Title

Demonstrate knowledge of mix design fundamentals and treatment selection for bituminous mixes

Level

4

Credits

6

Purpose

People credited with this unit standard are able to demonstrate knowledge of mix design fundamentals and treatment selection for bituminous mixes.

Classification

Infrastructure Works > Bitumen Surfacing Construction

Available grade

Achieved

Explanatory notes

1 Assessment against this unit standard must be based on the fundamental principles of treatment selection in the following references:
New Zealand Transport Agency specifications at http://www.nzta.govt.nz
NZTA P9: Specification for Construction of Asphaltic Concrete Paving;
NZTA P9P (Auckland): Specification for Construction of Asphaltic Concrete Paving
NZTA M10: Specification for Dense graded and stone mastic asphalt
NZTA M10 Notes: Notes to the Specification for Dense graded and stone mastic asphalt;
NZTA P11: Specification for Open Graded Porous Asphalt;
NZTA P11 Notes: Notes to the Specification for Open Graded Porous Asphalt;
NZTA T10: Specification for State Highway Skid Resistance Management;
NZTA T10 Notes: Notes to the Specification for State Highway Skid Resistance Management.

2 Definitions
Job Mix Formula (JMF) is the combined aggregate particle size distribution and total bitumen content that falls within the SME and produces a mix that complies with specified volumetric and mechanical criteria.
OGPA stands for open graded porous asphalt.
SME stands for Specified Mix Envelope or the asphaltic concrete particle size distribution and effective bitumen content limits, which are set out in NZTA Specification M10 Specification for Dense graded and stone mastic asphalt; available at http://www.nzta.govt.nz/resources/.
VMA stands for voids in mineral aggregates

Outcomes and evidence requirements

Outcome 1
Demonstrate knowledge of mix design fundamentals for bituminous mixes.
Evidence requirements

1.1 Components of bituminous mixes are defined in accordance with NZTA M10 and described in terms of their properties for use in road pavements.

Range components – coarse aggregate, fine aggregate, mineral filler, binder, RAP, one other component such as industrial by-product; properties – air voids, adhesion, gradation, absorption, cleanliness, moisture content, crushing resistance, polished stone value, abrasion.

1.2 Mix types are defined in terms of their composition and grades for different courses.

Range mix types – PA20, PA25HV, PA15HS; composition – layer thickness, binder content, VMA, nominal mix size; grades – gap graded, dense graded, open graded; courses – base, wearing, levelling.

1.3 Factors that impact on the performance of bituminous mixes are explained in terms of their effects.

Range aggregate absorption, adhesion, moisture susceptibility, traffic volume, traffic type, compaction, voids, texture, skid resistance, thickness, binder content, film thickness, noise reduction.

1.4 Tests for volumetric and mechanical properties of mixes are described and adjustments are explained in terms of what is required to achieve job mix formula.

Range three tests including volumetric; adjustments – target gradation, target binder content, tolerances, target air voids.

Outcome 2

Demonstrate knowledge of treatment selection for bituminous mixes.

Evidence requirements

2.1 Treatment selection for bituminous mixes is explained in terms of determining site conditions.

Range determining from – records, site visit; ten site conditions.

2.2 Treatment selection is explained in terms of appropriate mixes for different courses.

Range courses – base, wearing, levelling; two mixes for each course.
2.3 Treatment selection is explained in terms of selecting appropriate surface preparations for different mix types.

Range preparations – pre-levelling, blinding, membrane seal, tack coat; scabbling, texturing, milling; mix types – PA20, PA25HV, PA15HS.

2.4 Treatment selection is explained in terms of selecting combinations of mix type, mix binder, and mix additives for specific requirements.

Range requirements – texture, skid resistance, drainage, permeability, stress resistance, chemical resistance, carpark, container cranes, airport, hardstand, forklifts, high-deflection pavement, other.

2.5 Treatment selection is explained in terms of mix types for noise reducing surface layers.

Range OGPA, twin layer, noise measurement, voids, permeability, cleaning OGPA.

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**Planned review date**

31 December 2019

**Status information and last date for assessment for superseded versions**

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<th>Process</th>
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**Consent and Moderation Requirements (CMR) reference**

0101


**Please note**

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMRs). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.
Comments on this unit standard

Please contact the Infrastructure ITO qualifications@infrastructureito.org.nz if you wish to suggest changes to the content of this unit standard.