
Overview

This standard is for people who install enclosures for electrical cables, conductors and wiring systems internally and externally.

The person carrying out this work must be able to comply with the procedures and methods for installing enclosures for electrical cables, conductors and wiring systems in accordance with the current versions of the appropriate industry standards and regulations, the specification, industry recognised working practices, the working environment and the natural environment. They must know and understand the different types of enclosures for electrical cables, conductors and wiring systems, their limitations, applications and the techniques for the positioning, fitting, fixing and connection of the enclosures, their components and accessories.

Please note that industry specific terminology is identified by *italic* text and its explanation and/or definition can be found in the glossary of this standard.

**Performance
criteria**

To carry out this work in accordance with the current versions of the appropriate industry standards and regulations, the specification, working practices, the working environment and the natural environment

You must be able to:

- P1 confirm the existing electrical supply is suitable for the **electrical system**
- P2 confirm before work starts that the work location and work area can be accessed safely and has been checked for the risk to other personnel on the **site**, and take appropriate action if a risk is present
- P3 produce a risk assessment and method statement for the work to be carried out, including the identification and use of *personal protective equipment*
- P4 verify that job information and documentation is current and relevant and that the **plant**, instruments, *access equipment* and tools are fit for purpose
- P5 select enclosures and confirm that they are:
 - P5.1 of the right type and size
 - P5.2 fit for purpose in accordance with the **electrical system's** design
- P6 determine at the outset, that the plans for positioning and fixing the components and accessories of the selected enclosures are in accordance with:
 - P6.1 the **electrical system's** design
 - P6.2 manufacturers' instructions
- P7 comply with industry practices and **organisational procedures** to ensure the co-ordination of **site services** and the activities of other trades
- P8 identify the correct means of electrical isolation prior to commencing installation work
- P9 complete the correct safe-isolation procedures, as and when required, to ensure the safe installation of the **enclosures**
- P10 measure and mark out the locations for fitting and fixing the selected **enclosures** components and accessories in accordance with:
 - P10.1 the **electrical system's** design
 - P10.2 manufacturers' instructions
- P11 fit, fix and connect the selected **enclosures** its components and accessories in accordance with:
 - P11.1 the **electrical system's** design
 - P11.2 industry recognised methods

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- P11.3 manufacturers' instructions
 - P12 confirm with the **relevant people**:
 - P12.1 those necessary variations to the planned programme of work that may have the potential to introduce a hazard and/or impact on the installation work to be undertaken
 - P12.2 the correct actions to be undertaken to ensure that any variations to the planned programme of work will not introduce a hazard and have minimum impact on the installation work to be undertaken
 - P13 implement **organisational procedures** for the safe transport and/or disposal of waste materials, substances and liquids in accordance with suppliers' and manufacturers' instructions

Knowledge and understanding

To carry out this work in accordance with the current versions of *the appropriate industry standards and regulations, the specification, working practices, the working environment and the natural environment*

You need to know and understand:

- K1 the operation, applications, advantages and limitations of different **electrical systems**
- K2 the appropriate industry standards and regulations relevant to installing **enclosures**
- K3 how to produce a risk assessment and method statement for the work to be carried out, including the identification and use of *personal protective equipment*, in accordance with:
 - K3.1 the **electrical system's** design
 - K3.2 **organisational procedures**
- K4 how to verify that job information and documentation is current and relevant and that the **plant**, instruments, *access equipment* and tools are fit for purpose
- K5 the applications, advantages and limitations of types of *personal protective equipment*
- K6 the applications, advantages and limitations of types of **enclosures**
- K7 the industry recognised methods for determining the type and size of **enclosures**
- K8 how to interpret diagrams and drawings for the **electrical system** to locate **site services**
- K9 how to interpret diagrams and drawings for the **electrical system** to identify the planned location of the **enclosures**
- K10 the methods and techniques for fitting, fixing and connecting the selected enclosures and their components and accessories in accordance with:
 - K10.1 the **electrical system's** design
 - K10.2 **manufacturers'** instructions
- K11 the correct procedures for safe isolation
- K12 the **organisational procedures** for confirming with the **relevant people** the appropriate actions to be taken to ensure that any variations to the planned programme of work will not introduce a hazard and have minimum negative impact on the installation work to be undertaken
- K13 the methods for the safe transport and/or disposal of waste material,

substances and liquids in accordance with suppliers' and manufacturers' instructions

Additional information**Scope related to performance criteria**

The contexts and circumstances below identify where and when the NOS could apply.

1 Working environments (internal and/or external)

- 1.1 commercial
- 1.2 industrial
- 1.3 domestic
- 1.4 agricultural
- 1.5 horticultural
- 1.6 leisure and entertainment
- 1.7 residential medical and care facilities
- 1.8 public highways and parks
- 1.9 *public services establishments*
- 1.10 pre 1919 traditional/historic buildings

2 Electrical system

An electrical system, internal and/or external, in a building and/or structure that has an extra low voltage and/or low voltage single and/or multi-phase supply, circuits, equipment and components to provide:

- 2.1 control
- 2.2 communication
- 2.3 heating
- 2.4 lighting
- 2.5 power

3 Site

- 3.1 new build construction – building or structure
- 3.2 an existing building or structure

4 Site services

- 4.1 electricity
- 4.2 water

- 4.3 gas
- 4.4 oil
- 4.5 drainage
- 4.6 telecommunications
- 4.7 data transmission either underground or overhead

5 **Organisation procedures**

- 5.1 information management
- 5.2 project management
- 5.3 risk assessment
- 5.4 risk management
- 5.5 implementing and monitoring health and safety requirements and issues
- 5.6 implementing and monitoring issues relating to the *natural environment*
- 5.7 customer services
- 5.8 accident reporting
- 5.9 emergencies
- 5.10 communication with relevant people

6 **Plant**

- 6.1 generators
- 6.2 transformers for low voltage hand-tools
- 6.3 lifting equipment
- 6.4 *access equipment*

Range related to performance criteria

The contexts and circumstances below identify where and when the NOS must apply

1 Enclosures

- 1.1 PVC and steel conduit
- 1.2 PVC and steel trunking
- 1.3 cable tray
- 1.4 basket and ladder systems
- 1.5 ducting systems
- 1.6 bus-bar trunking
- 1.7 pre-fabricated conductor, cable and wiring systems

2 Relevant people

- 2.1 *customers/clients*
- 2.2 client representatives
- 2.3 supervisors
- 2.4 site/contract manager
- 2.5 other contractors/trades
- 2.6 members of the public
- 2.7 work colleagues

Scope related to knowledge and understanding

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Glossary**Building services engineering system**

A system that is installed externally or internally to provide climate/environmental control, communication, heating, lighting, operational/process control, power, refrigeration, security or water for a building or structure and/or appliances, equipment and machines therein.

Appropriate industry standards and regulations for:

- electricity at work
- the quality of buildings and building work in England, Northern Ireland, Scotland and Wales
- requirements for electrical installations
- electricity safety, quality and continuity
- working at heights
- managing health and safety at work
- workplace health and safety and welfare
- personal protection at work
- provision and use of work equipment
- manual handling operations
- construction design and management
- controlling noise at work
- controlling asbestos in the work place
- controlling substances hazardous to health
- recycling and disposal of waste electrical and electronic equipment

Operatives

Individuals who undertake activities on a work site in the air conditioning, consumer electrical and electronic products, domestic heating, electrotechnical, heating & ventilation, plumbing or refrigeration industries, and are deemed competent to carry-out their job role or are supervised when carrying out their job role.

Specification

A verbal and/or documented instruction that is an explicit set of requirements for

installing, maintaining and/or servicing identified systems, equipment or products, to be satisfied by materials, components, design, processes, procedures, data management and/or service(s).

Clients and customers

- purchaser of installation and/or maintenance services
- other trades and services at the work site
- colleagues within the same organisation
- architect
- contract manager
- main/sub-contractor
- consultant
- local authority representatives
- work colleagues

Traditional/Historic buildings

buildings built pre-1919

A **public services establishment** can be a:

- hospital/medical centre
- school/college/university
- museum
- library
- prison
- military base
- car park
- church or other place of worship

Natural environment

The climate, weather and natural resources that effect and are affected by human life and economic activity

Working practices

Methods, techniques and procedures that are adopted for carrying out specific tasks that ensures workers' exposure to hazardous situations is controlled in a safe manner when:

- working with equipment, tools and plant
- working with materials and substances (hazardous and non-hazardous)
- manual handling lifting
- using lifting equipment
- using personal protective equipment (PPE)

Access equipment

- scaffold
- ladders
- steps
- staging
- trestles
- mobile elevated work platform (MEWP)

Personal protective equipment (PPE)

- safety helmets/hats
- hairnets
- gloves
- safety steel toe capped boots/shoes
- safety spectacles/goggles
- face shields/visors
- ear plugs/muffs
- conventional or disposable overalls, boiler suits, aprons, chemical suits
- respiratory protective equipment (RPE)
- high visibility clothing

Links to other NOS

SUMETS1 Plan, prepare and install environmental technology systems

SUMETS7 Service and Maintain Environmental Technology Systems

SUMETS10 Inspect & Commission Environmental Technology Systems

SUMETS11 Diagnose & Rectify Faults in Environmental Technology Systems

External Links

Links correct at time of NOS approval:

- Health & Safety Executive Documents <http://www.hse.gov.uk/pubns>
- The quality of buildings and building work in England
<https://www.gov.uk/government/policies/providing-effective-building-regulations-so-that-new-and-altered-buildings-are-safe-accessible-and-efficient>
- The quality of buildings and building work in Wales
<http://wales.gov.uk/topics/planning/buildingregs/?lang=en>
- The quality of buildings and building work in Northern Ireland
<http://www.dfpni.gov.uk/building-regulations>
- The quality of buildings and building work in Scotland
<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards>
- British Standard 7671 – Requirements for Electrical Installations
<http://www.theiet.org/resources/wiring-regulations/>
- Carriage of dangerous goods authorisations
<https://www.gov.uk/government/publications/carriage-of-dangerous-goods-authorisations>
- The requirements and information on microgeneration
<https://www.gov.uk/government/publications/microgeneration-strategy>

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Status	Original draft
Originating organisation	SummitSkills
Original URN	EL7/8/9
Relevant occupations	Highway Electrical Systems Installer; Installation Electrician; Maintenance Electrician; Electrical Trades; Electrician; Highway Electrical Systems Commissioning Electrician; Highway Electrical Systems Service & Maintenance Electrician; Industrial and Commercial Systems Engineer
Suite	Electrotechnical
Key words	Electrical systems; install; enclosures for electrical cable; conductor and wiring systems; standards; regulations; electrical; electrotechnical