ICC-ES Evaluation Report

ESR-2601

Reissued May 2024

Revised June 2024

Subject to renewal May 2025

This report also contains:

- FBC Supplement

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DIVISION: 06 00 00—WOOD, PLASTICS, AND COMPOSITES Section: 06 50 00—Structural Plastics Section: 06 63 00—Plastic Railings	REPORT HOLDER: FYPON, LTD.	EVALUATION SUBJECT: FYPON® SYNTHETIC RAILING SYSTEM	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021, 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2024, 2021, 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Properties evaluated:

- Structural
- Durability
- Surface-burning characteristics

2.0 USES

The Fypon® Synthetic Railing System described in this report is limited to exterior use as guards for balconies, porches, decks and stairs. The products described in this report are used: in buildings of Type V-B (IBC) construction and other types of construction in applications where untreated wood is permitted by 2024, 2021 and 2018 IBC Section 705.2.3.1 (2015, 2012 and 2009 IBC Section 1406.3); One- and Two-family Dwellings under the IBC; and/or in buildings constructed in accordance with the IRC. See Table 1 for limitations.

3.0 DESCRIPTION

3.1 General:

The Fypon® Synthetic Railing System is sold under the following brand names: Fypon® QuickRail® Synthetic Plus, Fypon® QuickRail® Synthetic Premium and Fypon® Synthetic Premium Railing. It is a guard consisting primarily of top and bottom rails with infill balusters. A guardrail post (Ultra-Post) is also available. The height of the railing is 36 inches or 42 inches (914 or 1067 mm) above the walking surface. The railing system may be used as a horizontal railing or as a stair railing with a slope between 30 and 40 degrees. The railing system is white in color, and complies with the requirements of ASTM D7032. See Figure 1 for images of the railing assemblies.

3.2 Guard Components:

See Figure 2 for depictions of primary guard components. Dimensions not provided in the figures are included in the paragraphs below.

The top rail is T-shaped with a wall thickness of 0.125 inch (3.2 mm). The bottom rail is rectangular with a wall thickness of 0.14 inch (3.6 mm). Both top and bottom rails are available in 6-foot, 8-foot and 10-foot (1.83, 2.44 and 3.05 m) lengths. Top rails which are 8 feet (2.44 m) long or longer have an aluminum insert. Both top and bottom rails have holes for baluster placement.

The balusters are hollow, thermal formed spindles and square, co-extruded hollow pickets. The spindles are $1^1/_2$ inches (38.1 mm) square at the top and bottom. The pickets are $1^1/_2$ inches (38.1 mm) square. When the pickets or spindles are installed into the rails, there is a clear space of approximately $3^1/_4$ inches (82.5 mm) between pickets or spindles.

The post sleeves are 4 inches (102 mm) square and have a wall thickness of 0.186 inch (4.7 mm). Top and bottom rail mounting brackets are supplied along with bracket covers. The 6-foot (2.44 m) rail systems utilize one bottom rail support (crush block) located at the midspan. Longer rail systems utilize two crush blocks located at one-third points of the span.

3.3 Ultra-Post:

The Ultra-Post is a steel tube measuring 2 inches (51 mm) square and 0.109 inch [12 gauge (2.8 mm)] thick, welded to a $3^1/_2$-inch (89 mm) square and $^3/_8$-inch-thick (9.5 mm) galvanized steel leveling plate. Two PVC guide blocks are mounted onto the post to receive the screws from the railing brackets. These are covered by the post sleeve. Ultra-Post is available in heights of 36 and 42 inches (914 mm and 1067 mm). See Figure 3 for a profile of the Ultra-Post.

3.4 Materials:

The Fypon® Synthetic Railing System components are 100 percent PVC except for the following: top rail inserts, which are aluminum; top and bottom rail brackets, which are nylon; and the Ultra-Post, which consists of a steel tube welded to a steel base plate. The minimum yield and tensile strengths and minimum thickness of the aluminum and steel components are specified in the approved quality-control manual.

3.5 Fasteners:

Fasteners required to install the Fypon® Synthetic Railing System are galvanized screws, which are supplied with the railing system components.

3.6 Durability:

When subjected to weathering, insect attack, and other decaying elements, the material used to manufacture the Fypon® Synthetic Railing System is equivalent in durability to code-complying, preservative-treated or naturally durable lumber when used in locations described in Section 2.0 of this report. The Fypon® Synthetic Railing System has been evaluated for structural performance when exposed to temperatures from −20º (−29ºC) to 125ºF (52ºC).

3.7 Surface-burning Characteristics:

When tested in accordance with ASTM E84, the Fypon® Synthetic Railing System PVC has a flame-spread index of no greater than 200.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The Fypon® Synthetic Railing System is capable of resisting the loads specified in 2024 and 2021 IBC Section 1607.9.1 [2018, 2015 and 2012 IBC Section 1607.8.1 (2009 IBC Section 1607.7.1)] and IRC Table R301.5, when installed as described in Tables 1 and 2. Evaluation of railing to post connections is based on supporting posts being Southern Pine species with a minimum width of 3.5 inches and a minimum depth which allows the screws to be fully embedded in the wood. The adequacy of fastening to other species must be justified to the satisfaction of the code official. Wood posts must be sized to support the applied loads in accordance with the IBC or IRC, as applicable, and must be justified to the satisfaction of the code official. For the Ultra-Post, the capacity of the attachment to the supporting structure must be justified to the satisfaction of the code official.

4.2 Installation:

Installation of the Fypon® Synthetic Railing System must comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions must be available at the jobsite at all times during installation.

The Fypon® Synthetic Railing System must be fastened to the Ultra-Post assembly, or to posts and/or wall structure that comply with the applicable code.

Top and bottom rails must be attached to the supporting construction using the nylon brackets. Each bracket must be attached to the supporting construction using four No. 10 by $1^1/_2$-inch-long Phillips pan-head screws supplied with the bracket. Each top bracket must be fastened to the supported rail with four No. 10 by 1-inch-long Phillips pan-head screws supplied with the bracket, two on each side of the rail. Each bottom bracket must be fastened to the supported rail with two No. 10 by 1-inch-long Phillips pan-head screws supplied with the bracket, one on each side of the rail.

Once the rails are fastened to the brackets, the bracket covers must be slid into place over the brackets.

5.0 CONDITIONS OF USE:

The Fypon® Synthetic Railing System described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 These products are limited to exterior use as a guardrail system for balconies, porches, decks and stairs used in: buildings of Type V-B (IBC) construction and other types of construction in applications where untreated wood is permitted by 2024, 2021 and 2018 IBC Section 705.2.3.1 (2015, 2012 and 2009 IBC Section 1406.3); One- and Two-family Dwellings under the IBC; and/or in buildings constructed in accordance with the IRC. See Table 1 for limitations.

5.2 Installation must comply with this report, the manufacturer's published installation instructions and the applicable code. When the manufacturer's published installation instructions differ from this report, this report governs.

5.3 The compatibility of the fasteners and brackets with the supporting construction, including chemically treated wood, is outside the scope of this report.

5.4 The Fypon® Synthetic Railing System must be directly fastened to supporting construction having adequate strength and stiffness. Where required by the code official, engineering calculations and construction documents consistent with this report must be submitted for approval. The calculations must verify that the supporting construction complies with the applicable building code requirements and is adequate to resist the loads imparted upon it from the products and systems discussed in this report. The documents must contain details of the attachment to the supporting structure consistent with the requirements of this report. The documents must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.5 The top rail component of the Fypon® Synthetic Railing System must not be used as a handrail for stairways or ramps.

5.6 The capacity of wood posts, with or without post sleeves, is outside the scope of this report.

5.7 The Fypon® Synthetic Railing System is produced in Howe, Indiana, under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails) (AC174), dated January 2012 (editorially revised April 2024).

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-2601) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

7.2 In addition, the Fypon® Synthetic Railing System described in this report is identified by a stamp, on each individual piece or on the packaging, bearing the product name.

7.3 The report holder's contact information is the following:

FYPON, LTD.
1750 INDIAN WOOD CIRCLE
MAUMEE, OHIO 43537
(800) 446-3040
www.fypon.com

TABLE 1—MAXIMUM SPANS FOR GUARDS SUPPORTED BY BUILDING CONSTRUCTION[1]

RAILING SYSTEM DESCRIPTION[4]	APPLICABLE BUILDING CODE		MAXIMUM SPAN[2,3] (ft.-in.)	LIMITATIONS[5]
	IBC	IRC		
Horizontal, 42 inches high with aluminum insert	Yes	Yes	10 - 0	One- and Two-family Dwellings
Horizontal, 42 inches high with no insert	Yes	Yes	6 - 0	None
Stair, 42 inches high with no insert	Yes	Yes	6 - 0	One- and Two-family Dwellings
Horizontal, 36 inches high with aluminum insert	Yes	Yes	10 - 0	One- and Two-family Dwellings
Horizontal, 36 inches high with no insert	--	Yes	6 - 0	One- and Two-family Dwellings
Stair, 36 inches high with no insert	--	Yes	6 - 0	One- and Two-family Dwellings

For **SI:** 1 inch = 25.4 mm, 1 foot = 305 mm.

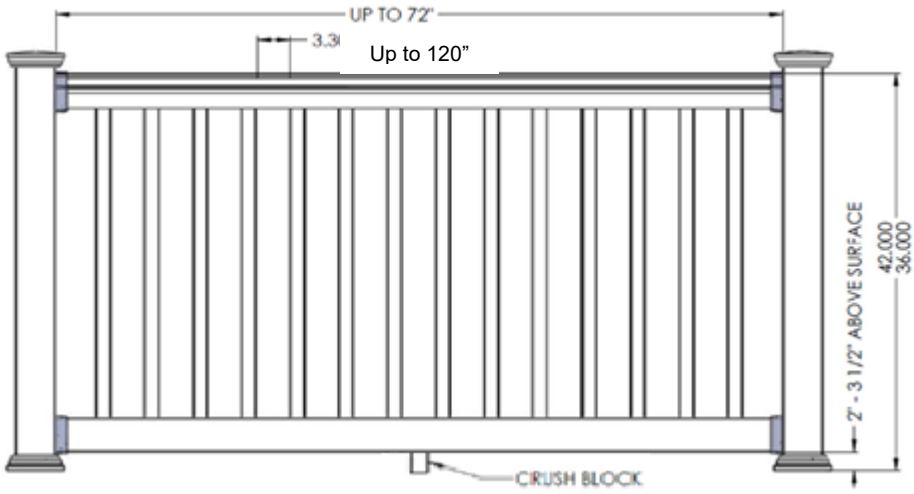
[1]The ability of the supporting construction and wood post to resist the loads from the guardrails must be justified to the satisfaction of the code official.
[2]Maximum span is measured from edge-of-post (or other support) to edge-of-post (or other support).
[3]Maximum allowable span has been adjusted for durability. No further increases are permitted.
[4]The minimum height of the top rail must be in accordance with 2024, 2021, 2018 and 2015 IBC Section 1015.3 [2012 IBC Section 1013.3 (2009 IBC Section 1013.2)] for the IBC and 36 inches for the IRC.
[5]Systems have only considered the following loads in accordance with the IBC/IRC, as applicable:
a. 50 plf live load for the top rail (not applicable to One- and Two-family Dwellings)
b. 200-pound concentrated live load for the top rail and post
c. 50-pound live load on an area not to exceed 12-inch by 12-inch for the balusters

TABLE 2—MAXIMUM SPANS FOR GUARDS SUPPORTED BY ULTRA-POST[1]

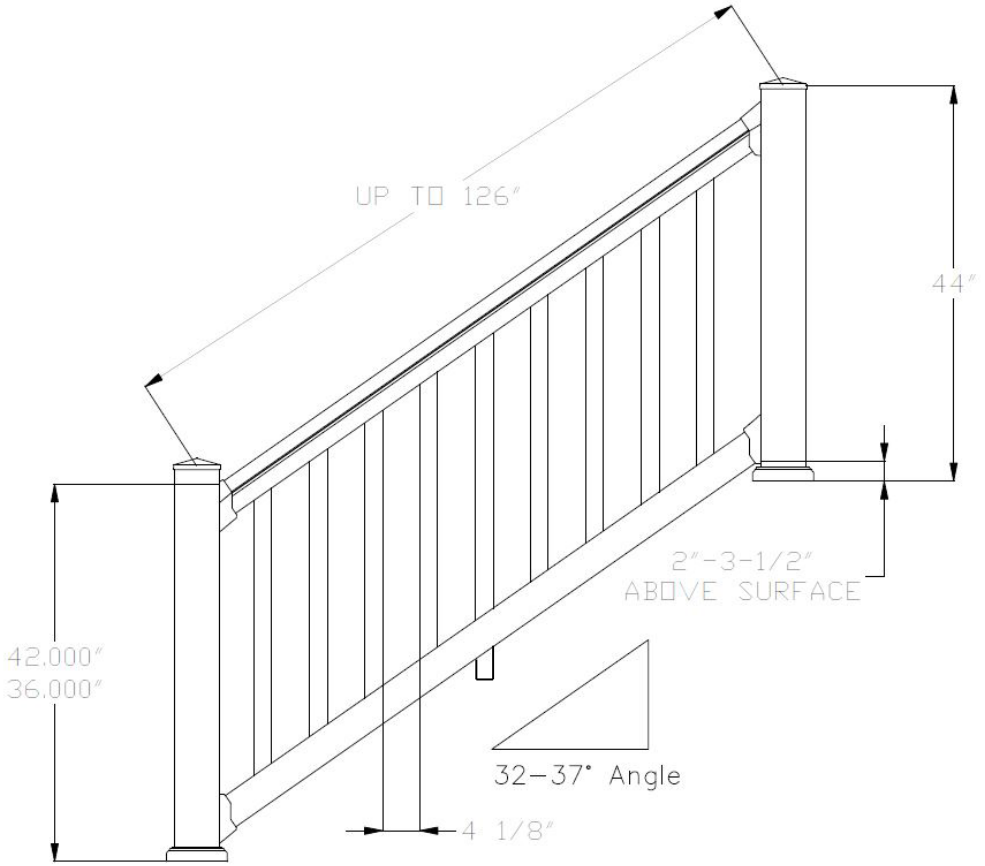
HEIGHT OF ULTRA-POST (inches)	MAXIMUM SPAN SUPPORTED (ft.-in.)
36	8 - 0
42	8 - 0

For **SI:** 1 inch = 25.4 mm, 1 foot = 305 mm.

[1]Span is measured from center of Ultra-Post to center of Ultra-Post or from center of Ultra-Post to the face of supporting construction at the opposite end.

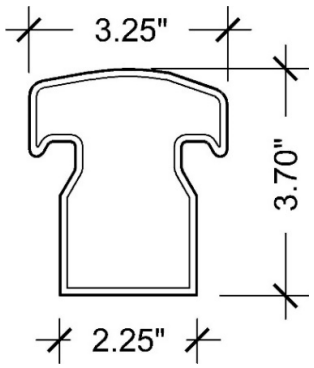


Horizontal Railing Assembly (6-foot lengths shown; lengths over 6 ft require 2 crush blocks)

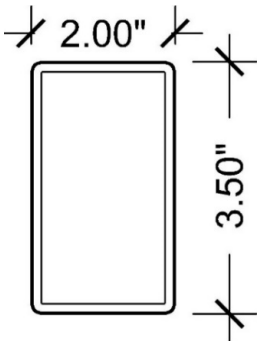


Stair Railing Assembly

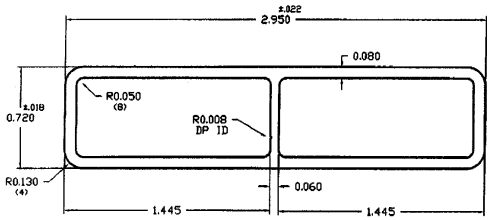
FIGURE 1—FYPON® SYTHETIC RAILING SYSTEM ASSEMBLIES



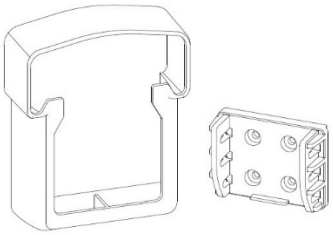
Top Rail

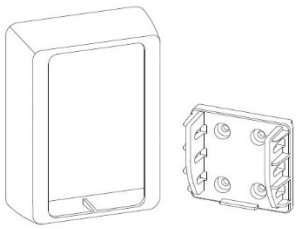


Bottom Rail

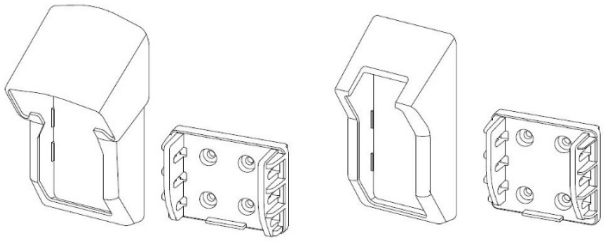


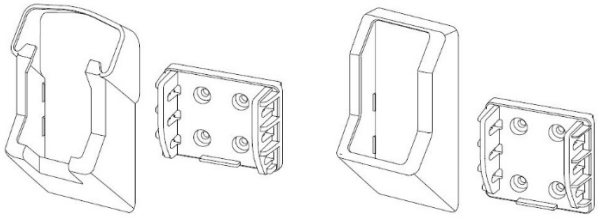
Aluminum Rail Insert



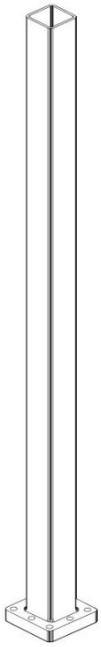


Horizontal Rail Brackets and Bracket Covers

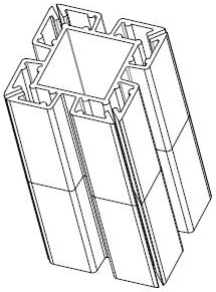




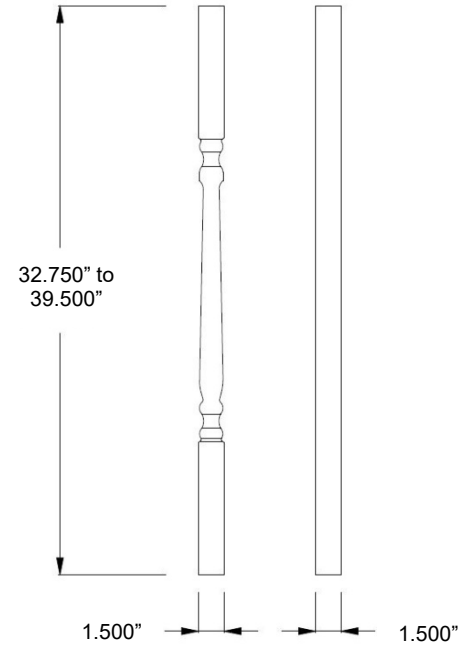
Stair Rail Brackets and Bracket Covers



Ultra-Post



Ultra-Post Molded Guide



Colonial and Square Balusters

FIGURE 2— FYPON® SYNTHETIC RAILING SYSTEM COMPONENTS

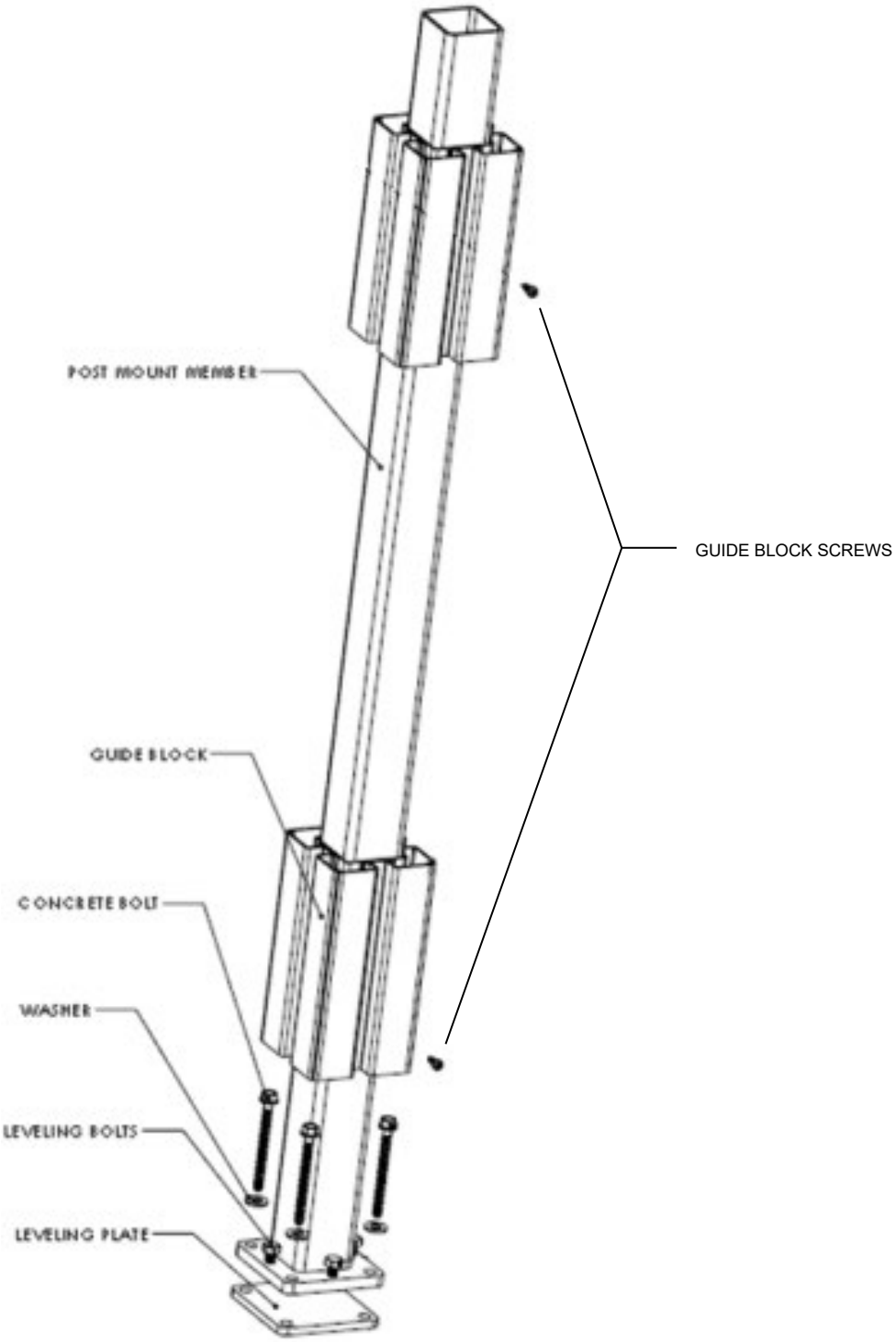


FIGURE 3—ULTRA-POST ASSEMBLY

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 50 00—Structural Plastics
Section: 06 63 00—Plastic Railings

REPORT HOLDER:

FYPON, LTD.

EVALUATION SUBJECT:

FYPON® SYNTHETIC RAILING SYSTEM

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Fypon® Synthetic Railing System described in ICC-ES evaluation report ESR-2601 has also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2023 *Florida Building Code—Building*
- 2023 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The Fypon® Synthetic Railing System, described in ICC-ES evaluation report ESR-2601 complies with the *Florida Building Code—Building* and the *Florida Building Code—Residential.* The design requirements must be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential,* as applicable. The installation requirements noted in ICC-ES evaluation report ESR-2601 for the 2021 *International Building Code®* meet the requirements of the *Florida Building Code—Building* and the *Florida Building Code—Residential.*

Use of the Fypon® Synthetic Railing System for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code-Building* or the *Florida Building Code-Residential* has not been evaluated, and is outside the scope of this supplemental report.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued May 2024 and revised June 2024.