

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

**Protection Systems
Engineering**

**Guide standard exemplification material
Threshold competence – Sample 2021**

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Introduction

The sample assessment materials within this document refers to the Protection Systems 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 provided are 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 tasks. 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 photographic/video 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 a description of the task and how the task links to the relevant assessment themes. It may also include the candidate's work, photographs of the work in production (or completed) and practical observation records of the assessment completed by centre assessors. This will be actual evidence that was captured as part of the assessment and then internally marked by the centre assessor.

Commentary section - 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 knowledge, skills and understanding that needs to be achieved 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 for 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 Protection Systems 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 faults and have some knowledge and skills in how to rectify them.

Mostly use industry terminology accurately in both written and verbal contexts.

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Task 1 – Planning the installation

(Assessment themes: Health and safety, design and planning)

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

Plan the installation of the I&HAS to include:

- Risk assessment
- Method statement with justifications
- Building plan with device locations indicated, with justifications
- Dimensional drawing of proposed installation in the given work area
- Materials list.

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

- Risk assessment
- Method statement with justifications
- Dimensional drawing of proposed installation in the given work area
- Materials list
- Assessor observation of measurements and marking out of space allocation/work area, should include how well the learner accurately measured the work area, checked against their dimensioned drawing.

The following Task 1 candidate assessment requirements have not been included as example candidate evidence for this version of the guided exemplification materials:

- Building plan with device locations indicated, with justifications
- Assessor observation showing details of any intervention and feedback where a candidate has produced a plan that is not fit for purpose.

Candidate evidence

Task 1 - Risk Assessment

Activity: Installation of containment		Date: 12 2 2021						
Location: Workspace		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	Installation of containment Cutting	Cuts/Scratches	Staff	Wear suitable gloves.	1	1	1	Y
2	Installation of containment 230 V AC containment	Death/Shock	Staff	Carry out safe isolation procedure.	3	1	3	Y
3	Installation of containment Loose Cables	Tripping	Staff	Maintain a tidy work area.	1 /2	1	1	Y
4	Installation of containment Fixing	Cuts/Bruises	Staff	Work carefully. Wear eye protection.	1 /2	1	1	Y

Activity: Installation of components		Date: 12 2 2021						
Location: Workspace		Position: Candidate						
SEVERITY (S): Degree of harm which may be caused (including numbers affected) 1 Minor Injury 2 Major Injury 3 Fatality LIKELIHOOD (L): Probability that event will occur 1 Remote 2 Possible 3 Likely							RISK RATING (RR): Severity x Likelihood 1-2 Low 3-5 Medium 6-9 High	
Item No	Activity	Hazard	Persons at Risk	Existing Controls (Mitigation)	S 1-3	L 1-3	RR	Are the Risks Controlled?
1	Installation of components Cable preparation and connection	Cuts	Staff	Use appropriate tools.	1	2	1	Y
2	Installation of components 230 V AC containment	Death/Shock	Staff	Carry out safe isolation.	3	2	3	Y
3	Installation of components Component installation	Cuts	Staff	Use appropriate tools.	1	1	1	Y
Activity: Decommissioning		Date: 12 2 2021						
Location: Workspace		Position: Candidate						
SEVERITY (S): Degree of harm which may be caused (including numbers affected) 1 Minor Injury 2 Major Injury 3 Fatality LIKELIHOOD (L): Probability that event will occur 1 Remote 2 Possible 3 Likely							RISK RATING (RR): Severity x Likelihood 1-2 Low 3-5 Medium 6-9 High	
Item No	Activity	Hazard	Persons at Risk	Existing Controls (Mitigation)	S 1-3	L 1-3	RR	Are the Risks Controlled?
1	Decommissioning 230 V AC electrical supply disconnection	Death/Shock	Staff	Carry out safe isolation	3	1	2	Y

2	Decommissioning Component removal	Cuts/Scratches	Staff	Wear suitable gloves. Use appropriate tools.	1	1	1	Y
Activity: Maintenance		Date: 12 2 2021						
Location: Workspace		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			
LIKELIHOOD (L): Probability that event will occur 1 Remote 2 Possible 3 Likely					1-2 Low 3-5 Medium 6-9 High			
Item No	Activity	Hazard	Persons at Risk	Existing Controls (Mitigation)	S 1-3	L 1-3	RR	Are the Risks Controlled?
1	Maintenance 230 V AC electrical supply	Death/Shock	Staff	Carry out safe isolation.	3	2	3	Y
2	Maintenance Component replacement	Cuts/Scratches	Staff	Wear suitable gloves. Use appropriate tools.	1	1	1	Y

Commentary

The candidate demonstrates good knowledge and understanding of the different types of risk and hazards associated with the tasks. The candidate has identified the major hazards and associated risks for each of the tasks but did not take into consideration contamination.

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 brief in detail.

Probability of each of the hazards/risks occurring has been considered for all risks which in most cases are accurate.

Candidate evidence

Task 1 - Method statement

Method statement of the installation

Before starting ensure I have the correct PPE...

- steel toe cap boots
- boiler suit
- eye protection
- gloves
- hi visibility vest

I will collect all items in my materials list.

I will make sure my work space is safe...

- move anything that is unwanted out of the way
- put a dust sheet down
- keep work area tidy

I will mark out my installation...

- measure and mark out the component positions
- check that the distances are as per the dimensioned drawing
- mark out the runs for all surface clipped cables
- use a spirit level

I will install my system...

- install the components in their respective locations
- install the cable containment
- install all low voltage cables as per the design drawing and system specification
- label cables
- check measurements and use a spirit level to ensure everything is straight and level

I will connect my system...

- connect each cable at the detectors and the CIE
- set programming jumper links / switches in detectors
- install and connect the 230 Vac supply cable after performing a safe isolation and lock-off and testing procedure
- perform a visual inspection of all connections, ensuring that everything is correct

I will commission my system...

- insert a fuse into the fused spur outlet to energise the I&HAS
- place the CIE into engineer programming mode
- program the CIE Zones as per the system specification
- set the shock sensor sensitivity
- replace all covers
- put the CIE into Walk Test mode and test everything.
- use a multimeter to complete the Record of Operational Checks
- replace the CIE front panel and restore it to Unset / Day mode

I will clean up my work area, making sure that the floor area is clear of all debris, tools and leftover materials.

I will prepare the documentation required for a system handover...

- handover acceptance certificate
- system instruction manual
- Zone list
- company contact details

I will hand the system over to the customer...

- walk them around the house explaining where everything is
- demonstrate the system operation
- ask the customer to operate their system
- complete the handover document, and all paperwork to the customer

Commentary

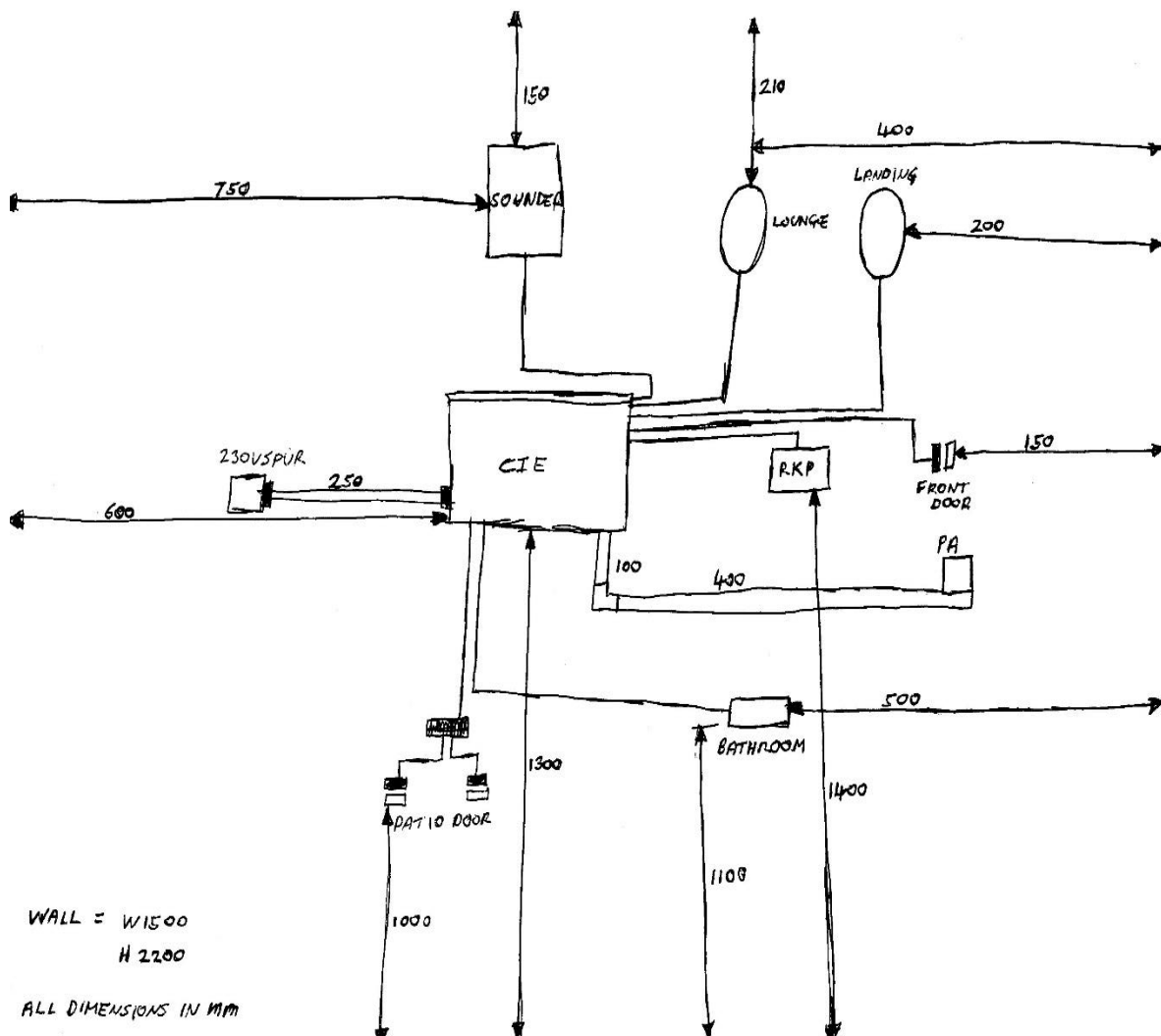
The candidate demonstrates a good understanding of the sequencing of activities in relation to the given tasks, with clear presentation, but there are some examples of minor gaps in understanding. For example, collecting materials before clearing and preparing the site may result in trip hazards and labelling cables only after they have all been installed can result in incorrect identification of cables and/or time wasted identifying the cables.

The methods statement identifies all of the key steps, showing that the candidate has a good understanding of system installation and commissioning, however no reasoning or justification has been given to support the methods given.

The candidate has produced sound method statements regarding PPE, marking out the installation, system connection and commissioning and system handover.

Candidate Evidence

Task 1 - Dimensional drawing



Commentary

The candidate demonstrates good knowledge and understanding having completed the drawing with some accuracy, relative to the design brief. However, in their first attempt they were unable to identify all components in the system design specification but this was rectified and the candidate was able to produce a reasonably well-presented final drawing.

The candidate worked alone but was hesitant on two occasions and sought reassurance, this included the drawing of the junction box for the patio door contacts and the identification of the cable type for the 230V supply to the CIE.

Because some of the work had to be performed a second time by the candidate, the task ran over the allotted time but was still completed to a good standard.

Candidate evidence

Task 1 - Materials list

Equipment/Materials	Quantity
Pencil	1
Spirit level	1
Tape measure	1
Screwdrivers	1
Wire cutters	1
Pliers	1
Hammer	1
Hacksaw	1
Drill and bits	1
Test meter	1
Voltage detector and proving unit	1
Screws	70
Cleaning rags	1
Alarm control panel	1
Battery	1
Sounder	1
Door contacts	1
Junction boxes	1
PIRs	2
PA Button	1
Vibration detector	1
8 core alarm cable	25m
3 core mains flex cable	1m
cable clips	30
20 mm conduit and saddles	2
PVC mini trunking	1m
PPE:	
Gloves	
Boots	
Goggles	
Hi - vis	

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 materials list includes all of the key components, tools and equipment to perform the tasks. Quantities have been included but some are not accurate, including the quantity of screws required and length of trunking, both slightly overestimated.

Some material descriptions are not clear, with some omissions in technical understanding to items, for example, 'battery' does not indicate the required capacity and correct terminology is not always used. The candidate demonstrates a good understanding of health and safety and listed the PPE required to carry out the tasks safely.

Candidate evidence

Task 1 – Measuring and marking out of proposed working area

Practical observation

Assessment ID	Qualification number
8710 -357	8710 – 31
Candidate name	Candidate number
Candidate A	CG12345
Centre name	Assessment theme
City & Guilds	Design and planning

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.
Measuring and marking out of proposed work area	<p>The measuring process was accurate bar some minor inaccuracies which was caused by the incorrect use of measuring equipment. Marking out the area was correct but on occasion took several attempts to establish accuracy.</p> <p>The candidate considers most aspects of the design layout with key details set out, but there were some omissions that were not taken into consideration.</p>

Assessor signature	Date
Assessor A	31/01/2021

Commentary

The candidate demonstrates that they could take measurements and mark out an allocated space/work area, using the correct equipment with reasonable accuracy and then use the information gathered to produce a system design and dimensioned drawing.

Task 2 – Installation, Commission and Decommission

(Assessment themes: Health and safety, systems and components, inspection and testing, commissioning and handover, reporting and information)

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

- Installation
- Connection of electrical supply
- Commissioning of system
- Decommissioning
- Completed Record of Operational Checks (Appendix 2)
- Written report of safe isolation
- All required documentation available and completed, as required, during system handover to customer

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

- Written report of safe isolation
- Assessor observations:
 - Safe isolation
 - Installation of the system - to include the selection and use of tools, working to tolerances and clipping and cabling
 - Commissioning - selection and use of test instruments and handover to customer
 - Decommissioning

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

- Completed Record of Operational Checks (Appendix 2)
- All required documentation available and completed, as required, during system handover.

Photographic evidence required:

Installation

Photographic evidence which shows:

- Candidate clearly marking out the location of key aspects of the installation **(photograph 1)**
- The installation of adequate cable clips and supporting brackets, using hand and power tools **(photograph 2)**
- The candidate cutting and installing PVC trunking and conduit using hand tools **(photograph 3)**
- The installation of all I&HAS components, in line with current regulations and manufacturer's literature **(photographs 4 & 5)**

Commissioning and Handover

Photographic evidence which shows:

- The candidate programming the system (**photograph 6**)
- The candidate using a multimeter and voltage indicator to perform safety and functional tests on the system (**photograph 7**)

Decommissioning

Photographic evidence which shows:

- The safe removal of system components, cables, and containment (**photograph 8**)
- Making good of building fabric such as filling of screw holes, painting over marking (**photograph 9**)
- The safe storage of components and waste segregation (**photograph 10**)

Candidate evidence

Task 2 - Written report of safe isolation

Safe isolation of 230 V AC supply

- Obtain permission to start work
- Identify the source of supply to the fused spur outlet
- Isolate the supply
- Lock off the supply and fit suitable warning sign that the circuit is being worked on
- Prove that the approved voltage indicator is functioning correctly
- Test between all incoming supply terminals in the fused spur outlet to prove that they are 'dead'
- Prove that the approved voltage indicator is functioning correctly
- Once the circuit has been proven to be 'dead', work can begin

Candidate evidence

Task 2 – Safe isolation

Practical Observation Form

Assessment ID	Qualification number
8710-357	8710 – 31
Candidate name	Candidate number
Candidate A	CG12345
Centre name	Assessment theme
City & Guilds	Health and safety

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.
Safe isolation	<p>The candidate prepared for the task by reviewing their method statement and referred to the method statement frequently throughout the task. They correctly selected all the equipment required, including voltage indicator, proving unit, lock off kit, correct signage.</p> <p>The candidate correctly checked the testing equipment and confirmed operation before continuing with tests to prove the supply was dead. The candidate articulated the purpose of each step in ensuring the electrical supply was correctly isolated. Candidate initially forgot to lock off the device but rectified this in the process.</p> <p>Candidate correctly identified signage and placed notices to advise the system was isolated and tested. The candidate always retained the lock off key on their person whilst working on the circuit.</p>

Assessor signature	Date
Assessor A	31/01/2021

Commentary

The candidate demonstrates a good understanding for safe isolation and carried out all necessary steps correctly in the safe isolation procedure, lock off and tag process as identified in their written report.

The safe isolation process was conducted correctly, the candidate referred to their method statement constantly to ensure the process was completed safely. The candidate was able to describe the reasoning behind each step in the process. For example, the candidate used the correct terminology for the testing equipment and explained what each check was proving before moving to next stage.

The candidate showed a sound level of knowledge and understanding and used accurate terminology for the testing equipment and explained what each check was for before moving to next stage.

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Candidate evidence

Task 2 – Installation of components

Practical Observation Form

Assessment ID	Qualification number
8710-357	8710 – 31
Candidate name	Candidate number
Candidate A	CG12345
Centre name	Assessment theme
City & Guilds	Health and safety, systems and components (installation)

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	<p>The candidate placed the dustsheet on the floor and took time to ensure the sheet covered the whole area.</p> <p>The candidate referred to their method statement and followed their equipment/materials list during collection but due to some minor inaccuracies on the material list, the candidate had to use verbal descriptions when obtaining the materials from the store's person. They did this with reasonable accuracy but some items needed more questioning from the stores person to ensure the correct materials were issued.</p> <p>The workspace was kept clean and tidy in the main with small omissions, some tools left out.</p> <p>Candidate did not make any reference to pre-existing marks or damage to the wall prior to marking out for their installation.</p> <p>Sequencing was not always logical, for example, conduit and trunking were cut before components were installed. This resulted in some incorrect lengths because of inaccuracies in the component positioning.</p> <p>All equipment was installed but with some small gaps in places.</p> <p>Cable clipping distances are acceptable but some are not accurately spaced.</p> <p>Good use was made of the spirit level to check that containment and component installation is level/plumb, but in some cases, installation was not true. For example, the external sounder was not totally level,</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>
	<p>however, it was still aesthetically sound. All components were installed in the locations detailed in the drawing.</p> <p>Cables were identified using suitable labels. However, the candidate realised that their method statement had small omissions and that they needed to label each cable as it was installed to avoid confusion.</p> <p>Cable ends were prepared and terminated correctly with no exposed conductors and no damage to the insulation, although the final installation was not as neat as it could have been in cable core routing.</p> <p>All devices were installed and connected as per the system design specification.</p> <p>Whilst there are some inaccuracies/gaps, tolerances have been met with overall aesthetics of the installation not affected.</p>

Assessor signature	Date
Assessor A	31/01/2021

Photographic evidence Task 2 – Installation

Installation: Marking out (photograph 1)

Photo: i.e., Candidate using a tape measure and pencil to mark component positions

Image shows correct marking out of component locations.

Candidate uses the correct equipment for marking out.

Installation: Clipping (photograph 2)

Photo: i.e., Candidate using Pozidrive screwdriver to fit spacer bar saddle, with clear view of saddles in straight line.

Image shows the correct use/type of saddles/cable clips, reasonably spaced and installed within permitted tolerance with some small gaps evident.

Candidate uses the correct tools for fixing the clips/saddles.

Installation: Cutting and preparing (photograph 3)

Photo: i.e., Candidate using a hacksaw to cut the conduit. Conduit is secured in a vice. Candidate is wearing appropriate PPE.

Image shows the candidate cutting PVC conduit safely with the conduit secured.

The finished cut was straight.
The candidate de-burred the conduit end.

Installation: Components (photograph 4)

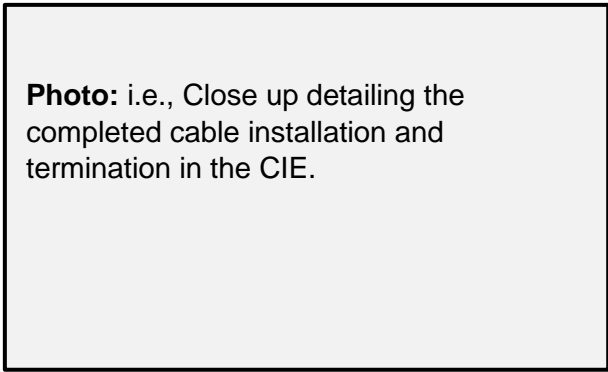
Photo: i.e., Candidate using a spirit level to check the sounder.

Image shows the candidate fixing the external sounder to the wall.

Candidate uses the correct hand tools for the installation and checks position and level.

Note that the completed sounder installation was not fully level.

Installation: Cables (photograph 5)



Images show the completed CIE cable installation.

Cables are clearly labelled.

Cable termination is to a satisfactory standard.

Cable routing is reasonably tidy and does not impede front cover fitting or future servicing.

Commentary

Candidate demonstrates a good understanding of the installation requirements for the task.

The correct process is followed and the candidate demonstrates an ability to sequence tasks logically as set out in their method statement. However, some lapses occurred that resulted in work having to be re-done, for example, incorrect conduit lengths and individual cables not identified following installation.

The candidate prepares the workstation correctly, showing a good consideration and understanding of health and safety bar minor omissions with dust sheers and minor clarification required at the stores.

Cable preparation and connection is to a good standard. The candidate meets most tolerances for the task.

The installation was acceptable, however, there were slight inaccuracies in measuring and cutting which has not affected the overall aesthetics.

Candidate evidence

Task 2 – Commissioning and handover

Practical Observation Form

Assessment ID	Qualification number
8710-357	8710 – 38
Candidate name	Candidate number
Candidate A	CG12345
Centre name	Assessment theme
City & Guilds	Inspection and testing of systems, reports/information and handover

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

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>
Commissioning and handover	<p>Commissioning checks</p> <p>Candidate performed only a brief visual inspection of the CIE wiring and connections before applying power and connecting the stand-by battery.</p> <p>During system programming the candidate had difficulty in understanding the programming menus and consequently did not follow a logical sequence. The assessor had to remind the candidate to make more use of manufacturer’s instruction manuals. The candidate made occasional reference to the original system specification, however, not all devices were set to meet this specification. For example, detector 4 (PIR) was not omitted during Part Set.</p> <p>A Record of Operational Checks was completed, but the candidate had to be prompted in the use of a multimeter to measure the system currents.</p> <p>Candidate placed the system into walk test mode and tested the system operation, however, little attention was paid to checking detector range and coverage. Signaling equipment was tested. Upon completion of the walk test, the candidate performed a Full Set, Part Set and Unset of the system, as well as an alarm activation and system reset.</p> <p>Handover to customer</p> <p>Candidate prepared for handover, however, they had to be prompted to include the handover checklist.</p> <p>Candidate communicated with the customer, but on occasion was not always clear in explaining the system operation, with some technical</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>
	<p>terms used without explanation and required prompting when forgetting to mention the operation of detector 4.</p> <p>Candidate walked the customer around their system and provided a basic explanation of the coverage of the detectors and signaling equipment. Setting, Unsetting and Resetting of the system was demonstrated, but the customer was not invited to perform these operations to demonstrate that they were understanding the instructions.</p> <p>Handover documentation was completed correctly with the candidate providing basic instruction on the system warranty and how to contact the installation company in the event of any trouble with the system.</p>

Assessor signature	Date
Assessor A	31/01/2021

Photographic evidence Task 2 – Commissioning

Commissioning: System programming (photograph 6)

Photo: i.e., Close up showing candidate using the CIE keypad to program the system. CIE display is visible showing a programming menu.

Images show candidate programming the system.

Candidate referred to the manufacturer's programming instructions.

Not all of the system met the system specification in terms of programming.

Commissioning: System measurements (photograph 7)

Photo: i.e., Candidate with multimeter performing a system measurement.

Images show correct connection and setting of multimeter to measure the battery charging voltage.

Commentary

The candidate demonstrates a good understanding of commissioning and completes the commissioning tests and checks required and programs the system as per the system specification. However, the candidate had to be prompted to refer to the system specification to check specific points such as the operation of detector 4.

Programming would have been made simpler if the candidate had made more use of the manufacturer's programming instructions.

Commissioning tests were completed correctly but with some prompting from the tutor when connecting a multimeter to take current measurements.

Voltage and resistance measurements using the multimeter were taken accurately and correct values were recorded.

System demonstration and handover was correct and the customer was taken around the system and the areas of coverage identified. However, the handover was brief and some technical terms were used without giving a full explanation to the customer.

Candidate evidence

Task 2 – Decommissioning

Practical Observation Form

Assessment ID	Qualification number
8710-357	8710 – 31
Candidate name	Candidate number
Candidate A	CG12345
Centre name	Assessment theme
City & Guilds	Health and safety, system and components (decommissioning)

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

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>
Decommissioning	<p>Candidate follows a logical sequence for decommissioning, referring to the method statement.</p> <p>Candidate follows safe working practices throughout the decommissioning.</p> <p>All components are returned to their packaging, with instruction sheets, in preparation for next use. Longer lengths of cable were retained, but the candidate had to be prompted to coil and tape them. Most re-useable items are retained and returned to store, but some smaller sundries which could have been re-claimed were disposed of.</p> <p>Candidate made a reasonable attempt to make good the working area with the use of appropriate fillers and sanding, although a top coat of paint was not applied.</p>

Assessor signature	Date
Assessor A	31/01/2021

Photographic evidence Task 2 – Decommissioning

Decommissioning: Component removal and recovery (photograph 8)

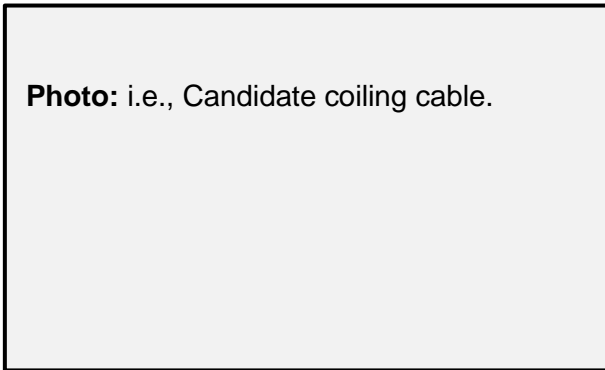


Image shows candidate ensuring that, materials could be re-used, bar small omissions.

Decommissioning: Component removal and recovery (photograph 9)

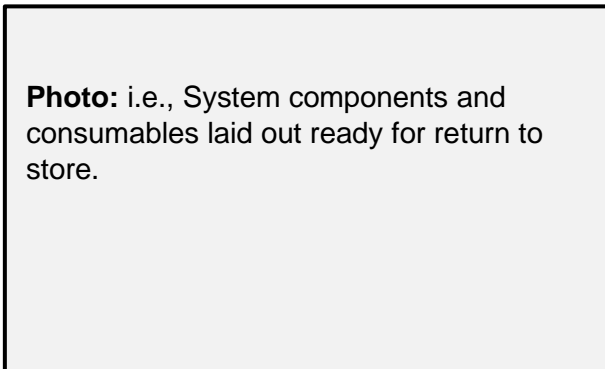


Image shows components are removed and prepared for storage.
On the whole, consumables are removed and stored such that they may be re-used – slight issue with not coiling cable rectified on prompting.

Decommissioning: Surface restoration (photograph 10)

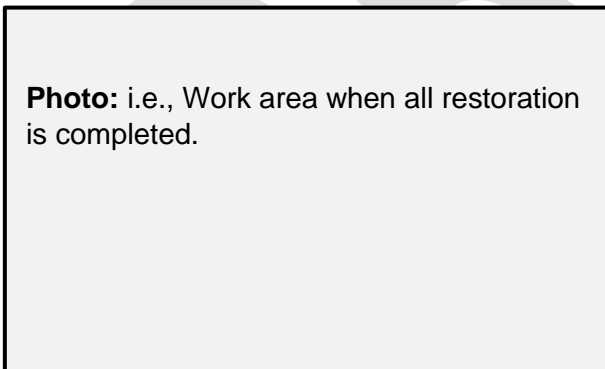


Image shows work area restored with fillers and sanded but without a top coat paint applied.

Commentary

The candidate demonstrates a good understanding of the decommissioning process and demonstrates the ability to sequence tasks logically whilst decommissioning the system.

The candidate correctly identified some of the components that can be reused, showing a good knowledge and understanding of the reuse and recycling of different materials.

The candidate followed the correct process for the safe disposal of waste and most of the components were recycled correctly.

The candidate began by ensuring that the 230 V electrical supply was isolated, using the correct procedure, before removing the supply cable connecting the fused spur outlet to the CIE.

The candidate made good the working area with the use of appropriate fillers and sanding but omitted to add a top coat of paint. Overall, the task was completed to an acceptable standard.

DRAFT

Task 3 – Carry out maintenance

(Assessment themes: Health and safety, working with faults, design and planning, systems and components, reports and information)

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

- Diagnose a single fault for I&HAS components
- Produce a written report of maintenance activity
- Produce a written report detailing cause of problem and work required to repair the fault
- Customer handover.

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

- A written report of maintenance activity
- Assessor observations
 - Fault diagnosis
 - Rectification of fault

The following Task 3 candidate assessment requirements have not been included as example candidate evidence for this version of the guided exemplification materials:

- Assessor observation of handover to customer.

Photographic evidence required:

- Candidate using RKP to interrogate the system (**photograph 11**)
- Candidate using a suitable test instrument to diagnose the fault (**photograph 12**)
- Candidate replacing the defective component/cable (**photograph 13**)

Candidate evidence

Task 3 - Written report of maintenance activity

Maintenance activity report: Practical diagnosis and rectification checklist

Fault Report: Unable to Set the I&HAS

Description of fault diagnosis

I attempted to Set the system, noting the error message on the keypad display, which indicated which detection circuit was at fault.

Using a multimeter I was able to confirm that the circuit was open, which is the reason for the system not setting.

I went and visually checked the detector, which looked to be OK. So I removed the detector cover and tested the DC voltage, which was OK. So I linked out the alarm circuit at the control panel and measured the resistance at the detector end – the resistance was very low, so the cable was OK. So it must be the detector that is faulty.

Possible solutions

The only way to repair the fault is to replace the detector. But, if I do not have one I will have to link out the circuit in the control panel to enable the system to be Set until I can come back and replace the detector. I must tell the customer about the reduction in coverage during the time that the detector is out of service.

Actions taken to rectify fault

To replace the detector, I carried out the following sequence:

- Disconnect the 12V supply to the detector at the control panel.
- Remove the faulty detector.
- Fit the new detector and connect the wires.
- Clean up any mess or dirt from the work area.
- Replace the cover and re-connect the 12V supply at the control panel.
- Place the control panel into Walk Test mode and check the detector is working.
- Set the system and generate an alarm condition from the detector.
- Inform the customer that the system is now working.

Commentary

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 process used to diagnose the defective component although sound, was not the most efficient method. The candidate did not obtain a written consent from the customer to temporarily degrade the system coverage whilst a replacement component was obtained.

The method used to replace the PIR, although acceptable, was not ideal. For example, no attempt was made to record the detector wiring before disconnection and little consideration was made for the aesthetics during removal and replacement.

Candidate evidence

Task 3 – Diagnosis and rectification of faults

Practical Observation Form

Assessment ID	Qualification number
8710- 357	8710 – 31
Candidate name	Candidate number
Candidate A	CG12345
Centre name	Assessment themes
City & Guilds	Working with faults

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

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>
Working with faults (Fault diagnosis)	<p>Initial interaction with the customer is slow, with limited eye contact, head down with arms folded although this improved as the candidate moved on with the fault diagnoses. Although the candidate did ask questions, they did not directly help with the initial fault diagnosis.</p> <p>Candidate made use of the system display to determine the defective circuit. A logical sequence of electrical tests was applied to identify the faulty component, but the candidate had to be prompted on occasions.</p> <p>The candidate’s selected repair method was acceptable but lacked an awareness of the wider implications of some of the actions taken, such as removing wires without first noting the colour code.</p> <p>Little consideration was given to possible damage to customer’s property.</p>
(Fault rectification)	<p>Candidate implemented all the health and safety preparations required to take care of components.</p> <p>The device was replaced and system operation restored, however, the candidate did not make any attempt to ensure that settings in the replacement device were the same as for the previous unit. Once prompted, the candidate compared the settings and made them the same.</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>
	<p>The candidate correctly isolated the DC supply to the detector before disconnecting the wiring. However, a note was not taken of the wiring convention before removal.</p> <p>The candidate paid only limited attention to possible damage to the décor around the PIR.</p> <p>The candidate completed the repair correctly in reasonable time. The completed repair was tested correctly, however, a full demonstration was not given to the customer.</p>

Assessor signature	Date
Assessor A	31/01/2021

Photographic evidence Task 3 Maintenance

Maintenance: Fault diagnosis (photograph 11)

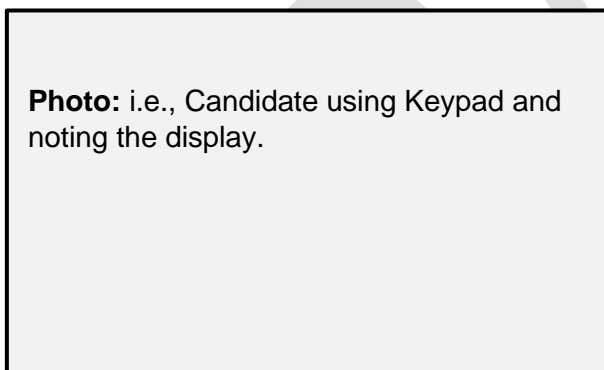


Image shows candidate using correct techniques to diagnose faults using keypad information to determine the defective circuit with direction on occasion

Maintenance: Test equipment (photograph 12)

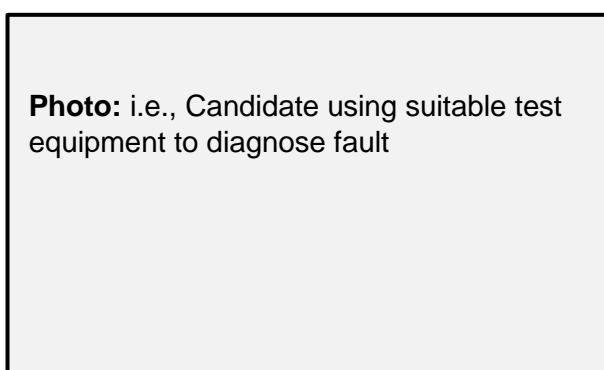


Image shows candidate using a multimeter after prompts to test the loop resistance of the alarm cable.

Maintenance: Fault rectification (photograph 13)

Photo: i.e., Candidate on step-up re-connecting the new PIR PCB.

Image shows candidate rectifying fault using the correct equipment to access the detector and correct tools to perform the repair adequately with some attention given to the customer's premises.

Commentary

The candidate demonstrated sound understanding of fault diagnosis and rectification. Initial interaction with the customer was laboured, not always making eye contact and standing with arms folded but this improved through the task. However, the candidate did not ask the customer appropriate questions to help determine the cause of the fault. The fault diagnosis and repair tasks followed a methodical order.

Although the candidate worked independently throughout the task, they needed to be prompted on occasions to remind them of certain critical points. When prompted, the candidate was able to recall the information and then perform to an acceptable standard with some care given to customer's premises.

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