

TEST REPORT

Intertek ETL SEMKO

REPORT NUMBER: 3121232COQ-003
ORIGINAL ISSUE DATE: April 30, 2007

EVALUATION CENTER

INTERTEK TESTING SERVICES NA LTD.
1500 BRIGANTINE DRIVE
COQUITLAM, BC V3K 7C1

RENDERED TO

EXCELL RAILING SYSTEMS LTD.
#306 – 12886 ANVIL WAY
SURREY, BC V3W 8E7

PRODUCT EVALUATED: Durarail Glass Infill Rail System With 2-½ in. Post
EVALUATION PROPERTY: Load Requirements

**Report of Glass Infill Aluminum Rail System for compliance with
the applicable requirements of the following criteria: 2006
International Building Code, Section 1607.7**

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2 Introduction

Intertek Testing Services NA Ltd. (Intertek) has conducted a test program for Excell Railing Systems Ltd. on the 2-1/2 inch post Durarail glass infill guard rail system. The evaluation was carried out to determine whether the guard would meet the loads specified in 2006 International Building Code (IBC), Section 1607.7. The evaluation was conducted in the month of April 2007.

3 Test Samples

3.1. SAMPLE SELECTION

The client submitted the sample guard rail specimen to the Evaluation Center on April 3, 2007 without a pretest inspection by an accredited third party agency.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

The railing system consisted of the following materials and connections (refer to drawings in Appendix B):

- Post: 2 1/2 in. x 2 1/2 in. 6063-T5 extruded aluminum post.
- Base Plate (deck): 4 in. x 4 in. x 3/8 in. 6061-T6 aluminum base plate with 4 mounting holes.
- Top Rails: 42 in. high, 6063-T5 aluminum rail.
- Glass Infill: 1/4 in. tempered glass panel.
- Connections: Connection details are provided in Appendix B.

Note: Post to sub-structure fastener evaluation is beyond the scope of this report. Four 3/8 inch Grade 5 bolts were used to install deck mount posts.

4 Testing and Evaluation Methods

Test specimen was loaded at a rate to achieve the specified loads between 10 seconds and 5 minutes. The specified test loads were held for one minute before the load was released. As per Section 1607.7 of the 2006 International Building Code, the following tests were conducted:

4.1. GENERAL (Clause 1607.7)

One complete railing system, consisting of two posts, was tested at maximum spacing and in the worst-case scenario.

4.2. IN-FILL LOAD TEST (Clause 1607.7.1.2)

A load consisting of 200 lbs. was applied over 1 sq. ft. (0.0929 m²) normal to the in-fill in a worst-case scenario. This load incorporated the required 4 times safety factor for glass in-fill.

4.3. UNIFORM LOAD TEST (Clause 1607.7.1)

A load consisting of 175 lbf/ft was applied across the top rail of the system in a 45° vectored direction.

4.4. CONCENTRATED LOAD TEST (Clause 1607.7.1.1)

Two separate tests were conducted where the proof load of 500 lbf was applied at the center of the top rail and at the top rail adjacent to the post.

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS


The product test results are shown in Table 1 below and the test data sheet is located in Appendix A.

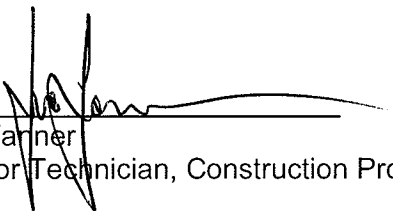
Table 1. Test Results				
System Description	System Height (inches)	Maximum Post to Post Center Spacing (inches)	Test	Compliance
6 ft. Glass Rail System with 2.5 in. Post	42	72	In-fill load	Complied
			Uniform Load	Complied
			Concentrated Load	Complied

6 Conclusion

The Durarail glass infill guard rail system identified in this test report has complied with the loads specified in 2006 International Building Code, Section 1607.7 as presented in Section 5 of this test report.

INTERTEK TESTING SERVICES NA LTD.

Reported by: 
Chris Chang, EIT
Engineer, Construction Products

Reviewed by: 
Ivo Tanner
Senior Technician, Construction Products

CC/ahvs

APPENDIX A: Test Data (1 page)



ETL SEMKO

Test: 2006 IBC
 Date: 5-Apr-07 Project: 3121232 Eng/Tech: Riccardo DeSantis
 Client: Excell Railing Systems Ltd. Kevin Penner
 Product: 6 ft Glass (6 mm) 2-1/2 in Aluminum Post System
 Post Spacing: 6 ft 1.83 m
 Effective Length: 6 ft 1.83 m
 Height of Guard: 42 in 1067 mm
 Opening in Guard: 1.75 in 44 mm
 Method: 2006 Internation Building Code Section 1607.7 Handrails and Guards
 2006 Internation Building Code Section 1714.3.1 Handrails and Guards

Safety Factor: 2.5
 Equipment: Revere 2000 lbf load cell ID # 2773 calibration due August, 2007

Note (*) Safety Factor of 4 times shall be used as per Section 2407.1.1

Test	Design Load (Inward/Outward) (lbf)	Factored Load (lbf)	Calculated Moment (lbf-ft)	Equivalent Quarter-Point Load (lbf)	Required Proof Load (lbf)	Pass/Fail
In-fill Load Test	50	200 *	-	-	200 *	Pass
Uniform Load Test (per ft) 45 deg	70	175	788	525	1050	Pass
Midspan Concentrated Load	200	500	-	-	500	Pass
Top of Post Concentrated Load	200	500	-	-	500	Pass

Test	Design Load (Inward/Outward) (kN)	Factored Load (kN)	Calculated Moment (kNm)	Equivalent Quarter-Point Load (kN)	Required Proof Load (kN)	Pass/Fail
In-fill Load Test	0.22	0.89	-	-	0.89	Pass
Uniform Load Test (per m)	1.02	2.55	1.07	2.34	4.67	Pass
Midspan Concentrated Load	0.89	2.22	-	-	2.22	Pass
Top of Post Concentrated Load	0.89	2.22	-	-	2.22	Pass

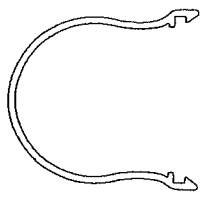
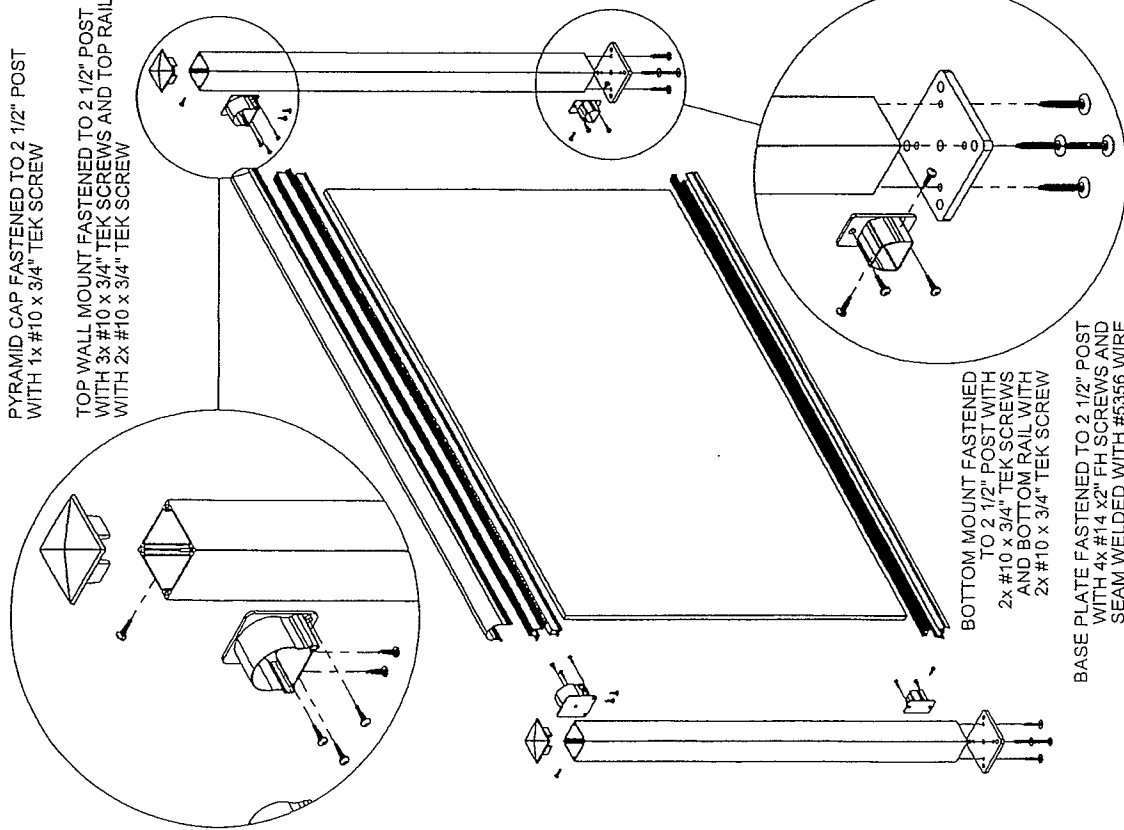
APPENDIX B: Drawings (2 pages)

THE MATERIAL CONTAINED HEREIN IS PROPRIETARY TO EXCELL RAILING SYSTEMS LTD. AND SHALL NOT BE REPRODUCED, DISCLOSED OR USED FOR ANY OTHER PURPOSE WITHOUT THE WRITTEN APPROVAL OF EXCELL RAILING SYSTEMS LTD.

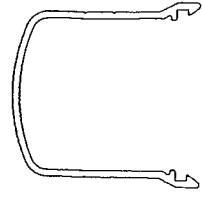
PYRAMID CAP FASTENED TO 2 1/2" POST WITH 1x #10 x 3/4" TEK SCREW

TOP WALL MOUNT FASTENED TO 2 1/2" POST WITH 3x #10 x 3/4" TEK SCREWS AND TOP RAIL WITH 2x #10 x 3/4" TEK SCREW

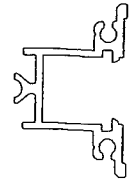
BASE PLATE FASTENED TO 2 1/2" POST WITH 4x #14 x2" FH SCREWS AND SEAM WELDED WITH #5356 WIRE



STANDARD ROUND TOP RAIL



STANDARD SQUARE TOP RAIL



COMPONENT GLASS RECEIVER CHANNEL



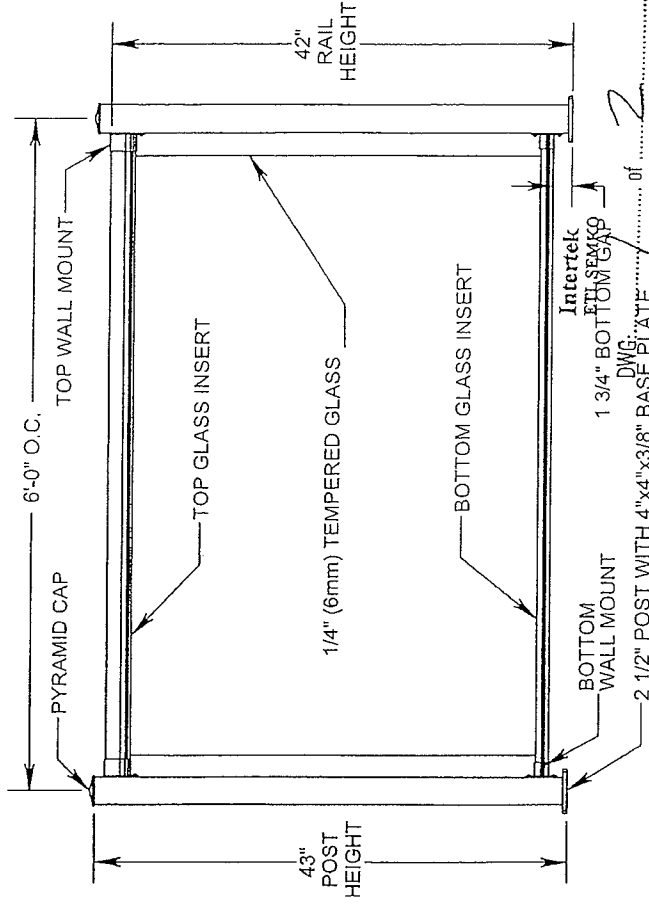
GLASS TOP INSERT



GLASS BOTTOM INSERT



COMPONENT GLASS BOTTOM RAIL



ALL DIMENSIONS ARE SUBJECT TO SITE MEASUREMENTS AND ARE TO BE CONFIRMED BEFORE FABRICATION OF PRODUCT APR 21 2007

Customer	Duracore Glass System with 2.5 Inch Posts
Project Name	Internal Documentation
Drawn By	Product Engineering
Revision No.	1
Scale	NTS
Date	April 16, 2007
Last Update	April 16, 2007
Project #	3721232
Customer	Duracore Glass System with 2.5 Inch Posts
Project Name	Internal Documentation
Drawn By	Product Engineering
Revision No.	1
Scale	NTS
Date	April 16, 2007
Last Update	April 16, 2007
Project #	3721232

Authorization Signature

Kansas City Warehouse
1722 Iron Street
North Kansas City, MO 64116
Toll Free: 1-800-338-3568
Fax: 1-816-421-2924

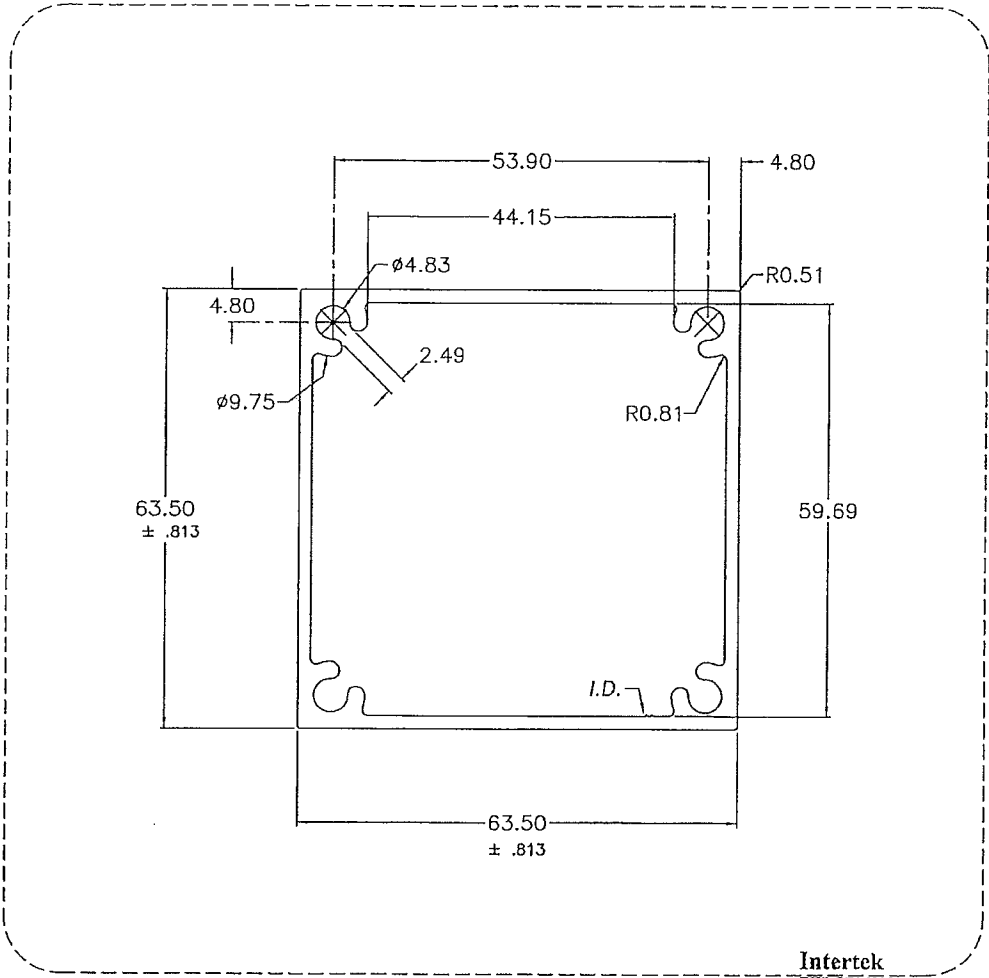


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Customer: Duracore Glass System with 2.5 Inch Posts
Project Name: Internal Documentation
Drawn By: Product Engineering
Revision No.: 1
Scale: NTS
Date: April 16, 2007
Last Update: April 16, 2007
Project #: 3721232
DWG. of 2

CUSTOMER Excell Railing Systems	CUSTOMER NO. 402383	PROPOSAL# 9335-1	DASH VH-35868 DIE NO.
DESCRIPTION: 2 1/2" x 2 1/2" x 0.075" Square Post	DATE	CLASSIFICATION#	
		REVISION	

EXPOSED ALL AROUND



ACTUAL SIZE

Intertek
ETL SEMKO
DWG: 2 of 2

APR 21 2007

PROJECT #: 3121232
REVIEWED BY: J. T. Tamm

Caradon Indalex		PRICING: <input type="checkbox"/> WT. <input type="checkbox"/> PC.	PLUGGING RATIO: <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	LIQ. NITROGEN <input checked="" type="checkbox"/> YES. <input type="checkbox"/> NO.
		DIE SIZE. 9 x 5.5"	PKT.	DIE LOC.
WALL THICKNESS 0.075 IN 1.91 MM	EXCEPT AS SHOWN	BACKER SIZE.	FEEDER SIZE.	
EST. AREA 0.894 IN ² 576.51 MM ²	OUT PER. 9.966 IN 253.13MM	BACKER NO. P.H.	FEEDER NO.	
EST. WT. 1.054 LBS/FT. 1.569 KG/M	FACTOR 20 / 341	BACKER LOC.	FEEDER LOC.	
EST. PER. 21.059 IN 534.91 MM	C.C.D. 3.519 IN 89.38 MM	BOLSTER NO. C1662(C9)	SHIM SIZE.	CAV. 1
DWN BY WL	ALLOY 6063-T5	SCALE 1:1	DATE 99/07/20	PRESS NO. 2
CONT'R 188		EXT. RATIO 48		
BREAK ALL CORNERS .010"R (0.25R) UNLESS OTHERWISE NOTED.			STANDARD TOLERANCES TO APPLY UNLESS OTHERWISE SPECIFIED	