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SECTION 05720 Aluminum Handrails and Railings: Sample Specifications

1.02 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Engineering handrail and railing systems to withstand structural loads indicated and to determine allowable design working stresses of railing materials based on the following:

- **a.** For Aluminum: The Aluminum Association's "Aluminum Design Manual"

B. Structural Performance of Handrails and Railing Systems:

i. Engineer, fabricate and install handrails and railing systems to withstand the following structural loads without exceeding the allowable design working stress of the materials for handrails, railing systems, anchors and connections. Apply each load to produce the maximum stress in each of the respective components comprising handrails and railing systems.

- **a.** Top Rail of Guardrail Systems: Capable of withstanding the following loads applied as indicated:
  - **i.** Concentrated load of 200 lbs applied at any point and in any direction.
  - **ii.** Uniform load of 50 lb. per lineal ft. applied horizontally and concurrently with uniform load of 100 lb. per lineal ft. applied vertically downward.
  - **iii.** Concentrated load need not be assumed to act concurrently with uniform loads.
- **b.** Handrails Not Serving as Top rails: Capable of withstanding the following loads applied as indicated:
  - **i.** Concentrated load of 200 lb. applied at any point and in any direction.
  - **ii.** Uniform load of 50 lb. per linear ft. applied in any direction.
  - **iii.** Concentrated and uniform loads need not be assumed to act concurrently.
- **c.** Infill Area of Guardrail Systems: Capable of withstanding a horizontal concentrated load of 200 lb. applied to one sq. ft. at any point in the system.
  - **i.** Above load need not be assumed to act concurrently with loads on top rails of railing systems in determining stress on guard.
- **d.** Glass Guardrails: Designated live loads above do not apply within glass guardrail systems. Wind loads with applicable safety factors shall apply.

ii. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

- **a.** Aluminum contacting metals not considered as compatible should be protected as follows:
  - **a.** Painting the dissimilar metal with a prime coat of zinc-chromate primer or other suitable primer, followed by one or two coats of aluminum and masonry paint or other suitable protective coating, excluding those containing lead pigmentation.
  - **b.** Painting dissimilar metal with a coating of a heavy bodied bituminous paint.
  - **c.** Applying a non-abrasive tape, gasket or other form of isolation material.
- **b.** Aluminum surfaces contacting lime-mortar, concrete or other cementitious materials, shall be protected with alkali resistant coatings.
  - **a.** Epoxy coating is recommended for the embedment of aluminum posts into concrete/cementitious structures.

iii. Thermal Movements: Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication, and installation of handrails and railings to prevent buckling, opening up of joints, overstressing of components, connections and other

detrimental effects. Base design calculation on actual surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.

a. Temperature Change (range): 100 degree F ambient; 150 degree F material surfaces.