<table>
<thead>
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<th>Draft Civil Engineering Standards</th>
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<td><strong>Standards design philosophy:</strong> These standards are designed to produce students who can plan the development of land for housing and other structures, including provision for roads, water, sewer, and other systems; understand the design and placement of structures such as bridges, basements, and foundations; and design and implement solutions to environmental problems involving water, soil, and rock.</td>
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### Types of Structures

**Geotechnical (Soil and Rock)**
- **Soil and Rock**
- **Soil Classification, other Natural Mechanics**
- **Disasters**
- **Cliffs, landslides, earthquakes**
- **Flooding, drought, sea level rise**

**Structures**
- **Buildings**
- **Roads and Bridges**
- **Tunnels and Ducts**
- **Parks and Sports Facilities**
- **Ships and Boats**

### Standards

**CCR-CE STR 1.** Understand that the design and placement of structures is constrained by the design and placement of the structure,

**CCR-CE STR 2.** Identify structural features that exist in many different types of structures.

**CCR-CE STR 3.** Understand that the design and placement of structures is constrained by the design and placement of the structure,

**CCR-CE STR 4.** Understand that the design and placement of structures is constrained by the design and placement of the structure,

**CCR-CE SLM 1.** Research, organize, and use the Unified Soil Classification System.

**CCR-CE MM 2.** Identify and explain the possible reasons why each material is used for a specified purpose.

**CCR-CE MM 3.** Determine which of the materials used in a home or other structure needs to bear the weight of the structure.

**CCR-CE MM 4.** Calculate the stresses inside a structure using engineering stress analysis.

**CCR-CE MM 5.** Research and document the methods used in the design of buildings to withstand the potential of structural damage.

**CCR-CE LG 6-8.** Identify non-regulatory information used to inform building requirements (e.g., financial, structural, and environmental considerations).

**CCR-CE BL 6-8.** Research and calculate the annual cost to maintain a home or apartment, from the internet, friends, family, and landlords.

**CCR-CE ND 6-8.** Distinguish how shear walls (i.e., solid walls with no doors or windows) are different from other structural components to heave, crack, or buckle unless compensated by introducing gaps or special materials into the structure.

**CCR-CE SLM 6-8.** Compare and contrast the results of sediment flow into an ecosystem can be positive or negative.

**CCR-CE SL 6-8.** Experiment and calculate the pressures experienced by a building panel, tree trunk, or other structures.

**CCR-CE MM 9-12.** Identify structural designs or applications that are the best match for each material type.

**CCR-CE LG 9-12.** Compare sections of building codes from two different geographic regions, covering the same topics and suggested exam questions for variation or difference.

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Plan. to obtain local or municipal
information (e.g., erosion control plan; erosion and sediment control plan, specifications for stormwater facilities) are met and offer suggestions
for the site. CCR-CE SP 9-12, 23.3. Review other plans to determine which municipality requirements (e.g., permanent stormwater
control plan; erosion and sediment control plan, specifications for stormwater facilities) are met and offer suggestions
for the site. CCR-CE SP 9-12, 23.2. Write a site development plan that meets most of the requirements for municipal site plan
review.

CCR-CE SP 9-12, 23.1. Select and determine sources to a method of managing stormwater for a developed site (e.g., rain garden, dry pond, storage pond).

CCR-CE RP 9-12, 22.4. Modify the existing contour map as necessary to show proximity and connections between
the survey information to explain why adjustments/revisions need to be made.

CCR-CE RP 9-12, 22.3. Research and organize the steps required to request a variance for a site, if necessary, and use
this information to support the site plan. CCR-CE RP 9-12, 22.2. Research, organize, and create a GANTT Chart to document what is required to be completed to
meet the project plan.

CCR-CE RP 9-12, 22.1. Use the site survey information and municipality requirements to write a site description.

CCR-CE LS 9-12, 21.8. Diagnose and describe any measures that might be needed to protect the nearby environment
from impacts caused by the site modification, site structures, stormwater and wastewater management.

CCR-CE LS 9-12, 21.7. Draw a landscaping plan, showing flora and landscaping structures to be retained, added, and
removed.

CCR-CE LS 9-12, 21.6. Design, develop, and document a landscaping strategy that meets maintenance, regulatory,
and aesthetic requirements.

CCR-CE LS 9-12, 21.5. Plan and estimate the quantities of materials needed to implement the landscape plan.

CCR-CE LS 9-12, 21.4. Research and select new flora to meet the needs of the site.

CCR-CE LS 9-12, 21.3. Identify and determine the flora and existing structures that will remain on the site.

CCR-CE LS 9-12, 21.2. Organize and describe processes and procedures to control soil erosion (e.g., plantings,
planting strips, terraces, rock or masonry terraces, mulch, or erosion control devices) to help prevent the loss of topsoil.

CCR-CE LS 9-12, 21.1. Analyze the ordinance and regulations for landscaping a particular site.

CCR-CE RD 9-12, 20.5. Revise and draw the cut and fill plan for the foundation to include any grading needed for roads
and accessible parking lot.

CCR-CE RD 9-12, 20.2. Revise the site plan to show the vertical and horizontal transit lines and station points necessary
for laying out a properly aligned road.

CCR-CE RD 9-12, 20.1. Use the site survey information and municipality requirements to lay out a properly aligned road.

CCR-CE COM 9-12, 19.3. Revise or modify site concept as necessary, to meet communications requirements.

CCR-CE COM 9-12, 19.2. Document potential site development issues related to communications availability supply
(e.g., lack of existing internet requires ISP to agree to extend fiber or cable connection from the neighboring street.)

CCR-CE COM 9-12, 19.1. Research and determine the capacity of communications utilities (e.g., phone, internet)
available to a site.

CCR-CE EU 9-12, 18.7. Draw the utilities plan by adding schematic symbols and connections to the site plan.

CCR-CE EU 9-12, 18.6. Revise or modify site concept as necessary, to meet energy requirements.

CCR-CE EU 9-12, 18.5. Document potential site development issues related to energy supply (e.g., on-site generator
needed to cover peak or emergency energy needs).

CCR-CE EU 9-12, 18.4. Research, calculate, and determine the size of energy utility supply lines to meet current
and future needs.

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and future needs.

CCR-CE EU 9-12, 18.2. Research, compute, and summarize the energy utility needs for a project.

CCR-CE EU 9-12, 18.1. Calculate building energy losses and propose ways to meet design criteria for energy
minimization.

CCR-CE EU 9-12, 17.8. Sketch structures associated with the wastewater management plan on the site plan.

CCR-CE WWM 9-12, 17.5. Sketch structures associated with the wastewater management plan on the site plan.

CCR-CE WWM 9-12, 17.4. Revise or modify site concept as necessary, to meet wastewater requirements.

CCR-CE WWM 9-12, 17.3. Document potential site development issues related to wastewater management (e.g., need
for a septic system to be used).

CCR-CE WWM 9-12, 17.2. Organize and describe processes and procedures to control soil erosion (e.g., plantings,
planting strips, terraces, rock or masonry terraces, mulch, or erosion control devices) to help prevent the loss of topsoil.

CCR-CE WWM 9-12, 17.1. Follow a landscaping plan, showing the site's drainage system, and the stormwater and
site plan.

CCR-CE WWM 9-12, 17.0. Document and describe any measures that might be needed to protect the nearby environment
from impacts caused by stormwater and wastewater management.

CCR-CE WWM 9-12, 16.6. Document final water plan by sketching water utility lines on the existing site plan.

CCR-CE WWM 9-12, 16.5. Revise or modify site selection or concept as necessary, to meet water availability
requirements.

CCR-CE WWM 9-12, 16.4. Document potential site development issues related to water availability (e.g., poor or seasonal
water supply, need for water treatment system to be used).

CCR-CE WWM 9-12, 16.3. Estimate the water demand (e.g., gallons per minute) needed for a site using tables that provide
the water pressure and flow rates needed for filling water needs and pressure (e.g., household appliances, irrigation, site
management).

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the water pressure and flow rates needed for filling water needs and pressure (e.g., household appliances, irrigation, site
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the water pressure and flow rates needed for filling water needs and pressure (e.g., household appliances, irrigation, site
management).

CCR-PP 9-12, 23.1. Use the site survey information and municipality requirements to write a property description
(e.g., address, features, site limitations, resource availability, utility availability).

CCR-PP 9-12, 23.2. Research and provide site data to write a SITLAS plan. CCR-PP 9-12, 23.3. Document what is required to be completed to
meet the site concept.

CCR-PP 9-12, 23.0. Research and organize the steps required to complete the site survey. CCR-PP 9-12, 23.0. Research and organize the steps required to complete the site survey.

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CCR-PP 9-12, 21.5. Research on managing of a local (township, county) site plan and a site plan application.

CCR-PP 9-12, 21.4. Review the site plan to determine if the site plan is adequate for the project requirements.

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