

Monitoring reinstatement and compaction of backfill materials

Certificate Aim

This certificate has been designed to allow the candidate to demonstrate the skills and knowledge required to monitor the reinstatement and compaction of backfill materials. The candidate will be able to monitor the selection and storage of backfill materials, monitor the selection of compaction plant for backfilling operations, monitor the construction of the backfill layer, and monitor the action taken to avoid damage to underground apparatus during backfilling. The candidate will also be able to monitor the site safety throughout backfill operations.

Learning Outcome 1	Monitor the selection and storage of backfill materials in footway and carriageway reinstatement
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Assessment criteria:

- 1.1 ensure that materials selected for re-use and imported materials are checked against the range of backfill materials permitted in the current specification
- 1.2 ensure that the correct materials are selected for use as surround to utilities' apparatus and in sensitive areas
- 1.3 ensure that the correct quantities of materials are calculated for use
- 1.4 ensure that safe arrangements are made for the storage of re-usable and imported materials in accordance with current specifications and procedures
- 1.5 ensure that safe temporary storage arrangements are made for materials not suitable for re-use in accordance with current specifications and procedures
- 1.6 ensure that the quantities of materials selected for re-use meet the reinstatement requirements
- 1.7 check for problems with the selection and storage of backfill materials and confirm the appropriate action required.

Learning Outcome 2	Understand how to monitor the selection and storage of backfill materials in footway and carriageway reinstatement
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Assessment criteria:

- 2.1 identify the range of backfill materials permitted in the current specification
- 2.2 define the factors that influence the selection of materials for use as backfill or for disposal
- 2.3 state the consequences of using unsuitable materials for backfill
- 2.4 identify the materials that are suitable for use in high-risk areas
- 2.5 define the safe storage arrangements for:
 - (a) re-usable materials
 - (b) imported materials
 - (c) materials unsuitable for re-use
- 2.6 state how the characteristics of materials affect storage arrangements
- 2.7 state the potential problems with selection and storage of backfill materials, and the appropriate remedial action.

Learning Outcome 3 Monitor the selection of plant for compaction of backfill material

Assessment criteria:

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

Learning Outcome 4 Understand how to monitor the selection of plant for compaction of backfill material

Assessment criteria:

- 4.1 define the factors that influence the selection of compaction plant and equipment
- 4.2 state how to check that the compaction plant is fit for purpose
- 4.3 state the potential problems with the selection of compaction plant, and the appropriate remedial action.

Learning Outcome 5 Monitor the construction of the backfill layer

Assessment criteria:

- 5.1 ensure that the backfill layer is constructed in accordance with the
 - (a) specification
 - (b) existing pavement structure
 - (c) road type
- 5.2 ensure that the backfill layer is checked using suitable equipment and materials for the job
- 5.3 check that the backfill layer is constructed correctly to
 - (a) the structural level
 - (b) the layer thickness
 - (c) the number of compaction passes and the degree of compaction
 - (d) high risk areas
- 5.4 check for any problems with the construction of the backfill layer and confirm the appropriate action required.

Learning Outcome 6 Understand how to monitor the construction of the backfill layer

Assessment criteria:

- 6.1 state how to interpret the specification for constructing the backfill layer in footway and carriageway reinstatement
- 6.2 define how to check the construction of the backfill layer to ensure:
 - (a) the correct use of equipment and materials
 - (b) the achieved compaction level
 - (c) the correct layer thickness and degree of compaction
 - (d) correct construction in high-risk areas.

6.3 state the methods used to confirm that construction of the backfill layer meets specifications

6.4 state the potential problems with the construction of the backfill layer, and the appropriate remedial action.

Learning Outcome 7 Monitor the action taken to avoid damage to underground apparatus during backfill operations

Assessment criteria:

- 7.1 ensure that exposed utilities apparatus is identified correctly
- 7.2 ensure the exposed utilities apparatus is **safely supported and protected**
- 7.3 ensure that precautions are taken to minimise the risk of damage to utilities apparatus
- 7.4 identify damage to underground utilities apparatus and confirm the action required.

Learning Outcome 8 Understand how to monitor the action taken to avoid damage to underground apparatus during backfill operations

Assessment criteria:

- 8.1 state how to identify the different types of utilities apparatus on site
- 8.2 identify the different methods of safely supporting and protecting exposed utilities apparatus
- 8.3 define the potential risks and consequences of damage to utilities apparatus
- 8.4 state the precautions required to avoid damage to utilities apparatus
- 8.5 state the potential problems arising from damage to utilities' apparatus, and the appropriate remedial action.

Learning Outcome 9 Monitor site safety

Assessment criteria:

- 9.1 ensure that a risk assessment has been carried out
- 9.2 monitor site operations in accordance with health and safety requirements
- 9.3 assess site conditions in accordance with health and safety requirements
- 9.4 ensure that safety equipment is available and fit for purpose
- 9.5 ensure that safe working practices are followed in line with current relevant specifications
- 9.6 check for risks to site safety, and confirm the appropriate action required
- 9.7 ensure that the site is left in a clean and safe condition

Learning Outcome 10 Understand how to monitor site safety

Assessment criteria:

- 10.1 define the purpose of a site-specific risk assessment
- 10.2 state the health and safety requirements for site operations
- 10.3 define the health and safety requirements for different site conditions
- 10.4 define the safety equipment required during site operations and how to ensure that it is fit for purpose
- 10.5 state the safe working practices on site
- 10.6 define the potential risks to site safety and the appropriate remedial action
- 10.7 state 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** include:
 - (a) Class A Graded Granular
 - (b) Class B Granular
 - (c) Class C Cohesive Granular
 - (d) Class D Cohesive
 - (e) Class E Unacceptable.
2. **Specifications and procedures** include:
 - (a) Specification for the Reinstatement of Openings in Highways/Roads
 - (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
 - (e) Safety and Street Works and Road Works – A Code of Practice.
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. **Compaction plant/powering equipment** includes:
 - (a) vibrotamper
 - (b) vibrating plate
 - (c) vibrating roller
 - (d) percussive rammer
 - (e) hand rammer.
5. **Measuring equipment** may include as necessary:
 - (a) measuring devices, rule and tape
 - (b) impact soil testing equipment.
6. **Utilities apparatus** includes:
 - (a) plastic and metallic gas mains
 - (b) plastic and metallic water mains
 - (c) sewers and drains
 - (d) high- and low-voltage electricity cables
 - (e) telecommunications and television cables.
7. Utilities apparatus is **safely supported and protected** using:
 - (a) slings
 - (b) ropes

(c) props.

8. **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.

9. **High risk areas** includes:

- (a) as a surround to utilities' apparatus
- (b) in close proximity to trees
- (c) bad ground conditions
- (d) special engineering difficulty.

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.