

## **Lateral Forces (Wind/Earthquake) Component of the Structural Engineering DEPTH Section CBT Specifications**

**Effective Beginning April 2024**

The **Lateral Forces (Wind/Earthquake)** depth section focuses on a single area of practice in structural engineering. Examinees have 5.5 hours to complete this section, which contains 5 scenarios with 12 questions each, totaling 60 questions. The 5.5-hour time includes a tutorial and a scheduled break. The section will contain scored and unscored (pretest) questions. All questions are alternative item type (AIT) questions. Examinees must choose either the **BUILDINGS** or the **BRIDGES** section. Examinees must work the same section on both components. That is, if bridges is the section chosen in the Vertical Forces component, then bridges must be the section chosen in the Lateral Forces component.

The exam section 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.

### **BUILDINGS**

The **Lateral Forces (Wind/Earthquake)** Structural Engineering depth section in **BUILDINGS** covers lateral forces, lateral force distribution, analysis methods, general structural considerations (element design), structural systems integration (connections), and foundations and retaining structures.

This 5.5-hour section contains at least one scenario from each of the following types:

- Steel structure
- Concrete structure
- Wood and/or masonry structure
- General analysis (e.g., existing structures, secondary structures, nonbuilding structures, and/or computer verification)

At least two scenarios include seismic content at Seismic Design Category D and above.

At least one scenario includes wind content of at least 140 mph.

Scenarios may include a multistory building.

Scenarios may include a foundation.

Knowledge areas may include:

- Conceptual design and project planning
- Structural loading and analysis
- Design and details of elements
- Design and details of joints and connections
- Preparation of documents and construction administration

## **BRIDGES**

The **Lateral Forces (Wind/Earthquake)** Structural Engineering depth section in **BRIDGES** covers gravity loads, superstructures, substructures, and lateral forces (including seismic).

This 5.5-hour section contains at least one scenario from each of the following types:

- Piers or abutments
- Foundations
- General analysis of seismic forces

Knowledge areas may include:

- Conceptual design and project planning
- Structural loading and analysis
- Design and preparation of details

### **Notes:**

1. All questions use the U.S. Customary System (USCS) of units.

## **STRUCTURAL ENGINEERING Design Standards**

*These standards apply to the Vertical and Lateral components of the Structural Engineering exam.*

**Effective Beginning April 2024**

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. Standards will be provided as individual chapters on the exam, and only one chapter at a time can be opened and searched. This ensures the exam software runs large files effectively.

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 U.S. 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.

<b>ABBREVIATION</b>	<b>DESIGN STANDARD TITLE</b>
<b>AASHTO</b>	<i>AASHTO LRFD Bridge Design Specifications</i> , 8th edition, American Association of State Highway & Transportation Officials, Washington, DC.
<b>IBC</b>	<i>International Building Code</i> , 2018 edition, International Code Council, Falls Church, VA.
<b>ASCE 7</b>	<i>Minimum Design Loads and Associated Criteria for Buildings and Other Structures</i> , 2016 edition, American Society of Civil Engineers, Reston, VA.
<b>ACI 318</b>	<i>Building Code Requirements for Structural Concrete</i> , 2014 edition, American Concrete Institute, Farmington Hills, MI.
<b>AISC</b>	<i>Steel Construction Manual</i> , 15th edition, American Institute of Steel Construction, Chicago, IL.
<b>AISC</b>	<i>Seismic Design Manual</i> , 3rd edition, American Institute of Steel Construction, Chicago, IL.
<b>AISI S100</b>	<i>North American Specification for the Design of Cold-Formed Steel Structural Members</i> , 2016 edition, with AISI S240-15 and AISI S400-15/S1-16, American Iron and Steel Institute, Washington, DC.
<b>NDS</b>	<i>National Design Specification for Wood Construction with NDS Supplement: Design Values for Wood Construction</i> , 2018 edition, American Wood Council, Leesburg, VA.
<b>NDS</b>	<i>Special Design Provisions for Wind and Seismic</i> , 2015 edition, American Wood Council, Leesburg, VA.
<b>TMS 402/602</b>	<i>Building Code Requirements and Specification for Masonry Structures</i> , 2016 edition, The Masonry Society, Longmont, CO.