

# TEST REPORT

**Intertek** ETL SEMKO

**REPORT NUMBER: 3113837COQ-004A**  
ORIGINAL ISSUE DATE: March 31, 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: 2-½ in. Durarail Picket Rail System  
EVALUATION PROPERTY: Load Requirements

**Report of Welded Picket 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

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Intertek Testing Services NA Ltd. (Intertek) has conducted a test program for Excell Railing Systems Ltd. on a railing system. The evaluation was carried out to determine whether the railing system would meet the loads specified in 2006 International Building Code (IBC), Section 1607.7. The evaluation was conducted in the month of March 2007.

## 3 Test Samples

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### 3.1. SAMPLE SELECTION

The client submitted the samples to the Evaluation Center on February 1, 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 (guard rail components drawings are located 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
- Picket Insert: 5/8 in. x 5/8 in. 6063-T5 aluminum spaced 4-1/2 in. o/c.
- 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

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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 125 lbs was applied over 1 sq. ft. (0.0929 m<sup>2</sup>) normal to the in-fill in a worst-case scenario.

#### 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 of the post.

## 5 Testing and Evaluation Results

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### 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.


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

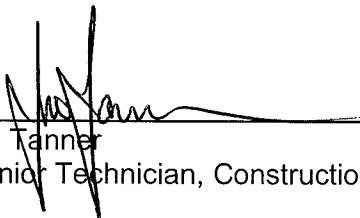
## 6 Conclusion

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The Durarail Welded Picket 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)**

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# ETL SEMKO

Test: **2006 IBC**  
 Date: 15-Mar-07 Project: 3113837 Eng/Tech: Kevin Penner  
 Client: Excell Railing Systems Ltd. Riccardo Desantis  
 Product: Durarail 6 ft Welded Picket 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: 3.875 in 98 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

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	125	-	-	125	<b>Pass</b>
Uniform Load Test (per ft)	70	175	788	525	1050	<b>Pass</b>
Midspan Concentrated Load	200	500	-	-	500	<b>Pass</b>
Top of Post Concentrated Load	200	500	-	-	500	<b>Pass</b>

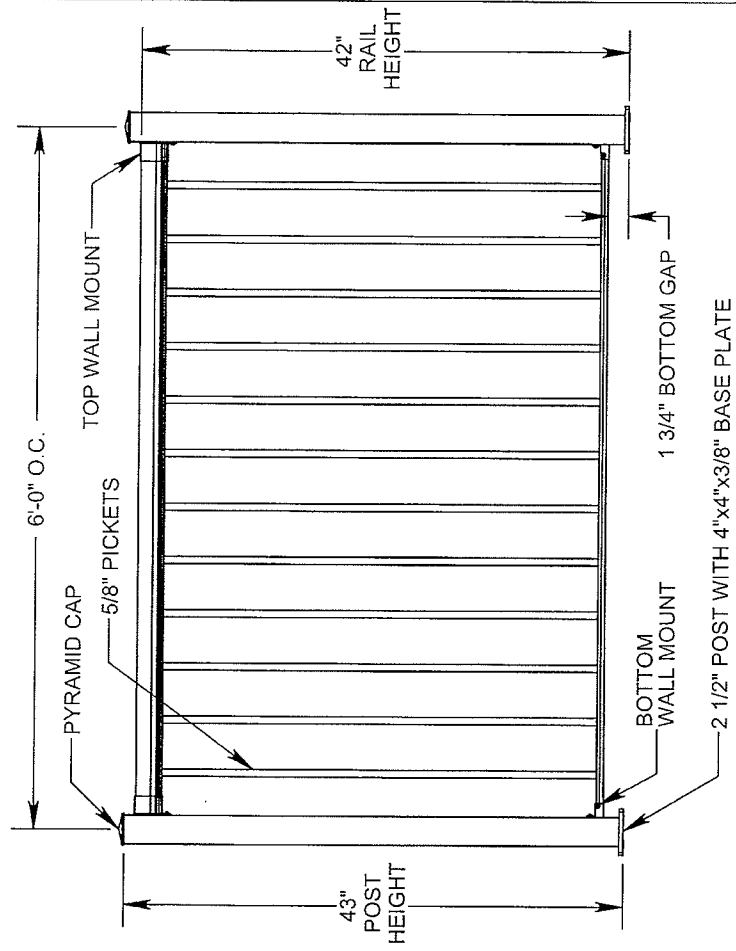
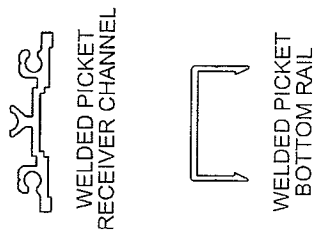
Test	Design Load (Inward/Outward) (kN)	Factored Load (kN)	Calculated Moment (kNm)	Equivalent Quarter-Point Load (kN)	Required Proof Load (kN)	Pass/Fail
In-fill Load Test	0.22	0.56	-	-	0.56	<b>Pass</b>
Uniform Load Test (per m)	1.02	2.55	1.07	2.34	4.67	<b>Pass</b>
Midspan Concentrated Load	0.89	2.22	-	-	2.22	<b>Pass</b>
Top of Post Concentrated Load	0.89	2.22	-	-	2.22	<b>Pass</b>

## **APPENDIX B: Drawings (2 pages)**

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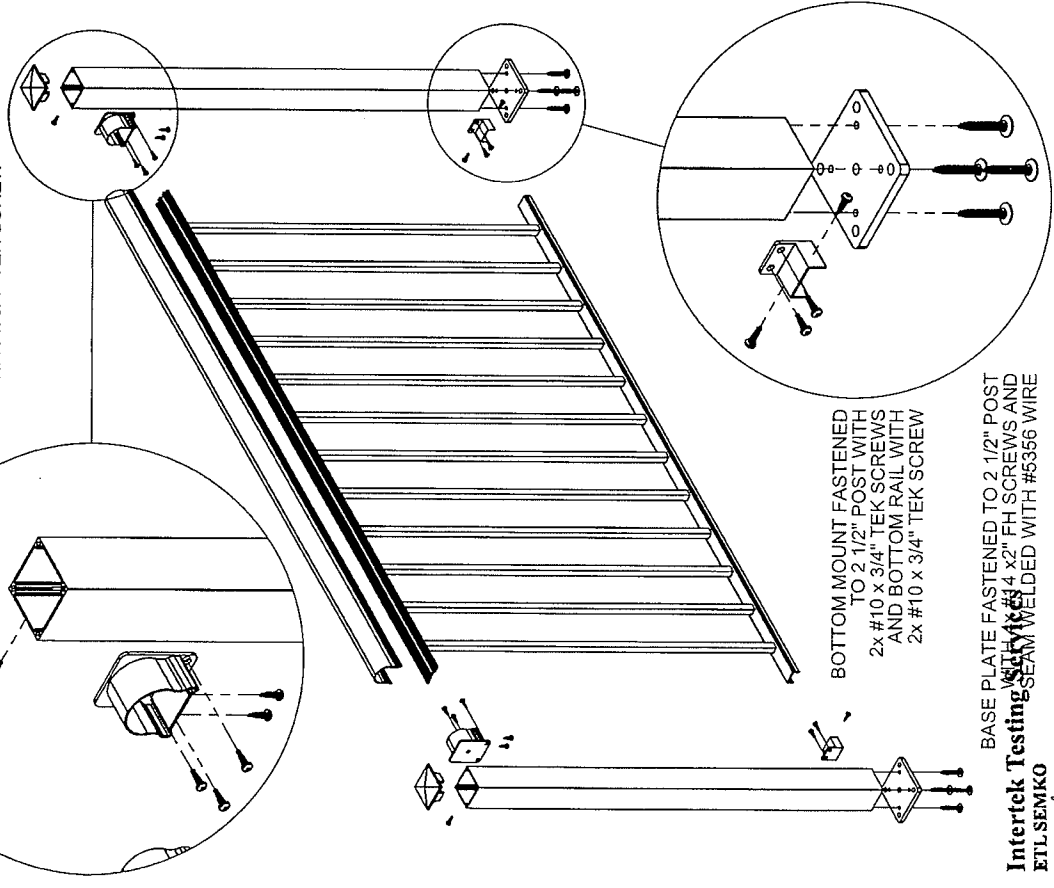


THE MATERIAL CONTAINED HEREIN IS PROPRIETARY TO EXCELL RAILING SYSTEMS LTD. AND SHALL NOT BE REPRODUCED, DISCLOSED OR USED FOR ANY OTHER PURPOSE WITHOUT THE WRITTEN APPROVAL OF EXCELL RAILING SYSTEMS LTD.



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



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

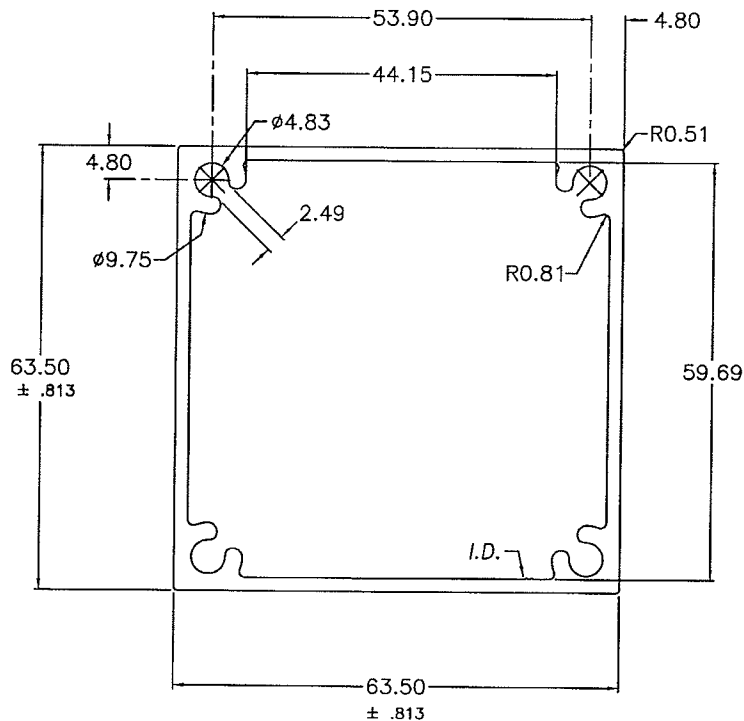
BASE PLATE FASTENED TO 2 1/2" POST WITH 3x #10 x 3/4" FH SCREWS AND SEAM WELDED WITH #8356 WIRE

Intertek Testing  
ETL-SEMKO

DWG: <i>[Signature]</i> of <i>[Signature]</i> Date of Authorization JUN 06 2007	
Authorization Signature	
Drawing Name: Welded Picket System with 2.5 Inch Posts Customer: Internal Documentation	
Project Name: Product Engineering	
Drawn By: Csaba Bezzegh	Date Created: March 16, 2007
Revision No.: 1	Scale: NTS
Last Update: March 21, 2007	Last Update: March 21, 2007
Ersrv\sales\Drawing Library\Engineering\Railing Assemblies\WP Panel Style 1 with 2.5 Posts\Durarail	
Ensurco Duradek Ltd. (Durarail) #306 - 12886 Anvil Way Surrey, BC Canada V3W 8E7 Phone: 604-501-0151 Fax: 604-501-0155 Toll Free: 1-866-999-7245	
Kansas City Warehouse 1722 Hop Street North Kansas City, MO 64118 Toll Free: 1-800-338-3568 REVISION: 1-23-2004	

CUSTOMER <b>Excell Railing Systems</b>	CUSTOMER NO. 402383	PROPOSAL# 9335-1	DIE NO. VH-358668
		CLASSIFICATION#	
DESCRIPTION: 2 1/2"x 2 1/2"x 0.075" Square Post	DATE	SYM	REVISION

EXPOSED ALL AROUND



Intertek Testing Services  
ETL SEMKO

DWG: 2 of 2

JUN 06 2007

ACTUAL SIZE

PROJECT #: 3113837

REVIEWED BY: *CL*

**Caradon Indalex**

PRICING:  WT.  PC.  1  2  3 PLUGGING RATIO : LIQ. NITROGEN  YES.  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<sup>2</sup> 576.51 MM<sup>2</sup> 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