<table>
<thead>
<tr>
<th>Title</th>
<th>Operate bitumen handbar sprayer equipment, and handspray bitumen for chipseal surfacing</th>
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<tbody>
<tr>
<td>Level</td>
<td>3</td>
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<td>Credits</td>
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**Purpose**

This unit standard is for people working in the pavement surfacing industry.

People credited with this unit standard are able to: identify, assess, control, and monitor health and safety hazards and adverse effects on the environment associated with bitumen handbar sprayer operations; perform operator servicing and maintenance on bitumen handbar sprayer and equipment; prepare for bitumen handbar sprayer operations; prepare for bitumen transfer and heating operations with a bitumen handbar sprayer; undertake bitumen transfer operations with a bitumen handbar sprayer; heat and circulate bituminous liquids in a bitumen handbar sprayer; confirm readiness of site for bitumen handbar spraying operations; prepare for, and spray bituminous liquids on pavement surfaces using a bitumen handbar sprayer; complete bitumen handbar spraying documentation and reporting; and clean bitumen handbar sprayer equipment.

**Classification**

Pavement Surfacing > Chipseal Surfacing

**Available grade**

Achieved

**Prerequisites**

Unit 20450 Describe safe heating, blending, modification, and transfer of bulk bituminous liquids; Unit 20455, Demonstrate basic knowledge of safety relating to bituminous materials and associated products; Unit 20459, Transport bulk bituminous liquids by road and assist with loading and unloading; and Unit 23615, Demonstrate knowledge of bitumen handbar sprayers and operations; or demonstrate equivalent knowledge and skills.

**Guidance Information**

1. The following legislation and requirements apply to this unit standard, and must be complied with:
   - Hazardous Substances and New Organisms Act 1996 (HSNO);
   - Health and Safety at Work Act 2015;
   - Resource Management Act 1991;
   - Land Transport Act 1998;
Local authority requirements;
*The Safe Handling of Bituminous Materials Used in Roading – Code of Practice 9904:2006,* and
*The Bitumen Safety Handbook,* Roading New Zealand, available for purchase at
https://civilcontractors.co.nz/resources/industry-information/order-resources/;
*Chipsealing in New Zealand,* New Zealand Transport Authority, available at
Contract specifications;
Bitumen handbar sprayer manufacturer’s manual;
Tank wagon manufacturer’s instructions;
Company procedure manuals.

Any legislation or other requirements superseding any of the above will apply, pending the review of this unit standard.

2 Personal protective equipment must be used throughout operations in accordance with company procedures.

3 Assessment against this unit standard must be based on evidence from a workplace context.

4 Definitions

*Bitumen handbar sprayer* means a tank wagon or trailer specifically built for hand spraying bituminous materials on pavement surfaces, and excludes gangbar types.

*Company procedures* refers to all documented policies, procedures, and methodologies of the candidate’s employer at the time of training including but not limited to those relating to health, safety, environment, quality, and operations.

*Job requirements* take account of site conditions to meet contract specifications, and accord with procedures and work instructions written in quality manuals.

*Walk round* means to walk around a machine or equipment inspecting it, and its environment, for hazards and removing hazards that may impair operation.

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**Outcomes and performance criteria**

**Outcome 1**

Identify, assess, control, and monitor health and safety hazards and adverse effects on the environment associated with bitumen handbar sprayer operations.

**Range**

operations – transferring, heating, circulating, flushing, decontaminating, clearing blockages.

**Performance criteria**

1.1 Health hazards are identified, assessed, and controlled in accordance with company procedures and legislation.

1.2 Safety hazards are identified, assessed, and controlled in accordance with company procedures, legislation, and *The Bitumen Safety Handbook*.

1.3 Adverse effects on the environmental are identified, assessed, and controlled in accordance with company procedures.
1.4 Health and safety hazards are monitored in accordance with company procedures.

Range includes but is not limited to – hazardous material, obstruction, people in the vicinity, personal injury.

1.5 Adverse effects on the environment are monitored in accordance with company procedures.

Range includes but is not limited to – noise, emission, spill.

1.6 Procedures for preventing water contamination of hot bituminous liquids are demonstrated in accordance with Code of Practice RNZ 9904:2006 and company procedures.

Range includes but is not limited to – process of adding additives.

1.7 Compatibility of previous load and product to be loaded is determined from documentation.

1.8 Tank and equipment are checked for possible water contamination and procedures for dealing with water contamination are demonstrated or simulated in accordance with Code of Practice RNZ 9904:2006 and company procedures.

1.9 Health and safety and environmental issues are communicated to operators and associated staff.

Outcome 2

Perform operator servicing and maintenance on bitumen handbar sprayer and equipment.

Performance criteria

2.1 Machinery is checked in accordance with operator servicing requirements, and minor adjustments are made in accordance with the bitumen handbar sprayer manufacturer’s manual.

Range includes but is not limited to – fuel, tank, valves, bitumen pump, pipework, hoses, spray nozzle, heating system, instrumentation; includes, if fitted, – bitumen filter, air tank, air control system.

2.2 Hoses and couplings are checked for current certification and for wear and tear, and are replaced, if necessary, in accordance with company procedures.

2.3 Safe operating procedures for regulating handbar pressure are demonstrated in accordance with the bitumen handbar sprayer manufacturer’s manual and company procedures.
2.4 Procedures for clearing blockages are demonstrated in accordance with Code of Practice RNZ 9904:2006, bitumen handbar sprayer manufacturer’s manual, and company procedures.

Range blockages – bitumen pump, valves, pipework, hoses, handbar.

2.5 Bitumen filter, if fitted, is cleaned and frequency of cleaning is maintained in accordance with bitumen handbar sprayer manufacturer’s manual and company procedures.

2.6 Routine servicing and maintenance are documented in accordance with company procedures.

Outcome 3

Prepare for bitumen handbar sprayer operations.

Performance criteria

3.1 Job requirements are determined in accordance with company procedures, Chipsealing in New Zealand, and contract specifications.

Range location, limits, binder type, binder quantity, application rate, temperature, quality assurance requirements.

3.2 Preoperational documentation is confirmed and/or completed in accordance with company procedures.

Range dangerous goods, emergency procedures, tank contents.

3.3 Prestart safety and operational checks are carried out in accordance with manufacturer’s instructions, handbar sprayer’s manual, and company procedures.

Range walk round, first aid equipment, vehicle controls, vehicle gauges, tank, heating system, valves, bitumen pump, pipework, hoses, handbar, personal protective equipment; includes, if fitted – bitumen filter, air tank, air control system.

Outcome 4

Prepare for bitumen transfer and heating operations with a bitumen handbar sprayer.

Range hot bitumen, emulsified bitumen; transfer from – storage tank, road tank wagon; transfer to another tank; evidence is required of each of the above in any combination.
Performance criteria

4.1 Site for heating and transferring of bulk bituminous liquids in the field is selected with consideration for workers, public, and environmental safety, and is in accordance with company procedures.

4.2 Compatibility of previous load with product to be loaded is determined in accordance with Code of Practice RNZ 9904:2006 and company procedures.

4.3 Quantity and type of product or blend to be transferred are confirmed in accordance with company procedures, and job and/or client requirements.

   Range includes but is not limited to – allowance for modifying existing contents of tank.

4.4 Delivery and receiving tanks, and placarding are inspected in accordance with dangerous goods classification of the product to be transferred.

4.5 Position and parking of bitumen handbar sprayer is checked to ensure safe transfer and enable vehicle to be moved with minimal manoeuvring in the event of an emergency.

4.6 Warning signage and cones are positioned and fire extinguishers are placed ready for use in accordance with Code of Practice RNZ 9904:2006 and company procedures.

4.7 Certification and safe condition of hoses and couplings are confirmed in accordance with Code of Practice RNZ 9904:2006 and company procedures.

4.8 Electrical bonding earth straps, if fitted, are connected and overhead filling equipment or filling hoses are positioned and securely clamped in preparation for loading and unloading in accordance with Code of Practice RNZ 9904:2006 and company procedures.

4.9 Delivery and receiving tanks, pumping equipment, hatches, valves, inlets, and outlets are inspected and confirmed as being ready for transfer in accordance with company procedures, The Bitumen Safety Handbook, bitumen handbar sprayer manufacturer’s manual, and tank wagon manufacturer’s instructions.

Outcome 5

Undertake bitumen transfer operations with a bitumen handbar sprayer.

Performance criteria

5.1 A check is made to ensure unauthorised persons are clear of the operational area.
5.2 Bitumen is transferred in accordance with company procedures, *The Bitumen Safety Handbook*, and bitumen handbar sprayer manufacturer’s manual.

Range hot bitumen, emulsified bitumen; transfer from – storage tank, road tank wagon; transfer to another tank; evidence is required of each of the above in any combination.

5.3 Total volume of load is checked and does not exceed the maximum load carrying capacity of vehicle.

5.4 On completion of transfer, pipelines and/or hoses are purged, the transfer equipment, hoses, and earth strap, if fitted, are disconnected and secured, and tank valves and hatches are secured, in accordance with *Code of Practice RNZ 9904:2006* and company procedures.

5.5 Handbar sprayer, ancillary equipment, and receiving tank are checked for leaks and the site is checked for spillage in accordance with company procedures, *The Bitumen Safety Handbook*, and the bitumen handbar sprayer manufacturer’s manual.

5.6 Warning signs and cones are removed and stored in accordance with company procedures.

5.7 Dangerous goods documentation appropriate to the load is completed, and is placed in the vehicle’s dangerous goods folder in accordance with *Code of Practice RNZ 9904:2006*.

**Outcome 6**

Heat and circulate bituminous liquids in a bitumen handbar sprayer.

**Performance criteria**

6.1 Bulk bituminous liquid is heated in accordance with company procedures, *The Bitumen Safety Handbook*, and the bitumen handbar sprayer manufacturer’s manual.

6.2 Heating rates and maximum temperatures are monitored and controlled in accordance with the requirements of the product.

Range straight or cutback bitumen, standard cationic or anionic emulsified bitumen.

6.3 Bitumen is circulated in accordance with company procedures and the bitumen handbar sprayer manufacturer’s manual.
Outcome 7

Confirm readiness of site for bitumen handbar spraying operations.

Performance criteria

7.1 Temporary traffic management and health and safety requirements are confirmed in accordance with job requirements.

7.2 Availability of materials, and availability and readiness of other plant required for chipseal construction, are confirmed in accordance with company procedures.

7.3 Acceptance of site for spraying is confirmed in accordance with job requirements.

Outcome 8

Prepare for, and spray, bituminous liquids on pavement surfaces using a bitumen handbar sprayer.

Range  liquids – a cutback bitumen, an emulsified bitumen; first coat seal, reseal, two-coat seal; evidence is required of each of the above in any combination.

Performance criteria

8.1 Services are protected and masking material is placed in accordance with job requirements.

8.2 Immediately prior to spraying, binder temperature and volume are measured and recorded in accordance with job requirements and company procedures.

8.3 Handbar sprayer is positioned and equipment is prepared for spraying in accordance with the bitumen handbar sprayer manufacturer’s manual and job requirements.

8.4 On-site communications are carried out in accordance with company procedures and job requirements.

8.5 Bituminous liquids are hand sprayed onto pavement surfaces in accordance with job requirements.

8.6 Uniform distribution of liquid is achieved from spray pattern.

8.7 Target application rates are monitored and achieved.

8.8 At the end of spraying operations all masking and surplus materials are removed and disposed of in accordance with company procedures.

8.9 Vehicle is prepared for travel in accordance with the bitumen handbar sprayer manufacturer’s manual, company procedures, and dangerous goods legislation.
Outcome 9

Complete bitumen handbar spraying documentation and reporting.

**Performance criteria**

9.1 Records and documents are completed in accordance with company procedures.

Range includes but is not limited to – dangerous goods documents, spray docket, quality assurance data.

9.2 Information is communicated to other parties, both internal and external, in accordance with company procedures and job requirements.

Range spray docket, quality assurance data, handbar sprayer maintenance.

Outcome 10

Clean bitumen handbar sprayer equipment.

**Performance criteria**

10.1 Handbar sprayer equipment is emptied, flushed, and decontaminated in accordance with the handbar sprayer’s manual and *The Bitumen Safety Handbook*.

Range tank, hoses, pipes, handbar.

10.2 Handbar sprayer equipment, hoses, and couplings are inspected and secured in accordance with the handbar sprayer’s manual.

10.3 Waste materials are disposed of in accordance with company procedures and legislation.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

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

<table>
<thead>
<tr>
<th>Process</th>
<th>Version</th>
<th>Date</th>
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<tr>
<td>Registration</td>
<td>1</td>
<td>25 May 2007</td>
<td>31 December 2013</td>
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<tr>
<td>Review</td>
<td>2</td>
<td>15 March 2012</td>
<td>31 December 2020</td>
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<tr>
<td>Review</td>
<td>3</td>
<td>24 January 2019</td>
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**Consent and Moderation Requirements (CMR) reference** 0101