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FRAMELESS HARWARE COMPANY LLC.
TEST REPORT

SCOPE OF WORK
ASTM E2353-21 TESTING ON THER SERIES MODEL = X2 SERIES AR RAILING SURFACE MOUNTED TO WOOD AND THEIR X2 SERIES AR RAILING FASCIA MOUNTED TO WOOD

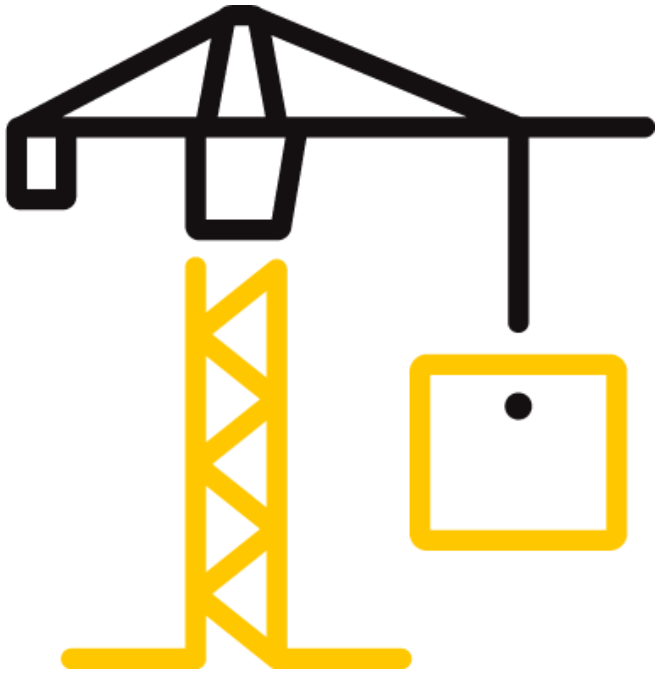
REPORT NUMBER
S3879.01-303-44 R0

TEST DATES
03/25/25 – 03/26/25

ISSUE DATE
03/31/25

PAGES
34

DOCUMENT CONTROL NUMBER
ATI 00645 (07/24/17)
RT-R-AMER-Test-2794



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TEST REPORT FOR FRAMELESS HARWARE COMPANY LLC.
Report No.: S3879.01-303-44 R0
Date: 03/31/25

REPORT ISSUED TO
FRAMELESS HARDWARE COMPANY LLC.
2323 Firestone Blvd.
South Gate, CA 90280

SECTION 1
SCOPE

Intertek Building & Construction (B&C) was contracted by Frameless Hardware Company LLC – 2323 Firestone Blvd. South Gate, CA 90280 to perform material and structural testing in accordance with ASTM E2353-21 on their X2 Surface Mounted to Wood and their X2 Fascia Mounted to Wood. Results obtained are tested values and were secured by using the designated test methods. The testing was conducted at Intertek test facility in Lake Forest, California.

The test record retention period ends four years after the test date. Test records, such as detailed drawings, datasheets, or other pertinent project documentation, will be retained for the entire test record retention period.

Representative samples of test specimens will be retained for 2 years after the report issue date.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

For INTERTEK B&C:

COMPLETED BY:	Benjamin Johns	**REVIEWED BY:**	Tyler Westerling P.E.
TITLE:	Lab Technician Building & Construction	**TITLE:**	Operations Manager Building & Construction
SIGNATURE:	Digitally Signed by: Benjamin Johns	**SIGNATURE:**	Digitally Signed by: Tyler Westerling
DATE:	03/31/25	**DATE:**	03/31/25

BAJ

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SECTION 2
TEST METHOD

The specimens were evaluated in accordance with the following:

> **ASTM E2353-21:** *Standard Test Methods for Performance of Glazing in Permanent Railing Systems, Guards, and Balustrades.*

SECTION 3
MATERIAL SOURCE

Test samples were provided by Frameless Hardware Company LLC.

SECTION 4
EQUIPMENT

Equipment calibration records are available for review at 130 Derry Court, York, PA 17406.

Load Cell No.: 63066
Calibration Due Date: 10/3/25

Transducer No.: INT03812
Calibration Due Date: 4/30/25

Transducer No.: G1804202A
Calibration Due Date: 7/27/25

Transducer No.: 62849
Calibration Due Date: 5/22/25

Stopwatch No.: INT03845
Calibration Due Date: 5/8/26

Micro-Mule No.: 005263
Calibration Due Date: 10/2/25

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SECTION 5
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Marco Ramirez	Frameless Hardware Company LLC.
Mario Salazar	Frameless Hardware Company LLC.
Noel Ayala	Frameless Hardware Company LLC.
Glen Bonila	Frameless Hardware Company LLC.
Benjamin Johns	Intertek B&C
Andrw Vogt	Intertek B&C
John Merritt	Intertek B&C

SECTION 6
TEST PROCEDURE

Structural Performance Testing of Assembled Railing Systems
Railing assembly tests were performed per ASTM E2353, in a self-contained structural frame designed to accommodate anchorage of a rail assembly and application of the required test loads. The specimen was loaded using a pneumatic ram mounted to a wood test frame, nylon straps, and a load distribution plate were used to impose test loads on the specimen. Applied load was measured using an electronic load cell located in-line with the loading system. Deflections were measured to the nearest 0.01 in using electronic linear displacement transducers.

The railing assembly Model = X2 Series ar railing surface mounted 2-sided support – 3 post two lite glazing as the infill was installed and tested as a single railing section by directly securing the base of the post mounts to a Douglas Fir test frame. The railing was assembled by a Frameless Hardware Company LLC. technician.

The railing assembly Model = X2 Series ar Fascia surface mounted 2-sided support – 3 post two lite glazing as the infill was installed and tested as a single railing section by directly securing the base of the post mounts to a Douglas Fir test frame. The railing was assembled by a Frameless Hardware Company LLC. technician.

Transducers mounted to an independent reference frame were located to record movement of reference points on the railing system components (infill material) to determine net component deflections.

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The test specimen was inspected prior to testing to verify the size and general condition of the materials, assembly, and installation. No potentially compromising defects were observed. Three specimen was used for all load tests which were performed in the order reported. Each design load test was performed using the following procedure:

1. Zeroed transducers and load cell at zero load.
2. Increased load to specified test load in no less than ten seconds; and
3. Held test load for no less than one minute.

Unless otherwise noted, all loads and displacement measurements were normal to the rail. The test results apply only to the railing assembly between the supports and anchorage to the support.

Key to Test Results Tables:

Test Load: Actual applied load at the designated load level (target). Where more than one value is reported, the test load was the range (min. - max.) that was held during the time indicated in the test.

Elapsed Time (E.T.): The amount of time into the test with zero established at the beginning of the loading procedure. Where more than one value is reported, the time was the range (start-end) that the designated load level was reached and sustained.

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SECTION 7

MODEL DESCRIPTION:

Model: X2 Series ar railing surface mounted to wood 2-sided support – 3 post two lite glazing as the infill.

Manufacturer:	Frameless Hardware Company LLC.
Product Type:	Type # II with surface mount.
Overall Size:	103-3/8" ´X 42" **General Note:** The height measurement taken from the top of the simulated wood floor.
Height between the floor and the bottom rail:	3"
Glass thickness:	3/8"
Glass size:	36-5/8" X 45-3/8"
Glass Type:	GL1 = Monolithic clear tempered glass.
Post size:	EX1 = 2-3/8" X 2-3/8" each post.
Top rail:	EX2, EX3
Bottom rail:	EX4, EX5
Parts at the top rail end posts:	EX3, HW1, HW2, HW3, HW11, HW12 EX2, V2
Parts at the bottom rail at the end posts:	HW4, HW9, HW8, V1, EX5, EX4, HW5
Parts at the top rail middle post:	HW4, HW5, HW6, HW8, HW7, HW9, HW10, HW13, V1 1 each both sides of the middle post = HW2, HW14
Parts at the bottom rail middle post:	1 each on both sides of the middle post = HW9, HW5, HW4
Parts at each base plate:	HW10, HW9, HW7, HW8, HW6
Installation Anchors:	3/8" X 3" stainless steel lag bolt

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SECTION 8

TEST RESULTS:

Model: X2 Series AR railing surface mounted to wood 2-sided support – 3 post two lite glazing as the infill.

SPECIMEN #1:

Infill: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Midspan of the middle glass panel**	
Results	Pass

Infill: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Top left corner of the left glass panel**	
Results	Pass

Infill: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Bottom right corner of the right glass panel**	
Results	Pass

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Uniform load: **Location: Horizontal - full length of the handrail.**			
LOAD LEVEL (lbs)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
430.54	430.54	60	Deflection Transducer/Location #1 = At the right corner of the handrail. Result =0.92
430.54	430.54	60	Deflection Transducer/Location #2 = At the midspan of the handrail. Result = 0.92
430.54	430.54	60	Deflection Transducer/Location #3 = At the left corner of the Handrail. Result = 0.76
430.54	430.54	60	**Result**: Withstood load equal to or greater than 430.54 lbs. for one full minute without failure.

Uniform load: **Location: Vertical - full length of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
430.54	430.54	60	Deflection Transducer/Location #1 = At the right corner of the handrail. Deflection = 0.01
430.54	430.54	60	Deflection Transducer/Location #2 = At the midspan of the handrail. Result = 0.01
430.54	430.54	60	Deflection Transducer/Location #3 = At the left corner of the handrail. Result = 0.01
430.54	430.54	60	**Result**: Withstood load equal to or greater than 430.54 lbs. for one full minute without failure.

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Concentrated load: **Location: Horizontal - mid-span of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.69
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated load: **Location: Horizontal - 3" from the left post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 1.37
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated load: **Location: Horizontal - top of the right post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 1.24
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: **Location: Vertical - mid-span of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.03
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

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Concentrated load: **Location: Vertical - 3" from the left post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.10
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated load: **Location: Vertical - right post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.11
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Shot bag:			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/RESULT/TYPE**
100	100	60	Location = Midspan of the left glass 460mm Type = 1 1220mm Type = 1 1525mm Type= 4

Pendulum:
Location = Midspan of the right glass Type = 1 Location = Top right corner of the right glass Type = 1 Location = Bottom right corner of the right glass Type = 1

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SPECIMEN #2:

Infill: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Midspan of the middle glass panel**	
Results	Pass

Infill: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Top left corner of the left glass panel**	
Results	Pass

Infill: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Bottom right corner of the right glass panel**	
Results	Pass

Uniform load: **Location: Horizontal - full length of the handrail.**			
LOAD LEVEL (lbs)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
430.54	430.54	60	Deflection Transducer/Location #1 = At the right corner of the handrail. Result =0.69
430.54	430.54	60	Deflection Transducer/Location #2 = At the midspan of the handrail. Result = 0.72
430.54	430.54	60	Deflection Transducer/Location #3 = At the left corner of the Handrail. Result = 0.62
430.54	430.54	60	**Result**: Withstood load equal to or greater than 430.54 lbs. for one full minute without failure.

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Uniform load: **Location: Vertical - full length of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
430.54	430.54	60	Deflection Transducer/Location #1 = At the right corner of the handrail. Deflection = 0.01
430.54	430.54	60	Deflection Transducer/Location #2 = At the midspan of the handrail. Result = 0.01
430.54	430.54	60	Deflection Transducer/Location #3 = At the left corner of the handrail. Result = 0.02
430.54	430.54	60	**Result**: Withstood load equal to or greater than 430.54 lbs. for one full minute without failure.

Concentrated load: **Location: Horizontal - mid-span of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.72
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated load: **Location: Horizontal - 3” from the left post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.62
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

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Concentrated load: Location: Horizontal - top of the right post of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.62
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated load: Location: Vertical - mid-span of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.01
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated load: Location: Vertical - 3” from the left post of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.02
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated load: Location: Vertical - right post of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.06
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

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Shot bag:			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/RESULT/TYPE**
100	100	60	Location = Midspan of the left glass 460mm Type = 1 1220mm Type = 4 Re-test: 1220mm Type = 1 1525mm Type= 4

Pendulum:
Location = Midspan of the right glass Type = 1 Location = Top right corner of the right glass Type = 1 Location = Bottom right corner of the right glass Type = 1

SPECIMEN #3:

Infill: **Load Level: 50 lbs.** **Hold time: 60 Seconds** **Location: Midspan of the middle glass panel**	
Results	Pass

Infill: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Top left corner of the left glass panel**	
Results	Pass

Infill: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Bottom right corner of the right glass panel**	
Results	Pass

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Uniform load: **Location: Horizontal - full length of the handrail.**			
LOAD LEVEL (lbs)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
430.54	430.54	60	Deflection Transducer/Location #1 = At the right corner of the handrail. Result = 1.19
430.54	430.54	60	Deflection Transducer/Location #2 = At the midspan of the handrail. Result = 1.17
430.54	430.54	60	Deflection Transducer/Location #3 = At the left corner of the Handrail. Result = 1.01
430.54	430.54	60	**Result**: Withstood load equal to or greater than 430.54 lbs. for one full minute without failure.

Uniform load: **Location: Vertical - full length of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
430.54	430.54	60	Deflection Transducer/Location #1 = At the right corner of the handrail. Deflection = 0.04
430.54	430.54	60	Deflection Transducer/Location #2 = At the midspan of the handrail. Result = 0.03
430.54	430.54	60	Deflection Transducer/Location #3 = At the left corner of the handrail. Result = 0.04
430.54	430.54	60	**Result**: Withstood load equal to or greater than 430.54 lbs. for one full minute without failure.

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Concentrated Load: Location: Horizontal - mid-span of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
300	300	60	Result = 1.12
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: Location: Horizontal -3" from the left post of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 1.07
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: Location: Horizontal - right post of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 1.06
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: Location: Vertical - mid-span of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.01
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

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Concentrated Load: **Location: Vertical - 3" from the left post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.05
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: **Location: Vertical - right post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.01
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Shot bag:			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/RESULT/TYPE**
100	100	60	Location = Midspan of the left glass 460mm Type = 1 1220mm Type = 4 Re-test: 1220mm Type = 1 1525mm Type= 4

Pendulum:
Location = Midspan of the right glass Type = 1 Location = Top right corner of the right glass Type = 1 Location = Bottom right corner of the right glass Type = 1

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SECTION 9

MODEL DESCRIPTION:

MODEL: X2 Series ar railing fascia mounted to wood 2-sided support – 3 post two lite glazing as the infill.

Manufacturer:	Frameless Hardware Company LLC.
Product Type:	Type II with fascia mount
Overall Size:	103-1/2" ´X 44-1/8" **General Note:** The height measurement taken from the top of the mounting bracket.
Height between the floor and the bottom rail:	3"
Glass thickness:	3/8" General note: fascia bracket installed below the floor line
Glass size:	36-5/8" X 45-3/8"
Glass type:	G1 = Monolithic clear tempered glass.
Post size:	EX1 = 2-3/8" X 2-3/8"
Top rail	EX2, EX3
Bottom rail:	EX4, EX5
Parts at the top rail end posts:	EX3, HW1, HW2, HW3, EX2, V2, HW11, HW12
Parts at the top rail middle post:	EX3, HW1, HW2, HW3, EX2, V2, 1 on each side of the post HW11, HW12
Parts at the bottom rail middle post:	1 of each on both sides of the middle post = HW4, HW9, HW5,
Parts at the bottom end posts:	HW4, HW9, HW5, EX5, EX4
Installation anchors:	3/8" X 4" stainless steel lag bolt
Fascia mounting bracket parts each posts:	HW9, HW10, HW6, HW8, HW7
Fascia mounting bracket size:	6" (w) X 6" (h) X 3-3/4" (d)

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SECTION 10

TEST RESULTS:
SPECIMEN #1:

Infill: **Load Level: 50 lbs.** **Hold time: 60 Seconds** **Location: Midspan of the middle glass panel**	
Results	Pass

Infill test: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Top left corner of the left glass panel**	
Results	Pass

Infill: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Bottom right corner of the right glass panel**	
Results	Pass

Uniform load: **Location: Horizontal - full length of the handrail.**			
LOAD LEVEL (lbs)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
430.54	430.54	60	Deflection Transducer/Location #1 = At the right corner of the handrail. Result = 0.68
430.54	430.54	60	Deflection Transducer/Location #2 = At the midspan of the handrail. Result = 0.75
430.54	430.54	60	Deflection Transducer/Location #3 = At the left corner of the Handrail. Result = 0.70
430.54	430.54	60	**Result**: Withstood load equal to or greater than 430.54 lbs. for one full minute without failure.

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Uniform load: **Location: Vertical - full length of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
430.54	430.54	60	Deflection Transducer/Location #1 = At the right corner of the handrail. Deflection = 0.03
430.54	430.54	60	Deflection Transducer/Location #2 = At the midspan of the handrail. Result = 0.01
430.54	430.54	60	Deflection Transducer/Location #3 = At the left corner of the handrail. Result = 0.01
430.54	430.54	60	**Result**: Withstood load equal to or greater than 430.54 lbs. for one full minute without failure.

Concentrated Load: **Location: Horizontal - mid-span of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.67
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: **Location: Horizontal - 3” from the left post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 1.02
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

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Concentrated Load: Location: Horizontal - right post of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 1.25
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: Location: Vertical - mid-span of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.01
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: Location: Vertical - 3” from the left post of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.03
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: Location: Vertical - right post of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.01
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

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Shot bag:			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/RESULT/TYPE**
100	100	60	Location = Midspan of the left glass 460mm Type = 1 1220mm Type =1 1525mm Type= 1

Pendulum:
Location = Midspan of the right glass Type = 1 Location = Top right corner of the right glass Type = 1 Location = Bottom right corner of the right glass Type = 1

SPECIMEN #2:

Infill: **Load Level: 50 lbs.** **Hold time: 60 Seconds** **Location: Midspan of the middle glass panel**	
Results	Pass

Infill: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Top left corner of the left glass panel**	
Results	Pass

Infill: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Bottom right corner of the right glass panel**	
Results	Pass

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Uniform load: **Location: Horizontal - full length of the handrail.**			
LOAD LEVEL (lbs)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
430.54	430.54	60	Deflection Transducer/Location #1 = At the right corner of the handrail. Result = 1.45
430.54	430.54	60	Deflection Transducer/Location #2 = At the midspan of the handrail. Result = 1.64
430.54	430.54	60	Deflection Transducer/Location #3 = At the left corner of the Handrail. Result = 1.61
430.54	430.54	60	**Result**: Withstood load equal to or greater than 430.54 lbs. for one full minute without failure.

Uniform load: **Location: Vertical - full length of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
430.54	430.54	60	Deflection Transducer/Location #1 = At the right corner of the handrail. Deflection = 0.03
430.54	430.54	60	Deflection Transducer/Location #2 = At the midspan of the handrail. Result = 0.01
430.54	430.54	60	Deflection Transducer/Location #3 = At the left corner of the handrail. Result = 0.06
430.54	430.54	60	**Result**: Withstood load equal to or greater than 430.54 lbs. for one full minute without failure.

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Concentrated Load: Location: Horizontal - mid-span of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
300	300	60	Result = 1.24
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: Location: Horizontal - 3" from the left post of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 2.15
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: Location: Horizontal - right post of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 2.20
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: Location: Vertical - mid-span of the handrail.			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.03
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

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Concentrated Load: **Location: Vertical - 3" from the left post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.05
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: **Location: Vertical - right post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.06
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Shot bag:			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/RESULT/TYPE**
100	100	60	Location = Midspan of the left glass 460mm Type =1 1220mm Type = 4 Re-test: 1220mm Type = 1 1525mm Type= 4

Pendulum:
Location = Midspan of the right glass Type = 1 Location = Top right corner of the right glass Type = 1 Location = Bottom right corner of the right glass Type = 1

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SPECIMEN #3:

Infill: **Load Level: 50 lbs.** **Hold time: 60 Seconds** **Location: Midspan of the middle glass panel**	
Results	Pass

Infill: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Top left corner of the left glass panel**	
Results	Pass

Infill: **Load level: 50 lbs.** **Hold time: 60 Seconds** **Location: Bottom right corner of the right glass panel**	
Results	Pass

Uniform load: **Location: Horizontal - full length of the handrail.**			
LOAD LEVEL (lbs)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
430.54	430.54	60	Deflection Transducer/Location #1 = At the right corner of the handrail. Result = 0.92
430.54	430.54	60	Deflection Transducer/Location #2 = At the midspan of the handrail. Result = 0.92
430.54	430.54	60	Deflection Transducer/Location #3 = At the left corner of the Handrail. Result = 0.76
430.54	430.54	60	**Result**: Withstood load equal to or greater than 430.54 lbs. for one full minute without failure.

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Uniform load: **Location: Vertical - full length of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
430.54	430.54	60	Deflection Transducer/Location #1 = At the right corner of the handrail. Deflection = 0.01
430.54	430.54	60	Deflection Transducer/Location #2 = At the midspan of the handrail. Result = 0.01
430.54	430.54	60	Deflection Transducer/Location #3 = At the left corner of the handrail. Result = 0.01
430.54	430.54	60	**Result**: Withstood load equal to or greater than 430.54 lbs. for one full minute without failure.

Concentrated Load: **Location: Horizontal - mid-span of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.69
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: **Location: Horizontal - 3” from the left post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 1.37
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

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Concentrated Load: **Location: Horizontal - right post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 1.24
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: **Location: Vertical - mid-span of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.03
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: **Location: Vertical - 3” from the left post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.10
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

Concentrated Load: **Vertical - right post of the handrail.**			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**DISPLACEMENT (in)/RESULT**
300	300	60	Result = 0.11
300	300	60	**Result**: Withstood load equal to or greater than 300 lbs. for one full minute without failure.

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Shot bag:			
LOAD LEVEL (lbs.)	**TEST LOAD (lbs.)**	**E.T. (min:sec)**	**LOCATION/RESULT/TYPE**
100	100	60	Location = Midspan of the left glass 460mm Type = 1 1220mm Type = 1 1525mm Type= 4

Pendulum:
Location = Midspan of the right glass Type = 1 Location = Top right corner of the right glass Type = 1 Location = Bottom right corner of the right glass Type = 1

SECTION 11
CONCLUSION

Structural Performance Testing of Assembled Railing Systems
Deflection values were recorded for information and comparative analysis purposes.

SECTION 12
DRAWINGS

The test specimen drawings have been reviewed by Intertek B&C and are representative of the test specimens reported herein. Test specimen construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.

***Note**: Complete drawings packet on file with Intertek B&C.*

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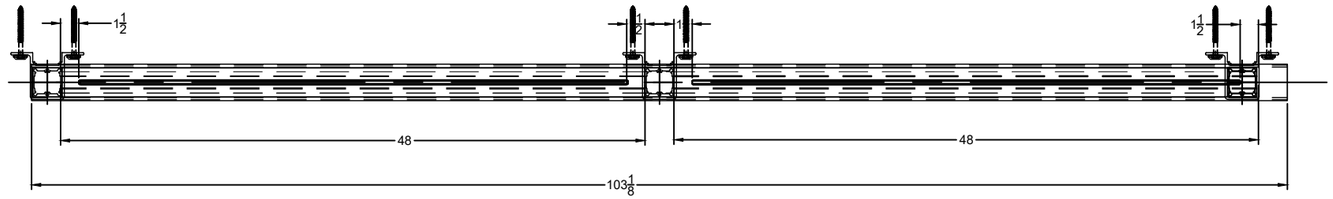

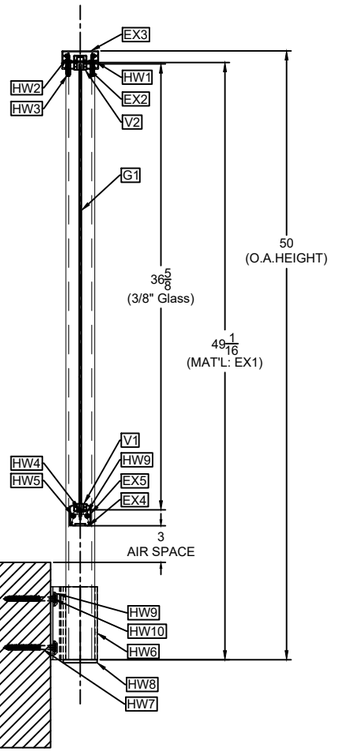

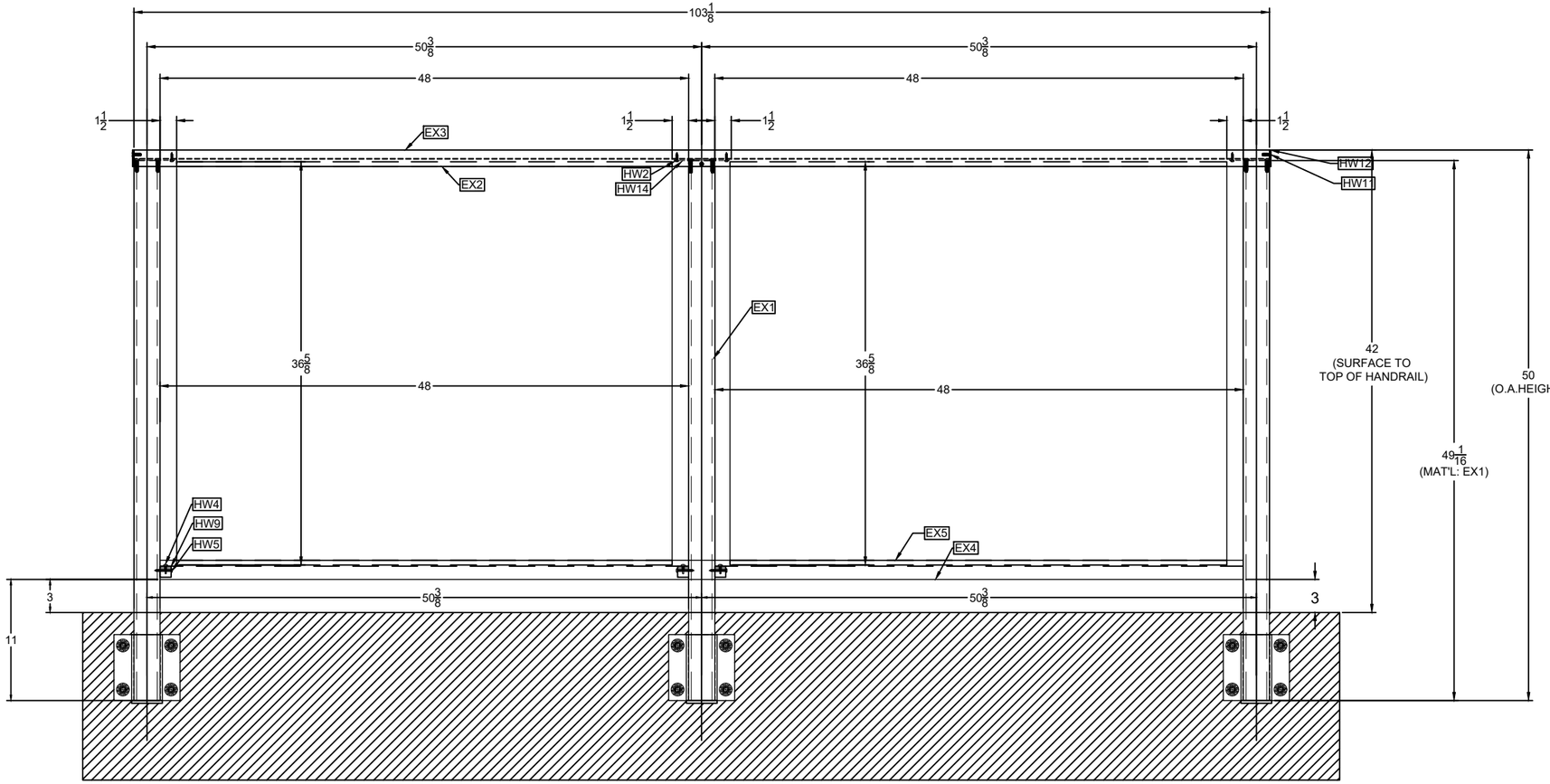

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HARDWARE & COMPONENTS				
MT'L	PART NUMBER	DESCRIPTION	QTY	UOM
HW1	ARSRCTPSEP	ARS RECTANGULAR POST SPLICE END PLATE	2	EA
HW2	8X38PPTS	8x3/8 PHIL PAN S/D #2 POINT 410 S/S	8	EA
HW3	516X1116PFTCS	5/16–18 X 11/16 PHILLIPS UNDERCUT FLAT HEAD	8	EA
HW4	8X34PHILPAN188	#8 X 3/4" Long Philips Round Head SMS 18–8 S/S	4	EA
HW5	10X112PANSMS188	#10 x 1–1/2" PHILIPS PAN HEAD SHEET METAL SCREW	6	EA
HW6	ARSFPBFABSM	FASCIA POST BRACKET 2–3/8" SQ POST – SIL MET	1	EA
HW7	LB384SS	FHC 3/8" x 4" Hex Head Lag Bolt – S/S –	12	EA
HW8	ARSFBPCSSM	ARS Fascia Base Plate – Center Square SILVER METALLIC	1	EA
HW9	ARSFSTCAPSM	ARS BASE PLATE FASTENER CAP – SILVER METALLIC	12	EA
HW10	ARSFSTWSHR	ARS BASE PLATE FINISHING WASHER – 316 L	12	EA
HW11	8X1PFHSMS188	8 x 1" PHILIPS FLAT SHEET METAL SCREW "A" 18–8	4	EA
HW12	ARSTHECSM	X2 TAHOE SERIES ALUM TOP RAIL END CAP – SILVER MET	2	EA
HW13	ARSCBLK2EXTML	CONNECTION BLOCK FOR BTM RAIL MILL FINISH 20'1" LONG	4.5	IN
HW14	ARSSQPSP	ARS SQUARE POST SPLICE PLATE	1	EA
ALUM EXTRUSIONS				
MT'L	PART NUMBER	DESCRIPTION	QTY	UOM
EX1	ARSSQPOSTEXTSM	2–3/8" ALUM SQ POST – SILVER METALLIC 20'1" LONG	10.25	FT
EX2	ARSTHEXTSM	X2 TAHOE SERIES ALUM TOP RAIL EXTRU – SIL MET 20'1"	9	FT
EX3	ARSTRPOKTEXTSM	ALUM TOP RAIL POCKET EXTRU SER TOP RAILS – SIL MET	8	FT
EX4	ARSBTMRLEXTSM	ALUM RAILING SYS BTM RAIL EXTRU – SIL MET 20'1"	8	FT
EX5	ARSBTMSCEXTSM	ALUM RAILING SYS BTM SNAP CVR EXTRU – SIL MET 20'1"	8	FT
		VINYL		
MT'L	PART NUMBER	DESCRIPTION	QTY	UOM
V1	ARSBRGSKT38	Bottom Rail Glazing Vinyl for 3/8" & 7/16" Glass	8	FT
V2	ARSTRGSKT38	Top Rail Glazing Vinyl for 3/8" & 7/16" Glass	8	FT
GLASS				
MT'L	PART NUMBER	DESCRIPTION	QTY	UOM
GL1	38CRLT	36–5/8 X 45 X 3/8" CLEAR TEMPERED GLASS	2	EA

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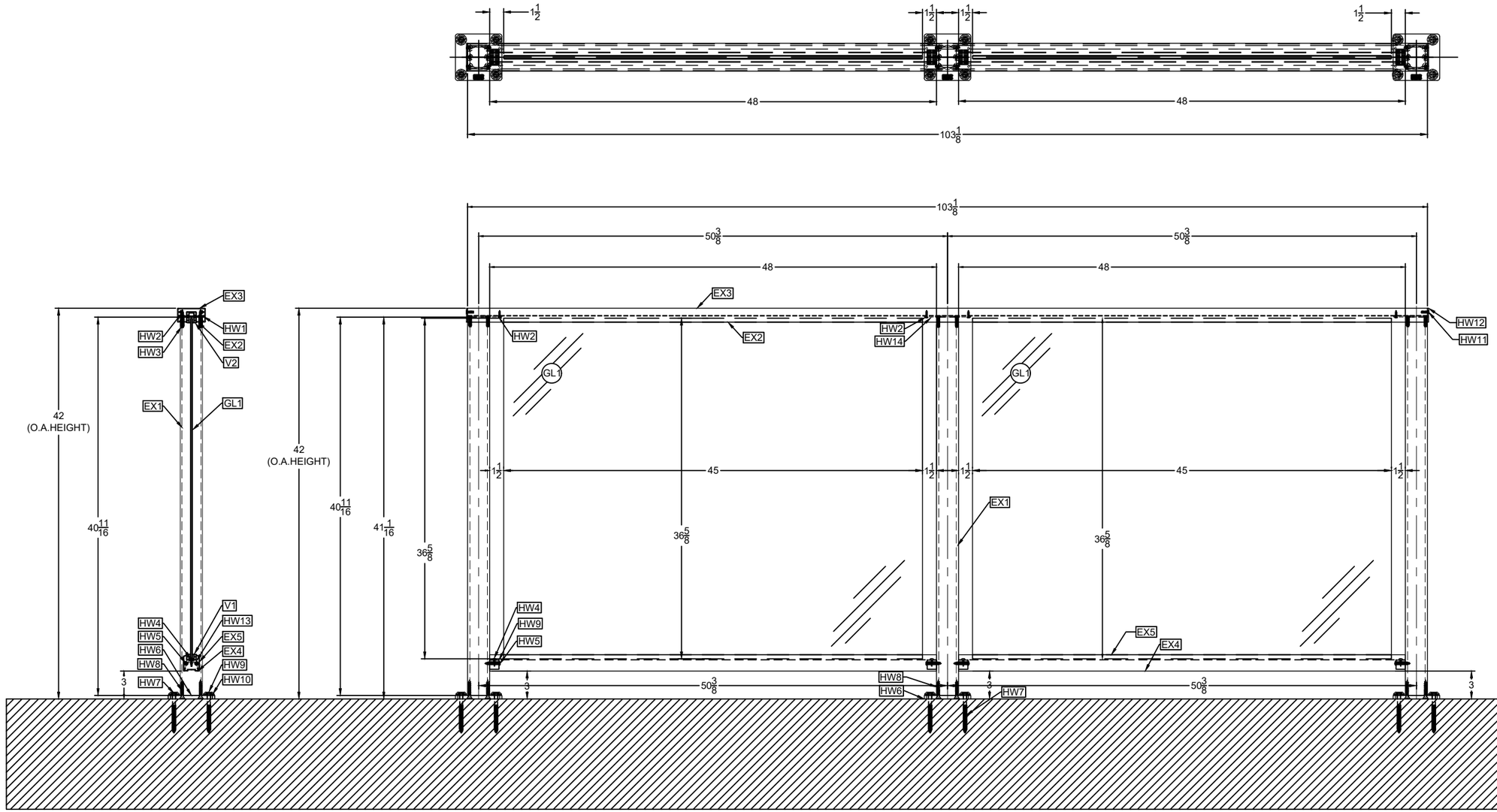

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HARDWARE & COMPONENTS				
MT'L	PART NUMBER	DESCRIPTION	QTY	UOM
HW1	ARSRCTPSEP	ARS RECTANGULAR POST SPLICE END PLATE	2	EA
HW2	8X38PPTS	8x3/8 PHIL PAN S/D #2 POINT 410 S/S	8	EA
HW3	516X1116PFTCS	5/16–18 X 11/16 PHILLIPS UNDERCUT FLAT HEAD	8	EA
HW4	8X34PHILPAN188	#8 X 3/4" Long Philips Round Head SMS 18–8 S/S	4	EA
HW5	10X112PANSMS188	#10 x 1–1/2" PHILIPS PAN HEAD SHEET METAL SCREW	6	EA
HW6	ARSSQBPSM	ARS 2–3/8" BASE PLATE – SILVER METALLIC	6	EA
HW7	LB384SS	FHC 3/8" x 4" Hex Head Lag Bolt – S/S –	12	EA
HW8	516X2PFSMS410	5/16X2 PHIL FLAT SMS T410 HT S/S – MAGNI 597 SILVER	18	EA
HW9	ARSFSTCAPSM	ARS BASE PLATE FASTENER CAP – SILVER METALLIC	12	EA
HW10	ARSFSTWSHR	ARS BASE PLATE FINISHING WASHER – 316 L	12	EA
HW11	8X1PFHSMS188	8 x 1" PHILIPS FLAT SHEET METAL SCREW "A" 18–8	4	EA
HW12	ARSTHECSM	X2 TAHOE SERIES ALUM TOP RAIL END CAP – SILVER MET	2	EA
HW13	ARSCBLK2EXTML	CONNECTION BLOCK FOR BTM RAIL MILL FINISH 20'1" LONG	4.5	IN
HW14	ARSSQPSP	ARS SQUARE POST SPLICE PLATE	1	EA
ALUM EXTRUSIONS				
MT'L	PART NUMBER	DESCRIPTION	QTY	UOM
EX1	ARSSQPOSTEXTSM	2–3/8" ALUM SQ POST – SILVER METALLIC 20'1" LONG	10.25	FT
EX2	ARSTHEXTSM	X2 TAHOE SERIES ALUM TOP RAIL EXTRU – SIL MET 20'1"	9	FT
EX3	ARSTRPOKTEXTSM	ALUM TOP RAIL POCKET EXTRU SER TOP RAILS – SIL MET	8	FT
EX4	ARSBTMRLEXTSM	ALUM RAILING SYS BTM RAIL EXTRU – SIL MET 20'1"	8	FT
EX5	ARSBTMSCEXTSM	ALUM RAILING SYS BTM SNAP CVR EXTRU – SIL MET 20'1"	8	FT
		VINYL		
MT'L	PART NUMBER	DESCRIPTION	QTY	UOM
V1	ARSBRGSKT38	Bottom Rail Glazing Vinyl for 3/8" & 7/16" Glass	8	FT
V2	ARSTRGSKT38	Top Rail Glazing Vinyl for 3/8" & 7/16" Glass	8	FT
GLASS				
MT'L	PART NUMBER	DESCRIPTION	QTY	UOM
GL1	38CRLT	36–5/8 X 45 X 3/8" CLEAR TEMPERED GLASS	2	EA

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TEST REPORT FOR FRAMELESS HARWARE COMPANY LLC.
Report No.: S3879.01-303-44 R0
Date: 03/31/25

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