National Unit Specification: general information

UNIT Installation of Trunking Systems (SCQF level 5)

CODE F5HY 11

SUMMARY

This Unit is intended for candidates with little or no prior knowledge of electrical trunking systems but who wish to gain some experience in the fabrication and assembly of such systems with a view to developing their skills further in terms of a career choice.

The aim of this Unit is to introduce candidates to trunking systems as a means of providing a protective enclosure for electrical wiring. They will be able to identify types of metallic and non-metallic trunking and their accessories and to develop the skills of fabrication and assembly of trunking systems.

Candidates will also be introduced to a simple lighting circuit having one-way control and will install this circuit in a safe manner using single-core PVC cables within a trunking enclosure.

This Unit may form part of an National Qualification Group Award or may be offered on a free-standing basis.

OUTCOMES

1 Identify trunking types and their accessories.
2 Demonstrate the techniques used in the fabrication and assembly of trunking systems.
3 Wire and operate a simple one-way lighting control circuit using single-core PVC cables enclosed in a trunking system.

Administrative Information

Superclass: XJ

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National Unit Specification: general information (cont)

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RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained one of the following or equivalent:

- Standard Grade Mathematics — General Level
- Standard Grade Technological Studies — General Level
- Standard Grade Science — GeneralLevel

CREDIT VALUE

1 credit at SCQF level 5 (6 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.*

CORE SKILLS

There is no automatic certification of Core Skills in this Unit.

This Unit provides opportunities for candidates to develop aspects of the following Core Skills:

- Problem Solving (SCQF level 5)
- Numeracy (SCQF level 5)

These opportunities are highlighted in the Support Notes of this Unit Specification.

National Unit Specification: statement of standards

UNIT Installation of Trunking Systems (SCQF level 5)

Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit Specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

OUTCOME 1

Identify trunking types and their accessories.

Performance Criteria

(a) Identify correctly non-metallic trunking of various sizes.
(b) Identify correctly metallic trunking of various sizes.
(c) Identify correctly accessories for non-metallic trunking systems.
(d) Identify correctly accessories for metallic trunking systems.

OUTCOME 2

Demonstrate the techniques used in the fabrication and assembly of trunking systems.

Performance Criteria

(a) Measure trunking to given dimensions.
(b) Cut non-metallic and metallic trunking to given dimensions.
(c) Correctly form 90^{o} flat and internal bends in both non-metallic and metallic trunking.
(d) Correctly form flat sets in both non-metallic and metallic trunking.
(e) Correctly assemble a simple trunking system using both non-metallic and metallic trunking.

OUTCOME 3

Wire and operate a simple one-way lighting control circuit using single-core PVC cables enclosed in a trunking system.

Performance Criteria

(a) Draw clearly and correctly the wiring diagram for a one-way lighting arrangement from a given circuit diagram.
(b) Wire correctly a one-way lighting arrangement in a trunking system, using single-core PVC cables.
(c) Terminate correctly electrical accessories to the wiring of a one-way lighting circuit.
(d) Operate a one-way lighting circuit in a safe and correct manner.

National Unit Specification: statement of standards (cont)

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EVIDENCE REQUIREMENTS FOR THIS UNIT

Evidence is required to demonstrate that candidates have achieved all Outcomes and Performance Criteria.

Performance evidence supplemented with an assessor observation checklist and written and/or recorded oral evidence should be produced to demonstrate that the candidate has achieved all the Outcomes and Performance Criteria. The evidence should be produced under supervised, controlled conditions in a practical environment throughout the duration of the Unit.

An appropriate form of assessment could be a single, holistic practical assignment which incorporates all the Outcomes and Performance Criteria.

Candidates should be presented with an 'installation specification' showing a trunking system comprising of non-metallic and metallic trunking, each having one flat 90^o bend, one internal 90^o bend and one flat set and accessories to include couplers, end caps and lids. A circuit diagram showing one light controlled by a one-way switch should also be included in the specification.

The wiring system should be connected to the energy supply through a consumer's Unit having appropriate circuit protection.

The assessment parameters are as follows:

With regard to Outcome 1:

- two types and two sizes for each of the metallic and non-metallic trunkings should be identified
- four accessories for use with each of the metallic and non-metallic trunking should be identified

With regard to Outcome 2:

- carry out the fabrication techniques of measuring, cutting, bending (90^o flat and internal), setting (flat) to given dimensions
- assemble the fabricated sections to form assemblies in both non-metallic and metallic trunking (both the non-metallic and metallic assemblies may be integrated into one trunking system)

With regard to Outcome 3:

- draw an appropriate wiring diagram from the circuit diagram provided (one-way lighting control)
- carry out a wiring exercise to form the lighting circuit using single-core PVC cables in a trunking enclosure
- terminate the wiring into the appropriate accessories and have the tutor inspect and test the wiring and connect the supply voltage
- operate the control switch to ensure correct operation of the circuit

National Unit Specification: support notes

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This part of the Unit Specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT

This is an optional Unit within the National Certificate in Electrical Engineering at SCQF level 5.

The aim of this Unit is to introduce candidates to trunking systems as a means of providing a protective enclosure for electrical wiring and to provide opportunities for them to develop their skills in the fabrication and assembly of a simple trunking system.

The Unit will enable candidates to identify types of metallic and non-metallic trunking and their accessories and to develop the skills of fabrication and assembly of trunking systems.
It will also introduce candidates to a simple lighting circuit having one-way control which they will install in a safe manner using single-core PVC cables within a trunking enclosure.

The tutor MUST ensure that the candidate works safely at all times and that the wiring arrangement has been inspected and tested and is correct, prior to energising the circuit.

This Unit has links with the technology Units in the National Certificate in Electrical Engineering at SCQF level 5 and may be delivered as part of the suite of 'Wiring System' Units.

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

This Unit should be delivered in a practical environment and should encourage candidates to become familiar with the terminology of the trunking installations and systems.

Candidates should be provided with opportunities to become familiar with 'specifications' for basic trunking installations and the transfer of this information into practical systems.

Opportunities should be provided to allow candidates to develop their practical skills in measuring, cutting and forming trunking systems to given dimensions and to the assembly of a simple system.

This practical approach should be continued to allow candidates to develop their skills in reading and interpreting circuit diagrams and how these are translated into wiring arrangements which are capable of being installed in trunking systems.

Candidates should be able to identify the hand tools used in the construction of trunking and wiring systems and be taught the correct use of hand tools in this context.

It is important that all THREE Outcomes of this Unit are delivered in a practical manner which develops the candidate's hand and assembly skills and an understanding of circuit and wiring diagrams.

National Unit Specification: support notes (cont)

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The Outcomes should be delivered in the sequence given in the 'statement of standards'. The practical aspects of these Outcomes should be demonstrated to candidates with the reasons for particular techniques being fully explained. Candidates should then be given opportunities to practice these techniques.

Tutors MUST always ensure that candidates work in a safe manner and the Health and Safety workshop procedures of the Centre should be continually emphasized and implemented.

Tutors MUST also ensure that they have inspected and tested ALL circuit wiring produced by candidates in accordance with the requirements of BS7671 and that circuits are connected to the supply voltage only after these conditions have been satisfied.

It is recommended that the supply voltage used to energise candidate circuits is of a suitable safe value and that the connection of this voltage is carried out by the tutor

OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

Aspects of the Core Skill of *Problem Solving* will be developed and enhanced as candidates apply their knowledge and understanding of electrical trunking systems to undertake practical tasks. Candidates must select appropriate tools and techniques as they correctly assemble a simple trunking system and wire and operate a one way lighting control circuit. Safety regulations and requirements must be adhered to as work is planned, organised and completed efficiently. Group discussion on the effectiveness of approaches taken will be particularly useful to candidates with no experience of similar work.

Candidates also develop practical skills in measuring, cutting and forming trunking systems to given dimensions. They read, interpret and translate circuit diagrams. *Numeracy* skills will be naturally enhanced, with a focus on the practical application of number and graphics in an electrical engineering context.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by information and communications technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003), SQA Guidelines on e-assessment for Schools (BD2625, June 2005).*
The assessment of this Unit should take the form of a 'Practical Exercise' which extends over the duration of the Unit.

This exercise could contain the three elements specified in the Unit Outcomes ie:

- identification of trunking types and accessories
- fabrication and assembly of trunking systems
- wiring and operation of a simple lighting circuit

National Unit Specification: support notes (cont)

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These three elements should be integrated into one practical exercise with the achievements of each element being clearly recorded for each candidate.

The practical exercise should be conducted in a workshop environment under supervised and controlled conditions.

The Health and Safety of candidates must be paramount at all times and the tutor must be responsible for ensuring that all wiring carried out for assessment purposes is of a sufficiently high standard that it meets all the necessary BS7671 requirements prior to connection of the supply voltage.

DISABLED CANDIDATES AND/OR THOSE WITH ADDITIONAL SUPPORT NEEDS

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website **www.sqa.org.uk/assessmentarrangements**