



National Unit specification: general information

Unit title: Monitoring Reinstatement and Compaction of Backfill Materials

Unit code: F93C 04

Superclass: TK

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Version: Second

Credit points and level

1 National Unit credit(s) at SCQF level 6: (1 SCQF credit points at SCQF level 6*)

**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 learner to demonstrate the skills and knowledge required to monitor the reinstatement and compaction of backfill materials. The learner 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 learner will also be able to monitor site safety throughout backfill operations.

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

- 2.1 describe the range of backfill **materials** permitted in the current specification
- 2.2 explain the factors that influence the selection of **materials** for use as backfill or for disposal
- 2.3 describe the consequences of using unsuitable **materials** for backfill
- 2.4 describe the **materials** that are suitable for use in **high risk areas**
- 2.5 describe safe storage arrangements for:
 - (a) re-usable **materials**
 - (b) imported **materials**
 - (c) **materials** unsuitable for re-use
- 2.6 explain how the characteristics of **materials** affect storage arrangements
- 2.7 describe 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** is:
 - (a) suitable to the location and **materials**
 - (b) suitable to the 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 **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 explain the factors that influence the selection of **compaction plant**
- 4.2 describe how to check that the **compaction plant** is fit for purpose
- 4.3 describe 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 compaction level
 - (b) the layer thickness
 - (c) 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 describe how to interpret the specification for constructing the backfill layer in footway and carriageway reinstatement
- 6.2 describe 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 describe the methods used to confirm that construction of the backfill layer meets **specifications**
- 6.4 describe 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 explain how to identify the different types of **utilities apparatus** on site
- 8.2 describe different methods of **safely supporting and protecting** exposed **utilities apparatus**
- 8.3 explain the potential risks and consequences of damage to **utilities apparatus**
- 8.4 explain the precautions required to avoid damage to **utilities apparatus**
- 8.5 describe 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 explain the purpose of an on-site risk assessment
- 10.2 describe the health and safety requirements for site operations
- 10.3 describe the health and safety requirements for different site conditions
- 10.4 describe the **safety equipment** required during site operations and how to ensure that it is fit for purpose
- 10.5 describe **safe working practices** on site
- 10.6 describe the potential risks to site safety and the appropriate remedial action
- 10.7 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** include:
 - (a) Class A
 - (b) Class B
 - (c) Class C
 - (d) Class D
 - (e) Class E.
2. **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
 - (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/powered equipment** includes:
 - (a) vibrotamper
 - (b) vibrating plate
 - (c) vibrating roller
 - (d) percussive rammer.
5. Measuring **equipment** may include as necessary:
 - (a) measuring devices, rule and tape.

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

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.