

DIVISION: 06 00 00– WOOD, PLASTICS, AND COMPOSITES

Section: 06 50 00 – Structural Plastics

Section: 06 63 00 – Plastic Railings

REPORT HOLDER:

Shanghai Longjie Plastics Co., Ltd.

No.656, Chonggu Street, Chonggu Town,

Qingpu District, Shanghai, China 201706

www.longjieplastics.com

REPORT SUBJECT:

Model 1121660 PVC Rail Systems

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2015 and 2012 *International Building Code*® (IBC)
- 2015 and 2012 *International Residential Code*® (IRC)

NOTE: This report references 2015 Code sections with [2012] Code sections shown in brackets where they differ.

1.2 Model 1121660 PVC Rail Systems have been evaluated for the following properties (see Table 1):

- Structural
- Durability
- Surface Burning

2.0 STATEMENT OF COMPLIANCE

2.1 Model 1121660 PVC Rail Systems identified in this report are guardrails under the definitions of the referenced Codes intended for use on elevated walking areas of buildings and walkways as required by the Codes.

2.2 Model 1121660 PVC Rail Systems identified in this report may be used in One- and Two-Family Dwellings regulated by the IRC and all construction types regulated by the IBC in accordance with Section 1406.3, Exception 2. Guardrails less than 42 inches high are limited to use in One- and Two-Family Dwellings (IRC). See Table 1 for additional restrictions based upon Use and Occupancy classification.

3.0 DESCRIPTION

3.1 Rail systems include a top and bottom rail with steel inserts (See Table 1), vertical balusters, post sleeves, post steel inserts, rail-to post brackets, foot blocks, and decorative moldings.

3.2 Materials and Processes-Railings are an assemblage of extruded and molded components utilizing polyvinyl chloride (PVC) material and steel reinforcements. Vinyl components are produced in white color. All systems consist of the following components:

3.2.1 The top and bottom rails are extruded PVC profiles (see Figure 1 and Figure 2).

3.2.2 Balusters are extruded PVC profiles (see Figure 4).

3.2.3 A cold-formed steel (DX51D+Z) insert (see Figure 6) provides reinforcement for the top rails.

3.2.4 Top and bottom rails are connected to posts with molded plastic brackets (see Figure 7 and Figure 8) that are secured to the supports with screws (see Table 2 and Figure 9).

3.2.5 Post sleeves are extruded PVC profiles (see Figure 3). A cold-formed steel (DX51D+Z) insert (see Figure 5) provides reinforcement for the post.

4.0 PERFORMANCE CHARACTERISTICS

4.1 The railing systems described in this report have demonstrated the capacity to resist the design loadings for Guardrails specified in Chapter 16 of the IBC and Section R301 of the IRC when tested in accordance with ICC-ES AC 174 and ASTM D7032.

4.2 Structural performance has been demonstrated for a temperature range from -20°F to 125°F.

4.3 Materials used are deemed equivalent to preservative treated or naturally durable wood for resistance to weathering effects, decay, and attack from termites.



4.4 The PVC materials used in the railing systems have a flame spread index not exceeding 200 when tested in accordance with ASTM E84-13a, as required by AC 174.

5.0 INSTALLATION

Installation shall be in accordance with the manufacturer's installation instructions and this report. Where differences occur between this report and the manufacturer's installation instructions, this report shall govern.

5.1 Railing assemblies consist of top and bottom rails with pre-routed holes to receive balusters. Steel railing reinforcements are inserted in the top rails during assembly (see Table 1).

5.2 Steel railing reinforcements are inserted in the posts during assembly (see Table 1).

5.3 The top and bottom rails are attached directly to structural posts utilizing mounting brackets and fasteners as stipulated in Table 2.

5.4 Post Anchorage:

5.4.1 The post insert shall be installed with the open side parallel with the rail length.

5.4.2 The steel post inserts (Figure 5) with the steel post base attachment plate (Figure 7) in the bottom shall be attached to the supporting structure using eight 1/4 inch diameter anchoring bolts. The type and length of anchor bolts shall be suitable for the material and condition of the supporting structure. See 6.0 CONDITIONS OF USE for additional requirements.

6.0 CONDITIONS OF USE

6.1 Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict, this report governs.

6.2 Guards recognized in this report and regulated by the IBC or IRC are limited to exterior use in One- and Two-Family Dwellings under the IRC, and residential use groups under the IBC that permit construction in accordance with the IRC.

6.3 Anchorage of the structural post is not within the scope of this report and is subject to evaluation and approval by the building official. Anchors must satisfy the design load requirements specified in Chapter 16 of the building code and must meet the following minimum requirements:

6.3.1 A minimum of eight anchor bolts must be used and located in the pre-drilled holes in the structural post base.

6.3.2 The anchors must have a minimum nominal diameter equal to 1/4 inch. The type and length of anchor bolts is dependent upon the material and condition of the supporting structure and is not within the scope of this report.

6.3.3 When the supporting structure is a wood-framed deck, installation must include anchorage to suitable structural framing. Decking is not considered structural framing and anchorage to decking alone is not an approved installation method.

6.3.4 Where required by the building official, engineering calculations and details shall be provided. The calculations shall verify that the anchorage and supporting structure complies with the Building Code for the type and condition of the supporting construction.

6.4 Compatibility of fasteners and other metallic components with the supporting structure, including chemically treated wood, is not within the scope of this report.

6.5 Only those types of fasteners and fastening methods described in this report have been evaluated for the installation of the railing systems; other methods of attachment are outside the scope of this report.

6.6 Compatibility of the supporting construction materials with all fasteners, metal post mount components, and other hardware components are subject to approval by the Code Official.

6.7 Model 1121660 PVC Rail Systems reported herein are manufactured by Shanghai Longjie Plastics Co., Ltd. in Shanghai, China in accordance with the manufacturer's approved quality control system with inspections by Intertek Testing Services NA, Inc. (AA-647).





7.0 SUPPORTING EVIDENCE

7.1 Drawings and installation instructions submitted by the manufacturer.

7.2 Reports of testing and engineering analysis demonstrating compliance with ICC-ES AC 174, Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails), revised February 2014, and ASTM D7032-10a, Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails).

7.2.1 Within the scope of this report, the following versions of referenced standards are deemed equivalent.

Standard	Version(s)	
ASTM D7032	08	10a
ASTM E84	09	13a

7.3 Documentation of an Intertek approved quality control system for the manufacturing of products recognized in this report.

7.4 Intertek Listing Report titled "Shanghai Longjie Plastics Co., Ltd. - Model 1121660 PVC Rail Systems" on the [Intertek Directory of Building Products](#).

8.0 IDENTIFICATION

Model 1121660 PVC Rail Systems produced in accordance with this report shall be identified with labeling on the individual components or the packaging that includes the following information:

8.1 Name and/or trademark of the manufacturer;

8.2 The following statement: "See CCRR-1104 at <https://bpdirectory.intertek.com> for uses and performances levels";

8.3 For the 36 inch guardrails the following statement: "For Use in One- and Two-Family Dwellings Only";

8.4 The Intertek Mark as shown below and the Code Compliance Research Report number (CCRR-1104).



9.0 OTHER CODES

This section is not applicable.

10.0 CODE COMPLIANCE RESEARCH REPORT USE

10.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

10.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

10.3 Reference to the <https://bpdirectory.intertek.com> is recommended to ascertain the current version and status of this report.

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TABLE 1 – GUARDRAIL ASSEMBLIES AND CODE OCCUPANCIES

Guard System	Rail Inserts	Rail Brackets		Balusters	Guardrail Dimensions ⁽¹⁾	Code Occupancy Classification
		Top	Bottom			
1121660 PVC	Top: Steel (Fig. 6) Post: Steel (Fig. 5)	PVC	PVC	PVC (Fig. 4)	68.5" by 36"	The use shall be limited to one-and two-family dwellings in accordance with the IRC and residential use groups under the IBC that permit construction in accordance with the IRC.

1. Guardrails are qualified up to and including the listed maximum guardrail system dimensions for use in the referenced Code Occupancy Classification. Guardrail lengths are actual railing lengths, i.e. clear space between supports.

TABLE 2 – FASTENING SCHEDULE

Connection	Fastener
Rail Bracket to Post	Four #10 x 3/4 Zinc coated, carbon steel, self-drive, pan-head screws
Rail Bracket to Rail	Two #10 x 1-1/2" stainless steel, self-drive, pan-head screws
Support Block to Rail	One #10 x 1-1/2" stainless steel, self-drive, pan-head screws
Foot Block to Bottom Rail	Four #10 x 3/4 Zinc coated, carbon steel, self-drive, pan-head screws

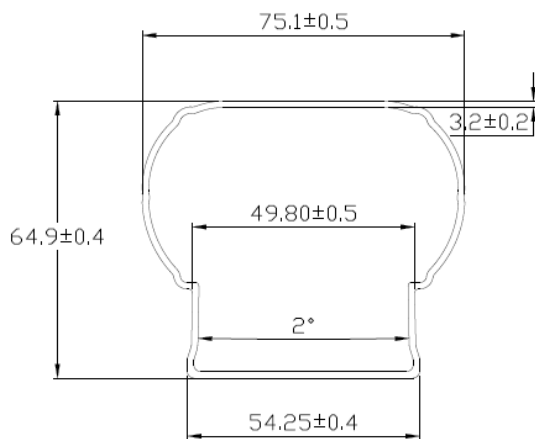


Figure 1 – Top Rail (unit: mm)

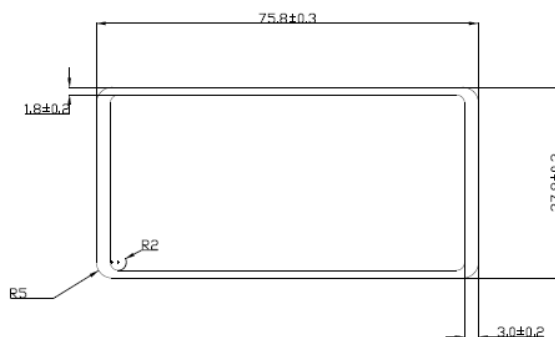


Figure 2 – Bottom Rail (unit: mm)



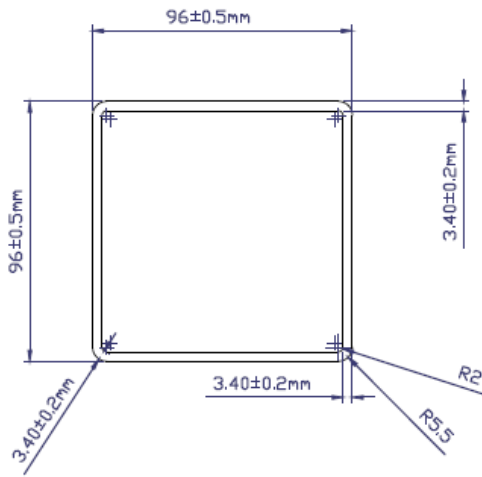


Figure 3 – Post (unit: mm)

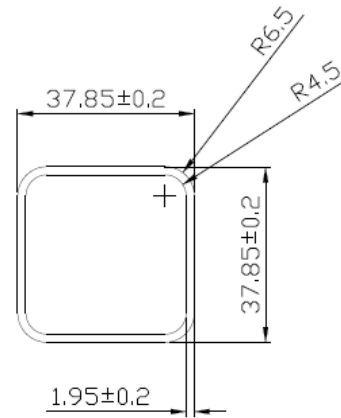


Figure 4 – Baluster (unit: mm)

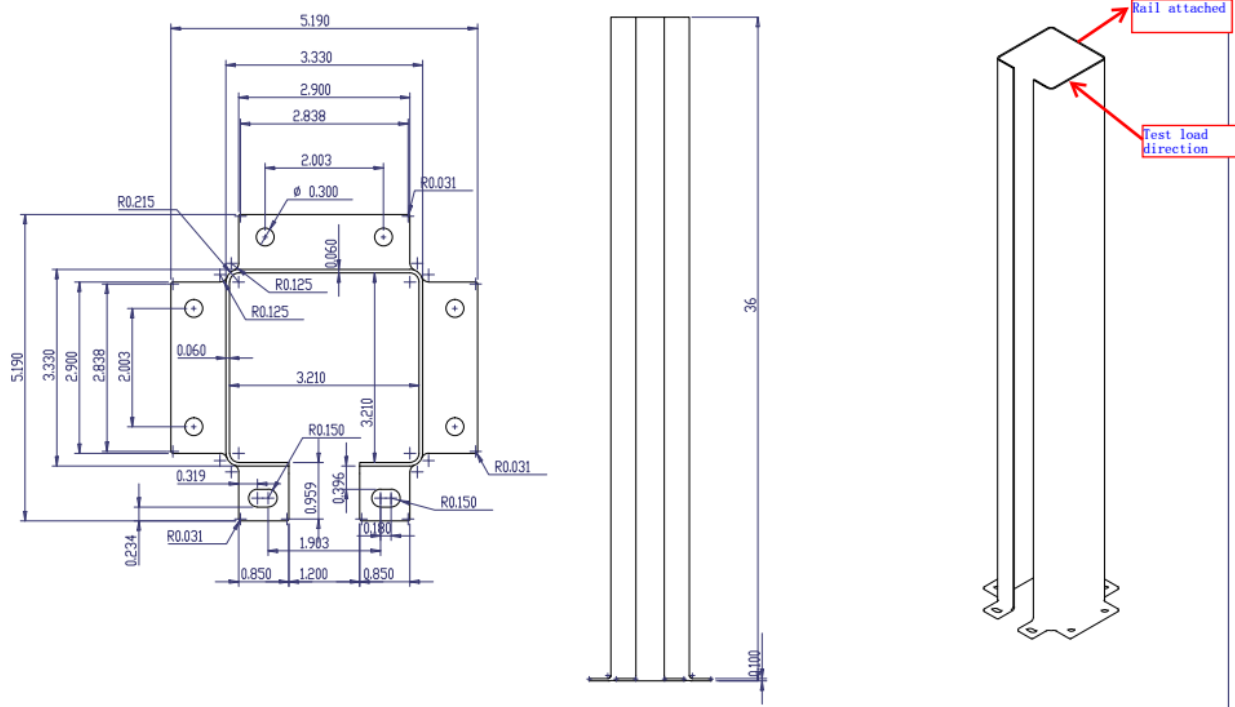


Figure 5 – Post Steel Insert (Top Rail- Attached to non-open face of post) (unit: inch)

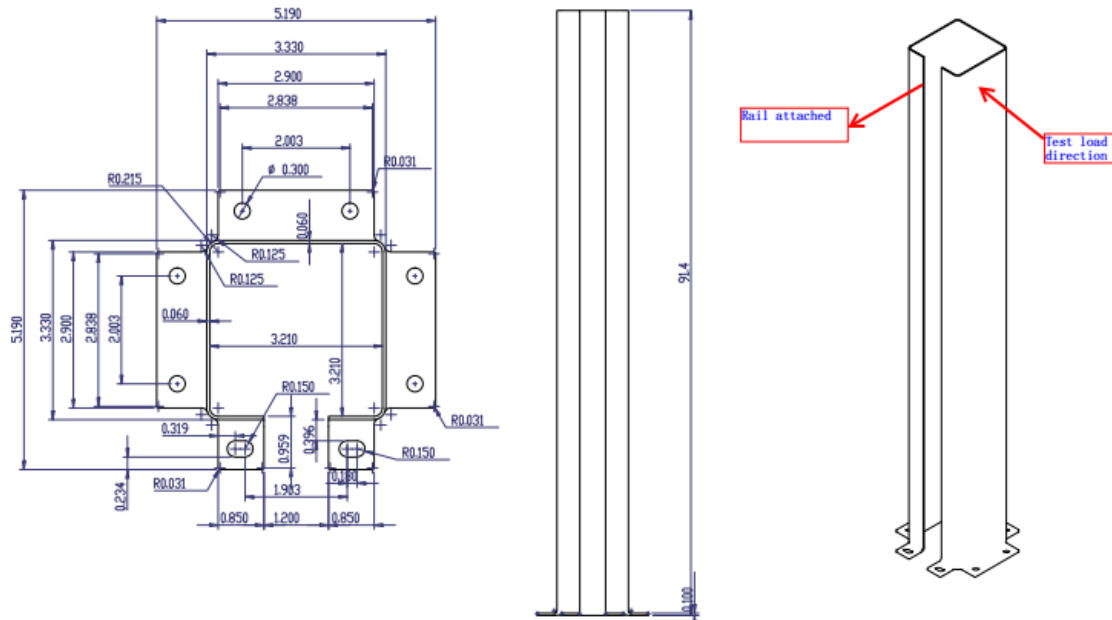


Figure 6 – Post Steel Insert (Top Rail – Attached to open face of post) (unit: inch)

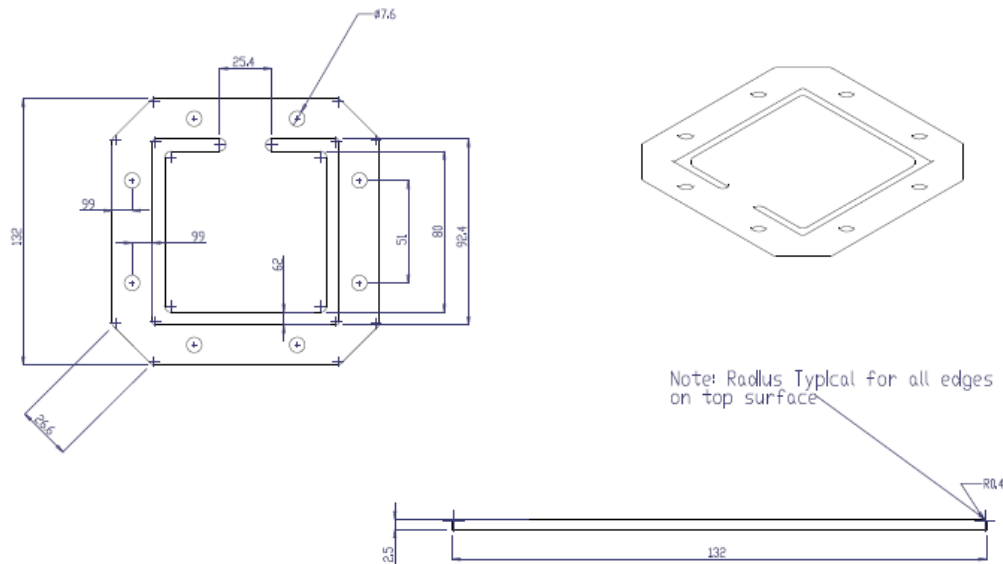


Figure 7 – Post Base Attachment Plate (unit: mm)

Note: Post anchorage and supporting structure are not within the scope of this report and must be designed and constructed in accordance with Chapter 16 of the IBC. Minimum anchorage is eight 1/4 inch bolts. Length and type as appropriate for the type and condition of the supporting structure

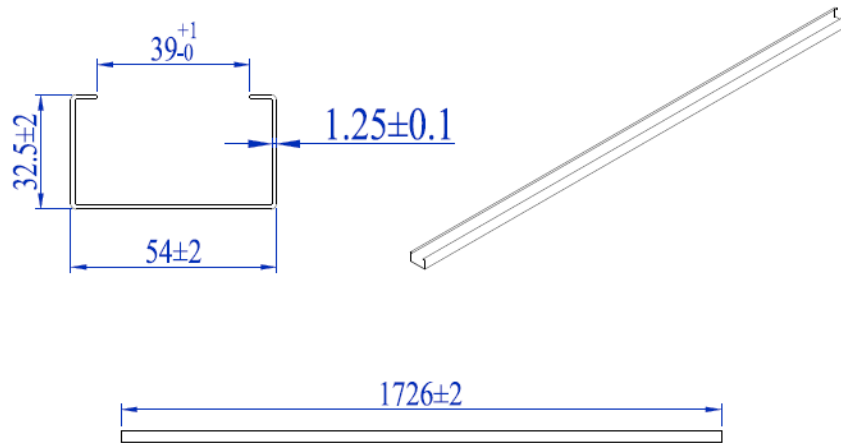


Figure 8 – Top Rail Steel Insert (unit: mm)

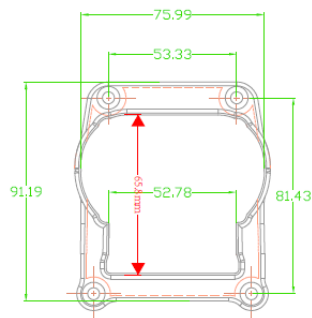


Figure 9 – Top Bracket (unit: mm)

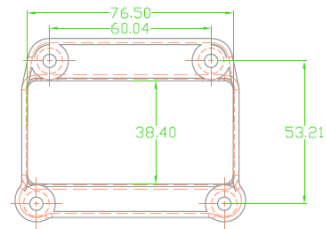


Figure 10 – Bottom Bracket (unit: mm)

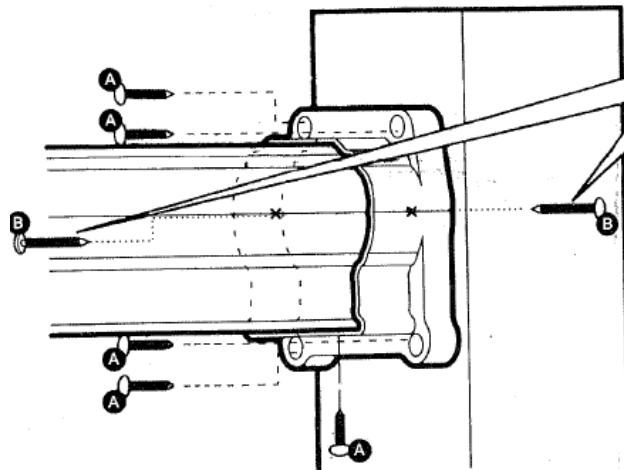


Figure 11 – Fasteners Schedule

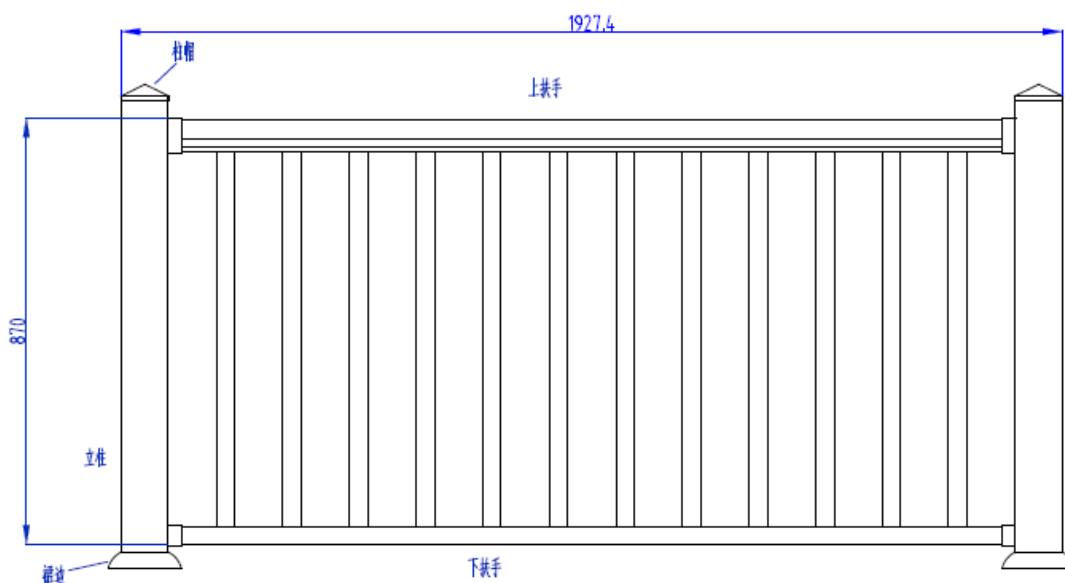


Figure 12 – Assembly Drawing (unit: mm)

Note: The unit of the dimensions in the drawings is mm.