NCEES
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Structural Breadth—Lateral Forces (Wind/Seismic) Exam Specifications

Effective Beginning April 2027

- The exam is computer-based. It is closed book with electronic references. The NCEES *PE Structural Engineering Reference Handbook* is included in the exam along with the design standards shown on the last page of the specifications.
- Examinees have 6 hours to complete this exam, which contains 55 multiple-choice questions. The 6-hour appointment time includes a tutorial and a scheduled break. The exam will contain scored and unscored (pretest) questions.
- The exam section uses the US Customary System (USCS) of units.
- The exam is developed with questions that require a variety of approaches and methodologies, including design, analysis, and application.
- The knowledge areas specified as examples of kinds of knowledge are not exclusive or exhaustive categories.
- The exam contains approximately 20% bridge questions.
- All questions are equally weighted.
- Questions related to materials and foundations include both design and details.
- Solutions to wood, masonry, and cold-formed steel design questions are based on the Allowable Stress Design (ASD) method.
- Solutions to structural steel and concrete design questions are based on the Strength Design (LRFD) method.
- The exam includes bridge wind content and seismic content of Seismic Zones 3 and 4.
- Solutions to bridge seismic design are based on force-based methodology following *AASHTO LRFD Bridge Design Specifications*.
- The exam includes building seismic content of Seismic Design Category D and above and building wind content of at least 140 mph.

	Number of Questions
1. Load Generation	**6–9**

A. Seismic loads on buildings and other structures
B. Seismic loads on bridges
C. Wind loads on buildings (e.g., Main Wind Force Resisting System, Components and Cladding, building appurtenances, other structures)
D. Wind loads on bridges
E. Load combinations

2. Load Distribution and Analysis **6–9**
- A. Vertical lateral force distribution
- B. Horizontal lateral force distribution
- C. Approximate frame analysis methods

3. General Structural Considerations and Systems Integration **3–5**
- A. Construction administration (e.g., procedures for correcting nonconforming work, testing methods, inspection methods, structural observation)
- B. Load path and drift/deflection requirements (e.g., load path, stability, deflection, building drift)
- C. Design and details of components and/or cladding elements
- D. Seismic regularities/irregularities (e.g., redundancy factor, overstrength factor, deflection amplification factor)
- E. Bridge seat considerations (e.g. seat width, restrainers, bearings)
- F. General structural systems selection based on design criteria

4. Structural Steel **7–11**
- A. Braced frames
- B. Moment-resisting frames
- C. Dual systems
- D. Bridge-bracing elements

5. Cold-Formed Steel **2–4**
- A. Horizontal diaphragms
- B. Bearing wall systems (e.g., shear wall systems, flat strap bracing)
- C. Framing with out-of-plane loads (e.g., curtainwall systems)

6. Concrete **8–12**
- A. Structural walls
- B. Moment-resisting frames
- C. Horizontal diaphragms
- D. Bridge piers/abutments

7. Wood **4–6**
- A. Shear walls
- B. Framing with out-of-plane loads
- C. Diaphragms and/or subdiaphragms

8. Masonry **4–6**
- A. Shear walls
- B. Walls with out-of-plane loads
- C. Anchorage of walls
- D. Attachment of elements to masonry

9. Foundations **5–8**
- A. Shallow foundations
- B. Piles (e.g., concrete, steel, timber) and pile caps
- C. Drilled shafts/drilled piers

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Structural Breadth—Lateral Forces Design Standards

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In addition to the NCEES *PE Structural Engineering Reference Handbook*, the following codes and standards will be supplied in the exam as searchable, electronic pdf files with links for easy navigation. Solutions to exam questions that reference a standard of practice are scored based on this list and the revision year shown. Solutions based on other standards will not receive credit. All questions use the US Customary System (USCS) of units.

NCEES does not sell design standards or printed copies of the NCEES handbook. The NCEES handbook is accessible from your MyNCEES account.

ABBREVIATION	DESIGN STANDARD TITLE
AASHTO	*AASHTO LRFD Bridge Design Specifications*, 10th edition, American Association of State Highway & Transportation Officials, Washington, DC.
ACI 318	*Building Code Requirements for Structural Concrete*, 2019 (2022), American Concrete Institute, Farmington Hills, MI.
AISC	*Seismic Design Manual*, 4th edition, American Institute of Steel Construction, Chicago, IL.
AISC	*Steel Construction Manual*, 16th edition, American Institute of Steel Construction, Chicago, IL.
AISI S100	*North American Specification for the Design of Cold-Formed Steel Structural Members*, 2016 edition (reaffirmed 2020) with Supplement 2, 2020 edition, with *AISI S240-20* and *AISI S400-20*, American Iron and Steel Institute, Washington, DC.
ASCE 7	*Minimum Design Loads and Associated Criteria for Buildings and Other Structures*, 2022 edition, American Society of Civil Engineers, Reston, VA.
IBC	*International Building Code*, 2024 edition, International Code Council, Falls Church, VA.
NDS	*National Design Specification for Wood Construction* with *NDS Supplement: Design Values for Wood Construction*, 2024 edition, American Wood Council, Leesburg, VA.
NDS	*Special Design Provisions for Wind and Seismic*, 2021 edition, American Wood Council, Leesburg, VA.
TMS 402/602	*Building Code Requirements and Specification for Masonry Structures*, 2022 edition, The Masonry Society, Longmont, CO.