



## **National Unit specification: general information**

**Unit title:** Reinstatement in Hot-lay Bituminous Materials

**Unit code:** F937 04

**Superclass:** TK

**Publication date:** October 2014

**Source:** Scottish Qualifications Authority

**Version:** Second

## **Credit points and level**

1 National Unit credit(s) at SCQF level 5: (1 SCQF credit points at SCQF level 5\*)

*\*SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

### Unit Aim

This unit is designed to allow the candidate to demonstrate the skills and knowledge required to carry out reinstatement using hot-lay bituminous surfacing material. The candidate will be able to prepare the pavement layer to receive hot-lay surfacing materials, to identify and select materials to be used for the reinstatement, and to construct the hot-lay bituminous binder course and the asphalt surface course, using the correct equipment. They will also be able to identify and dispose correctly and safely of surplus materials, and materials that cannot be re-used.

#### Learning Outcome 1 Prepare the layer of pavement structure to receive hot-lay surfacing materials

##### **Assessment criteria:**

- 1.1 use suitable **equipment** to remove interim reinstatement material to the correct depth
- 1.2 remove loose and unacceptable **materials** from the area to be reinstated using suitable **equipment**
- 1.3 identify and rectify any pavement layer surface contamination or defects
- 1.4 use suitable **equipment** to trim back edges where damage has occurred
- 1.5 use suitable **equipment** to re-position displaced ironwork, kerbs and edge restraints in accordance with established levels
- 1.6 confirm against the **specifications** that the correct depth is left for the hot-lay surface material.

#### Learning Outcome 2 Understand how to prepare the layer of pavement structure to receive hot-lay surfacing materials

##### **Assessment criteria:**

- 2.1 describe **equipment** to use for removing interim reinstatement material
- 2.2 explain how to check that interim reinstatement material is removed to the correct depth
- 2.3 explain why loose and unacceptable **materials** are removed from the area to be reinstated
- 2.4 describe how to remove loose and unacceptable **materials** from the area to be reinstated
- 2.5 explain the implications of pavement layer surface contamination or defects
- 2.6 explain how to identify and rectify pavement layer surface contamination or defects
- 2.7 explain how to identify and rectify edge damage and undercut
- 2.8 describe how to re-position displaced ironwork, kerbs and edge restraints
- 2.9 explain the implications of incorrect pavement layer construction.

### Learning Outcome 3 Construct the bituminous binder course

#### **Assessment criteria:**

- 3.1 confirm the delivery temperature of hot-lay bituminous material prior to laying
- 3.2 select compaction **equipment** and ensure that it is
  - (a) suitable for the operation
  - (b) in working condition and safe to use
- 3.3 maintain specialist tools at the correct temperature for working with hot bituminous material
- 3.4 seal the edges according to the specification
- 3.5 select, spread and level hot bituminous material binder course
- 3.6 handle hot-lay bituminous material correctly
- 3.7 store hot-lay bituminous material correctly
- 3.8 compact the hot bituminous material according to the specification.

### Learning Outcome 4 Understand how to construct a bituminous base (roadbase) and binder course

#### **Assessment criteria:**

- 4.1 describe quality requirements of the selected material
- 4.2 explain why it is important to use hot-lay bituminous material at the correct temperature
- 4.3 explain why it is important to maintain tool temperatures when working with hot-lay bituminous **materials**
- 4.4 describe how to spread and level bituminous material in base (roadbase) and/or binder course and surface course layers
- 4.5 explain the factors that influence the selection of **equipment** for the prescribed operation
- 4.6 explain how to select hand tools and compaction **equipment** for the prescribed operation
- 4.7 explain how to check that **equipment** is in working condition and safe to use
- 4.8 describe handling and storage **procedures** for hot-lay bituminous material
- 4.9 explain the reasons for sealing cavity edges before placing surface layers
- 4.10 explain compaction **procedures** for hot-lay bituminous material
- 4.11 describe how to confirm that compacted layer thickness meets **specifications**.

### Learning Outcome 5 Construct the asphalt surface course

#### **Assessment criteria:**

- 5.1 apply tack coat as necessary
- 5.2 check the temperature of hot bituminous material before laying it
- 5.3 maintain specialist tools at the correct temperature for working with bituminous material
- 5.4 handle hot-lay bituminous material correctly
- 5.5 store hot-lay bituminous material correctly
- 5.6 use suitable **equipment** to select, spread and level hot bituminous material in a surface course layer
- 5.7 select compaction **equipment** that is in working condition and safe to use
- 5.8 compact the hot-lay bituminous material according to the specification
- 5.9 make adequate provision for skid resistance and texture depth in the surface course.

## Learning Outcome 6 Understand how to construct an asphalt surface course

### Assessment criteria:

- 6.1 explain the correct **procedures** and requirements for applying tack coat
- 6.2 describe the quality requirements for the selected material
- 6.3 explain why it is important to use hot-lay bituminous material at the correct temperature
- 6.4 explain why it is important to maintain tool temperatures when working with hot-lay bituminous **materials**
- 6.5 describe how to spread and level bituminous material in an asphalt surface course layer
- 6.6 explain the factors that influence the selection of **equipment** for the prescribed operation
- 6.7 describe handling and storage **procedures** for hot-lay bituminous material
- 6.8 explain how to check that **equipment** is in working condition and safe to use
- 6.9 explain compaction **procedures** for hot-lay bituminous material
- 6.10 explain the method used to ensure skid resistance and texture depth from **specifications**

## Learning Outcome 7 Dispose of surplus materials

### Assessment criteria:

- 7.1 identify **materials** that are unsuitable for re-use or surplus to requirements
- 7.2 store surplus **materials** and those unsuitable for reuse in safe temporary storage
- 7.3 ensure **materials** for disposal are loaded safely for transportation

## Learning Outcome 8 Understand how to dispose of surplus materials

### Assessment criteria:

- 8.1 explain how to identify **materials** that are unsuitable for re-use or surplus to requirements
- 8.2 explain the importance of storing unsuitable and re-usable **materials** separately
- 8.3 describe how to load **materials** safely for transportation
- 8.4 explain when surplus **materials** should be removed from site.

## Learning Outcome 9 Follow safe working practices for locating and avoiding underground apparatus and highways services

### Assessment criteria:

- 9.1 follow current relevant health and safety regulations, standards and other legislation relating to:
  - (a) **working practices** within the construction environment
  - (b) **working practices** specific to any practical task that they are required to carry out.
- 9.2 identify the current relevant health and safety regulations, standards and other legislation that must be applied in relation to:
  - (a) **working practices** within the construction environment
  - (b) **working practices** specific to any practical task that they are required to carry out.
- 9.3 leave the site in a clean and safe condition

9.4 describe how to leave the site in a clean and safe condition.

### Evidence Requirements / Scope

Some terms, used in the assessment criteria, cover a range of situations, as follows:

1. **Equipment** includes:
  - (a) Hand tools – including square and round mouth shovels, hand pick, hard bristle broom, profile board, measuring tape, rake hot hand tamper, tool heater, wheelbarrow, water butt, probe thermometer, bitumen bucket, edge seal applicator, Turk’s head brush.
  - (b) powered equipment – including breakout equipment, pavement saw, vibrotamper, vibrating roller or vibrating plate, disc cutter, road saw
2. Safe **working practices** include:
  - (a) safe use of tools and equipment
  - (b) PPE (including, as necessary: high visibility jacket or waistcoat, hard hat, ear defenders, gloves, protective footwear, waterproof clothing, eye protection visor or goggles, dust mask)
  - (c) use of risk assessment methods to identify and control hazards on site
  - (d) precautions to minimise danger or inconvenience to road users
  - (e) precautions to minimise danger or inconvenience to site personnel
  - (f) precautions to minimise damage to equipment or apparatus
  - (g) safe working practices for working with molten bitumen
  - (h) personal hygiene measures in connection with skin contamination.
3. **Specifications** and **procedures** include:
  - (a) Specification for the Reinstatement of Openings in Highways
  - (b) Health and Safety Guidance 47, *Avoiding Danger from Underground Services*
  - (c) Health and Safety Guidance 150, *Health and Safety in Construction*
  - (d) manufacturers’ operating procedures for powered tools and plant.
4. **Materials** identified for constructing a bituminous binder course include:
  - (a) dense binder course materials (20mm nominal stone size), hot rolled asphalt 50/20 binder course
  - (b) close graded surface course materials (10mm stone size), hot rolled asphalt 30/14 surface course.

*(Note: In small excavations and narrow trenches, the preferred binder course mixture may be replaced by any surface course mixture given in the Specification, for the respective road Type, provided the same mixture is used as the surface course.)*
5. **Materials** identified for constructing an asphalt concrete surface course to BS EN 13108 and PD 6691 in accordance with specifications to include:
  - (a) hot rolled asphalt binder and surface course
  - (b) close graded surface course materials (10mm stone size)
  - (c) asphalt concrete dense surface course
  - (d) stone mastic asphalt surface and binder course
  - (e) pre-coated 14mm or 20mm chippings
  - (f) edge sealants
  - (g) tack coat.
6. **Materials** for disposal include:

- (a) unsuitable surplus materials
- (b) surplus materials that are suitable for re-use.

7. **Procedures** for handling, transportation and laying of asphalt concrete in accordance with specifications BS 594987 and PD 6691. (*Note: These standards and documents replace earlier ones and should be used in conjunction with the BS EN 13108.*)

### **Assessment Requirements**

Assessment for this unit consists of practical observations and knowledge questioning to cover the requirements of the learning outcomes.

Current requirements for practical observations, including assessor and verifier qualifications and facilities requirements are provided in the joint awarding organisation centre document.