



**Specifier Notes:** This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format.

This section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings.

Delete or format in hidden text "Specifier Notes" after editing this section.

Items contained in brackets [---] indicate choices the Architect should make, in consultation with the manufacturer, to ensure the products comply with the Owner's program of requirements.

## SECTION 06 52 10

### STRUCTURAL POLYMER (PVC) RAILINGS AND BALUSTRADES

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### 1.2 SECTION INCLUDES

- A. Structural polymer (PVC) railing and balustrade systems, including:
  - 1. Polymer railing sections
  - 2. Balustrades
  - 3. Post mounts
  - 4. Fittings and accessories
- B. Related Sections
  - 1. Division 06 Section – Rough Carpentry for wood structural components incorporated into **[railing] [balustrade] systems.**

##### 1.3 REFERENCES

- A. ASTM International:

1. ASTM D 790 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
2. ASTM D 1784 Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
3. ASTM D 2565 Standard Practice for Operating Xenon-Arc-Type Light-Exposure Apparatus With and Without Water for Exposure of Plastics
4. ASTM D 6109 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastic Lumber
5. ASTM D 7032 Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deckboards and Guardrail Systems (Guardrails and Handrails)
6. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.

B. International Code Council (ICC): ICC-174

**Specifier Notes:** Review and edit quality requirements. Delete requirements not applicable to the Project.

#### 1.4 QUALITY ASSURANCE

- A. Source Limitation: Provide railing, balustrades, and accessories produced by or as otherwise approved by the specified manufacturer.
- B. Manufacturer's Qualifications:
  1. All raw materials are extracted and all products are manufactured within the continental United States.
  2. The manufacturer implements an environmental responsibility policy to reduce industrial waste and conserve energy consumption in its plant operations.
  3. Manufacturer has trained field representatives available to monitor work in progress.
- C. Installer Qualifications: Installer has not less than three years of documented experience installing the specified products.

**Specifier Notes:** The following building code references are from the International Building Code current edition. Revise to suit Project and to comply with requirements of authorities having jurisdiction. For some occupancy categories under certain circumstances, less-stringent provisions may apply.

## 1.5 BUILDING CODE REQUIREMENTS

- A. Provide railings for walking surfaces greater than 30" off the ground.
- B. Rail Height:
  - 1. 36" from the deck surface for residential use
  - 2. 42" from the deck surface for commercial use
- C. Spacing: Design railings and balusters so that a 4" sphere cannot pass through any railing opening except the area above a stair tread through which a 6" sphere cannot pass.
- D. Handrail Requirements: Railings at stairs with more than 3 risers shall be designed with an ADA-compliant handrail.
  - 1. Handrails shall be 34" to 38" from top of Handrail to "nose" of the step, between 1-1/2" to 2" diameter, and have at least 1-1/2" minimum of clearance between wall & inside of handrail. The handrails shall follow the same fall line (slope) as the stairs and be continuous from landing to landing so the hand can slide smoothly without interruption.
- E. Structural Performance: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated. All testing shall comply with Chapter 16 IBC, Section 301 IRC, and Chapter 16 UBC.
  - 1. Handrails and Top Rails of Guards:
    - a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
    - b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
    - c. Uniform and concentrated loads need not be assumed to act concurrently.
  - 2. Infill of Guards:
    - 1. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
    - 2. Infill load and other loads need not be assumed to act concurrently.

Note: The loads specified above are design loads. A safety factor of 2.5 or greater shall be applied.

**Specifier Notes:** Sustainability criteria vary from project to project according to the Owner's requirements. They are not used for every project. The primary sustainability models identified in this Section include:

- U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED).
- Enterprise Green Communities Criteria 2011.
- National Association of Home Builders NAHB National Green Building Standard (ICC 700-2008):
- U.S. Environmental Protection Agency/U.S. Department of Energy Star Program

Edit according to the Owner's requirements and coordinate with related Division 01 requirements.

## 1.6 SUSTAINABILITY REQUIREMENTS

- A. LEED For New Construction and Major Renovations (v3)
  - 1. Credit MR 4: Recycled Content: 10% (post-consumer + 1/2 pre-consumer)
- B. NAHB National Green Building Standard (ICC 700-2011):
  - 1. Practice # 601.7 No Site-Applied Finishing Materials
  - 2. Practice #604.1 Recycled Content
- C. Sustainable Design Submittals: Comply With Division 01 Section– Sustainable Design Requirements.

**Specifier Notes:** Edit submittal requirements as required. Delete submittals not required.

## 1.7 SUBMITTALS FOR REVIEW

- A. Manufacturer's Technical Data Sheet identifying physical properties of specified materials.
- B. Manufacturer's Color/Pattern Selections: Provide chart representing the complete range of available colors and patterns available for each type of **[railing]** **[balustrade]** specified.
- C. Shop drawings showing elevations, sections, and fabrication details for railings and balustrades.
  - 1. Provide structural calculations prepared and certified by a qualified structural engineer licensed to practice in the project jurisdiction.
- D. Samples for Verification:

1. Railing section infill (i.e. slats, pickets, rails, etc.): Submit one sample for each type specified.
2. Cross section of each type of post specified: 1'-0" in length.
3. Post stabilizers: One (1) each.

**Specifier Notes:** Retain the following if sustainability requirements are specified. Refer to Sustainability Requirements article above.

- E. Sustainable Design Submittals: Provide manufacturer's certification that products comply with the requirements specified in Sustainability Requirements article above.

### 1.8 SUBMITTALS FOR INFORMATION

- A. Qualification data for manufacturer and installers. Refer to Quality Assurance Article above.

**Specifier Notes:** Select Certified Test Reports (B) or Manufacturer's certification (C) below.

- B. Certified test reports verifying compliance of railing and balustrade materials with the performance requirements specified in Building Code Requirements article above.
- C. Manufacturer's Installation Instructions.
- D. Manufacturer's certification that materials comply with specified requirements and are suitable for the intended applications.
- E. Sample Warranty: Submit copy of manufacturer's standard warranty terms for Owner's information and review.

### 1.9 SUBMITTALS FOR CONTRACT CLOSEOUT

**Specifier Notes:** Retain the following if sustainability requirements are specified. Refer to Sustainability Requirements article above.

- A. Sustainable Design Closeout Submittals: Refer to Division 01 Section—Sustainable Design Requirements.
- B. Warranty: Warranty submitted on the Manufacturer's standard form, signed and dated according to the conditions of the Contract.

### 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Refer to Manufacturer's published "Delivery Storage and Handling Requirements."
- B. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- C. Storage and Handling Requirements:
  - 1. Store and handle materials in accordance with manufacturer's instructions and to prevent damage.
  - 2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
  - 3. Store materials in clean, dry area.
  - 4. Protect materials from excessive heat exposure.
  - 5. Protect materials during storage, handling, and installation.

## 1.11 WARRANTY

- A. Manufacturer's standard warranty for applications indicated.

## 1.12 COORDINATION

**Specifier Notes:** Retain the following if a mock-up is required.

- A. Field-Constructed Mock-Up: At a location and time approved by the Owner's representative, construct a complete railing/balustrade section to demonstrate installation techniques and general workmanship techniques. Protect installed mock-up until approved by the Manufacturer's field representative and the Owner's Representative. Installation may proceed following approval of mock-up. Installed mock-up may be incorporated into the finished work.
- B. Pre-Construction Meeting: At a location and time prior to scheduled commencement of the Work of this Section, convene a meeting at the Project site. Attendees include the Owner's Representative, the Manufacturer's field representative, the Contractor, the Installer, and related trades. Review the following.
  - 1. Project conditions.
  - 2. Status of other trades.
  - 3. Project duration.
  - 4. Field-constructed mock-ups.

## PART 2 – PRODUCT

### 2.1 PRODUCTS, GENERAL

**Specifier Notes:** Retain the following if sustainability requirements are specified. Refer to Sustainability Requirements article above.

**Note: Series 1000 and 3000 railings contain no recycled content.**

- A. Sustainable Design Requirements: Comply with Division 01 Section – Sustainable Design Requirements and as follows:
  - 1. Recycled Content:
    - a. PVC Extrusions: Not less than 15%
    - b. Steel Components: Not Less than 20%
    - c. Aluminum Components: Not Less than 20%
  - 2. No Site-Applied Finish Materials.

**2.2 MANUFACTURERS**

- A. Basis of Design: Design is based upon products manufactured by Superior Plastic Products, Inc., 260 Jalyn Drive, New Holland, Pennsylvania, 17557 [(800) 633-7093]; [www.superiorplasticproducts.com](http://www.superiorplasticproducts.com).
- B. Substitutions: Refer to substitution procedures specified in the bidding requirements for the Project.

**2.3 PVC PHYSICAL PROPERTIES**

- A. Performance Requirements: Comply with the following:

GENERAL PROPERTIES		
	TEST METHOD	VALUES/RESULTS
UV Resistance	ASTM D 7032	Strength: +4.7%; Stiffness: -3.1% Loss within 10%
Temperature Effect	ASTM D 790	MOR 7000 psi MOE 309,000 psi (@ 125° F test Temp)
FLEXURAL PROPERTIES		
Strength	ASTM D 790/6109	10,940 psi
Modulus	ASTM D 790/6109	363,000 psi
FIRE PERFORMANCE		
Flame Spread Index	ASTM E 84	15

**Specifier Notes:** Retain types of railings required for the project. Omit those not applicable.

## 2.4 PVC RAILINGS

### A. Balusters: <Select from the following>

1. Glass: Clear tempered glass: 5/16" x 4" x 31" long panels
  - a) Series **[1000] [3000]**
  - b) Height: **[36"] [42"]**
  - c) Max. Spacing: 3.25"
2. Aluminum Round:
  - a. Holland: 0.75" round
    - a) Series **[1000] [3000]**
    - b) Height: 36"
    - c) Max. Spacing: 3.875"
    - d) Color: **[Black] [Bronze]**
  - b. York: 0.75" round
    - a) Series **[200] [1000] [3000]**
    - b) Height: **[36"] [42"]**
    - c) Max. Spacing: 3.875"
    - d) Color:
      - 1) 36": **[Black] [Bronze] [Kona] [White]**
      - 2) 42": **[Black] [White]**
3. Aluminum Square:
  - a. Witmer: 0.75" x 0.75"
    - a) Series **[1000] [3000]**
    - b) Height: 36"
    - c) Max. Spacing: 3.875"
    - d) Color: **[Black] [Bronze] [Kona] [White]**
  - b. Olde Town: 0.75" x 0.75"
    - a) Series **[1000] [3000]**
    - b) Height: 36"



- c) Max. Spacing: 3.875"
  - d) Color: **[Black] [Bronze]**
- 5. Vinyl Square:
  - a. Heritage: 1.3" x 1.3"
    - a) Series **[1000] [3000]**
    - b) Height: **[36"] [42"]**
    - c) Max. Spacing: 3.25"
  - b. Kinzer: 1.3" x 1.3"
    - a) Series **[1000] [3000]**
    - b) Height: **[36"] [42"]**
    - c) Max. Spacing: 3.25"
  - c. Lexus: 1.3" x 1.3"
    - a) Series **[1000] [3000]**
    - b) Height: **[36"] [42"]**
    - c) Max. Spacing: 3.25"
  - d. Madison: 1.3" x 1.3"
    - a) Series **[1000] [3000]**
    - b) Height: **[36"] [42"]**
    - c) Max. Spacing: 3.25"
  - e. Model: 1.3" x 1.3"
    - a) Series **[200] [1000] [3000]**
    - b) Height: **[36"] [42"]**
    - c) Max. Spacing: 3.25"
- 5. Vinyl Rectangular
  - a. Traditional: 0.875" x 1.5"
    - a) Series **[1000] [3000]**
    - b) Height: **[36"] [42"]**
    - c) Max. Spacing: 3.25"
  - b. Victorian: 0.875" x 1.5"
    - a) Series **[1000] [3000]**
    - b) Height: **[36"] [42"]**
    - c) Max. Spacing: 3.25"

6. Vinyl Color: **[Almond] [Clay] [Tan] [White]**

B. Rails: Aluminum-reinforced and as follows **[1000] [3000]**:

1. Dimensions:

- a. Top Rail: 3" x 3.5"
- b. Bottom Rail: 1.75" x 3.5"

Rails: Aluminum-reinforced and as follows **[200]**:

1. Dimensions:

- a. Top Rail: 2.96 x 1.78"
- b. Bottom Rail: 1.6 x 2.5"

C. Newel Posts:

1. Style:

- a. Heritage **[4"] [5"]**
- b. Kinzer 4"
- c. Lexus 4"
- d. Madison 4"
- e. Plain **[4"] [5"] [6"] [8"]**
- f. Recessed Panel: **[5"] [6"] [8"]**
- g. Vintage 6"

D. Provide straight sections unless indicated to be curved.

**Specifier Notes:** Retain types of balusters required for the project. Omit those not applicable.

## 2.5 PVC BALUSTRADE

A. 4000 Series

- 1. Height: **[36"] [42"]**
- 2. Balusters: **<Select from the following>**
  - a. Brentwood: 1.75" x 1.75" (36" high only)
  - b. Fairmount: 1.75" x 1.75" (36" high only)
  - c. Portland: 1.5" x 1.5"

- d. Richmond: 1.5" x 1.5" (36" high only)
- e. Williamsburg: 1.3" x 2" (36" high only)
- 3. Max. Baluster Spacing: 3.5"
- 4. Rails: Aluminum-reinforced and as follows:
  - a. Dimensions: 3.75" flat x 2.25" high
- 5. Newel Posts:
  - a. Dimensions: 5" x 5"
  - b. Style: **[Plain] [Recessed Panel]**
- 6. Color: **[Almond] [Clay] [White]**

**B. 5000 Series**

- 1. Height: **[36"] [42"]**
- 2. Balusters: **<Select from the following>**
  - a. Denver: 1.75" x 1.75"
  - b. Vintage: 2.625"x 2.625"
- 3. Max. Baluster Spacing:
  - a. Denver: 3.5"
  - b. Vintage: 2.875"
- 4. Rails: Aluminum-reinforced and as follows:
  - a. Dimensions: 4.5" flat x 3.375" high
- 5. Newel Posts:
  - a. Dimensions: 6" x 6"
  - b. Style: **[Plain] [Recessed Panel] [Vintage]**
- 6. Color: **[Clay] [Tan] [White]**

**C. 7000 Series**

- 1. Height: **[36"] [42"]**
- 2. Balusters: **<Select from the following>**
  - a. Bedford: 2.625"x 2.625"
  - b. Belmont: 3.75" x 3.75"
- 3. Max. Baluster Spacing:
  - a. Bedford: 3.875"
  - b. Belmont: 2.875"

4. Rails: Aluminum-reinforced and as follows:
  - a. Top Rail Dimensions: 6.5" contoured x 4.5" high
  - b. Bottom Rail Dimensions: 6.5" flat x 4.5" high

Newel Posts:

- a. Dimensions: 8" x 8"
  - b. Style: **[Plain] [Recessed Panel]**
6. Color: **[Tan] [White]**

## 2.6 HANDRAIL

- A. Provide ADA-compliant handrail, including mounting brackets, elbows, transitions, wall brackets and other appurtenances necessary for a complete installation complying with requirements of authorities having jurisdiction.

## 2.7 ACCESSORIES

- A. Post Caps and Trim: Molded PVC finial type caps and trim as selected by the Architect from the manufacturer's available selections. Provide colors and textures matching **[railing] [balustrade]** types selected.
- B. Fasteners, Inserts, and Sleeves: Provide non-corrosive fasteners as provided by the manufacturer for applications indicated.
- C. Metal Post Mounts: Provide pre-fabricated metal post mounts and leveling plates as recommended by the manufacturer for posts must be installed over concrete slabs, wood decking, or other hard substrates that preclude excavation for concrete footings. Check for acceptable anchoring applications on all surfaces.

**<Select from the following>**

1. Aluminum post mounts with stainless steel leveling plates (5" posts)
  2. Galvanized steel post mounts with stainless steel leveling plates (4" and 5" posts)
  3. Stainless steel post mounts with stainless steel leveling plates
- D. Brackets and Wedges: Provide molded PVC brackets and wedges as recommended by the manufacturer for each type of condition indicated.

## PART 3 – EXECUTION

### 3.1 PREPARATION

- A. Take adequate measures to protect existing site improvements in the work area, including but not limited to landscaping, irrigation, and plantings that may be affected by installation.

### **3.2 INSTALLATION**

- A. Install posts and **[railing] [balustrades]** in accordance with approved shop drawings and the manufacturer's instructions.
- D. Install **[railing] [balustrades]** panels according to the manufacturer's instructions.

### **3.3 CLEAN-UP**

- A. Remove excavated soil from the project site or deposit in an approved soil area on the Owner's property.
- B. Restore landscaping and lawns. Clean pavement, sidewalks, and decking as required
- C. Wipe down surfaces of installed products that have been soiled by excavation and installation operations.

**END OF SECTION**