

Install and test plumbing and heating systems

Overview

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

The person performing this work must be able to comply with the correct procedures and practices for installing and testing 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 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

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Performance criteria

- You must be able to:*
1. verify that the job information and documentation are current and relevant and that the plant, instruments, access equipment and tools are fit for purpose
 2. 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
 3. select appliances, components and accessories and confirm that they are:
 - of the right type and size
 - fit for purpose in accordance with the plumbing and heating system's design
 - suitable for the working environment in which they are to be installed
 4. confirm that the site services and system supply are compatible with the plumbing and heating system's design
 5. produce a risk assessment and method statement for the work to be
 6. carried out, including the identification and use of personal protective
 7. equipment, in accordance with the working environment
 8. determine at the outset, that the plans for positioning and fixing the appliances, components and accessories are in accordance with:
 - the plumbing and heating system's design
 - the working environment
 - manufacturer instructions
 9. comply with industry practices and organisational procedures to ensure the co-ordination of site services and system supply and the activities of other trades
 10. measure and mark out the locations for fitting and fixing the selected appliances, components and accessories in accordance with:
 - the plumbing and heating system's design
 - manufacturer instructions
 11. fit, fix and connect the selected appliances, components and accessories in accordance with:

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- the plumbing and heating system's design
 - the working environment
 - manufacturer instructions
12. confirm the integrity of the installed system using appropriate testing procedures
13. confirm with the relevant people:
- those variations to the planned programme of work
 - the actions to be taken to ensure that any variations to the
 - planned programme of work will minimise the potential for hazard risk
14. implement organisational procedures for the safe transport and/or disposal of waste material, substances and liquids in accordance with suppliers' and manufacturers' instructions

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Knowledge and understanding

You need to know and understand:

1. the applications, advantages and limitations of different plumbing and heating systems
2. the applications, advantages and limitations of appliances, components and accessories in relation to the working environment
3. the appropriate industry standards and regulations relevant to installing and testing plumbing and heating systems
4. 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
5. 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:
 - the plumbing and heating system's design
 - the conditions of the working environment
 - organisational procedures
6. the methods for determining the type of size of appliances, components and accessories in accordance with industry recognised organisational procedures
7. how to interpret diagrams and drawings for the plumbing and heating system to locate site services and system supply
8. how to interpret diagrams and drawings for the plumbing and heating system to identify the planned location of the appliances, components and accessories
9. 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
10. the methods and techniques for fitting, fixing and connecting the selected appliances, components and accessories in accordance with:
 - the plumbing and heating system's design
 - the working environment
 - manufacturers' instructions
11. the appropriate testing procedures for confirming the systems' integrity

12. 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
13. the methods for the safe transport and/or disposal of waste materials, substances and liquids in accordance with suppliers' and manufacturers' instructions

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Scope/range related to performance criteria **Working environments (internal and/or external)**

- domestic
- non-domestic
 - commercial
 - industrial
 - agricultural
 - horticultural
 - leisure and entertainment
 - residential medical and care facilities
 - public services establishments
 - pre-1919 traditional/historic buildings

Plumbing and heating systems

- cold water – direct and indirect
- hot water – direct and indirect
- unvented hot water storage systems
- hot water heating systems
- above ground discharge
- below ground drainage

Site

- new build construction – building or structure
- existing building or structure

Site services and system supply

- electricity
- water
- gas
- oil
- solid fuel
- solar thermal
- heat pumps
- water harvesting
- drainage

Organisational procedures

- information management

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- project management
- risk assessment and management
- implementing and monitoring health and safety requirements and issues
- implementing and monitoring issues relating to the natural environment
- customer service
- accident reporting
- emergencies
- communication with clients, customers and stakeholders

Plant

- generators
- transformers for low voltage hand-tools
- lifting equipment
- access equipment

Appliances, components and accessories

- pipework
- boilers
- heat exchangers
- pumps
- accelerators
- valves
- storage vessels
- sanitary appliances
- cisterns
- backflow prevention devices
- control devices

Relevant people

- customers/clients
- client representatives
- supervisors
- site/contract manager
- other contractors/trades
- members of the public
- work colleagues

Appropriate testing procedures

- pressure tests for pipework systems
- static pressure tests
- air tests
- system hygiene and charging
- performance tests

Glossary

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Suite Plumbing and Domestic Heating

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