

**Level III Content Outline****Engineering Technician**

The candidates for NICET certification at Level III in Construction Materials Testing – Soils should have the knowledge, experience and skills needed to work without direct supervision, under the guidance of a registered professional engineer. They create sampling programs; select the appropriate tests; perform complex soils laboratory and field testing; perform soils stabilization mix designs; observe complex construction of fill, shallow and deep foundations; trouble shoot problem areas; evaluate materials, conditions and give recommendations; supervise and train Levels I and II technicians, reviewing their testing procedures and practices; perform equipment maintenance and calibration; maintain records; and prepare reports.

3.1 Personal and Worksite Safety

(Questions related to these tasks make up 1-9% of the exam.)

- 3.1.1 Provide internal safety training (as qualified). 57, 58, 59
- 3.1.2 Prepare internal safety plans.

3.2 Plans and Specifications

(Questions related to these tasks make up 5-15% of the exam.)

- 3.2.1 Relate plans to field conditions, e.g. determine distances, locations and elevations.
- 3.2.2 Calculate quantities of material.

3.3 Sampling of Soils

(Questions related to these tasks make up 1-9% of the exam.)

- 3.3.1 Create a soil sampling program. 21, 33, 41, 46, 50, 53, 56
- 3.3.2 Implement soils sampling program, e.g. sample retrieval, documentation and processing.
15, 18, 19

3.4 Soils Sample Preparation

(Questions related to these tasks make up 5-15% of the exam.)

- 3.4.1 Implement soils sample preparation processes, e.g. drying, splitting, sieving, moisture conditioning. 1, 2, 3, 5, 8, 10, 22, 32, 37, 39, 42
- 3.4.2 Remold soil samples for specialized testing. 20, 26, 30, 52, 62

3.5 Field Testing of Soils

(Questions related to these tasks make up 5-15% of the exam.)

- 3.5.1 Observe pile load tests. 12
- 3.5.2 Perform soils field resistivity tests. 54, 55
- 3.5.3 Perform soils infiltration tests. 40, 65
- 3.5.4 Perform field CBR tests. 66
- 3.5.5 Identify type of materials tested. 63, 64
- 3.5.6 Document assigned test limitations. 12, 30, 36, 40

3.6 Laboratory Testing of Soils

(Questions related to these tasks make up 10-20% of the exam.)

- 3.6.1 Perform soils consolidation tests. 25
- 3.6.2 Perform soils swell tests. 36
- 3.6.3 Perform soil stabilization mix designs. 9, 46
- 3.6.4 Perform soils direct shear tests. 30
- 3.6.5 Perform constant head permeability tests. 39
- 3.6.6 Perform soils triaxial tests. 27
- 3.6.7 Perform soils falling head permeability tests. 39
- 3.6.8 Perform lab resistivity tests for soils. 52
- 3.6.9 Perform soils expansion index tests. 37
- 3.6.10 Perform soils resilient modulus tests. 51



3.7 Field Observation of Soils Construction Operations

(Questions related to these tasks make up 5-15% of the exam.)

- 3.7.1 Observe complex fill placement. 6, 61, 64
- 3.7.2 Observe complex shallow foundations. 61
- 3.7.3 Observe complex installations of deep foundations. 61
- 3.7.4 Perform plate bearing tests. 13, 14
- 3.7.5 Observe complex soil stabilization operations. 47, 63

3.8 Evaluation of Soils Test Results

(Questions related to these tasks make up 5-15% of the exam.)

- 3.8.1 Determine whether soils test results meet specifications. 3, 11, 43, 47, 52, 55, 61, 63
- 3.8.2 Identify suspect soils test data. 8, 9, 10, 16, 17, 43, 63

3.9 Communication of Results

(Questions related to these tasks make up 5-15% of the exam.)

- 3.9.1 Prepare soils test data sheets. 7, 8, 10, 12, 16, 20, 22
- 3.9.2 Prepare preliminary soils reports for clients. 20, 23, 24, 26, 30, 34, 35, 66
- 3.9.3 Make preliminary interpretations of test results and observations. 1, 3, 4, 8, 16, 22, 28, 29, 34, 43, 63

3.10 Equipment Calibration and Maintenance

(Questions related to these tasks make up 5-15% of the exam.)

- 3.10.1 Perform verification/calibration of soils testing equipment. 7, 8, 10, 16, 23, 31, 53, 54
- 3.10.2 Maintain verification/calibration documentation of soils testing equipment. 26, 30, 31, 38, 45

3.11 Training

(Questions related to these tasks make up 1-9% of the exam.)

- 3.11.1 Train Level I and II soils technicians on standards for testing procedures.
8, 10, 11, 20, 22, 24, 29, 31, 35, 38, 42, 44, 46

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footnote number is linked to a reference on the Selected General References listing