

Level 3 Diploma in Air Conditioning Energy Assessment (6361-[06]) and Level 4 Diploma in Air Conditioning Energy Assessment (6361-[07])

Candidate logbook

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Level 3 Diploma in Air Conditioning Energy Assessment (6361-[06]) and Level 4 Diploma in Air Conditioning Energy Assessment (6361-[07])

Candidate logbook

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1 About your candidate logbook

1.1 Contact details

Candidate name	
Candidate enrolment no	
Centre name	
Centre number	
Programme start date	
Date of registration with City & Guilds	

Keep a record of relevant contact details in the space provided below. You may find it helpful to make a note of phone numbers and e-mail addresses here.

Your Assessor(s)	
Your Internal Quality Assurer	
Quality Assurance Contact	

1 About your candidate logbook

1.2 Introduction to the logbook

This logbook will help you complete the units in City & Guilds' **Level 3 Diploma in Air Conditioning Energy Assessment (6361-[06])** and **Level 4 Diploma in Air Conditioning Energy Assessment (6361-[07])**. It contains forms you can use to record your evidence of what you have done.

There are 8 units in total available in these qualifications. You should discuss and agree with your assessor/tutor which of these units you are going to work towards. The units in this logbook are for the Level 3 and Level 4 qualification.

About City & Guilds

City & Guilds is your awarding body for this qualification. City & Guilds is the UK's leading awarding body for vocational qualifications.

Information about City & Guilds and our qualifications is available on our website **www.cityandguilds.com**.

2 Units

To achieve the **Level 3 Diploma in Air Conditioning Energy Assessment 6361-06**, learners must achieve **37** credits from the mandatory units. To achieve the **Level 4 Diploma in Air Conditioning Energy Assessment 6361-07**, learners must achieve **73** credits from the mandatory units.

Level 3 Diploma in Air Conditioning Energy Assessment 6361-06

City & Guilds unit	Unit title	GLH	Credit value
315	Prepare for energy assessments of air conditioning systems	25	6
316	Demonstrate understanding of simple/ packaged air conditioning system inspections	30	8
317	Inspect simple/ packaged air conditioning systems	35	10
318	Provide a report on the energy performance of simple/package air conditioning systems	25	7
331	Conduct energy assessments in a safe, effective and professional manner	30	6

Level 4 Diploma in Air Conditioning Energy Assessment 6361-07

City & Guilds unit	Unit title	GLH	Credit value
315	Prepare for energy assessments of air conditioning systems	25	6
331	Conduct energy assessments in a safe, effective and professional manner	30	6
407	Provide a report on the energy performance of simple/package air conditioning systems and complex/central air conditioning systems	35	10
408	Demonstrate understanding of simple/package air conditioning system inspections and complex/central air conditioning system inspections	60	23
409	Inspect simple/ packaged and complex/central air conditioning systems	70	28

3 The assessment process

Simulation may be allowed in some of the units in this qualification. Where simulation is needed this must be agreed with your qualification consultant in advance to ensure validity. Candidates should be assessed under normal workplace conditions. However, there are situations where the actual workplace may not be appropriate, or where waiting for naturally occurring evidence is impractical. Therefore, the setting up or devising of assessment situations will be allowed where appropriate.

The following people at your centre will explain the assessment process and help you achieve your unit(s).

The assessor/tutor

The assessor/tutor is the person you will have the most contact with as you work towards your unit(s). You may have more than one assessor/tutor depending on which unit(s) you take or you may be assessed by a person who is not your tutor.

The internal quality assurer

The internal quality assurer maintains the quality of assessment within the centre.

The qualification consultant

The qualification consultant works for City & Guilds and helps to ensure that your centre meets the required standards for quality and assessment.

4 Using your logbook

Recording forms

This logbook contains all of the forms you and your assessor will need to plan, review and organise your evidence. Your assessor will be able to help you decide which forms you need to complete and help you fill them in.

Please photocopy these forms as required.

5 Candidate progress record

Level 3 Diploma in Air Conditioning Energy Assessment (6361-[06])

Units	315	317	318	331									
Credits	6	10	7	6									
Total Credits Achieved:													

Minimum 37 credits

I confirm that the evidence supplied for the above listed units is authentic and a true representation of my own work. The work logged in the following pages is my own work carried out during my normal work duties.

The answers in the question bank are my own work and discussed with my assessor on completion. I have been observed in my workplace by my assessor on several occasions.

Candidate Name:	
Candidate Signature:	
Date:	

I confirm that this candidate has achieved all the requirements of this qualification with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor Name:	
Assessor Signature:	
Date:	

IQA Name:	
IQA Signature:	
Date:	

Level 4 Diploma in Air Conditioning Energy Assessment (6361-[07])

Units	315	331	407	409									
Credits	6	6	10	28									
Total Credits Achieved:													

Minimum 73 credits

I confirm that the evidence supplied for the above listed units is authentic and a true representation of my own work. The work logged in the following pages is my own work carried out during my normal work duties.

The answers in the question bank are my own work and discussed with my assessor on completion. I have been observed in my workplace by my assessor on several occasions.

Candidate Name:	
Candidate Signature:	
Date:	

I confirm that this candidate has achieved all the requirements of this qualification with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor Name:	
Assessor Signature:	
Date:	

IQA Name:	
IQA Signature:	
Date:	

Unit 315

Prepare for energy assessments of air conditioning systems

6 credits

Outcome 1 Know the information and techniques required to prepare an energy assessment

Assessment criteria (Knowledge) The learner can:	Portfolio reference	
1.1 describe the relevant records kept on air conditioning systems		
1.2 explain current guidance relating to <ul style="list-style-type: none">• building log books• operations and maintenance manuals• health and safety files• relevant statutory compliant records		
1.3 identify the techniques and methods required for the energy assessment		
1.4 describe the health and safety procedures relating to air conditioning		
1.5 describe site specific operating procedures.		
	Type of evidence →	
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report		

Outcome 2 Clarify the requirements for an energy assessment

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
2.1 explain to the client the purpose of an energy assessment and the processes involved						
2.2 explain to the client what the outcomes of the energy assessment will be and the purpose and structure of the report provided						
2.3 obtain the relevant and appropriate information required prior to conducting an inspection						
2.4 determine whether the system to be inspected is a simple/package or complex/central system.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 3 Develop and agree a method for the inspection with the client

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
3.1 identify the air conditioning system/s to be inspected and the requirements for appropriate sampling						
3.2 clarify the observations to be conducted and gain approval from the client						
3.3 estimate how long the inspection will take						
3.4 develop a risk assessment based on documentation and research of the site and surrounding areas						
3.5 provide the client with a detailed method statement for the inspection.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 4 Prepare and agree a clear and comprehensive scope of works with the client

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
4.1 explain to the client the purpose and format of a scope of works including proposed budgetary arrangements						
4.2 confirm the date, time and location of the on-site inspection and any specific arrangements that apply to the energy assessment including <ul style="list-style-type: none"> gaining access system specific safety and operating procedures non-invasive and non-hazardous techniques 						
4.3 agree communication channels for the on-site inspection including who to contact in the event of queries						
4.4 explain the techniques that will be used to conduct the inspection						
4.5 identify any circumstances that prevent a full energy assessment taking place including <ul style="list-style-type: none"> systems beyond level of competence difficulty in gaining access conflicts of interest health and safety issues 						
4.6 explain to the client clearly and politely any reasons why the inspection cannot take place						
4.7 explain to the client any circumstances where assumptions may be made that are not supported by evidence.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Declaration

I confirm that the evidence supplied for the above listed unit is authentic and a true representation of my own work. The work logged is my own work carried out during my normal work duties.

The answers in the question bank are my own work and discussed with my assessor on completion. I have been observed in my workplace by my assessor on several occasions.

Candidate Name:	
Candidate Signature:	
Date:	

I confirm that this candidate has achieved all the requirements of this unit with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor Name:	
Assessor Signature:	
Date:	

IQA Name:	
IQA Signature:	
Date:	

Unit 317

Inspect simple/package air conditioning systems

10 credits

Outcome 1 Conduct the inspection following current best practice

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
1.1 make contact with people present at the property before starting the inspection						
1.2 describe the equipment and resources needed for the inspection and make sure these are to hand						
1.3 use test equipment in line with manufacturers' instructions						
1.4 explain to the client circumstances that prevent the inspection from continuing						
1.5 record all evidence supporting the assumptions and decisions made during the inspection						
1.6 carry out the specific, non-invasive and non hazardous techniques included in the scope of works						
1.7 make observations and measurements to provide data for the assessment of the energy performance of the system where applicable						
1.8 use appropriate methods and techniques to identify faults in the system						
1.9 make further investigations to address inconsistencies with existing evidence and expected findings						
1.10 provide advice and refer clients to sources of information on energy performance						
1.11 explain to the client instances of inadequate maintenance or neglect which may have implications for health and safety, including <ul style="list-style-type: none"> • legionella • refrigerant leakage 						
1.12 deal with potential conflicts of interest that may arise during the inspection.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 2 Obtain information relating to the energy performance of simple/package air conditioning systems

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
2.1 interpret building drawings, documents and records and evaluate their impact on energy performance						
2.2 identify the installed equipment, controls, and characteristics of the building						
2.3 record evidence of regular inspection and maintenance						
2.4 assess the frequency and scope of maintenance to the system and equipment						
2.5 make comparisons between cooling loads and installed cooling capacity in accordance with relevant good practice and guidance						
2.6 explain to the client problems arising from investigations that prevent assessment of the energy performance of the system						
2.7 advise the client when investigations reveal routine servicing and maintenance is not being undertaken.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 3 Locate and inspect outdoor units

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
3.1 record the general state of the equipment and the space immediately around it						
3.2 examine the heat exchanger surfaces to ensure they are free from debris						
3.3 perform checks to ensure there is adequate airflow to and from the equipment.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 4 Locate and inspect indoor units within treated areas

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
4.1 examine heat exchangers for damage and blockages						
4.2 perform checks on air filters for compliance with manufacturers' requirements						
4.3 check facilities manager's complaints log for evidence of complaints linked to ventilation problems						
4.4 perform checks on the fan coil unit to ensure it complies with design conditions.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 5 Locate and examine cooling unit and heating system controls and temperature sensors

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
5.1 assess the appropriateness of cooling sensor positioning						
5.2 examine control timers and whether they can be manually over-ridden						
5.3 make accurate records of: <ul style="list-style-type: none"> • date and time settings • on and off periods • the set temperatures for heating and cooling in each zone • the means of inhibiting the simultaneous operation of the heating and cooling equipment in the same location • control arrangements for cooling units installed in spaces with opening windows 						
5.4 assess the suitability of control timers and the set periods in use						
5.5 assess the suitability of set temperatures						
5.6 determine the type and age of the cooling units						
5.7 assess the indoor and outdoor units for the likely efficiency of the system compared to current good practice.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Declaration

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Candidate Name:	
Candidate Signature:	
Date:	

I confirm that this candidate has achieved all the requirements of this unit with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor Name:	
Assessor Signature:	
Date:	

IQA Name:	
IQA Signature:	
Date:	

Unit 318

Provide a report on the energy performance of simple/package air conditioning systems

7 credits

Outcome 1 Prepare the structure and content of the report

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
1.1 identify the required format and content of the report as defined in current guidance						
1.2 collate information from the onsite inspection and other relevant and reliable sources including <ul style="list-style-type: none"> • details of the location and the property owner/manager • inspectors name, affiliation and status and date of the inspection • details of systems inspected • inventory of equipment inspected • details of the results of the inspection. 						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 2 Develop recommendations for the report

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
2.1 explain the importance of providing clear, concise and easy to understand recommendations to clients						
2.2 identify information from the inspection which is relevant for the recommendations						
2.3 create recommendations that improve the performance of simple/package air conditioning systems including <ul style="list-style-type: none"> • alternative solutions for improving efficiency • alternative cooling techniques 						
2.4 provide recommendations in a clear, concise and easy to understand way.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 3 Develop the report

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
3.1 develop a summary of findings						
3.2 review the recommendations and insert into the report						
3.3 provide advice on sources of good practice publications and funding to support further investigations and improvements in efficiency						
3.4 check the report is clear, complete and easy to understand						
3.5 check the report meets the relevant codes of practice and standards.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 4 Issue the report and clarify any areas as required by the client

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
4.1 issue the report to the client and explain the recommendations and their implications						
4.2 respond to queries about the report within their limits of authority.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Declaration

I confirm that the evidence supplied for the above listed unit is authentic and a true representation of my own work. The work logged is my own work carried out during my normal work duties.

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Candidate Name:	
Candidate Signature:	
Date:	

I confirm that this candidate has achieved all the requirements of this unit with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor Name:	
Assessor Signature:	
Date:	

IQA Name:	
IQA Signature:	
Date:	

Unit 331

Conduct energy assessments in a safe, effective and professional manner

6 credits

Outcome 1 Understand the health and safety requirements when undertaking energy assessments

Assessment criteria (Knowledge) The learner can:	Portfolio reference	
1.1 explain the relevant legal duties for health, safety and security in the workplace		
1.2 identify the health, safety and security risks that could exist in different locations, and the action to take to minimise or mitigate risks		
1.3 identify the risks to self which are associated with lone working		
1.4 explain why it is important to remain alert to the presence of risks in the workplace		
1.5 explain the importance of personal conduct in maintaining the health, safety and security of yourself or others		
1.6 explain how to make use of relevant suppliers and manufacturers' instructions for the safe use of equipment, materials and products		
1.7 explain who should be informed of any conflicts between different health, safety and security requirements		
1.8 describe the procedures for different types of emergency		
1.9 identify the types of suggestions for improving health, safety and security at work that could be made and who should be given them		
1.10 identify the actions that may be taken to protect customers' property.		
	Type of evidence →	
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report		

explain the relevant legal duties for health, safety and security in the workplace

Outcome 2 Understand the legislation, codes of conduct and compliance requirements in relation to energy assessment

Assessment criteria (Knowledge) The learner can:	Portfolio reference	
2.1 explain why it is important to promote goodwill and trust when working with others and ways in which this can be achieved		
2.2 explain how to identify the information you require and the potential sources of such information		
2.3 describe how to respond to enquiries from others and how to clarify their information needs		
2.4 explain how to respond to enquiries which are outside your authority, beyond your area of knowledge or expertise or where the information requested is confidential		
2.5 define the extent and limits for your own competence and expertise and the importance of not working beyond these limits		
2.6 describe the ways in which disputes or differences of opinion should be handled and resolved to minimise offence and maintain respect		
2.7 describe the formal complaints procedure that covers your work in terms of: <ul style="list-style-type: none"> • any specific organisational requirements with regard to complaints • your own responsibility to deal with complaints and attempt to resolve them before escalating to the Accreditation Body, or the equivalent in the Devolved Administrations 		
2.8 identify the range of potential conflicts of interest that you may encounter and the action required to manage these		
2.9 explain why it is important to present a positive personal and professional image when dealing with people and how this can be achieved		
2.10 describe the ways in which you may develop yourself within your role to cover your development needs		
2.11 define the level of service expected by customers, their expectations as to the outcomes of the energy assessment or advice process and how to deliver an appropriate level of customer service		
2.12 explain the need for prompt responses to enquiries.		
Type of evidence →		
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report		

Outcome 3 Understand the legislation, codes of conduct and compliance requirements in relation to energy assessment

Assessment criteria (Knowledge) The learner can:	Portfolio reference	
3.1 describe the relevant policies and legislation on combating climate change and the reduction of carbon emissions from buildings		
3.2 describe the relevant legislation covering: <ul style="list-style-type: none"> • the energy performance of buildings • compliance with safe working practices • the relevant regulations in the Devolved Administrations • where appropriate relevant legislation on the use of refrigerants 		
3.3 describe the relevant official guidance and conventions relating to the assessment of energy performance		
3.4 describe your specific responsibilities under prescribed codes of conduct and ethical standards		
3.5 describe why it is important to comply with mandatory and advisory codes of practice		
3.6 describe the specific auditing or monitoring requirements that relate to your registration with your accreditation organisation(s), or the equivalent in the Devolved Administrations and your responsibilities in complying with these		
3.7 describe the framework under which Accreditation Bodies, or the equivalent in the Devolved Administrations, are required to operate, including their Scheme Operating Requirements or equivalent in the Devolved Administrations		
3.8 explain the importance of obtaining and maintaining appropriate professional indemnity insurance (PII) cover, either through your own business or your employer and the extent and limitations of this type of cover.		
Type of evidence →		
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report		

Outcome 4 Be able to comply with organisational and legal requirements at all times

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
4.1 carry out work in accordance with the relevant legal requirements, legislation and advisory and mandatory codes of practice						
4.2 carry out work in accordance with the auditing and monitoring requirements of the relevant accreditation or certification organisation/s						
4.3 record customer contact information in accordance with organisational and legal requirements such as the Data Protection legislation						
4.4 identify and maintain appropriate evidence to record to support your decisions and assumptions made when carrying out energy assessments						
4.5 identify the evidence requirements defined in Scheme Operating Requirements, or their equivalent in the Devolved Administrations.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 5 Be able to maintain health, safety and security at work

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
5.1 take action to mitigate health, safety and security risks						
5.2 ensure personal conduct does not endanger the health, safety and security of self and other people						
5.3 take action to ensure the protection of client's property and buildings						
5.4 adhere to workplace policies and suppliers' or manufacturers' instructions for the safe use of equipment, personal protective equipment (PPE), materials and products						
5.5 identify procedures for different types of emergency and implement them						
5.6 make recommendations for improving health, safety and security in the workplace to the relevant person/s.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 6 Be able to develop and maintain effective working relationships with colleagues, professionals, clients and others

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
6.1 develop and maintain productive working relationships with others						
6.2 request information from colleagues, professionals, clients and others in a polite, clear and professional manner						
6.3 identify and make use of further sources of information/help						
6.4 deal with enquiries from colleagues, professionals, clients and others and seek clarification where necessary						
6.5 Handle enquiries which: <ul style="list-style-type: none"> • are outside own authority • are beyond own area of knowledge or expertise • involve confidential information 						
6.6 handle and resolve disputes and/or differences of opinion						
6.7 adhere to the formal complaints procedure when dealing with a complaint.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 7 Be able to conduct energy assessments in a professional manner

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
7.1 deal with colleagues, professionals, clients and others in a tactful, courteous and equitable manner						
7.2 carry out work in accordance with prescribed codes of conduct, ethical standards and recognised good practice						
7.3 record all evidence supporting the assumptions and decisions made during the assessment						
7.4 demonstrate effective management of work activities and personal and professional development						
7.5 respond appropriately to pressure from any person/s which may affect own judgment						
7.6 demonstrate delivery of the appropriate level of customer service						
7.7 assess customer expectations as to the outcomes of the energy assessment or advice process.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Declaration

I confirm that the evidence supplied for the above listed unit is authentic and a true representation of my own work. The work logged is my own work carried out during my normal work duties.

The answers in the question bank are my own work and discussed with my assessor on completion. I have been observed in my workplace by my assessor on several occasions.

Candidate Name:	
Candidate Signature:	
Date:	

I confirm that this candidate has achieved all the requirements of this unit with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor Name:	
Assessor Signature:	
Date:	

IQA Name:	
IQA Signature:	
Date:	

Unit 407

Provide a report on the energy performance of simple/packaged and complex/central air conditioning systems

10 credits

Outcome 1 Prepare the structure and content of the report

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
1.1 clarify the required format and content of the report as defined in current guidance						
1.2 collate information from the onsite inspection and other relevant and reliable sources including <ul style="list-style-type: none"> • details of the location and the property owner/manager • inspectors name, affiliation and status and date of the inspection • details of systems inspected • inventory of equipment inspected • details of the results of the inspection. 						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 2 Develop recommendations for the report

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
2.1 summarise the importance of providing clear, concise and easy to understand recommendations to clients						
2.2 demonstrate how to report complex information in a clear, concise and easy to understand way						
2.3 differentiate between simple/packaged and complex/central air conditioning systems in the report						
2.4 analyse information from the inspection which is relevant for the recommendations						
2.5 synthesise inspection information for recommendations that improve the performance of simple/packaged and complex/central air conditioning systems, including <ul style="list-style-type: none"> • alternative solutions for improving efficiency • alternative cooling techniques 						
2.6 provide recommendations in a clear, concise and easy to understand way.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 3 Develop the report

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
3.1 develop a summary of findings						
3.2 evaluate the recommendations and insert into the report						
3.3 provide advice on sources of good practice publications and funding to support further investigations and improvements in efficiency						
3.4 check the report is clear, complete and easy to understand						
3.5 check complex information included in the report is clear, concise and easy to understand						
3.6 check the report meets the relevant codes of practice and standards.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 4 Issue the report and clarify any areas as required by the client

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
4.1 issue the report to the client and summarise the recommendations and their implications						
4.2 respond to queries about the report within their limits of authority.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Declaration

I confirm that the evidence supplied for the above listed unit is authentic and a true representation of my own work. The work logged is my own work carried out during my normal work duties.

The answers in the question bank are my own work and discussed with my assessor on completion. I have been observed in my workplace by my assessor on several occasions.

Candidate Name:	
Candidate Signature:	
Date:	

I confirm that this candidate has achieved all the requirements of this unit with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor Name:	
Assessor Signature:	
Date:	

IQA Name:	
IQA Signature:	
Date:	

Unit 409

Inspect simple/packageged and complex/central air conditioning systems

28 credits

Outcome 1 Conduct the inspection following current best practice

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
1.1 make contact with people present at the property before starting the inspection						
1.2 clarify the equipment and resources needed for the inspection and make sure these are to hand						
1.3 use test equipment in line with manufacturers' instructions						
1.4 clarify with the client circumstances that prevent the inspection from continuing						
1.5 record all evidence supporting the assumptions and decisions made during the inspection						
1.6 perform the specific, non-invasive and non hazardous techniques included in the scope of works						
1.7 make observations and measurements to provide data for the assessment of the energy performance of the system where applicable						
1.8 perform appropriate methods and techniques to identify faults in the system						
1.9 evaluate the need for further investigations if observations are inconsistent with existing evidence and expected findings						
1.10 provide advice and refer clients to sources of information on energy performance						
1.11 explain to the client instances of inadequate maintenance or neglect which may have implications for health and safety, including <ul style="list-style-type: none"> • legionella • refrigerant leakage 						
1.12 manage potential conflicts of interest that may arise during the inspection.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 2 Obtain information relating to the energy performance of complex/central air conditioning systems

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
2.1 analyse building drawings, documents and records and evaluate their impact on energy performance						
2.2 identify the installed equipment, controls, and characteristics of the building						
2.3 make accurate recordings of <ul style="list-style-type: none"> evidence of regular inspection and maintenance the frequency and scope of maintenance to the system and equipment 						
2.4 make critical comparisons between cooling loads and installed cooling capacity in accordance with relevant good practice and guidance						
2.5 clarify with the client problems arising from investigations that prevent assessment of the energy performance of the system						
2.6 estimate the fan power of air movement systems						
2.7 advise the client when investigations reveal routine servicing and maintenance is not being undertaken.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 3 Locate and inspect refrigeration equipment

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
3.1 locate refrigerant compressors and confirm if they can be operated						
3.2 make accurate recordings of <ul style="list-style-type: none"> the state of the refrigerant equipment and the space immediately around it state of refrigerant and symptoms of plant problems 						
3.3 perform checks for <ul style="list-style-type: none"> condenser blockage to ensure adequate water flow rates through the condensers and evaporators water pressure drops across the condensers and evaporators. 						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 4 Locate and inspect heat rejection equipment

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
4.1 perform relevant checks <ul style="list-style-type: none"> on the enclosures around heat rejection equipment to confirm heat exchanger surfaces are free from debris and undamaged to investigate instances of air short circuiting for signs of leakage on direct expansion heat exchanger surface on the operation of heat rejection fans on water distribution and water flow and the route and condition of cooling water systems. 						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 5 Locate and inspect waterborne cooling systems in treated areas

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
5.1 perform relevant checks <ul style="list-style-type: none"> • on the route, condition and controls of cooling or chilled water systems • on the condition and operation of local heat exchange units • to confirm heat exchanger surfaces are free from debris and undamaged • to ensure the condition of intake filters is in line with manufacturers' requirements • on the operation of local heat pump unit compressors 						
5.2 perform checks to ensure <ul style="list-style-type: none"> • inlet and outlet grilles are not obstructed • rotation and control of heat exchange fans is correct • controls on fan coils are set correctly • signs of leakage of refrigerant are identified 						
5.3 report any signs of leakage to the relevant person/s.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 6 Locate and inspect airborne cooling and air conditioning systems in treated spaces

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
6.1 analyse the condition of air delivery and extract openings, ducts and dampers, grilles and diffusers						
6.2 analyse facilities manager's complaints log for evidence of complaints linked to ventilation problems						
6.3 evaluate whether building modifications, partitioning or fitted furniture have affected system performance						
6.4 perform checks to ensure <ul style="list-style-type: none"> • airflow is apparent through identified openings • individual temperature and volume controls are functioning appropriately. 						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 7 Locate and inspect airborne cooling and air conditioning systems and outdoor air inlets

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
7.1 plan for air handling fans and air distribution systems to be switched on or off before the inspection						
7.2 make accurate recordings of <ul style="list-style-type: none"> • the state and frequency of filter changing, cleanliness, and any blockages and damage • the fan type, method of control and setting and operation of dampers • any obstructions and blockages to air inlet grilles, screens and pre-filters • instances where air inlets may be affected by local sources of heat or air exhausts • the condition, fit and sealing of the filter 						
7.3 measure filter resistance and air path resistance						
7.4 perform relevant checks <ul style="list-style-type: none"> • on heat exchangers for damage, blockage and debris and signs of refrigerant leakage • on the operation of energy conservation facilities and the air handling plant. 						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Outcome 8 Locate and examine air conditioning and heating system controls and temperature sensors

Assessment criteria (Performance)	Evidence date					
The learner can:	Portfolio reference					
8.1 assess the individual control zones for heating and cooling and assess the appropriateness of zoning						
8.2 examine control timers and record date and time settings, on and off periods and whether they have been manually over-ridden						
8.3 analyse the suitability of control timers and the set periods in use						
8.4 make accurate recordings of <ul style="list-style-type: none"> the location of zone heating and cooling emitters the set temperatures for heating and cooling in each zone and their suitability 						
8.5 evaluate the appropriateness of the type and location of sensors being used						
8.6 synthesise documentation to demonstrate the current values of the timers and temperatures						
8.7 determine the type and age of the refrigeration compressor and the method of refrigeration capacity control						
8.8 analyse the indoor and outdoor units for the likely efficiency of the system compared to current good practice						
8.9 assess the method used to set, modulate or control airflow rate						
8.10 record hours run and number of starts to determine control of compressors.						
Type of evidence →						
O = Observation WT = Witness Testimony P = Product Q = Questioning PD = Professional Discussion R =Report						

Declaration

I confirm that the evidence supplied for the above listed unit is authentic and a true representation of my own work. The work logged is my own work carried out during my normal work duties.

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Candidate Signature:	
Date:	

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Assessor Name:	
Assessor Signature:	
Date:	

IQA Name:	
IQA Signature:	
Date:	

Appendix 1 Summary of City & Guilds assessment policies

Health and Safety

All centres have to make sure that they provide a safe and healthy environment for learning, including induction and assessment. City & Guilds qualification consultants check this when they visit assessment centres.

Equal Opportunities

Your centre will have an equal opportunities policy. Your centre will explain this to you during your induction, and may give you a copy of the policy.

City & Guilds equal opportunities policy is available from our website www.cityandguilds.com, City & Guilds Customer Relations Team or your centre.

Access to assessment

City & Guilds qualifications are open to all candidates, whatever their gender, race, creed, age or special needs. Some candidates may need extra help with their assessment, for example, a person with a visual impairment may need a reader.

If you think you will need alternative assessment arrangements because you have special needs, you should discuss this with your centre during your induction, and record this on your assessment plan. City & Guilds will allow centres to make alternative arrangements for you if you are eligible and if the qualification allows for this. This must be agreed before you start your qualification.

City & Guilds guidance and regulations document *Access to assessment and qualifications* is available on the City & Guilds website www.cityandguilds.com, from the City & Guilds Customer Relations Team or your centre.

Complaints and appeals

Centres must have a policy and procedure to deal with any complaints you may have. You may feel you have not been assessed fairly, or may want to appeal against an assessment decision if you do not agree with your assessor.

These procedures will be explained during induction and you will be provided with information about the Quality Assurance Co-ordinator within your centre who is responsible for this.

Most complaints and appeals can be resolved within the centre, but if you follow the centre procedure and are still not satisfied you can complain to City & Guilds.

Our complaints policy is on our website www.cityandguilds.com or is available from the City & Guilds Customer Relations Team or your centre.

City & Guilds
Believe you can



www.cityandguilds.com

Useful contacts

UK learners

General qualification information

T: +44 (0)844 543 0033

E: learnersupport@cityandguilds.com

International learners

General qualification information

T: +44 (0)844 543 0033

F: +44 (0)20 7294 2413

E: **intcg@cityandguilds.com**

Centres

Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

E: **centresupport@cityandguilds.com**

Single subject qualifications

Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

F: +44 (0)20 7294 2404 (BB forms)

E: **singlesubjects@cityandguilds.com**

International awards

Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

E: **intops@cityandguilds.com**

Walled Garden

Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

E: **walledgarden@cityandguilds.com**

Employer

Employer solutions, Mapping, Accreditation, Development Skills, Consultancy

T: +44 (0)121 503 8993

E: **business@cityandguilds.com**

Publications

Logbooks, Centre documents, Forms, Free literature

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

If you have a complaint, or any suggestions for improvement about any of the services that City & Guilds provides, email: feedbackandcomplaints@cityandguilds.com

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