



SLESSER ENGINEERING, INC.

STRUCTURAL ENGINEERS

April 26, 2010

WireCrafters LLC
6208 Strawberry Lane
Louisville, KY 40214
Attn: Mr. Gary Bruner

Subject: Two Rail Tube Handrail

Dear Mr. Bruner:

At your request, we have performed a structural analysis of your two-rail tube handrail to determine if it has sufficient structural capacity to meet the requirements of the International Building Code and the OSHA Railing Requirements. This letter summarizes the criteria used in our analysis and the conclusions of our analysis.

Handrail Definition

Our analysis is based on the handrail drawings that you provided to us. Specifically, our structural analysis is based on the following WireCrafters drawings:

- 1) Handrail – Part Number HR8, dated 1-6-04
- 2) Handrail Corner Post – Part Number HRCPP, dated 3-10-10
- 3) Handrail End Post – Part Number HREPP, dated 3-10-10
- 4) Handrail Run Post – Part Number HRRPP, dated 3-10-10
- 5) Handrail Channel Insert – Part Number HRI4C, dated 9-19-03
- 6) Handrail Inserts – Part Number HRI4F, dated 5-22-08
- 7) Handrail Installation Instructions

In addition, our structural analysis is based on the assumption that the post base plates will be bolted to a sufficiently-thick concrete slab (with a minimum compressive strength of 3,000 psi) with 3/8 inch diameter carbon steel Simpson Wedge-All expansion anchors that are embedded into the concrete slab a minimum of 2 1/4 inches.

Design Loading

We have performed our analysis for the handrail loading requirements specified in the OSHA Railing Requirements and in Section 1607.7.1 of the 2006 International Building Code. Our analysis is based on the understanding that these handrails will be installed and utilized in industrial/factory type settings. The handrails are not intended for use in areas that are readily accessible to the public.


Conclusions of Analysis

The conclusions of our analysis are addressed in three parts.

- 1) Our structural analysis indicates that the handrail assemblies (as detailed on the aforementioned WireCrafters drawings), including the horizontal rails, the vertical posts, the base plates, the rail-to-post connections, and the post-to-base plate connections, have sufficient structural capacity to safely resist the required loadings of the OSHA Railing Standards and the 2006 International Building Code.
- 2) The connection of the post base plates with 3/8 inch diameter Simpson Wedge-All expansion anchors with a minimum embedment of 2 1/4 inches (as detailed on the aforementioned WireCrafters drawings) are adequate, provided that the base concrete has a minimum strength of 3,000 psi, and that the base concrete has sufficient thickness to develop the capacity of the expansion anchors, and that the expansion anchors are spaced no closer to the edge of the base concrete slab than 1 1/2 inches.
- 3) The adequacy of the handrail is dependent on the connection of the posts to the base structure. Our analysis assumes that the post base plates and anchor bolts are connected to a sufficiently-strong concrete slab. Post connections to any other structural base must be evaluated by the end user. The determination of the adequacy of the base structure is the responsibility of the end user.

We trust that this report is sufficient to meet your needs. If you have any questions, or if we can be of any further service, please don't hesitate to contact us.

Sincerely,
SLESSER ENGINEERING, INC.



Thomas E. Lewis, P.E.
Project Engineer

TEL/mc



Carl J. Slessor, P.E.
President