



*Performance Testing of B.W. Creative Wood Industries Ltd.'s  
Clearview Stair Rail System to Section 9.8.7.7 of the 2005  
National Building Code of Canada*

Final Report No.: 3088853COQ-014B  
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**IMPORTANT NOTE:**

This engineering test report applies ONLY to product manufactured by BW Creative Wood Industries Ltd. This test report does NOT cover RONA "Uberhaus Select" branded product manufactured by others and sold in Ontario, Quebec or Atlantic Canada.



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## 2 Preface

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All services undertaken are subject to the following general policy:

- 1) This report is for the exclusive use of Intertek Testing Services NA Ltd.'s (Intertek's) client and is provided pursuant to the agreement between Intertek and its client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report.
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### 3 Introduction

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Intertek Testing Services NA Ltd. (Intertek) personnel have conducted tests of Structural Performance on the Clearview Stair Rail System for B.W. Creative Wood Products Ltd. The railing system was evaluated for the ability to resist the loads specified in Part 9 of the 2005 National Building Code of Canada, Section 9.8.7.7 *Design and Attachment of Handrails*. This evaluation was completed in the month of November 2006.

### 4 Materials and Methods

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#### 4.1. SAMPLE SELECTION

The specimen stair rail system components were independently sampled and assembly construction was witnessed by Intertek representative, Kalvir Kooner on October 20, 2006.

#### 4.2. SAMPLE DESCRIPTION

The stair rail system identified as the Clearview Stair Rail system was assembled as follows: Nylon 6 connector brackets (black) are mechanically fastened to cedar handrails using two No. 8 x 1-3/4 in. stainless steel screws. The cedar bottom rail is then attached to the 3-1/4 in. square cedar post using the same connector bracket and screws, then four additional No. 8 x 1-3/4 in. stainless steel screws connect the brackets to posts at four points. Both the top and bottom rails are pre-drilled to accept the tempered glass pickets. The glass pickets are then placed into the bottom rail and the top rail is pressed down onto the assembly and fastened to the posts with the same four No. 8 x 1-3/4 in. stainless steel screws. A 3 in. cedar cap rail is then mechanically connected to the top rail at 300 mm spacing using 3 in. finishing nails. Details of the assembly are provided in the drawings located in Appendix B of this report.

Post: 3-1/4 in. (82.5 mm) cedar, profile as shown in Appendix B.

Rails: 38 in. (965 mm) high, cedar profile as shown in Appendix B.

Picket Insert: 6 in. (152.4 mm) wide x 8 mm thick tempered glass panels.

Rail Connections: Black Nylon 6 connector as detailed in Appendix B.

Note: Post to sub-structure fastener evaluation is beyond the scope of this report. Steel plates with two 3/8 in. grade 5 bolts on each post were used to install the specimen for testing.

## 4.3. TEST PROCEDURES

### 4.3.1. CODE REQUIREMENTS

#### **NBC 2005: Section 9.8.7.7 *Design and Attachment of Handrails***

- 1) Handrails and any building element that could be used as a handrail shall be designed and attached in such a manner to resist:
  - a) A concentrated load at any point of not less than 0.9 kN, and
  - b) For handrails other than those serving a single dwelling unit, a uniformly distributed load of 0.7 kN/m.

### 4.3.2. TEST PROGRAM – 3-1/2 Foot Clear View Cedar Stair Rail

Tests specimens were loaded at a rate to achieve the specified loads between 10 seconds and 5 minutes. The specified proof loads were held for one minute before the load was released.

#### 4.3.2.1. In-fill Load Test

A load of 1 kN (225 lbf) was applied using a 300 mm. square block on the center of the glass picket system normal to the in-fill in a worst-case scenario. After release of the load, the system was evaluated for failure, any evidence of disengagements of any component and visible cracks in any component.

#### 4.3.2.2. Uniform Load Test

The top rail of the guardrail system was subjected to a maximum equivalent uniform load of 1.4 kN/m (96 plf) applied horizontally. The load was applied using quarter point loading calculated to impose an equivalent moment to the uniform load specified. After release of the load, the system was evaluated for failure, any evidence of disengagements of any component and visible cracks in any component.

#### 4.3.2.3. Concentrated Load Test

The top rail of the guardrail system was subjected to two separate tests where a concentrated load of 1.8 kN (405 lbf) was applied at the following locations:

- Horizontally at the centre of the stair rail.
- Horizontally at the top rail adjacent to the rail post connection to verify the connection capacity.

## 5 Test Results

The product test results are shown in Table 1 below.

System Description	System Height (in.)	Maximum Post to Post Center Spacing (in.)	Test	Compliance
Clearview Stair Rail	38	42	In-fill Load	Complied
			Uniform Load	Complied
			Concentrated Load	Complied


Note: A complete set of Test Data is provided in Appendix A.

## 6 Conclusion


The Clearview Stair Rail system manufactured by B.W. Creative Wood Products Ltd., assembled as described in this report, has complied with the loads specified in the 2005 National Building Code of Canada, Section 9.8.7.7 *Design and Attachment of Handrails*.

INTERTEK TESTING SERVICES NA LTD.

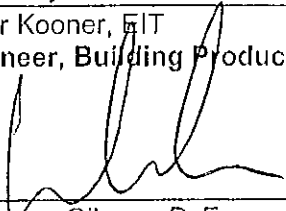
Reported by:

  
Ivo Tanner  
Senior Technician, Construction Products

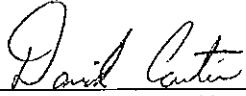
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Reviewed by:

  
Lawrence Gibson, P. Eng.  
General Manager, Building Products

Reviewed by:

  
David Carter, P. Eng.  
Engineer, Building Products

IT/ahvs



**Appendix A: Test Data (1 page)**

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# ETL SEMKO

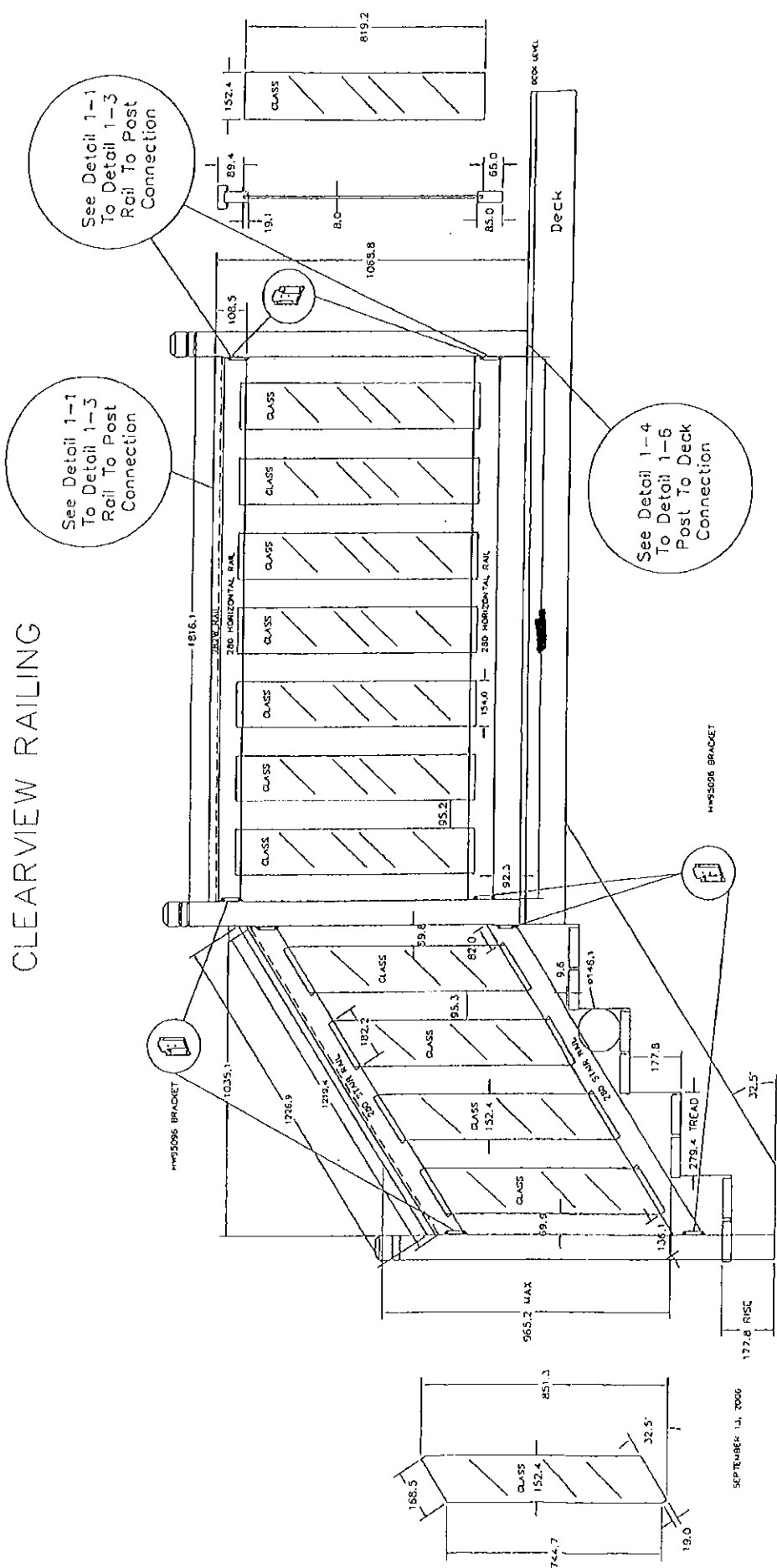
Test: NBC Loads on Handrails - Clearview Cedar Stair Rail  
Date: 7-Nov-06 Project: 3088853 Eng/Tech: Adam Mantei  
Client: B W Creative Kevin Penner  
Product: Clearview Cedar 3-1/4 in. post, glass picket with Nylon 6 brackets  
Post Spacing: 4 ft 1.23 m  
Height of Guard: 36.75 in 933 mm  
Opening in Guard: 3.75 in 95 mm  
Method: National Building Code 2005  
9.8.7.7 Design and Attachment of Handrails  
Safety Factor: 2  
Equipment: Artech 2000 lbs Load cell ID # 2723 due August 2007

Test	Design Load (Inward/Outward) (lbf)	Factored Load	Calculated Moment (lbf-ft)	Equivalent Quarter-Point Load (lbf)	Required Proof Load (lbf)	Pass/Fail
Individual Elements	112	225	-	-	225	Pass
Midspan Horizontal Concentrated Load	202	405	-	-	405	Pass
Post/Rail Horizontal Concentrated Load	202	405	-	-	405	Pass
Horizontal Uniform Load (per ft)	48	96	194	193	386	Pass

Test	Design Load (Inward/Outward) (kN)	Factored Load	Calculated Moment (kNm)	Equivalent Quarter-Point Load (kN)	Required Proof Load (kN)	Pass/Fail
Individual Elements	0.5	1	-	-	1	Pass
Midspan Horizontal Concentrated Load	0.9	1.8	-	-	1.8	Pass
Top of Post Horizontal Concentrated Load	0.9	1.8	-	-	1.8	Pass
Horizontal Uniform Load (per m)	0.7	1.4	0.26	0.26	0.52	Pass

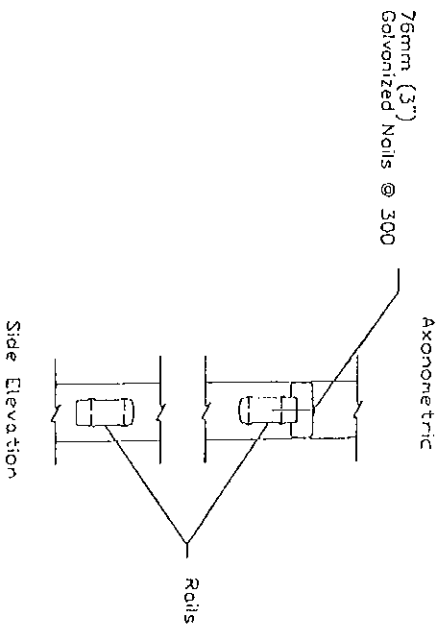
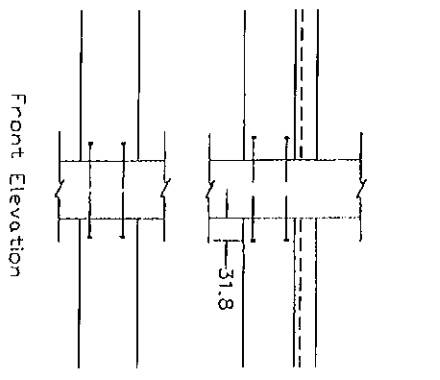
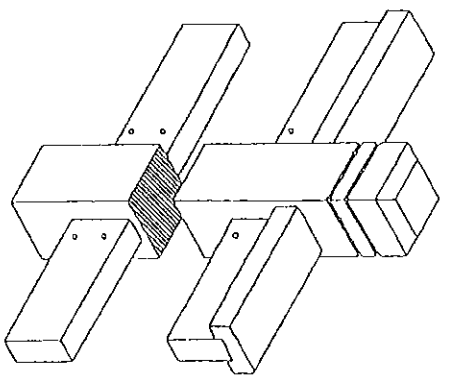
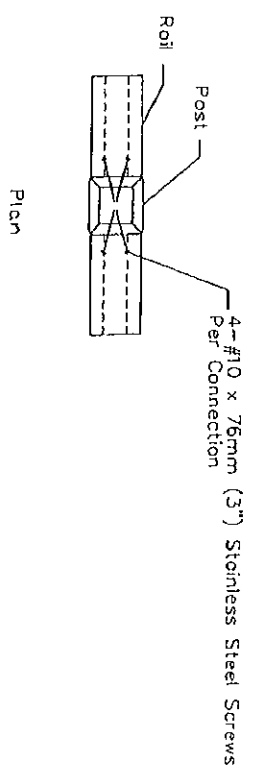
**Appendix B: Assembly Details (4 pages)**

# CLEARVIEW RAILING



SEPTEMBER 13, 2006

# Detail 1-1 Exterior Connection: Rail Fastened To Post

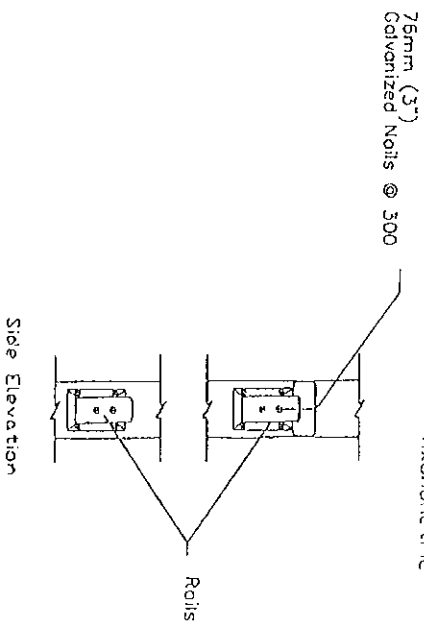
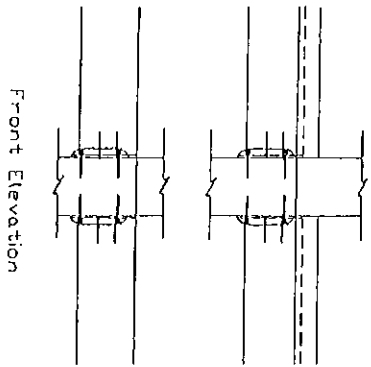
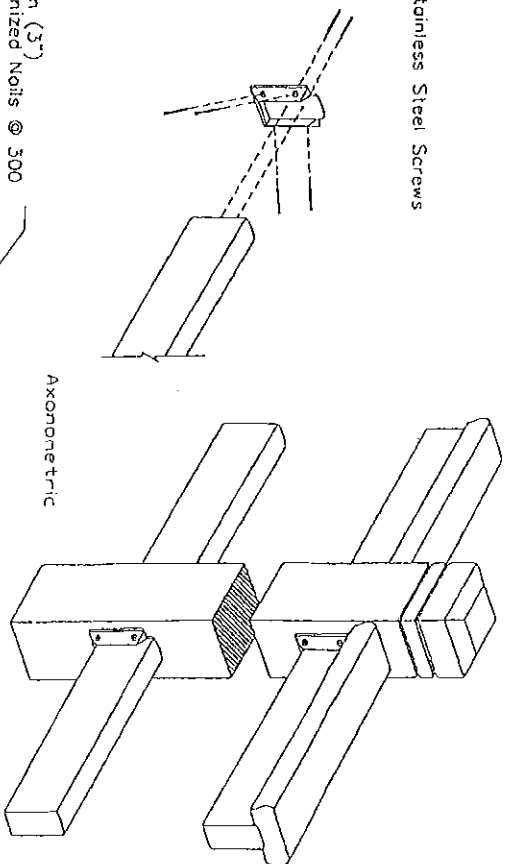
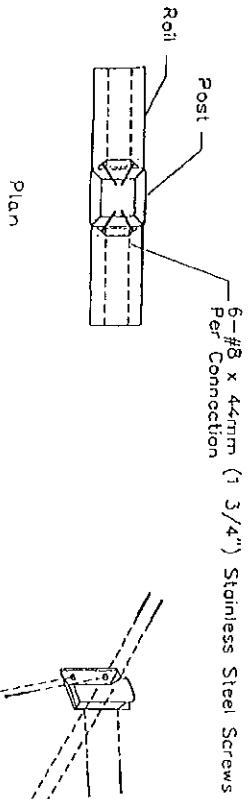
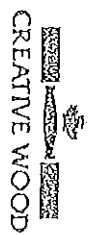


Detail 1-1  
Exterior Connection: Top/Bottom Rail Skew Screwed To Post--53mm Screws

- 1) Nails and screws shall not cause splitting of wood elements.
- 2) Fasteners shall be resistant to corrosion.

DIMENSIONS IN MM  
REVISION: OCTOBER 19, 2006  
APPROVED: \_\_\_\_\_  
CAD FILE: INSTALLATION INSTRUCTIONS

# Detail 1-3 Exterior Connection: Rail Fastened To Post With Hanger Bracket

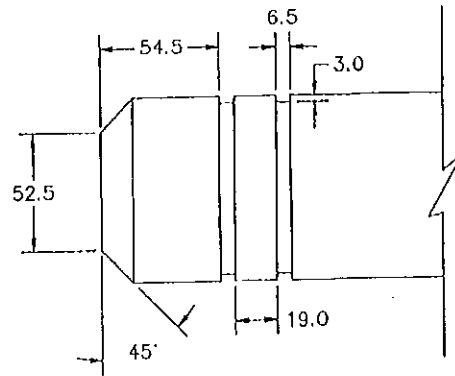
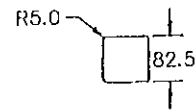
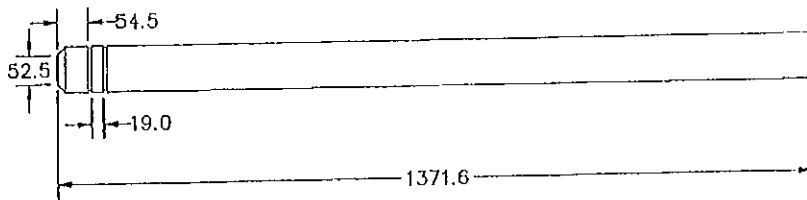


Exterior Connection: Top/Bottom Rail Skew Screwed To Post-63mm Screws  
Hanger Bracket Screwed To Rail And Post

- 1) Nails and screws shall not cause splitting of wood elements.
- 2) Fasteners shall be resistant to corrosion.

DIMENSIONS IN MM  
REVISION: OCTOBER 23, 2006  
APPROVED: \_\_\_\_\_  
CAD FILE: INSTALLATION INSTRUCTIONS

Cedar Deck Post  
C910654



DIMENSIONS IN MM  
REVISION: JANUARY 11, 2006  
APPROVED: \_\_\_\_\_  
CAD FILE: 9100-FULLDIM.DWG