

Reinstatement of concrete slabs

Certificate Aim

This certificate has been designed to allow the candidate to demonstrate the skills and knowledge required to carry out the reinstatement of a concrete slab. The candidate will be able to prepare the sub-base to receive the concrete slab. The candidate will be able to prepare the edges of the existing slab for concrete reinstatement, lay mesh reinforcement and form the concrete slab using the correct equipment and materials. The candidate will also be able to correctly identify and safely dispose of surplus materials and materials that cannot be re-used.

Learning Outcome 1 Prepare sub-base to receive concrete slab

Assessment criteria:

- 1.1 remove loose and unacceptable materials from the area to be reinstated using suitable equipment
- 1.2 identify and correct any defects in the sub-base using specified materials
- 1.3 select sub base compaction equipment and ensure that it is
 - (a) suitable for the operation
 - (b) in working conditions and safe to use
- 1.4 compact the sub base according to specification
- 1.5 use the specification to confirm that the finished sub-base level accommodates the correct slab thickness.

Learning Outcome 2 Understand how to prepare sub-base to receive concrete slab

Assessment criteria:

- 2.1 state why loose and unacceptable materials are removed from the area to be reinstated
- 2.2 state how loose and unacceptable materials are removed from the area to be reinstated
- 2.3 identify different sub-base defects that could be encountered
- 2.4 identify approved sub-base materials for replacing unacceptable materials
- 2.5 define the procedures for replacing defective sub-base materials with approved materials
- 2.6 define the factors that influence the selection of equipment for the prescribed operation
- 2.7 state the checks required to ensure that equipment is in working condition and safe to use
- 2.8 state how to check that the sub-base material is adequately compacted
- 2.9 define how the cavity depth is checked to ensure it will accommodate the specified slab thickness.

Learning Outcome 3 Prepare the edges of existing slab to receive concrete reinstatement

Assessment criteria:

- 3.1 saw cut the edge of the existing slab according to the specification, using the appropriate equipment
- 3.2 prepare the unsawn section of the exposed slab edge according to the specification to form a support using steel dowel bars or taper edge support
- 3.3 place the slip membrane in position and overlap it
- 3.4 clean and wet all edges prior to placing the concrete.

Learning Outcome 4 Understand how to prepare the edges of existing slab to receive concrete reinstatement

Assessment criteria:

- 4.1 state how to correctly saw cut the edge of an existing slab
- 4.2 state how to rough cut the unsawn section of the exposed slab edge to form a taper-edge support
- 4.3 define the support requirements for concrete slab reinstatement using dowel bars including
 - (a) how to drill the unsawn section to provide a sliding fit for dowel bars
 - (b) the diameter and length of dowel bars required for the reinstatement
 - (c) how to cut and position dowel bars
- 4.4 define the problems that may be caused by not placing slip membranes in accordance with specifications
- 4.5 state the importance of cleaning and wetting the edges of the existing slab prior to the placement of concrete.

Learning Outcome 5 Lay mesh reinforcement

Assessment criteria:

- 5.1 expose the existing mesh reinforcement
- 5.2 select new mesh reinforcement to match the existing reinforcement
- 5.3 cut the mesh reinforcement to the correct size, including the required overlap
- 5.4 tie the new mesh reinforcement securely to the existing reinforcement.

Learning Outcome 6 Understand how to lay mesh reinforcement

Assessment criteria:

- 6.1 state the minimum length of the existing reinforcement to expose, and when to use further trimming
- 6.2 define the factors that influence the selection of mesh reinforcement
- 6.3 state the procedures for measuring and cutting mesh reinforcement
- 6.4 define how to position new reinforcement and how to attach it to existing reinforcement

Learning Outcome 7 Form concrete slab

Assessment criteria:

- 7.1 replace missing or damaged joints to match existing joints
- 7.2 carry out slump testing of concrete to confirm workability
- 7.3 place concrete to a uniform level according to the specification
- 7.4 compact the concrete using suitable equipment to achieve maximum density
- 7.5 finish the concrete surface to the approved texture to ensure skid resistance
- 7.6 apply suitable curing method appropriate to prevailing conditions.

Learning Outcome 8 Understand how to form concrete slab

Assessment criteria:

- 8.1 identify the types of carriageway on which concrete reinstatement is carried out
- 8.2 state the correct procedures for replacing and constructing different types of joints
- 8.3 define how to check that concrete conforms to specifications and quality requirements
- 8.4 identify equipment required to compact concrete safely and achieve maximum density
- 8.5 state the strength of concrete required prior to opening to traffic
- 8.6 define how to confirm the workability of concrete
- 8.7 state the texture and skid resistance required for the finished surface
- 8.8 define the methods and purpose of curing concrete according to prevailing conditions.

Learning Outcome 9 Dispose of surplus materials

Assessment criteria:

- 9.1 identify materials that are unsuitable for re-use or surplus to requirements
- 9.2 Store surplus materials and those unsuitable for reuse in safe temporary storage
- 9.3 ensure materials for disposal are loaded safely for transportation

Learning Outcome 10 Understand how to dispose of surplus materials

Assessment criteria:

- 10.1 define how materials that are unsuitable for re-use or surplus to requirements are identified
- 10.2 state the importance of removing unsuitable materials from site.
- 10.3 state when surplus materials should be removed from site.

Learning Outcome 11 Follow safe working practices

Assessment criteria:

- 11.1 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.
- 11.2 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.
- 11.3 leave the site in a clean and safe condition
- 11.4 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 as necessary square mouth shovel, hand pick, rake, hand rammer, reinforcing bar cutters, wire cutting tools, trowel, hand tamping beam, hard bristle broom.
 - (b) powered equipment – including as necessary vibrotamper, powered concrete cutting equipment, powered concrete drill, powered saw, a proprietary vibrator.
- 2. **Sub-base material** includes:
 - (a) granular sub-base Type 1 material
 - (b) pavement quality concrete (as described in specifications and SHW 1000)
 - (c) alternative reinstatement materials (ARMs).
- 3. **Safe working practices** may 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.
- 4. **Specifications and procedures** include:
 - (a) Specification for the Reinstatement of Openings in Highways
 - (b) Specification for Highways Works Series 1000 (Clause 1001)
 - (c) *Safety and Street Works and Road Works – A Code of Practice.*
 - (d) Health and Safety Guidance 47, *Avoiding Danger from Underground Services*
 - (e) Health and Safety Guidance 150, *Health and Safety in Construction*
 - (f) manufacturers' operating procedures for powered tools and plant.

5. **Support** must be provided using
 - (a) steel dowel bars of 20mm or 25mm nominal diameter.
6. The **mesh reinforcement** includes standard weights of mesh reinforcement.
7. **Joints** include:
 - (a) contraction joints
 - (b) expansion joints
 - (c) warping joints.
8. The **concrete** includes:
 - (a) Class 32/40 concrete
 - (b) air entrainment additive.
9. **Materials** for disposal include:
 - (a) unsuitable surplus materials
 - (b) surplus materials that are suitable for re-use.
10. Types of carriageway to include Types 0, 1, 2, 3 and 4 concrete and bituminous overlaid concrete roads

Assessment Requirements and Guidance

Assessment for this unit consists of practical observations and a multiple-choice knowledge examination to cover the requirements of the learning outcomes.

Current requirements for practical observations, including Assessor and Internal Quality Assurer qualifications and facilities requirements are provided in the HAUC (UK) The Street Works Assessment Strategy and The Streetworks Centre Compliance Document.