

Bituminous Binder strand – Technician Option

New 46

Describe bitumen or modified bitumen tests in the civil engineering industry

Level: 4 Credits: 15

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>
AS/NZS 2341:2008 – *Methods of testing bitumen and related roadmaking products*
Available at <http://www.standards.co.nz>.
ASTM D2170 - *07 Standard Test Method for Kinematic Viscosity of Asphalts (Bitumens)*
ASTM D140 / D140M - *09 Standard Practice for Sampling Bituminous Materials*
Available at <http://www.astm.org/index.shtml>
- 2 Definitions
Samples may include but are not limited to – prepared materials and test samples.
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.

Include – penetration, softening point, kinematic viscosity. And

Evidence for 2 of the following tests which may include but not limited to – dynamic viscosity, solubility, flash point (Cleveland open cup), rolling thin film, rheology (dynamic shear), flexural creep (bending beam rheometer), pressure ageing, ductility.

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 bitumen or modified bitumen test method.		
Performance Criteria	Candidate	Verifier/Assessor
<p>1.1 The principle of the test is explained in terms of sample requirements, equipment, processes involved and results.</p> <p>1.2 Critical factors of the test are described in accordance with organisational requirements.</p> <p>Range: may include but is not limited to – sample preparation, temperature, environment.</p> <p>1.3 Variables of the test are described and the options to minimise variability is described in accordance with organisational requirements.</p> <p>Range: may include but is not limited to – equipment, apparatus, material, technique, calibration, environment.</p> <p>1.4 Quality assurance of the test is described in accordance with organisational requirements.</p> <p>Range: may include but is not limited to – test method, recording requirements.</p>	<ul style="list-style-type: none"> ▪ 	

Element 2

Describe the application of test results.

Performance Criteria	Candidate	Verifier/Assessor
<p>2.1 The application of test results is described in terms of material properties.</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 47

Perform bitumen or modified bitumen tests in the civil engineering industry

Level: 4 Credits: 15

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>
TNZ M/1:2007 - *Specification For Roading Bitumens*
Available at <http://www.transit.govt.nz/technical/specifications.jsp>
AS/NZS 2341:2008 - *Methods of testing bitumen and related roadmaking products*
Available at <http://www.standards.co.nz>.
ASTM D4 - 86(2004) - *Standard Test Method for Bitumen Content*
ASTM D2170 - 07 - *Standard Test Method for Kinematic Viscosity of Asphalts (Bitumens)*
Available at <http://www.astm.org/index.shtml>.
- 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.
Include – penetration, softening point, kinematic viscosity.
Evidence for 2 of the following tests which may include but not limited to – dynamic viscosity, solubility, flash point (Cleveland open cup), rolling thin film, rheology (dynamic shear), flexural creep (bending beam rheometer), pressure ageing, ductility.

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		
Perform a bitumen or modified bitumen test		
Performance Criteria	Candidate	Assessor
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.		

Element 2		
Calculate and report results of bitumen or modified bitumen tests.		
Performance Criteria	Candidate	Assessor
2.1 Results are recorded accurately and calculations performed according to organisational requirements.	▪	
2.2 Calculations are reported in accordance with organisational requirements.		

New 48

Explain and complete bituminous binder sampling in the civil engineering industry

Level: 4 Credits: 8

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>
TNZ M/1:2007 - *Specification For Roading Bitumens*
Available at <http://www.transit.govt.nz/technical/specifications.jsp>
AS/NZS 2341:2008 - *Methods of testing bitumen and related roadmaking products*
Available at <http://www.standards.co.nz>.
ASTM D4 - 86(2004) - *Standard Test Method for Bitumen Content*
ASTM D2170 - 07 - *Standard Test Method for Kinematic Viscosity of Asphalts (Bitumens)*
Available at <http://www.astm.org/index.shtml>.
- 2 Definitions
Samples may include but are not limited to – prepared materials and test samples.
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.

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		
Explain requirements for bituminous binder sampling.		
Performance Criteria	Candidate	Assessor
1.1 The selection of sampling locations is explained in terms of representative sampling.	▪	
1.2 The selection of sample increments is explained in terms of homogeneous and representative sampling.		
1.3 The methods of sampling are described in terms of their use, limits and standards.		
1.4 The documentation requirements are explained in accordance with test and organisational requirements.		

Element 2		
Complete bituminous binder sampling.		
Performance Criteria	Candidate	Assessor
2.1 Sampling is planned in accordance with bituminous binder test and company requirements.	▪	
Range: may include but is not limited to – transport, access to sample site, customer communication.		
2.2 Take samples in accordance with test and company requirements.		
2.3 Label samples and document observations in accordance with test and company requirements.		
2.4 Sample is transported to testing location in accordance with test and company requirements.		

New 49

Describe bitumen emulsion tests in the civil engineering industry

Level: 4 Credits: 10

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>
TNZ M/1:2007 - *Specification For Roading Bitumens*
Available at <http://www.transit.govt.nz/technical/specifications.jsp>
AS/NZS 2341:2008 - *Methods of testing bitumen and related roadmaking products*
Available at <http://www.standards.co.nz>.
ASTM D4 - 86(2004) - *Standard Test Method for Bitumen Content*
ASTM D2170 - 07 - *Standard Test Method for Kinematic Viscosity of Asphalts (Bitumens)*
Available at <http://www.astm.org/index.shtml>.
- 2 Definitions
Samples may include but are not limited to – prepared materials and test samples.
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.

Evidence is required for tests including but not limited to - viscosity, sieve, binder content. pH

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 bitumen emulsion test method.

Performance Criteria	Candidate	Verifier/Assessor
1.1 The principle of the test is explained in terms of sample 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 – sample preparation, temperature, 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 – 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 – test method, recording requirements.		

Element 2		
Describe the application of bitumen emulsion test results.		
Performance Criteria	Candidate	Verifier/Assessor
<p>2.1 The application of test results is described in terms of material properties.</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>	<ul style="list-style-type: none"> ▪ 	

New 50

Perform bitumen emulsion tests in the civil engineering industry

Level: 4 Credits: 12

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>
TNZ M/1:2007 - *Specification For Roading Bitumens*
Available at <http://www.transit.govt.nz/technical/specifications.jsp>
AS/NZS 2341:2008 - *Methods of testing bitumen and related roadmaking products*
Available at <http://www.standards.co.nz>.
ASTM D4 - 86(2004) - *Standard Test Method for Bitumen Content*
ASTM D2170 - 07 - *Standard Test Method for Kinematic Viscosity of Asphalts (Bitumens)*
Available at <http://www.astm.org/index.shtml>.
- 2 Definitions
Samples may include but are not limited to – prepared materials and test samples.
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 is required for tests including but not limited to – viscosity, sieve, binder content.

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		
Perform bitumen emulsion tests		
Performance Criteria	Candidate	Assessor
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.		

Element 2		
Calculate and report results of bitumen emulsion tests.		
Performance Criteria	Candidate	Assessor
2.1 Results are recorded accurately and calculations performed according to organisational requirements.	▪	
2.2 Calculations are reported in accordance with organisational requirements.		

Bituminous strand – Senior Technician Option

New 51

Explain bitumen or modified bitumen tests in the civil engineering industry

Level: 5 Credits: 20

Entry information: technician describe unit

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>
TNZ M/1:2007 - *Specification for Roading Bitumens*
Available at <http://www.transit.govt.nz/technical/specifications.jsp>
AS/NZS 2341:2008 - *Methods of testing bitumen and related roadmaking products*
Available at <http://www.standards.co.nz>.
ASTM D2170 - 07 - *Standard Test Method for Kinematic Viscosity of Asphalts (Bitumens)*
ASTM D4 - 86(2004) - *Standard Test Method for Bitumen Content*
Available at <http://www.astm.org/index.shtml>.
- 2 Definitions
Samples may include but are not limited to – prepared materials and test samples.
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.
Tests include – penetration, softening point, kinematic viscosity. And
Evidence for 2 of the following tests which may include but not limited to – dynamic viscosity, solubility, flash point (Cleveland open cup), rolling thin film, rheology (dynamic shear), flexural creep (bending beam rheometer), pressure ageing, ductility.

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

Explain a bitumen or modified bitumen test method.

Performance Criteria	Candidate	Verifier/Assessor
1.1 The principle of the test is explained in terms of sample 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 Bitumen and modified bitumen testing requirements are contrasted in terms of variations.		
Range: may include but is not limited to – technique, sample preparation, materials, equipment, apparatus.		

Element 2

Explain the application of bitumen or modified bitumen test results.

Performance Criteria	Candidate	Verifier/Assessor
<p>2.1 The application of test results is explained in terms of material properties.</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 52

Evaluate and troubleshoot bitumen or modified bitumen tests in the civil engineering industry

Level: 5 Credits: 10

Entry information: Technician perform unit.

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>
TNZ M/1:2007 - *Specification for Roading Bitumens*
Available at <http://www.transit.govt.nz/technical/specifications.jsp>
AS/NZS 2341:2008 - *Methods of testing bitumen and related roadmaking products*
Available at <http://www.standards.co.nz>.
ASTM D2170 - 07 - *Standard Test Method for Kinematic Viscosity of Asphalts (Bitumens)*
ASTM D4 - 86(2004) - *Standard Test Method for Bitumen Content*
Available at <http://www.astm.org/index.shtml>.
- 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.
Tests include – penetration, softening point, kinematic viscosity. And
Evidence for 2 of the following tests which may include but not limited to – dynamic viscosity, solubility, flash point (Cleveland open cup), rolling thin film, rheology (dynamic shear), flexural creep (bending beam rheometer), pressure ageing, ductility.

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 bitumen or modified bitumen tests.

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 bitumen or modified bitumen test results.

Performance Criteria

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

Candidate

Troubleshoot abnormal bitumen or modified bitumen test results in accordance with organisational requirements.

- identify the nature of the problem
- Use effective problem solving techniques
- Reaches a valid solution

Assessor

Troubleshooting identifies the nature of the problem, use effective problem solving techniques and reaches a valid solution to abnormal field investigation test situations and results in accordance with organisational requirements

Model scenarios can be developed or captured to provide a benchmark for troubleshooting situations appropriate to the level.

New 53

Explain bitumen emulsion tests in the civil engineering industry

Level: 5 Credits: 8

Entry information: Technician describe unit.

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>
TNZ M/1:2007 - *Specification for Roving Bitumens*
Available at <http://www.transit.govt.nz/technical/specifications.jsp>
AS/NZS 2341:2008 - *Methods of testing bitumen and related roadmaking products*
Available at <http://www.standards.co.nz>.
ASTM D2170 - 07 - *Standard Test Method for Kinematic Viscosity of Asphalts (Bitumens)*
ASTM D4 - 86(2004) - *Standard Test Method for Bitumen Content*
Available at <http://www.astm.org/index.shtml>.
- 2 Definitions
Samples may include but are not limited to – prepared materials and test samples.
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.
Tests include but are not limited to – viscosity, sieve, binder content. pH

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

Expalin a bitumen emulsion test method.

Performance Criteria	Candidate	Verifier/Assessor
1.1 The principle of the test is explained in terms of sample 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, 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 – 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.		

Element 2

Explain the application of bitumen emulsion test results.

Performance Criteria	Candidate	Verifier/Assessor
<p>2.1 The application of test results is explained in terms of material properties.</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 54

Evaluate and troubleshoot bitumen emulsion tests in the civil engineering industry

Level: 5 Credits: 7

Entry information: Technician perform unit.

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>
TNZ M/1:2007 - *Specification for Roading Bitumens*
Available at <http://www.transit.govt.nz/technical/specifications.jsp>
AS/NZS 2341:2008 - *Methods of testing bitumen and related roadmaking products*
Available at <http://www.standards.co.nz>.
ASTM D2170 - 07 - *Standard Test Method for Kinematic Viscosity of Asphalts (Bitumens)*
ASTM D4 - 86(2004) - *Standard Test Method for Bitumen Content*
Available at <http://www.astm.org/index.shtml>.
- 2 Definitions
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- 3 Performance must be demonstrated and assessed in accordance with organisational requirements.
Tests include – penetration, softening point, kinematic viscosity.
Evidence for 2 of the following tests which may include but not limited to – dynamic viscosity, solubility, flash point (Cleveland open cup), rolling thin film, rheology (dynamic shear), flexural creep (bending beam rheometer), pressure ageing, ductility.

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 bitumen emulsions tests.

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 bitumen emulsions test results.

Performance Criteria

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

Candidate

▪

Assessor

New 55

Explain bitumen sprayer tests in the civil engineering industry

Level: 5 Credits: 10

Entry information: Technician describe unit

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>
BCA T/1 Method for spray bar distribution test
BCA T/2 Method for thermometer calibration
BCA T/3 Method for dipstick calibration
BCA T/4 Method for speed control test
Available at ???
- 2 Definitions
Samples may include but are not limited to – prepared materials and test samples.
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

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		
Explain the bitumen sprayer distribution test method.		
Performance Criteria	Candidate	Verifier/Assessor
1.1 The principle of the test is explained in terms of materials, 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 – sprayer preparation, location, temperature, 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 – 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 – test method, recording requirements.		

Element 2

Describe bitumen sprayer verification test methods.

Range: temperature gauge verification, speed control verification, dipstick verification

Performance Criteria	Candidate	Verifier/Assessor	
2.1 The principle of the test is explained in terms of equipment, processes involved and results.	▪		
2.2 Critical factors of the test are explained in accordance with organisational requirements. Range: may include but is not limited to – preparation, location, environment.			
2.3 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 – equipment, apparatus, material, technique, calibration, environment.			
2.4 Quality assurance of the test is explained in accordance with organisational requirements. Range: may include but is not limited to – test method, recording requirements.			

Element 3

Explained the application of bitumen sprayer test results.

Range: sprayer distribution, temperature gauge verification, speed control verification, dipstick verification

Performance Criteria	Candidate	Verifier/Assessor
<p>3.1 The application of test results is explained in terms of material properties.</p> <p>Range: may include but is not limited to – out of specification results, in specification results, reporting.</p> <p>3.2 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>3.3 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>	<ul style="list-style-type: none">▪	

New 56

Perform bitumen sprayer tests in the civil engineering industry

Level: 5 Credits: 15

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>
TNZ T/01:1977 - Benkelman Beam Deflection Measurements
TNZ T/03:1981 - Measurement of Texture by the Sand Circle Method
TNZ T/04:1981 - Description of Test Locations on Highways
What is T/2?
Available at <http://www.transit.govt.nz/technical/specifications.jsp> .
- 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.

Sprayer distribution plus 2 of the following - temperature gauge verification, speed control verification, dipstick verification

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		
Perform bitumen sprayer tests		
Performance Criteria	Candidate	Assessor
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.		

Element 2		
Calculate, interpret and report results of bitumen sprayer tests.		
Performance Criteria	Candidate	Assessor
2.1 Results are recorded accurately and calculations performed according to organisational requirements.	▪	
2.2 Results are interpreted in accordance with organisational requirements.		
2.3 Calculations are reported in accordance with organisational requirements.		