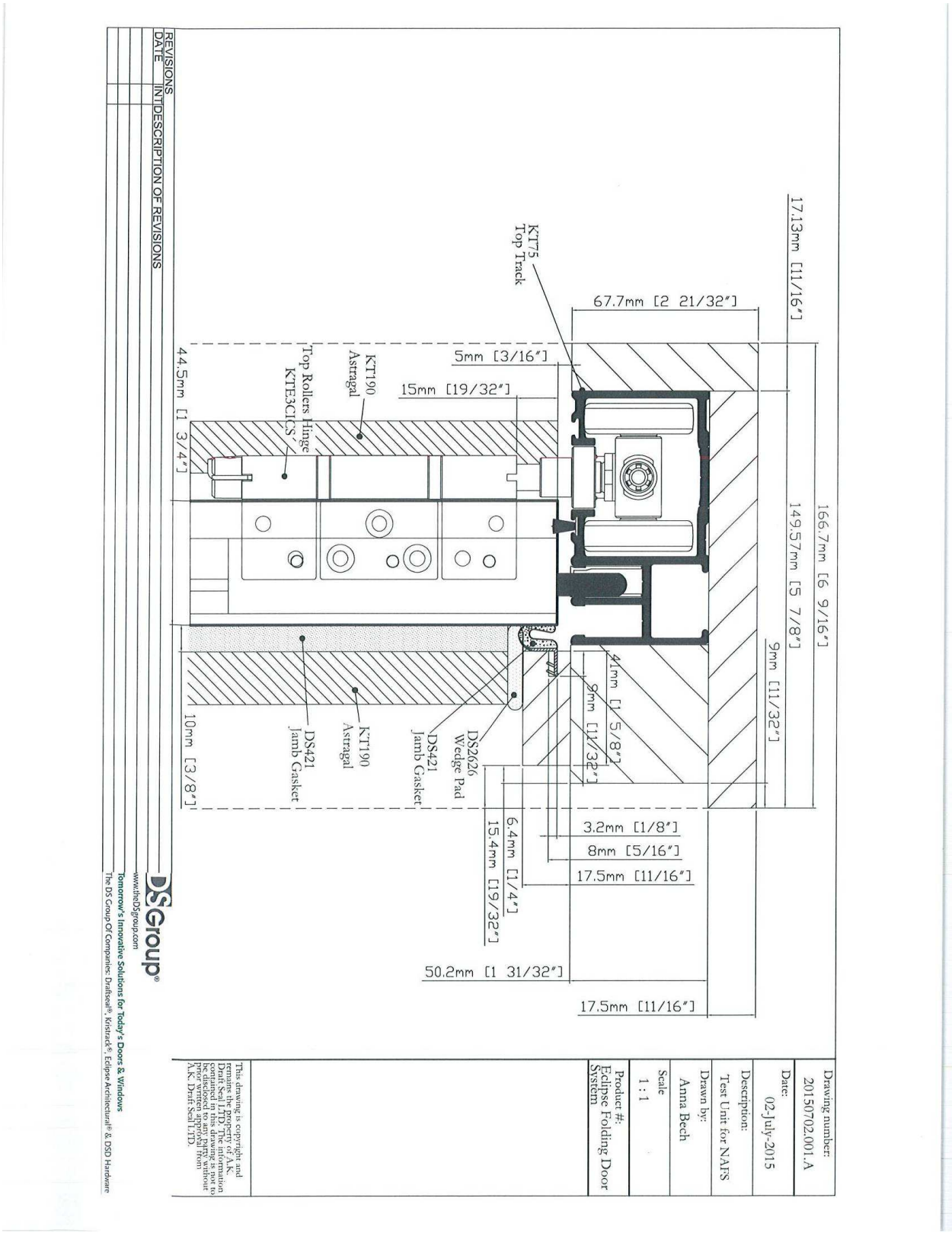
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Astragal
Top Rollers Hinge
KTE3CICS
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41mm [1 5/8"]
9mm [11/32"]
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Jamb Gasket
KT190
Astragal
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Drawing number:
20150702.001.A
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02-July-2015
Description:
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Drawn by:
Anna Bech
Scale
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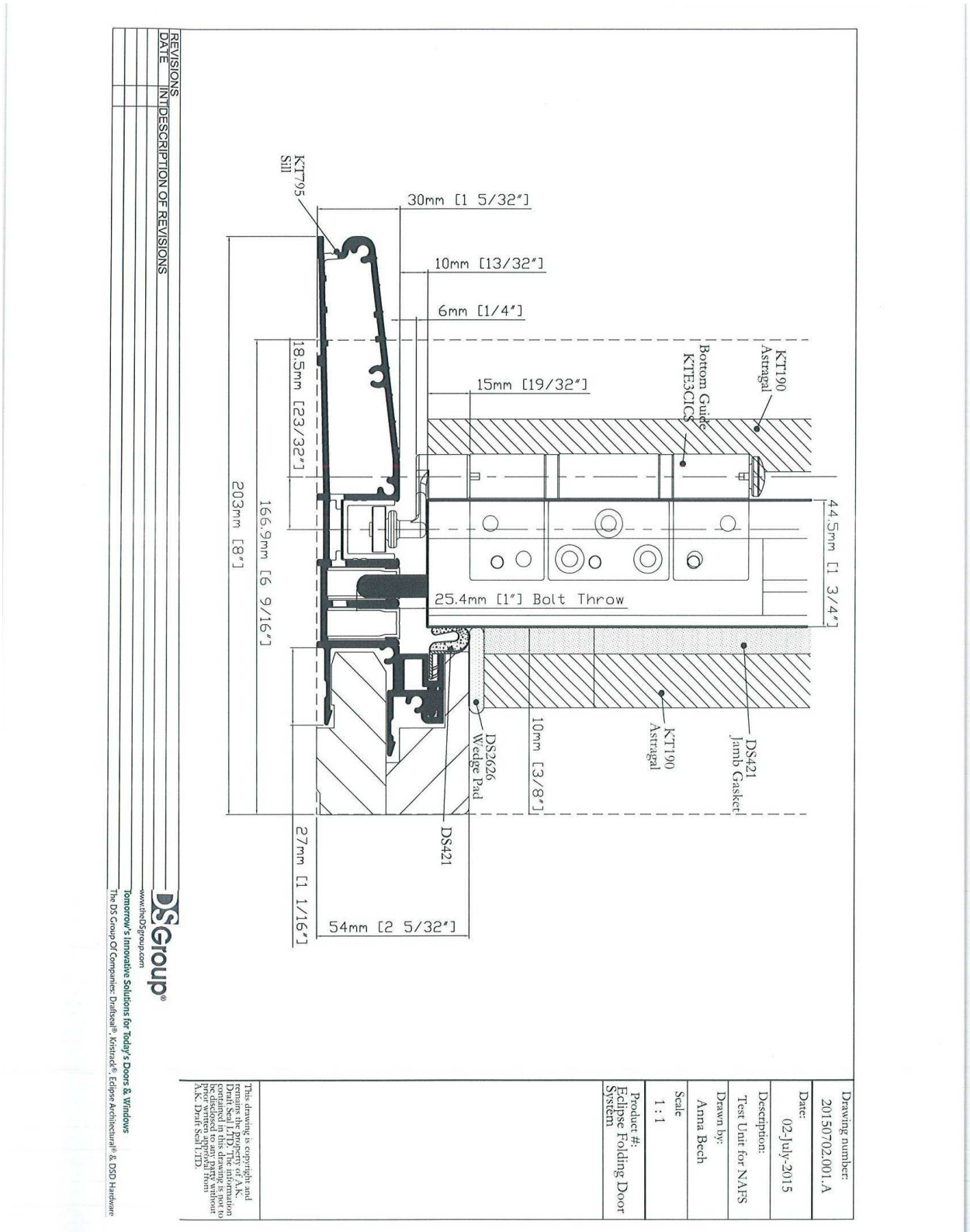
Product #:
Eclipse Folding Door System



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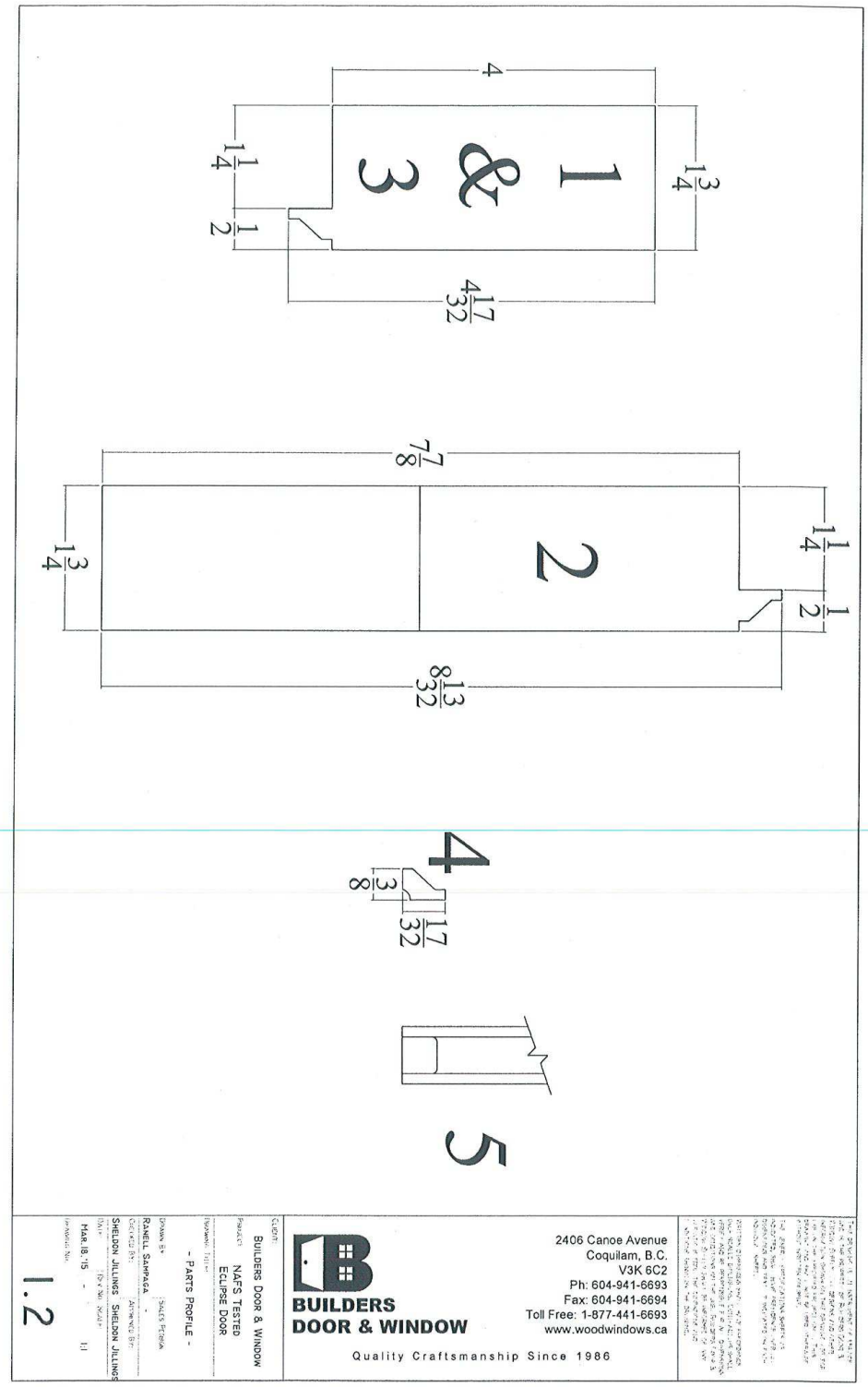
Drawn by: Anna Beech
Scale 1 : 1
Product #: Eclipse Folding Door System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4
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BUILDERS DOOR & WINDOW
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ECLIPSE DOOR
- PARTS PROFILE -
RANELL SAMPAGA
SHELDON JILLINGS
SHELDON JILLINGS
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Coquilam, B.C.
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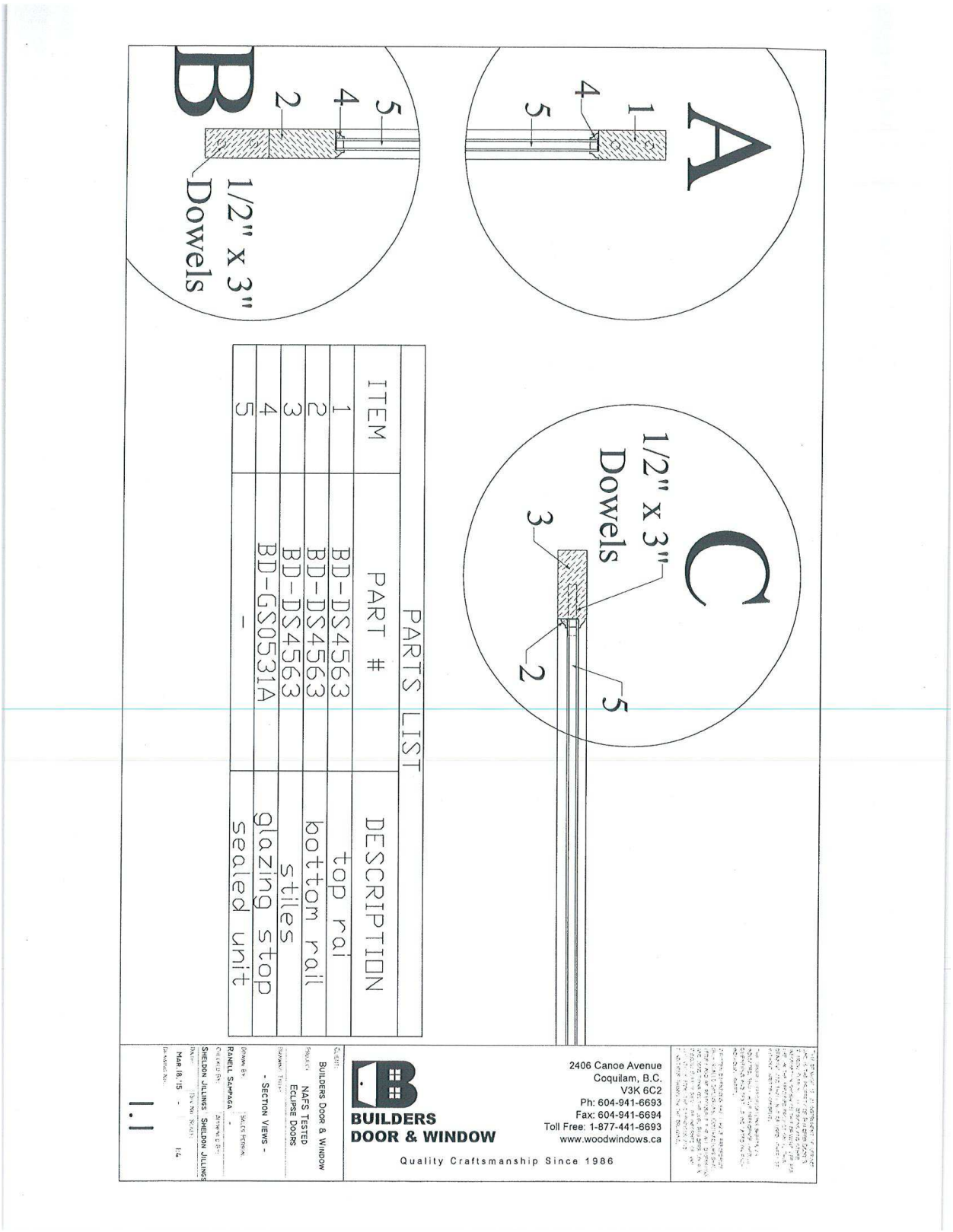

ITEM	PART #	DESCRIPTION
1	BD-DS4563	top rai
2	BD-DS4563	bottom rail
3	BD-DS4563	stiles
4	BD-GS0531A	glazing stop
5	-	sealed unit

PARTS LIST

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NAFS TESTED
ECLIPSE DOORS
- SECTION VIEWS -
RANELL SAMPAGA
SHELDON JILLINGS SHELDON JILLINGS
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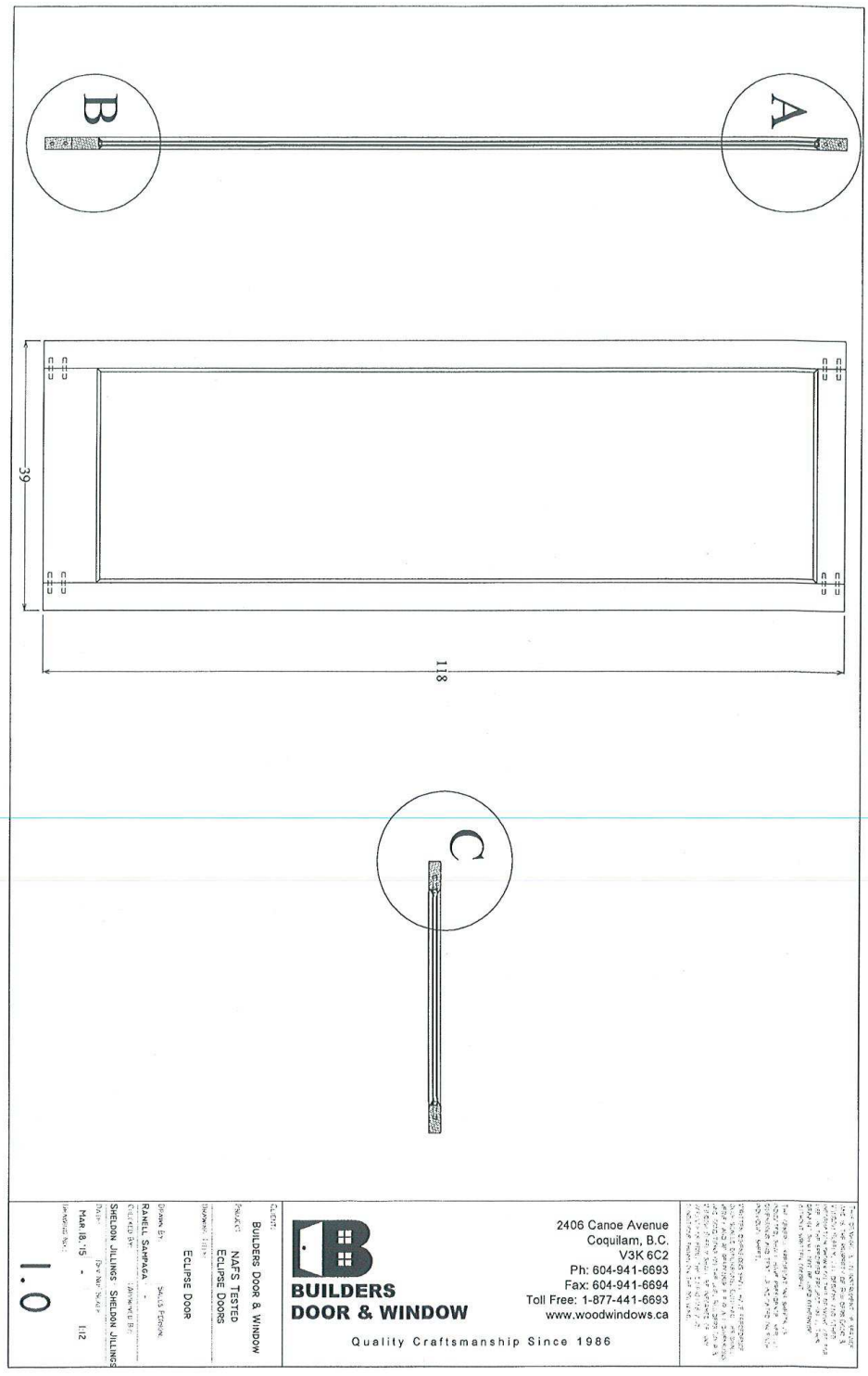
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BUILDERS DOOR & WINDOW
NAFS TESTED
ECLIPSE DOORS
ECLIPSE DOOR
RANELL SAMPAGA
SHELDON JILLINGS
SHELDON JILLINGS
MAR 18, 15
1/2
1.0
BUILDERS
DOOR & WINDOW
Quality Craftsmanship Since 1986
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APPENDIX B

Photographs – 2 Pages

Eclipse 4-panel Wood Folding Door System-
Left to Right, Panel # 4 - #1

Corner Detail

Panel Stile

Flushbolt

APPENDIX C

Revision Table – 1 Page

Revision Table				
Date	**Section**	**Description**	**Technician**	**Reviewer**
Aug 5/15	---	Original Issue Date	----	---