

# ICC-ES Evaluation Report

ESR-5033

Reissued September 2023


This report also contains:

- CBC Supplement

Subject to renewal September 2024

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<p><b>DIVISION: 12 00 00 - FURNISHINGS</b></p> <p><b>Section: 12 66 00 – Telescoping Stands</b></p>	<p><b>REPORT HOLDER: HUSSEY SEATING COMPANY</b></p>	<p><b>EVALUATION SUBJECT: MAXAM, MAXAM+ AND MXP UNDERSTRUCTURES</b></p>	
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## 1.0 EVALUATION SCOPE

### 1.1 Compliance with the following codes:

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

### Property evaluated:

- Structural

### 1.2 Evaluation to the following standard:

ICC 300-2017 *Standard for Bleachers, Folding and Telescopic Seating, and Grandstands* (ICC 300-2017)

## 2.0 USES

The MAXAM, MAXAM+ and MXP understructure consists of the deck and structural framing members for wall attached telescopic bleachers intended for indoor use only. The understructure design complies with the structural requirements outlined in Section 303 of ICC 300-2017 as referenced by the IBC.

## 3.0 DESCRIPTION

### 3.1 General:

The MAXAM, MAXAM+ and MXP understructure rows are made up of decks made of plywood sheathing spanning between proprietary cold-formed steel nose and rear beam. The rear beam is supported by two steel columns welded to rolling wheel channels (casterhorns). When the bleacher is retracted, the nose beam is supported by two cold-formed steel cantilever members which are welded to the two columns. When the bleacher is open, and the nose beam has deflected approximately 1/4 inch (6.4 mm), the nose beam engages and is supported by the rear beam and columns of the row below. The lowest row is supported by deck stabilizers on wheels that bear directly on the floor. To resist lateral seismic or sway loads applied parallel to each row, flat steel x-braces or steel knee braces are used to resist loads in tension and a cold-formed steel hat-shaped member is used to resist loads in compression, if applicable. See [Figures 1](#) through [6](#) for additional information.

The MAXAM bleachers are wall attached and consist of up to 30 tiers with row spacing between 22 inches to 26 inches (559 mm to 660 mm), a rise of 9 5/8 inches, 11 5/8 inches or 16 inches (245 mm, 295 mm or 406 mm) between rows with a maximum frame height of 290 inches, 290 inches or 288 inches (7.4 m, 7.4 m or 7.3 m), respectively. The bleacher comes in section widths between 9 feet to 27 feet (2.7 m to 8.2 m), and in 1 foot 6-inch (0.46 m) increments.

The MAXAM+ bleachers are wall attached and consist of up to 30 tiers with row spacing between 30 to 34 inches and a rise of 9 5/8, 11 5/8 or 16 inches (245 mm, 295 mm or 406 mm) between rows with a maximum frame height of 290 inches, 290 inches or 288 inches (7.4 m, 7.4 m or 7.3 m), respectively. The bleacher comes in section widths between 9 feet to 19 feet 6 inches (2.7 m to 5.9 m), and in 1 foot 6-inch (0.46 m) increments.

The MXP bleachers are wall attached and consist of up to 30 tiers with row spacing between 30 inches to 39.37 inches (762 mm to 1000 mm) and a rise of 8.5 inches to 24 inches (216 mm to 610 mm) between rows and a maximum frame height of 259 inches (6.6 m). The bleacher comes in section widths in any increment up to 20 feet (6.1 m).

### 3.2 Materials:

**3.2.1 Nose Beam** The MAXAM and MAXAM+ nose beams are 0.075 inch (14 gauge) proprietary tubular shaped cold-formed steel members, complying with ASTM A653 Grade 40. The MXP nose beams are proprietary extruded aluminum members with an alloy and temper of 6063-T6, with a yield strength of  $F_y = 31$  ksi (213.7 MPa) and an ultimate strength of  $F_u = 35$  ksi (241.3 MPa).

**3.2.2 Rear Beam:** The MAXAM and MAXAM+ rear beams are 0.075 inch (14 gauge) proprietary shaped cold-formed steel members complying with ASTM A653 with a minimum yield strength of 64 ksi (441.3 MPa). The MXP rear beams are 0.105 inch (12 gauge) proprietary shaped cold-formed steel members complying with ASTM A1011 Grade 50.

**3.2.3 Cantilever Beams:** The MAXAM cantilever beams are 0.135 inch (10 gauge) cold-formed steel members complying with ASTM A1011 Grade 50. The MAXAM+ and MXP cantilever beams are 0.179 inch (7 gauge) cold-formed steel members complying with ASTM A1011 Grade 50.

**3.2.4 Deck Stabilizers:** The MAXAM and MAXAM+ deck stabilizers are 0.075 inch (14 gauge) cold-formed steel members complying with ASTM A1011 Grade 45. The MXP deck stabilizers are 0.105 inch (12 gauge) cold-formed steel members complying with ASTM A1011 Grade 45.

**3.2.5 Steel Columns:** The MAXAM steel columns are 3-inch x 1.5-inch (76.2 mm x 38.1 mm) x 0.083-inch (14 gauge) or 4-inch x 1.5-inch (101.6 mm x 38.1 mm) x 0.120 inch (11 gauge) hot-rolled steel tube sections complying with ASTM A500 Grade B. The MAXAM+ steel columns are 4-inch x 1.5-inch (101.6 mm x 38.1 mm) x 0.120 inch (11 gauge) hot-rolled steel tube sections complying with ASTM A500 Grade B. The MXP steel columns are 2-inch x 5-inch (50.8 mm x 127 mm) x 0.120 inch (11 gauge) hot-rolled steel tube sections complying with ASTM A500 Grade B.

**3.2.6 Diagonal Brace:** The MAXAM and MAXAM+ diagonal braces are 1.5-inch (83.1 mm) x 0.075 inch (14 gauge) flat steel straps complying with ASTM A653 Grade 40. The MXP diagonal braces are 1.5 inch (83.1 mm) x 0.105 inch (12 gauge) flat steel straps complying with ASTM A653 Grade 40.

**3.2.7 Knee Braces:** The MXP knee braces are 1.5-inch x 1.5-inch (38.1 mm x 38.1 mm) x 0.072 inch (15 gauge) ASTM A513 with a minimum yield of 46 ksi (317.2 MPa) or 2-inch x 2-inch (50.8 mm x 50.8 mm) x 0.120-inch (11 gauge) ASTM A500 GR B.

**3.2.8 Horizontal Brace:** The MAXAM, MAXAM+ and MXP horizontal braces are cold-formed steel hat braces with a 0.105-inch (12 gauge) thickness, complying with ASTM A653 Grade 40 (276 MPa).

**3.2.9 Plywood Deck:** The plywood complies with ANSI/Voluntary Product PS1, APA. The MAXAM plywood deck is 19/32-inch (15.1 mm) Southern Yellow Pine (Group 1) Grade A-C, Structural 1. The MAXAM+ plywood deck is 23/32 inch (18.26 mm) Southern Yellow Pine (Group 1), Grade A-C, Structural 1. The MXP plywood deck is 1-inch (25.4 mm) (Group 1) Sturd-I-Floor rated.

**3.2.10 Casterhorn:** The MAXAM and MAXAM+ casterhorn is a horizontally oriented channel shaped member 0.090 inch (13 gauge) complying with ASTM A1011 Grade 50. The MXP casterhorn is a horizontally oriented channel shaped member 0.105 inch (12 gauge) complying with ASTM A1011 Grade 33.

**3.2.11 Welds:** Welding must comply with ANSI/AWS D1.3.

**3.2.12 Fasteners:** Bolted connections are 3/8-16, 1/2-13 or 1/4-20 nominal diameter and threads per inch, complying with a minimum SAE Grade 5 steel material.

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

The MAXAM, MAXAM+ and MXP understructure components listed under Section 3.2 of this report have been designed to support dead loads, live loads, sway loads, and rail loads considering the applicable load combinations as required by Section 303.5 of ICC 300 as referenced by the 2021 and 2018 IBC. Design loads considered have been outlined in the table below:

Table 1: LOAD CRITERIA

	ICC 300 Reference	MAXAM	MAXAM+	MXP
MAXIMUM DEAD LOAD (PSF)	-	7.9	13.6	13.1
LIVE LOAD (PSF or PLF)	Section 303.2	100 psf or 120 plf		
SWAY LOAD – PARALLEL (PLF)	Section 303.4.1	24		
SWAY LOAD – PERPENDICULAR (PLF)	Section 303.4.2	10		
GUARDRAIL LOAD <sup>1</sup> (LBS OR PLF)	Table 303.2	200 lbs		

SI units: 1 in = 25.4 mm; 1 lb = 0.454 kg

<sup>1</sup>Guardrail load considered is applied at a height of 47.9 inches as a moment to ends of rear beam.

The maximum dead load includes the self-weight of the understructure, seats and finishes. The final dead load must be verified by the registered design professional as not to exceed the value listed in [Table 1](#).

For MAXAM and MAXAM+, lateral seismic loads in the transverse direction (perpendicular to seating) are determined in accordance with ASCE 7 Equation 13.3-1 using an  $a_p = 1.0$ ,  $R_p = 2.5$ , and  $I_p = 1.0$ . Lateral seismic loads in the longitudinal direction (parallel to seating) are determined in accordance with ASCE 7 Equation 12.8-7 using an  $R = 1.25$  per Table 15.4-2 (All other self-supporting structures) and an  $I_e = 1.0$  per ASCE 7 Table 1.5-2 Occupancy Category III.

Design of the guardrail, attachment of the understructure to the wall, the structural wall the understructure is attached to, and the floor below the understructure, is outside of the scope of this report and must be designed by a registered design professional, in accordance with the applicable code, to be submitted to the code official for approval.

#### 4.2 Installation:

Installation of the MAXAM, MAXAM+ and MXP must comply with the manufacturer's published 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.

Installation supervision shall be performed by trained personnel authorized by Hussey Seating Company.

#### 4.3 Inspection:

The MAXAM, MAXAM+ and MXP understructure must be inspected after installation in accordance with Section 105 of ICC 300.

## 5.0 CONDITIONS OF USE

The MAXAM, MAXAM+ and MXP understructure described in this report comply with, or are 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 Components related to freestanding, reverse fold and portable configurations are outside the scope of this report.
- 5.2 Corrosion resistance as noted in Section 302.3 of ICC 300 is outside the scope of the report.
- 5.3 The supporting structure, attachment to the supporting structure, rails, steps, accessories and components not included under Section 3.2 are outside of the scope of this report and must be designed by a registered design professional and constructed to support the loads imposed by the systems in accordance with the applicable code.
- 5.4 Seismic design for the MAXAM and MAXAM+ understructure in areas where  $S_{DS} > 2.0g$  and seismic design for the MXP understructure is outside the scope of this report and must be designed by a registered design professional in accordance with the applicable code.
- 5.5 Additional drawings and design details for the MAXAM, MAXAM+ and MXP understructure, using the information noted in this report, must be included on construction plans submitted to the code official for approval where required by the local jurisdiction. The drawings and details must be prepared by a registered

design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.6 Installation is restricted to interior locations.

5.7 Inspection must be in accordance with Section 4.3. of this report.

## 6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with Section 303 of ICC 300-2017.

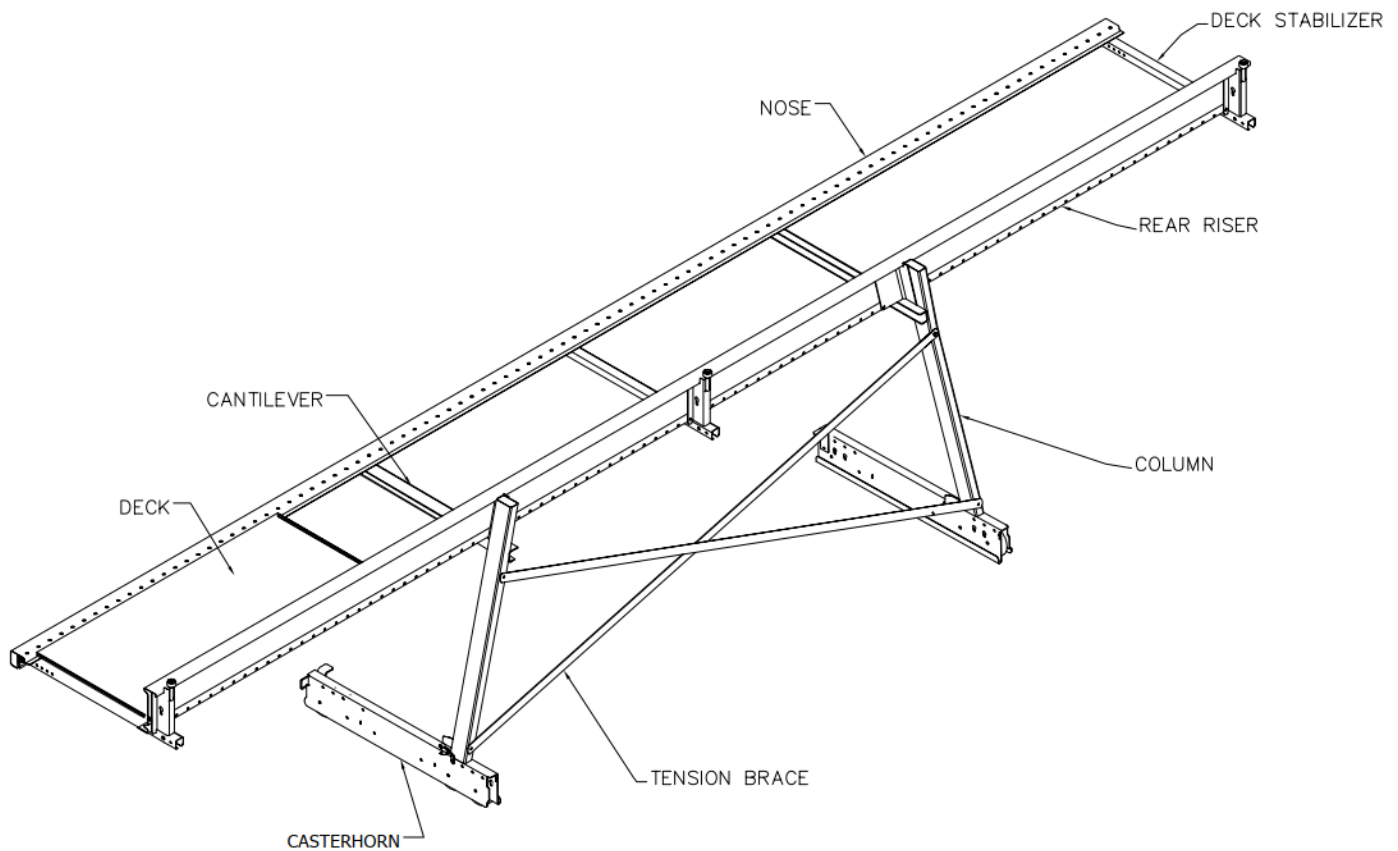
6.2 Quality control documentation.

## 7.0 IDENTIFICATION

7.1 The MAXAM, MAXAM+ and MXP understructure described in this report are identified by a label on the packaging bearing the manufacturer's name; product description and/or part number; and the ICC-ES evaluation report number (ESR-5033).

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

**HUSSEY SEATING COMPANY**  
**38 DYER STREET**  
**NORTH BERWICK, MAINE 03906**  
**(207) 676-2271**  
[www.husseyseating.com](http://www.husseyseating.com)



**FIGURE 1 : MAXAM and MAXAM + UNDERSTRUCTURE ISOMETRIC VIEW**

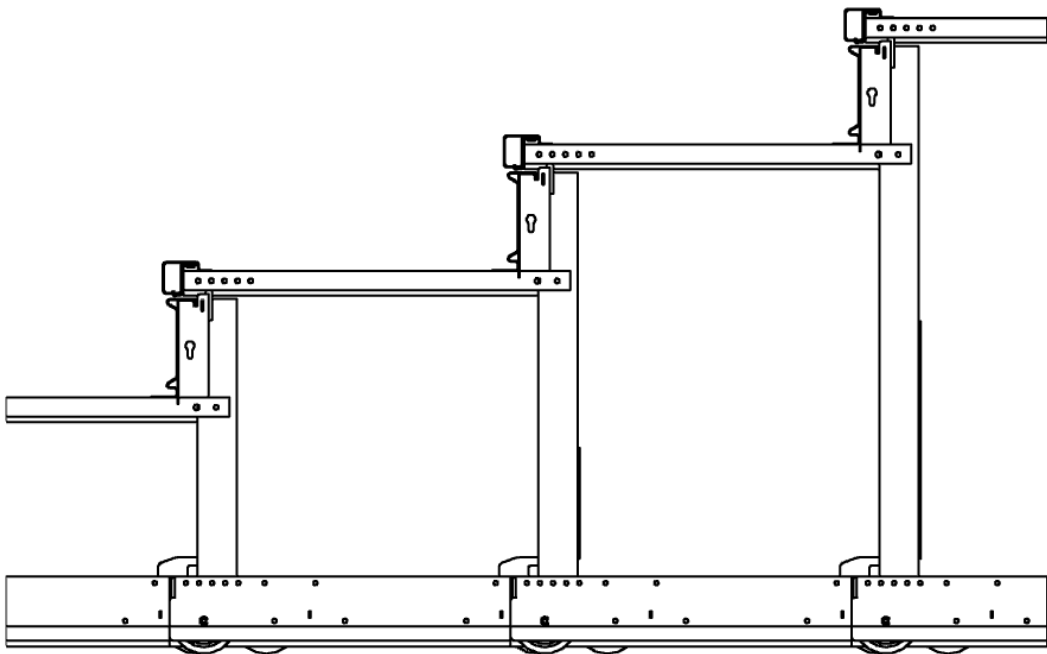


FIGURE 2: MAXAM and MAXAM + UNDERSTRUCTURE TIER ENGAGEMENT VIEW

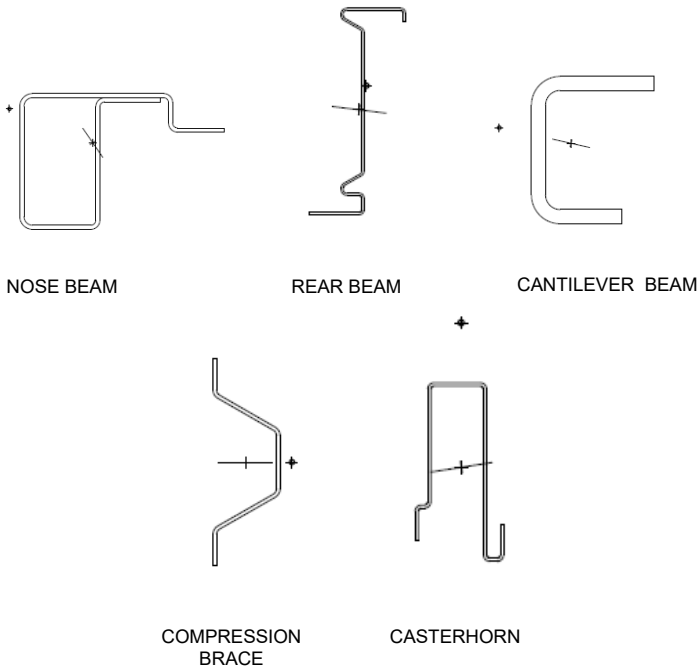


FIGURE 3: MAXAM and MAXAM + UNDERSTRUCTURE COMPONENTS

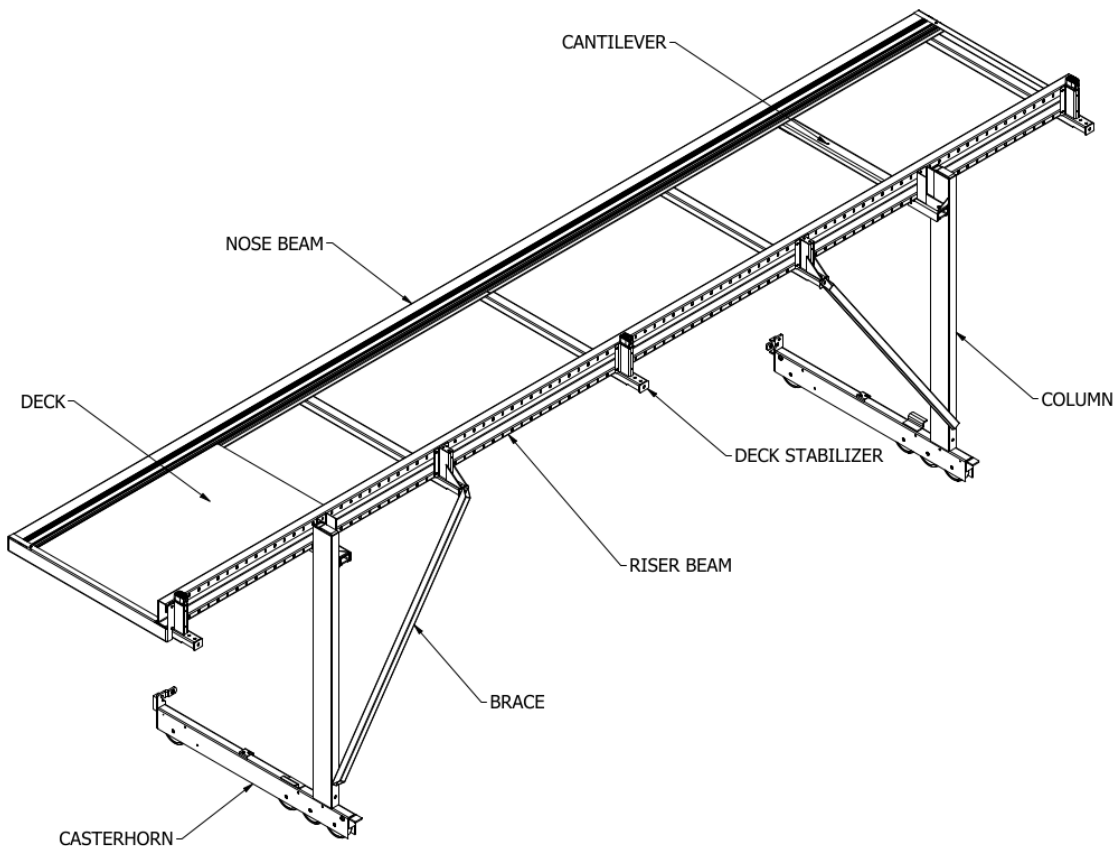


FIGURE 4: MXP UNDERSTRUCTURE ISOMETRIC VIEW

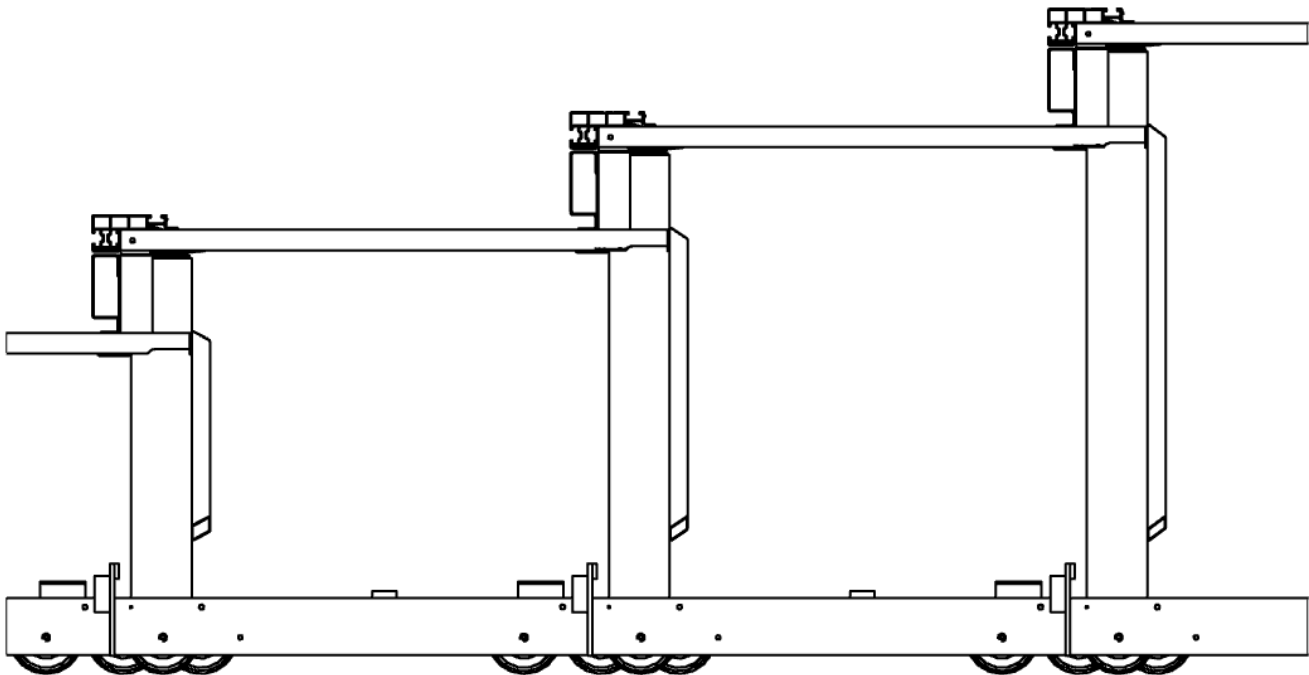


FIGURE 5: MXP UNDERSTRUCTURE TIER ENGAGEMENT VIEW

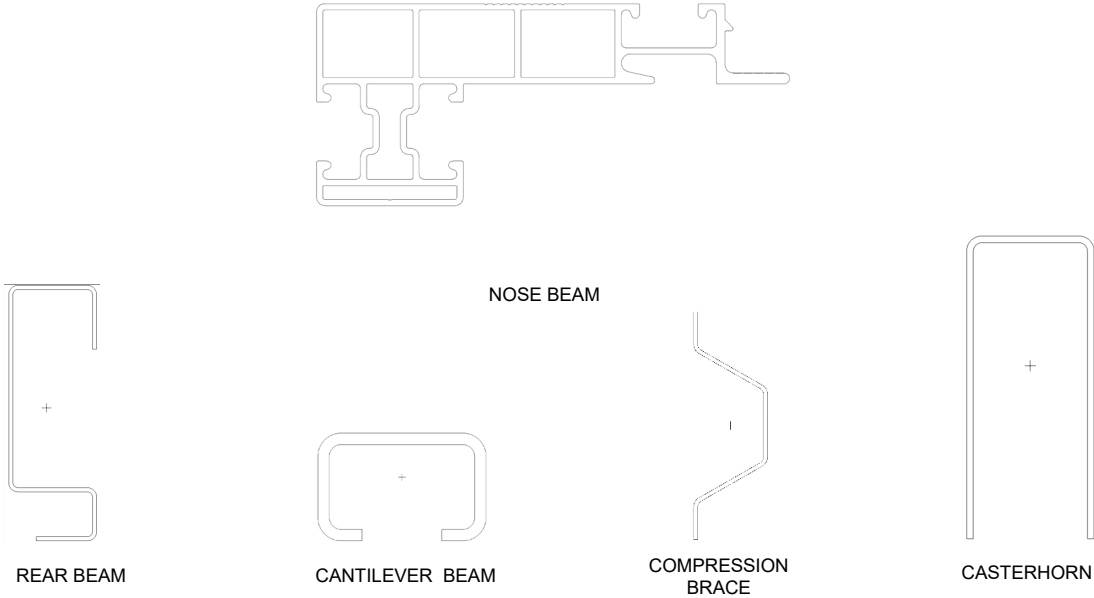


FIGURE 6: MXP UNDERSTRUCTURE COMPONENTS

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DIVISION: 12 00 00—FURNISHINGS

Section: 12 66 00—Telescoping Stands

## REPORT HOLDER:

HUSSEY SEATING COMPANY

## EVALUATION SUBJECT:

MAXAM, MAXAM+ AND MXP UNDERSTRUCTURES

## 1.0 REPORT PURPOSE AND SCOPE

### Purpose:

The purpose of this evaluation report supplement is to indicate that MAXAM, MAXAM+ and MXP understructures, described in ICC-ES evaluation report ESR-5033, have also been evaluated for compliance with the code 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.

## 2.0 CONCLUSIONS

### 2.1 CBC:

The MAXAM, MAXAM+ and MXP understructures, described in Sections 2.0 through 7.0 of the evaluation report ESR-5033, comply with CBC Chapter 10, 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 Chapter 16, as applicable.

#### 2.1.1 OSHPD:

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

#### 2.1.2 DSA:

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

This supplement expires concurrently with the evaluation report, reissued September 2023.