ICC-ES Evaluation Report

ESR-5480

Issued *September 2024*

Revised *September 2024*

Subject to renewal September 2025

This report also contains:

- **CHI Supplement**
- **LABC Supplement**
- **OSSC Supplement**
- **CBC Supplement**
- **FBC Supplement**

RailMaster

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DIVISION: 05 00 00 – METALS Section: 05 52 00 – Metal Railings	REPORT HOLDER: MASTER HALCO®	EVALUATION SUBJECT: RAILMASTER ALUMINUM RAILING SYSTEM	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021 and 2018 *International Building Code®* (IBC)
- 2024, 2021 and 2018 *International Residential Code®* (IRC)

Property evaluated:

- Structural

2.0 USES

The Master Halco® RailMaster Aluminum Railing System described in this report has been evaluated for interior or exterior use as a guard for balconies, porches and decks in accordance with the IBC and IRC.

3.0 DESCRIPTION

3.1 General:

The Master Halco® RailMaster Aluminum Railing System consists of surface mounted posts supporting an infill panel consisting of a top and bottom rail with vertical pickets. The railing system is available in heights up to 42 inches (1067 mm). The posts are available in heights up to 43 inches (1092 mm). The infill panels are available in widths up to 93 inches (2.36 m).

3.2 Material:

The railing system posts are composed of 0.125-inch thick (3 mm) ASTM B221 grade 6005-T5 square aluminum tubing measuring 2.5 inches x 2.5 inches (63.5 mm x 63.5 mm) or 3 inches x 3 inches (76 mm x 76 mm). The posts are factory welded to a 5 inch x 5 inch x 0.5 inch thick (127 mm x 127 mm x 12.7 mm) ASTM B221 grade 6005-T5 aluminum base plate. Aluminum brackets with material specifications noted in the quality documentation on file with ICC-ES are factory attached via #10-1 inch (25.4 mm) Flat Head Self Tapping 410 SS screws to the posts to accommodate the attachment of the infill panels. The infill panels are fabricated using top rails consisting of 1 ½ inch x 1 ¼ inch x 0.12 inch thick (38 mm x 32 mm x 3 mm) ASTM B221 grade 6005-T5 square aluminum tubing, bottom rails consisting of 1 ½ inch x 1 ¼ inch x 0.071 inch thick (38 mm x

32 mm x 1.8 mm) ASTM B221 grade 6005-T5 square aluminum tubing, and vertical pickets composed of 5/8 inch x 5/8 inch x 0.047 inch thick (15.9 mm x 15.9 mm x 1.2 mm) ASTM B221 grade 6063-T5 square aluminum tubing or 3/4 inch x 3/4 inch x 0.05 inch thick (19.05 mm x 19.05 mm x 1.27 mm) ASTM B221 grade 6063-T5 square aluminum tubing; the pickets are factory assembled via compression to the top and bottom rails. The rail cover measures 1.86 inch x 1.32 inch (47.2 mm x 33.5 mm) and is extruded from ASTM B221 grade 6005-T5 aluminum. The railing system posts, infill panels, and rail cover are factory powder coated, and are available in multiple colors.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The Master Halco® RailMaster Aluminum Railing Systems have been found to be capable of resisting the following minimum design loads prescribed in 2024 and 2021 IBC Section 1607.9.1 (2018 IBC Section 1607.8.1) and IRC Table 301.5 for rail heights up to 42 inches (1067 mm) above the supporting surface with an on-center post spacing of up to 74.5 inches (1.89 m) for the 2.5 inches x 2.5 inches (63.5 mm x 63.5 mm) post and up to 96 inches (2.44 m) for the 3-inch x 3-inch (76mm x 76mm) post:

- A live load of 50 lb/ft (67.8 N/m) applied in any direction along the top rail.
- A single concentrated live load of 200 lbs (0.89 kN) applied in any direction at any point along the top rail.
- A horizontally applied normal live load of 50 lbs (0.22 kN) applied perpendicular to the infill panel on an area measuring 12 inches x 12 inches (305 mm x 305 mm).

The Master Halco® RailMaster Aluminum Railing Systems have also been found to be capable of resisting the following minimum design loads prescribed in 2024 and 2021 IBC Section 1607.9.1 (2018 IBC Section 1607.8.1) for one- and two- family dwellings only and IRC Table 301.5 for rail heights up to 42 inches (1067 mm) above the supporting surface with an on-center post spacing of up to 96 inches (2.44 m) for the 2.5-inch x 2.5-inch (63.5 mm x 63.5 mm) post:

- A single concentrated live load of 200 lbs (0.89 kN) applied in any direction at any point along the top rail.
- A horizontally applied normal live load of 50 lbs (0.22 kN) applied perpendicular to the infill panel on an area measuring 12 inches x 12 inches (305 mm x 305 mm).

The picket spacing in the infill panels meets the requirements of IBC Section 1015.4 and IRC Section R312.1.3.

4.2 Installation:

4.2.1 General: Installation of the Master Halco® RailMaster Aluminum Railing System must be in accordance with the manufacturer's published installation instructions, this report, and the guard height and opening limitations outlined in Section 1015 of the IBC and Section R312 of the IRC, as applicable. The manufacturer's published installation instructions must be available at the jobsite at all times during construction.

4.2.2 Posts: The posts are attached to the building substrate with project specific fasteners. The design of this attachment is outside of the scope of this report.

4.2.3 Infill Panels: The ends of the top and bottom rails of infill panels are inserted into the brackets on the posts.

4.2.4 Top Rail Cover: The top rail cover is placed over the top rail of the infill panel.

5.0 CONDITIONS OF USE:

5.1 The Master Halco® RailMaster Aluminum Railing System is limited to installations in which it is not subject to vehicle impacts.

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 Master Halco® RailMaster Aluminum 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 to 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 system discussed in this report. The documents must contain details of the attachment 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.

5.4 When installed where the system anchors are exposed to moisture, the system anchors must be of a material intended for the use and identified by the anchor manufacturer as acceptable for exterior applications.

5.5 Use of the system as a grab bar is outside of the scope of this report.

5.6 All metals in contact with aluminum must either be an alloy approved for direct aluminum contact or isolated from the aluminum by an approved coating.

5.7 The Master Halco® RailMaster Aluminum Railing System is manufactured under a quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Handrails and Guards (AC273), dated June 2017 (editorially revised May 2024).

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5480) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

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

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ICC-ES Evaluation Report

ESR-5480 Chicago Title 14 Supplement

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DIVISION: 05 00 00—METALS
Section: 05 52 00—Metal Railings

REPORT HOLDER:

MASTER HALCO®

EVALUATION SUBJECT:

RAILMASTER ALUMINUM RAILING SYSTEM

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that RailMaster Aluminum Railing System, described in ICC-ES evaluation report ESR-5480, has also been evaluated for compliance with the Chicago Construction Codes (Title 14 of the Chicago Municipal Code) as noted below.

Applicable code editions:

- 2019 *Chicago Building Code* (Title 14B)

2.0 CONCLUSIONS

The RailMaster Aluminum Railing System, described in Sections 2.0 through 7.0 of the evaluation report ESR-5480, complies with Title 14B, and is subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The RailMaster Aluminum Railing System described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-5480.
- The design, installation, conditions of use and identification of the RailMaster Aluminum Railing System are in accordance with the 2018 *International Building Code®* (IBC) provisions noted in the evaluation report ESR-5480.
- The design, installation and inspection are in accordance with additional requirements of Chapters 16 and 17 of Title 14B, as applicable.

This supplement expires concurrently with the evaluation report, issued September 2024 and revised September 2024.

ICC-ES Evaluation Report

ESR-5480 LABC and LARC Supplement

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DIVISION: 05 00 00—METALS
Section: 05 52 00—Metal Railings

REPORT HOLDER:

MASTER HALCO®

EVALUATION SUBJECT:

RAILMASTER ALUMINUM RAILING SYSTEM

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that RailMaster Aluminum Railing System, described in ICC-ES evaluation report ESR-5480, has also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2023 *City of Los Angeles Building Code* (LABC)
- 2023 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The RailMaster Aluminum Railing System, described in Sections 2.0 through 7.0 of the evaluation report ESR-5480, complies with the LABC Chapters 10 and 16, and the LARC, and is subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The RailMaster Aluminum Railing System described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-5480.
- The design, installation, conditions of use and identification of the RailMaster Aluminum Railing System are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report ESR-5480.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the evaluation report, issued September 2024 and revised September 2024.

ICC-ES Evaluation Report

ESR-5480 OSSC Supplement

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DIVISION: 05 00 00—METALS
Section: 05 52 00—Metal Railings

REPORT HOLDER:

MASTER HALCO®

EVALUATION SUBJECT:

RAILMASTER ALUMINUM RAILING SYSTEM

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that RailMaster Aluminum Railing System, described in ICC-ES evaluation report ESR-5480, has also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2022 Oregon Structural Specialty Code *(OSSC)*

2.0 CONCLUSIONS

The RailMaster Aluminum Railing System, described in Sections 2.0 through 7.0 of the ICC-ES evaluation report ESR-5379, complies with the OSSC Chapters 10 and 16, and is subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The RailMaster Aluminum Railing System described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-5480.
- The design, installation, conditions of use and identification of the RailMaster Aluminum Railing System are in accordance with the 2021 *International Building Code®* (IBC) provisions noted in the ICC-ES evaluation report ESR-5480.
- The design, installation and inspection are in accordance with additional requirements of OSSC Chapters 10, 16, and 17, as applicable.

This supplement expires concurrently with the evaluation report, issued September 2024 and revised September 2024.

DIVISION: 05 00 00—METALS
Section: 05 52 00—Metal Railings

REPORT HOLDER:

MASTER HALCO®

EVALUATION SUBJECT:

RAILMASTER ALUMINUM RAILING SYSTEM

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that RailMaster Aluminum Railing System, described in ICC-ES evaluation report ESR-5480, has also been evaluated for compliance with the code*(s)* noted below.

Applicable code edition*(s)*:

- *2022 California Building Code* (CBC)

For evaluation of applicable Chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- *2022 California Residential Code (CRC)*

2.0 CONCLUSIONS

2.1 CBC:

The RailMaster Aluminum Railing System, described in Sections 2.0 through 7.0 of the evaluation report ESR-5480, complies/comply with CBC Chapters 10 and 16, provided the design and installation are in accordance with the 2021 *International Building Code®* (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 10 and 16, as applicable.

2.1.1 OSHPD:

The RailMaster Aluminum Railing System, described in Sections 2.0 through 7.0 of the evaluation report ESR-5480, complies with CBC amended Chapter 10 and 16, and Chapter 16A, provided the design and installation are in accordance with the 2021 International Building Code® (IBC) provisions noted in the evaluation report.

Condition of Use:

All loads applied shall be determined by a registered structural engineer and shall comply with applicable loads from CBC Chapter 16 [OSHPD 3] and its applicable amendments [OSHPD 1R, 2 and 5], and Chapter 16A [OSHPD 1 and 4].

2.1.2 DSA:

The RailMaster Aluminum Railing System, described in Sections 2.0 through 7.0 of the evaluation report ESR-5480, complies with CBC amended Chapter 10 and 16, and Chapter 16A, provided the design and installation are in accordance with the 2021 International Building Code® (IBC) provisions noted in the evaluation report.

Condition of Use:

- When used with means of egress under CBC Section 1014 [DSA-AC], the Shoe Glass Panel Railing System must comply with Section 11B-505 of the IBC.
- All loads applied shall be determined by a registered structural engineer and shall comply with applicable loads from applicable sections of CBC Chapter and its applicable amendments [DSA-SS/CC], and Chapter 16A [DSA-SS].

2.2 CRC:

The RailMaster Aluminum Railing System, described in Sections 2.0 through 7.0 of the evaluation report ESR-5480, comply with CRC Chapter 3, provided the design and installation are in accordance with the 2021 *International Residential Code®* (IRC) provisions noted in the evaluation report and the additional requirements of CRC Chapter 3.

This supplement expires concurrently with the evaluation report, issued September 2024 and revised September 2024.

DIVISION: 05 00 00—METALS
Section: 05 52 00—Metal Railings

REPORT HOLDER:

MASTER HALCO®

EVALUATION SUBJECT:

RAILMASTER ALUMINUM RAILING SYSTEM

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that RailMaster Aluminum Railing System, recognized in ICC-ES evaluation report ESR-5480, 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 RailMaster Aluminum Railing System, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-5480, comply with the 2023 *Florida Building Code—Building* and 2023 *Florida Building Code—Residential*. The design requirements must be in accordance with the *Florida Building Code—Building* or *Florida Building Code—Residential,* as applicable. The installation requirements noted in ICC-ES evaluation report ESR-5480 for the 2021 *International Building Code®* meet the requirements of the *Florida Building Code-Building* or the *Florida Building Code-Residential,* as applicable.

Use of the RailMaster Aluminum Railing System has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code-Building* or the *Florida Building Code-Residential*.

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).

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