Title | Demonstrate knowledge of chipseal design fundamentals and treatment selection for chipseals
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Level | 4 Credits 6

Purpose | People credited with this unit standard are able to demonstrate knowledge of: chipseal design fundamentals, and treatment selection for chipseals.

Classification | Infrastructure Works > Bitumen Surfacing Construction

Available grade | Achieved

Explanatory notes

1 Competence in this unit standard requires knowledge of the current editions of the following references:
   New Zealand Transport Agency specifications at http://www.nzta.govt.nz/resources/:
   - NZTA P/3: Specification for First Coat Sealing;
   - NZTA P/3 Notes: Notes for First Coat Sealing;
   - NZTA P/4: Specification for Resealing;
   - NZTA P/4 Notes: Notes for Resealing;
   - NZTA P17: Performance Based Specification for Reseals;
   - NZTA P17 Notes: Notes for the Specification for Bituminous Reseals;
   - NZTA T/3: Standard test procedure for measurement of texture by the sand circle method;

2 Definition
   - ELV means equivalent light vehicles.
   - HCV means heavy traffic vehicles.
Outcomes and evidence requirements

Outcome 1

Demonstrate knowledge of chipseal design fundamentals.

Evidence requirements

1.1 The measurement and effect of texture on chipseal design is described in accordance with Chapter 9 in *Chipsealing New Zealand*.

  Range measurement – sand circles and their location, laser, void bitumen.

1.2 The effect of traffic on chipseal design is described in accordance with Chapter 9 in *Chipsealing New Zealand*.

  Range traffic – volume, heavy commercial vehicles, equivalent light vehicles per lane per day, location of traffic on road.

1.3 The effects of chip size and shape on chipseal design are described in accordance with Chapter 9 Sections 11 and 12 in *Chipsealing New Zealand*.

1.4 The effects of site specific factors on chipseal are described in accordance with Chapter 9 in *Chipsealing New Zealand*.

  Range soft substrate, absorptive surface, steep grade, bridge, passing lane, slow lane, parking bay, low volume traffic, very high volume traffic, narrow lane widths.

1.5 The effect of chip shape on chipseal is described in accordance with Chapter 9 in *Chipsealing New Zealand*.

1.6 The design of residual binder application rates for seals is explained in accordance with the principles described in Chapter 9 in *Chipsealing New Zealand*.

  Range seals – void fill, single coat, two coat, racked-in, cape, sandwich, geotextile, combination, pre-coated chip.

1.7 Factors affecting the final treatment selection and design are explained in accordance with Chapter 9 in *Chipsealing New Zealand*.

  Range traffic segmentation, traffic volume, texture variation, pavement hardness, high stress sites.

1.8 The design of residual binders is described in accordance with Section 9.9 in *Chipsealing New Zealand*.

  Range first coat seal – establishing a good bond, temperature, cutter; second coat and reseals – timing of design test, texture testing, grade of bitumen, high temperature, low temperature.
1.9 The design of chipseals is explained in terms of the reasons for using additives and the impacts of these additives on binder storage and handling requirements.

Range additives – flux, adhesion agent, emulsion, polymer, latex.

1.10 The design of chipseals is explained in terms of affects of construction factors on the quality of the final seal.

Range binder application factors – timing, sequence, process, temperature, viscosity, chemical reactions, seasonal recipe, additives;
traffic factors – rolling, volumes, speed, management;
climatic factors – wind, evaporation rate.

1.11 The design of chipseals is explained in terms of affects of chip application rates on the quality of the final seals.

Range seals – single coat, void filling, racked in, two coat, sandwich, combination, membrane, geotextile.

Outcome 2

Demonstrate knowledge of treatment selection for chipseals.

Evidence requirements

2.1 Types of pavement surface and their surfacing requirements are described in accordance with *Chipsealing in New Zealand*.

Range types of surface – granular base, stabilised base, chipseal, dense graded asphalt, cold mix, gap graded mix, open graded porous asphalt, slurry seal, concrete.

2.2 Site assessments for chipseal design are described in accordance with *Chipsealing in New Zealand*.

Range traffic usage, size of chip, texture and variation of existing surface, pavement suitability, pavement stresses, pavement shape.

2.3 Reasons for surface treatment selections and their impact on design processes are explained in accordance with *Chipsealing in New Zealand*.

Range surface treatments – first coat, second coat, reseal, texturising, crack-filling, multicoat, racked in, combination, sandwich, void, rejuvenation;
selection of – seal types, binder types, chip types, PSVs or aggregate sources, residual binder application rate, binder application rate, chip spread rate.
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.