DSA IR PC-3

PRE-CHECK (PC) DESIGN CRITERIA FOR MODULAR ELEVATOR TOWERS: 2025 CBC

Disciplines:	All	**History:**	Revised 12/29/25 Under 2025 CBC Last Revised 11/09/22 Under 2022 CBC Original Issue 04/21/20 Under 2019 CBC

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 requirements for pre-check (PC) applications to promote uniform statewide criteria for code compliance in the design and plan review of stand-alone modular elevator towers for projects under DSA jurisdiction. The PC design criteria documents were created by DSA as a means for the responsible engineer to demonstrate code compliance when developing and submitting construction documents for DSA review.

The provisions of this IR are intended as a tool to identify and highlight the common and unique, critical and/or overlooked code requirements that must be considered and incorporated into the design, as applicable, to provide a complete and consistent set of construction documents accepted at all DSA regional offices. Other methods proposed by design professionals to solve a particular issue may be considered by DSA and reviewed for code and regulation compliance, subject to concurrence of the DSA Codes and Standards Unit. For methods not specifically prescribed in the code, see California Building Code (CBC) Section 104.2.3.

Appendix A is provided below as a guide to assist design professionals and DSA plan reviewers when preparing and reviewing site-specific project applications that incorporate PC modular elevator towers designed in accordance with this IR.

SCOPE

The provisions of this IR apply to 2025 PC applications for new modular elevator towers submitted to DSA under the 2025 CBC. Modular elevator towers are stand-alone structures with their own systems to resist gravity and lateral loads. They are structurally independent from the buildings they serve.

As noted in Bulletin (*BU) 18-01: Applicability of Pre-Check (PC) Design Criteria for Non-PC Projects*, these provisions shall also be considered and incorporated in site-specific applications for structures of the same project type, even if not part of a PC application.

BACKGROUND

The PC approval process is intended to streamline DSA plan review by providing a procedure for approving the design of commonly used structures prior to the submission of plans to DSA for a construction project. The PC approval process allows designers to incorporate designs for structures that have already been “pre-checked” by DSA into their plans for actual site-specific construction projects. The design criteria provided in this document are neither regulations nor law and are not appropriate for verbatim inclusion in project specifications. The design professional in responsible charge is responsible for specifying and detailing the requirements for each project. Additional information regarding the design and site application of PC structures can be found in *Procedure (PR) 07-01: Pre-Check (PC) Approval* and *Policy (PL) 07-02: Over-the-Counter Review of Projects Using Pre-Check (PC) Approved Designs*.

PRE-CHECK (PC) DESIGN CRITERIA FOR MODULAR ELEVATOR TOWERS: 2025 CBC

1. GENERAL

1.1 Pre-Check Submission Requirements

Refer to PR 07-01 for a detailed list of items required for all PC applications. The documents required to be submitted for PC approval are listed on form *DSA 3: Project Submittal Checklist*. Site-specific information is not necessary as that information will be provided when a specific construction project is submitted for DSA review.

1.2 Cover Sheet and General Notes

1.2.1 In accordance with PR 07-01 Section 1.4.2, the first sheet(s) of the PC drawings shall include a design information section that defines the basis of the PC design. Refer to PR 07-01 Appendices B and C and the remainder of this IR for required content of the design information section. The design information section shall address each type of structure (i.e., elevator tower and machine room).

1.2.2 The PC construction documents shall include complete and comprehensive general notes and/or specifications as required for construction and inspection. It is common for PC construction documents to consist of drawings only without a book specification or project manual. Refer to PR 07-01 Appendix B, Footnote 8. In this case, the PC drawings shall include information that might otherwise be communicated in a project manual or book specification. For each primary material or group of materials, the following information shall be specified in the construction documents when applicable:

1.2.2.1 Required material properties, including compliance with American Society for Testing and Materials (ASTM) specifications when applicable.

1.2.2.2 Proprietary products' name, manufacturer, and evaluation report number. Refer to Section 1.12 below.

1.2.2.3 Quality control performed by the supplier.

1.2.2.4 Standards for the execution of the work, including associated tolerances. References to recognized standards are acceptable.

1.2.2.5 Required qualifications of personnel performing the work for each applicable trade.

1.2.2.6 Product and material finish requirements for weather protection or safety.

1.2.2.7 Quality assurance tests not covered by Section 1.3 below, including frequency requirements and citation of ASTM standards when applicable.

1.3 Structural Tests and Special Inspections

The PC drawings shall include example form(s) *DSA 103: List of Structural Tests and Special Inspections*. See PR 07-01 Section 1.5 for additional information.

1.3.1 The example DSA 103 will be used as a guide to develop the DSA 103 for the site-specific project. Example form(s) on the PC drawings will be crossed out when the DSA 103 is provided with the site-specific application.

1.3.2 The example DSA 103 shall include both in-plant and on-site testing and inspection requirements as applicable. Manufacturers shall be involved in the coordination of in-plant testing and inspection with the project inspector, Laboratory of Record (LOR), and owner of the site-specific project using the PC design prior to commencing fabrication.

1.3.3 Only the site-specific DSA 103 can exempt structural tests and special inspections; therefore, the exemptions appendix of the example DSA 103 shall not be included on the PC drawings. The applicability of exemptions may be considered during plan review of the site-

specific project scope, must be justified by the project design professional, and is subject to DSA review and approval. Refer to Appendix A below for additional information.

1.3.4 Nondestructive Testing (NDT) of complete joint penetration welds and partial joint penetration welds shall comply with the American Institute of Steel Construction (AISC) requirements per CBC Section 1705A.2.1. When NDT is required, the example form DSA 103 shall check the boxes for both Ultrasonic and Magnetic Particle testing.

1.3.4.1 For welds that are part of the seismic force resisting system, NDT shall comply with AISC 341: Seismic Provisions for Structural Steel Buildings (AISC 341), Chapter J. When required, NDT shall be performed at the rates required by AISC 341 Sections J7.2a and J7.2b. The test frequency reductions of AISC 341 Sections J7.2g and J7.2h are not allowed.

1.3.4.2 For welds that are not part of the seismic force resisting system, NDT shall comply with AISC 360: Specification for Structural Steel Buildings (IASC 360), Chapter N as modified by CBC Section 1705A.2.1.

1.4 Options and Variations

The PC drawings shall provide checkboxes of options and variations if there is more than one configuration or design criteria. See PR 07-01 Section 2 for more information, including the maximum number of options permitted.

1.5 Design Parameters

The PC drawings shall state on the cover sheet (and subsequent sheets if necessary) design information as defined in PR 07-01 Section 1.4.2 and Appendix B. If the PC includes design variations for multiple tiers or levels of the same design parameter, that design information should be presented in a checklist format and provide general direction to future users (i.e., design professionals and plan reviewers) for the application of the PC to site-specific projects. Additionally, refer to and coordinate with PL 07-02 Section 3, which summarizes common site-specific parameters to be verified at over-the-counter (OTC) plan reviews.

1.6 Risk Category

The PC drawings shall indicate the maximum Risk Category (RC) the structure is designed for in the design information section. The PC design may include design options for multiple RC in accordance with Sections 1.4 and 1.5 above.

1.6.1 An elevator tower servicing three stories or less is permitted to be designed for RC II per CBC Table 1604A.5 unless the site application requires the elevator tower design to comply with the RC of the building it serves in accordance with CBC Section 1604A.5.1. Per CBC Section 1003.7, elevator towers are typically not allowed to be used as a required means of egress.

1.6.2 When required by CBC Section 1604A.5.1, the elevator tower design shall comply with the RC of the building it serves. The following cases are examples of conditions requiring the PC design to match the RC of the building it serves.

1.6.2.1 Elevator is part of a required accessible means of egress in accordance with CBC Section 1009.2.1.

1.6.2.2 Elevator is required for the building to comply with the stretcher accommodation requirements of CBC Section 3002.4 and 3002.4a.

1.6.2.3 Elevator is protected by a fire sprinkler system that is shared with the building it serves. A drift accommodating pipe connection at the boundary of the two structures is required but does not mean the system is not shared.

1.6.3 The design information section shall include a note requiring the site-specific application drawings to provide all information necessary for DSA to verify the RC of the PC structure as it applies to the site in accordance with CBC Section 1604A.5, which includes:

1.6.3.1 Definition of the required means of egress and whether or not the elevator is included.

1.6.3.2 Definition of the Use and Occupancy of the building it serves.

1.6.3.3 Demonstration of compliance with CBC Sections 3002.4 and 3002.4a.

1.6.3.4 Definition of all life safety systems, designated seismic systems, emergency power systems, and emergency and egress lighting systems.

1.7 Flood Zone

The PC design shall comply with CBC Section 1612A and *PR 14-01: Flood Design and Project Submittal Requirements*.

1.7.1 The design information section shall include a note requiring the building pad be raised above the design flood elevation. See PL 07-02 Section 4.9 for additional information.

1.7.2 The design information section shall include a note stating that when a site-specific project is located in a flood zone other than Zone X, a letter stamped and signed by a geotechnical engineer is required to validate the applicability of the allowable soil values listed on the PC drawings. This note may include an exemption for the validation letter for projects located in Zone D (undefined) if the applicant provides either of the following:

1.7.2.1 Evidence from the local jurisdiction or a qualified design professional confirming the site is not in a flood hazard zone.

1.7.2.2 Geotechnical report written for improvements on the same campus and in accordance with the current CBC that acknowledges the flood hazard but confirms it does not reduce the soil capacity.

1.7.3 Electrical component locations shall conform to American Society of Civil Engineers (ASCE) Standard 24: Flood Resistant Design and Construction (ASCE 24), Section 7.2.

1.8 Geohazard Report

It is recommended the design information section state that geohazard reports are not required for modular elevator towers provided they do not exceed 4,000 square feet (SF) in plan area and are not located within a mapped geologic hazard zone. Refer to *IR A-4: Geohazard Report Requirements*, Sections 3.5 and 4.

1.9 Weather Protection

The PC design shall comply with the requirements of *IR 16-1: Design and Construction Requirements for Relocatable Buildings and Modular Elevator Towers,* Section 2.1. Cold-formed steel and structural steel members shall be protected by a rust inhibitive coating where exposed to weather or moisture. Refer to CBC Section 2201A.3 and American Iron and Steel Institute (AISI) S240: North American Standard for Cold-Formed Steel Structural Framing, Table A4-1.

1.10 Sheet Index

The PC drawings shall include a sheet index. When a PC includes multiple major options such that not all sheets are applicable to a given site-specific project based on the option being used, the sheet index shall include check boxes. When the PC drawings are incorporated into a site-specific application, the submitted sheets will be identified by marking the check boxes (i.e., it is not necessary to strike out sheets that are not applicable). See PR 07-01 Appendix E for additional information.

1.11 Stamps

The PC drawings shall include the following:

1.11.1 2025 CBC PC Stamp per PR 07-01 Section 1.4.1.

1.11.2 Two blank areas on each PC sheet title block as required by *PR 18-04: Electronic Plan Review for Design Professionals*, Section 1: one for the PC Identification Stamp and one for the future site-specific Identification Stamp.

1.12 Structural Product Acceptance

All structural products shall meet the requirements set forth in *IR A-5: Product and Material Acceptance Based on a Valid Evaluation Report*. Code-based engineering calculations to substantiate the adequacy of a manufactured product will be considered by DSA.

2. MODULAR ELEVATORS

2.1 Structure Configuration

The structural analysis and design of modular elevator towers shall be in accordance with this section.

2.1.1 Modular elevator towers are considered one-story buildings and typically consist of a roof with elevator access provided at corresponding floor levels of the adjacent building being serviced. Because the structure is typically limited to an elevator shaft, floor diaphragms do not occur at the associated floor levels.

2.1.2 Modular elevator towers shall be free standing and seismically separated from any adjacent structure. Elevator towers eligible for PC approval shall not be physically connected to an adjacent structure. If attachment to an adjacent structure is proposed the project shall be submitted and reviewed under a site-specific application.

2.2 Wall Framing

The PC drawings shall specify all wall framing requirements and provide all necessary construction details, including compliance with the following:

2.2.1 Maximum opening dimensions with jamb, header, and sill members specified and connections detailed.

2.2.2 Details showing the connection of the wall framing to beams, columns, and braces (as applicable).

2.2.3 Beams above and below door openings shall be designed and detailed to resist vertical and out-of-plane concentrated reactions from jambs**.**

2.2.4 Soffit framing details with complete dimensions**.**

2.2.5 In accordance with CBC Section 1617A.1.20, power actuated fasteners are not allowed for anchorage into concrete for exterior wall applications. Power actuated fasteners are permitted for steel-to-steel connections on exterior wall applications in accordance with an approved evaluation report.

2.3 Finishes and Embellishments

The approved PC design constitutes a code-compliant building. Aspects of the design governed by code regulations shall be fully detailed on the PC drawings and cannot be deferred to the site-specific project application.

2.3.1 Exterior wall finishes, including weather protection requirements, shall be fully defined on the PC drawings. In accordance with Section 1.4 above and PR 07-01 Section 2, multiple wall finish options may be included in the same PC approval.

2.3.2 Roofing and the roof drainage system shall be fully defined on the PC drawings. In accordance with Section 1.4 above and PR 07-01 Section 2, multiple roofing options may be included in the same PC approval.

2.3.3 See Section 7.2 below for additional information regarding construction in hazardous fire areas.

2.3.4 The PC design may include allowances for “embellishments”, which are decorative features that may be attached to a modular elevator tower but are not required for its code compliance. Examples of embellishments are surface mounted signage, scoreboards, display boards, clocks, etc. The PC drawings shall define the embellishment allowances by weight, size, and location. Embellishments shall not be configured in a manner that increases the tributary wind load to the modular elevator tower.

2.4 Elevator Guide Rails

The PC drawings shall show all guide rails, support brackets, and connections. The design of elevator guide rails, support brackets, and connections shall be justified by structural calculations. Refer to CBC Sections 1617A.1.27 and 1617A.1.28.

2.5 Elevator Machine Room

The elevator machine room adjacent to the elevator tower shall have independent gravity and lateral force-resisting systems unless the loads are included in the elevator tower design. A nominal connection between the machine room and the elevator tower is permitted.

2.6 Fire-Resistance Rating

The structural system shall be compatible with the fire-resistance rating requirements. The fire-resistance rating requirements for the elevator tower building elements (i.e., structural frame, walls, and roof per CBC Table 601) may significantly affect the structural design and detailing. Coordination of the structural design with fire and life safety requirements relative to the type of construction classification and structural system (i.e., building frame or bearing wall system) is critical.

2.7 Utility and Service Lines

In accordance with ASCE Standard 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE 7), Section 13.6.9, all pipes, conduits, and other utility lines crossing separation joints shall be designed to accommodate, without rupture or distress, differential movements from design displacements between connection points. The PC drawings shall indicate the maximum lateral displacement demand for each building option at each floor and roof level in the design information section.

3. GRAVITY LOAD DESIGN

3.1 Dead Load

3.1.1 In accordance with CBC Section 1606A.6, the design dead load shall include the weight of at least one additional roof covering in addition to other applicable loadings, if the new roof is permitted to be applied over the original roofing without its removal.

3.1.2 The PC drawings shall clearly indicate (and the structural calculations account for) the maximum size and weight of any embellishment allowances per Section 2.3.4 above.

3.1.3 The roof plans shall show the allowed locations and weights of mechanical equipment, coordinated with the mechanical plans.

3.2 Snow Load

3.2.1 The design information section shall state the snow and ice loads accounted for in the PC design. The PC drawings shall indicate 0 (zero) pounds per square foot if the design does not account for snow or ice loads.

3.2.2 If the structure is designed for snow load, the design information section of the PC drawings shall include a note the same as or similar to the following: “Site application design professional and DSA plan reviewer shall verify the structure to be located at least xx feet from any adjacent higher structure” where the distance “xx” is calculated and stated by the PC applicant. Refer to ASCE 7 Section 7.7. If the horizontal separation from a higher structure is less than 20 feet and six times the vertical dimension separating the roofs, snow drift analysis shall be provided by the PC applicant, and the project is not eligible for OTC submittal.

3.2.3 Refer to IR 16-1 Section 4.2 for roof snow load posting signage requirements. Signs shall be posted in public view.

3.2.4 The effective seismic weight shall include snow load per ASCE 7 Section 12.7.2.

3.3 Ponding

Roof configurations that allow for ponding are to be properly drained with primary and secondary drain systems, and the roof framing design must account for any ponding buildup in the event of primary drain blockage. Refer to ASCE 7 Chapter 8 and CBC Sections 1502 and 1611A.

3.4 Deformation Compatibility

Exterior non-bearing walls shall be designed and detailed to accommodate the vertical deflection of beams or similar gravity load resisting members.

4. LATERAL LOAD DESIGN

4.1 Seismic Load Criteria

4.1.1 The seismic design criteria upon which the PC design is based shall be stated in the design information section of the PC drawings in accordance with PR 07-01 and CBC Section 1603A.1.5.

4.1.2 If the design is based upon the maximum spectral response acceleration parameters occurring in the state of California, the PC can be used at any site in the state. The PC design may be based on lesser values but doing so will limit the sites where the PC can be used.

4.1.3 The base shear is permitted to be calculated using a cap on the maximum design spectral response acceleration parameter value of S_{DS} in accordance with ASCE 7 Section 12.8.1.3, provided that *all* of the required criteria are met.

4.1.3.1 The PC design shall demonstrate compliance with the required criteria specific to the modular elevator tower structure: e.g., no irregularities, period not exceeding 0.5 seconds, redundancy factor equal to 1.0, response modification coefficient of 3 or greater, etc. The PC drawings shall list these properties in the design information section. For the purpose of checking compliance with these criteria, the period shall be determined based on the actual properties of the structure, including foundation flexibility, not the approximate period in ASCE 7 Section 12.8.2.1.

4.1.3.2 The design information section shall include a note stating the site-specific limitations of the design based on the S_{DS} cap and requiring these to be verified by the site-specific project applicant: e.g., Site Class E or F not permitted, RC I or II, etc.

4.1.3.3 Per PR 07-01 Appendix C, if a capped value of S_{DS} is used to determine C_S, the design information section shall list the S_{DS} (cap) used to determine C_S as well as the S_{DS} (no cap) used for verification of site-specific application and to determine other parameters such as nonstructural component anchorage. ←

4.2 Seismic Force Resisting System (SFRS)

An elevator tower is considered a building. Therefore, the design of the SFRS shall be based on ASCE 7 Chapter 12 (not Chapter 15). CBC Chapter 2 defines a building as “any structure utilized or intended for supporting or sheltering any occupancy”. The SFRS shall comply with ASCE 7 Chapter 12 including the height limitations defined in ASCE 7 Table 12.2-1.

4.2.1 The SFRS shall comply with material-specific code provisions and adopted design standards, including aspect ratio limits of SFRS elements.

4.2.2 Vertical irregularity Types 1a, 1b, 2, 4a, and 4b as defined in ASCE 7 Table 12.3-2 will not apply provided the PC design has no horizontal floor diaphragms and qualifies as a one-story building. See ASCE 7 Section 12.3.2.2, Exception 2. Vertical irregularity Type 3, In-Plane Discontinuity in Vertical Lateral Force-Resisting Element, may apply.

4.2.3 A redundancy factor of 1.3 shall be used unless calculations are provided to demonstrate a lesser value in accordance with the requirements of ASCE 7 Section 12.3.4.

4.2.4 For combinations of seismic force resisting systems the response modification factor (R), overstrength factor (Ω_0), and deflection amplification factor (C_d) shall be selected in accordance with ASCE 7 Section 12.2.3.1 and used for the entire tower in the direction being considered. ←

4.2.5 Beams supporting discontinuous columns at the end of a braced frame or moment frame (e.g., at elevator door jambs) shall be designed for seismic load combinations with the overstrength factor per ASCE 7 Section 12.3.3.4. The beams shall also be checked for out-of-plane stability based on their unbraced length.

4.2.6 When seismic forces are resisted by cold-formed steel strap bracing, 7 gauge and thinner, the system shall be designed to meet the requirements of AISI S400: North American Standard for Seismic Design of Cold-Formed Steel Structural Systems (AISI S400), Section E3; see Section 4.4 below. Systems using diagonal bracing members with thicknesses greater than 3/16” shall comply with AISC 341 Chapter F; see Section 4.3 below.

4.3 Structural Steel SFRS

Structural steel SFRS shall comply with AISC 341.

4.3.1 Steel columns that are part of the seismic force resisting system shall comply with AISC 341 Section D1.4, which includes consideration of load combinations with the overstrength factor per ASCE 7.

4.3.2 Column splices shall comply with AISC 341 Section D2.5, which includes consideration of load combinations with the overstrength factor per ASCE 7.

4.3.3 Moment connections in Ordinary Moment Frame (OMF) systems shall comply with AISC 341 Section E1. Refer to AISC 360 Chapter K for moment connections between hollow structural section beams and columns. ←

4.3.4 SFRS utilizing braced frames shall be configured such that a K-brace mechanism does

not occur.

4.3.4.1 A series of X-braces at each level with a horizontal member at each corresponding level, will create a vertical truss with out-of-plane support provided by the perpendicular braces, and is not considered a K-brace system.

4.3.4.2 Where the horizontal members on the perpendicular sides of the elevator shaft do not align, the design shall comply with the requirements for multi-tiered braced frames per AISC 341 Section F1.4c, F2.4e, or F4.4d (as applicable).

4.4 Cold-Formed Steel SFRS

Cold-formed steel SFRS shall comply with AISI S400. Factors to determine the expected brace strength (i.e., R_y and R_t) shall be in accordance with AISI S400 Section A3.2 and Table A3.2-1.

4.4.1 Strap brace connections shall be designed as capacity protected components in accordance with AISI S400 Sections B3 and E3.4.2. Connections shall be welded per AISI S400 Section E3.4.1(a) Method 1 unless the criteria in AISI S400 Section E3.4.1(a) Method 2 or Method 3 are satisfied for light gage straps.

4.4.2 Chord studs, vertical boundary elements, and hold-down anchorage shall be designed as capacity protected components in accordance with AISI S400 Sections B3 and E3.4.2. The load path shall comply with AISI S400 Section E3.4.1(d).

4.4.3 Strap braced wall aspect ratios shall comply with AISI S400 Section E3.4.1(b). The height/width aspect ratio can be based on each panel of X-bracing as long as perpendicular braces are provided at the top and bottom of each panel as described in Section 4.3.4.1 above.

4.4.4 Strap eccentricity shall comply with AISI S400 Section E3.4.2.

4.4.5 Strap construction shall comply with AISI S400 Section E3.4.1(c). The PC drawings shall include notes defining the responsibilities of the site erection contractor to ensure the strap bracing remains tensioned after shipping and erection

4.4.6 The slenderness ratio of the diagonal strap member may exceed 200.

4.5 Lateral Seismic Displacement

4.5.1 Allowable drift may be based on the limits for the first row of ASCE 7 Table 12.12-1, described as “Structures, other than masonry shear wall structures, four stories or less above the base…”. Exterior walls are required to accommodate the story drifts per ASCE 7 Section 13.5.3 regardless of what drift limit is used.

4.5.2 The minimum seismic separation shall be determined in accordance with ASCE 7 Section 12.12.2. The PC drawings shall indicate the maximum lateral displacement demand for each building option in the design information section for use by the site-specific project applicant in correctly locating the building on the project site relative to existing and other new buildings. See Section 2.7 above.

4.5.3 The PC design shall provide deformation compatibility. Exterior non-bearing, non-shear walls shall be designed and detailed to accommodate in-plane story drift per ASCE 7 Section 13.5.3. Special detailing is not required at wall intersections or corner conditions to accommodate drift.

4.6 Wind Design Loads

An elevator tower is not considered a low-rise building as defined in ASCE 7 Chapter 26 because its height typically exceeds its least horizontal dimension. Therefore, wind design cannot utilize the envelope procedure of ASCE 7 Chapter 28. The PC design shall be based on

the directional procedure of ASCE 7 Chapter 27 or the wind tunnel procedure of ASCE 7 Chapter 31.

4.6.1 For conditions where roof beams, purlins, or trusses are subject to net uplift from wind forces, the bottom flange or chord shall be braced or justified by calculation as not requiring bracing.

4.6.2 Where the top connection of exterior stud walls imparts a horizontal reaction from wind loads on the bottom beam flange, the PC design shall provide bracing or justification by calculation.

4.6.3 Member end connections shall be designed for wind uplift where it occurs.

4.7 Metal Roof Panel Systems

Metal roof panel systems shall comply with CBC Sections 1504.4 and 1507.4. A manufacturer, product, and basis of approval for the metal roof panel system including fasteners, parts, and layout shall be specified. The interpretations listed below do not preclude the project from meeting the other requirements of CBC Chapter 15 (e.g., fire classification, insulation, etc.).

4.7.1 The PC drawings shall fully detail the panel clip spacing and fasteners, metal material specification, panel profile, thickness, etc.

4.7.2 The underlayment, flashing, and other waterproofing shall be fully detailed on the PC drawings and shall comply with CBC Chapter 15.

4.7.3 The wind load uplift resistance provided by the panels and their connections shall be based on test data in accordance with ASTM E1592, Underwriters Laboratory (UL) 580, UL 1897, or Factory Mutual (FM) 4474 as appropriate by an independent accredited laboratory. Qualification of the metal roof panel system shall be provided in accordance with one of the following methods:

4.7.3.1 If the system has a UL or FM certification or has an evaluation report issued by an accepted agency per IR A-5, this basis of approval shall be denoted on the PC drawings. A copy of the UL or FM product report, if applicable, shall be submitted to substantiate the design capacity of the product.

4.7.3.2 If the system does not have a qualified certification per Section 4.7.3.1 above, a wind uplift test report by an independent accredited testing laboratory shall be submitted with the PC project. The test results shall be interpreted for applicability and adjusted for factor of safety in accordance with AISI S100: North American Specification for the Design of Cold-Formed Steel Structural Members (AISI S100), Section I6.3.1 by a California registered structural engineer. The testing laboratory shall be accredited by International Organization for Standardization (ISO) 17025 in accordance with International Code Council Evaluation Service (ICC-ES) AC85: Acceptance Criteria for Test Reports. Other accreditations (e.g., ISO 17020) may be acceptable with DSA approval.

5. FOUNDATION

5.1 Vertical Allowable Soil Pressure

The PC design shall be based on the presumptive allowable soil bearing pressure corresponding to Class 5 soil in CBC Table 1806A.2 unless justified by a site-specific geotechnical report. To base the design on values greater than those given for Class 5 soil, a statement requiring a site-specific geotechnical report at the time of site application must be included in the design information section of the PC drawings.

5.1.1 An allowable stress increase in the presumptive load-bearing value is not permitted when using the allowable stress design load combinations per ASCE 7 Section 2.4. An allowable stress increase is permitted in accordance with CBC Section 1806A.2 when using the alternative allowable stress design load combinations per CBC Section 1605A.2 that include seismic or wind loads.

5.1.2 A reduction of foundation overturning per ASCE 7 Section 12.13.4 is permitted when using the allowable stress design load combinations per ASCE 7 Section 2.4. This reduction is not permitted when using the alternative allowable stress design load combinations per CBC Section 1605A.2.

5.2 Foundation Design Load

Design of the foundation and its connection to the superstructure shall comply with CBC Section 1617A.1.15, which commonly includes consideration of load combinations including the overstrength factor.

5.3 Liquefiable Soil or Site Class F

PC designs will not be approved with an option for construction on sites with liquefiable soil or soil categorized as Site Class F. If the site is not in a mapped liquefaction hazard zone, it may be presumed that no liquefaction hazard exists on that site unless a site-specific geotechnical report identifies such a hazard. Refer to IR A-4 Section 4.

5.4 Adjacent Slopes

The PC drawings shall specify minimum setback limits (values are required) of the structure relative to slopes per CBC Section 1808A.7 for building clearance, foundation setback, etc. for protection from slope drainage, erosion, and shallow failures. If the PC drawings define setback limits smaller than the CBC allows, a statement requiring a site-specific geotechnical report at the time of site application shall be included in the design information section.

5.5 Concrete Mix

In addition to those requirements dictated by the PC design, the concrete mix used in the foundation elements shall comply with the durability requirements of the American Concrete Institute (ACI) 318: Building Code Requirements for Structural Concrete and Commentary (ACI 318), Section 19.3. The PC drawings shall account for the dependency of these durability requirements on site-specific characteristics.

5.5.1 When the PC drawings do not require a site-specific geotechnical report that quantifies sulfate content in the soils, the PC drawings shall require a concrete mix complying with one of the following per ACI 318 Table 19.3.2.1:

5.5.1.1 Maximum water/cement ratio of 0.45; minimum compressive strength of 4,500 pounds per square inch (psi); Type V cement plus pozzolan or slag cement complying with footnote 7 of the table; and prohibition of admixtures containing calcium chloride.

5.5.1.2 Maximum water/cement ratio of 0.40; minimum compressive strength of 5,000 psi; Type V cement complying with footnote 8 of the table; and prohibition of admixtures containing calcium chloride.

5.5.2 When the PC drawings require a site-specific geotechnical report that quantifies sulfate content in the soil, the PC drawings shall clearly state the exposure class for each category (i.e., F, S, W and C), or combination thereof, for which the PC design is approved. The maximum water/cement ratio, minimum compressive strength, cementitious material requirements, and admixture limitations shall be stated on the PC drawings for each approved case.

5.5.3 Both approaches given in Section 5.5.1 and 5.5.2 above can be included on the PC drawings as separate options in accordance with Section 1.4 above.

5.5.4 The PC drawings shall include a note requiring that concrete exposed to freezing-and-thawing cycles be air entrained per ACI 318 Section 19.3.3.

5.6 Superstructure Anchorage at Foundation

The connection of the superstructure to foundation shall be designed for forces in accordance with CBC Section 1617A.1.15 and adjusted as required by ACI 318 Chapter 17. Temporary block outs in the concrete to allow anchor bolt installation after concrete placement (i.e., "can-outs") are not permitted.

5.6.1 Post-installed anchor placement must comply with ACI 318 Chapter 17 and the product evaluation report per IR A-5.

5.6.2 Shear connections are required on all four sides of each modular unit.

5.6.3 The base plates, anchor bolt/rods, and the entire load path of each connection assembly shall be analyzed for the effects of load eccentricities, prying action, stiffness compatibility, load reversals, and appropriate boundary conditions to ensure all code requirements are satisfied.

5.7 Site-Specific Foundation Design

When the PC includes an option for a site-specific foundation design, the PC drawings shall include the following in the design information section. The foundation design and detailing shall match the fixity assumption.

5.7.1 Statement indicating whether the design is based on a pinned or fixed superstructure to foundation connection.

5.7.2 Complete listing of all forces applied to the foundation at each base connection location.

6. ACCESS COMPLIANCE REQUIREMENTS

Accessibility requirements shall comply with CBC Chapter 11B. Appropriate details shall be provided on the PC drawings to assure compliance with all applicable code requirements.

7. FIRE AND LIFE SAFETY REQUIREMENTS

7.1 Type of Construction

Specify the type of construction per CBC Chapter 6.

7.2 Construction in Hazardous Fire Area(s)

Modular elevators constructed in designated hazardous fire areas shall comply with the provisions of the California Wildfire-Urban Interface Code (CCR Title 24, Part 7). The design information section of the PC drawings shall state whether or not the design is approved for use in a designated hazardous fire area.

7.3 Guards

Guards shall comply with CBC Section 1015.

7.4 Safety Glazing

Safety glazing is required in hazardous locations (e.g., in doors, adjacent to doors, in windows, etc.) per CBC Section 2406.4.

7.5 Multistory Modular Buildings

Elevator design and construction shall comply with the following:

- CBC Chapter 30.
- California Fire Code (CFC) Section 604.
- NFPA 72, National Fire Alarm and Signaling Code, as adopted and amended in CFC Chapter 80.
- California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders.

8. SUSTAINABILITY REQUIREMENTS

The PC design shall comply with the mandatory measures of the California Green Building Standards Code and the California Energy Code. Refer to California Energy Code Section 120.6(f) for mandatory requirements. A completed NRCC-PRC-E shall be submitted on the drawings.

REFERENCES:

2025 California Code of Regulations (CCR) Title 24
Part 2: California Building Code (CBC).
Part 6: California Energy Code.
Part 7: California Wildfire-Urban Interface Code.
Part 9: California Fire Code (CFC).
Part 11: California Green Building Standards Code.

PRE-CHECK (PC) DESIGN CRITERIA FOR MODULAR ELEVATOR TOWERS: 2025 CBC

APPENDIX A: SITE-SPECIFIC APPLICATION GUIDE

The following notes are provided as a guide to assist design professionals and DSA plan reviewers when preparing and reviewing site-specific project applications that incorporate PC modular elevator towers designed in accordance with this IR. This appendix is not intended to be an all-inclusive list of design and submission requirements but rather is an aid to identify aspects of the design criteria described in this IR of particular interest to its site application.

- ☐ Verify site-specific suitability of the PC including all parameters in PL 07-02 Section 3.
- ☐ Verify site-specific requirements of PL 07-02 Section 4 are met.
- ☐ Verify site-specific requirements of IR 16-1 are met.
- ☐ Review the site-specific DSA 103 in comparison with the example DSA 103 for required structural tests and special inspections and for any site-specific exemptions. Refer to Section 1.3 above.
- ☐ Verify the Risk Category (RC) of the site-specific design is compliant with the design information section of the PC drawings. Refer to Section 1.6 above.
- ☐ In addition to the requirements of PL 07-02 Section 4.9, if the site is located in a flood zone other than Zone X, verify a validation letter from a geotechnical engineer is provided. Refer to Section 1.7 above.
- ☐ Verify utility and service lines crossing building separation joints are designed to accommodate, without rupture or distress, the differential building movements defined on the PC drawings. Refer to Section 2.7 above.
- ☐ If the site has a ground snow load greater than zero, verify the modular elevator tower is positioned with sufficient distance from adjacent structures as defined on the PC drawings. If the horizontal separation is less than 20 feet, snow drift analysis is required, and the project is not eligible for OTC review. Refer to Section 3.2 above.
- ☐ In addition to the requirements of PL 07-02 Section 3.1.3, if the PC design is based on a capped S_{DS} value per ASCE 7 Section 12.8.1.3, verify the site-specific criteria are met. Refer to Section 4.1.3 above.
- ☐ Verify the location of the elevator tower on the site complies with the dimensional requirements for building separation relative to existing and other new buildings as defined on the PC drawings. Unless a detailed analysis is provided, the movement of an adjacent existing building shall be assumed to be that corresponding to the maximum drift allowed by the governing code at the time of the existing building's design or construction. Alternatively, the lateral displacement of an existing building can be assumed to be 3 percent of its height (0.03h) in accordance with ASCE 41 Section 7.2.15.1. Refer to Section 4.5 above.
- ☐ If the PC requires (or elects as an option) a site-specific foundation design, the project is not eligible for OTC review. Verify the foundation has been designed for the criteria defined in the design information section of the PC drawings. These criteria include the pinned/fixed nature of the base connections to the foundation and the magnitudes of forces/moments transferred at the base connections. Refer to Section 5.7 above.
- ☐ If the building is placed adjacent to a slope, verify the building location complies with the setback requirements defined on the PC drawings. Refer to Section 5.4 above.