National Council of Examiners for Engineering and Surveying

Principles and Practice of Engineering
Civil—CONSTRUCTION Depth Exam Specifications
Effective Beginning with the April 2008 Examinations

		Approximate Percentage of Examination
I.	**Earthwork Construction and Layout** A. Excavation and embankment (cut and fill) B. Borrow pit volumes C. Site layout and control D. Earthwork mass diagrams	**10%**
II.	**Estimating Quantities and Costs** A. Quantity take-off methods B. Cost estimating C. Engineering economics 1. Value engineering and costing	**17.5%**
III.	**Construction Operations and Methods** A. Lifting and rigging B. Crane selection, erection, and stability C. Dewatering and pumping D. Equipment production E. Productivity analysis and improvement F. Temporary erosion control	**15%**
IV.	**Scheduling** A. Construction sequencing B. CPM network analysis C. Activity time analysis D. Resource scheduling E. Time-cost trade-off	**17.5%**
V.	**Material Quality Control and Production** A. Material testing (e.g., concrete, soil, asphalt) B. Welding and bolting testing C. Quality control process (QA/QC) D. Concrete mix design	**10%**
VI.	**Temporary Structures** A. Construction loads B. Formwork C. Falsework and scaffolding D. Shoring and reshoring E. Concrete maturity and early strength evaluation F. Bracing G. Anchorage	**12.5%**

H. Cofferdams (systems for temporary excavation support)
I. Codes and standards [e.g., American Society of Civil Engineers (ASCE 37), American Concrete Institute (ACI 347), American Forest and Paper Association-NDS, Masonry Wall Bracing Standard]

VII. Worker Health, Safety, and Environment **7.5%**

A. OSHA regulations
B. Safety management
C. Safety statistics (e.g., incident rate, EMR)

VIII. Other Topics **10%**

A. Groundwater and well fields
   1. Groundwater control including drainage, construction dewatering
B. Subsurface exploration and sampling
   1. Drilling and sampling procedures
C. Earth retaining structures
   1. Mechanically stabilized earth wall
   2. Soil and rock anchors
D. Deep foundations
   1. Pile load test
   2. Pile installation
E. Loadings
   1. Wind loads
   2. Snow loads
   3. Load paths
F. Mechanics of materials
   1. Progressive collapse
G. Materials
   1. Concrete (prestressed, post-tensioned)
   2. Timber
H. Traffic safety
   1. Work zone safety

Total **100%**

Notes

1. The examination is developed with problems that will require a variety of approaches and methodologies including design, analysis, and application. Some problems may require knowledge of engineering economics.
2. The knowledge areas specified under A, B, C, etc., are examples of kinds of knowledge, but they are not exclusive or exhaustive categories.
3. Each depth (PM) exam contains 40 multiple-choice questions. Examinee chooses **one** depth examination and works all questions in the depth examination chosen.
4. Score results are combined with breadth exam results for final score.