TESTING ENGINEERS, INC.

Quality Assurance Services
Materials Consulting
Since 1954

August 9th , 2012

TEI Job No. D1203

Michael Wentworth
Architectural Metal
1483 67th Street
Emeryville, California 94608

SUBJECT: ***Hand Rail AMW-WL 3000 (Rod) Series - Load Testing***

Dear Mr. Wentworth:

At your request, Testing Engineers, Inc. conducted load testing of the AMW-WL 3000 series aluminum hand rail system in order to determine the amount of deflection at specified loads.

PROCEDURE

The handrail system was assembled and installed at your facility in Emeryville for the purpose of testing. The total height of the assembly was 42 ½ inches.

The system consisted of two 1 ½ inch by 2 inch vertical aluminum tube post supports with a .125 inch wall thickness. The posts were placed at 46 inches on center and where grouted in to holes within the slab. The top hand rail was a 53 inch long by 2 ½ inch wide extruded aluminum section centered, placed atop and fastened with screws to the support posts.

Horizontal 1/2 inch stainless steel rods, placed at 4 ½ inch centers, made up the intermediate rails.

A drawing, supplied by you, can be found on the following page.

Load testing was performed at values specified in the International Building Code 2012, section 1607.8. Loading was performed using a calibrated 12 ton hydraulic ram fitted with a 0-2000 psi gauge and hand pump. The ram was placed against the block wall of the facility for loading. Deflection measurements were taken using a 0 to 1 inch dial indicator gauge capable of reading to the nearest .001 of an inch.

A linear load of 200 pounds (lbs) was applied to the handrail (50 lbs/linear foot) and a concentrated load of 200 lbs atop the rail. A concentrated load of 500 lbs was placed atop the rail directly above a support post. Intermediate rails were tested to a concentrated load of 50 lbs. There was no displacement of either component upon unloading.

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RESULTS

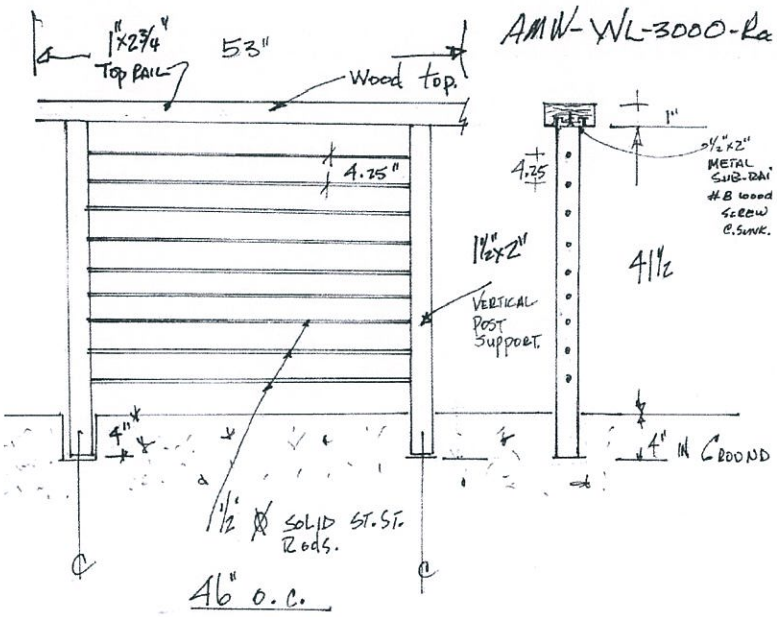
Handrail

A linear load of 220 lbs was applied along the edge of the handrail at a mid point between the two support posts. A total deflection of .32 inches was measured with no displacement.

An additional load of 300 lbs was applied where a total of .510 inches deflection was measured with no displacement.

A concentrated load of 200 lbs was applied along the top of the handrail, between the two support posts. A total deflection of .355 inches was measured with no displacement.

A concentrated load of 500 lbs was applied at the top of the handrail at a support post. A total deflection of .002 inches was measured with no displacement.



Intermediate rails

A concentrated load of 50 lbs was applied to the ½ diameter stainless steel rod/intermediate rails with a deflection of .055 inches. The load was increased to 100 lbs with a deflection of .110 inches with no displacement.

If you have any questions, or if we may be of further service, please contact me at (510) 504-5895.

TESTING ENGINEERS, INC.

Sean P. Hughes
Engineering Technician