TESTING ENGINEERS, INC.

Quality Assurance Services
Materials Consulting
Since 1954

July 13th , 2012 *TEI Job No. D1203*

Michael
Architectural Metal
1483 67th Street
Emeryville, California 94608

SUBJECT: ***Hand Rail AMW-G1 420 Series - Load Testing***

Dear Mr. Wentworth:

At your request, Testing Engineers, Inc. conducted load testing of the AMW-GL 420 series aluminum hand rail system in order to determine the amount of deflection at specified loads.

PROCEDURE

The top hand rail was a 53 inch long by 2 ¾ inch wide by 1 inch thick extruded aluminum section placed atop the posts and centered. Below the handrail a 3/8 inch thick glass panel completed the infill section.

The handrail system was assembled and installed at your facility in Emeryville for the purpose of testing. The total height of the rail assembly was 42 ½ inches. The system consisted of two ¾ inch thick by 2 inch wide, slotted stainless posts positioned 50 inches center to center. The glass infill was placed in the slots. The posts were cast in to grouted holes within the slab prior to our arrival. 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 linier load of 225 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. Glass infill panel was tested to a concentrated load of 100 lbs per square foot. Upon loading each component a deflection measurement was taken. Upon unloading each component any displacement was recorded.

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RESULTS

Hand Rail

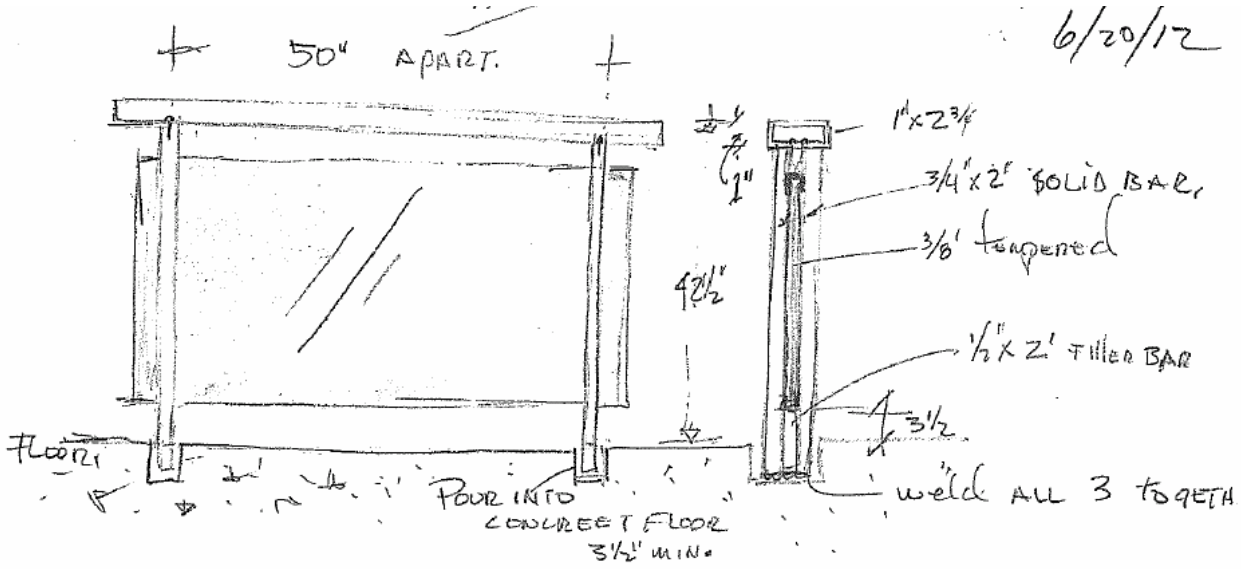
A linear load of 225 lbs was applied along the edge of the handrail at a mid point between the two support posts. A total deflection of .32 inches was measured and no displacement. An additional load of 300 lbs was applied where a total of .510 inches deflection was measured and no displacement.

A concentrated load of 200 lbs was applied at the top of the handrail at a mid point between the two support posts. A total deflection of .355 inches was measured and 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 and no displacement.

Glass Panel

A direct load of 50 psf and then 100 psf was applied to the glass panel. No deflection was detected at 50 psf. A deflection measurement of .358 inch was measured at 100 psf load. No displacement of the panel was measured.



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