

ICC-ES Evaluation Report

ESR-4654

Reissued May 2024

This report also contains:


- CBC Supplement

Subject to renewal May 2025

- LABC Supplement

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<p>DIVISION: 05 00 00—METALS.</p> <p>Section: 05 52 00—Metal Railings</p>	<p>REPORT HOLDER:</p> <p>VALMONT INDUSTRIES, INC.</p>	<p>EVALUATION SUBJECT:</p> <p>INGAL ZEE-PARK® AND INGAL ZEE-PARK® SENTINEL VEHICLE BARRIER SYSTEMS</p>	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015 and 2012 [International Building Code® \(IBC\)](#)

For evaluation for compliance with codes adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architects (DSA), see [ESR-4654 CBC Supplement](#).

For evaluation for compliance with codes adopted by [Los Angeles Department of Building and Safety \(LADBS\)](#), see [ESR-4654 LABC Supplement](#).

Properties evaluated:

- Structural

2.0 USES

The Ingal Zee-Park® and Ingal Zee-Park® Sentinel are used as vehicle barrier systems in accordance with Section 1607 of the IBC.

3.0 DESCRIPTION

3.1 General:

The Ingal Zee-Park® and Ingal Zee-Park® Sentinel systems are composed of a 310 mm (12.2 inch) tall W-beam profile guardrail supported by 616 mm (24.3 inch) tall proprietary post profiles.

3.2 Materials:

Unless specifically noted, the materials for each component are specified in the approved quality documentation.

The Ingal Zee-Park® and Ingal Zee-Park® Sentinel W-beam profile guardrail composed of 2.66 mm (0.10 inch) thick steel with a minimum AASHTO M111 Type I (1.8 oz/ft²) galvanized coating (see [Figure 1](#)).

The Ingal Zee-Park® and Ingal Zee-Park® Sentinel posts are 4.3 mm (0.17 inch) thick z-shaped profiles composed of steel with a minimum G90 (0.90 oz/ft²) galvanized coating factory-welded to a 16 mm (0.63 inch) thick baseplate composed steel with a minimum G90 galvanized coating (0.90 oz/ft²). See [Figure 1](#).

The Ingal Zee-Park® posts have a section depth of 90 mm (3.54 inches), and the Ingal Zee-Park® Sentinel posts have a section depth of 140 mm (5.51 inches). The dimensions of the base plates for the Ingal Zee-Park® system are 100 mm (3.94 inches) by 200 mm (7.87 inches), and the dimensions of the base plates for the Ingal Zee-Park® Sentinel system are 200 mm (7.87 inches) by 300 mm (11.81 inches).

Galvanized 16mm (0.63 inch) shank diameter oval shoulder button headed bolts, washers, and heavy hex nuts, complying with AASHTO M180 specifications, are used to attach the guardrail to the posts.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The Ingal Zee-Park® and Ingal Zee-Park® Sentinel systems, when installed in accordance with this report, are capable of resisting the loads specified in Section 1607 of the IBC.

4.1.1 Installation:

4.1.2 General: Installation must include a minimum of three posts. In any installation, the end posts must not be solely relied upon to act as a barrier. The installation must also be in accordance with the manufacturer's published installation instructions, this report, and the IBC, as applicable.

The manufacturer's published installation instructions must be available at the jobsite at all times during installation. In the event of a conflict between this report and the manufacturer's instructions, this report governs.

4.1.3 Posts:

The posts must be installed at a maximum spacing of 2000 mm (78.75 inches) using one or more anchors to attach each baseplate to the supporting structure (See [Figure 2](#)).

4.1.4 W-beam Profile Guardrail:

4.1.5 The W-beam profile guardrail is attached to the posts using the nuts, washers and bolts provided by the manufacturer. One bolt, one washer and one nut is used at each post. The bolts are tightened with an impact driver per the manufacturer's installation instructions.

5.0 CONDITIONS OF USE:

The INGAL Zee-Park® and Ingal Zee-Park® Sentinel systems described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** Use in parking garages, or similar parking structures, accommodating trucks and buses is outside of the scope of this report
- 5.2** The Ingal Zee-Park® and Ingal Zee-Park® Sentinel systems, described in this report, have been evaluated for ordinary impact conditions as outlined in IBC Section 1607. Conditions in which unusual vibrations or impact forces are present are outside of the scope of this report.
- 5.3** Corrosion resistance of fasteners is outside of the scope of this report. Evidence of corrosion resistance shall be submitted to the satisfaction of the code official.
- 5.4** The Ingal Zee-Park® and Ingal Zee-Park® Sentinel systems 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 anchorage to the supporting structure consistent with the requirements of this report and the applicable code. 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.

6.0 EVIDENCE SUBMITTED

- 6.1** Data in accordance with Section 1607.10 of the IBC (Section 1607.9 of the 2018 IBC and Section 1607.8.3 of the 2015 and 2012 IBC).
- 6.2** Quality documentation in accordance with the [ICC-ES Acceptance Criteria for Quality Documentation \(AC10\)](#), approved January 2019.

7.0 IDENTIFICATION

7.1 The INGAL Zee-Park[®] and Ingal Zee-Park[®] Sentinel systems, described in this report, are identified by a label bearing the report holder's name (Valmont Industries, Inc.), the system name (INGAL Zee-Park[®] or Ingal Zee-Park[®] Sentinel, as applicable) and the ICC-ES Evaluation Report Number (ESR-4654).

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

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W-BEAM GUARDRAIL



ZEE-PARK[®] POST



ZEE-PARK[®] SENTINEL POST

FIGURE 1—INGAL ZEE-PARK[®] COMPONENTS



FIGURE 2—TYPICAL BASEPLATE ATTACHMENT

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

REPORT HOLDER:

VALMONT INDUSTRIES, INC.

EVALUATION SUBJECT:

INGAL ZEE-PARK® AND INGAL ZEE-PARK® SENTINEL VEHICLE BARRIER SYSTEMS

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the Ingal Zee-Park® and Ingal Zee-Park® Sentinel systems, described in ICC-ES evaluation report [ESR-4654](#), have 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:

- 2020 *City of Los Angeles Building Code* (LABC)

2.0 CONCLUSIONS

The Ingal Zee-Park® and Ingal Zee-Park® Sentinel systems, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4654](#), comply with the LABC Chapter 16, and are subjected to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Ingal Zee-Park® and Ingal Zee-Park® Sentinel systems, described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-4654](#).
- The design, installation, conditions of use and identification of the Ingal Zee-Park® and Ingal Zee-Park® Sentinel systems are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-4654](#).
- The design, installation and inspection are in accordance with additional requirements of the LABC Chapters 16 and 17, as applicable.

This supplement expires concurrently with the evaluation report, reissued May 2025.

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1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Ingal Zee-Park® and Ingal Zee-Park® Sentinel systems, described in ICC-ES evaluation report ESR-4654, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2019 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.

2.0 CONCLUSIONS

2.1 CBC:

The Ingal Zee-Park® and Ingal Zee-Park® Sentinel systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-4654, comply with CBC Chapter 16, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapter 16, as applicable.

2.1.1 OSHPD:

The Ingal Zee-Park® and Ingal Zee-Park® Sentinel systems comply with CBC Chapter 16 [OSHPD 3], CBC amended Chapter 16 [OSHPD 1R, 2 and 5], and CBC Chapter 16A [OSHPD 1 and 4] provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16, 16A, 17 and 17A, as applicable.

2.1.2 DSA:

The Ingal Zee-Park® and Ingal Zee-Park® Sentinel systems comply with amended CBC Chapter 16 [DSA SS/CC], and CBC Chapter 16A [DSA SS], provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16, 16A and 17A, as applicable.

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