

# Field testing strand – Technician Option

## New 37

### Describe field tests in the civil engineering industry

Level: 4 Credits: 15

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Entry information: Open.

Special notes

- 1 Applicable Rules, standards, and codes  
ISO/IEC 17025:2005 – *General Requirements for the Competence of Testing and Calibration Laboratories* (ISO/IEC 17025); Available at <http://www.iso.org/iso/store.htm>  
NZS 4402:1986 - *Methods of testing soils for civil engineering purposes*;  
Available at <http://www.standards.co.nz>.  
Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes. December 2005  
Available at <http://www.nzgeotechsoc.org.nz>
- 2 Definitions  
*Samples* may include but are not limited to – prepared materials and test materials such as standards and reagents.  
*Organisational requirements* refers to instructions to staff on policy and procedures which are formally documented or generally accepted at the work site. This may include legislation; industry standards and methods; national and international standards and methods; customer/organisation developed methods, standard operating procedures, specifications, manuals, and manufacturer's information.
- 3 Performance must be demonstrated and assessed in accordance with organisational requirements.  
Field tests must include Nuclear Density Meter, Benkelman Beam, Shear Vane, Scala penetrometer.  
And evidence for 5 of the following tests which may include but not limited to – cone penetrometer test, Static penetrometer test, Falling Weight Deflectometer, Lightweight deflectometer, Impact Soil Tester (Clegg), Sand circle, British pendulum, NAASRA, Grip Tester, Sand replacement, Balloon densometer, Core cutters, In situ - California Bearing Ratio, Plate bearing, soil and rock Logging.

Judgment statement

Verifier: The trainee has shown ability to meet the standard stated within this unit in accordance with company specifications, procedures and where appropriate manufacturer's instructions.

Assessor: Based on the evidence of the verifier and demonstrated skills and knowledge the candidate has met the criteria as specified within this unit including all range statements.

Focus: Throughout this area of assessment the candidate will need to consistently apply knowledge learned relating to: sound businesses practices, organisational business rules and legislative requirements relating to acts, codes and legislation listed above.

**Element 1**

Describe a field test method.

<b>Performance Criteria</b>	<b>Candidate</b>	<b>Verifier/Assessor</b>
1.1 The principle of the test is explained in terms of test requirements, equipment, processes involved and results.	▪	
1.2 Critical factors of the test are described in accordance with organisational requirements.		
Range: may include but is not limited to – temperature, humidity, environment.		
1.3 Variables of the test are described and the options to minimise variability is described in accordance with organisational requirements.		
Range: may include but is not limited to – selection of test location, equipment, apparatus, material, technique, calibration, environment.		
1.4 Quality assurance of the test is described in accordance with organisational requirements.		
Range: may include but is not limited to – sampling plan, test method, recording requirements.		

**Element 2**

Describe the application of field test results.

<b>Performance Criteria</b>	<b>Candidate</b>	<b>Verifier/Assessor</b>
<p>2.1 The application of test results is described in terms of process implications.</p> <p>Range: may include but is not limited to – out of specification results, in specification results, reporting.</p> <p>2.2 Critical limits of test results are described in accordance with organisational requirements.</p> <p>Range: may include but is not limited to – uncertainty of measurement, suitability, limitations.</p> <p>2.3 Reporting requirements for test results are described in accordance with organisational requirements.</p> <p>Range: may include but is not limited to – equipment, apparatus, material, technique, calibration, environment.</p>	▪	

## New 38

### Perform field Investigation tests in the civil engineering industry

Level: 4 Credits: 15

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Entry information: Open.

Special notes

- 1 Applicable Rules, standards, and codes  
ISO/IEC 17025:2005 – *General Requirements for the Competence of Testing and Calibration Laboratories* (ISO/IEC 17025); Available at <http://www.iso.org/iso/store.htm>  
NZS 4402:1986 - *Methods of testing soils for civil engineering purposes*;  
Available at <http://www.standards.co.nz>.  
Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes. December 2005  
Available at <http://www.nzgeotechsoc.org.nz>
- 2 Definitions  
*Samples* may include but are not limited to – prepared materials and test materials such as standards and reagents.  
*Organisational requirements* refers to instructions to staff on policy and procedures (including the application of legislation to work site situations) which are formally documented or generally accepted at the work site. This may include legislation; industry standards and methods; national and international standards and methods; standards and methods published in internationally recognised reputable texts; customer/organisation developed methods, standard operating procedures, specifications, manuals, and manufacturer’s information.
- 3 Performance must be demonstrated and assessed in accordance with organisational requirements.  
  
Evidence for 5 of the following tests which may include but not limited to – Nuclear Density Meter, Benkelman Beam, Shear Vane, Scala penetrometer, cone penetrometer test, Static penetrometer test, Falling Weight Deflectometer, Lightweight deflectometer, Impact Soil Tester (Clegg), Sand circle, British pendulum, NAASRA, Grip Tester, Sand replacement, Balloon densometer, Core cutters, In situ - California Bearing Ratio, Plate bearing, soil and rock Logging, soakage.

Judgment statement

- Verifier: The trainee has shown ability to meet the standard stated within this unit in accordance with company specifications, procedures and where appropriate manufacturer’s instructions.
- Assessor: Based on the evidence of the verifier and demonstrated skills and knowledge the candidate has met the criteria as specified within this unit including all range statements.
- Focus: Throughout this area of assessment the candidate will need to consistently apply knowledge learned relating to: sound businesses practices, organisational business rules and legislative requirements relating to acts, codes and legislation listed above.

<b>Element 1</b>		
Perform field tests on civil engineering materials		
<b>Performance Criteria</b>	<b>Candidate</b>	<b>Assessor</b>
1.1 Materials and equipment are prepared in accordance with organisational requirements.	▪	
1.2 Tests are performed according to organisational requirements.		
1.3 Test results are within precision requirements.		
1.4 Test equipment is maintained and stored.		

<b>Element 2</b>		
Calculate and report results of field tests on civil engineering materials.		
<b>Performance Criteria</b>	<b>Candidate</b>	<b>Assessor</b>
2.1 Results are recorded accurately and calculations performed according to organisational requirements.	▪	
Range: may include but is not limited to – sample site, sample description.		
2.2 Calculations are reported in accordance with organisational requirements.		

# Field testing strand – Senior Technician Option

## New 39

### Explain field tests in the civil engineering industry

Level: 5 Credits: 25

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Entry information: Open.

Special notes

- 1 Applicable Rules, standards, and codes  
ISO/IEC 17025:2005 – *General Requirements for the Competence of Testing and Calibration Laboratories* (ISO/IEC 17025);  
Available at <http://www.iso.org/iso/store.htm>  
NZS 4402:1986 - *Methods of testing soils for civil engineering purposes*;  
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- 2 Definitions  
*Samples* may include but are not limited to – prepared materials and test materials such as standards and reagents.  
*Organisational requirements* refers to instructions to staff on policy and procedures which are formally documented or generally accepted at the work site. This may include legislation; industry standards and methods; national and international standards and methods; customer/organisation developed methods, standard operating procedures, specifications, manuals, and manufacturer's information.
- 3 Performance must be demonstrated and assessed in accordance with organisational requirements.  
Field tests include - Nuclear Density Meter, Benkelman Beam, Shear Vane, Scala penetrometer, soil and rock Logging.  
And evidence for 5 of the following tests which may include but not limited to – cone penetrometer test, Static penetrometer test, Falling Weight Deflectometer, Lightweight deflectometer, Impact Soil Tester (Clegg), Sand circle, British pendulum, NAASRA, Grip Tester, Sand replacement, Balloon densometer, Core cutters, In situ - California Bearing Ratio, Plate bearing, soakage.

Judgment statement

- Verifier: The trainee has shown ability to meet the standard stated within this unit in accordance with company specifications, procedures and where appropriate manufacturer's instructions.
- Assessor: Based on the evidence of the verifier and demonstrated skills and knowledge the candidate has met the criteria as specified within this unit including all range statements.
- Focus: Throughout this area of assessment the candidate will need to consistently apply knowledge learned relating to: sound businesses practices, organisational business rules and legislative requirements relating to acts, codes and legislation listed above.

<b>Element 1</b>		
Explain a field test method.		
<b>Performance Criteria</b>	<b>Candidate</b>	<b>Verifier/Assessor</b>
1.1 The principle of the test is explained in terms of test requirements, equipment, processes involved and results.	▪	
1.2 Critical factors of the test are explained in accordance with organisational requirements.		
Range: may include but is not limited to – temperature, humidity, environment.		
1.3 Variables of the test are explained and the options to minimise variability is described in accordance with organisational requirements.		
Range: may include but is not limited to – selection of test location, equipment, apparatus, material, technique, calibration, environment.		
1.4 Quality assurance of the test is explained in accordance with organisational requirements.		
Range: may include but is not limited to – sampling plan, test method, recording requirements.		
1.5 Investigation and compliance testing are compared in terms in result use		
Range: may include but is not limited to – design, specification, verification.		

**Element 2**

Explain the application of investigation test results.

<b>Performance Criteria</b>	<b>Candidate</b>	<b>Verifier/Assessor</b>
<p>2.1 The application of test results is explained in terms of process implications.</p> <p>Range: may include but is not limited to – out of specification results, in specification results, reporting.</p> <p>2.2 Critical limits of test results are explained in accordance with organisational requirements.</p> <p>Range: may include but is not limited to – uncertainty of measurement, suitability, limitations.</p> <p>2.3 Reporting requirements for test results are explained in accordance with organisational requirements.</p> <p>Range: may include but is not limited to – equipment, apparatus, material, technique, calibration, environment.</p>	▪	

## New 40

### Evaluate and troubleshoot field tests in the civil engineering industry

Level: 5 Credits: 10

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Entry information: Tech unit.

#### Special notes

- 1 Applicable Rules, standards, and codes  
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NZS 4402:1986 - *Methods of testing soils for civil engineering purposes*;  
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- 3 Performance must be demonstrated and assessed in accordance with organisational requirements.  
  
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#### Judgment statement

- Verifier: The trainee has shown ability to meet the standard stated within this unit in accordance with company specifications, procedures and where appropriate manufacturer’s instructions.
- Assessor: Based on the evidence of the verifier and demonstrated skills and knowledge the candidate has met the criteria as specified within this unit including all range statements.
- Focus: Throughout this area of assessment the candidate will need to consistently apply knowledge learned relating to: sound businesses practices, organisational business rules and legislative requirements relating to acts, codes and legislation listed above.

**Element 1**

Evaluate results of field tests on civil engineering materials.

**Performance Criteria**

1.1 Results are interpreted in accordance with organisational requirements.

Range: may include but is not limited to – non-conformance, corrective action taken.

**Element 2**

Troubleshoot abnormal field test situations and results.

**Performance Criteria**

2.1 Troubleshooting abnormal field test situations identifies the nature of the problem, uses effective problem solving techniques and reaches a valid solution in accordance with organisational requirements.

2.2 Troubleshooting abnormal field test results identifies the nature of the problem, uses effective problem solving techniques and reaches a valid solution in accordance with organisational requirements.

**Candidate**

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**Assessor**