SUMPH04
Install and test domestic plumbing and heating systems

Overview

This standard is for people who install and test domestic plumbing and heating systems.

The person performing this work must be able to comply with the correct procedures and practices for installing and testing domestic plumbing and heating systems. This work must be 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:

- direct and indirect cold water systems
- direct and indirect hot water systems
- hot water heating systems
- unvented domestic hot water storage systems
- above ground sanitary pipework systems
- rainwater systems
- site services and system supplies
- methods and techniques for connecting appliances, 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 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 verify that the job information and documentation are current and relevant and that the **plant,** instruments, *access equipment* and tools are fit for purpose

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 select **appliances, components and accessories** and confirm that they are:

P3.1 of the right type and size

P3.2 fit for purpose in accordance with the **domestic plumbing and heating system's** design

P3.3 suitable for the working environment in which they are to be installed

P4 confirm that the **site services and system supply** are compatible with the **domestic plumbing and heating system's** design

P5 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 the **working environment**

P6 determine at the outset, that the plans for positioning and fixing the **appliances, components and accessories** are in accordance with:

P6.1 the **domestic plumbing and heating system's** design

P6.2 the **working environment**

P6.3 manufacturer instructions

P7 comply with industry practices and **organisational procedures** to ensure the co-ordination of **site services and system supply** and the activities of other trades

P8 measure and mark out the locations for fitting and fixing the selected **appliances, components and accessories** in accordance with:

P8.1 the **domestic plumbing and heating system's** design

P8.2 manufacturer instructions

P9 fit, fix and connect the selected **appliances, components and accessories** in accordance with:

P9.1 the **domestic plumbing and heating system's** design

P9.2 the **working environment**

P9.3 manufacturer instructions

P10 confirm the integrity of the installed system using **soundness testing procedures**

P11 confirm with the **relevant people**:

P11.1 those variations to the planned programme of work

P11.2 the actions to be taken to ensure that any variations to the planned programme of work will minimise the potential for hazard and risk

P12 implement **organisational procedures** for the safe transport and/or disposal of waste material, substances and liquids in accordance with suppliers' and manufacturers' instructions

Knowledge and understanding

To carry out 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 applications, advantages and limitations of different **domestic plumbing and heating systems**

K2 the applications, advantages and limitations of **appliances, components and accessories** in relation to the **working environment**

K3 the **appropriate industry standards and regulations** relevant to installing and testing **domestic plumbing and heating systems**

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 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:

- K5.1 the **domestic plumbing and heating system's** design
- K5.2 the conditions of the **working environment**
- K5.3 **organisational procedures**

K6 the methods for determining the type of size of **appliances, components and accessories** in accordance with industry recognised **organisational procedures**

K7 how to interpret diagrams and drawings for the **domestic plumbing and heating system** to locate **site services and system supply**

K8 how to interpret diagrams and drawings for the **domestic plumbing and heating system** to identify the planned location of the **appliances, components and accessories**

K9 the organisational procedures for confirming, 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 for taking appropriate action if a risk is present

K10 the methods and techniques for fitting, fixing and connecting the selected **appliances, components and accessories** in accordance with:

- K10.1 the **domestic plumbing and heating system's** design
- K10.2 the **working environment**

K10.3 manufacturers' instructions

K11 the **soundness testing procedures** for confirming the systems' integrity

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 materials, 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 Environment** (Internal and/or External)

1.1 light commercial

1.2 domestic

1.3 agricultural

1.4 horticultural

1.5 leisure and entertainment

1.6 residential medical and care facilities

1.7 public services establishments

1.8 pre 1919 traditional/historic buildings

2 **Domestic plumbing and heating systems**

2.1 cold water – direct and indirect

2.2 hot water – direct and indirect

2.3 unvented domestic hot water storage systems

2.4 hot water heating systems

2.5 above ground discharge

2.6 below ground drainage

3 **Site**

3.1 new build construction – building or structure

3.2 existing building or structure

4 **Site services and system supply**

4.1 electricity

4.2 water

4.3 gas

4.4 oil

4.5 *solid fuel*

4.6 solar thermal

4.7 heat pumps
4.8 water harvesting
4.9 drainage

5 **Organisational procedures**

5.1 information management
5.2 project management
5.3 risk assessment and management
5.4 implementing and monitoring health and safety requirements and issues
5.5 implementing and monitoring issues relating to the *natural environment*
5.6 customer service
5.7 accident reporting
5.8 emergencies
5.9 communication with clients, customers and stakeholders

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 **Appliances, components and accessories**

1.1 pipework

1.2 boilers

1.3 heat exchangers

1.4 pumps

1.5 accelerators

1.6 valves

1.7 storage vessels

1.8 sanitary appliances

1.9 cisterns

1.10 backflow prevention devices

1.11 control devices

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

3 **Soundness testing procedures**

3.1 pressure tests for pipework systems

3.2 static pressure tests

3.3 air tests

3.4 system hygiene and charging

3.5 performance tests

Scope related to knowledge and understanding

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Glossary

Appropriate industry standards and regulations for:

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

Specification

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

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

- hospital/medical centre
- school/college/university
- museum/library
- prison
- military base
- car park
- 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)

- excavating

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)

Pipework

- copper pipes
- low carbon steel pipes
- plastic pipes (hot and cold water; sanitation; rainwater)
- flanges
- joints
- fitting and fixing accessories

Solid fuel

- mineral
- biomass
- wood

Links to other NOS

EUSDSG3.10 Install gas warm air central heating systems and appliances
EUSDSG3.11 Maintain gas warm air central heating systems and appliances
EUSDSG3.3 Install gas water heating and wet central heating appliances
EUSDSG3.5 Install gas pipework up to 35mm BS6891
EUSDSG3.60 Gas tightness testing and direct purging – IGE/UP/1B
SUMETS1 Plan, prepare and install environmental technology systems
SUMETS7 Service and maintain environmental technology systems
SUMETS10 Inspect and commission environmental technology systems
SUMETS11 Diagnose and 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/
- International industry standards and regulations http://www.iso.org/iso/catalogue_ics_browse?ICS1=27&ICS2=060&ICS3=30&

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