

## **Vertical Forces (Gravity/Other) and Incidental Lateral Component of the Structural Engineering DEPTH Exam Specifications**

Effective Beginning with the April 2011 Examination

The 4-hour **Vertical Forces (Gravity/Other) and Incidental Lateral** depth examination is offered on Friday afternoon. The depth modules of the Structural Engineering exam focus on a single area of practice in structural engineering. Examinees must choose either the **BUILDINGS** or the **BRIDGES** module. Examinees must work the same module on both components. That is, if bridges is the module chosen in the Vertical Forces component, then bridges must be the module chosen in the Lateral Forces component. All questions are constructed response (essay).

The exam uses the US Customary System (USCS) of units.

### **BUILDINGS**

The **Vertical Forces (Gravity/Other) and Incidental Lateral** Structural Engineering depth exam in **BUILDINGS** covers loads, lateral earth pressures, analysis methods, general structural considerations (element design), structural systems integration (connections), and foundations and retaining structures. This 4-hour module contains one problem from each of the following areas:

- Steel structure
- Concrete structure
- Wood structure
- Masonry structure

All problems are equally weighted. At least one problem includes a multistory building, and at least one problem includes a foundation.

### **BRIDGES**

The **Vertical Forces (Gravity/Other) and Incidental Lateral** Structural Engineering depth exam in **BRIDGES** covers gravity loads, superstructures, substructures, and lateral loads other than wind and seismic and may test pedestrian bridge and/or vehicular bridge knowledge. This 4-hour module contains three problems, one from each of the following areas:

- Concrete superstructure (25% of your score)
- Other elements of bridges (e.g., culverts, abutments, retaining walls) (25% of your score)
- Steel superstructure (50% of your score)

## STRUCTURAL ENGINEERING Design Standards<sup>1</sup>

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

**Effective Beginning with the April 2017 Examinations**

*Revisions are shown in red.*

<b>ABBREVIATION</b>	<b>DESIGN STANDARD TITLE</b>
<b>AASHTO</b>	<i>AASHTO LRFD Bridge Design Specifications, 7<sup>th</sup> edition, American Association of State Highway &amp; Transportation Officials, Washington, DC.</i>
<b>IBC</b>	<i>International Building Code, 2012 edition (without supplements), International Code Council, Falls Church, VA.</i>
<b>ASCE 7</b>	<i>Minimum Design Loads for Buildings and Other Structures, 3rd printing, 2010, American Society of Civil Engineers, Reston, VA.</i>
<b>ACI 318</b>	<i>Building Code Requirements for Structural Concrete, 2011, American Concrete Institute, Farmington Hills, MI.</i>
<b>AISC</b>	<i>Steel Construction Manual, 14th edition, American Institute of Steel Construction, Inc., Chicago, IL.</i>
<b>AISC</b>	<i>Seismic Design Manual, 2nd edition, American Institute of Steel Construction, Inc., Chicago, IL.</i>
<b>AISI</b>	<i>North American Specification for the Design of Cold-Formed Steel Structural Members, 2007 edition with Supplement No. 2 (2010), American Iron and Steel Institute, Washington, DC.</i>
<b>NDS</b>	<i>National Design Specification for Wood Construction ASD/LRFD, 2012 edition &amp; National Design Specification Supplement, Design Values for Wood Construction, 2012 edition, American Forest &amp; Paper Association, Washington, DC.</i>
<b>NDS</b>	<i>Special Design Provisions for Wind and Seismic with Commentary, 2008 edition, American Forest &amp; Paper Association, Washington, DC.</i>
<b>PCI</b>	<i>PCI Design Handbook: Precast and Prestressed Concrete, 7th edition, 2010, Precast/Prestressed Concrete Institute, Chicago, IL.</i>
<b>TMS 402/602</b>	<i>Building Code Requirements and Specifications for Masonry Structures (and related commentaries), 2011; The Masonry Society, Boulder, CO; American Concrete Institute, Detroit, MI; and Structural Engineering Institute of the American Society of Civil Engineers, Reston, VA.</i>

### Notes

1. Solutions to exam questions that reference a standard of practice are scored based on this list. Solutions based on other editions or standards will **not** receive credit. All questions use the US Customary System (USCS) of units.