T Level Technical Qualification in Engineering and Manufacturing – Maintenance, Installation and Repair

8712-313 Electrical & Electronic

Grade standard exemplification material

Pass - summer 2024

Version 1-0

Version and date	Change detail	Section	Question
v1-0 Oct 2024			

Contents

Introduction

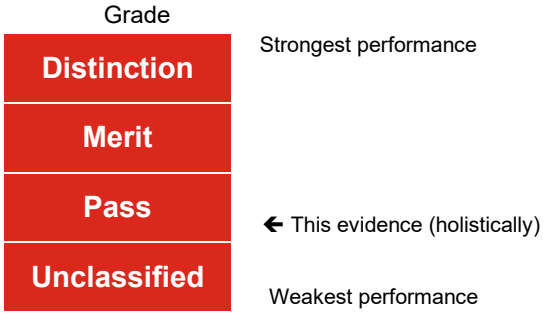
Summer 2024 Results

This document is aimed at providers and learners to help understand the standard that was required in the summer 2024 assessment series to achieve a pass grade for the 8712-313 Maintenance, Installation and Repair in Electrical & Electronic engineering Occupational Specialism (OS).

The grade standard exemplification evidence (Grade SEM) provided for the pass grade displays the holistic standard required across the tasks to achieve the pass grade boundary in the summer 2024 series.

The aim of these materials is to provide examples of knowledge, skills and understanding that attested to **five marks above** pass standard (threshold competence) in summer 2024. 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.

The Occupational Specialism is graded Distinction, Merit, Pass or Unclassified.



The pass grade boundary is based on a synoptic mark across all tasks. The materials in this Grade SEM are separated into two sections as described below. Materials are presented against a number of tasks from the assignment.

Tasks

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 photograph/video evidence. Candidate evidence that was or was not included in this Grade SEM has also been identified within this section.

In this Grade SEM there is candidate evidence from:

Task 1 Plan and prepare for the maintenance activities
Task 2 Perform and record the maintenance activities
Task 3A Review and report the maintenance activities
Task 3B Peer review
Task 4 Complete handover

Candidate evidence

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

The Occupational Specialism brief and tasks can be downloaded from here.

Important things to note:

- We discussed the approach to standard setting/maintaining with Ofqual and the other awarding organisations before awarding this year. We have agreed to take account of the newness of qualifications in how we award this year to recognise that students and teachers are less familiar with the assessments (grading-arrangements-for-vtqsand-technical-qualifications-within-t-levels-in-the-academic-year-2023-to-2024), whilst also recognising the standards required for these qualifications.

- The evidence presented, as a whole, was **five marks** above the pass grade. However, performance across the tasks may vary (i.e. some tasks completed to a higher/lower standard than pass grade).

Grade descriptors

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

Interpret technical information, plan, assess risk and follow safe working methods appropriately when applying practical skills to an acceptable standard to satisfy the requirements of the brief.

Adequately prepare working areas to allow safe working, acknowledging potential risks and applying acceptable housekeeping techniques during tasks.

Demonstrate basic technical skills for diagnosing components, assemblies and sub-assemblies to complete maintenance, installation and repair activities in line with the requirements of the brief.

Demonstrate adequate skills using tools and equipment for electrical and electronic maintenance, installation and repair, ensuring safe isolation, removal and replacement of components.

Demonstrate basic knowledge and understanding of the principles and processes required for disassembly, repair, configuration and re-assembly of electrical and electronic systems, ensuring that most tolerances and calibrations are in-line with specification.

Work safely showing an understanding and suitable level of awareness in the preparation and application of processes, selection and use of tools, equipment, materials and components for maintenance, installation and repair activities.

Mostly use industry and technical terminology accurately across different communication methods with some consideration of technical and non-technical audiences.

Task 1 Plan and prepare for the maintenance activities

Assessment number (eg 1234-033)	8712-313
Assessment title	Electrical and Electronic Occupational Specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	1
Evidence title / description	List of requirements and resources, including justifications for the selections Risk Assessment
Date submitted by candidate	DD/MM/YY

Task 1

Assessment themes:

- Health and safety
- Planning and preparation
- Systems and components

You must analyse the brief and technical information about the system provided and then:

- create a list of the requirements and resources needed to carry out the maintenance activities, justifying your selections. This should include:
    - all necessary technical information to confirm the type, scope and requirements of the activity
    - tools and equipment
    - materials, components and consumables
    - wastage and disposal requirements
    - time needed to carry out the activity
    - fault diagnosis techniques to be used
    - any access requirements
- produce and complete a risk assessment
- produce a method statement.

Additional evidence of your performance that must be captured for marking:
none.

Candidate evidence

Task 1 - List of requirements and resources

Tools and Equipment:

For the experiment it is required to have a multi meter because its very important for finding and faults and short circuits and long circuits within your system and circuit.
It would save a lot of time to do so rather than manually going ahead and looking at every component on the circuit to then find the issue after possibly wasting money, as well as sometimes you have gone ahead and buy all new products and fit them all to replace the correct component that's either been tripping or is damage. Rather than going along with trial and error you'd find the issue within your circuit in no time as long as you have a multi-meter and as long as you use it correctly. It can find short circuits and long circuits and has customizable tolerances. Along with the multi-meter there are positive and negative wires which are used to place onto your circuit to emit your reading onto the multi-meter.
You can purchase a basic multi-meter for around £5-£20, however if you look at some of the high-end multi-meters on the markets you could look at spending a bit of a price as some can go for £40,000 to £50,000 however disregarding the price the multi-meter is a safe tool and doesn't hold any dangers or hazards.

With the multi-meter you will need a soldering iron for this system and a soldering iron is used to replace components within your circuit. You can find some around the price of £15 unless you want a more specific professional one which you can pay the price for.
However, unlike the multi-meter, the soldering iron can be dangers and can go to temperatures up to 200 to 480 degrees Celsius. Knowing these soldering irons have and been known to cause severe burns and set things alight. To avoid this, you must keep the soldering irons in its stand when not in use and to wear Personal protective equipment (PPE) such as gloves and glasses as it can burn and emit toxic steams and gas when melting components and sticking them on.

As well as soldering irons you will need a residual current device (RCD) to prevent electrocutions as for working with broken circuits. They cost approximately £10-£15 and once again doesn't have any safety concerns as it is used to find the issues as it turns off the electricity when there's a fault.

Materials components and consumables:

What you will need to carry out this maintenance activity is materials such as wires, tools which I've already spoke about, necessary components that may need replacing such as LEDs and resistors and solder.

Wastage and disposal requirements:

A lot of waste might come from this maintenance process, waste such as faulty components, excess wires, etc. With the WEEE regulation, old electrical components and items need be reused or recycled to ensure no waste and harm is being fed to the environment. This means any waste product that may come from this maintenance activity will be stored correctly and safely and then disposed of or recycled safely and securely without harming the environment.

Time needed to carry out the activity:

The time needed to carry out the activity will be 11 hours, as that is enough time to put on PPE, and then asses the circuit and the situation, carry out tests to find the problem, change any components that may need changing and then finish up and clear up waste.

Fault diagnosis techniques to be used:

You must look at the system and analyse, test the circuit and flow, test the temperatures of the wires, and change what might need changing.
Common faults that may need diagnosing:
Short-circuits in a circuit. This happens when there is a leakage and current is going somewhere else this should be resulting in components not functioning.
Open circuit in a circuit. This happens when this is no flow going from the circuit from one end to the other.

Wastage and disposal requirements:

All disposal should be recycled as it keeps planet healthy

Task 1 – Risk Assessment

hazard	Person at risk	Risk	Control measures
Electricity	me and colleagues	Severe burns electric shock even death.	Be careful from charged capacitors and be weary of cutting wires, make sure to de charge capacitors.
Sharp tools	me and colleagues	Sharp tools can cause cuts and wounds which may be prone to infection.	Wear necessary protective clothing, and be weary of the sharp tools
Soldering iron	me and colleagues	Using a soldering iron makes you more in the danger for burns and fires.	Be cautious and careful when touching the soldering iron and where to place it.
Hazards objects	me and colleagues	Wet surfaces	Keep look out of your whereabouts and your walking area so you don’t slip or fall over.

Task 2 Perform and record the maintenance activities

Assessment number (eg 1234-033)	8712-313
Assessment title	Electrical and Electronic Occupational Specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	2
Evidence title / description	Completed test record sheets Updated maintenance schedule and records Assessor observation (Practical Observation Form) Photographic evidence
Date submitted by candidate	DD/MM/YY

Task 2

Assessment themes:

- Health and Safety
- Planning and preparation
- Systems and components
- Working with faults
- Reviewing and reporting

You must:

- prepare the work area for the maintenance activities
- perform the maintenance activities in accordance with the method statement and planning documents produced in Task 1. This should include:
  - decommissioning and inspection of the system
  - disassembly and reassembly of the system
  - diagnosing and recording faults within the system, including carrying out appropriate tests
  - repairing the faults and replacing components as required
  - safely using the appropriate tools and equipment
  - recommissioning of the system
  - re-instating the work area
- record the maintenance activities, to include:
  - producing and completing test record sheets
  - updating the maintenance records and control documents
  - annotating the method statement, including any recommendations for further investigation if required.

Additional evidence of your performance that must be captured for marking:
none.

Candidate evidence

Task 2 - Test records

Symptoms Observed

Equipment under test: PIR Lighting circuit **PSU make**: SCE2.02 **Number of system:** 4 **Model**: 12V DC S/N: 004		
Tests applied	**Results**	**Conclusions**
Tested the system, waved my hand over the internal sensor	Both front door light and corridor light come on	
Then waved my hand over external sensor	No light came on so theres a fault with the external flood light.	Theres a fault with the external flood light
Measured the voltage around the circuit using a multimeter. Tested the external flood LED	Found a location within the system where no voltage is flowing The LED was not damaged.	So LED wasn't lighting up However the LED wasn't damage and was fine when tested with the multimeter. So problem was with the circuit which turned out to be open circuited.
I then rectified the system by making changes to wires as the issue was that it was an open circuit	After wires were changed circuit worked fine.	The wires were changed and the system worked as expected.
	Faulty Component/ Part: External flood light/ opened circuit	

Equipment under test: PIR Lighting circuit **PSU make**: SCE2.02 **Number of system:** 5 **Model**: 12V DC S/N: 005		
Tests applied	**Results**	**Conclusions**
Tested the whole system by waving my hand in front of the sensors.	Internal front door light and corridor light worked fine.	The lights were timed well and working fine.
Waved my hand over the external sensors.	Flood light didn't turn on.	The flood light isn't working so there's an issue with LED.
Tested around the circuit, there was no light turning on when testing LED. Tested LED separately and LED was faulty possibly blown.	LED was faulty most likely blown.	The issue here was that the flood light wasn't working, after doing tests waving my hand and testing LED, turns out the LED was the fault and it was blown or somewhat damaged.
I rectified the system after diagnosing the fault. I replaced the flood light LED with a working one.	The LED and circuit worked perfectly fine.	After changing the flood light LED it worked and the fault was solved.
	Faulty Component/ Part: Flood Light	

Equipment under test: PIR Lighting circuit **PSU make**: SCE2.02		

Number of system: 6 **Model**: 12V DC S/N: 006		
Tests applied	**Results**	**Conclusions**
Waved my arm over both sensors to see if the system works fine.	Only the external flood light and corridor light work.	In conclusion to this as the internal sensor was triggered only the internal front door light wasn't working.
I took the multimeter around and was measuring the voltage around the circuit and testing the lights (LEDs).	Turns out the internal front door light wasn't working and it didn't work when tested.	The internal front door light was blown.
I rectified the faulty LED as I asked for a new LED from the technician and replaced it.	The new internal front door light works after replacing it with a new one.	After replacing the LED it then worked afterwards and the system and circuit was fixed.
	Faulty Component/ Part: Internal front door light	
Equipment under test: PIR Lighting circuit **PSU make**: RS **DMM MAKE**: Rapid **Number of system:** 1 **Model**: Three Rail PSU 3180 S/N: 654-455		
Tests applied	**Results**	**Conclusions**
I started off by trying to make the sensors trip however they didn't. The power supply was off so I turned it on but it	The whole system turned off. Didn't work.	There is an issue with the PSU (power supply unit).

automatically turned off again. The light on the power supply turned off. After acknowledging the issue I rectified the power supply until but replacing it with a new one. I also tested the plugs earth and live pins on the new and old plug. In the end I waved my hand over the sensors and the both triggered correctly and all lights showed up for its correct time.	RCD was tripping so it didn't allow the system to work. After replacing the power supply, the circuit then worked. When checking the reading on the multimeter there was no reading with the faulty power supply unit.	The RCD picked up on a leakage of resistance which made the power trip The problem was with the power supply unit after changing it, it then worked. Readings on the multimeter wer not shown after testing the earth and live pins of the faulty plug however they did show up when testing the new power supplys pins.
	Faulty Component/ Part: PSU Unit	

Task 2 – Updated maintenance schedule and records

Maintenance Schedule and Records

Equipment/System type	Identification No.
Security lighting system	8712-313
Brand/Model	**Location**
City & Guilds	Workshop

Equipment/System specification
• The residual current device (RCD) should protect the system from any electrical issues. • The AC/DC convertor converts 230 V AC to 12 V DC • The external passive infrared sensor (PIR) should switch on the external LED of the building if it detects movement up to a maximum of a 10-metre range. • External LED should be on for a minimum of 20 seconds after movement was last detected. • The internal PIR should switch internal front door and corridor LED lights on if movement is detected in the building and then go off after 10 seconds once movement has stopped.

Maintenance records

Service No	Maintenance date	Maintenance type (scheduled/routine, fault/repair,)	Checked by	Repair details (where relevant)	Maintenance Engineer - signature
01	20/4/2022	routine/scheduled	JS	No faults or repairs required. System functionality as per specification	J Smith

02	28/5/2023	routine/scheduled + fault/repair	AB	Two faults found; • Replaced external motion sensor as intermittently working, system functionality as per specification after replacement component installed. **Noted** water penetrated external motion sensor. • Replaced loose wiring to RCD output	A Bloggs
03	23rd + 24th April 2024	routine/ scheduled + fault / repair		• Faulty flood light, rectified it and replaced it • Faulty internal front door lights changed LED • Faulty PSU unit. Replaced it with a new one • Faulty flood light, rectified it by changing wires not LED. 4 faults found all rectified	
04					
05					
06					

Maintenance Schedule – annual unless specified otherwise

Service No	Year	Detail inspection	Recommended planned maintenance	Maintenance Head Engineer signature	Maintenance Engineer signature
01	2022	Annual	Annual - routine/scheduled	D Jones	J Smith
02	2023	Annual	Annual - routine/scheduled	D Jones	A Bloggs
03	2024	Annual	Annual - routine/scheduled	D Jones	
04	2025	Annual	Annual – Routines/ scheduled		
05					

06					

Commentary	
Service No	Recommendations for future maintenance activity
01	Check Calibration and functionality of PIR Sensor.

Task 2 – Practical Observation Form

8712-313 Maintenance Engineering Technologies: Electrical and Electronic - Summer 2024

Candidate Name	Candidate number
Provider name	**Date**
	03/05/2024

Complete the table below referring to the relevant marking grid, found in the assessment pack.

Do not allocate marks at this stage.

This observation must cover	Assessor observation should include:	Assessment Themes
Work area preparation	• The work area preparation.	• Health and Safety • Planning and Preparation • Systems and Components
Maintenance activities	• Decommissioning and inspection of the system. • Disassembly and reassembly of the system. • Diagnosing faults within the system, including carrying out appropriate tests. • Repairing the faults and replacing components as required. • Using appropriate tools and equipment. • Recommissioning of the system. • Re-instating the work area.	• Health and Safety • Planning and Preparation • Systems and Components

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.*

Work area preparation:

Candidate gathered their instruments (Digital multi meter, stopwatch, power supply) also there PPE listed in the resource pack. All necessary documents were within easy reach such as wiring diagrams, data sheets timing settings. Risk assessments for the lab were clearly in view. Barriers were placed between candidates to prevent false triggering of the PIR system during testing and calibration of the system. Candidate was given four fault report sheets and a spare black pen.

Maintenance activities:

- Decommissioning and inspection of the system
- Disassembly and reassembly of the system
- Diagnosing faults within the system, including carrying out appropriate tests
- Repairing the faults and replacing components as required
- Using appropriate tools and equipment
- Recommissioning of the system
- Re-instating the work area.

- **Decommissioning and inspection of the system**

  Candidate checked that all the components for the system were in place such as the PIRS the Leds etc he then checked the operation of the RCD by pressing the test button and he had the correct PPE whilst inspecting the system.

- **Disassembly and reassembly of the system**

  Candidate dissembled the system in accordance with his repair method using the correct tools, PPE and instruments.

- **Diagnosing faults within the system, including carrying out appropriate tests**

Candidate complied his test reports carrying out appropriate tests to find the failure within the system using logical thought processes using the correct tools and instruments.

- **Repairing the faults and replacing components as required**

Once Candidate found the faulty part with the system this he asked the technician for the

new part which was replaced.

- **Using appropriate tools and equipment.**

Candidate used appropriate tools and equipment at all times whilst carrying out the repair process

- **Recommissioning of the system.**

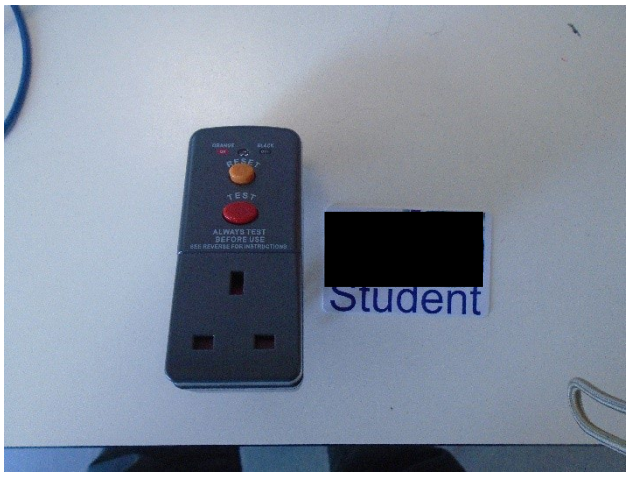
After the repair was completed candidate commissioned the system by using a stopwatch and setting the external PIR light to just over 20 seconds and the internal PIR to 10 seconds.

- **Re-instating the work area.**

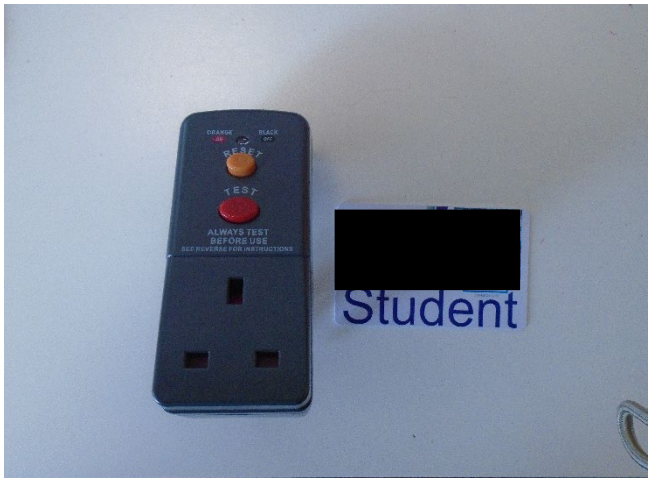
Candidate placed all tools and instruments away and tidied up his work area placed the meter leads in its bag.

Internal assessor signature	Date

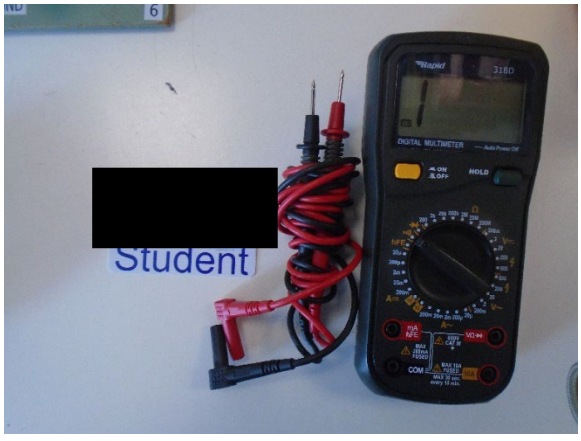
Task 2 – Photographic Evidence



Risk mitigations or control measures the candidate has put in place to maintain health and safety (**HS**)

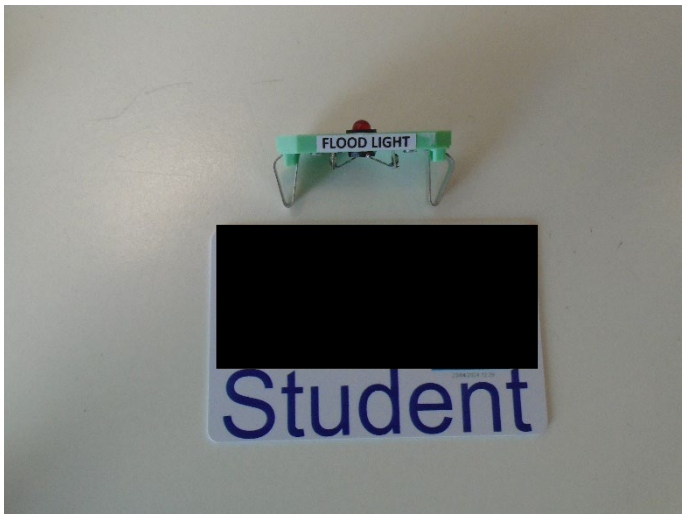


Safe isolation procedures whilst wearing the correct PPE (**HS**)

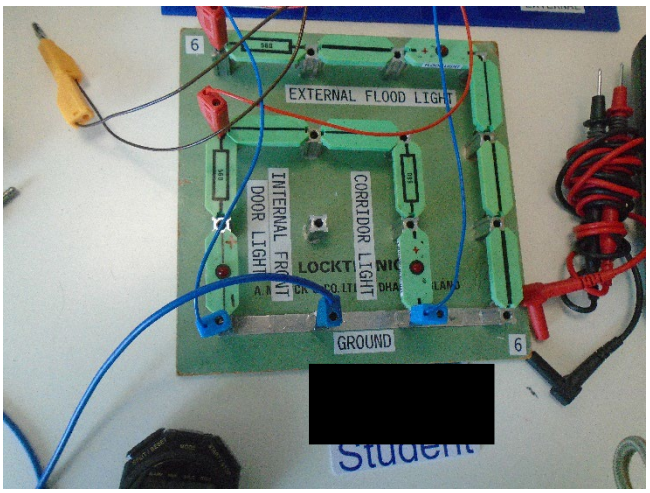


The candidate checking the correctly selected tools and equipment for service and repair activities (**PP**)

The candidate calibrating any tools and equipment (**PP**)

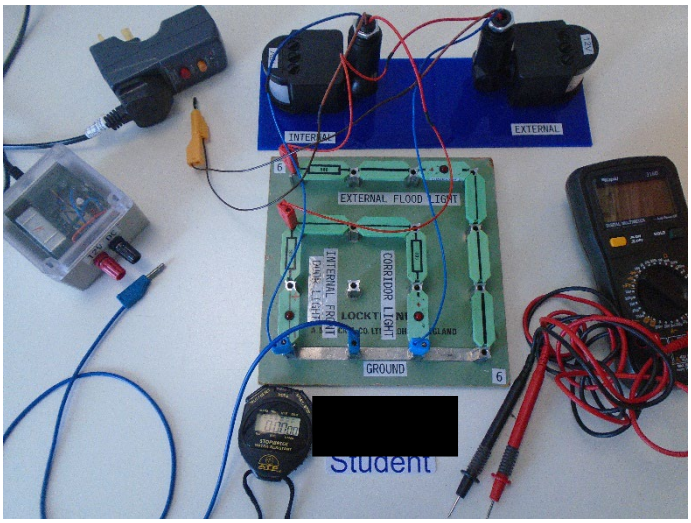


Faulty components and a clear cause of each fault e.g. loose wiring (**WWF**)

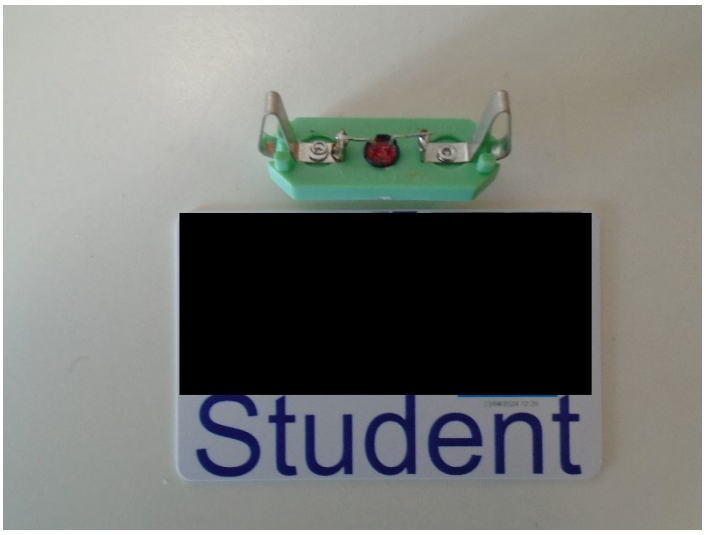


The candidate has maintained a safe work environment during their maintenance task (**HS**)

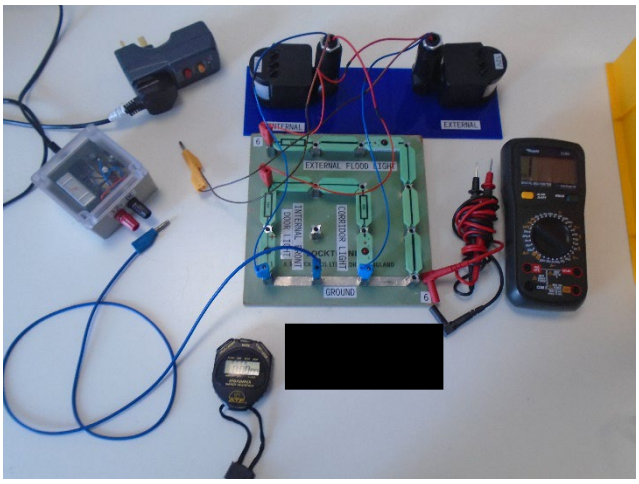
Calibration/tolerance values are within operational specification ensuring system functionality (**WWF**



The candidate has correctly reassembled the system/components (**SC**) e.g. polarised components
the correct way around, clearly marked, screw connections tightened, matching crimps and wires,
no exposed wiring or connections, insulated, colour coding.



The quality of repairs e.g. soldered joints (**WWF**)



The condition of the work area after the maintenance activity has been completed (**HS, SC**)

The return of tools and equipment to the correct storage area and waste disposed of correctly (**HS, SC**).

Task 3A Review and report the maintenance activities

Assessment number (eg 1234-033)	8712-313
Assessment title	Electrical and Electronic Occupational specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	3A
Evidence title / description	A technical report
Date submitted by candidate	DD/MM/YY

Task 3A

Assessment themes:

- Health and safety
- Systems and components
- Reviewing and reporting

You must:

- produce a technical report for the supervisor. This should typically be 850 words and include:
    - a review of the maintenance activities, including fault diagnosis/detection techniques and suggestions for future improvements
    - the faults found and how they were rectified
    - any outstanding faults, including recommendations that may require attention before the next planned maintenance activity according to the current maintenance schedule
    - reporting of stock levels and waste disposal
- produce a revised maintenance schedule from your activities and findings, this must include:
    - recommendations for future planned maintenance, including justifications
    - due date of next maintenance activity.

Additional evidence of your performance that must be captured for marking:
none

Candidate evidence

Task 3a – Technical report

Introduction:

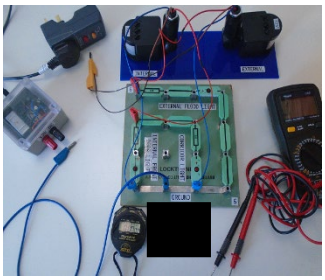
I made sure I have the correct PPE to keep me safe then I started by inspecting the entire LED circuit system visually. I also checked for any physical damages like broken components, loose connections, or signs of overheating. I then ensured that the circuit is properly grounded and that there are no exposed wires or connectors.

Then after that I tested the functionality of the LEDs by powering on the circuit and watching their performance. I checked if all LEDs are lighting up as expected and if there are any flickering or dimming issues. I then used a multimeter to measure voltage and current across the circuit components to ensure they are within the specified range.

I Inspected individual components such as resistors, LEDs, wires and PIR sensors for any signs of damage or wear. After that I had to verify the connections of these components on the circuit board and re-soldered any loose connections where I had to. I documented all maintenance activities performed, including observations, tests conducted, components replaced or repaired, and any adjustments made to the circuit.

I would suggest preventive maintenance measures such as regular inspections, cleaning, and component checks to prolong the lifespan of the circuit.

However, I did come across some issues and faults within the circuit.

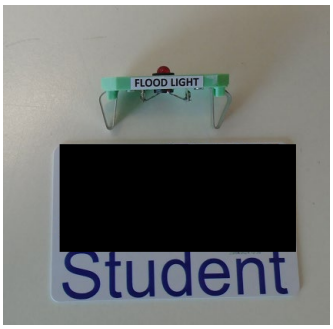


Faults I came across: System 4

After turning on and observing the circuit and testing the sensors by creating motion, the PIR lighting system was faulty. System number 4 wasn't functioning properly as the external flood light wasn't turning on as supposed to however both the front door light and the corridor light were working as supposed to. After carrying tests and using my multimeter around the circuit the LED turned out to be fine and there was no fault with the LED itself.

It wasn't blown or anything so I knew the problem wasn't with the LED. Turns out there was a fault with the wiring as when I tested the system there was a location within the system where no voltage was flowing through it which made me come to the conclusion that it was open circuited.

For me to rectify the fault here I had to replace wiring and after the wires on the circuit were changed the system worked as expected. With the old faulty wiring it was disposed off in a safe manner where it would end up being either recycled or repaired and reused.

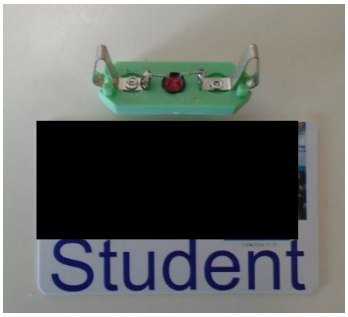


Faults I came across: System 5

After turning on and visually inspecting the entire PIR lighting system for system 5, the visible fault was that the external flood light wasn't working once again, however after running the multimeter around the circuit again and over the LEDs, turns out there was no open circuit and voltage flowed smoothly through the system.

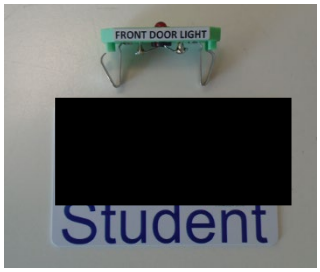
After testing the specific external flood light LED again separately I came to the conclusion that the LED was faulty and it was most certainly blown.

This made me quickly make the decision to rectify the system by replacing the singular LED. After replacing the LED and running my tests again with the multimeter and by waving my hand over the sensors the external flood light worked and the whole PIR lighting system was working perfectly. I got rid of the old faulty LED for it to either be led on to get repaired or recycled as electrical components can be harmful to the environment and may take a very long time to decompose.



Faults I came across: System 6

Once again, I began by turning on the system and visually inspecting and waving my hands around the sensors. The sensors were calibrated correctly as I timed them with a stopwatch and they stayed on for the correct amount of time and all lights apart from one worked. The external flood light and corridor light worked fine but the internal front door light wasn't working.



I retested the whole circuit however I then measured around the circuit with a multimeter to find if there was an open circuit somewhere or something but there wasn't and the flow of voltage was fine. However, I tested the internal front door light LED and once again based on my judgment the LED was blown. So once again I rectified the fault by replacing the old internal front door LED and after asking the technician for a new LED, the system worked fine and as intended after replacing it.

Faults I came across: System 1

After turning on the system, I came to an abrupt stop, as the system would not stay on. It would turn on when I pressed reset on the RCD for a split second then turn completely back off. This reaction made me look straight at the PSU (Power Supply Unit). As every time I turned on the PSU it just automatically turned off. I came to the conclusion that the RCD (residual current device) was tripping as the PSU was faulty. The reason the RCD was tripping the system off was because the RCD was picking up on a leakage of resistance that was coming from the PSU.

I knew it was the PSU because it was connected to the RCD and that's what was making it trip and even to confirm I tested the PSUs plug pins. The problem was with the power supply unit after changing it the whole system then worked. Readings on the multimeter were not shown after testing the earth and live pins of the faulty plug however they did show up when testing the new power supply units plug pins. After acknowledging the fault, I rectified the system by replacing the whole Power Supply Unit with a new and working one and after that the whole PIR system was working perfectly fine, and the sensors were well calibrated as well as I timed them with the stopwatch.

Stock levels and waste disposal and future maintenance:

Regarding stock there was a limited number of LEDs so for future maintenance there should be enough replacement components such as LEDs and resistors, wires and most importantly PIR sensors for rectifications. Regarding next maintenance date, I recommend that it is every month, to ensure PIRS aren't covered or damaged from the elements of weather as well as the rest of the components. Once a month is perfect as it isn't too long and isn't too short of timing. Regarding disposal since the WEEE regulation is in place which ensures no waste and harm come from old electrical components.

The regulation ensures that electrical components are either reused or recycled. This means any waste product that came from this maintenance activity will be stored correctly and safely and then disposed of or recycled safely and securely without harming the environment. On top of that organisation is important, so I made sure all the tools used during the maintenance were put back in a safe manner and away.

Step by step summary of maintenance order

1 **Initial Assessment:**

- I visually inspected the entire PIR lighting circuit for any physical damages, loose connections, or signs of wear.
- I checked if the PIR sensor is positioned correctly and has a clear way of sight to detect motion effectively.
- I then ensured that the wiring is properly insulated and secured to prevent short circuits or electrical dangers.

2 **Functional Testing:**

- I tested the functionality of the PIR sensor by triggering it with movement and watching the response of the lighting system.
- I then checked if the lights turn on and off smoothly based on the detected motion.
- I verified that the sensitivity and duration settings of the PIR sensor are correct and calibrated correctly.
-

3 **Component Check:**

- I Inspected individual components such as the PIR sensor for any signs of malfunction or damage.
- I then tested the continuity and resistance of electrical connections using a multimeter to identify any faulty components such as the LEDs or wiring which was the case for system 4.
- I also cleaned the PIR sensor lens and ensure it is free from anything blocking it or dirt that could affect its performance.
-

4 **Power Supply and Voltage Check:**

- I Measured the voltage levels across the circuit components to ensure they are within the specified range.
- I also checked the power supply unit (PSU) and replaced it if necessary to maintain proper operation such as system 1.

5 **Documentation and Reporting:**

- I documented all maintenance activities performed, including tests that I made, components checked or replaced, adjustments made, and any issues encountered.
- I also kept a record of the maintenance schedule and noted any recurring problems that may require further attention or upgrades.

6 **Recommendations for Improvement:**

- Preventive maintenance measures such as regular sensor calibration, cleaning, and regular inspections to ensure continued functionality on the systems.

Task 3B Peer review

Assessment number (eg 1234-033)	8712-313
Assessment title	Electrical and Electronic Occupational specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	3B
Evidence title / description	No evidence provided
Date submitted by candidate	DD/MM/YY

Task 3B

Assessment themes:

- Reviewing and reporting

You must:

- carry out a peer review on two annotated method statements provided by the assessor. You must consider the following:
    - *how well does the method statement enable planned maintenance activities to be performed and recorded?*
    - *how appropriate is the method statement and why?*
    - *what are the implications to the business of the proposed method statement?*
    - *how could the method statement be optimised/ improved?*
- write up feedback for each of the annotated method statements produced by other candidates on separate peer review forms
- update your own annotated method statement following feedback from the peer review. Any updates need to include justifications for these changes and any changes not made will be reviewed in the handover.

Additional evidence of your performance that must be captured for marking:

none

Task 4 Complete Handover

Assessment number (eg 1234-033)	8712-313
Assessment title	Electrical and Electronic Occupational specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	4
Evidence title / description	Assessor observation
Date submitted by candidate	DD/MM/YY

Task 4

Assessment themes:

- Health and safety
- Reviewing and reporting

You must now hold a meeting with the client to return to service and complete handover procedures, including:

- demonstration of system functionality
- confirmation of work completed
- amended method statement and how they addressed peer review feedback, including any suggested changes that were not made and why
- appropriate handover documentation.

Additional evidence of your performance that must be captured for marking:

none

Candidate Evidence

Task 4 – Assessor observation

8712-313 Maintenance Engineering Technologies: Electrical and Electronic - Summer 2024

Candidate Name	Candidate number
Provider name	**Date**
	08/05/2024

Complete the table below referring to the relevant marking grid, found in the assessment pack.

Do not allocate marks at this stage.

This observation must cover	Assessor observation should include:	Assessment Themes
Handover	• the handover of the work completed.	• Health and Safety • Reviewing and Reporting

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 Candidate introduced himself then started by mentioning the PPE and safety used such as safe use of the RCD using a armlet and a antistatic mat. Candidate did not mention he was not wearing nylon. His explanation of how the RCD worked was not technical and was very vague. Candidate did not explain fully what the function of the system and he then straight into the fault-finding, he showed a key document (test report) but not really explaining what the document was and its importance. He did not show the wiring diagram for the system. Candidate also mentioned making note of the serial number of test instruments for trace ability reasons. Candidate then asked for another PSU he then changed and got the circuit working and demonstrated the system, and provided a brief functional walk through of the system in operation. Technical terminology was used but was limited. Candidate checked resistance from live to earth using the DMM and found a resistance, but was vague on what that meant. Candidate did not commission the system by calibrating the timing of the PIRS external 20 seconds/internal10 seconds. Overall, the handover was adequate, but could have benefited from more attention to detail and thorough explanation when talking about the documents and potential future issues with the system.

Internal assessor signature	**Date**

Get in touch

The City & Guilds Quality team are here to answer any queries you may have regarding your T Level Technical Qualification delivery.

Should you require assistance, please contact us using the details below:

Monday - Friday | 08:30 - 17:00 GMT

T: 0300 303 53 52

E: **technicals.quality@cityandguilds.com**

W: **http://www.cityandguilds.com/tlevels**

Web chat available **here**.