

FOLDING AND TELESCOPIC SEATING: 2025 CBC

Disciplines: Structural

History: Revised 07/15/25 under 2025 CBC

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Division of the State Architect (DSA) documents referenced within this publication are available on the [DSA Forms](#) or [DSA Publications](#) webpages.

PURPOSE

This Interpretation of Regulations (IR) clarifies design and inspection requirements for indoor folding and telescopic seating on projects under DSA jurisdiction.

SCOPE

This IR is applicable to indoor folding and telescopic seating systems and their components. Such systems may be reviewed and approved by DSA as part of the project's primary construction documents, as a pre-check (PC) application per *Procedure (PR) 07-01: Pre-Check Approval*, or as a deferred submittal when permitted by DSA. This IR is not applicable to other structure types including exterior bleachers or grandstands, which are addressed in *IR 16-5: Bleachers and Grandstands*.

Refer to *IR A-22: Construction Projects and Items Exempt from DSA Review* for seating systems with five or fewer rows.

See the Glossary in *IR 16-5* for definitions of some terms used in this IR.

BACKGROUND

In accordance with California Building Code (CBC) Section 1030.1.1, bleachers, grandstands, and folding and telescopic seating shall comply with International Code Council (ICC) 300: Standard for Bleachers, Folding and Telescopic Seating, and Grandstands (ICC 300). ICC 300 defines additional loads, load combinations, and other structural design requirements specific to systems of these types but relies on the building code for other requirements. As such, these systems must also comply with the applicable requirements of the CBC and the American Society of Civil Engineers (ASCE) Standard 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE 7).

Prior to the 2022 CBC, DSA provided guidance on bleachers, grandstands, and folding and telescopic seating in a single document: *IR 16-5*. Since the 2022 CBC update folding and telescopic seating systems are specifically addressed in this IR.

1. GENERAL

1.1 Design Professional

Seating systems shall be designed by a qualified design professional licensed in California. The design professional shall be a licensed architect or structural engineer, unless the system is approved as a deferred submittal, in which case a licensed civil engineer is acceptable.

1.1.1 The responsible design professional shall prepare and submit construction documents along with supporting documents, such as calculations, to DSA for review and approval.

1.1.2 Documents shall bear the stamp and signature of the responsible architect or engineer in accordance with *IR A-19: Design Professional Stamp (Seal) and Signature on Documents*.

1.1.3 The design professional in general responsible charge of the project may use

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construction documents prepared by the fabricator's engineer in accordance with *IR A-18: Use of Construction Documents Prepared by Other Design Professionals*.

1.2 Approval by Comparison

Project applicants may request DSA review and approve seating systems based on comparison with a similar system that was previously approved by DSA under a different application number. Approval by comparison is subject to the conditions and limitations of this section, and DSA reserves the authority to make the final determination of when review and approval based on comparison will be permitted.

1.2.1 The structural elements and connections (e.g., welds, bolts, etc.) must be the same or stronger than the previously approved comparison design.

1.2.2 The length of structural elements must be the same or shorter than previously approved. The spans of the structural system must be the same or less than the previously approved comparison design.

1.2.3 A design approved by comparison is also subject to the following additional limitations:

1.2.3.1 There are no conceptual changes to the configuration of the structural system.

1.2.3.2 There have been no changes in the CBC or DSA policy that would nullify the design.

1.2.3.3 The design loads are no greater than those used in the previously approved design as documented on the construction documents.

1.2.3.4 Material specifications (i.e., minimum material properties such as yield strength, ultimate strength, etc.) are unchanged or greater.

1.2.4 Revisions and corrections may be required in the following cases:

1.2.4.1 Errors or omissions in the original design.

1.2.4.2 CBC or DSA policy changes since the time the comparison design was approved.

1.3 Approval by Testing

When approved by DSA, load tests may be used to substantiate the structural capacity of a seating system or component (e.g., guardrail) and serve as the basis for approval in lieu of engineering analysis. Load tests to substantiate the primary structure or components may be permitted on a case-by-case basis.

1.3.1 Testing shall be performed by an independent laboratory accredited in accordance with ISO/IEC 17025: General requirements for the competence of testing and calibration laboratories.

1.3.2 The test specimen must be an identical prototype of the design submitted for approval. The test specimen material must match the material specified on the project.

1.3.3 New testing will be required if the system or component design is changed relative to a previously tested specimen to the extent that cannot be justified by engineering analysis.

1.3.4 The testing procedure and acceptance criteria must be approved by DSA prior to performing the tests. When available, the test procedure and acceptance criteria shall be in accordance with a consensus standard. The test load shall be applied in four or more increments, with the load added in each step being approximately equal.

1.3.5 The test apparatus shall apply the test load in a manner that avoids all the following:

1.3.5.1 Stiffening the test specimen.

1.3.5.2 Arching of the test load.

FOLDING AND TELESCOPIC SEATING: 2025 CBC**1.3.5.3** Impact loading the test specimen.

1.3.6 The test load must be approved by DSA prior to performing the tests and shall not be less than twice the unfactored design load (e.g., *D*, *L*, *Z*, *E*, etc. as defined by the CBC, ASCE 7, and ICC 300). When the test endeavors to substantiate capacity under combined loads from multiple sources, DSA will make the final determination of the required test load magnitude.

1.4 Accepted Fabrication Plants

Fabrication plants require DSA acceptance to be exempt from in-plant special inspection. To qualify for DSA acceptance the fabricator shall comply with this section.

1.4.1 The fabricator shall obtain and maintain plant accreditation from one of the following organizations:

1.4.1.1 International Accreditation Service (IAS).

1.4.1.2 American Welding Society (AWS) per AWS QC17: Specification for AWS Accreditation of Certified Welding Fabrications.

1.4.1.3 Canadian Welding Bureau (CWB) per CSA W47.1: Certification of Companies for Fusion Welding of Steel, Division 1.

1.4.2 In lieu of Section 1.4.1 above, DSA may accept accreditation by other nationally recognized evaluation services or accreditation bodies, equivalent to those listed above; however, DSA acceptance of this accreditation must be obtained prior to fabrication.

1.4.3 The fabrication plant shall have a minimum of five years of documented continuous experience in the fabrication of folding and telescopic seating.

1.4.4 Documentation showing evidence of valid accreditation and experience shall be submitted to DSA for initial acceptance and upon subsequent renewals. The required documentation shall be sent to DSA at the following address:

ATTN: Laboratory Evaluation and Acceptance (LEA) Program
DSA Headquarters
1102 Q Street, Suite 5100
Sacramento, CA 95811

1.4.5 Any change to a fabrication plant's accreditation status requires DSA acceptance prior to fabrication.

1.5 Relocation

DSA approval of non-PC project applications is for the specific location shown on the construction documents. Moving a seating system to a different location voids the original approval and requires submission of a new application for approval at the new site.

1.5.1 To be relocated, the original project must have been certified, or the seating system must be rehabilitated to meet the provisions of the CBC and ICC 300 in accordance with this IR.

1.5.2 The relocated seating system shall comply with ICC 300 Section 506 and the fire and life safety and access compliance requirements of the current CBC.

1.5.3 The relocation project must demonstrate that the seismic load demand of the new site is less than or equal to the criteria used in the original design under the same code edition.

1.6 Existing Seating Systems

Existing seating systems shall comply with ICC 300 Chapter 5.

1.6.1 After installation, the school district is responsible to conduct annual inspections of the system as required by ICC 300 Section 105.2. The district shall maintain copies of all annual

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inspection reports and make them available to DSA upon request.

1.6.2 The school district is responsible for conducting annual inspections of existing seating systems as required by ICC 300 Section 501.2.

1.6.3 The school district is required to maintain and repair seating systems in accordance with ICC 300 Section 502.

1.6.4 Additions or alterations to a seating system require DSA approval. Similarly, reconstruction or rehabilitation of a seating system requires DSA approval.

2. STRUCTURAL DESIGN

The structural design of gravity and lateral force-resisting systems, members, and connections shall be in accordance with ICC 300 Section 303, the CBC, ASCE 7, and this section.

2.1 Sway Loads

Seating systems and all supporting elements (e.g., floor and wall connections, wall, etc.) shall be designed for sway loads per ICC 300 Section 303.4 and CBC Section 1607A.18.1.

2.2 Load Combinations

Load combinations shall be in accordance with CBC Section 1605A and ICC 300 Section 303.5.

2.2.1 Horizontal sway loads (Z) stipulated in ICC 300 need not be considered live loads (L) in the load combinations required by CBC Section 1605A.1 and defined in ASCE 7 Sections 2.3 and 2.4. While sway loads are defined as live loads in CBC Section 1607A.18 the specific reference to ICC 300 therein is interpreted to define sway loads as “ Z ” and separate from “ L ”.

2.2.2 When considering the live load requirements of CBC Section 1607A.9.1, combination #2a of ASCE 7 Section 2.3.1 will control over ICC 300 Equation 3-4 and combination #2a of ASCE 7 Section 2.4.1 will control over ICC 300 Equation 3-9.

2.3 Seismic Loads: Seating Connected to Building Wall

Where the lateral support of indoor folding and telescopic seating is provided entirely, or in part, by attachment to the building wall and the weight of the seating is less than 20 percent of the effective seismic weight of the building (including the seating system), the provisions of this section shall apply. Where the weight of the seating system is greater than or equal to 20 percent of the effective seismic weight of the building, refer to ASCE 7 Section 15.3.2.

2.3.1 The seating structure shall be designed to resist seismic forces determined in accordance with ASCE 7 as described in this section.

2.3.1.1 In the transverse direction (i.e., perpendicular to the seating) seismic forces shall be determined in accordance with ASCE 7 Section 13.3.1 and applied according to commentary Section C13.3.1, which discusses elements with attachment points at multiple heights. The F_p/W_p coefficient shall be equal to the average of coefficients at the upper and lower anchorage heights calculated per Section 2.3.2.1 below.

2.3.1.2 In the longitudinal direction (i.e., parallel to the seating) seismic forces shall be determined in accordance with ASCE 7 Table 15.4-2: Seismic Coefficients for Nonbuilding Structures Not Similar to Buildings using a response modification coefficient (R) of 1.25 for “All other self-supporting structures...”. All prescriptive requirements and limitations, including the height limit (h_n), apply. The importance factor (I_e) shall be per ASCE 7 Table 1.5-2.

2.3.2 The supports and attachments shall be designed to resist seismic forces determined in accordance with ASCE 7 Section 13.3.1 as described in this section.

2.3.2.1 In the transverse direction the coefficients C_{AR} and R_{po} shall be based on “Other rigid components” in ASCE 7 Table 13.5-1.

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2.3.2.2 In the longitudinal direction the coefficients C_{AR} and R_{po} shall be based on “Other flexible components” with “Limited-deformability elements and attachments” in ASCE 7 Table 13.5-1. The seismic force demand shall not be less than that required by Section 2.3.1.2 above.

2.3.2.3 Seismic forces in the transverse and longitudinal directions shall be combined in accordance with ASCE 7 Section 13.3.1, unless the force is applied in the direction(s) demonstrated to produce the most critical load effects.

2.3.2.4 As defined by ASCE 7 Section 13.3.1.1, height “z” is the elevation of the point of attachment, whether to the floor or wall, with respect to the base of the building.

Note: For PC applications, it is recommended that the design be based on a ratio “z/h” equal to or greater than 0.80 for the upper anchorage and equal to or greater than 0.15 for the lower anchorage. The “z/h” ratios upon which the design is based shall be stated as maxima on the PC drawings for verification of the site-specific project’s compliance. Alternatively, PC approvals may be designed for multiple sets of “z/h” ratios in accordance with PR 07-01 Section 2.

2.3.2.5 When required for anchorage to concrete or masonry per ASCE 7 Section 13.4.2, the overstrength factor (Ω_o) shall be as given in ASCE 7 Table 13.5-1 for the entries defined in Sections 2.3.2.1 and 2.3.2.2 above.

2.4 Seismic Loads: Seating Connected to Floor Only

Where the lateral support of indoor folding and telescopic seating is provided entirely by attachment to the building floor, the seating structure, its supports, and its attachments shall be designed in accordance with this section. Seismic forces applied in both the transverse (i.e., perpendicular to the seating) and longitudinal (i.e., parallel to the seating) directions shall be determined in accordance with ASCE 7.

2.4.1 The seismic force shall be determined in accordance with ASCE 7 Table 15.4-2 using a response modification coefficient (R) of 1.25 for “All other self-supporting structures...”. All prescriptive requirements and limitations, including the height limit (h_n), apply. The importance factor (I_e) shall be per ASCE 7 Table 1.5-2.

2.4.2 The seismic force shall not be less than that determined in accordance with ASCE 7 Equation 13.3-1, using coefficients based on “Other flexible components” with “Limited-deformability elements and attachments” in ASCE 7 Table 13.5-1. Height “z” shall be taken as the elevation of the floor to which the seating system is anchored.

3. TESTING AND INSPECTION

Testing and inspection requirements are summarized in this section. Refer to *PR 13-01: Construction Oversight Process* for additional requirements applicable to special inspection, material testing, and the laboratory of record (LoR), including verified report requirements.

3.1 Fabrication Inspection

Inspection of fabrication depends on the qualifications of the shop performing the work.

3.1.1 Special inspection is not required for fabrication performed in a shop accepted by DSA per Section 1.4 above. At the completion of fabrication, the fabricator’s engineer shall submit a form *DSA 130: Certificate of Compliance – Accepted Folding and Telescopic Seating Fabricator* and all supporting documentation indicated therein to the school district, project inspector, architect or engineer in general responsible charge, and DSA.

3.1.2 Fabrication in shops without DSA acceptance per Section 1.4 above is subject to in-plant special inspection in accordance with IR 16-5 Section 3.1.

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3.2 Material Testing

If material testing is required, such as for unidentified steel, it must be performed by the LoR employed by the school district and qualified by the DSA Laboratory Evaluation and Acceptance (LEA) program. LEA qualified testing laboratories are listed on the DSA website.

3.2.1 For remotely located fabricators, refer to *IR A-15: Testing and Inspection of Remotely Fabricated Structural Elements*.

3.2.2 Test reports shall be submitted by the LoR in accordance with the requirements of the California Administrative Code (CAC), and a final verified report (i.e., form *DSA 291: Laboratory of Record Verified Report*) shall be submitted at the conclusion of the fabrication.

3.3 Field Inspection

When the seating system is delivered to the job site, field inspection shall be performed in accordance with this section. Installation of the seating system shall not commence until the project inspector has received the DSA 130 or all in-plant special inspection documents in accordance with Section 3.1 above.

3.3.1 The project inspector is responsible for field inspection including, but not limited to, the following actions:

3.3.1.1 Verifying all required documents per Section 3.1 and 3.2 above are submitted by the fabricator.

3.3.1.2 Reviewing the documents submitted by the fabricator for compliance with the DSA approved construction documents.

3.3.1.3 Inspecting the seating system for compliance with the approved construction documents, including a cursory review of shop welds.

3.3.1.4 Inspecting the field installation, including site assembly.

3.3.1.5 Identifying defects by issuing a form *DSA 154: Notice of Deviations/Resolution of Deviations* when appropriate.

3.3.1.6 Scheduling and monitoring the field welding inspector when applicable.

3.3.1.7 Scheduling testing per Section 3.2 above when applicable.

3.3.2 If field welding is performed, an AWS-certified welding inspector or senior welding inspector shall inspect the welding in accordance with the CBC and *IR 17-3: Structural Welding Inspection*. The welding inspector shall provide detailed daily inspection reports per *IR 17-12: Special Inspection Reporting Requirements*.

REFERENCES:

2025 California Code of Regulations (CCR) Title 24
Part 1: California Administrative Code (CAC)
Part 2: California Building Code (CBC), Sections 1030, 1605A, 1607A.

This IR is intended for use by DSA staff and by design professionals to promote statewide consistency for review and approval of plans and specifications as well as construction oversight of projects within the jurisdiction of DSA, which includes State of California public schools (K-12), community colleges and state-owned or state-leased essential services buildings. This IR indicates an acceptable method for achieving compliance with applicable codes and regulations, although other methods proposed by design professionals may be considered by DSA.

This IR is subject to revision at any time. Please check DSA's website for currently effective IRs. Only IRs listed on the webpage at www.dgs.ca.gov/dsa/publications at the time of project application submittal to DSA are considered applicable.