

Unit Aim

This unit is designed to allow the learner to demonstrate the skills and knowledge required to monitor the reinstatement of flexible base (roadbase) and surface layers in bituminous materials. The learner will be able to monitor the selection of bituminous materials (hot and cold-lay), monitor the selection of compaction plant for the reinstatement of bituminous materials and monitor the construction of the flexible base (roadbase) and surface layers. The learner will also be able to monitor site safety throughout sub-base and base (roadbase) reinstatement.

Learning Outcome 1 Monitor the selection of bituminous materials for flexible footway and carriageway reinstatement
Assessment criteria:

- 1.1 ensure that the bituminous **materials** are identified and checked against the current **specification**
- 1.2 ensure that the quantities of **materials** selected for use meet reinstatement requirements
- 1.3 ensure that bituminous **materials** are stored in line with current **specifications and procedures**
- 1.4 check for any problems with the selection and storage of bituminous **materials**, and confirm the appropriate action.

Learning Outcome 2 Understand how to monitor the selection of bituminous materials for flexible footway and carriageway reinstatement
Assessment criteria:

- 2.1 describe the range of bituminous **materials** permitted in the current **specification**
- 2.2 explain the **factors** influencing the selection of bituminous **materials** and the consequences of using unsuitable **materials**
- 2.3 calculate quantities of different bituminous **materials** used in flexible footway and carriageway reinstatement
- 2.4 describe suitable and safe storage **procedures** for bituminous **materials**
- 2.5 describe potential problems with selection and storage of bituminous **materials**, and the appropriate remedial action.

Learning Outcome 3 Monitor the selection of plant for compaction of bituminous materials
Assessment criteria:

- 3.1 ensure that the **compaction plant** is:
 - (a) suitable to the location and **materials**
 - (b) suitable to dimensions and access provisions of the site
 - (c) in working condition and safe to use
- 3.2 check for any problems with the selection of plant for the compaction of bituminous material, and confirm the appropriate action.

Learning Outcome 4 Understand how to monitor the selection of plant for the compaction of bituminous materials

Assessment criteria:

- 4.1 explain the **factors** that influence the selection of **compaction plant**
- 4.2 describe how to check that the **compaction plant** is in working condition and safe to use
- 4.3 describe potential problems with the selection of **compaction plant** for reinstatement in bituminous **materials**, and the appropriate remedial action.

Learning Outcome 5 Monitor the construction of flexible base (roadbase) and surface layers in hot and cold-lay bituminous materials

Assessment criteria:

- 5.1 ensure that the base (roadbase) and flexible surface layers are constructed in accordance with
 - (a) the **specification**
 - (b) the existing pavement structure and road type
- 5.2 check using the correct measuring **equipment** that the layers are constructed
 - (a) using suitable **powered equipment** and **materials**
 - (b) to the correct compaction level
 - (c) to the correct layer thickness and degree of compaction
- 5.3 check that the texture depth and finished level of the surface reinstatement are correct
- 5.4 ensure that the profile of the finished surface is within permitted tolerances
- 5.5 check for any problems with the construction of the base (roadbase) and flexible surface layers, and confirm the appropriate action.

Learning Outcome 6 Understand how to monitor the construction of flexible, base (roadbase) and surface layers in hot and cold-lay bituminous materials

Assessment criteria:

- 6.1 describe how to interpret the **specification** for constructing the bituminous flexible, base (roadbase) and surface layers in different pavement structures and road types
- 6.2 describe the intervention limits permitted in **specifications**
- 6.3 describe how to check construction of the layers to ensure the
 - (a) correct use of **equipment** and **materials**
 - (b) achieved compaction level
 - (c) correct layer thickness, degree of compaction and permitted tolerances
- 6.4 describe how to check that the texture depth and finished level of the surface reinstatement are correct
- 6.5 describe how to check that the profile of the finished surface is within permitted tolerances
- 6.6 describe potential problems with the construction of the base (roadbase) and surface layers and the appropriate remedial action.

Learning Outcome 7 Monitor site safety

Assessment criteria:

- 7.1 ensure that a risk assessment has been carried out
- 7.2 monitor site operations in accordance with health and safety requirements.
- 7.3 assess site conditions in accordance with health and safety requirements.
- 7.4 ensure that **safety equipment** is available and fit for purpose
- 7.5 ensure that **safe working practices** are followed in line with health and safety requirements and current relevant **specifications**
- 7.6 check for risks to site safety, and confirm the appropriate action required
- 7.7 ensure that the site is left in a clean and safe condition.

Learning Outcome 8 Understand how to monitor site safety

Assessment criteria:

- 8.1 explain the purpose of an on-site risk assessment
- 8.2 describe the health and safety requirements for site operations
- 8.3 describe the health and safety requirements for particular site conditions
- 8.4 describe the **safety equipment** required during site operations and how to ensure that it is fit for purpose
- 8.5 describe **safe working practices** on site
- 8.6 describe the potential risks to site safety and the appropriate remedial action
- 8.7 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. **Materials** are materials identified for constructing base (roadbase) and for constructing an asphalt concrete surface course to BS EN 13108 and PD 6691 in accordance with specifications, to include:
 - (a) deferred set mixtures for reinstatement
 - (b) permanent cold-lay binder course materials
 - (c) edge sealants
 - (d) dense binder course materials (20mm nominal stone size), hot rolled asphalt 50/20 binder course
 - (e) close graded surface course materials (10mm stone size), hot rolled asphalt 30/14 surface course
 - (f) hot rolled asphalt binder and surface course
 - (g) close graded surface course materials (10mm stone size)
 - (h) asphalt concrete dense surface course
 - (i) stone mastic asphalt surface and binder course
 - (j) pre-coated 14mm or 20mm chippings
 - (k) tack coat.

(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.)

2. **Factors** influencing the selection of materials and compaction plant include:
 - (a) constituent mix for asphalt concrete
 - (b) temperature limits for hot bituminous materials
 - (c) polished stone values
 - (d) aggregate abrasion values
 - (e) penetration grade of binders
 - (f) constituent mix for hot dense bituminous materials
3. **Specifications and procedures** include:
 - (a) Specification for the Reinstatement of Openings in Highways
 - (b) Health and Safety Guidance 150, *Health and Safety in Construction*,
 - (c) manufacturers' operating procedures for powered tools and plant
 - (d) *Safety and Street Works and Road Works – A Code of Practice*.
4. **Safe working practices** include:
 - (a) safe use of tools and equipment
 - (b) use of appropriate 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 practice for working with molten bitumen
 - (h) personal hygiene measures in connection with skin contamination.
5. **Compaction plant/powered equipment** includes:
 - (a) vibrotamper
 - (b) vibrating plate
 - (c) vibrating roller
 - (d) percussive rammer.
6. **Equipment** may include as necessary:
 - (a) measuring devices, rule and tape
 - (b) forks
 - (c) rakes
 - (d) shovels
 - (e) tool heater
 - (f) hand tamper.
7. **Safety equipment** may include as necessary:
 - (a) adequate range of signing, lighting and guarding equipment (including signs, cones, signals, lamps, footway boards, barriers, portable traffic signals)
 - (b) high visibility safety equipment
 - (c) suitable materials to construct ramps.

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.