intertek
Total Quality. Assured.

LIV BUILDING PRODUCTS TEST REPORT

SCOPE OF WORK
TESTING OF LIV BUILDING PRODUCTS GUARD SYSTEMS WITH METAL AND WOOD TOP RAILS TO ASSESS RESISTANCE TO LOADS ON GUARDS FOR EXTERIOR GUARDS AS PRESCRIBED IN THE 2015 NATIONAL BUILDING CODE OF CANADA (NBC), AND 2012 ONTARIO BUILDING CODE (OBC)

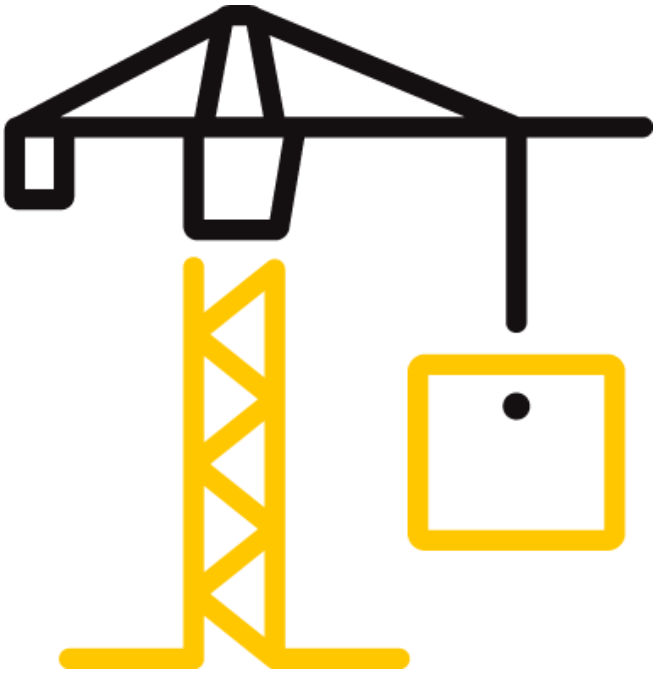
REPORT NUMBER
103287266TOR-001C

TEST DATE(S)
10/17/17 - 10/19/18

ISSUE DATE **[REVISED DATE]**
11/30/18 MM/DD/YY

PAGES
25

DOCUMENT CONTROL NUMBER
GFT-OP-10c (AUGUST 27, 2018)



6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

REPORT ISSUED TO

LIV BUILDING PRODUCTS
6050 Owen Road
Uxbridge ON, L6P 1R1
Canada

SECTION 1
SCOPE

Intertek Building & Construction (B&C) was contracted by LIV Building Products (LIV) to perform testing of Liv Building Products Guard Systems with Stainless Steel (SS), Cedar and Pressure Treated SPF, Top Rails to assess resistance to specified loads as prescribed for "All Other Guards" in Table 9.8.8.2 pf the following codes:

- 2015 National Building Code of Canada (NBC)
- 2012 Ontario Building Code (OBC)

The testing was performed during the period November 10, 2017 to October 19, 2018.

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

SECTION 2
SUMMARY OF TEST RESULTS

The Liv Building Products Guard Systems with SS, Cedar and Pressure Treated SPF Top Rails, with a maximum 70 in. long tempered glass glazing infill, as detailed in this report demonstrated resistance to Loads on Guards. Safety factors as outlined in this report were applied to the specified loads.

For INTERTEK B&C:

COMPLETED BY:	Joe DeRose, P. Eng.	**REVIEWED BY:**	Vern Jones
TITLE:	Project Engineer	**TITLE:**	Senior Technologist
SIGNATURE:		**SIGNATURE:**	
DATE:	11/30/18	**DATE:**	11/30/18

6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

SECTION 3
TEST METHOD(S)

The samples were evaluated in accordance with the following:

- 2015 National Building Code of Canada (NBC) Table 9.8.8.2, All other guards
- 2012 Ontario Building Code(OBC) Table 9.8.8.2, All other guards

SECTION 4
MATERIAL SOURCE/INSTALLATION
Assembled guard systems installed on an SPF wooden deck frame were submitted to Intertek directly from the client. Samples were not independently selected for testing. Tests were performed at the Intertek laboratory in Mississauga, Ontario.

SECTION 5.
EQUIPMENT
Calibration of test equipment was performed by Intertek B&C in accordance with ISO 17025 requirements.

Equipment Calibration		
Instrument/Equipment	**Asset #**	**Calibration Due Date**
2K Load Cell with Digital Indicator	280-01-0774	Jan-15-2019
2K Load Cell with Digital Indicator	280-01-0773	Jan-15-2019
Stop Watch	273-01-1201	Apr-13-2019
Digimatic indicator	280-01-0836	Mar-26-2019
Tape Measure	280-01-1222	Aug-7-2019
Powerfist 24” stroke Hydraulic Ram coupled to a motorized hydraulic pump	**N/A**	N/A

SECTION 6
LIST OF OFFICIAL OBSERVERS

NAME	**COMPANY**
Maurizio Bertato	LIV Building Products
Joe DeRose	Intertek B&C
Vern Jones	Intertek B&C

Note: The above observers witnessed a portion of the test program.

6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

SECTION 7
TEST PROCEDURE

Test Loads

Load tests were conducted with the following guard configurations:

- SS Top Rail – two post straight linear guard with 1773 mm (70 in.) glass lite, with corner return guard section connected only for the corner connection test.
- Cedar and Pressure Treated SPF Top Rail – 3 post straight linear guard with 1773 mm (70 in.) and 1201 mm (47.3 in.) glass lites, with corner return guard section connected for all tests.

The NBC/OBC specified Live Loads are summarized in Table 2 below:

Table 2 - OBC 2012, NBC 2010 and NBC 2015 Minimum Specified Loads

Horizontal Load Applied at any Point at the Minimum Required Height of the Guard	Horizontal Load Applied Elements Within the Guard, Including Solid Panels and Pickets	Evenly Distributed Vertical Load Applied at the Top of the Guard
0.75 kN/m or concentrated load of 1.0 kN applied at any point, whichever governs	Concentrated load of 0.5 kN applied at any point on individual elements	1.5 kN/m uniform load

The applicable test loads to be applied are based on the specified loads in Table 1 increased by the following safety factors:

- specified loads multiplied by 1.5/ø, where ø=0.90 resistance factor for bearing stress on aluminum or stainless steel members resulting in plastic yielding failure, resulting safety factor was 1.67,
- specified loads multiplied by 1.5/ø, where ø=0.67 resistance factor for fasteners, for testing of aluminum and stainless steel connections the resulting safety factor was 2.24,
- specified loads multiplied by 1.5/ø, where ø=0.60 resistance factor for glass, for testing of glass infill panels the resulting safety factor was 2.5.
- Specified loads multiplied by 1.5/ø, where ø=0.9 resistance factor for wood failure perpendicular to grain, the resulting safety factor was 1.67
- Specified loads multiplied by 1.5/ø/KT, where ø=0.9 resistance factor for wood failure and KT=0.85 Treatment factor, the resulting safety factor was 1.96
- Specified loads multiplied by 1.5/ø, where ø=0.67 resistance factor for brittle failure mode for aluminium, the resulting safety factor was 2.24
- Specified loads multiplied by 1.5/ø, where ø=0.6 resistance for wood screw connection, the resulting safety factor was 2.5

- Specified loads multiplied by 1.5/ø/KT, where ø=0.6 resistance for wood screw connection and KT=0.85 Treatment factor, the resulting safety factor was 2.94

The deflection of the guard system components under the specified and factored loads was measured and is detailed in this report.

Vertical Uniform Load on Top Rail

Quarter-point loading was applied to the top surface of the Top Rail in a vertical direction by means of the loading system comprised of a calibrated load cell/single ram/pump system and load distributing steel bar. The specified test load corresponding to 1.5 kN/m was applied to the top rail and held for 1 minute. The factored load indicated in Section 5.1 was applied and the deflection was measured at full load and after removal of the test load. After release of the load, the system was evaluated for failure, evidence of disengagement of any component, and visible cracks in any component.

Horizontal Concentrated Load of Top Rail

The initial position of the top of the Top Rail (at mid span) was measured. A concentrated horizontal load of 1.0 kN (applied using a 100 mm by 100 mm platen) was applied to the Top Rail at the mid span and adjacent to the post, by means of a calibrated load cell/single ram/pump system and held for 1 minute, whereupon the position of the top rail was measured. The load was then released and the residual position of the top rail was measured. The factored load indicated in Section 5.1 was applied and the deflection was measured at full load and after removal of the test load. After release of the load, the system was evaluated for residual deflection, failure, evidence of disengagement of any component and visible cracks in any component.

Horizontal Concentrated Load at Corner Connection

A secondary section of guard was installed at a perpendicular angle to create a corner. The end of the secondary section was restrained. A concentrated horizontal load of 1.0 kN (delivered with a 100 mm by 100 mm platen) was applied parallel to the infill at the top of the SS Top Rail. The load was applied by means of the loading system comprised of a calibrated load cell/single ram/pump system and held for 1 minute. The factored load indicated in Section 5.1 was applied and the post deflection was measured at full load and after removal of the test load. After release of the load, the system was evaluated for failure, evidence of disengagement of any component and visible cracks in any component.

Horizontal Concentrated Load on Post

The initial position of the post was measured. A concentrated horizontal load of 1.0 kN (delivered with a 100 mm by 100 mm platen) was applied to top of the post by means of a calibrated load cell/single ram/pump system and held for 1 minute, whereupon the position of post was measured. The load was released and the residual position of the post was again measured. The factored load indicated in Section 5.1 was applied and the post deflection was measured at full load and after removal of the test load. After release of the load, the system

was evaluated for residual deflection, failure, evidence of disengagement of any component and visible cracks in any component.

Horizontal Load on Infill

An outward concentrated horizontal test load of 0.5 kN (delivered with a 100 mm by 100 mm platen) was applied at the top edge of the glass lite at the mid-span by means of a calibrated load cell/single ram/pump system and held for 1 minute. The factored load indicated in Section 5.1 was applied and the glass deflection was measured at full load and after removal of the test load. After release of the load, the system was evaluated for failure, evidence of disengagement of any component and visible cracks in any component.

Shot Bag Impact on Infill

A test apparatus capable of supporting a 45.4 kg (100 lbs) and allowing unimpeded swinging was set up. A 45.4 kg (100 lbs) shot bag was suspended from the overhead support via a 1.83 m (6') cable and positioned to impact the geometric centre of the glass infill panel. The shot bag was pulled back and upwards through an arc shaped trajectory to the required test height and then released, impacting the centre of the glass infill panel. The test was performed at 540 J (400 ft·lbs).

SECTION 8
TEST SPECIMEN DESCRIPTION

The Liv Building Products Guard Systems with SS, Cedar and Pressure Treated SPF Top Rails were tested as “L” shaped guard assemblies with four (4) surface mounted or fascia mounted posts, three (3) tempered glass infill panels and SS, Cedar or Pressure Treated SPF top rails. Posts were spaced 1870 mm and 1030 mm along the length and 1297 mm on the shorter 90° return section. The guard assembly was installed on a wooden frame constructed with 2 in. x 6 in. headers and 6 in. x 6 in. SPF wood joists, the overall deck frame measured 1520 mm x 3123 mm.

Posts were anchored to a 21.5mm thick composite deck board and 6 in. x 6 in SPF wood joists using six (6) 3/8 in. x 6 in. U2 Construction Screw™ The height of the guard measured 1100 mm from the surface of the composite deck board to the top of the wooden rails. Tests were conducted with top rails installed.

The Liv Building Products Guard Systems component descriptions and key dimensions are summarized in Table 3.

6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

Table 3: Guard Assembly Description						
Component	**Part**	**Drawing Number**	**Part Dimensions (mm)**			**Reported Material**
			Length (mm)	**Width (mm)**	**Thickness (mm)**	
POSTS						
InvisiPost Aluminum Post, Surface Mount	Post welded to 4.75 in. (121mm) x 2.5 in. (64 mm) x 0.375 in. (9.5mm) surface mount base. Installed 45° angle for 90° corner.	1511.2391	1080	72 to 48 taper	10	Aluminum
InvisiPost SS Post, Surface Mount	Post welded to 4.75 in. (121mm) x 2.5 in. (64 mm) x 0.375 in. (9.5mm) surface mount base. Installed 45° angle for 90° corner.	1406.0793	1080	64 to 45 taper	8	Stainless Steel
ALX HD Aluminum Post (for SLX Invisirail™), Surface Mount	Post welded to 5.0 in. (127mm) x 5.0 in. (127mm) x 0.375 in. (9.5mm) surface mount base.	IN136608	1118	64 x 64	3.8	Aluminum 6005-T5
TOP RAILS						
Stainless Steel Tube Continuous Top Rail	42 mm OD SS Tube Rail	-	152 (3861)	1.654 (42) OD	0.063 (1.6)	Stainless Steel
	Rail Corner Multi-Angle Fitting with set screws at both male ends inserted through the fitting and tube rail	1412.2463 (male section), 1412.3678 (female section	Per Appended Drawing(s)			Stainless Steel
	Inline - Rail to Post Bracket	1711.0736	Per Appended Drawing(s)			Stainless Steel
	Corner – Rail to Post Bracket	1711.0712	Per Appended Drawing(s)			Stainless Steel
Wood Continuous Top Rail	25 x 137 mm Cedar Rail		1420 and 3060	137	25	Cedar
	25 x 137 mm Pressure Treated SPF Rail		1420 and 3060	137	25	Pressure Treaded SPF
	SS Holder for Top Rail - Supports wood top rail and bolts to Invisirail post using a single M8x1.5x25. socket head bolt with nut.	1406.0793	Per Appended Drawing(s)			Stainless Steel
	SS angled Block Spacer - Bolted to the Invisirail post installed at the corner, using a single M8x1.25x37 socket head bolt.	1804.2390	Per Appended Drawing(s)			Stainless Steel

6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

Table 3: Guard Assembly Description						
Component	**Part**	**Drawing Number**	**Part Dimensions (mm)**			**Reported Material**
			Length (mm)	**Width (mm)**	**Thickness (mm)**	
INFILL						
Glass Lites	Tempered Glass	-	1773 1202 974	987 984 984	10 10 10	Tempered Glass
	Clamps (4 per section) located 75 mm up from lower edge of glass, and 60 mm down from upper edge of glass on both sides.	-	64	45	6.3	Stainless Steel
	Glass Clip Sandwich Fasteners (2 each)	-	M6x1.0 Countersink 10mm screw type			Stainless Steel
	Glass Retaining Pin	-	20 by 8 OD			Stainless Steel
	Retaining Pin Bushing	-	8 by 12 OD			Nylon

SPECIMEN PREPARATION

The test guard assembly was assembled by the client. For testing of the guard assemblies, the post flanges were anchored to concrete and wood substrate as follows:

	Number of Fasteners	**Concrete Slab**	**6 x 6 SPF Wood Beam**
InvisiPost Aluminum Surface Mount	6	Cobra Tork concrete screw anchors (5/16 X 3 inch)	US Fasteners™ 2-22 106000 (3/8 x 6 in.)
InvisiPost SS Surface Mount	6		
ALX HD Aluminum Surface Mount (for SLX Invisirail™)	4		

CONDITIONING

The guard specimens were tested in the laboratory under ambient conditions. No specific conditioning parameters were required before testing.

6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

SECTION 9
TEST RESULTS

TESTING OF SS INVISIRAIL™ with SS TUBE TOP RAIL
The testing was conducted under Intertek projects G103542752 and G102784150.

Load Type	Specified Load kN (lbf)	Applicable Safety Factor	Required Factored Load kN (lbf)	Factored load Applied kN (lbf)	Outward Deflection at Specified Load (mm)	Inward Deflection at Specified Load (mm)	Pass/Fail
Horizontal concentrated load applied on the top edge of the glass [1]	0.5 kN (112 lbf)	2.5	1.25 kN (280 lbf)	1.25 kN (280 lbf)	23.8		Pass
Vertical Uniform Load at Continuous Top Rail [2]	1.5 kN/m (103 plf)	1.67	2.5 kN/m (172 plf)	2.5 kN/m (172 plf)	25		Pass
Mid-span Concentrated Load at Continuous Top Rail [3]	1.0 kN (225 lbf)	1.67	1.67 kN (376 lbf))	2.22 kN (500 lbf)	71	69	Pass
Adjacent to Post Connection Concentrated Load at Continuous Top Rail [3]	1.0 kN (225 lbf)	1.67	1.67 kN (376 lbf))	2.22 kN (500 lbf)	63	59	Pass
Top of Post Concentrated Load [3]	1.0 kN (225 lbf)	1.67	1.67 kN (376 lbf)	2.22 kN (500 lbf)	18		Pass
Corner Condition Adjacent to Post Concentrated Load at Continuous Top Rail [3]	0.89 kN (200 lbf)	1.67	1.67 kN (376 lbf)	2.22 kN (500 lbf)	15	15	Pass

Notes:
1. Testing conducted under Intertek project G103670754
2. Testing conducted under Intertek project G103542752.
3. Testing conducted under Intertek project G102784150.

After release of the load there was no evidence of disengagement or visible cracks in any components of the guard rail system.

SHOT BAG IMPACT TESTING
The 70 in. (1773mm) tempered glass infill panel secured to posts was tested at the 540 J (400 ft·lbs) impact level. The tempered glass panel was unbroken and the panel was retained. The bottom left glass clip fastener was loosened but did not disengage from the post.

intertek
Total Quality. Assured.

6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

TESTING OF SS INVISIRAIL™ with WOOD TOP RAIL

The testing was conducted under Intertek projects G103670754.

Guard Assembly With Wooden Top Rail Installed (Testing Conducted with Cedar Top Rail)						
Test		**Specified load kN (lbf)**	**Deflection at Specified load mm (In.)**	**Safety Factor**	**Factored load Applied kN (lbf)**	**Pass/Fail**
Horizontal concentrated load applied at the top edge of the glass over a width of 100 mm x height of 100 mm		0.5 (112)	23.8 (0.9)	2.5	1.25 (280)	Pass
Quarter point vertical load applied at the top of the guard, mid-span of the largest span		1.5kN/m (103lbf/ft.)	1.0 (0.04)	1.67	2.5kN/m (172 lbf/ft.)	Pass
Horizontal concentrated load applied at the top of corner post		1.0 (225)	57 (2.2)	2.24	2.24 (504)	Pass
Horizontal concentrated load applied at the top of end post		1.0 (225)	40.3 (1.6)	2.24	2.24 (504)	Pass
Cedar Wood Top Rail						
Quarter point Horizontal load applied at the top of the guard, mid-span of the largest span		0.75kN/m (51 lbf/ft.)	43.45 (1.7)	1.67	1.25kN/m (85 lbf/ft.)	Pass
Horizontal concentrated load applied at the top Rail	Adjacent to corner Post, **return end post Restrained**	1.0 (225)	1.4 (0.05)	2.5	2.5 (563)	Pass
	Adjacent to corner Post.	1.0 (225)	57.0	2.5	2.5 (563)	Pass
	Adjacent to Post (End Post)	1.0 (225)	36.2 (1.4)	2.5	2.5 (563)	Pass
Pressure Treated SPF Wood Top Rail						
Quarter point Horizontal load applied at the top of the guard, mid-span of the largest span		0.75kN/m (51 lbf/ft.)	8.89 (0.35)	1.96	1.47kN/m (100 lbf/ft.)	Pass
Horizontal concentrated load applied at the top Rail	Adjacent to corner Post, **return end post Restrained**	1.0 (225)	3.00 (0.12)	2.94	2.94 (662)	Pass
	Adjacent to corner Post, **return end post unrestrained**	1.0 (225)	5.33 (0.21)	2.94	2.94 (662)	Pass
	Adjacent to Post (End Post)	1.0 (225)	23.62 (0.93)	2.94	2.94 (662)	Pass

After release of the load there was no evidence of disengagement or visible cracks in any components of the guard rail system.

6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

SECTION 10
CONCLUSION

Intertek has conducted testing for LIV Building Products on Guard Systems with Stainless Steel (SS), Cedar and Pressure Treated SPF Top Rails, to assess resistance to specified loads as prescribed for "All Other Guards" in Table 9.8.8.2 pf the following codes:

- 2015 National Building Code of Canada (NBC)
- 2012 Ontario Building Code(OBC)

The LIV Building Products Guard Systems with Stainless Steel (SS), Cedar and Pressure Treated SPF Top Rails, using the components detailed in Section 5.3 of this report with a maximum 1778 mm (70 in.) tempered glass infill lite, demonstrated resistance to the Specified Loads as prescribed in Table 9.8.8.2 of the 2015 National Building Code of Canada (NBC) and 2012 Ontario Building Code (OBC). Applicable load safety factors were applied as detailed in this report. The Guard System resisted an infill shot bag impact of 100 lb swung from a height of 48 in.

The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

Glass for guard systems subject to OBC/NBC requirements must comply with CAN/CGSB-12.1-M90 and must be marked with the manufacturer's name and the characters "CAN/CGSB-12.1-M90."

Welding of the posts to base plates must conform to the applicable CSA standard including the qualification of welding operators and procedures.

6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

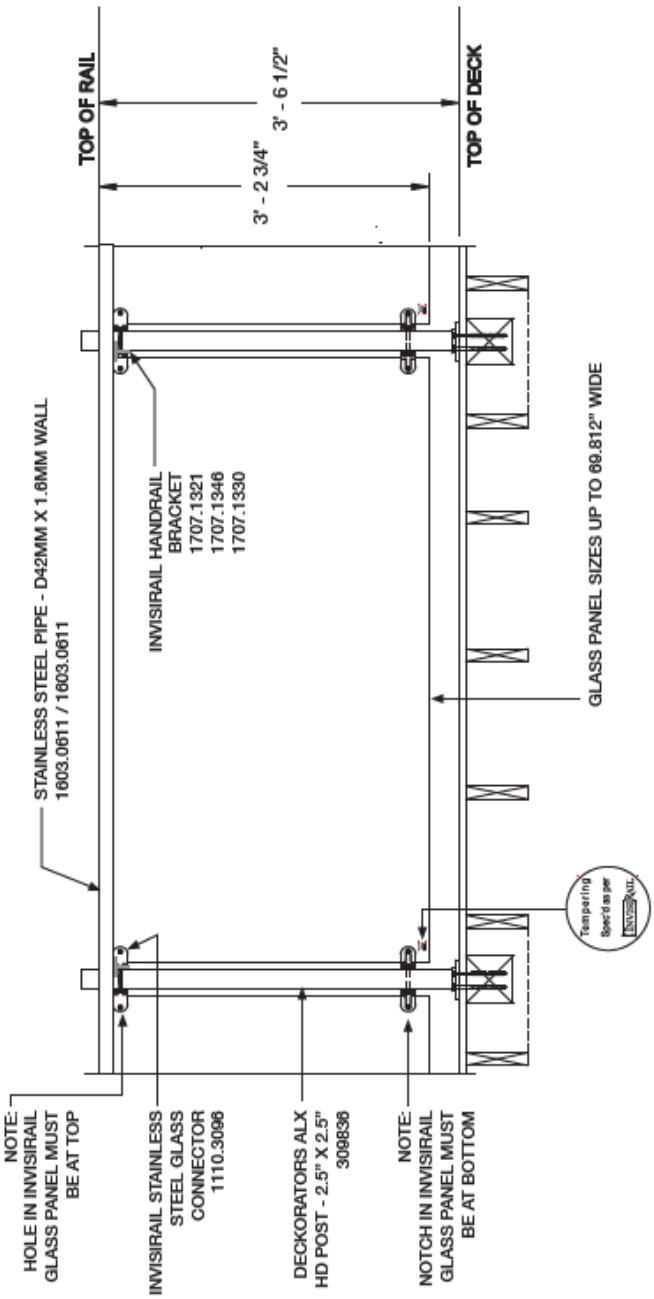
SECTION 11
PHOTOGRAPHS

Photo No. 1
Photo of Assembled Guard with Cedar Top Rail Installed

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

SECTION 12
DRAWINGS

ALX POST WITH SS TUBE TOP RAIL GUARD SYSTEM

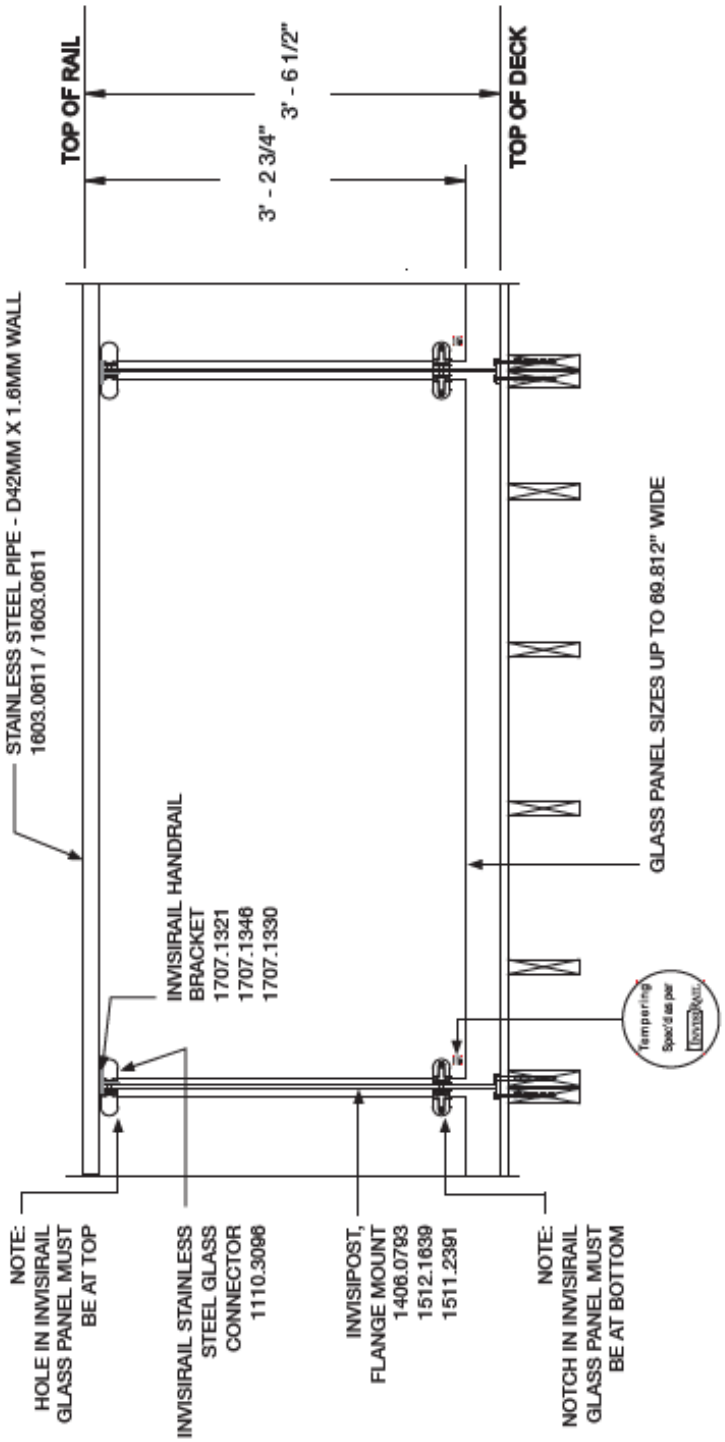


6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

INVISIRAIL™ SS POST WITH SS TUBE TOP RAIL GUARD SYSTEM



6225 Kenway Drive
Mississauga, ON L5T 2L3

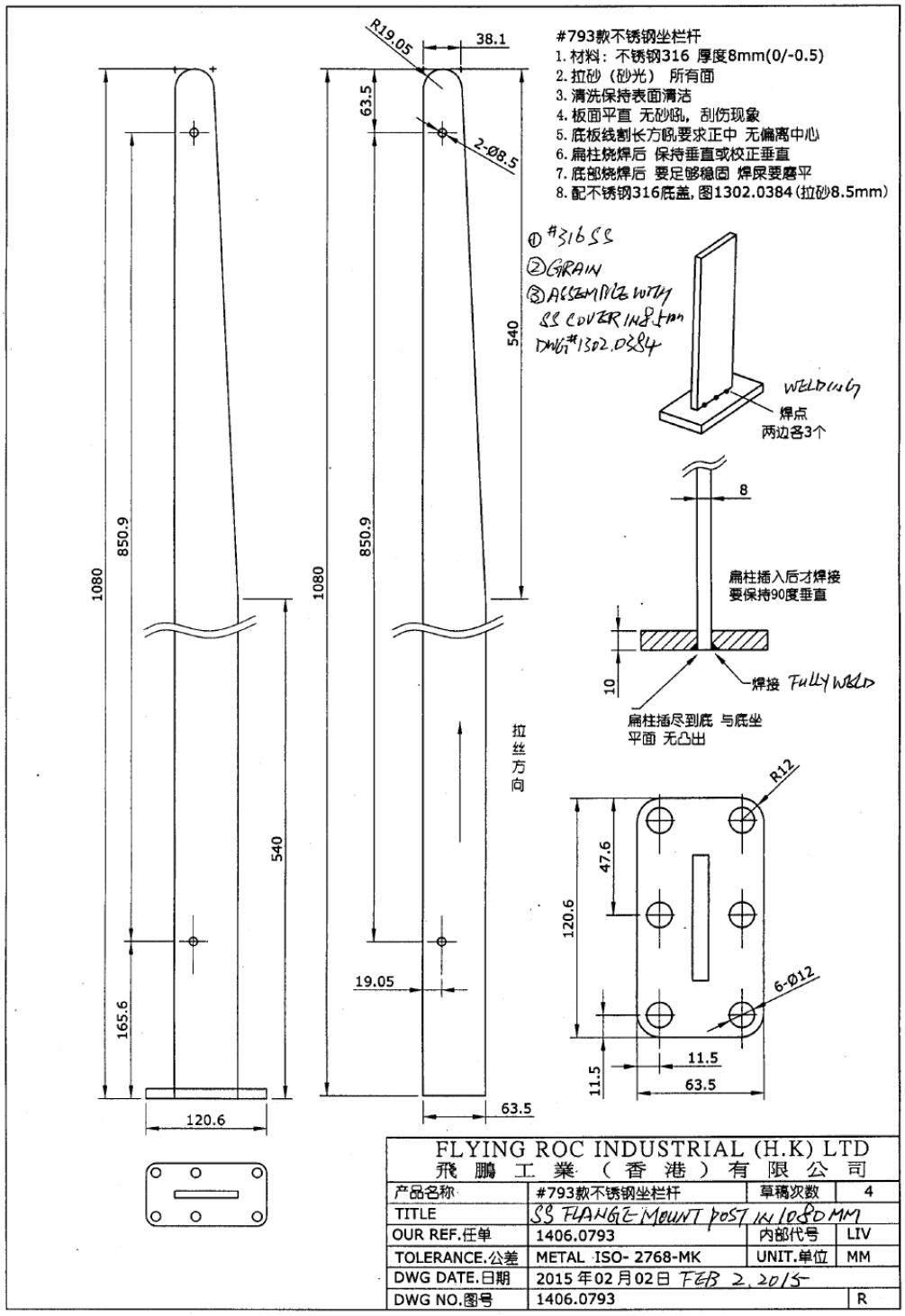
Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS

Report No.: 103287266TOR-001C

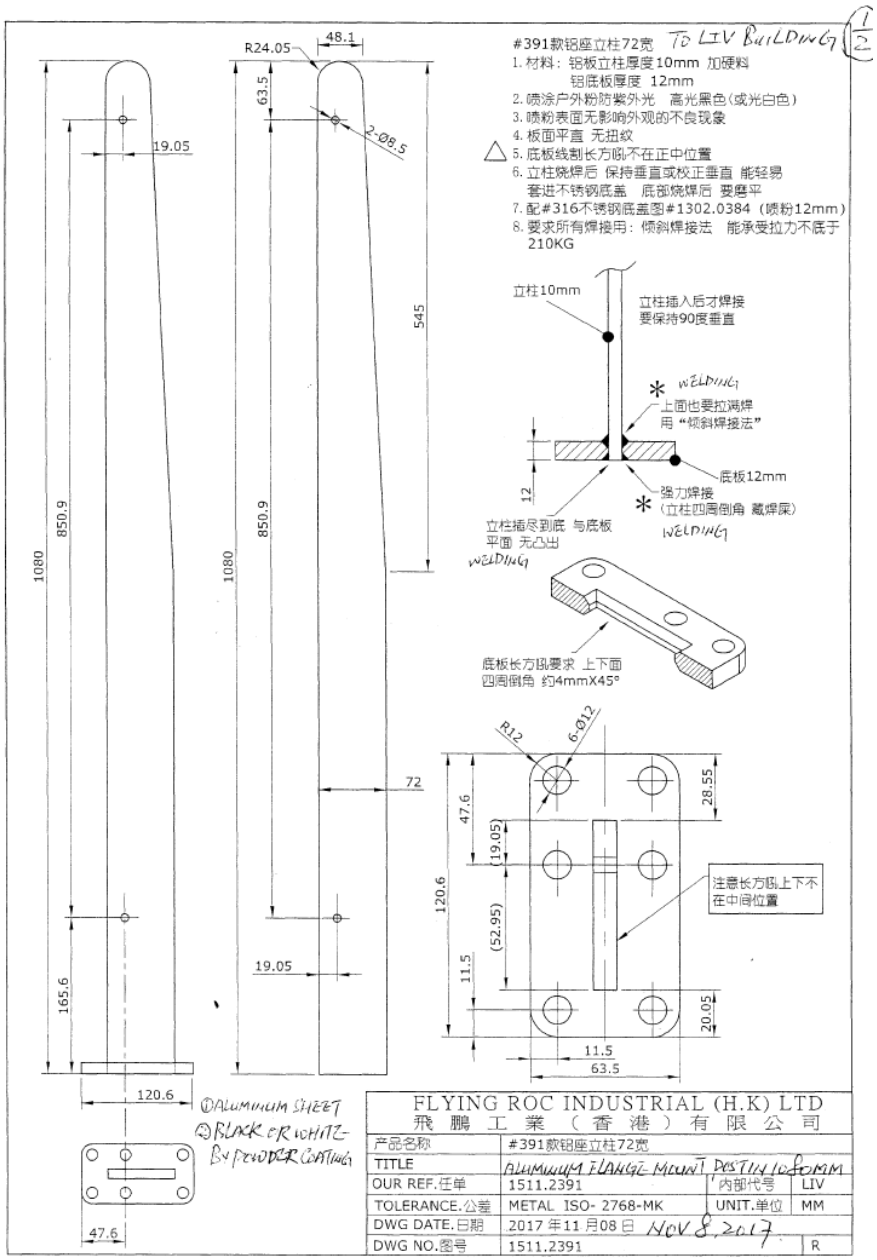
Date: 11/30/18

SS INVISIPOST



TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

ALUMINUM INVISIPOST

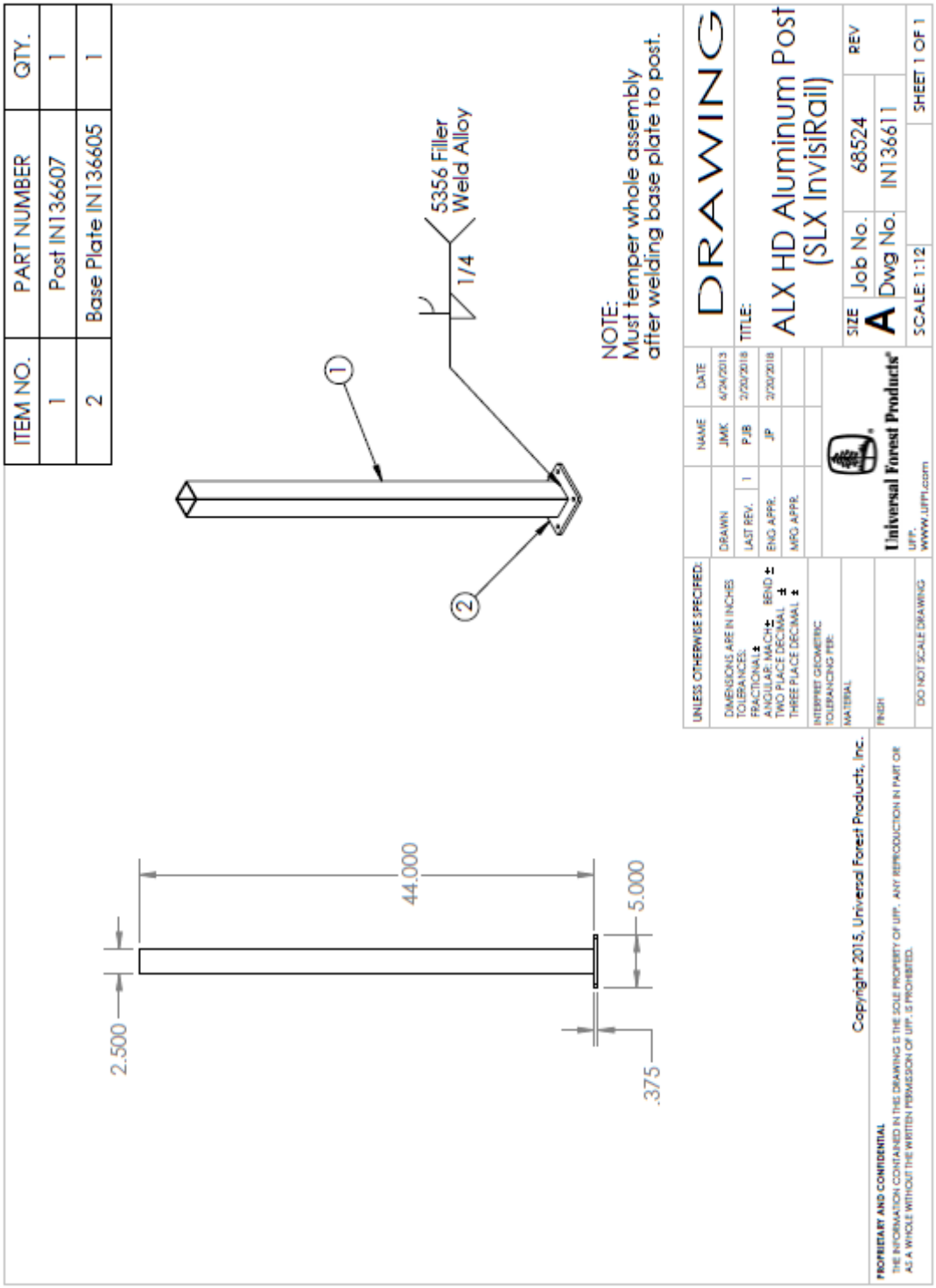


6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

ALX POST

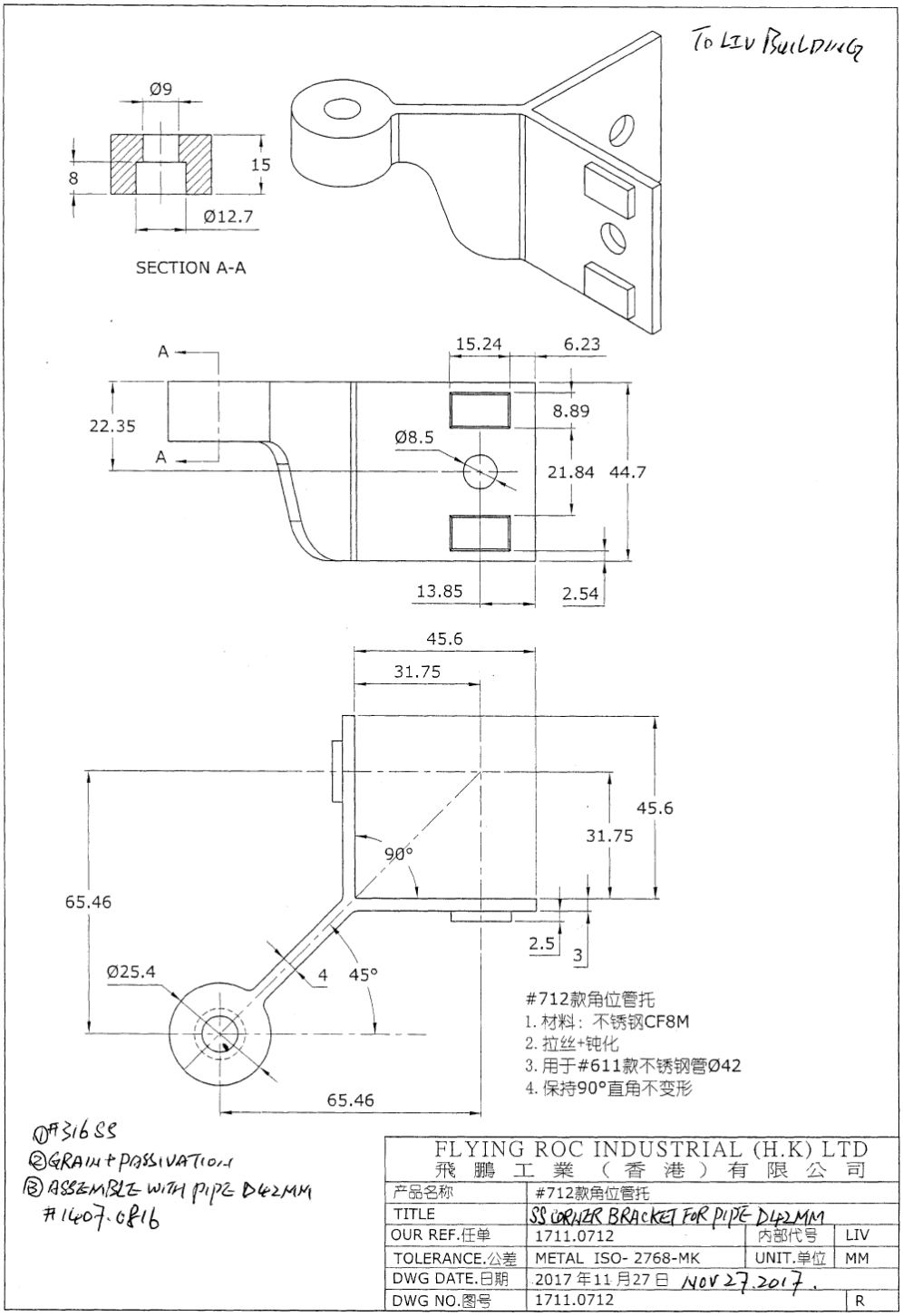


6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

SS CORNER BRACKET FOR SS TUBE TOP RAIL

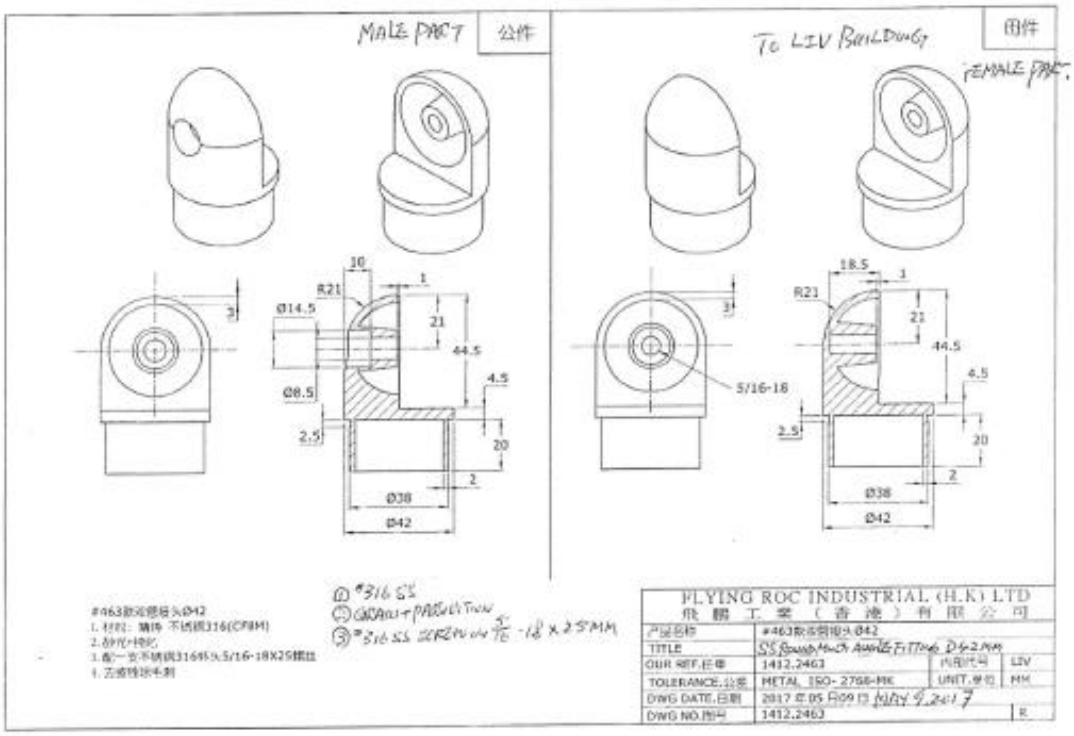


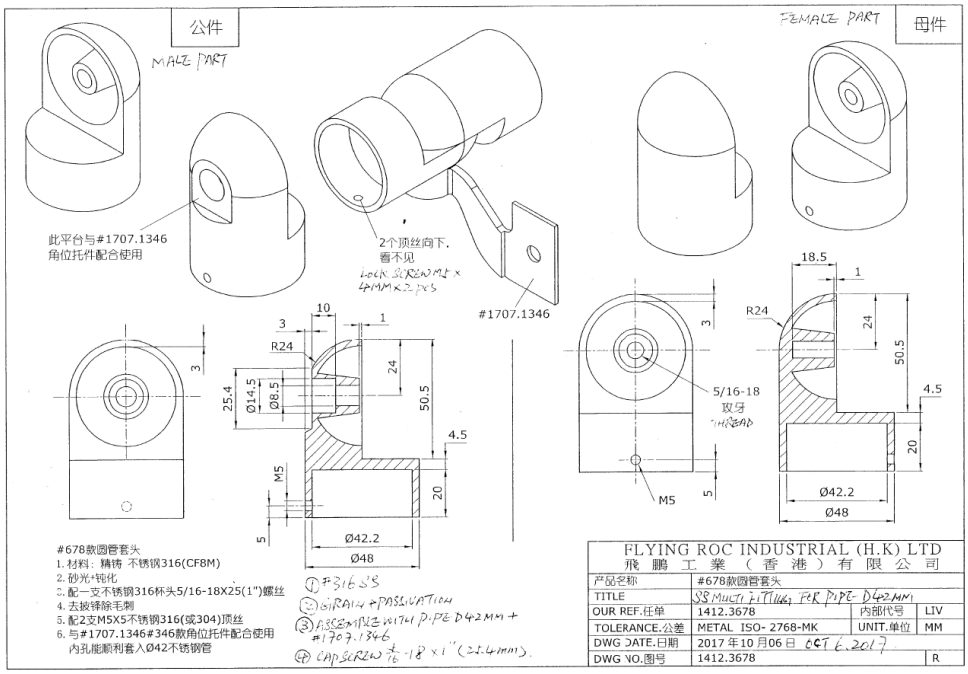
6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

SS TUBE RAIL CORNER MULTI-ANGLE FITTING





6225 Kenway Drive
Mississauga, ON L5T 2L3

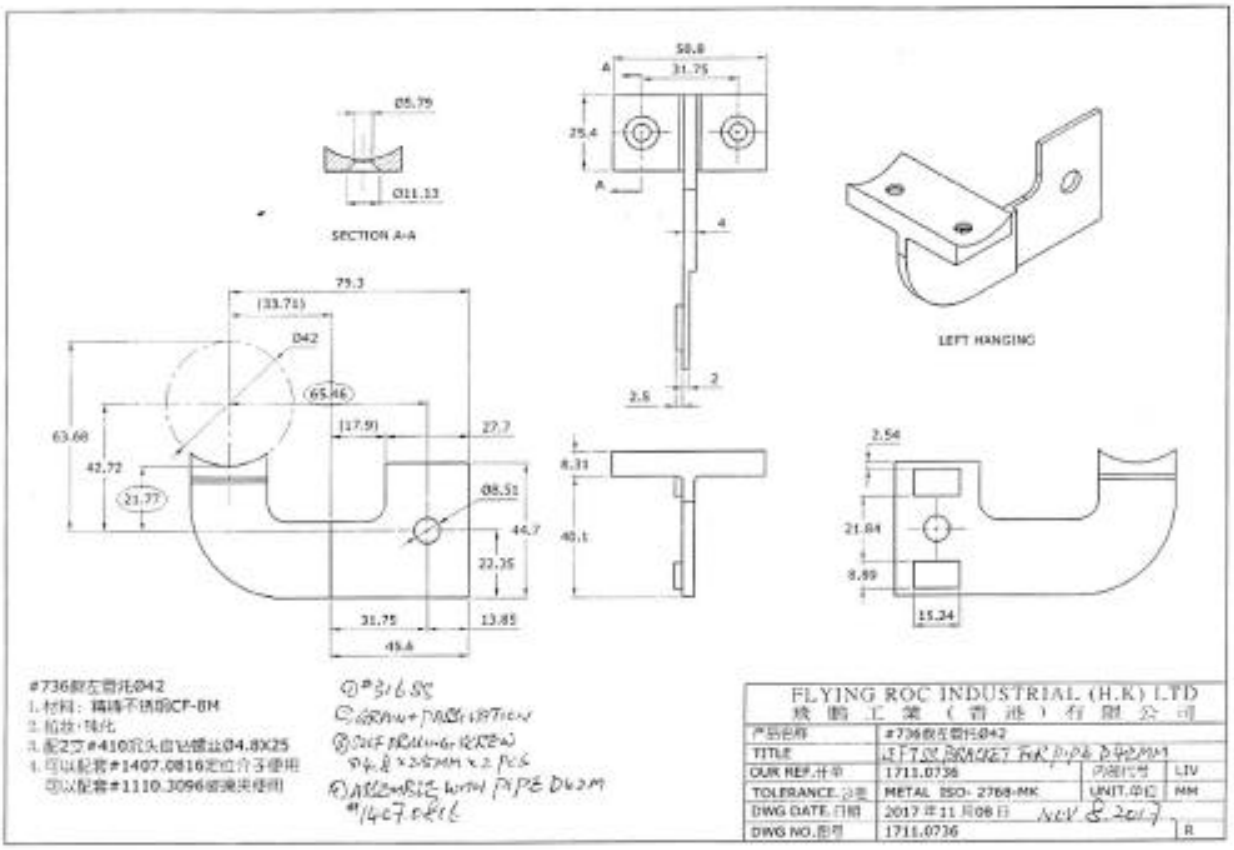
Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS

Report No.: 103287266TOR-001C

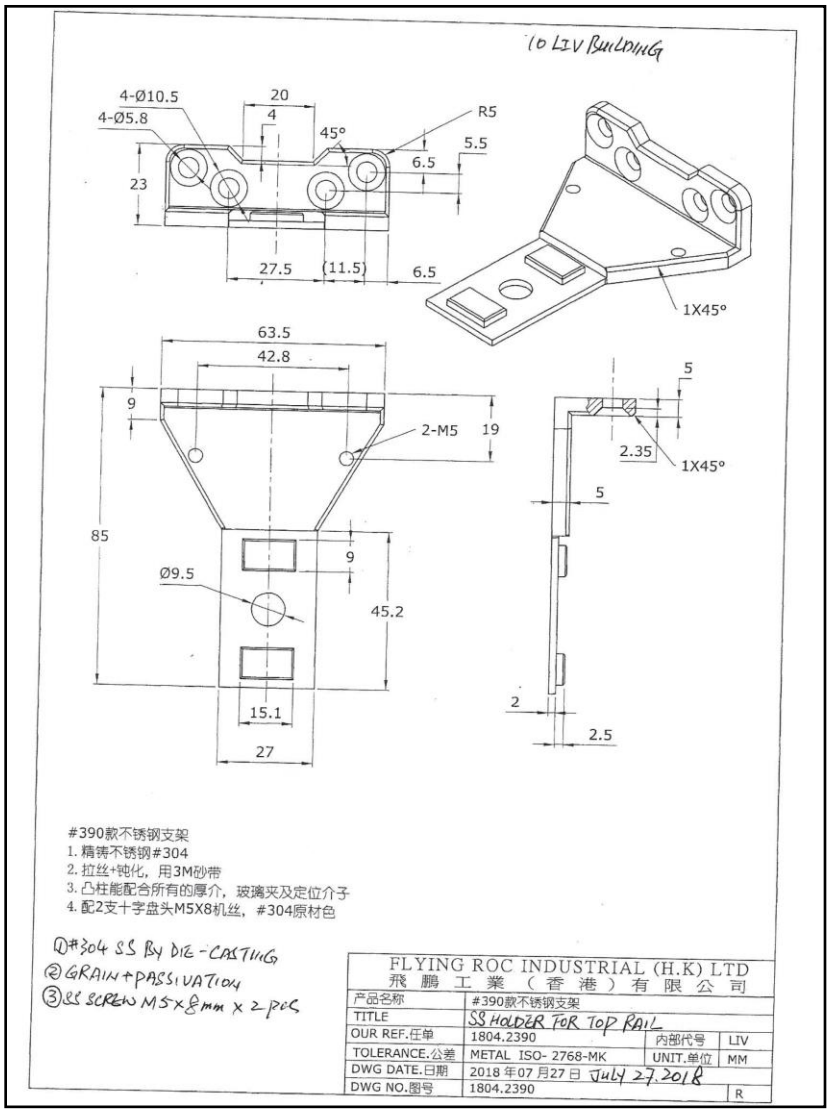
Date: 11/30/18

SS INLINE BRACKET FOR SS TUBE TOP RAIL



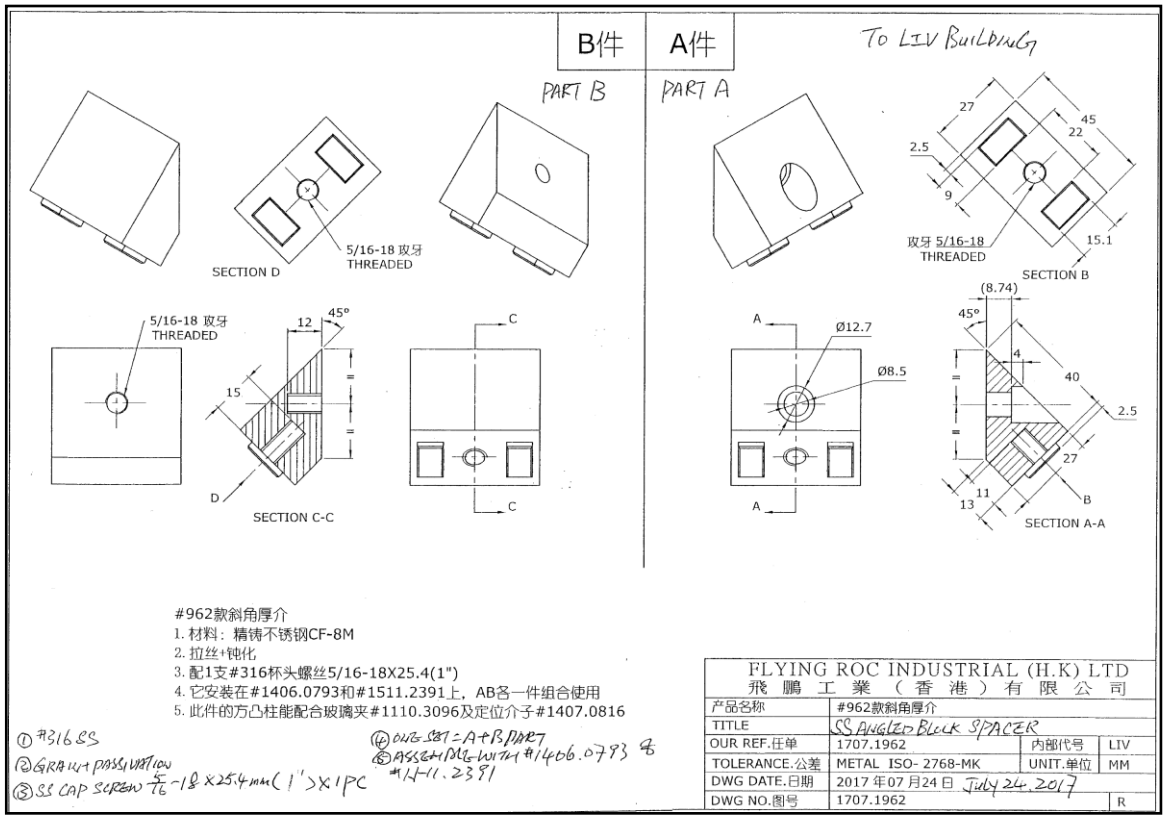
TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

SS Holder for Top Rail



TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

SS Angled Block Spacer

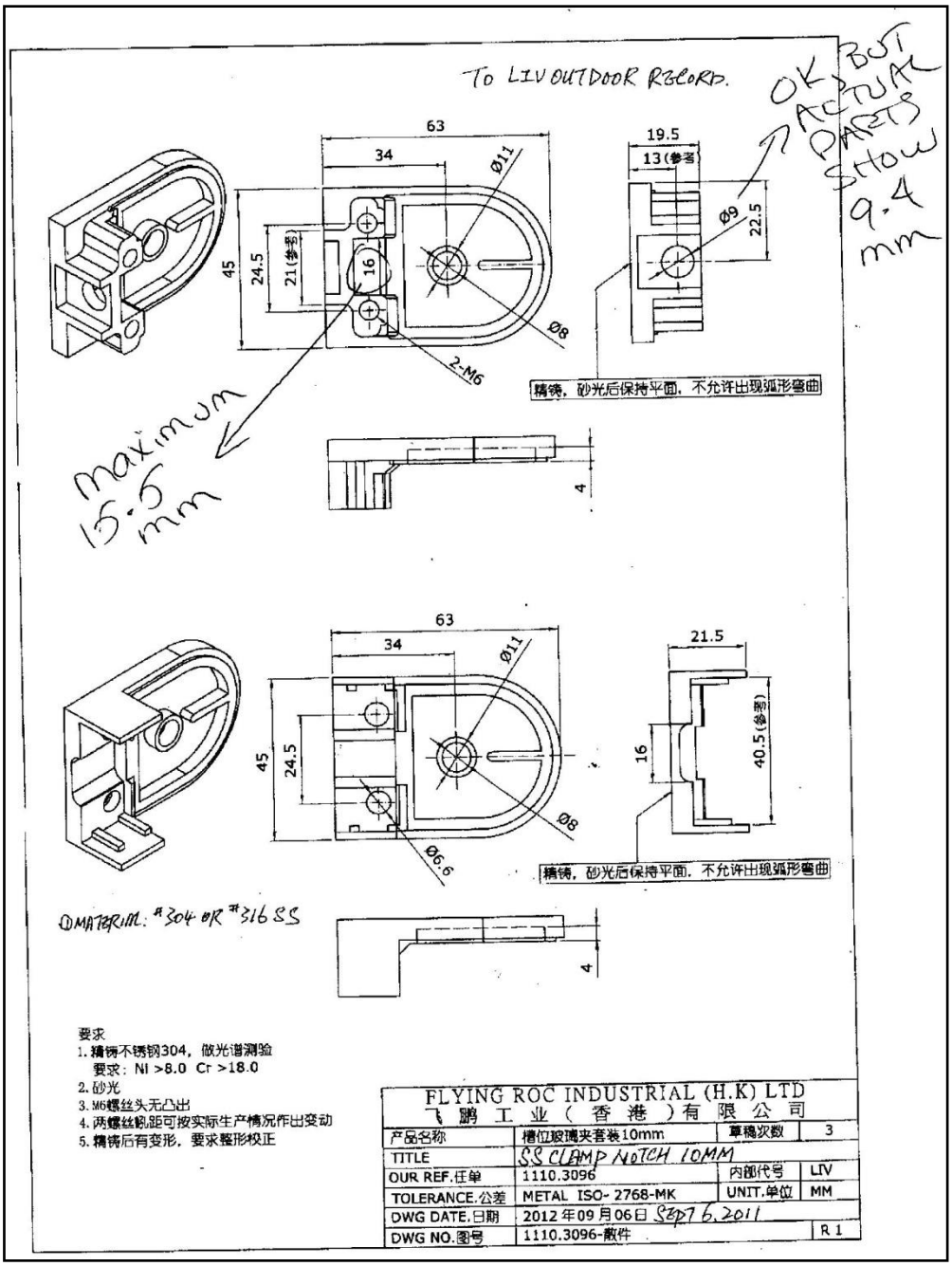


6225 Kenway Drive
Mississauga, ON L5T 2L3

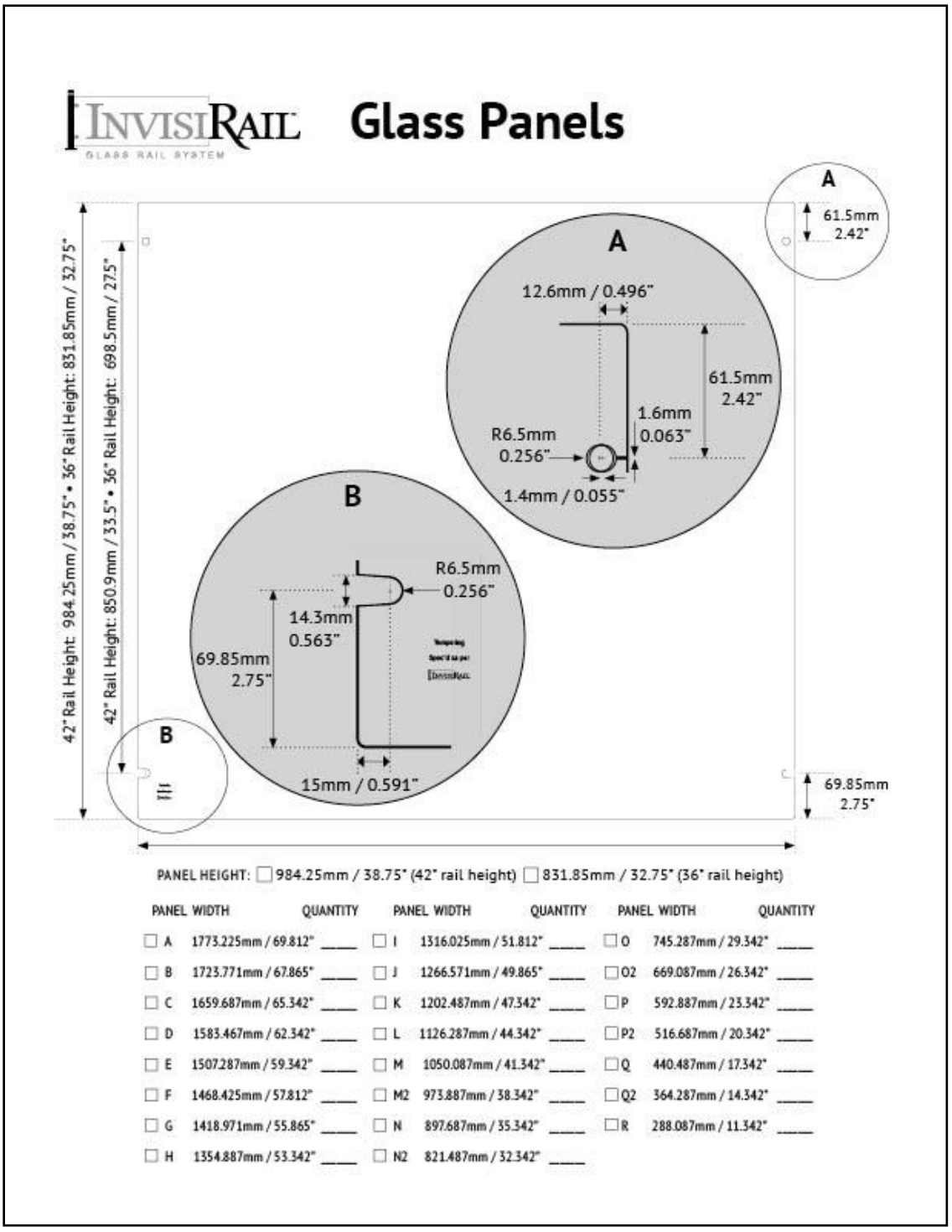
Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

SS Clamp Notch 10 mm



TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18



6225 Kenway Drive
Mississauga, ON L5T 2L3

Telephone: 905-678-7820
www.intertek.com/building

TEST REPORT FOR LIV BUILDING PRODUCTS
Report No.: 103287266TOR-001C
Date: 11/30/18

SECTION 13
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	11/30/18	N/A	Original Report Issue