

**REPORT OF**

**PRODUCT EVALUATION**

**CONDUCTED ON A**

**“WELDED PICKET”  
ALUMINUM GUARDRAIL ASSEMBLY**

**TO THE**

**NATIONAL BUILDING CODE OF CANADA, 1995 EDITION**

**FOR**

**ENSURCO DURADEK LTD.  
8288 – 129<sup>TH</sup> STREET  
SURREY, BC  
V3W 0A6**

**REPORT PREPARED BY**

**INTERTEK TESTING SERVICES NA LTD.  
WARNOCK HERSEY  
211 SCHOOLHOUSE STREET  
COQUITLAM, BC  
V3K 4X9**

**REPORT NUMBER: 481-1457 – 1a**

**DATE: MARCH 6, 2000**



## INTRODUCTION

Intertek Testing Services NA Ltd./Warnock Hersey has conducted Uniform and Concentrated load tests on an aluminum guardrail assembly manufactured at Ensuro Duradek Ltd.'s manufacturing plant in Surrey, BC. The guardrail assembly was identified as the "Welded Picket System (42" Height)" and was tested on January 19, 2000.

The testing was conducted in accordance with the National Building Code of Canada, 1995 Edition, Section 4. 10. "Loads on Guards."

## DESCRIPTION

The guardrail is (120") wide measured from corner post to corner post and (42") high measured from deck level to the top of the guardrail.

The top rail is constructed in two pieces consisting of a sub-rail and a snap-on Square Top Rail cap. The sub-rail is fastened to the top of each corner post using two #12 x 1-1/2" panhead screws. The corner sleeve portion of the top cap is mitre cut and welded and extends approximately 4" to either side. Each top cap runs continuously from one 90° corner segment to the other. Where the top and bottom rails attach to the building wall structure a wall attachment plate is provided.

A 2-1/2" wide x 3" high x 1/8" aluminum plate assembly (complete with 1-1/2" long welded sleeve) is fastened to the end of the top rail using two #12 x 1-1/2" panhead screws and three #14 x 2" panhead screws (complete with Mungo brand, model MN8x40 sleeve anchors) which secure the wall attachment plate to the concrete wall structure. A 1-5/8" wide x 1-1/2" high x 1/8" thick aluminum plate assembly is fastened to the end of the bottom rail using a single #8 x 3/4" self tapping panhead screw and two #14 x 2" panhead screws (complete with Mungo brand, model MN8x40 sleeve anchors) which secure the wall attachment plate to the concrete wall structure. The bottom rails are fastened to a 1" long extruded aluminum rail clip using a single #8 x 3/4" self tapping panhead screw. Each of the rail clips, located on either side of each post, are fastened to the post using two #12 x 1-1/2" panhead screws.

Aluminum pickets measuring 5/8" x 5/8" x 0.050" thick are welded between the top sub-rail and the channel shaped bottom rail and spaced 4-1/2" apart c/c. Each picket is welded at either side to the top sub-rail and fits through a square punched opening in the bottom rail and welded to one side.

The corner posts are 1-5/8" square complete with a screw chase at each inside corner and mid-section with a wall thickness of 0.068" thick. An aluminum baseplate measuring 3-1/2" x 3-1/2" x 1/4" thick was fastened to the base of each post using four #12 x 2" hardened steel flathead screws (Robertson Whitehouse Type "A"). Four #14 x 2" panhead screws (complete with Mungo brand, model MN8x40 sleeve anchors) secure each post to the concrete floor. Supporting the welded picket bottom rail at three equally spaced points between the posts are 1/2" square, 0.060" wall aluminum picket support legs which are inserted approximately 1" into the 5/8" pickets and secured using a single #8 x 1/2" self tapping screw. Each leg is fastened to the concrete floor using a #12 x 2" panhead screw (complete with a Mungo brand, model MN8x40 sleeve anchor). See attached drawings in the appendix for details and a general layout.

## TEST RESULTS

A uniform load of 0.75 kN/m (51 lbs/ft) was applied horizontally outward and normal to the span at the top of the guardrail system.

2. A concentrated load of 0.5 kN (101.2 lbs) was applied to individual elements within the guard including solid panels.

A uniform load of 1.5 kN/m (102.8 lbs/ft) was applied vertically to the top of the guardrail system.

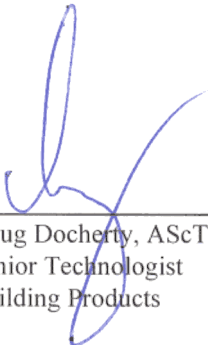
The guardrail assembly withstood the loading conditions as described above which included a 1.5 safety factor (the top rail was uniformly loaded to 1.5 x 51.1 lbs/ft or 76.7 lbs/ft).

## CONCLUSION

The guardrail system and installation as described in this report (and attached drawings) meets the loading requirements of the National Building Code, 1995 Edition, Section 4.1.10.1 "Loads on Guards."


INTERTEK TESTING SERVICES NA LTD.  
Warnock Hersey

Tested by:



\_\_\_\_\_  
Doug Docherty, AScT  
Senior Technologist  
Building Products

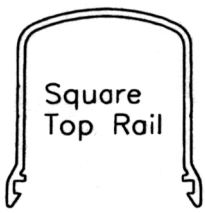
Reviewed by:



\_\_\_\_\_  
Sheldon Warman, P.Eng.  
Manager  
Physical Testing and Certification

DD/cr

# COMPONENTS



Square Top Rail



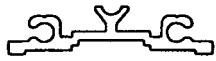
Square Top Sleeve



Round Top Rail



Round Top Sleeve



Top Rail Receiver



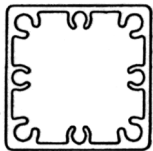
5/8" Square Picket



Bottom Rail



Rail Clip

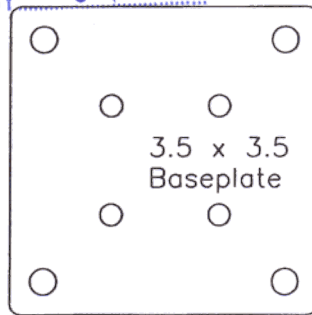


1-5/8" Square Post

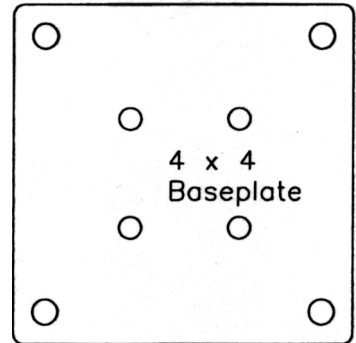
DWG No. *1/4*

APR 26 2000

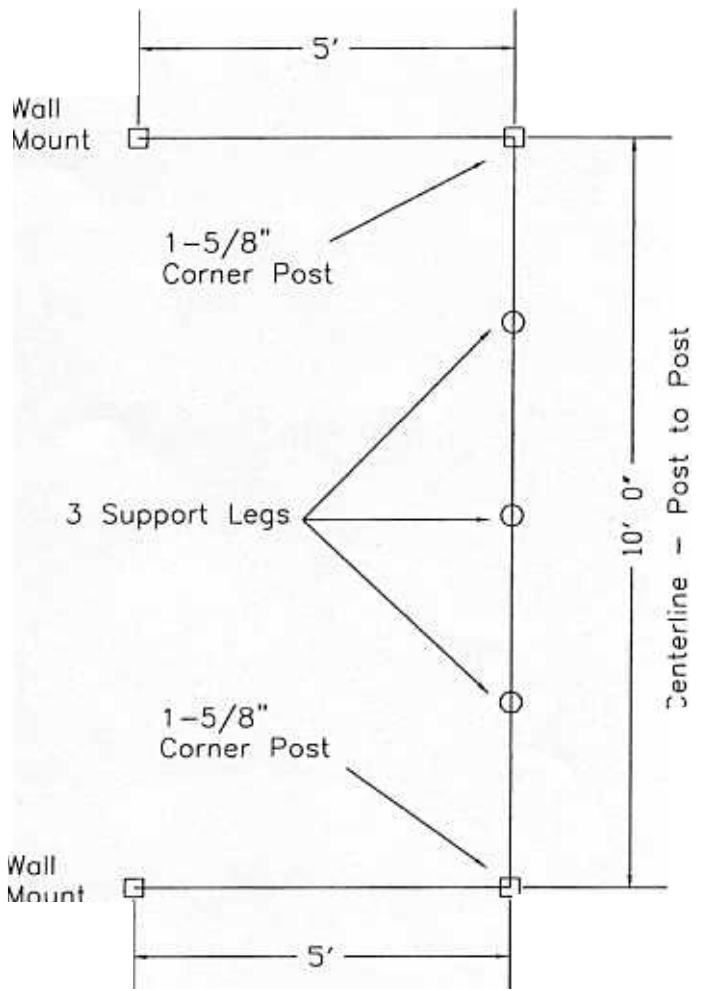
APP BY *[Signature]*



3.5 x 3.5 Baseplate



4 x 4 Baseplate



**ENSURCO DURADEK LTD.**

Corporate Office 8288 - 129th STREET  
SURREY, BC  
CANADA V3W 0A6

Bus: (604) 591-5594  
Fax: (604) 591-3100

Distribution Office 1722 IRON STREET  
NORTH KANSAS CITY  
MISSOURI, 64116

Bus: (816) 421-5830  
Fax: (816) 421-2924

TITLE Welded Picket System @ 42" Height

SCALE 3/8" = 1'	DATE Jan.2000	N.B.C. 120" Centerline
DRAFT P.Bacon	CHK'D	U.B.C. 120" Centerline
ENG.	CHK'D	BOCA 120" Centerline
APPR'D	AS BUILT	JOB No. Intertek Testing Services

DRAWING No.

003

