

**National Occupational Standards  
for Energy Assessors (Air Conditioning Systems)**

**Asset Skills – September 2007**

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# National Occupational Standards for Energy Assessors (Air Conditioning Systems)

These standards have been developed for individuals assessing the energy performance of air conditioning systems (over 12Kw rated cooling output) to comply with Article 9 of the Energy Performance of Buildings Directive (EPBD). They require the competent application of the technical methodology developed by the Chartered Institution of Building Services Engineers / Federation of Environmental Trade Associations) (CIBSE / FETA) Working Group on Article 9 implementation (*'Inspection of Air Conditioning Systems'*), and referred to as the 'CIBSE methodology'.

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## UNIT 1

## Work in a safe, effective and professional manner

Element 1.1	Contribute to the maintenance of health, safety and security at work
Element 1.2	Develop and maintain effective working relationships
Element 1.3	Conduct energy assessments in a professional and ethical manner

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### About this Unit

This Unit covers the essential, general competences expected of all accredited professionals in Energy Assessment regardless of their working environment. It is common to the National Occupational Standards for Asset Ratings, Operational Ratings and Air Conditioning Systems.

Element 1.1 describes the activities involved in contributing to the maintenance of health, safety and security at work. You must identify and manage the risks associated with your work, and ensure that your conduct does not endanger yourself or others. You are expected to know, and work in accordance with, the provisions of relevant legislation (e.g. Health and Safety at Work Act) and any relevant workplace policies.

Element 1.2 covers the development and maintenance of effective working relationships with all those people with whom you come into contact during your work. You are expected to communicate with others in a polite, clear and respectful manner, respond to enquiries and work towards avoiding any disputes that may arise. You are also expected to comply with formal complaints procedures if and when complaints are received. The main groups of people with whom you will need to develop good working relationships are your clients, other professionals, colleagues, and anyone else with whom you come into contact in the course of your work.

Element 1.3 covers the conduct of work in a professional and ethical manner. You are expected to present a positive and professional image at all times, work in accordance with prescribed codes of conduct and standards of good practice, and take steps to avoid any potential conflicts of interest during your work. It is also vital that you comply with the specific auditing and monitoring requirements of your accrediting organisation. Importantly, you must recognise and work within the limits of your own competence and expertise.

**Element 1.1****Contribute to the maintenance of health, safety and security at work****Performance Criteria****You must be able to:**

- 1 carry out working practices in accordance with legal requirements
- 2 identify any health, safety and security risks in different locations and take action to minimise or mitigate such risks
- 3 ensure your own personal conduct in the workplace does not endanger the health, safety and security of self and other people
- 4 follow the workplace policies and suppliers' or manufacturers' instructions for the safe use of equipment, materials and products
- 5 follow emergency procedures effectively to protect the health, safety and security of people
- 6 pass on any suggestions for improving health, safety and security within the workplace to the responsible persons

**Knowledge and Understanding****You must know and understand:**

- (a) the legal duties for health, safety and security in the workplace as required by legislation
- (b) what health, safety and security risks could exist in different locations, and the action to take to minimise or mitigate risks
- (c) why it is important to remain alert to the presence of risks in the workplace
- (d) the importance of personal conduct in maintaining the health, safety and security of self and others
- (e) suppliers' and manufacturers' instructions for the safe use of equipment, materials and products
- (f) who should be informed of any conflicts between different health, safety and security requirements
- (g) the procedures for different types of emergency
- (h) what types of suggestions for improving health, safety and security at work could be made and who should be given them

**Element 1.1**

**Contribute to the maintenance of health, safety and security at work**

**Scope**

- A. **workplace:**
- (i) the office
  - (iii) any other location you visit in the course of your work

**Element 1.2****Develop and maintain effective working relationships****Performance Criteria****You must be able to:**

- 1 develop and maintain productive working relationships with others which promote goodwill and trust
- 2 request information from others in a polite, clear and professional manner
- 3 respond promptly to enquiries from others and ask questions to clarify their information needs
- 4 take action in cases where you are unable to respond to enquiries from others
- 5 handle and resolve disputes and differences of opinion in ways which minimise offence and maintain respect
- 6 comply with formal complaints procedures

**Knowledge and Understanding****You must know and understand:**

- (a) why it is important to promote goodwill and trust when working with others, and ways in which this can be achieved
- (b) how to identify the information you require and the potential sources of such information
- (c) how to respond to enquiries from others and how to clarify their information needs
- (d) how to respond to enquiries which are outside your authority, beyond your area of knowledge / expertise or where the information requested is confidential
- (e) ways in which disputes or differences of opinion should be handled and resolved to minimise offence and maintain respect
- (f) the details of the formal complaints procedure that covers your work, and any specific organisational requirements with regard to complaints

**Element 1.2****Develop and maintain effective working relationships****Scope****A. others:**

- (i) clients
- (ii) other professionals
- (iii) colleagues
- (iv) anyone else with whom you come into contact in the course of your work

**B. action:**

- (i) inform the enquirer
- (ii) pass the enquiry onto the relevant person or organisation

**Element 1.3                      Conduct energy assessments in a professional and ethical manner**

<b>Performance Criteria</b>	<b>Knowledge and Understanding</b>
<p><b>You must be able to:</b></p> <ol style="list-style-type: none"> <li>1     present a positive personal and professional image at all times when dealing with <b>others</b></li> <li>2     carry out your work in accordance with prescribed codes of conduct, ethical standards and recognised good practice</li> <li>3     develop yourself within your role</li> <li>4     manage your own work activities effectively</li> <li>5     deal with <b>others</b> in a tactful, courteous and equitable manner at all times</li> <li>6     work within the limits of your own competence and expertise</li> <li>7     recognise and respond appropriately to pressure from any person which might influence the objectivity of your judgement</li> <li>8     recognise and manage any potential conflicts of interest that may arise during your work</li> <li>9     comply with the auditing and monitoring requirements of the accreditation or certification organisation to which you belong</li> <li>10    comply with all legislation relevant to your work</li> <li>11    have regard to all relevant guidance relating to the assessment of energy performance</li> </ol>	<p><b>You must know and understand:</b></p> <ol style="list-style-type: none"> <li>(a)    why it is important to present a positive personal and professional image when dealing with people, and how this can be achieved</li> <li>(b)    your specific responsibilities under prescribed codes of conduct and ethical standards</li> <li>(c)    the importance of complying with <b>recognised good practice</b></li> <li>(d)    the extent and limits for your own competence and expertise; the importance of not working beyond these limits</li> <li>(e)    the range of potential conflicts of interest that you may encounter, and the action required to manage these</li> <li>(f)    the specific auditing or monitoring requirements that relate to your registration with your accreditation organisation; your responsibilities in complying with these</li> <li>(g)    An outline of UK Government policy on combating Climate Change and the reduction of carbon emissions from buildings</li> <li>(h)    the main points of the legislation relevant to your work – be it derived from the Housing Act 2004 and associated Regulations for Home Information Packs or the European Performance of Buildings Directive (EPBD) and its associated Regulations</li> <li>(i)    all relevant official guidance relating to the assessment of energy performance</li> </ol>



**Element 1.3**

**Conduct energy assessments in a professional and ethical manner**

**Scope**

**A. others:**

- (i) clients
- (ii) other professionals
- (iii) colleagues
- (iv) others with whom you may be in contact during the course of your work as an Energy Assessor

**B. recognised good practice:**

- (i) mandatory codes of practice
- (ii) advisory codes of practice

## UNIT 2

# Prepare for the energy assessment of air conditioning systems

Element 2.1 Prepare for the energy assessment of air conditioning systems

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### About this Unit

This Unit covers those activities that are carried out in preparation for the on-site energy assessment of air conditioning systems.

Note that the term 'assessment' is used throughout the standards when referring to the overall process of determining the energy performance of air conditioning systems, whereas 'inspection' is used only when referring to on-site inspection of air conditioning systems.

Element 2.1 requires that you confirm the time, date and location of the on-site inspection and confirm any specific arrangements that apply to your visit e.g. access to the air conditioning system (or parts of the system), or who will be present at the time of the inspection. You are also expected to contribute to agreeing a 'scope of works' in consultation with the property owner or manager (henceforth called 'the client'), and to identify any circumstances that prevent you from undertaking the energy assessment e.g. systems beyond your current level of competence, health and safety issues.

Element 2.1 Prepare for the energy assessment of air conditioning systems	
<p><b>Performance Criteria</b></p> <p><b>You must be able to:</b></p> <ol style="list-style-type: none"> <li>1 confirm the date, time and location of the on-site inspection</li> <li>2 confirm any <b>specific arrangements</b> that apply to the energy assessment</li> <li>3 contribute to the preparation of a clear and comprehensive scope of works in consultation with the client</li> <li>4 identify any <b>circumstances</b> that prevent you from undertaking an energy assessment and explain the reasons to the client politely and clearly</li> </ol>	<p><b>Knowledge and Understanding</b></p> <p><b>You must know and understand:</b></p> <ol style="list-style-type: none"> <li>(a) the overall aim of the energy assessment of air conditioning systems and the report that is provided</li> <li>(b) the importance of confirming the date, time and location of the on-site inspection</li> <li>(c) the importance of confirming whether any specific arrangements apply to the energy assessment</li> <li>(d) the purpose and format of a scope of works, and the importance of agreeing a clear and comprehensive scope of works with the client</li> <li>(e) how to identify and explain any circumstances that prevent you from undertaking an energy assessment</li> </ol>

**Element 2.1      Prepare for the energy assessment of air conditioning systems**

**Scope**

**A.    specific arrangements:**

- (i) access to the system and its components
- (ii) use of specific, non-hazardous techniques (e.g. use of a smoke pencil to observe air flow)
- (iii) those present at the time of on-site inspection
- (iv) health and safety issues
- (v) site-specific operating procedures

**B.    circumstances:**

- (i) systems beyond your current level of competence
- (ii) difficulties in gaining access
- (iii) conflicts of interest
- (iv) health and safety issues

## **UNIT 3                    Inspect simple / packaged air conditioning systems**

Element 3.1	Review information relating to the energy performance of simple / packaged air conditioning systems
Element 3.2	Inspect simple / packaged air conditioning systems to determine energy performance
Element 3.3	Record inspection findings

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### **About this Unit**

This Unit covers the competences required to inspect simple / packaged air conditioning systems, and would generally be applied where cooling is provided in conditioned spaces using indoor units that contain refrigerant to air heat exchangers and an integral air circulation fan. These may be either integral with outdoor units that contain the refrigerant compressor, refrigerant to outdoor air heat exchanger or circulation fan, or connected to the outdoor unit by refrigerant pipework. Such systems would include:

- Unitary packaged systems
- Split packaged systems
- Multi-split packaged systems
- Variable refrigerant flow (VRF) systems.

The aim of the inspection is to assess the efficiency and sizing of the system compared to the cooling requirements of the building. In turn, this will enable the production of a report, which advises clients on issues that affect energy efficiency and the use of installed air conditioning systems, and suggest potential improvements.

Element 3.1 requires that you review existing information relating to the air conditioning system, its maintenance and energy consumption. You should ensure that the client understands that which is 'essential', that which is 'desirable' and that which is 'optional', and take appropriate action where information is not forthcoming, is incomplete or inaccurate. You are expected to use existing information to identify any significant factors that may influence the conduct of the inspection e.g. access issues, the need to inspect a sample of system components, the need to shut-down the system.

Element 3.2 covers the competences required to inspect simple / packaged air conditioning systems. You are expected to conduct a thorough, visual inspection of all relevant aspects of the air conditioning system in accordance with the requirements set out within the current CIBSE methodology. You must carry out any specific, non-hazardous techniques that have been included within the agreed scope of works e.g. the use of a smoke pencil to observe air flow, and collect the information required to determine the energy performance of the system. This element also requires extensive knowledge and understanding of, for example, the design intent of the installed air conditioning system, the definitions and conventions embodied in the CIBSE methodology, and the factors relevant to determining the energy performance of air conditioning systems.

Element 3.3 requires that you produce complete and accurate records of your findings. You must record information using appropriate methods and ensure that records are legible and complete.

<b>Element 3.1      Review information relating to the energy performance of simple / packaged air conditioning systems</b>	
<p><b>Performance Criteria</b></p> <p><b>You must be able to:</b></p> <ol style="list-style-type: none"> <li>1 ensure that the client understands what <b>information</b> is essential, what is desirable and what is optional</li> <li>2 take appropriate <b>action</b> where <b>information</b> is not forthcoming, is incomplete or is inaccurate</li> <li>3 review available <b>information</b> and identify that which is relevant to the energy performance of the air conditioning <b>system</b></li> <li>4 review available <b>information</b> provided and identify any <b>significant factors</b> that may influence the conduct of the energy assessment</li> <li>5 inform the client promptly in cases where your investigations reveal problems that prevent you from assessing the energy performance of the air conditioning <b>system</b></li> </ol>	<p><b>Knowledge and Understanding</b></p> <p><b>You must know and understand:</b></p> <ol style="list-style-type: none"> <li>(a) the range of information that may be available relating to the air conditioning system installed, its maintenance and energy consumption</li> <li>(b) the potential sources of relevant information</li> <li>(c) what information is ‘essential’, ‘desirable’ and ‘optional’ to the pre-inspection review</li> <li>(d) the action to take in cases where information is not forthcoming, is incomplete or is inaccurate</li> <li>(e) how to review available information in order to identify that which is relevant to the energy performance of the air conditioning system</li> <li>(f) how to review available information in order to identify any significant factors that may influence the energy assessment</li> <li>(g) how to identify circumstances that prevent you from assessing the energy performance of the air conditioning system</li> </ol>

**Element 3.1      Review information relating to the energy performance of simple / packaged air conditioning systems**

**Scope**

**A. information:**

- (i) the design intent of the system installed
- (ii) the type, features and location of the system installed
- (iii) the size of the area served by the system
- (iv) maintenance records relating to the system
- (v) energy consumption of the system

**B. action:**

- (i) explain to the client the consequences of inadequate information
- (ii) request information from other sources
- (iii) prepare 'essential' information as part of the inspection procedure

**C. system:**

- (i) unitary packaged system
- (ii) split packaged system
- (iii) multi-split packaged system
- (iv) variable refrigerant flow (VRF) system

**D. significant factors:**

- (i) concerns about information (e.g. missing, incomplete, out of date, inaccurate)
- (ii) health and safety considerations
- (iii) access issues
- (iv) the need to inspect a sample of system components (e.g. fan-coil units)
- (v) the need to shut-down the system

**Element 3.2      Inspect simple / packaged air conditioning systems to determine energy performance**

<p><b>Performance Criteria</b></p>	<p><b>Knowledge and Understanding</b></p>
<p><b>You must be able to:</b></p> <ol style="list-style-type: none"> <li>1 ensure that you have the equipment and resources needed for the inspection</li> <li>2 use equipment correctly and interpret data accurately</li> <li>3 identify yourself to those present at the property before commencing the inspection</li> <li>4 identify any <b>circumstances</b> when at the property that prevent you continuing with the inspection and explain the reasons to the client</li> <li>5 undertake a methodical visual inspection of all relevant aspects of the air conditioning <b>system</b> in accordance with the requirements of the CIBSE methodology</li> <li>6 carry out any specific, non-hazardous techniques that have been included within the agreed scope of works</li> <li>7 make accurate observations and measurements which are necessary to provide data for assessment of the energy performance of the air conditioning <b>system</b></li> <li>8 obtain all additional information that is needed about the air conditioning <b>system</b></li> <li>9 make further investigations where observations are inconsistent with existing evidence and expected findings</li> <li>10 follow the correct procedures for collecting information to enable the energy performance of the air conditioning <b>system</b> to be determined</li> <li>11 draw the client's attention to obvious instances of inadequate maintenance or neglect, particularly where these might have implications for the health and safety of occupants or the public</li> </ol>	<p><b>You must know and understand:</b></p> <ol style="list-style-type: none"> <li>(a) the principles and theory of how an air conditioning system works</li> <li>(b) the components and controls of air conditioning systems and their interrelationship</li> <li>(c) how to identify the type, features and location of the air conditioning system(s) present at the property</li> <li>(d) the design intent of the installed air conditioning system, and the impact of any changes in building usage over time</li> <li>(e) what equipment and resources are needed for the inspection</li> <li>(f) the detailed inspection requirements that apply to the system as defined by the current CIBSE methodology</li> <li>(g) the definitions and conventions embodied within current CIBSE methodology</li> <li>(h) how to conduct the inspection in a thorough, methodical and consistent manner</li> <li>(i) how to carry out any specific, non-hazardous techniques included within the agreed scope of works</li> <li>(j) how to make accurate observations and take accurate measurements</li> <li>(k) how to make further investigations where observations are inconsistent with existing evidence and expected findings, and how to identify the causes of these inconsistencies</li> <li>(l) the requirements and application of relevant regulations / standards that apply to assessment of the energy performance of air conditioning systems</li> <li>(m) the factors which are relevant to determining the energy performance of air conditioning systems</li> <li>(n) how to collate information required to</li> </ol>



assess the energy performance of air conditioning systems

- (o) the types of advice that can be provided to clients during inspection
- (p) the sources of information and advice about energy performance to which clients can be referred

**Element 3.2**

**Inspect simple / packaged air conditioning systems to determine energy performance**

**Scope**

**A. circumstances:**

- (i) the discovery of unexpected or hazardous conditions or materials
- (ii) other potential threats to health and safety

**B. system:**

- (i) unitary packaged system
- (ii) split packaged system
- (iii) multi-split packaged system
- (iv) variable refrigerant flow (VRF) system

<b>Element 3.3 Record inspection findings</b>	
<p><b>Performance Criteria</b></p> <p><b>You must be able to:</b></p> <ol style="list-style-type: none"> <li>1 produce complete, accurate and legible records of your findings</li> <li>2 record clearly, if necessary, where and why accurate inspection has not been possible</li> <li>3 sign and date your records in order to validate when and by whom they were produced</li> </ol>	<p><b>Knowledge and Understanding</b></p> <p><b>You must know and understand:</b></p> <ol style="list-style-type: none"> <li>(a) the methods, formats and conventions for recording data and information about the air conditioning systems and its energy performance as defined within the current CIBSE methodology</li> <li>(b) the required range of data and information relating to the air conditioning system and its energy performance as defined within the current CIBSE methodology</li> <li>(c) the level of detail within your records required to produce a complete and comprehensive energy assessment report</li> <li>(d) the importance of producing records that are complete, accurate and legible</li> <li>(e) the reasons why it is necessary and important to record where and why accurate inspection has not been possible</li> <li>(f) the importance of validating your records</li> <li>(g) the purposes for which your records may be used</li> </ol>

**Note: there is no Scope for this Element**

## **UNIT 4            Inspect complex / central air conditioning systems**

Element 4.1	Review information relating to the energy performance of complex / central air conditioning systems
Element 4.2	Inspect complex / central air conditioning systems to determine energy performance
Element 4.3	Record inspection findings

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### **About this Unit**

This Unit covers the competences required to inspect complex / central air conditioning systems, and would apply to more extensive and more complex systems that are generally characterised by the use of water or air distribution systems to deliver cooling to conditioned spaces using a variety of active (i.e. that contain air moving fans) or passive terminal devices. They generally include more complex controls that may break down the conditioned spaces into zones where different control parameters can be applied, and that could be located remotely from the equipment, or incorporated into a building management system (BMS). Such systems would include:

- Centralised cooled air systems
- Centralised cooled water systems
- Water loop / reversible heat pump systems
- Additional systems i.e. where areas are served by packaged, split and multi-split packaged comfort cooling equipment, including variable refrigerant flow (VRF) equipment.

The aim of the inspection is to assess the efficiency and sizing of the system compared to the cooling requirements of the building. In turn, this will enable the production of a report, which advises clients on issues that affect energy efficiency and the use of installed air conditioning systems, and suggest potential improvements.

Element 4.1 requires that you review existing information relating to the air conditioning system, its maintenance and energy consumption. You should ensure that the client understands that which is 'essential', that which is 'desirable' and that which is 'optional', and take appropriate action where information is not forthcoming, is incomplete or inaccurate. You are expected to use existing information to identify any significant factors that may influence the conduct of the inspection e.g. access issues, the need to inspect a sample of system components, the need to shut-down the system.

Element 4.2 covers the competences required to inspect complex / central air conditioning systems. You are expected to conduct a thorough, visual inspection of all relevant aspects of the air conditioning system in accordance with the requirements set out within the current CIBSE methodology. You must carry out any specific, non-hazardous techniques that have been included within the agreed scope of works e.g. the use of a smoke pencil to observe air flow, and collect the information required to determine the energy performance of the system. This element also requires extensive knowledge and understanding of, for example, the design intent of the installed air conditioning system, the definitions and conventions embodied in the CIBSE methodology, and the factors relevant to determining the energy performance of air conditioning systems.

Element 4.3 requires that you produce complete and accurate records of your findings. You must record information using appropriate methods and ensure that records are legible and complete.

<b>Element 4.1      Review information relating to the energy performance of complex / central air conditioning systems</b>	
<p><b>Performance Criteria</b></p> <p><b>You must be able to:</b></p> <ol style="list-style-type: none"> <li>1      ensure that the client understands what <b>information</b> is essential, what is desirable and what is optional</li> <li>2      take appropriate <b>action</b> where <b>information</b> is not forthcoming, is incomplete or is inaccurate</li> <li>3      review available <b>information</b> and identify that which is relevant to the energy performance of the air conditioning <b>system</b></li> <li>4      review available <b>information</b> provided and identify any <b>significant factors</b> that may influence the conduct of the energy assessment</li> <li>5      inform the client promptly in cases where your investigations reveal problems that prevent you from assessing the energy performance of the air conditioning <b>system</b></li> </ol>	<p><b>Knowledge and Understanding</b></p> <p><b>You must know and understand:</b></p> <ol style="list-style-type: none"> <li>(a)    the range of information that may be available relating to the air conditioning system installed, its maintenance and energy consumption</li> <li>(b)    the potential sources of relevant information</li> <li>(c)    what information is ‘essential’, ‘desirable’ and ‘optional’ to the pre-inspection review</li> <li>(d)    the action to take in cases where information is not forthcoming, is incomplete or is inaccurate</li> <li>(e)    how to review available information in order to identify that which is relevant to the energy performance of the air conditioning system</li> <li>(f)    how to review available information in order to identify any significant factors that may influence the energy assessment</li> <li>(g)    how to identify circumstances that prevent you from assessing the energy performance of the air conditioning system</li> </ol>

**Element 4.1            Review information relating to the energy performance of complex / central air conditioning systems**

**Scope**

**A. information:**

- (i) the design intent of the system installed
- (ii) the type, features and location of the system installed
- (iii) the size of the area served by the system
- (iv) maintenance records relating to the system
- (v) energy consumption of the system

**B. action:**

- (i) explain to the client the consequences of inadequate information
- (ii) request information from other sources
- (iii) prepare 'essential' information as part of the inspection procedure

**C. system:**

- (i) centralised cooled air system
- (ii) centralised cooled water system
- (iii) water loop / reversible heat pump system
- (iv) additional systems i.e. where areas are served by packaged, split and multi-split packaged comfort cooling equipment, including variable refrigerant flow (VRF) equipment

**D. significant factors:**

- (i) concerns about information (e.g. missing, incomplete, out of date, inaccurate)
- (ii) health and safety considerations
- (iii) access issues
- (iv) the need to inspect a sample of system components (e.g. fan-coil units)
- (v) the need to shut-down the system

Element 4.2 <b>Inspect complex / central air conditioning systems to determine energy performance</b>	
<p><b>Performance Criteria</b></p> <p><b>You must be able to:</b></p> <p>1      ensure that you have the equipment and resources needed for the inspection</p> <p>2      use equipment correctly and interpret data accurately</p> <p>3      identify yourself to those present at the property before commencing the inspection</p> <p>4      identify any <b>circumstances</b> when at the property that prevent you continuing with the inspection and explain the reasons to the client</p> <p>5      undertake a methodical visual inspection of all relevant aspects of the air conditioning <b>system</b> in accordance with the requirements of the CIBSE methodology</p> <p>6      carry out any specific, non-hazardous techniques that have been included within the agreed scope of works</p> <p>7      make accurate observations and measurements which are necessary to provide data for assessment of the energy performance of the air conditioning <b>system</b></p> <p>8      obtain all additional information that is needed about the air conditioning <b>system</b></p> <p>9      make further investigations where observations are inconsistent with existing evidence and expected findings</p> <p>10     follow the correct procedures for collecting information to enable the energy performance of the air conditioning <b>system</b> to be determined</p> <p>11     draw the client's attention to obvious instances of inadequate maintenance or neglect, particularly where these might have implications for the health and safety of occupants or the public</p>	<p><b>Knowledge and Understanding</b></p> <p><b>You must know and understand:</b></p> <p>(a)    the principles and theory of how an air conditioning system works</p> <p>(b)    the components and controls of air conditioning systems and their interrelationship</p> <p>(c)    how to identify the type, features and location of the air conditioning system(s) present at the property</p> <p>(d)    the design intent of the installed air conditioning system, and the impact of any changes in building usage over time</p> <p>(e)    what equipment and resources are needed for the inspection</p> <p>(f)    the detailed inspection requirements that apply to the system as defined by the current CIBSE methodology</p> <p>(g)    the definitions and conventions embodied within current CIBSE methodology</p> <p>(h)    how to conduct the inspection in a thorough, methodical and consistent manner</p> <p>(i)    how to carry out any specific, non-hazardous techniques included within the agreed scope of works</p> <p>(j)    how to make accurate observations and take accurate measurements</p> <p>(k)    how to make further investigations where observations are inconsistent with existing evidence and expected findings, and how to identify the causes of these inconsistencies</p> <p>(l)    the requirements and application of relevant regulations / standards that apply to assessment of the energy performance of air conditioning systems</p> <p>(m)    the factors which are relevant to determining the energy performance of air conditioning systems</p> <p>(n)    how to collate information required to</p>

assess the energy performance of property

- (o) the types of advice that can be provided to clients during inspection
- (p) the sources of information and advice about energy performance to which clients can be referred



**Element 4.2      Inspect complex / central air conditioning systems to determine energy performance**

**Scope**

**A.    circumstances:**

- (i) the discovery of unexpected or hazardous conditions or materials
- (ii) other potential threats to health and safety

**B.    system:**

- (i) centralised cooled air system
- (ii) centralised cooled water system
- (iii) water loop / reversible heat pump system
- (iv) additional systems i.e. where areas are served by packaged, split and multi-split packaged comfort cooling equipment, including variable refrigerant flow (VRF) equipment

<b>Element 4.3 Record inspection findings</b>	
<p><b>Performance Criteria</b></p> <p><b>You must be able to:</b></p> <ol style="list-style-type: none"> <li>1 produce complete, accurate and legible records of your findings</li> <li>2 record clearly, if necessary, where and why accurate inspection has not been possible</li> <li>3 sign and date your records in order to validate when and by whom they were produced</li> </ol>	<p><b>Knowledge and Understanding</b></p> <p><b>You must know and understand:</b></p> <ol style="list-style-type: none"> <li>(a) the methods, formats and conventions for recording data and information about the air conditioning systems and its energy performance as defined within the current CIBSE methodology</li> <li>(b) the required range of data and information relating to the air conditioning system and its energy performance as defined within the current CIBSE methodology</li> <li>(c) the level of detail within your records required to produce a complete and comprehensive energy assessment report</li> <li>(d) the importance of producing records that are complete, accurate and legible</li> <li>(e) the reasons why it is necessary and important to record where and why accurate inspection has not been possible</li> <li>(f) the importance of validating your records</li> <li>(g) the purposes for which your records may be used</li> </ol>

**Note: there is no Scope for this Element**

## **UNIT 5            Report on the energy performance of air conditioning systems**

Element 5.1            Report on the energy performance of air conditioning systems

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### **About this Unit**

This Unit covers the activities undertaken once the inspection is completed i.e. the production and communication of a complete and comprehensive report on the energy performance of air conditioning systems.

Element 5.1 requires that you collate all the information you have obtained on the air conditioning system, and generate recommendations for measures to improve the energy performance of the system. You must issue the report, and respond appropriately to any requests for clarification on aspects of the report. You are expected to adhere to the requirements of the current CIBSE methodology relating to reporting on the energy performance of air conditioning systems.

**Element 5.1 Report on the energy performance of air conditioning systems**

**Performance Criteria**

**You must be able to:**

- 1 assemble and collate information from on-site inspection and from other relevant and reliable sources
- 2 generate recommendations for **measures** to improve the energy performance of the air conditioning system
- 3 prepare and issue a **report** that meets relevant codes of practice and standards
- 4 explain the recommendations included within the **report**, and their implications, referring to relevant sources of information and advice where necessary

**Knowledge and Understanding**

**You must know and understand:**

- (a) the prescribed format and content of a report on the energy performance of air conditioning systems as defined with the current CIBSE methodology
- (b) the range of measures that may improve the energy performance of air conditioning systems
- (c) the importance of checking the report to ensure it is clear and complete
- (d) how to explain the recommendations included within the report and their implications
- (e) the limitations on answers to queries about the report which it is appropriate to provide
- (f) the sources of further information and advice to which you could refer

**Element 5.1****Report on the energy performance of air conditioning systems****Scope****A. measures:**

- (i) replacement of system or parts of the system
- (ii) rectification of faults
- (iii) improvements (e.g. to maintenance regime, to system controls)
- (iv) best practice

**B. report:**

- (i) details of the property inspected and the inspector
- (ii) details of the system inspected
- (iii) details of the results of the inspection, including recommendations
- (iv) the design intent of the system inspected versus its actual operating performance (taking account of any ways in which building usage has changed over time)
- (v) additional advice