

# Level 3 NVQ in Heating and Ventilating (Complex Domestic Installation) (6088)

National occupational standards and Assessment requirements



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# **Level 3 NVQ in Heating and Ventilating (Complex Domestic Installation) (6088)**

**National occupational standards and Assessment requirements**

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A separate candidate assessment evidence recording document is supplied on CD-ROM with all Heating and Ventilating occupations and the units applicable to them.

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*Level 3*  
*Heating and Ventilating NVQ*  
**6088-05 Domestic Installation**

*Introduction*

This qualification has been produced from a set of Heating and Ventilating National Occupational Standards. They are based upon the Mechanical Engineering Services 2000 Standards. The qualification reflects the competencies required to operate at **Craft** level within the Heating and Ventilating industry.

The set of standards that define the level 3 Heating and Ventilating NVQ are shown in the H&V Qualification Matrix. This identifies that the same set of standards are used to define three separate disciplines. The qualification is awarded in the context of a particular discipline. These disciplines are:

- Industrial/Commercial
- **Domestic**
- Ductwork

This document refers to the discipline in **bold**

The evidence of competence needs to be presented within a particular context. This will define the range, evidence requirements and assessment guidance for the different disciplines. Candidates will be expected to demonstrate personal responsibility and be able to work with minimum supervision from drawings, specifications and schedules, and from oral or written instructions.

*The non-routine aspects of this level 3 qualification involve:*

- liaison with supporting trades
- solving problems and devising solutions
- ensuring compliance with all relevant standards

*The range of activities include:*

- identifying customer requirements
- planning and programming work
- installing system components
- pre-commissioning and decommissioning systems

Health and safety, working relationships, quality and environmental awareness are also included. They can be assessed from evidence produced whilst undertaking the technical units.

The standards used to structure this qualification offers greater flexibility than previously. This is achieved via the use of Optional Units, which allows for particular skills within occupations to be recognised.

Candidates must choose from the Optional Units, those units or that unit that suits their working circumstances. The unit or grouping of units recognise particular competencies within specialist areas of occupations. These Optional Units recognise these specialisms such as welding, general service and maintenance of industrial and commercial, domestic and dutwork systems. Additional specialist areas catered for are in design and programming of H&V work and the application of domestic design principles.

The welding units have been imported from OSC Eng. and they relate to:

- preparation of the work location, tools and equipment, and materials
- welding of carbon steel pipework
- visual inspection of welds

These units are likely to appeal to industrial and commercial candidates.

The difference between level 2 and level 3 qualifications lie principally in the depth of technical knowledge and the level of responsibility.

- |         |   |
|---------|---|
| Level 2 | Candidates need to demonstrate a fundamental knowledge of how components relate to each other within the system.  |
| Level 3 | Candidates must demonstrate detailed knowledge of systems operating principles. They should also be capable of installing and modifying the components within an entire system. |

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## **Section 1 – Scheme information**

### **1.1 Scope of the awards**

NVQs in Heating and Ventilating are work-based qualifications designed for those employed within the Heating and Ventilating sector and cover installation, service and maintenance, and ductwork. The main objective of the awards is to offer the opportunity to prove competence of industrial performance, knowledge and understanding, and recognise the ability of individuals working in the sector.

They are suitable for people involved in the industry sectors from trainees to senior operatives.

The NVQs in Heating and Ventilating are available at levels 2 and 3. There are four main pathways at level 2, and 3. The awards are made up of mandatory and optional units. The mandatory units cover those areas which have a common approach, such as health and safety and working relationships. The optional units offer a choice of activities that can be combined to meet the needs of organisations and candidates.

#### ***The level 3 award has been to cover those people who are***

- Senior operatives who are employed as team leaders and first line managers who are responsible for carrying out industry based activities
- People who through training and development are extending their competences to take on additional responsibilities in both technical and managerial areas.
- New employees who have undergone training and development and are now acquiring a more in depth knowledge and experience of the industry sectors.

## 1.2 Qualification Structure

The awards have been designed to allow progression through the various levels where appropriate. Thus candidates who have achieved units which are common to awards at differing levels can take these units forward for the purpose of certification. The certificate structure requires candidates to complete common mandatory units followed by a choice of pathways.

The certificate referred to in this guide is as follows

### ***LEVEL 3 HEATING AND VENTILATING Domestic Installation***

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#### ***Mandatory Units***

Unit 1	Maintain the safe working environment for hvacr activities
Unit 2	Maintain effective working relationships
Unit 3	Contribute to the improvement of business products and services for hvacr work activities
Unit 6	Plan heating and ventilating work activities
Unit 7	Install complex heating and ventilating systems and components
Unit 8	Commission and decommission heating and ventilating systems

#### ***Optional Units***

Unit 12	General service and maintenance of domestic systems and components
Unit 14	Apply domestic system design principles
Unit 15	Design heating and ventilating systems
Unit 16	Specify programmes for working on heating and ventilating systems

The qualification is achieved by gaining:

- the **six** Mandatory Units (within a particular context)
- and **one** Optional Unit

### **Level 3 Heating and ventilating Domestic Installation**

Candidates need to demonstrate their competence and understanding across the particular system types for the evidence pathway being followed, ie:

- Industrial and Commercial
- **Domestic**
- Ductwork

This document refers to the discipline in **bold**

#### **Domestic**

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- Cold Water Services
  - mains
  - indirect
- Hot Water Services
  - direct
  - indirect
  - unvented
- Hot Water Heating
  - Low temperature
- Above ground waste and sanitary pipework systems
- Warm Air Heating

Cross-reference grid of City & Guilds and ESTTL/Summitskills unit references

City & Guilds Unit Number	ESTTL / Summitskills Reference Number	Unit Title
001	1	Maintain the safe working environment for HVACR work activities
002	2	Maintain effective working relationships
003	3	Contribute to the improvement of business products and services for HVACR work activities
006	6	Plan heating and ventilating work activities
007	7	Install complex heating and ventilating systems and components
008	8	Commission and de-commission heating and ventilating systems
012	12	General service and maintenance of domestic systems and components
014	14	Apply domestic system design principles to meet customer requirements
015	15	Design heating and ventilating systems
016	16	Specify programmes for working on heating and ventilating systems

**Combustion Fuel Evidence Indicators:**

- 301 Gas Systems
- 302 Oil Systems
- 303 Solid Fuel Systems

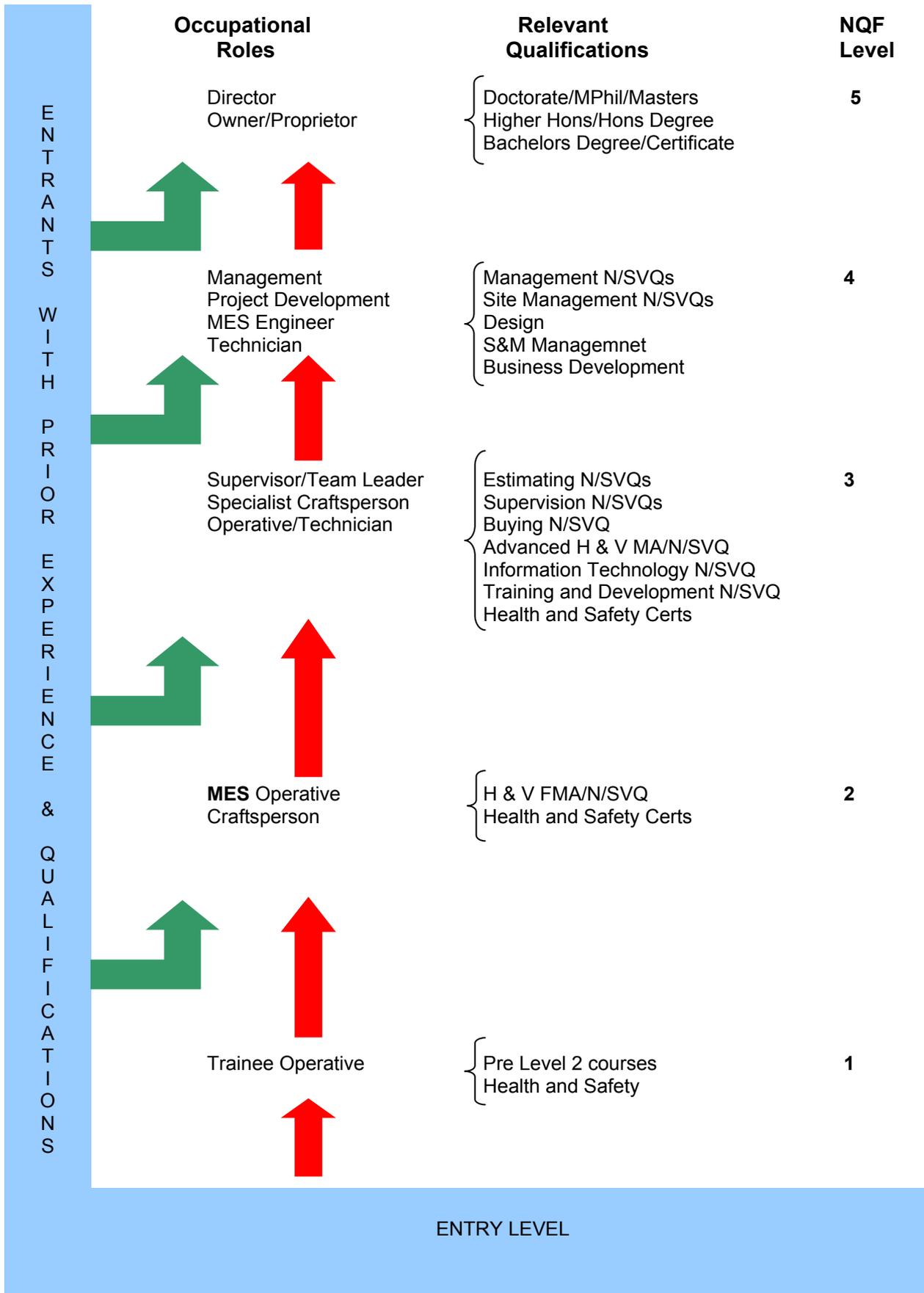
**Welding Unit Evidence Indicator:**

- 777 Gas
- or
- 888 ARC

All units 001-003 and 006-8 and one of 012, 014, 015 or 016 are required to achieve the award 6088-05-level 3 Heating and Ventilating Domestic Installation.

The combustion fuel and welding unit evidence indicator must also be indicated when applying for a certificate.

# 1.3 Heating & Ventilating Sector Progression Routes



# Level 3 Heating and Ventilating

## ***National Occupational Units***

### ***Domestic Installation***

**[General service and maintenance & domestic design option]**

#### **Level 3 NVQ Heating and Ventilating-Domestic Installation units**

- 001 Maintain the safe working environment for hvacr activities
- 002 Maintain effective working relationships
- 003 Contribute to the improvement of business products and Services for hvacr work activities
- 006 Plan heating and ventilating work activities
- 007 Install complex heating and ventilating systems and components
- 008 Commission and decommission heating and ventilating systems
- 012 General service & maintenance of domestic systems & components
- 014 Apply domestic system design principles
- 015 Design heating and ventilating systems
- 016 Specify programmes for working on heating and ventilating systems

***Unit content sequence order:***

- Title***
- Elements***
- Unit commentary***
- Performance criteria***
- Range***
- Performance evidence***
- Knowledge statements***
- Assessment Guidance***

**Note:** *This is what the candidate must do:*  
**Unit 001** **Maintain the safe working environment for HVACR work activities**  
*This involves being able to:*

Element 1.1 Use safe procedures when working with others  
Element 1.2 Use safe working practices

---

### **Unit Commentary**

- This unit is the same across all HVACR Level 2 and 3 Units. Evidence gathering opportunities to satisfy the criteria will occur whilst working towards achievement of the technical units. Some safety critical aspects of the technical units may not be achievable through the workplace. For these situations, simulation in a realistic work environment is acceptable.
- The unit covers 'core' health and safety requirements. These requirements apply to Level 2 and 3. Health and safety differences specific to individual disciplines and levels are incorporated within the relevant technical units.
- This unit deals with the candidate's ability to work in a safe manner for the well being of themselves and others who may be affected by the actions or omissions of the candidate.
- Candidates must be capable of making a positive contribution to safety on an ongoing basis and be able to respond effectively in the event of an emergency situation arising.
- A knowledge of safety information, practice and procedures is required, as well as the ability to communicate relevant information to others, for example; colleagues, other workers, customers and occupants of buildings.
- Be able to operate safely within and monitor agreed safety related agreements regarding potential hazards, correct use of relevant personal protective equipment and observing and following the requirements of safety information.
- Limit injury to persons or damage to property in the event of an accident or emergency. This covers basic safety procedures and damage reporting requirements. Fire, explosion or toxic atmospheres within the workplace, requires candidates to demonstrate the effective summoning of appropriate emergency services and procedures to adopt in the event of such emergencies.
- There are many potential hazards within our industry. This unit is designed to ensure that candidates who meet its requirements are aware of the potential dangers, likely hazards and where to source; safety information, appropriate regulations and apply them to the workplace and the people who operate within it.

**Unit 001                      Maintain the safe working environment for HVACR work activities**

Element 1.1                      Use safe procedures when working with others

Performance criteria

**The candidate must provide evidence to prove that they can:**

**1.1.1 Comply with** health and safety legislation <sup>(1)</sup> **when working with** other persons<sup>(2)</sup>

**1.1.2 Take** precautionary actions <sup>(3)</sup> **to minimise the potential safety risk to persons in the** work location <sup>(4)</sup>

**Candidates will be required to produce evidence for all range items.**

Range

**1. Health and Safety Legislation**

- a. Health and Safety At Work, etc. Act
- b. Construction (Health, Safety and Welfare) Regulations 1961
- c. Construction (Lifting Operations) Regulations 1961
- d. Electricity At Work Regulations 1989
- e. Control of Substances Hazardous to Health Regulations (COSHH)
- f. Manual Handling Regulations 1992
- g. Employer's responsibility under Health and Safety At Work Act
- h. Employee's responsibility under Health and Safety At Work Act
- i. How safety regulations affect your work
- j. General safety measures
  - Site inspections
  - Risk assessments
  - Danger of slips, trips or falls
  - Danger of falling objects

**2. Other Persons**

- a. Customers
- b. Colleagues – own trade
- c. Colleagues – other trades
- d. Site officials
  - Site management
  - Statutory inspections
- e. Visitors
  - Authorised
  - Unauthorised

**3. Precautionary Actions**

- a. Provision of PPE
- b. Safety signs and notices
- c. Follow accident prevention methods
- d. Protection of workforce and public
- e. Working on drains and sanitary appliances
- f. Working with LPG and welding equipment
- g. Personal hygiene
- h. First aid facilities
- i. Fire fighting equipment
- j. Access route and equipment
- k. Manual handling and lifting
- l. Actions in an emergency

#### **4. Working Location**

- a. New buildings
- b. Occupied buildings
- c. Service and maintenance workplaces
- d. Working at heights
- e. Excavations and confined spaces
- f. Scaffolding
- g. Vehicles

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Follow current regulations, recommendations and guidelines for health and safety protection of self and others.  
(PC 1.1.1) (Range All)
2. Check the work location layout and structure is safe for work to proceed  
(PC 1.1.1, 1.1.2) (Range 1, 2, 3)
3. Alert visitors to potential hazards  
(PC 1.1.2) (Range 3, 4)
4. Respond promptly and appropriately to accidents involving injury to others  
(PC 1.1.2) (Range 3, 4)
5. Summon emergency services  
(PC 1.1.2) (Range 3, 4)
6. Take the appropriate actions in the event of:
  - fire
  - emergency working(PC 1.1.2) (Range 3, 4)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range.

## Knowledge Statements

<b>The candidate must provide evidence that they know:</b>	
1.	The general responsibilities of the employer and employee for ensuring safety in the work place (PC 1.1.1) (Range 1, 2)
2.	The requirements of safety legislation for the range of work operations (PC 1.1.1) (Range 1)
3.	The potential hazards or risks associated with the range of work locations in which work on systems is undertaken, and the measures to be taken to reduce risk. (PC 1.1.2) (Range 3, 4)
4.	General measures to be taken to create safety awareness, company on-site policies, applying and supervising site safety practices, including measures to report potential safety hazards (PC 1.1.1, 1.1.2) (Range All)
5.	Accident reporting procedures - Basic first aid procedures (PC 1.1.1, 1.1.2) (Range: All)
6.	The procedures for summoning the different emergency services. The information required by the emergency services to permit them to respond promptly. (PC 1.1.2) (Range 3, 4)
7.	The range of fire extinguishers used for different types of fire and how to extinguish small fires in a safe manner. (PC 1.1.2) (Range 3, 4)
8.	Typical evacuation procedures for work locations in which system installation or maintenance work is to be carried out. (PC 1.1.2) (Range 3, 4)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. Comply with Health and Safety requirements at all times.
  - b. Take the appropriate precautionary actions to ensure safe working
  - c. Act appropriately in the event of an emergency.
  - d. Undertake the correct procedures for basic first aid and reporting of accidents.
  - e. Demonstrate in a simulated situation the ability to:
    - i) select fire extinguishing equipment appropriate to a specified fire source
    - ii) correctly apply fire fighting equipment
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Unit 001                      Maintain the safe working environment for HVACR work activities**

Element 1.2                      Use Safe Working Practices

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 1.2.1 Work to the procedures laid down in risk assessments <sup>(1)</sup>**
- 1.2.2 Take remedial action(s) where work methods do not comply with risk assessment <sup>(1)</sup> requirements**
- 1.2.3 Use tools and equipment <sup>(2)</sup> in a manner which complies with health and safety requirements**
- 1.2.4 Maintain tools and equipment <sup>(2)</sup> to a standard which meets health and safety requirements**
- 1.2.5 Demonstrate work processes which comply with health and risk assessment <sup>(1)</sup> safety requirements**
- 1.2.6 Handle potentially hazardous materials <sup>(3)</sup> in a manner, which complies with health and safety requirements**
- 1.2.7 Take precautionary actions <sup>(4)</sup> during work activities to ensure the safety of customer's property <sup>(5)</sup>**
- 1.2.8 Comply with hazard warning and prohibition notices <sup>(6)</sup>**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Risk Assessments**

- a. Identifying risks
- b. Risk factors
- c. Risk exposure
- d. Safeguard hardware
- e. Control measures
- f. Assessment forms
- g. Risk assessment associated with:
  - Work locations
  - Tools and equipment
  - Hazardous materials
  - Hazardous processes

**2. Tools and Equipment**

- a. Hand tools
- b. Power operated tools
- c. Test equipment
- d. Access equipment
- e. Personal protective equipment
- f. Plant
- g. Lifting devices
- h. Movable equipment

**3. Potentially Hazardous Materials**

- a. Compressed gasses
- b. Cleaning agents
- c. Solvents
- d. Asbestos based products
- e. By-products from working processes
- f. Electricity

**4. Precautionary Actions**

- a. Use of PPE
- b. Safety signs and notices
- c. Follow accident prevention methods
- d. Protection of others
- e. Personal hygiene
- f. Location of first aid facilities
- g. Location of fire fighting equipment
- h. Access routes and equipment
- i. Manual handling and lifting

**5. Customer's Property**

- a. External building surfaces
- b. Internal building surfaces
- c. Building contents

**6. Hazardous Warning and Prohibition Notices**

- a. Fire fighting signs
- b. Rescue equipment signs
- c. Emergency exit signs
- d. Prohibition signs
- e. Warning signs
- f. Mandatory signs
- g. Safe condition signs

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Use approved, safe methods and techniques when lifting heavy or bulky items  
(PC 1.2.6) (Range 3)
2. Identify damage to property and minimise the risk of further damage  
(PC 1.2.7) (Range 4, 5)
3. Use safe working procedures to safeguard persons and property in the workplace, including working to procedures laid down in risk assessments.  
(PC All) (Range All)
4. Monitor safety procedures and take remedial action where potential hazards are identified  
(PC 1.2.2) (Range All)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range.

## Knowledge Statements

<b>The candidate must provide evidence that they know:</b>	
1.	How to work to, or produce general risk assessments and how to apply them in the workplace (PC 1.2.1) (Range 1)
2.	Safe practices when carrying out work on systems and components (PC All) (Range All)
3.	The range of tools and equipment for installation or maintenance work, their safe use, maintenance requirements and selection of appropriate safety equipment (PC 1.2.3, 1.2.4) (Range 2)
4.	The range of tools and equipment whose use is controlled by legislation (PC 1.2.3, 1.2.4) (Range 2)
5.	The range of potential hazardous materials used for system installation or maintenance work. (PC 1.2.6) (Range 3)
6.	The methods of identifying potentially hazardous materials and level of risk, including asbestos (PC 1.2.1, 1.2.6) (Range 1, 3)
7.	Safety precautions including the use of personal protective equipment (PC All) (Range All)
8.	The legislation or recommendations governing the safe use or disposal of hazardous materials. (PC 1.2.6) (Range 3)
9.	The methods of protecting customer's property within the types of locations in which system installation or maintenance work is carried out (PC 1.2.7) (Range 4, 5)
10.	How to liaise with the customer, pre-work inspection, reporting existing damage or identifying damage arising from work operations (PC 1.2.7) (Range 4, 5)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. All performance evidence must be of a commercially acceptable standard.
2. Candidates must follow correct procedures to:
  - a. make safe the range of hazards listed
  - b. conform to company and customer safety requirements
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Note:** *This is what the candidate must do:*  
**Unit 002** **Maintain effective working relationships**  
*This involves being able to:*

Element 2.1 Establish, maintain and develop effective working relationships with others

---

### **Unit Commentary**

- This unit is the same across all Level 2 disciplines. Evidence gathering opportunities to satisfy the criteria will occur whilst working towards the achievement of the technical units
- The unit covers 'core' working relationships. The requirements apply across all the Occupational Standards at Level 2 disciplines. Differences in levels of responsibility within working relationship specific to individual Occupational Standards are incorporated within the relevant technical units.
- This unit deals with the candidate's ability to work in harmony with other people for the benefit of themselves and their employer/employee' organisation.
- Candidates must be capable of starting off and developing effective work relationships. They must know the most effective means of doing so and also understand why this is important to themselves and their employer.
- In the case of 'other persons', candidates should be capable of obtaining sufficient details before commencing work to provide a sound basis to establish and develop good customer relations. Candidates should also be able to provide relevant information, respond positively and promptly, know how to deal with different types of customer and realise why the individual has such an important role to play in the success of an organisation.
- When dealing with site visitors, it is vital that candidates know the range of possible visitors they can expect to encounter and the way in which they should be treated. The ability to confirm identification, and the reason why this should be done as well as the ability to deal with requests for information in the correct manner.
- Colleagues may include line managers, peers, customers and fellow workers. Occupants of premises where work is being undertaken are also included and the candidate should understand why good relations with colleagues are important to both the customer and to their employer. Candidates are required to provide information and some support to new colleagues and those who experience work difficulties.

**Unit 002                      Maintain effective working relationships**

Element 2.1                      Establish, maintain and develop effective working relationships with others

Performance criteria

**The candidate must provide evidence to prove that they can:**

- 2.1.1 Identify other persons <sup>(1)</sup> within the work location that are essential to the development of an effective working relationship.**
- 2.1.2 Respond effectively to requests for job information <sup>(2)</sup> from others in the workplace.**
- 2.1.3 Use a range of methods of communication <sup>(3)</sup> to pass job information <sup>(2)</sup> to others in the workplace**
- 2.1.4 Develop and maintain effective working relationships with other persons <sup>(1)</sup> in the workplace.**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Other Persons**

- a. Customers
- b. Any worker within work location
- c. Visitors to work location
- d. Colleagues

**2. Job Information**

- a. Specifications
- b. Drawings
- c. Statutory regulations and recommendations
- d. Instructions – verbal or written

**3. Methods of Communication**

- a. Oral
- b. Written
- c. Information Communication Technology

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Obtain and record details of customer, customer's representative or co-contractor.  
(PC 2.1.1) (Range 1)
2. Treat other persons within the work location in a manner conducive to the establishment of good relationships.  
(PC 2.1.4) (Range 1)
3. Provide information through a range of methods to meet the requirements of others in the workplace.  
(PC 2.1.2, 2.1.3) (Range All)
4. Respond promptly and willingly to reasonable requests from other persons within the work location.  
(PC 2.1.2, 2.1.4) (Range 1)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range.

## Knowledge Statements

<b>The candidate must provide evidence that they know:</b>	
1.	The range of other persons encountered within the work location with whom it may be necessary to establish working relationships. (PC 2.1.1) (Range 1)
2.	The types of management structures within different organisations employing MES labour, and the roles and responsibilities of the different individuals within these structures. (PC 2.1.1) (Range 1)
3.	What other persons expect from a good working relationship. (PC 2.1.4) (Range 1)
4.	The types of job information that may be requested by others in the workplace, e.g.: sources of information, methods of accessing information and possible restrictions on passing information to others. (PC 2.1.2, 2.1.3) (Range 2, 3)
5.	The methods of communication used for the range of job or company information best suited to its purpose. (PC 2.1.3) (Range 2, 3)
6.	How to use the key principles of good communication in work situations, including methods of confirming that the communication has been understood. (PC 2.1.3) (Range 2, 3)
7.	The actions that are necessary to begin, develop and maintain good working relationships. (PC 2.1.4) (Range 1)
8.	The principles of good working relationships and reasons why working relationships may break down. (PC 2.1.4) (Range 1)
9.	The actions to take to restore working relationships where a breakdown occurs. (PC 2.1.4) (Range 1)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. All performance evidence must be of a commercially acceptable standard.
2. Candidates must undertake across the listed range:
  - a. negotiation, discussion and explanation
  - b. face-to-face and telephone conversation
  - c. provision of effective written communication
3. Candidates must:
  - a. ascertain visitors authority using the range of visitor details and information listed
  - b. provide appropriate and relevant information to requests, in line with organisational procedures

**Note:** *This is what the candidate must do:*  
**Unit 003** **Contribute to the improvement of business products and services for HVACR work activities**  
*This involves being able to:*

Element 3.1 Promote the image of the business to others  
Element 3.2 Identify and recommend opportunities for improving customer care  
Element 3.3 Demonstrate environmental awareness within the workplace

---

### **Unit Commentary**

- This unit is the same across all Level 2 disciplines. Evidence gathering opportunities to satisfy the criteria will occur whilst working towards achievement of the technical units.
- The unit covers the 'core' requirements of business improvement that apply to all the Occupational disciplines at Levels 2. Quality improvement differences specific to individual Occupational Standards and levels are incorporated within the relevant technical units.
- This unit deals with the candidate's ability to present a positive image of the organisation and industry and be able to identify and make recommendations regarding improvements to; products, services and procedures.
- It is important to present the organisation and industry's image by being positive about the work carried out and that personal presentation and general manner gives a good impression to customers and co-contractors.
- Candidates are required to consider the methods they use when undertaking work activities and seek to improve the quality of products, services and organisational procedures. They are also expected to feed back recommendations to relevant persons and be aware of customer expectations regarding the service they, and their organisation provide.
- A prime requirement of this unit is the demonstration of environmental awareness in the workplace. Working methods that make effective and economical use of materials and energy and the ability to work with hazardous materials, employing sound work practices are essential to safeguarding the environment.

**Unit 003**                      **Contribute to the improvement of business products and services for HVACR work activities**

Element 3.1                      Promote the image of the business to others

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 3.1.1**    **Ensure personal presentation provides a positive image of the business to other persons <sup>(2)</sup>.**
- 3.1.2**    **Ensure that the job information <sup>(1)</sup> provided meets the needs of other persons <sup>(2)</sup> in the workplace.**
- 3.1.3**    **Present job information <sup>(1)</sup> in ways, which encourage a positive image of the business.**
- 3.1.4**    **Recognise and act on opportunities for promoting the services of the business to other persons <sup>(2)</sup>.**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Job Information**

- a. Specifications
- b. Drawings
- c. Statutory regulations and recommendations
- d. Instructions – verbal or written

**2. Other Persons**

- a. Customers
- c. Any worker within work location
- d. Work location visitors
- e. Colleagues

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Promote industry/organisation in a positive way.  
(PC All)

(Range All)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range.

## Knowledge Statements

<b>The candidate must provide evidence that they know:</b>	
1.	The importance of correct personal presentation, e.g.: clothing worn and manner. (PC 3.1.1, 3.1.4) (Range All)
2.	The type of actions that will promote the business that are within the candidate's daily routine (PC 3.1.2, 3.1.3, 3.1.4) (Range 1, 2)
3.	The types of action that produce positive and negative responses (PC 3.1.2, 3.1.3) (Range 1, 2)
4.	The range of promotional information appropriate to different work situations and how to ensure the information provided is appropriate to its intended use. (PC 3.1.2) (Range 1, 2)
5.	The methods of presenting information that are appropriate to the situation or the person requesting the information. (PC 3.1.4) (Range 1)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. Present verbal and written information to personnel within the range
  - b. Demonstrate the desired standard of personal presentation
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Unit 003**                      **Contribute to the improvement of business products and services for HVACR work activities**

Element 3.2                      Identify and recommend opportunities for improving customer care

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 3.2.1 Identify opportunities for improving customer care and enhancing business procedures<sup>(2)</sup>.**
- 3.2.2 Take actions to rectify problems with business procedures<sup>(2)</sup>.**
- 3.2.3 Take actions to address customer complaints on system or component<sup>(1)</sup> operation.**
- 3.2.4 Report to job supervisor or line manager potential opportunities for improving business procedures<sup>(2)</sup>.**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Systems or Components**

- a. Systems
- b. Appliances
- c. Materials
- d. Controls

**2. Business Procedures**

- a. Customer service
- b. Internal and external communication
- c. Business administration
- d. Efficient use of resources

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Identify source of customer expectation shortcomings and product variance, formulate and produce a solution.  
(PC All) (Range All)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range.

## Knowledge Statements

<b>The candidate must provide evidence that they know:</b>	
1.	The typical formal and informal approaches to ensuring good customer service. (PC 3.2.1) (Range 2)
2.	The typical details contained in written statements of customer service policy. (PC 3.2.1) (Range 2)
3.	The work actions necessary to support the business's customer service policy. (PC 3.2.2) (Range 2)
4.	The checks to be carried out during work activities to ensure customer satisfaction with the service provided, and the measures to be taken where deficiencies in customer service are identified. (PC 3.2.2, 3.2.3) (Range 1, 2)
5.	The actions necessary to record and report any deficiencies in the performance of systems or components. (PC 3.2.4) (Range 2)
6.	The methods of dealing with customer complaints arising from dissatisfaction with work standards or attitude of the workforce. (PC 3.2.1, 3.2.2, 3.2.3, 3.2.4) (Range 1, 2)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. Identify shortcomings and present solutions to rectify them to personnel listed
  - b. Provide verbal and written communications regarding customer services expectations
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Unit 003**                      **Contribute to the improvement of business products and services for HVACR work activities**

Element 3.3                      Demonstrate environmental awareness within the workplace

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 3.3.1 Apply environmentally friendly work procedures when working on systems or components<sup>(1)</sup>**
- 3.3.2 Refer to immediate job supervisor or line manager systems or component<sup>(1)</sup> factors that may damage the environment.**
- 3.3.3 Ensure that customers are advised of all systems or component<sup>(1)</sup> operating procedures that are intended to protect the environment.**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Systems or Components**

- a. Systems
- b. Appliances
- c. Materials
- d. Controls

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Undertake work in a manner which takes account of:  
Effective and economic use of materials  
Working methods which are not harmful to the environment  
Minimising wastage of materials and environmental damage  
Observing principles of energy efficiency  
(PC All) (Range All)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range.

## Knowledge Statements

<b>The candidate must provide evidence that they know:</b>	
1. The potential implications for the environment of the work procedures used in installing or maintaining systems or components. (PC 3.3.1)	(Range All)
2. Alternative 'low risk' materials, products and procedures. (PC 3.3.1)	(Range All)
3. Prefabrication, installation and maintenance methods that reduce material wastage. (PC 3.3.1)	(Range All)
4. The importance of reporting hazards that may damage the environment that can arise from work procedures and of confirming that appropriate action has taken place. (PC 3.3.2)	(Range All)
5. The range of information that needs to be passed to the customer to ensure the correct and economic use of energy dependant systems. (PC 3.3.3)	(Range All)
6. The general advice that can be given to customers on methods of reducing waste of resources and effective savings. (PC 3.3.3)	(Range All)
7. The disposal methods to be used for waste materials. (PC 3.3.1)	(Range All)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

<b>To assist in assessment of candidates</b>	
1.	Performance evidence should be generated from the workplace. All performance evidence must be of a commercially acceptable standard.
2.	Candidates must demonstrate planning and execution of work in line with good environmental practices.
3.	In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Unit 006**      **Plan heating and ventilating work activities**  
*This involves being able to:*

Element 6.1    Plan the work activities to be carried out.

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**UNIT COMMENTARY**

- This unit measures the candidate's ability to undertake planning activities prior to the installation process.
- It involves identifying what needs to be done and how best to undertake it, given the various circumstances and the work locations that candidates need to work in.
- Candidates are required to determine what they need in terms of tools, materials and equipment, in order to carry out the work at various stages in the installation process.
- It is important that candidates can organise work activities into a logical sequence and be able to produce and alter work programmes.
- Within the industrial and commercial, large domestic and ductwork contexts, customers' requirements are more likely to be identified from documentation and line managers.
- Within this unit, customers can be the client, the client's representatives, sub-contractors and internal contacts from within the candidate's employing organisation.

**Unit 006                      Plan heating and ventilating work activities**

Element 6.1                      Plan the work activities to be carried out

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 6.1.1    Ensure that all job information <sup>(1)</sup> essential to the correct installation of the system component(s) <sup>(2)</sup> is on site before job commencement**
- 6.1.2    Identify from job information <sup>(1)</sup> the key features of the system or component(s) <sup>(2)</sup>**
- 6.1.3    Confirm compliance of the proposed installation with industry requirements <sup>(3)</sup>**
- 6.1.4    Confirm that the building structure <sup>(4)</sup> is suitable to accommodate the system or component(s) <sup>(2)</sup>**
- 6.1.5    Identify from job information <sup>(1)</sup> the point(s) within the installation process where liaison with other persons <sup>(5)</sup> will be necessary.**
- 6.1.6    Obtain customer approval of any proposed deviation from the original system or component <sup>(2)</sup> specification.**
- 6.1.7    Agree an installation/work programme with other persons <sup>(5)</sup>**
- 6.1.8    Agree revisions to installation/work programmes with other persons <sup>(5)</sup> where modifications and deviations prove necessary**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Job Information**

- a. Specifications
- b. Drawings
- c. Statutory regulations and recommendations
- d. Instructions – verbal or written
- e. Manufacturers' instructions

**2. System or Components**

- a. Systems from the appropriate appendix
  - Appendix A: Industrial and Commercial
  - Appendix B: Domestic
  - Appendix C: Ductwork
- b. Components
  - Appliances
  - Materials
  - Controls

**3. Industry Requirements**

- a. Statutory regulations and recommendations
- b. Safety legislation governing activities in the workplace
- c. Specifications
- d. Company procedures
- e. Relevant to the level of responsibility

**4. Building Structure**

- a. Method of construction and materials used
- b. Performance requirements of system components
- c. Availability of input service

**5. Other Persons**

- a. Customers
- b. Colleagues
- c. Other workers

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Confirm that all necessary job information essential to the correct installation of the system components is on site before job commencement  
(PC 6.1.1) (Range 1, 2)
2. Identify the installation requirements from the information listed and determine the most appropriate approach to undertake the work, in accordance with industry requirements.  
(PC 6.1.2, 6.1.3) (Range 1, 2, 3)
3. Confirm that the building structure is suited to the proposed system component installation  
(PC 6.1.4) (Range 2, 4)
4. Identify when liaison with other people will be necessary during the installation  
(PC 6.1.5) (Range 1, 5)
5. Produce and agree installation/work programmes with the appropriate people and advise them of any anticipated or actual deviations or variations  
(PC 6.1.6, 6.1.7, 6.1.8) (Range 5)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge statements

<b>The candidate must provide evidence that they know:</b>	
1.	The system types and their intended functions: system components and layouts (PC 6.1.2) (Range 1, 2)
2.	The regulations governing system installation and operation (PC 6.1.3) (Range 3)
3.	The main construction features of buildings into which the systems are installed. (PC 6.1.4) (Range 2, 4)
4.	The sources of information on specific systems, plans and drawings and specifications (PC 6.1.1, 6.1.2) (Range 1, 2)
5.	The installation requirements for systems, including installation sequences and routine liaison with others in the overall construction programme (including the customer). (PC 6.1.5) (Range 1, 5)
6.	How to obtain detail from installation/work programmes and how to monitor progress against the programme (PC 6.1.7) (Range 1)
7.	How to negotiate variations to work/installation programmes and the need to obtain written acceptance for major work or materials variations. (PC 6.1.8) (Range 1, 5)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace, a proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. produce evidence from a minimum of two work locations, incorporating a significant proportion of the installation.
  - b. demonstrate a clear understanding of how to deal with situations which do not go according to plan.
  - c. provide evidence which may include sketches, material and equipment lists, timesheets and diary entries.
  - d. for domestic systems only, provide evidence from one or more of the main fuel supply systems (gas, oil, solid fuel), depending on the work experience available. Where the evidence is based on gas, it must comply with the requirements of relevant sections of the gas ACS and nationally accredited scheme for the certification of gas operatives.
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Note:** *This is what the candidate must do:*  
**Unit 007** **Install complex heating and ventilating systems and components**  
*This involves being able to:*

Element 7.1 Prepare work locations for the installation of complex systems and components  
Element 7.2 Carry out the installation of complex systems and components

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## **UNIT COMMENTARY**

- This unit measures the candidate's ability to:
  - Ensure the work location is properly prepared for the work to be carried out
  - Undertake the installation of complex heating and ventilating systems and components.
- Candidates will be expected to carry out the appropriate specified testing procedures during or after the installation of components.
- At this level, candidates should possess a detailed knowledge of the systems operating principles. They should also be capable of installing components within an entire system.
- This unit requires industrial and commercial and domestic candidates to install, connect and test for soundness the fuel supply pipework. Where appropriate, evidence should be assessed to and meet industrial requirements.
- For industrial and commercial and ductwork candidates, electrical requirements are limited to the candidates ensuring that the electrical supply for the tools and equipment being used for the installation is appropriate. For domestic installation, candidates are required to install electrical wiring to system components from a fused spur.

**Unit 007                      Install complex heating and ventilating systems and components**

Element 7.1                      Prepare work locations for the installation of complex systems and components

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 7.1.1    Ensure that safety provisions <sup>(1)</sup> within the immediate work location conform to the requirements of health and safety legislation.**
- 7.1.2    Ensure that access provision <sup>(2)</sup> to and from the immediate work location complies with health and safety requirements for the safe movement of the workforce, members of the public and materials.**
- 7.1.3    Report any pre-installation damage or defects to existing building features, to the job supervisor, line manager, customer <sup>(3)</sup>.**
- 7.1.4    Protect customer's property <sup>(4)</sup> and the building fabric <sup>(5)</sup> against possible damage being caused during the installation process.**
- 7.1.5    Check that input services <sup>(6)</sup> to the system components are suited to their intended purpose.**
- 7.1.6    Confirm that the customer <sup>(3)</sup> is aware that job information <sup>(7)</sup> on all key aspects of the installation process is available.**
- 7.1.7    Confirm that all materials, tools and equipment <sup>(8)</sup> necessary for the installation process will be available as required.**
- 7.1.8    Arrange safe storage provision for materials, tools and equipment <sup>(8)</sup>, which meet industry requirements.**
- 7.1.9    Confirm that all preparatory work <sup>(9)</sup> to meet the installation requirements of systems and components <sup>(10)</sup> has been carried out.**

Candidates will be required to produce evidence for all range items.

Range

**1. Safety Provisions**

- a. Personal protection equipment
- b. Fire fighting equipment
- c. First aid
- d. Accident prevention methods
- e. Tools and equipment
- f. Risk assessment
- g. Permit to work

**2. Access Provision**

- a. Ladders
- b. Scaffold (fixed and mobile)
- c. Walkways

**3. Customer**

- a. Client
- b. Co-contractor
- c. Supervisor
- d. Employer
- e. Co-worker

**4. Customer's Property**

- a. Domestic
- b. Industrial/Commercial

**5. Building Fabric**

- a. Walls
- b. Floor
- c. Fittings, fixings, finishes
- d. Roofs

**6. Input Services**

- a. Existing systems
- b. Fuel, water<sup>(1)</sup>, electricity and drainage<sup>(1)</sup>
- c. Temporary or permanent supplies for tools and equipment  
<sup>(1)</sup> not for ductwork

**7. Job Information**

- a. Specifications
- b. Drawings
- c. Statutory regulations and recommendations
- d. Instructions – verbal or written

**8. Materials, Tools and Equipment**

- a. Materials relevant to the installation
- b. Hand tools
- c. Powered tools
- d. Mechanical tools

**9. Preparatory Work**

- a. Relevant to the work activity

**10. Systems and Components**

- a. Systems from the appropriate appendix
  - Appendix A: Industrial and Commercial
  - Appendix B: Domestic
  - Appendix C: Ductwork
- b. Components
  - i) Appliances
  - ii) Materials
  - iii) Controls

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Check and confirm the safety of the work location.  
(PC 7.1.1) (Range 1, 7)
2. Check the appropriate arrangements are in place for the movement and storage of materials, tools and equipment.  
(PC 7.1.2, 7.1.8) (Range 2)
3. Confirm that all necessary input services to which the components will be connected are available and of the correct type. Domestic only.  
(PC 7.1.5) (Range 6, 7, 9, 10)
4. Assess the suitability of the electrical supply (temporary or permanent) for the tools and equipment to be used in carrying out the work.  
(PC 7.1.5) (Range 6, 7, 9, 10)
5. Confirm that the electrical supply is suitable for the system requirements. Domestic only.  
(PC 7.1.5) (Range 6, 7, 9, 10)
6. Ensure that all materials, tools and equipment to carry out the work are available on site at the appropriate time.  
(PC 7.1.7) (Range 8)
7. Ensure that all tools, equipment, materials and system components are stored securely and safely in accordance with manufacturers' recommendations.  
(PC 7.1.8) (Range 8)
8. Confirm that the necessary safety and access provisions are taken account of in work activities arising from risk assessment or where a permit to work may be required.  
(PC 7.1.1, 7.1.2) (Range 1, 2, 7)
9. Ensure disturbance and damage to customer's property is kept to a minimum.  
(PC 7.1.3, 7.1.4) (Range 3, 4, 5, 9)
10. Explain to customers, job deadlines and potential disruptions, and negotiate alterations best suited to them within constraints previously agreed.  
(PC 7.1.6) (Range 3, 7)
11. Ensure that preparatory work, relevant to the work activity, meets the installation requirements of systems and components.  
(PC 7.1.9) (Range 9, 10)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge Statements

### The candidate must provide evidence that they know:

1. The sources of information on the preparatory work necessary for the system or component installation.  
(PC 7.1.4, 7.1.9) (Range 1, 7, 9, 10)
2. Regulations, recommendations governing safety in the workplace. General responsibilities of the operative for their own safety and that of others who may be affected by their errors or omissions.  
(PC 7.1.1) (Range 1, 7)
3. The equipment necessary to provide safe access to work at heights, or in confined spaces.  
(PC 7.1.2) (Range 2, 7)
4. How to protect customer's property or the building fabric prior to the work commencing.  
(PC 7.1.3, 7.1.4) (Range 3, 4, 5, 9)
5. The input services or supplies required for new systems or components, or for extending systems or adding components to existing systems. How to confirm that input services are adequate.  
(PC 7.1.5) (Range 6, 7, 9, 10)
6. The person to which deficiencies in input services should be reported and procedures for isolating input services.  
(PC 7.1.5) (Range 6, 7, 9, 10)
7. How to ensure that the customer is fully briefed on all aspects of the installation programme.  
(PC 7.1.6) (Range 3, 7)
8. The tools, equipment, materials and components required for the system installation – order and supply advice, delivery and checking procedures.  
(PC 7.1.7) (Range 7, 8)
9. The actions to be taken should materials not be available at site to commence the installation activity.  
(PC 7.1.8) (Range 7, 8)
10. Secure storage procedures for tools, equipment, materials and components. Basic stores procedures to ensure security and to minimise loss or wastage.  
(PC 7.1.7, 7.1.8) (Range 8)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. A proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. Produce evidence from a minimum of two work locations, incorporating a significant proportion of the installation.
  - b. Include examples of documentary evidence such as records made by the candidate and passed on to the customer, diary entries, delivery notes and timesheets.
  - c. For industrial and commercial or domestic provide evidence from one or more of the main fuel supply systems (gas, oil, solid fuel), depending on the work experience available. Where the evidence is based on gas, it must comply with the requirements of relevant sections of the gas ACS and nationally accredited scheme for the certification of gas operatives.
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Unit 007                      Install complex heating and ventilating systems and components**

Element 7.2                      Carry out the installation of complex systems and components

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 7.2.1    Confirm that the materials, tools and equipment<sup>(1)</sup> required for the installation processes are fit for their intended purpose.**
- 7.2.2    Assemble system components<sup>(2)</sup> using work methods that conform to industry requirements<sup>(3)</sup>.**
- 7.2.3    Position system components<sup>(2)</sup> to conform to the system design requirement<sup>(4)</sup>.**
- 7.2.4    Fix systems components<sup>(2)</sup> using methods that conform to industry requirements<sup>(3)</sup>.**
- 7.2.5    Connect system components<sup>(2)</sup> to systems and input services<sup>(7)</sup> using methods that meet industry requirements<sup>(3)</sup>.**
- 7.2.6    Carry out the installation of complex systems and components<sup>(2)</sup> using processes that minimise damage to customer property and building features.**
- 7.2.7    Report to the immediate job supervisor, line manager (or customer) circumstances that affect the progress of the installation of the complex systems and components<sup>(2)</sup>**
- 7.2.8    Confirm the integrity of the installed system using specified testing procedures<sup>(5)</sup>.**
- 7.2.9    Take precautionary actions<sup>(6)</sup> to prevent the unauthorised use of un-commissioned systems and components.**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Materials, Tools and Equipment**

- a. Materials relevant to the installation
- b. Hand tools
- c. Powered tools
- d. Mechanical tools

**2. Systems and Components**

- a. Systems from the appropriate appendix
- b. Components
  - i) Appliances
  - ii) Materials
  - iii) Controls

**3. Industry Requirements**

- a. Statutory regulations and recommendations
- b. Safety legislation governing activities in the workplace
- c. Work sequence
- d. Co-ordination with work of others
- e. Work practices and installation techniques for system components
- f. Company procedures
- g. Job specifications

**4. System Design Requirement**

- a. Pipe or ductwork sizes and layouts
- b. Component types, locations and positions
- c. Connections and fixing requirements

**5. Specified Testing Procedures**

- a. System integrity
- b. Water pressure
- c. Air pressure
- d. Leakage
- e. Continuity and earth leakage

**6. Precautionary Actions**

- a. Liaison with other persons
- b. Safe system shut down
- c. Labelling systems and components
- d. Systems and components isolation

**7. Input Services**

- a. Existing systems
- b. Fuel, water <sup>(1)</sup>, electricity and drainage <sup>(1)</sup>
- c. Temporary or permanent supplies for tools and equipment

<sup>(1)</sup> not for ductwork

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Assemble, position and fix system components as specified that conform to industry regulations, fixing methods and tools.  
(PC 7.2.1, 7.2.2, 7.2.3, 7.2.4) (Range 1, 2, 3, 4)
2. Check the input services are appropriate to the systems requirements.  
(PC 7.2.5) (Range 2, 3, 4, 7)
3. Assess the suitability of the electrical supply for the tools and equipment to be used in carrying out the work.  
(PC 7.2.5) (Range 2, 3, 4, 7)
4. Confirm that the electrical supply is suitable for the systems requirements. Domestic only.  
(PC 7.2.5) (Range 2, 3, 4, 7)
5. Identify, record and report any defects and potential dangers which arise prior to, or as the work is being undertaken.  
(PC 7.2.7) (Range 2, 3)
6. Reduce waste of materials and time to a minimum.  
(PC 7.2.2, 7.2.4) (Range 2, 3)
7. Install and connect system components according to industry requirements.  
(PC 7.2.5) (Range 2, 3, 7)
8. Carry out specified testing procedures on systems and components including input services for system integrity.  
(PC 7.2.8) (Range 2, 3, 5)
9. Confirm that precautionary actions are observed during the installation operation.  
(PC 7.2.9) (Range 2, 3, 5, 6)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge Statements

<b>The candidate must provide evidence that they know:</b>		
1.	How to measure and record site details for installation purposes. (PC 7.2.2)	(Range 2, 3, 4)
2.	The industry practices and work standards for installing system components. (PC 7.2.2)	(Range 2, 3, 4)
3.	The positioning and fixing requirements for system components, which conform, to the system design and intended functions. (PC 7.2.3, 7.2.4)	(Range 2, 3, 4)
4.	The procedures required for connecting to input services or connecting pipework into existing systems. (PC 7.2.5)	(Range 2, 3, 4, 7)
5.	Methods of working which protect the building fabric, customer property and existing systems or components. (PC 7.2.6, 7.2.9)	(Range 3, 6)
6.	Job management structures and methods of reporting and recording job progress or problems delaying progress. (PC 7.2.7)	(Range 3, 6)
7.	The care and maintenance requirements of tools and equipment, and the checks required to confirm they are in a safe condition. (PC 7.2.1)	(Range 1)
8.	The range of tests used to confirm the soundness of systems and components and how to use the range of specified testing procedures. (PC 7.2.8)	(Range 5)
9.	The precautionary actions required during installation and testing. (PC 7.2.9)	(Range 2, 3, 5, 6)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. A proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. Install:
    - i) pipework – carbon steel, copper, plastic – not ductwork
    - ii) brackets and supports
    - iii) boilers (including flues) - not ductwork
    - iv) storage vessels - not ductwork
    - v) heat emitters
    - vi) ventilation equipment - not industrial and commercial
    - vii) sanitary appliances – not ductwork
    - viii) controls (mechanical) - - not industrial and commercial
    - ix) controls (electrical and wiring – from a fused spur) - not ductwork
    - x) pressure vessels - not domestic or ductwork
    - xi) air conditioning equipment - not domestic
    - xii) ductwork ancillaries - not domestic
  - b. Install the items listed in a. on at least three occasions, within one and preferably more of the following systems:
    - i) cold water - not ductwork
    - ii) hot water - not ductwork
    - iii) hot water heating - not ductwork
    - iv) rectangular ductwork – ductwork only
    - v) flat oval ductwork – ductwork only
    - vi) circular ductwork – ductwork only
  - c. For industrial and commercial or domestic provide evidence from one or more of the main fuel supply systems (gas, oil, solid fuel), depending on the work experience available. Where the evidence is based on gas, it must comply with the requirements of relevant sections of the gas ACS and nationally accredited scheme for the certification of gas operatives.

Continued/...

## Assessment Guidance

### To assist in assessment of candidates

- d. Connect and test:
    - i) pipework – carbon steel, copper, plastic – not ductwork
    - ii) brackets and supports
    - iii) boilers (including flues) – not ductwork
    - iv) storage vessels - not ductwork
    - v) heat emitters
    - vi) ventilation equipment
    - vii) sanitary appliances – domestic only
    - viii) controls (mechanical)
    - ix) controls (electrical and wiring – from a fused spur) – domestic only
    - x) pressure vessels - not ductwork
    - xi) air conditioning equipment - not domestic
    - xii) ductwork ancillaries ductwork only
  
  - e. Apply the following tests:
    - i) water pressure - not ductwork
    - ii) air pressure
    - iii) leakage
    - iv) continuity and earth leakage – domestic only
  
  - f. Connect items listed in d. and apply the tests on e. at least three occasions within one, or preferably more, of the following systems:
    - i) cold water - not ductwork
    - ii) hot water - not ductwork
    - iii) hot water heating - not ductwork
    - iv) ductwork – ductwork only
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Note:** *This is what the candidate must do:*  
**Unit 008** **Commission and de-commission heating and ventilating systems**  
*This involves being able to:*

Element 8.1 Carry out pre-commission checks and tests on systems  
Element 8.2 Commission systems  
Element 8.3 De-commission systems

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## **UNIT COMMENTARY**

- This unit measures the candidate's ability to undertake the various checks and tests necessary before the system is brought into operation. It includes bringing the system into operation and ensuring it operates effectively as intended. It also requires candidates to de-commission the system, ready for further work or long-term isolation. Permanent de-commissioning involves the removal of components.
- Candidates are required to check that components are installed correctly, ensure there are no leaks and undertake cleaning and flushing. They should also be capable of rectifying complex faults. For ductwork there is a specified permissible level of air leakage.
- It is not intended for candidates to meet the demands of commissioning specialists. As a guide, they should be able to operate on heating systems with an input of up to 60kW for domestic installation and 150kW for industrial and commercial.
- For de-commissioning, candidates are required to make arrangements with users of the work location and ensure their safety throughout the process.
- It is important that candidates are aware of the effect that isolating part of a system has on the full system.

**Unit 008**                      **Commission and de-commission heating and ventilating systems**

Element 8.1                      Carry out pre-commissioning checks and tests on systems

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 8.1.1**    **Confirm that the** system or component <sup>(1)</sup> **installation complies with** industry requirements <sup>(2)</sup>.
- 8.1.2**    **Check that** input services <sup>(3)</sup> **to the** system or component <sup>(1)</sup> **are suited to their intended purpose.**
- 8.1.3**    **Check** system or component <sup>(1)</sup> **for soundness, using procedures that comply with** industry requirements <sup>(2)</sup>
- 8.1.4**    **Carry out** pre-commissioning tests and checks <sup>(4)</sup> **in accordance with** industry requirements <sup>(2)</sup>.
- 8.1.5**    **Check that the system cleanliness, additives and charging comply with** industry requirements <sup>(2)</sup>.

**Candidates will be required to produce evidence for all range items.**

Range

**1. Systems or Components**

- a. Systems from the appropriate appendix
  - Appendix A: Industrial and Commercial
  - Appendix B: Domestic
  - Appendix C: Ductwork
- b. Components
  - Appliances
  - Materials
  - Controls

**2. Industry Requirements**

- a. Statutory regulations and recommendations
- b. Safety legislation governing activities in the workplace
- c. Work sequences
- d. Co-ordination with the work of others
- e. Work practices and techniques for commissioning systems or components
- f. Company procedures
- g. Job specifications

**3. Input Services**

- a. Existing systems
- b. Fuel, water<sup>(1)</sup>, electricity and drainage<sup>(1)</sup>  
<sup>(1)</sup> not for ductwork

**4. Pre-commissioning Tests and Checks**

- a. Component function
- b. System integrity

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Apply approved procedures to:
  - i) clean the system
  - ii) flush the system – not ductwork
  - iii) charge the system – not ductwork(PC 8.1.1, 8.1.5) (Range 1, 2)
2. Carry out preliminary checks to ensure the component function.  
(PC 8.1.1, 8.1.2, 8.1.3) (Range 1, 2, 3, 4)
3. Inspect and test the system:
  - i) to ensure components are positioned correctly
  - ii) for leakage – not ductwork(PC 8.1.1, 8.1.3, 8.1.4) (Range 1, 2, 4)
- 3.2.5 Confirm that electrical power and control systems are safe for loading via the correct authority – not domestic  
(PC 8.1.2) (Range 1, 3)
5. Ensure that all faults found in the system are rectified.  
(PC All) (Range 1, 2, 3, 4)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge Statements

The candidate must provide evidence that they know:	
1.	The procedures, equipment and legislative requirements for applying specified tests to systems. (PC 8.1.1) (Range 2, 4)
2.	The methods of establishing that input services adequately supply all components within the system. (PC 8.1.2) (Range 1, 3)
3.	The methods of connecting components to systems. (PC 8.1.3) (Range 1, 2)
4.	The actions to take where pre-commissioning checks or tests reveal system or component defects. (PC 8.1.4) (Range 2, 4)
5.	How to complete pre-commissioning documentation confirming the safe pre-commissioning of systems and components. (PC All) (Range All)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. A proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. Carry out procedures for:
    - i) Cleaning the system
    - ii) Flushing the system – not ductwork
    - iii) Charging the system – not ductwork
  - b. Check and inspect:
    - i) Pipework (carbon steel, copper, plastic) – not ductwork
    - ii) Brackets and supports
    - iii) Boilers (including flues) – not ductwork
    - iv) Storage vessels – not ductwork
    - v) Heat emitters – not ductwork
    - vi) Ventilation equipment
    - vii) Sanitary appliances – domestic only
    - viii) Controls
    - ix) Pressure vessels – not ductwork
    - x) Air conditioning equipment – not domestic
    - xi) Ductwork ancillaries – ductwork only
  - c. Apply the following tests:
    - i) Water pressure – not ductwork
    - ii) Air pressure
    - iii) Leakage – not ductwork
    - iv) Operation of mechanical controls
    - v) Electrical tests – domestic only
  - d. Carry out a, b and c on at least three occasions within one – and preferably more – of the appropriate systems:
    - i) Cold water – not ductwork
    - ii) Hot water – not ductwork
    - iii) Hot water heating – not ductwork
    - iv) Ductwork – ductwork only

Continued/...

## Assessment Guidance

### To assist in assessment of candidates

- e. For domestic systems only, provide evidence from one or more of the main fuel supply systems (gas, oil, solid fuel), depending on the work experience available. Where the evidence is based on gas, it must comply with the requirements of relevant sections of the gas ACS and nationally accredited scheme for the certification of gas operatives.
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Unit 008**                      **Commission and de-commission heating and ventilating systems**

Element 8.2                      Commission systems

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 8.2.1**    **Ensure that the necessary** information <sup>(1)</sup> **on the** system or component <sup>(2)</sup> **performance is available.**
- 8.2.2**    **Liase with** other persons <sup>(3)</sup> **at appropriate points within the commissioning process to minimise disturbance to work routines.**
- 8.2.3**    **Check the correct function of** systems or components <sup>(2)</sup> **against performance requirements.**
- 8.2.4**    **Adjust** system controls <sup>(4)</sup> **to establish that** system components <sup>(2)</sup> **meet design specification.**
- 8.2.5**    **Provide the customer with** information <sup>(1)</sup> **necessary to the continuing operation of the system or component.**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Information**

- a. Commissioning specification
- b. Manufacturers specification
- c. Installation specification
- d. Test records and certificate
- e. User information

**2. System and Components**

- a. Systems from the appropriate appendix
  - Appendix A: Industrial and Commercial
  - Appendix B: Domestic
  - Appendix C: Ductwork
- b. Components
  - i) Appliances
  - ii) Materials

**3. Other Persons**

- a. Customers
- b. Colleagues
- c. Any site workers

**4. System Controls**

- a. The main controls within the systems

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Complete appropriate information. Not industrial and commercial  
(PC 8.2.1, 8.2.5) (Range 1, 2)
2. Confirm that appropriate persons have been notified of commissioning activities in order to minimise disturbance to work routines.  
(PC 8.2.2) (Range 3)
3. Bring the system into operation and confirm that systems and components are functioning correctly against performance requirements.  
(PC 8.2.3) (Range 1, 2, 4)
4. Contribute to bringing the system into operation and confirm that systems and components are functioning correctly against performance requirements. Not domestic.  
(PC 8.2.3) (Range 1,2,4)
5. Carry out combustion testing. Domestic only.  
(PC 8.2.3) (Range 1, 2)
6. Check and adjust controls to meet specifications.  
(PC 8.2.4) (Range 1, 2, 4)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge Statements

The candidate must provide evidence that they know:	
1.	The sources of information on the performance of systems or components. (PC 8.2.1) (Range 1, 2)
2.	The procedures for establishing correct system or component performance and checking against the job specification. (PC 8.2.3, 8.2.4) (Range 1, 3)
3.	The routines and sequences for commissioning systems or components. (PC All) (Range All)
4.	The points in the commissioning process where co-operation and liaison with other trades and customers may be required. (PC 8.2.2) (Range 3)
5.	Where to access user information appropriate to different systems and components. (PC 8.2.1) (Range All)
6.	How to complete commissioning documentation confirming the safe commissioning of systems and components. (PC 8.2.5) (Range 1, 2)
7.	System handover procedures and demonstrating the operation of systems and components to end-users. (PC 8.2.5) (Range All)
8.	The actions to take when components being commissioned do not meet performance requirements. (PC All) (Range All)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. A proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. Commission at least two hot water heating systems – industrial and commercial only
  - b. Commission at least two hot water heating systems, including the electrical controls from a fused spur – domestic only
  - c. Commission at least one of the following:
    - i) Cold water – not ductwork
    - ii) Hot water – not ductwork
  - d. For industrial and commercial or domestic provide evidence from one or more of the main supply systems (gas, oil, solid fuel), depending on the work experience available. Where the evidence is based on gas, it must comply with the requirements of relevant sections of the gas ACS and nationally accredited scheme for the certification of gas operatives – not ductwork
  - e. Commission at least two ductwork systems – ductwork only
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Unit 008 Commission and de-commission heating and ventilating systems**

Element 8.3 De-commission systems

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 8.3.1 Liaise with other persons <sup>(1)</sup> at appropriate points within the de-commissioning process to minimise disturbance to work routines.**
- 8.3.2 Check that conditions within the system or components <sup>(2)</sup> will permit safe de-commissioning.**
- 8.3.3 De-commission systems or components <sup>(2)</sup> using tests and procedures which comply with industry requirements <sup>(3)</sup>**
- 8.3.4 Take precautionary actions <sup>(4)</sup> to ensure that de-commissioned systems or components <sup>(2)</sup> do not prove a safety hazard.**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Other Persons**

- a. Customers
- b. Co-workers
- c. Other contractors

**2. System or Components**

- a. Systems from the appropriate appendix
  - Appendix A: Industrial and Commercial
  - Appendix B: Domestic
  - Appendix C: Ductwork
- b. Components
  - i) Appliances
  - ii) Materials
  - iii) Controls

**3. Industry Requirements**

- a. Statutory regulations and requirements
- b. Safety legislation governing activities in the workplace
- c. Work sequences
- d. Co-ordination with the work of others
- e. Work practices and decommissioning techniques for systems or components
- f. Company procedures
- g. Job specifications

**4. Precautionary Actions**

- a. Liaison with other persons
- b. Safe systems shutdown
- c. Safe isolation methods
- d. Labelling systems and components

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Ensure the safety of all relevant persons involved in, or affected by, the de-commissioning process.  
(PC All) (Range All)
2. Empty the system and confirm that it is:  
- empty - not ductwork  
- safe for further work  
(PC 8.3.2, 8.3.3, 8.3.4) (Range 2, 3, 4)
3. Ensure system or section of the system is isolated from use, operation and all energy sources.  
(PC 8.3.2, 8.3.3, 8.3.4) (Range 2, 3, 4)
4. Remove components.  
(PC 8.3.3, 8.3.4) (Range 2, 3, 4)
5. Identify, label and store components or contents, for re-use.  
(PC 8.3.3, 8.3.4) (Range 2, 3, 4)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge Statements

The candidate must provide evidence that they know:	
1.	The importance of confirming the system functions and outcomes of suspending the operation of the system. (PC 8.3.1) (Range 1)
2.	The need to liaise with others whose procedures or routines may be affected by the suspension of the system operation. (PC 8.3.1) (Range 1)
3.	The potential hazards that could arise from de-commissioning activities and the checks to be carried out before de-commissioning takes place. (PC 8.3.2, 8.3.4) (Range 2, 4)
4.	De-commissioning procedures for temporary and permanent de-commissioning of systems. (PC 8.3.3) (Range 2, 3)
5.	The precautions to ensure that de-commissioned systems do not prove a safety hazard – measures to prevent systems being brought into operation – safety and warning notices. (PC 8.3.4) (Range 2, 4)
6.	How to safely collect and dispose of system contents that may be hazardous to health or the environment. (PC 8.3.3, 8.3.4) (Range 2, 3, 4)
7.	How to complete systems de-commissioning records. (PC All) (Range All)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. A proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. Carry out de-commissioning activities on at least two occasions and/or one or more of the following systems, or significant parts of them:
    - i) Cold water – not ductwork
    - ii) Hot water – not ductwork
    - iii) Hot water heating – not ductwork
    - iv) Ductwork – ductwork only
  - b. For domestic systems only, provide from one or more of the main fuel supply systems (gas, oil, solid fuel), depending on the work experience available. Where the evidence is based on gas, it must comply with the requirements of relevant sections of the gas ACS and nationally accredited scheme for the certification of gas operatives.
  - c. Specify the necessary arrangements which need to be made to:
    - i) ensure safety
    - ii) notify relevant people – not ductworkfor de-commissioning carried out in a and/or b above.
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Note:** *This is what the candidate must do:*  
**Unit 012** **General service and maintenance of domestic systems and components**  
*This involves being able to:*

Element 12.1 Establish service and maintenance requirements for domestic systems and components

Element 12.2 Carry out the service and maintenance of domestic systems and components

Element 12.3 Diagnose the cause and rectify faults in domestic systems and components

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### **Unit Commentary**

- This unit measures the candidate's ability to plan, organise and execute both planned and breakdown (rectify faults) maintenance.
- Within the large domestic context, maintenance requirements will normally be planned from schedules provided. Candidates are required however to produce simple schedules for less complex systems.
- Candidates should produce simple schedules using the normal available information sources.
- Candidates should be able to diagnose and repair electrical faults within the system, from a fused spur connection. For large domestic systems, candidates should also be able to identify electrical faults and carry out fundamental checks relating to fuse failures and loose/faulty connections and plug in components.
- It is not intended that candidates will be able to meet the more specialised demands of the Service and Maintenance award. As a guide, candidates should be able to operate on heating systems with an input up to 60kW.

**Unit 012**                      **General service and maintenance of domestic systems and components**

Element 12.1                Establish service and maintenance requirements for domestic systems and components

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 12.1.1 **Confirm that the information<sup>(1)</sup> necessary to service and maintain system or component<sup>(2)</sup> is available.**
- 12.1.2 **Identify the activities that make up the maintenance schedule for the system or component<sup>(2)</sup>**
- 12.1.3 **Plan service and maintenance work to minimise the disruption of system or component<sup>(2)</sup> operation.**
- 12.1.4 **Confirm that all materials, tools and equipment<sup>(3)</sup> necessary for the service and maintenance activities will be available as required.**
- 12.1.5 **Liase with other persons<sup>(4)</sup> at appropriate points within the maintenance activities to minimise disruption to work routines.**
- 12.1.6 **Confirm that maintenance activities comply with industry requirements<sup>(5)</sup>**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Information**

- a. Work sequences for maintaining systems
- b. Technical data
- c. Manufacturer's recommendations
- d. Design specifications

**2. Systems or Components**

- a. Systems  
Appendix B: Domestic
- b. Components
  - appliances
  - materials
  - controls

**3. Materials, Tools and Equipment**

- a. Materials for cleaning and lubricating
- b. Tools and equipment
  - Hand tools
  - Powered tools
  - Test equipment

**4. Other Persons**

- a. Customers
- b. Any site worker
- c. Colleagues

**5. Industry Requirements**

- a. Statutory regulations, recommendations and system documentation
- b. Work sequences for maintenance
- c. Co-ordination with other trades/customers
- d. Maintenance practice and procedures
- e. Company procedures

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Identify the systems maintenance requirements and organise them into a logical work sequence  
(PC 12.1.1, 12.1.2, 12.1.3) (Range 1, 2, 3)
2. Produce simple operational plans which meet requirements of customers, the company, and industry requirements  
(PC 12.1.3, 12.1.5, 12.1.6) (Range All)
3. Quantify and ensure the tools, materials and equipment required to undertake the work are available as required.  
(PC 12.1.4) (Range 3)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge Statements

The candidate must provide evidence that they know:	
1.	The range of information available on the routine and non-routine service and maintenance requirements of systems and components. (PC 12.1.1) (Range 1, 2)
2.	The service and maintenance procedures across the range of systems and components (PC 12.1.2, 12.1.6) (Range All)
3.	How to plan, service and maintenance procedures to minimise interference with system operation and customer routines (PC 12.1.3) (Range All)
4.	How and when to liaise with others during service and maintenance activities (PC 12.1.5) (Range 4, 5)
5.	The materials required for routine maintenance and sources of information on the materials required for structured servicing operations (PC 12.1.4) (Range 3)
6.	The tools and equipment required for routine maintenance and structured servicing operations (PC 12.1.4) (Range 3)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## ASSESSMENT GUIDANCE

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. A proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. demonstrate the ability to identify maintenance requirements for at least two of the following systems:
    - cold water
    - hot water
    - hot water heating
    - fuel supply
  - b. demonstrate the ability to plan work and organise the availability of tools, materials and equipment.
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Unit 012**                      **General service and maintenance of domestic systems and components**

Element 12.2                Carry out the service and maintenance of domestic systems and components

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 12.2.1 **Carry out service and maintenance activities using procedures which comply with industry requirements<sup>(1)</sup>**
- 12.2.2 **Service and maintain systems or components<sup>(2)</sup> to ensure continued effective operation of the system.**
- 12.2.3 **Complete records<sup>(3)</sup> to provide an accurate history of the service and maintenance of system or component<sup>(2)</sup>**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Industry Requirements**

- a. Statutory regulations, recommendations and system documentation
- b. Work sequences for maintenance activity
- c. Co-ordination with other trades
- d. Maintenance methods including fault diagnosis
- e. Company procedures
- f. Performance specifications

**2. Systems or Components**

- a. Appliances
- b. Materials
- c. Controls

**3. Records**

- a. Any legislative records
- b. Schedules
- c. Company records

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Check component performance or operation to identify faults, using the appropriate fault diagnosis techniques  
(PC 12.2.1, 12.2.2) (Range 1, 2)
2. Safely isolate components from input services and all other sources of energy  
(PC 12.2.1) (Range 1, 2)
3. Carry out routine repairs, maintenance and cleaning of components in accordance with industry requirements  
(PC 12.2.1, 12.2.2) (Range 1, 2)
4. Complete service and maintenance records to industry requirements  
(PC 12.2.3) (Range All)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge Statements

<b>The candidate must provide evidence that they know:</b>	
1.	How to use performance specifications for systems and components and the service and maintenance procedures necessary to restore or maintain the continued performance of systems and components. (PC All) (Range All)
2.	The service and maintenance procedures necessary to ensure compliance with industry requirements for routine and non-routine service and maintenance activities. (PC 12.2.1, 12.2.2) (Range 1, 2)
3.	How to complete records and reports of the service and maintenance of systems and components (PC 12.2.3) (Range 3)
4.	The action to take when the system or component does not work to full performance specification. (PC All) (Range All)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. A proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. Apply the listed work practices and procedures to undertake maintenance of the following components:
    - Pipework
    - brackets and supports
    - boilers
    - storage vessels
    - heat emitters
    - ventilation equipment
    - sanitary appliances
    - controls (electrical and mechanical)
    - pressure vessels
    - air conditioning equipment
  - b. Carry out (a) on at least two of the following systems:
    - cold water
    - hot water
    - hot water heating
  - c. Provide evidence from one or more of the main fuel supply systems (ie gas, oil, solid fuel), depending on the work experience available. Where the evidence is based on gas, it must comply with the requirements of relevant sections of the gas ACS and nationally accredited scheme for the certification of gas operatives.
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

Note: Domestic candidates should be able to diagnose and repair electrical faults within the system, from a fused spur connection.

For industrial and commercial/large domestic systems, candidates should be able to identify the fault as electrical and carry out fundamental checks relating to fuse failures and loose/faulty connections and plug in components.

**Unit 012**                      **General service and maintenance of domestic systems and components**

Element 12.3                      Diagnose the cause and rectify faults in domestic systems and components

Performance Criteria

**The candidate must provide evidence to prove that they can:**

**12.3.1 Locate** faults <sup>(1)</sup> **in** systems or components <sup>(2)</sup> **using procedures that comply with** industry requirements <sup>(3)</sup>

**12.3.2 Liaise with** other persons <sup>(4)</sup> **to agree fault rectification procedures, which will minimise disruption to work routines.**

**12.3.3 Rectify** faults <sup>(1)</sup> **in systems to restore the** system or component <sup>(2)</sup> **function to performance specification.**

**12.3.4 Take** precautionary actions <sup>(5)</sup> **to prevent the unauthorised use of unsafe** system or component <sup>(2)</sup>

**Candidates will be required to produce evidence for all range items.**

Range

**1. Faults**

- a. Electrical
- b. Mechanical

**2. System or Component**

- a. Systems  
Appendix B: Domestic
- b. Components
- c. Appliances
- d. Materials
- e. Controls

**3. Industry Requirements**

- a. Statutory regulations, recommendations and system documentation
- b. Work sequences for maintenance activity
- c. Co-ordination with other trades/customers
- d. Company procedures
- e. Maintenance practices and procedures

**4. Other Persons**

- a. Customers
- b. Any site worker
- c. Colleagues

**5. Precautionary Actions**

- a. Systems isolation and labelling
- b. Minimise risk to individuals and the environment
- c. Health and safety procedures

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Take appropriate action to any reported fault according to organisational procedures (PC 12.3.2) (Range All)
2. Establish that the system and work locations are safe (PC 12.3.1) (Range All)
3. Use a logical sequence to find faults (PC 12.3.1) (Range 1, 2, 3)
4. Use appropriate services and maintenance equipment to rectify faults (PC 12.3.3) (Range 1, 2, 3, 5)
5. Inform people where rectification is or cannot be completed (PC 12.3.1, 12.3.2, 12.3.3) (Range 1, 2, 3, 4)
6. Confirm that precautionary actions had taken place to prevent unauthorised use of unsafe systems or components (PC 12.3.4) (Range 5)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge Statements

The candidate must provide evidence that they know:	
1.	How to interpret information on system or component performance, including user feedback, visual inspections, checks or diagnostic tests to locate faults (PC All) (Range All)
2.	The work procedures for the rectification of faults in systems or components, which will ensure minimum disruption to customers and routines. (PC 12.3.1, 12.3.2) (Range 1, 2, 3, 4)
3.	How to liaise with others to ensure co-operation in the fault rectification process (PC 12.3.2) (Range 1, 2, 3, 4)
4.	The work action and sequences required to rectify faults in systems and components (PC 12.3.1, 12.3.1, 12.3.2) (Range 1, 2, 3, 4)
5.	The measures to ensure that systems do not present a safety hazard to potential users, or the workforce, when carrying out rectification procedures (PC 12.3.4) (Range 2, 5)
6.	The actions to be taken when the system or component cannot be restored to full performance (PC All) (Range All)
7.	How to isolate unsafe systems and components (PC All) (Range All)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. A proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. Diagnose and repair the following faults:
    - insufficient or no supply at outlet point
    - air locks
    - noise in the system
    - component failure (electrical or mechanical)
    - blockage
    - leakage
    - corrosion of components including pipework
  - b. Carry out (a) on at least two of the following systems
    - cold water
    - hot water
    - hot water heating
  - c. Provide evidence from one or more of the main fuel supply systems (ie gas, oil, solid fuel), depending on the work experience available. Where the evidence is based on gas, it must comply with the requirements of relevant sections of the gas ACS and nationally accredited scheme for the certification of gas operatives.
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

Note: Domestic candidates should be able to diagnose and repair electrical faults within the system, from a fused spur connection.

For industrial and commercial/large domestic systems, candidates should be able to identify the fault as electrical and carry out fundamental checks relating to fuse failures and loose/faulty connections and plug in components

**Note:**            *This is what the candidate must do:*  
**Unit 014**        **Apply domestic system design principles**

---

### **Unit Commentary**

- This unit measures the candidate's ability to deal with domestic customers in identifying their system design requirements and providing a commercially acceptable solution to them.
- In terms of design, candidates should be able to assess the implications, impact and feasibility of installation alterations and changes to the system.

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 14.1.1 **Identify and record the** customer job requirements <sup>(1)</sup>.
- 14.1.2 **Obtain and record information on** site structures and features <sup>(2)</sup>.
- 14.1.3 **Identify any areas of the proposed installation where compliance with** industry requirements <sup>(3)</sup> **is necessary.**
- 14.1.4 **Design systems to meet** key design requirements <sup>(4)</sup>
- 14.1.5 Present <sup>(5)</sup> **the agreed design option to the customer which meets** industry requirements <sup>(3)</sup>
- 14.1.6 **Carry out basic calculations to determine** system component <sup>(6)</sup> **requirements.**
- 14.1.7 **Obtain customer** agreement <sup>(7)</sup> **to the proposal.**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Customer Job Requirements**

- h. System design concept and layout
- i. Locations of components
- j. Appliances
- k. Materials
- l. Controls
- m. System performance
- n. Specifications

**2. Site Structures and Features**

- d. Structures intended use
- e. Method of construction and materials used
- f. Performance requirements of systems and components
- g. Availability of input services

**3. Industry Requirements**

- c. Statutory regulations and recommendations
- d. Safety legislation governing activities in the workplace
- e. Work sequence
- f. Company procedures
- g. Job specifications

**4. Key Design Requirements**

- e. System design concept and layout
- f. Location of components
- g. Appliances
- h. Materials
- i. Controls
- j. System performance
- k. Specifications

**5. Present**

- a. Oral
- b. Written
- c. Standard company issue
- d. Sketches

**6. System Components**

- a. Systems  
Appendix B: Domestic
- b. (i) Appliances  
(ii) Materials  
(iii) Controls

**7. Agreement**

- a. Verbal
- b. Written
- c. Standard company issue

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Identify customer requirements in respect of the system type, function, installation and performance.  
(PC 14.1.1) (Range 1)
2. Advise on the industry requirements of the installation and implications to the customer.  
(PC 14.1.1, 14.1.3) (Range 1, 3)
3. Produce records and sketches as required by company procedures.  
(PC 14.1.2, 14.1.5) (Range 2, 5)
4. Incorporate oral and written information on design requirements.  
(PC All) (Range All)
5. Ensure that the proposal:
  - a. Complies with information on design requirements
  - b. Complies with specifications and drawings
  - c. Takes account of the work locations, structures and features(PC 14.1.1, 14.1.2, 14.1.3, 14.1.4, 14.1.5) (Range All)
6. Carry out basic calculations to ensure that the installation complies with industry requirements.  
(PC All) (Range All)
7. Ensure that the proposal is agreed with the customer.  
(PC 14.1.7) (Range 7)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge Statements

The candidate must provide evidence that they know:		
11.	How to identify customer requirements in respect of the system type, function, installation and performance. (PC 14.1.1)	(Range 1)
12.	How to obtain information from site (PC 14.1.1, 14.1.2)	(Range 1, 2)
3.	The range of documentation detailing industry requirements. (PC 14.1.3, 14.1.5)	(Range 3, 5)
4.	How to ensure that the proposal meets the following: - customer requirements - site structures and features requirements - industry requirements - key design requirements (PC 14.1.1, 14.1.2, 14.1.3, 14.1.4)	(Range 1, 2, 3, 4)
5.	How to calculate the requirements of simple domestic system components, size and specification. (PC 14.1.6)	(Range 6)
6.	How to obtain agreement from the customer to progress the proposal. (PC 14.1.5, 14.1.7)	(Range 3, 5, 7)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. A proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. Provide evidence from a minimum of two work locations where significant changes to the original specification have occurred.
  - b. Demonstrate a clear understanding of the company's requirements for agreeing modifications.
  - c. Include sketches and notes relating to the installation or modification and its agreement.
  - d. Provide evidence from one or more of the main fuel supply systems (gas, oil, solid fuel), depending on the work experience available. Where the evidence is based on gas, it must comply with the requirements or relevant sections of the gas ACS and nationally accredited scheme for the certification of gas operatives.
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Note:** This is what the candidate must do:  
**Unit 015** Design heating and ventilating systems  
*This involves being able to:*

Element 15.1 Identify customer's requirements

Element 15.2 Design systems to meet customer needs

---

### **Unit Commentary**

- This unit measures the candidate's ability to deal with customers in identifying their design requirements and providing commercially acceptable solutions to them.
- Within the industrial and commercial, large domestic and ductwork sites context, customers' requirements are most likely to be identified indirectly from documentation and line managers or supervisors.
- Customers within this unit cover the client, the client's representatives, sub-contractors and internal contacts within the candidate's employing organisation, as appropriate.
- The range of competence required for this unit extends to changes and alterations required by the customer throughout the installation.
- In terms of design, candidates will be able to assess the implications, impact and feasibility of alterations and changes to the system.
- Reference to costs relates to the time and materials required to undertake the work, rather than detailed costing.

**Unit 015                      Design heating and ventilating systems**

Element 15.1                Identify customers' requirements

Performance Criteria

**The candidate must provide evidence to prove that they can:**

- 15.1.1 **Identify and record the** customer job requirements <sup>(1)</sup>.
- 15.1.2 **Obtain and record information on** site instructions and features <sup>(2)</sup>.
- 15.1.3 **Identify any areas of the proposed installation where compliance with** industry requirements <sup>(3)</sup> **is necessary.**
- 15.1.4 **Prepare a range of design options, which comply with** key design requirements <sup>(4)</sup>.
- 15.1.5 **Use a range of** methods of presentation <sup>(5)</sup> **to explain design options to the customer which meet identified requirements.**
- 15.1.6 **Obtain customer agreement** <sup>(6)</sup> **to the design proposals.**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Customer Job Requirements**

- o. System design concept and layout
- p. Locations of components
- q. Appliances
- r. Materials
- s. Controls
- t. System performance
- u. Specifications

**2. Site Structures and Features**

- h. Structures intended use
- i. Method of construction and materials used
- j. Performance requirements of systems and components
- k. Availability of input services

**3. Industry Requirements**

- h. Statutory regulations and recommendations
- i. Specifications
- j. Company procedures
- k. In accordance with industry's expectations

**4. Key Design Requirements**

- l. System design concept and layout
- m. Location of components
- n. Appliances
- o. Materials
- p. Controls
- q. System performance
- r. Specifications

**5. Methods of Presentation**

- e. Oral
- f. Written
- g. Standard company issue
- h. Sketches

**6. Agreement**

- d. Verbal
- e. Written
- f. Standard company issue

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

8. Identify customer requirements in respect of the system type, function, installation and performance.  
(PC 15.1.1) (Range 1)
9. Advise on the requirements of the installation and implications of changes to the pre-designed system.  
(PC 15.1.4) (Range 4)
10. Produce records and sketches as required by company procedures.  
(PC 15.1.2) (Range 2)
11. Incorporate oral and written information on design requirements.  
(PC All) (Range All)
12. Ensure that proposed options:
  - a. Comply with information on design requirements
  - b. Comply with specifications and drawings
  - c. Take account of the work locations, structures and features(PC 15.1.1, 15.1.2, 15.1.3, 15.1.4, 15.1.5) (Range All)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge Statements

The candidate must provide evidence that they know:		
13.	How to obtain information from site drawings and plans. (PC 15.1.1, 15.1.2)	(Range 1, 2)
14.	How to carry out site surveys (PC 15.1.2)	(Range 2)
3.	The range of documentation detailing industry requirements. (PC 15.1.3)	(Range 3)
4.	How to identify possible design options which meet the following: - customer requirements - site structures and features requirements - industry requirements (PC 15.1.3, 15.1.4, 15.1.5)	(Range 3, 4, 5)
5.	How to obtain agreement from the customer to progress a selected design option. (PC 15.1.5, 15.1.6)	(Range 5, 6)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. A proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
3. Candidates must:
  - e. Provide evidence from a minimum of two work locations where significant changes to the original specification have occurred.
  - f. Demonstrate clearly the ability to interpret and apply oral and written information on design requirements.
  - g. Produce a typical company report for variations to the original specification.
  - h. Provide evidence from one or more of the main fuel supply systems (gas, oil, solid fuel), depending on the work experience available. Where the evidence is based on gas, it must comply with the requirements or relevant sections of the gas ACOP and nationally accredited scheme for the certification of gas operatives. Not ductwork.
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Unit 015                      Design heating and ventilating systems**

Element 15.2                Design systems to meet customers' needs

Performance Criteria

**The candidate must provide evidence to prove that they can:**

15.2.1 **Design systems to meet key** design requirements <sup>(1)</sup>.

15.2.2 **Carry out design calculations to determine** system component <sup>(2)</sup> **requirements.**

15.2.3 Present <sup>(3)</sup> **the system design in a manner which enables customer agreement.**

15.2.4 **Confirm that the completed system design meets** key design requirements <sup>(1)</sup>.

15.2.5 **Amend system design options to meet** customer job requirements <sup>(4)</sup>

**Candidates will be required to produce evidence for all range items.**

Range

**1. Key Design Requirements**

- a. System design concept and layout
- b. Locations of components
- c. Appliances
- d. Materials
- e. Controls
- f. System performance
- g. Specifications
- h. Structures and features of the work location
- i. Statutory regulations and recommendations

**2. System Component**

- a. Appliances
- b. Materials
- c. Controls

**3. Present**

- a. Oral
- b. Written
- c. Visual
- d. Use of Information and Communication Technology (ICT)

**4. Customer Job Requirements**

- a. System design concept and layout
- b. Locations of components
- c. Appliances
- d. Materials
- e. Controls
- f. System performance
- g. Specifications

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

1. Incorporate the customers' requirements into a workable modification.  
Domestic only.  
(PC All) (Range All)
2. Incorporate the customers' requirements for alterations to the original specification into a workable option.  
(PC All) (Range All)
3. Ensure that the proposed options are agreed with the customer.  
(PC 15.2.3, 15.2.4, 15.2.5) (Range 1, 3, 4)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge Statements

### The candidate must provide evidence that they know:

1. The range of job information that is required to carry out design work:
  - a. New buildings
  - b. Existing properties(PC 15.2.1, 15.2.4) (Range 1)
2. Positioning requirements for components within systems and standard system layouts. (Range 1, 2)
3. How to calculate the requirements of system components – size and specification. (PC 15.2.2) (Range 2)
4. Methods of presenting design information to customers
  - a. Drawings
  - b. Specifications
  - c. Quotations(PC 15.2.5) (Range 2, 4)
5. How information and communication technology (ICT) may be used in presenting design information. (PC 15.2.3) (Range 3)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. A proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
2. Candidates must:
  - a. Provide evidence from a minimum of two work locations where significant changes to the original specification have occurred.
  - b. Demonstrate a clear understanding of the company's requirements for agreeing modifications.
  - c. Include sketches and notes relating to the modification and its agreement.
  - d. Provide evidence from one or more of the main fuel supply systems (gas, oil, solid fuel), depending on the work experience available. Where the evidence is based on gas, it must comply with the requirements or relevant sections of the gas ACOP and nationally accredited scheme for the certification of gas operatives. Not ductwork.
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Note:** *This is what the candidate must do:*  
**Unit 016** **Specify programmes for working on heating and ventilating systems**  
*This involves being able to:*

Element 16.1 Produce and monitor work programmes

Element 16.2 Negotiate job contract terms and conditions

---

### **Unit Commentary**

- This unit measures the candidate's ability to produce, negotiate and agree programmes of work.
- It involves identifying the activities involved in undertaking a significant part of an installation, together with the human resources, equipment and material requirements.
- Within the domestic context, candidates will be expected to produce programmes for a complete installation.
- It is important that candidates are able to adjust programmes in order to maintain completion dates or minimise delays.

## **Unit 016 Specify programmes for working on heating and ventilating systems**

### Element 16.1 Produce and monitor work programmes

#### Performance Criteria

#### **The candidate must provide evidence to prove that they can:**

- 16.1.1 **Produce details of** resource requirements <sup>(1)</sup> **for system installations.**
- 16.1.2 **Produce** work programmes <sup>(2)</sup> **which make the best use of resources within the contract conditions** <sup>(3)</sup>.
- 16.1.3 **Schedule any** inspection or approval requirements <sup>(4)</sup> **by third party organisations within the work programme.**
- 16.1.4 **Produce a schedule of payments for the job based on the** contract conditions <sup>(3)</sup>
- 16.1.5 **Monitor the progress of jobs against the** work programmes <sup>(2)</sup>.
- 16.1.6 **Negotiate revisions to** work programmes <sup>(2)</sup> **where modifications and deviations prove necessary.**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Resource Requirements**

- v. Human resources
- w. Materials
- x. Plant and equipment
- y. Tools

**2. Work Programmes**

- l. Work sequences
- m. Work plans
- n. Bar charts

**3. Contract Conditions**

- l. Standard form of contract

**4. Inspection or Approval Requirements**

- s. Statutory regulations and recommendations affecting the work undertaken
- t. Safety legislation affecting the work undertaken

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

13. Identify resource requirements and schedule work programmes incorporating:
  - a. operational constraints
  - b. inspections
  - c. work completion timescale
  - d. best use of resources(PC 16.1.1, 16.1.2, 16.1.3, 16.1.4) (Range 1, 2, 3, 4)
  
2. Monitor and adjust work programmes as the installation progresses, taking into account any changes and variations which arise.  
(PC 16.1.5, 16.1.6) (Range 2)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge Statements

The candidate must provide evidence that they know:	
15.	How to determine the following for specific jobs: <ul style="list-style-type: none"><li>- material requirements</li><li>- labour requirements</li><li>- plant and equipment requirements</li></ul> (PC 16.1.1) (Range 1)
16.	How to produce basic work programmes in bar chart format to identify key stages in job progress. (PC 16.1.2) (Range 2)
17.	How to develop work programmes which meet the requirements of customer and/or main contractor work programmes. (PC 16.1.2) (Range 2)
18.	How to schedule inspection or approval site visits into work programmes. (PC 16.1.3) (Range 4)
19.	How to specify job payment requirements, which meet, work progress, job contract and business requirements. (PC 16.1.4) (Range 3)
20.	Typical situations in which the work programme may have to be adjusted and how to obtain approval to adjust the work programme. (PC 16.1.5, 16.1.6) (Range 2)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. A proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
14. Candidates must produce work programmes for a minimum of two work locations which incorporate an entire installation or significant proportion of a large installation.
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

**Unit 016**                      **Specify programmes for working on heating and ventilating systems**

Element 16.2                  Negotiate job contract terms and conditions

Performance Criteria

**The candidate must provide evidence to prove that they can:**

16.2.1 **Negotiate and agree contract conditions between** relevant parties <sup>(1)</sup>

16.2.2 **Specify** contract conditions <sup>(2)</sup> **in an agreed** contract format <sup>(3)</sup>.

16.2.3 **Confirm customer satisfaction with the** contract conditions <sup>(2)</sup>.

16.2.4 **Identify and negotiate with** relevant parties <sup>(1)</sup> **changes to the** contract conditions <sup>(2)</sup> **where deviations or modifications prove necessary.**

**Candidates will be required to produce evidence for all range items.**

Range

**1. Relevant Parties**

- e. Supplies  
Customers

**2. Contract Conditions**

- c. Standard form of contract

**3. Contract Format**

- h. Customer's requirements
- i. Variation to contract

## Performance Evidence

**Candidates must produce sufficient evidence to demonstrate consistency in their ability to:**

- |    |  |              |
|----|--|--------------|
| 1. | Agree programmes of work with relevant parties.<br>(PC 16.2.1, 16.2.3)   | (Range 1, 2) |
| 3. | Complete and maintain documentation associated with the installation contract as required by organisational procedures.<br>(PC 16.2.2) | (Range 2, 3) |
| 3. | Confirm changes to contracts where required.<br>(PC 16.2.4)  | (Range 1, 2) |

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Knowledge Statements

### The candidate must provide evidence that they know:

10. The basic forms of job agreement applicable to the size and contract:
  - Quotations and acceptance letters
  - Formal contract documents
  - Orders for material supply(PC 16.2.1, 16.2.2, 16.2.3) (Range 1, 2, 3)
11. The circumstances in which deviations or variations to the contract may prove necessary.  
(PC 16.2.4) (Range 1, 2)
12. The actions necessary to obtain agreement with customers or suppliers to deviations or variations to the contract conditions.  
(PC 16.2.3, 16.2.4) (Range 1, 2)

Note: Numbers in brackets allow you to refer back to the relevant performance criteria and range

## Assessment Guidance

### To assist in assessment of candidates

1. Performance evidence should be generated from the workplace. A proportion may be produced in a realistic working environment. All performance evidence must be of a commercially acceptable standard.
2. Candidates must be observed by the assessor or provide witness testimony of their ability to negotiate and agree programmes of work with at least one of the relevant parties listed in the range.
3. In addition, candidates must possess sufficient knowledge and understanding across all range and satisfy all performance criteria.

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