

**T Level Technical
Qualification in
Building Services
Engineering for
Construction**

**Ventilation
Engineering**

Guide standard exemplification material

Threshold competence – Sample 2021

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Introduction

The sample assessment materials within this document refers to the ventilation engineering sample occupational specialism assignment. The aim of these materials is to provide centres with examples of knowledge, skills and understanding that attest to minimal threshold competence. In this document all exemplar evidence attests as examples of minimal threshold competence. The examples provided do not reflect all evidence from the sample assignment as the focus of this material is the quality and standards that need to be achieved rather than the volume of exemplar evidence provided. However, the examples provide a representative of all tasks in the sample assignment. It is important to note that in live assessments a candidate's performance is very likely to exhibit a spikey profile and standard of performance will vary across task and minimal threshold competence will be based on a synoptic mark across all tasks.

The materials in this GSEM are separated into three sections as described below. Materials are presented against a number of tasks from the assignment.

Task

This section details the tasks that the candidate has been asked to carry out. What needs to be submitted for marking and any additional evidence required including any photographic evidence. Also referenced in this section are the assessment themes the candidates will be marked against when completing the tasks within it. In addition, candidate evidence that has been included or not been included in this GSEM has been identified within this section.

In this GSEM there is candidate evidence from:

Task 1

Task 2

Task 3

Candidate evidence

This section includes exemplars of candidates work, photographs of the work in production (or completed) and practical observation records of the assessment completed by centre assessors. This will be exemplar evidence that was captured as part of the assessment and then internally marked by the centre assessor.

Commentary

This section includes detailed comments to demonstrate how the candidate evidence attests to the standard of minimal threshold competence by directly correlating to the grade descriptors for this occupational area. Centres can compare the evidence against the performance indicators in the marking grid descriptors within the assessor packs, to provide guidance on the standard of knowledge, skills and understanding that need to be met for minimal threshold competence.

It is important to note that the commentary section is not part of the evidence or assessment but are evaluative statements on how and why that piece of evidence meets a particular standard.

Grade descriptors

To achieve a pass (threshold competence), a candidate will be able to:

Demonstrate an acceptable performance that meets the requirement of the brief and that is required to enter the industry to begin to work in the occupational area.

Demonstrate the adequate technical skills in cutting, fabricating, fixing ductwork and installing components that is in line with industry standards.

Interpret information, demonstrate planning, assess risk and follow safe working methods when applying practical skills to an acceptable standard as recognised by industry.

Demonstrate basic knowledge and understanding of the principles and processes required for ventilation engineering.

Work safely showing an understanding in the selection and use of tools and equipment and demonstrate a basic awareness of straightforward preparation and application processes.

Attempt some complex tasks and the level of performance mostly meets an acceptable level.

Identify causes of ventilation faults and have some knowledge and skills in how to rectify them.

Use industry terminology most of the time that is accurate in both written and verbal contexts.

Task 1 – Planning the installation

(Assessment themes: Health and Safety, Design and planning, Systems and components)

For task 1 candidates need to produce the following pieces of evidence:

- Risk assessment
- Method statement with justifications
- Schematic drawing annotated with air volume calculations
- Materials list

For illustration, the guided exemplification materials (GSEM) for Task 1 contain examples of candidate evidence for the following assessment requirements only:

- Risk assessment
- Method statement with justifications
- Schematic drawing annotated with air volume calculations
- Materials list

Candidate evidence

Schematic drawing annotated with air volume calculations

Air Changes Per Hour (CIBSE Guide A Environmental Design Criteria Table 1.5) = 5 ACH

GRILLE 001 – MALE WC

ROOM VOLUME (m ³)	11.25m ³	
	DESIGN	ACTUAL
FLOW (m ³ /s)	0.015m ³ /s	As measured

GRILLE 002 – FEMALE WC

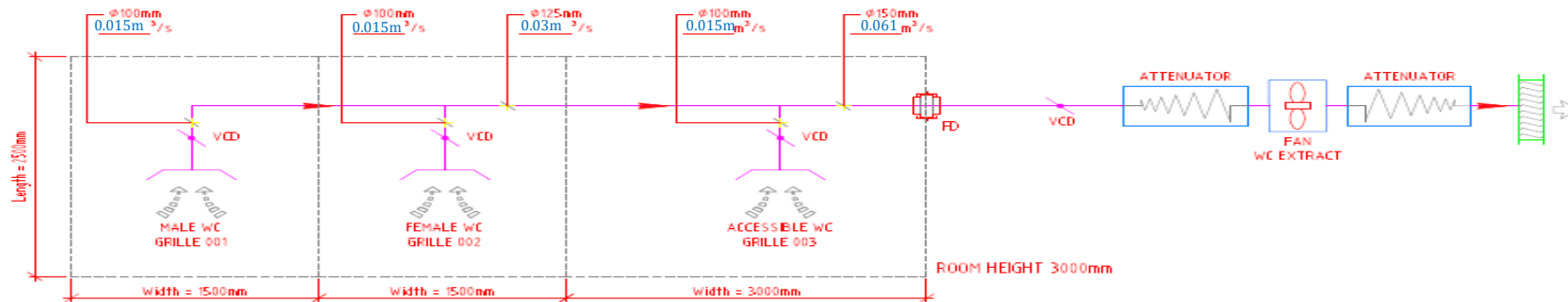
ROOM VOLUME (m ³)	11.25m ³	
	DESIGN	ACTUAL
FLOW (m ³ /s)	0.015 m ³ /s	As measured

GRILLE 003 – ACCESSIBLE WC

ROOM VOLUME (m ³)	22.5m ³	
	DESIGN	ACTUAL
FLOW (m ³ /s)	0.031 m ³ /s	As measured

EXTRACT FAN

	DESIGN	ACTUAL
FLOW (m ³ /s)	0.061 m ³ /s	As measured
TOTAL PRESSURE (Pa)	As measured	



Commentary

Candidate demonstrates good knowledge and understanding of the requirements of a schematic drawing in relation to the assignment brief. Candidate has annotated the schematic drawing with accurate air volume calculations. Drawing is clear, but brief, with no working out shown for calculations.

Candidate evidence

Risk assessment

Activity: Installation of ductwork		Date: 31/01/21						
Location: Centre A		Position: Candidate						
SEVERITY (S): Degree of harm which may be caused (including numbers affected) 1 Minor Injury 2 Major Injury 3 Fatality						RISK RATING (RR): Severity x Likelihood 1-2 Low 3-5 Medium 6-9 High		
LIKELIHOOD (L): Probability that event will occur 1 Remote 2 Possible 3 Likely								
Item No:	Activity:	Hazard	Persons at Risk	Existing Controls (Mitigation)	S 1-3	L 1-3	RR	Are the Risks Controlled?
1	Cutting ductwork sections	Skin cut from steel ductwork edges	Self	Handle ductwork cutting tools and equipment with care, using appropriate PPE	2	2	4	Yes
2	Bending duct edges	Skin cut	Self	Use correct bending tools and appropriate PPE	1	2	2	Yes
3	Manual handling	Personal injury	Self	Correct kinetic lifting techniques	2	1	2	Yes
4	Working with power tools	Electrocution	Self	Visual inspection	3	2	6	Yes
5	Loose Cables	Tripping	Self	Stick all cables down	2	2	4	Yes

Activity: Decommissioning		Date: 31/01/21						
Location: Centre A		Position: Candidate						
SEVERITY (S): Degree of harm which may be caused (including numbers affected) 1 Minor Injury 2 Major Injury 3 Fatality					RISK RATING (RR): Severity x Likelihood 1-2 Low 3-5 Medium 6-9 High			
LIKELIHOOD (L): Probability that event will occur 1 Remote 2 Possible 3 Likely								
Item No:	Activity:	Hazard	Persons at Risk	Existing Controls (Mitigation)	S 1- 3	L 1- 3	RR	Are the Risks Controlled?
1	Dust and dirt in system	Airborne particles affecting breathing	Self	Correct use of PPE	1	1	1	Yes
2	Removing ductwork	Cuts and grazes	Self	Handle ductwork cutting tools and equipment with care, using appropriate PPE	2	2	4	Yes
3	Manual handling	Personal injury	Self	Correct kinetic lifting techniques	2	1	2	Yes
4	Working with power tools	Electrocution	Self	Visual inspection	3	2	6	Yes

Activity: Maintenance		Date: 31/01/21						
Location: Centre A		Position: Candidate						
SEVERITY (S): Degree of harm which may be caused (including numbers affected) 1 Minor Injury 2 Major Injury 3 Fatality					RISK RATING (RR): Severity x Likelihood 1-2 Low 3-5 Medium 6-9 High			
LIKELIHOOD (L): Probability that event will occur 1 Remote 2 Possible 3 Likely								
Item No:	Activity:	Hazard	Persons at Risk	Existing Controls (Mitigation)	S 1- 3	L 1- 3	RR	Are the Risks Controlled?
1	Ventilation system components	Cut	Self	Take care when handling and removing the damper as ductwork exposed could be sharp	1	1	1	Yes
2	Wet surfaces because of system cleaning	Slips and trips	Self	Watch out for any wet surfaces around the working area	2	1	2	Yes

Commentary

The candidate demonstrates a good knowledge and understanding of the different types of risk and hazards associated with ventilation activities. The candidate has identified the major hazards and associated risks for each of the tasks.

The candidate demonstrates some understanding of the mitigations that can be used to minimise the identified risks and hazards and has attempted to identify controls, although these are somewhat brief the candidate does demonstrate some understanding by making links to the correct use of PPE, when cutting and removing ductwork.

The probability of each of the hazards/ risks occurring has been attempted and mostly accurate and realistic.

Candidate evidence

Method statement

- 1) Ensure you have the correct PPE
- 2) Collect all ductwork, components and necessary tools
- 4) Measure from a suitable fixed position for the ductwork and components to be fitted according to the specification
- 5) Fit Unistrut and hangers to the correct measurements and according to the specification
- 6) Measure and cut the ductwork at the correct positions for system length and component fittings
- 7) Install the ductwork components
- 8) Tighten and double check fittings
- 9) Clean the ductwork
- 10) Test the ductwork for air leakages

Commentary

The candidate demonstrates a good understanding of the sequencing of activities in relation to the given tasks, marking out tasks, collecting materials and installing the ductwork and components.

The methods given follow the logical stages of the installation: measuring, cutting and fitting, followed by pressure testing

The methods statements identify all of the key steps, the steps are brief but accurate, however no reasoning or justification has been given to support the methods given.

Candidate evidence

Materials list

Equipment/Materials	Quantity
TOOLS	
Marker pen	1
Spirit level	1
Tape measure	1
Metal snips	1
Grinder	1
Power drill with assorted drill bits	1
Power screwdriver with assorted screw bits	1
Manual screwdrivers	2
Adjustable spanners	2
Open and box spanners	2
Hacksaw	1
MATERIALS	
Circular ductwork	8.5 meters approx
Volume control dampers	3
Ductwork brackets	Centre discretion
Extract grilles	3
Plenum box	3
Flexible ductwork	1.5 meters approx
Fire dampers	1
Circular bends and branches	1 bend, 2 branches, 3 reducers
Unistrut	Centre discretion
Assortment of 8mm/10 mm threaded bar, nuts and washers	Centre discretion
Dust sheets	1
PPE	
Boiler suit/protective clothing	
Steel toe capped boots	
Goggles	
Gloves	

Commentary

The candidate shows good knowledge and understanding of the different resources required to carry out the tasks and meet the requirements of the assignment brief.

The candidate has selected the minimum materials and equipment required for the toilet block to allow successful installation in line with the assignment brief.

The candidate has identified quantities that are accurate and relevant to the tasks.

The candidate demonstrates a good understanding of health and safety and listed the PPE required to carry out the tasks safely, as well as including dust sheets and floor protection which demonstrates consideration to customer property.

Task 2 – Installation and commissioning

(Assessment themes: Health and Safety, Systems and components, Reports and information, Inspecting and testing systems and components, Handover and communication)

For task 2 candidates need to produce the following pieces of evidence:

- Air leakage pro forma test sheet
- Commissioning certificate
- Schematic drawing with calculated and measured data
- Assessor observations:
 - Measure and mark out position of ductwork and components
 - Installation of ductwork and components
 - Commissioning checks
 - Handover to customer

For illustration, the guided exemplification materials (GSEM) for Task 2 contain examples of candidate evidence for the following assessment requirements only:

- Commissioning certificate
- Assessor observations:
 - Measure and mark out position of ductwork and components
 - Installation of ductwork and components
 - Commissioning checks
 - Handover to customer

The following task 2 candidate assessment requirements have not been included as example candidate evidence for this version of the guided exemplification materials:

- Air leakage test sheet
- Schematic drawing with measured data

Photographic evidence

Installation of components

Photographic evidence which shows:

- Tolerances have been met for the measurement of ductwork. Photos may show any excess/ waste materials caused by inaccurate measurements – **Photograph 1**
- Finished installation showing finished ductwork and component positioning which demonstrates the aesthetics of the completed installation. Visible signs of ductwork damage. None of which stops the system operating correctly - **Photograph 2**
- Use of tools (bending and cutting equipment) and ductwork skills. Photos may show ductwork cut offs - **Photograph 3**
- Tolerances have been met for the installation of the toilet block - **Photograph 4**
- Results of tool usage. Photos may show tooling marks - **Photograph 5**

Candidate evidence

Practical Observation Form – Measure and mark out position of ductwork and components

Assessment ID	Qualification number
8710-359	8710-35
Candidate name	Candidate number
Candidate A	CG12345
Centre name	Assessment theme
City & Guilds	Systems and components

Complete the table below referring to the relevant marking grid, found in the assessment pack. **Do not** allocate marks at this stage.

Task	Notes – detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.
Measure and marking out of proposed ductwork cutting positions and components	<p>The candidate used the edge of the wall to establish the correct positions of system fixing materials (e.g. unistrut, threaded bar, nuts and washers) in the ductwork system. The measuring process had some minor inaccuracies which was caused by incorrect use of measuring equipment and the use of the edge of wall instead of a datum line.</p> <p>Candidate displayed some disorganization in working from a set point and this resulted in them having to double check some positioning (VCD, fan, attenuator), which impacted on time. Overall, the system was set out accurately.</p> <p>Candidate took several attempts to mark out resulting in lines left on wall.</p>

Assessor signature	Date
Assessor A	31/01/2021

Commentary

The candidate demonstrates that they can take measurements from an allocated space/ work area in line with their installation diagram.

The candidate used measuring and marking out equipment which was not best practice for this task. This resulted in some minor inaccuracies, which could impact on the installation ductwork not being level, the finished aesthetics and soundness of the installation.

The marking out took several attempts resulting in lines left on wall.

The measurements were recorded accurately and clearly.

Candidate evidence

Practical Observation Form – Installation of ductwork and components

Assessment ID	Qualification number
8710-359	8710-35
Candidate name	Candidate number
Candidate A	CG12345
Centre name	Assessment theme
City & Guilds	Systems and components

Complete the table below referring to the relevant marking grid, found in the assessment pack. **Do not** allocate marks at this stage.

Task	Notes – detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.
Installation of ventilation ductwork and components	<p>Candidate has ensured all H&S and site preparation works are in place before starting task by putting dust sheets on floor, storing tools and materials in safe location. However, maintenance of work space during the task was minimal with some tools left out and not stored correctly after use.</p> <p>Candidate prepared the work space using suitable spacing for the ductwork system supports (bearers and hangers). These were installed with appropriate spacing (set by the duct section size) with attention to aesthetics and ensuring ductwork was level and secured.</p> <p>VCD was installed at a suitable position for correct operation however when measured was not completely accurate but within 20 mm of tolerance.</p> <p>Candidate made some errors with the ductwork cuts, which resulted in some wasted materials and inaccuracies from the original work plan. Most tolerances were met, but minor inaccuracies in the dimensions of the assembly, at a tolerance of 20 mm. Overall aesthetics of the installation were not affected.</p> <p>Candidate has effectively marked out and measured ductwork to suitable lengths to carry out the installation, with some wastage of materials.</p> <p>Candidate use of tools is mostly good however some tasks require more than one attempt, resulting in tooling marks to ductwork/ components.</p>

Assessor signature	Date
Assessor A	31/01/2021

Photographic evidence

Tolerances have been met for the measurement of ductwork. Photos may show any excess/waste materials caused by inaccurate measurements

Photograph 1 (to be added)

Tolerances (15mm – 20mm) have been met during the installation of ductwork.

Finished installation showing finished ductwork and component positioning which demonstrates the aesthetics of the completed installation. Visible signs of ductwork damage. None of which stops the system operating correctly.

Photograph 2 (to be added)

Finished installation of the toilet block and associated ductwork.
Overall aesthetics of the installation have been met.

Use of tools (bending and cutting equipment) and ductwork skills. Photos may show ductwork cut offs.

Photograph 3 (to be added)

The correct operation/use of machine and duct cutting tools.

Tolerances have been met for the installation of the toilet block

Photograph 4 (to be added)

Tolerances have been met for the installation of the toilet block.

Results of tool usage. Photos may show tooling marks

Photograph 5 (to be added)

Component fitted correctly with signs of tool marks from installation.

Commentary

Candidate demonstrates a good understanding of the installation requirements of both the toilet block. The correct process is followed, and the candidate demonstrates an ability to sequence tasks logically as set out in their method statements.

The candidate prepares the workstation with dust sheets and stores tools safely at some stages of the tasks, showing a good consideration and understanding of health and safety.

The candidate is mostly confident in the practical elements of the task, however they require some reassurance from the assessor, for example with the selection and use of appropriate tools and components. The candidate can successfully select correct tools and components but at times looks for confirmation from the assessor before proceeding with the task. The use of tools is mostly good however some tasks require more than one attempt/ or the wrong tool is used, resulting in tooling marks to ductwork/ components.

The candidate meets some tolerances for the task.

The candidate completes the installation in the allocated time, however it is clear that timing was not planned thoroughly, and the later parts of the installation are rushed.

Candidate evidence

Practical Observation Form – Commissioning

Assessment ID	Qualification number
8710-359	8710-35
Candidate name	Candidate number
Candidate A	CG12345
Centre name	Assessment theme
City & Guilds	Inspecting and testing of systems and components/reports and information

Complete the table below referring to the relevant marking grid, found in the assessment pack. **Do not** allocate marks at this stage.

Task	Notes – detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.
Commissioning	<p>Candidate did not follow correct procedure for an air leakage test in accordance with the procedure in DW143.</p> <p>Visual inspection was not completed which resulted in an air leak from a ductwork joint. Candidate rectified the leak successfully.</p> <p>Commissioning checks and test were completed for air flow rates at grilles, air leakage in the ductwork and the correct operation of the system VCD. An initial running of the extract fan was also carried out.</p>

Assessor signature	Date
Assessor A	31/01/2021

Commentary

The candidate demonstrates a good understanding of commissioning and completes the required commissioning tests and checks for the installation, however the tests and checks do not always follow a logical sequence.

Test and checks are completed accurately but with some impact on timings, due to missing the visual inspection.

Candidate makes reference to manufacturer's guidance at some stages during the task.

Candidate records all relevant information from the commissioning checks accurately on the commissioning checklists.

Candidate evidence

Practical Observation Form – Handover to customer

Assessment ID	Qualification number
8710-359	8710-35
Candidate name	Candidate number
Candidate A	CG12345
Centre name	Assessment theme
City & Guilds	Handover & Communication

Complete the table below referring to the relevant marking grid, found in the assessment pack. **Do not** allocate marks at this stage.

Task	Notes – detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.
Handover to customer	<p>Candidate has arms folded and doesn't make eye contact.</p> <p>Candidate gives information about location of the extract fan and explains the operating principles of the VCD.</p> <p>Candidate provides detail of maintenance requirements e.g. cleaning processes but misses information about limitation of the system e.g. excessive system vibration noise at some fan speeds.</p> <p>Candidate made reference to manufacturer instructions at some stages of the task.</p>

Assessor signature	Date
Assessor A	31/01/2021

Commentary

The candidate demonstrates a good understanding of the handover process and the operating principles of the systems and these were explained to the customer as part of the handover. The handover of the system to the customer was mostly clear and accurate, however some minor details were missed, e.g. maintenance requirements.

The candidate displays some customer care skills, but these were limited with minimal eye contact and interaction with the customer.

Candidate evidence

Commissioning checklist

Project: Office Building Extension 8710 (359)	Drawing. Refs:
System: Extension toilet block extract ventilation	Candidate pack Figure 1; Figure 2

Air Tightness	Test Pressure: +100 Pa	Duration of Test: 15 minutes	Pressure loss: Pass ✓ Fail
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COMMENTS

- Ductwork assembly was to be as airtight as possible to maximise system performance
- Ductwork was handled into position for testing
- A ventilation duct is typically under a positive pressure relative to the air surrounding it, which means that leakage from sheet metal ductwork can occur at connection joints between section lengths and at seams
- Other weak points include damper, filter and fan fixing penetrations, control sensors, test holes, access panels etc.
- Ventilation performance will be adversely affected by excessive air leakage
- 100% airtightness is not likely but the test results will show if this was the case
- Construction to the standards in DW/144 ensures acceptable air leakage rates
- Acceptable air leakage rates from ductwork were noted from the assessor
- Test result notes:
 - At the beginning of the test, the duct was pressurised to +100 Pa using air pressurisation equipment (rig)
 - The air pressure rig was then switched off at +100 Pa and the test time of 15 minutes was started
 - Air flow rate 1 (l/sec) was measured at the start time of the test
 - Air flow rate 2 (l/sec) was measured at 15 minutes
 - The results were compared

	Design		Test
Fan	Flow Rate	0.038 m ³ /s	0.0285 m ³ /s
	Pressure, suction	Pa	Pa
	Pressure, discharge	Pa	Pa

INSTRUMENTS USED/ COMMENTS

- The building regulations Part F requires mechanical fans to provide adequate ventilation flow rates in certain types of rooms including toilets
- Every building must be designed and constructed in such a way that ventilation is provided for the health and of occupants
- A ventilation standard for toilets in commercial office buildings is set at 5 air changes per hour (ach)
- The fan installed for this target flow rate was 150 mm in diameter, which had a design extraction rate of 81 l/sec, which was more than enough for the design performance target
- The test fan pressures were as expected

	Extract grille number	Extract grille size mm	Design volume m ³ /s	Actual volume m ³ /s	% design	Comments
Air Extraction System	001 (Male WC)	200x200	0.0094 m ³ /s (33.75 m ³ /h)	0.005 m ³ /s	53%	5 ach minimum ventilation from the Building Regs Part F
	002 (Female WC)	200x200	0.0094 m ³ /s (33.75 m ³ /h)	0.0075 m ³ /s	80%	5 ach minimum ventilation from the Building Regs Part F
	003 (Accessible WC)	300x300	0.019 m ³ /s (67.5 m ³ /h)	0.016 m ³ /s	84%	5 ach minimum ventilation from the Building Regs Part F
INSTRUMENTS USED/ COMMENTS <ul style="list-style-type: none"> • Instrumentation: Rotating vane anemometer; hot-wire anemometer • The commissioning included an inspection of ductwork <u>cleanliness and section joints integrity</u> • The <u>minimum</u> standard of extraction flow rate to be achieved is 5 ach from each of the three toilet spaces • The actual flow rate at extract grille 001 was 53% of the design flow rate number 001 • The other two actual flow rates were 80% and 84% of the design target values • There must be a fault in the system at the fan or in the ductwork 						
Candidate Name:			Candidate Signature:		Date:	
Tutor Name:			Tutor Signature:		Date:	

Commentary

The candidate shows a good understanding of the principles and requirements of the commissioning tests and checks. The checklist is completed but some areas are brief in content. Calculations are correct but working out is not always shown. The candidate demonstrates a good understanding of building regulations and these are referenced in some of the relevant places.

Task 3 – Carry out maintenance

(Assessment themes: Reports and information, Handover and communication, Working with faults)

For task 3 candidates need to produce the following pieces of evidence:

- A written report of the maintenance activity
- Assessor observations:
 - Fault diagnosis
 - Rectification of fault
 - Discussion with customer

For illustration, the guided exemplification materials (GSEM) for Task 3 contain examples of candidate evidence for the following assessment requirements only:

- A written report of the maintenance activity
- Assessor observations:
 - Fault diagnosis
 - Rectification of fault
 - Discussion with customer

Photographic evidence required:

Fault diagnosis and rectification of fault

Photographic evidence which shows:

- Results of tool usage. Photos may show tooling marks – **Photograph 6**
- Sequence of photos which show the replacing and removal of the faulty component, and reinstallation of the new component – **Photographs 7, 8 and 9**
- System on completion of all works – **Photograph 10**

Candidate evidence

Written report of maintenance activity

Maintenance activity

FAULT Report of a volume control damper (VCD) not operating correctly

Description of fault diagnosis

I checked the air flow at the ductwork terminal. This would confirm that there was an air extraction problem in the system. The fan was working so I decided that there was a fault on the VCD. The damper blades were stuck, which reduced the extraction flow rate. The VCD would need to be replaced.

Possible solutions

The solution to this problem was either to replace only the damper actuator or to remove the faulty VCD unit entirely and replace it with a new one. I decided to replace the full damper unit and re-connect the existing actuator.

Actions taken to rectify fault

To repair the fault, I carried out the following sequence:

- Isolate the power supply to the system and check that fan and damper motor are not 'live'
- Locate the faulty VCD
- Remove the existing damper and actuator
- Fit the new VCD in position
- Re-connect the actuator
- Ensure all fixing bolts are tightened properly and test the system air flow at the terminal when the damper should be open and closed

Commentary

The maintenance report completed is brief and, in a bullet, pointed format.

The candidate demonstrates good understanding of the maintenance requirements, for the given task, and provides a brief but accurate description of the fault diagnosis process.

The candidate identifies a brief but accurate 6 step process/ sequence to rectify the fault, which shows a good knowledge and understanding of how to repair and rectify the fault.

No reasoning has been given to support the methods selected to rectify the fault.

Candidate evidence

Practical Observation Form – Fault diagnosis and fault rectification

Assessment ID	Qualification number
8710-359	8710-35
Candidate name	Candidate number
Candidate A	CG12345
Centre name	Assessment themes
City & Guilds	Working with faults/ handover and communication/ reports and information

Complete the table below referring to the relevant marking grid, found in the assessment pack. **Do not** allocate marks at this stage.

Task	Notes – detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.
Fault diagnosis and customer discussion	<p>Candidate showed some nerves at the beginning of the customer discussion, with an initial lack of eye contact and inappropriate body language. Candidate had their arms folded and missed some opportunities to put the customer at ease.</p> <p>The candidate asked various questions to gain an insight into the fault and some of these were irrelevant to the task.</p> <p>Appropriate questions were eventually asked:</p> <ul style="list-style-type: none"> • How long has the fault been happening? • Is the damper fixed closed or fixed open? • Does the damper operate sometimes? <p>This allowed candidate to make some judgments and confirm the fault and repair solution, although this may have been guesswork/trial and error rather than systematic fault analysis.</p> <p>Candidate carried out a visual inspection of the system to identify the location of the fault.</p>
Fault rectification	<p>Candidate considers health and safety preparations, using dust sheets, removing customer property where required.</p> <p>Candidate followed a methodical and logical sequence, safely identifying and isolating the faulty VCD, prior to selecting the correct tools to remove it from its ductwork location (connection flange) and replacing it with the new component.</p> <p>The candidate completed the repair efficiently with only minor issues such as difficulty in connecting the actuator to the new fitting, but completed everything in good time.</p>

Task	Notes – <i>detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.</i>

Assessor signature	Date
Assessor A	31/01/2021

Photographic evidence

Results of tool usage. Photos may show tooling marks.

Photograph 6 (to be added)

Component fitted correctly with signs of tool marks from installation of replacement component.

Sequence of photos which show the replacing and removal of the faulty component, and reinstallation of the new component.

Photograph 7 (to be added)

Loosening of faulty component.

Photograph 8 (to be added)

Removal of faulty component.

Photograph 9 (to be added)

Replacement of component.

System on completion of all works.

Photograph 10 (to be added)

Repair completed.

Commentary

The candidate lacked some confidence when carrying out the discussion with customer, not always making eye contact and standing with arms folded.

The candidate asked questions to the customer to try and determine the cause of the fault, however some of the questions asked were irrelevant to the task and fault finding process. The candidate did eventually ask enough appropriate questions to diagnose the fault, demonstrating a good knowledge of the operating principles/ service requirements of the WC block.

The candidate demonstrates a good understanding of the methods and techniques used to diagnose faults on ventilation systems/ components.

The diagnosis of the fault followed a logical sequence.

The candidate shows some understanding of the techniques used to repair/ rectify faults in relation to the component that has been identified as being faulty.

The fault repair tasks followed a methodical order, however some reassurance was needed from the assessor with some aspects and made some minor mistakes that did not impact the finished product.

The candidate is able to select the correct tools for the task. The use of tools is mostly good, however some tasks require more than one attempt resulting in tooling marks to components/ ductwork.

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