



REPORT OF

PRODUCT EVALUATION

CONDUCTED ON A

**“WELDED PICKET”
ALUMINUM GUARDRAIL ASSEMBLY**

TO THE

BOCA NATIONAL BUILDING CODE 1993

FOR

**ENSURCO DURADEK LTD.
8288 – 129TH 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 – 1c

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 BOCA National Building Code 1993, Sections 1615.8.2 "Guard Design and Construction" and 1615.8.2.1 "In-fill Areas".

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

BOCA National Building Code: Sections 1615.8.2 and 1615.8.2.1

1615.8.2

Guards shall be designed and constructed for a concentrated load of 200 pounds (91 kg) applied at any point and in any direction along the top railing member. Guards located in other than dwelling units in occupancies in Use Groups R-2 and R-3 shall also be designed and constructed for a uniform load of 50 pounds per foot (74 kg/m) applied horizontally at the required guard height and a simultaneous uniform load of 100 pounds per foot (149 kg/m) applied vertically downward at the top of the guard. The concentrated and uniform loading conditions shall not be applied simultaneously.

1615.8.2.

The in-fill area of a guard shall be designed and constructed for a horizontal concentrated load of 200 pounds (91 kg) applied on a 1 square foot (0.093 m²) area at any point in the system, including intermediate rails or other elements serving this purpose. This loading condition shall not be applied simultaneously with the loading conditions in Section 1615.8.2.

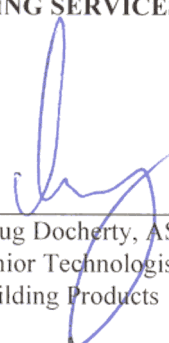
The guardrail assembly withstood the loading conditions as described above which included a 2.0 safety factor.

CONCLUSION

The guardrail system and installation as described in this report (and attached drawings) meets the loading requirements of the BOCA National Building Code 1993 Edition, Sections 1615.8.2 and 1615.8.2.1.


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



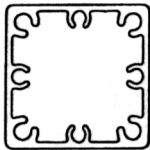
5/8" Square Picket



Bottom Rail

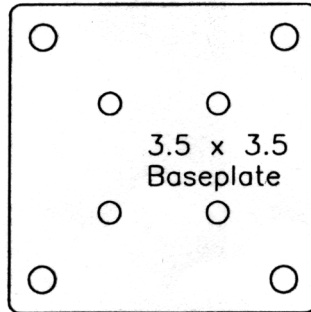
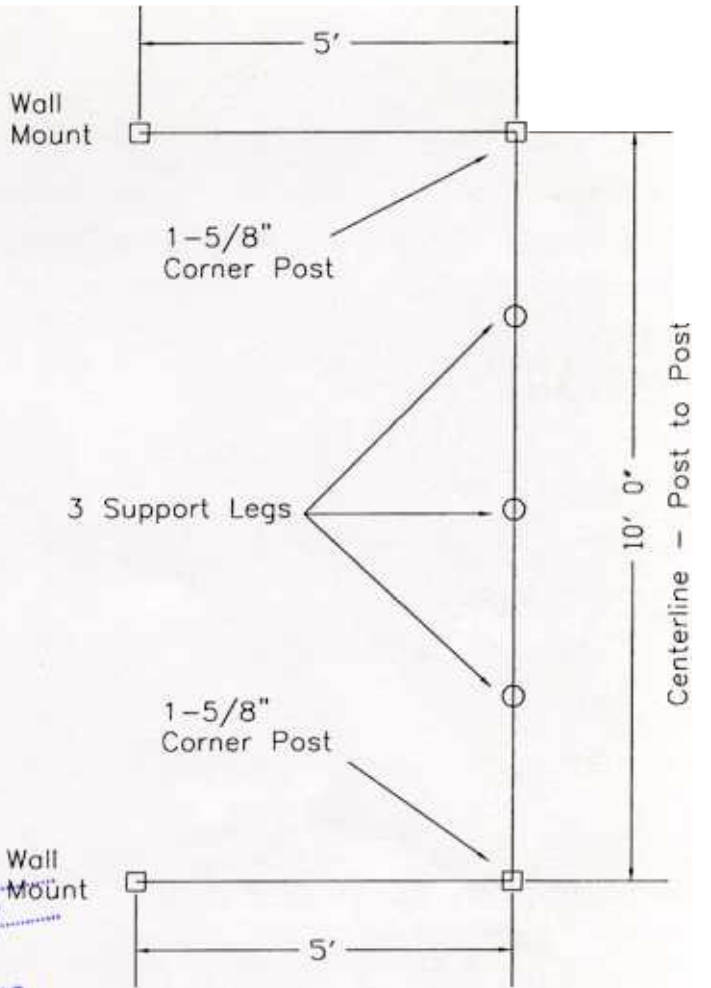


Rail Clip

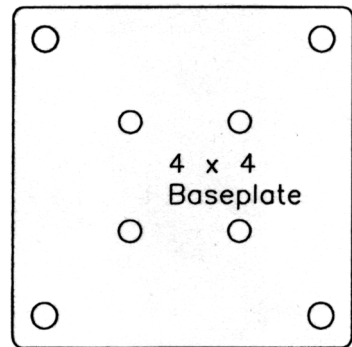


1-5/8" Square Post

DWG No. 176
 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" = '	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	

durarail™

DRAWING No. 003

