

T Level Technical Qualification in Building Services Engineering for Construction

# 8710-353 Electrotechnical Engineering

Grade standard exemplification material Pass - Summer 2024







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

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### Introduction

#### Summer 2024 Results

This document is aimed at providers and candidates to help understand the standard that was required in the summer 2024 assessment series to achieve a pass grade for the 8710-353 Electrotechnical 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 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.

#### 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 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 Task 2 Task 3

#### **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:

8710-353 electrotechnical engineering Summer24 v1-0

#### 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 candidates 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 sufficient to achieve 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:

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 Electrotechnical 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 locate and rectify them.

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

## Task 1 – Planning the installation

Assessment number (eg 1234-033)	8710-353
Assessment title	Electrotechnical Engineering Occupational Specialism
Candidate name	<first name=""> <surname></surname></first>
City & Guilds candidate No.	ABC1234
Provider name	<provider name=""></provider>
City & Guilds provider No.	999999a

Task(s)	1
Evidence title / description	<ul> <li>Completed design grid showing calculations</li> <li>Completed assessment of general characteristics form</li> <li>Completed earth fault loop impedance schedule</li> <li>Completed materials take-off sheet</li> </ul>
Date submitted by candidate	DD/MM/YY

## Task

#### Assessment themes:

- Health and safety
- Design and planning
  - o **Documentation**
  - Technical information
- Reports and information
- a) Complete the design grid in **Figure 3**. Any assumptions made in order to complete the design must be listed on a separate sheet with justifications.
- b) Complete the assessment of general characteristics form in **Figure 4**, detailing what requires an assessment for this installation.
- c) Complete the earth fault loop impedance schedule in **Figure 5** based on the design drawings in **Figures 1** and **2**, and the installation design schedule in **Figure 3**.
- d) Complete the material take off sheet in Figure 6 based on the installation drawings in Figures 1 and 2 and your design grid Figure 3.

#### What the candidate must produce for marking:

- Completed design grid (Figure 3) showing calculations
- Completed assessment of general characteristics form (Figure 4)
- Completed earth fault loop impedance schedule (Figure 5)
- Completed materials take-off sheet (Figure 6)

#### Additional evidence of candidate performance that must be captured for marking:

• Tutor/assessor's notes of the candidates referencing and research describing the methods used to reference or research information and how information was used or processed.

## Candidate evidence

#### **Completed Design Grid**

Consumer u work VOLTAGE COMPLY W	nit located in shop DROP TO ITH BS 7671	Nominal Volta	ge (U/Uo) 230 /	Earthing Arrangement TN-C- S		External Earth Fault Loop Impedance (Ζ <sub>e</sub> ) 0.11 Ω		
Circuit	1	2	3	4	5	6	7	
Description	Ring-final sockets West side of building	Ring-final sockets East side of building	Radial-final FCU for roller door motors 1 and 2 (west & centre)	Radial-final FCU for roller door motor 3 (East)	Air Compressor supply (to be located outdoors)	Lighting North side Iuminaire	Lighting South side Iuminaires	
No. outlets	5	5	2	1	1	5	7	
Type of wiring	70 <sup>o</sup> C thermoplastic single-core non-sheathed	70 <sup>o</sup> C thermoplastic single-core non- sheathed	70 <sup>o</sup> C thermoplastic single-core non- sheathed	70 <sup>o</sup> C thermoplastic single-core non- sheathed	90 <sup>o</sup> C thermosetting multi-core SWA	70 <sup>0</sup> C thermoplastic single-core non- sheathed	70 <sup>o</sup> C thermoplastic single-core non- sheathed	
Design Current (I <sub>b</sub> )	20 A	20 A	12 A	6 A	12 A	2.36 A	2.93 A	

Type and Nominal rating (I <sub>n</sub> )	32 A B	32 A B	16 A C	16 A C	16 A C	6 A C	6 A C	
Length (metres)	35 m loop	14.5 m loop	5.5 m	16 m	29 m	11.5 m	19.7 m	
Installation method	В	В	В	В	С	В	В	
Ambient temperature °C	25 °C	25 °C	25 °C	25 °C	30 °C	30 °C	30 °C	
Rating Factor Ambient air temp. C <sub>a</sub>	1.03	1.03	1.03	1.03	1	1	1	
Total circuits in group	2	2	2	2	1	1	1	

Rating factor	1	1	0.8	0.8	1	1	1	
grouping C <sub>g</sub>								
Minimum current	31.06	31.06	19.4	19.4	16	6	6	
capacity ( <l<sub>t)</l<sub>								
mV/A/m	18	18	18	18	16	6	6	
Actual Voltage	12.6	5.22	1.188	1.728	5.568	0.78	1.67	
drop								
Minimum conductor	2.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>					
csa mm²								

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$$\frac{VO14ag = drap}{(mV/A/m) \times I_{b} \times L}$$

$$\frac{IOOO}{I.18 \times 20 \times 35} = 12.6$$

$$\frac{1000}{I000} = 1.2.6$$

$$\frac{18 \times 20 \times 14.5}{I000} = 5.22$$

$$\frac{18 \times 12 \times 5.5}{I000} = 1.188$$

$$\frac{18 \times 6 \times 16}{I000} = 1.725$$

$$5.16 \times 12 \times 29 = 5.568$$

$$6.29 \times 2.36 \times 11.5 = 0.78$$

$$7.29 \times 2.93 \times 19.7 = 1.67$$

#### Completed assessment of general characteristics

Make an assessment of all impacts on the installation as detailed in Chapters 31 – 36 of BS 7671.

No.	What has an impact on the installation	Any relevant regulation number and/or code number from Appendix 5	Actions required due to the impact identified
eg. 1	Impact damage to wiring system and enclosures	Chapter 32 Code AG3	Use metallic wiring systems to protect cables and metal-clad socket- outlets and switches.
1.	Water damage to air compressor supply (SWA)	Chapter 32 Code AD2	IPX1 or IPX2 installation
2.	Damage to external luminaires from water	Chapter 32	IPX4 installation

		Code AD4	
3.	Exposed conductive parts	Chapter 31	All exposed parts are connected to PEN conductor
4.	Install being in one circuit	Chapter 31 314.1	Every install should be divided into circuits to avoid danger, reduce unwanted tripping
5.	Wrongly installed wiring	Chapter 36 361.1	All wiring must be checked for continuity before handover

6.	No fire systems	Chapter 35	Fire systems must be installed as its statutory and will be frequently regulated
7.	Lack of earths	Chapter 33 331	Earths must be connected to ensure safety from unwanted shocks

Circuit	Protective device	Circuit length	R <sub>1</sub> +R <sub>2</sub> at operating temperatures	Zs	Maximum permitted Z <sub>s</sub> (BS7671)	Calculations/comments
1. Ring final circuit West side socket- outlets	32 A B Type BS EN 61009	35 m loop	14.82	15.92	1.1	$Zs = Z_e + (R_1 + R_2)$ $Z_e = 0.11$ 14.82 + 1.1 = 15.92
4. Radial- final door supply FCU	16 A C Type BS EN 61009	16 m	14.82	14.91	1.09	14.82 + 1.09 14.91

#### Completed Earth Fault Loop Impedance Schedule

Symbol	Description	Quantity
	Gongumer unit 1.5 M above FF1.	1
$\square$	120 W Hi-bay LED luminaire	8
	Fused switch (rating given)	5
OM	Multi-gang light switch	1

**Completed Materials Take off Sheet** (relating to Figures 1, 2 and 3)

aft.	2-gang 13 A switched socket outlet	10
-	1-gang 13 A switched FCU for door motor supplies (allow 6A per unit)	3
X	65 W LED outdoor flood light luminaire	4

## Practical Observation (PO) Form (Task 1)

8710-33 T Level Technical Qualification in Building Services Engineering for Construction

#### 8710-353 Electrotechnical Engineering (Summer 2024)

Candidate name	<first name=""> <surname></surname></first>
City & Guilds candidate No.	ABC1234
Date	DD/MM/YY
Provider name	<provider name=""></provider>
City & Guilds Provider No.	999999a

#### Task 1 assessment themes:

- Health and safety
- Design and planning
  - o Documentation
  - Technical information
- Reports and information

Record observation notes below to inform internal marking and external moderation. Notes must be detailed, accurate and differentiating which use terminology from the mark grid along with specific examples observed. Notes must identify areas of strength and weakness, distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.

Assessment Themes	Assessor observation notes
Health and safety (Related to planning the installation)	Health and safety is followed during preparation and throughout tasks and all work completed safely. Risks and hazards that occur during the tasks are correctly mitigated against as they arise.

Design and planning (use of documentation)	General planning and design work to a good standard with good links between drawing and practical situations. Documentation is generally acceptable over most aspects. May show some inefficiencies and may lack in some attention to detail. Terminology is used correctly throughout.
Design and planning (use of technical information)	<ul> <li>Partially captured assessment of general characteristics and made some links to installation drawings.</li> <li>Calculations may contain minimal errors and most factors are considered and are accurate. Good use of BS 7671 and other technical documents but may seek reassurance with some information.</li> <li>All items identified using provided resources with good technical descriptions and accurate quantities. Able to understand all aspects of drawing and understands the associated accessories needed rather than the basic accessories shown on drawings.</li> <li>Diagrams accurate and meets the installation specification.</li> </ul>
Reports and information (Related to planning the installation)	Reports and information provided contain technical language and reasoned rectification solutions. Certification and schedules completed with minimal but accurate detail in all aspects.

Any other aspects	

X DD/MM/YY	Internal assessor signature	Date
	X	DD/MM/YY

If completing electronically, double click next to the 'X' to add an electronic signature once the record is **finalised**.

## Task 2 Installation, commissioning and decommissioning

Assessment number (eg 1234-033)	8710-353
Assessment title	Electrotechnical Engineering Occupational Specialism
Candidate name	<first name=""> <surname></surname></first>
City & Guilds candidate No.	ABC1234
Provider name	<provider name=""></provider>
City & Guilds provider No.	999999a

Task(s)	2
Evidence title / description	<ul> <li>Photographs of the installation process (at the stipulated stages of the work - see centre guidance for details).</li> <li>Completed Electrical Installation Certificate and associated documents.</li> </ul>
Date submitted by candidate	DD/MM/YY

## Task

#### Assessment themes:

- Health and safety
- Systems and components
  - o Documentation
  - Technical information
- Reports and information
- Inspecting and testing of systems and components
- Handover and communication

#### a) Installation

Candidates must:

• Complete the installation in accordance with the drawing (**Figure 7**) and to the dimensions agreed with your tutor/assessor.

All cables and wiring systems **must** be terminated and installed in accordance with BS 7671. All terminations, joints and couplings must be mechanically secure and electrically continuous where applicable. Wastage must be minimised as far as possible.

#### b) Inspection, testing and commissioning

Candidates must:

- Carry out safe isolation to the distribution board prior to commencement of the installation
- Carry out an inspection and complete the inspection schedule for initial verification.
- Carry out the full range of applicable tests, in the correct sequence, to the completed installation. Permission must be obtained from the tutor/assessor before proceeding with any tests involving switching on the supply.
- Use instruments safely and in accordance with manufacturer's information and HSE GS38.
- Complete a schedule of test results for the results obtained.
- Compare results with BS 7671 and design criteria.
- Complete the Electrical Installation Certificate for this installation.
- Carry out a handover of the installation assuming your tutor/assessor to be your client including the operation of the electrical system.

All work must be to current standards and carried out in accordance with all health and safety requirements. Any unsafe actions will result in termination of this assessment.

The tutor/assessor must be satisfied that the work complies with BS 7671 and is electrically safe prior to the circuits being energised and tested for function.

#### c) Decommissioning

Once the installation has been completed, checked and verified by the client (tutor/assessor) candidates must:

- Decommission in a safe manner ensuring safe isolation.
- Ensure the workspace is made good, including filling, sanding and painting any holes or damage to the building fabric.
- Undertake a professional discussion with the client (tutor/assessor) on the correct methods for recycling or disposing of waste.

#### What the candidate must produce for marking:

• Completed Electrical Installation Certificate and associated documents.

#### Additional evidence of candidate performance that must be captured for marking:

- Tutor/assessor feedback on performance
- Photographs of the installation process (at the stipulated stages of the work see centre guidance for details).
- Installed components are to be installed to required standards, with photographic evidence confirming accuracies and attention to details.
- Digital recording of decommissioning professional discussion

## Candidate evidence Completed Electrical Installation Certificate

			-
ETAIL			
ISTALLATION ADDRESS			
ESCRIPTION AND EXTENT OF THE INSTALLATION		Now installation	17
escription of installation: Warkshop Lighting and	Mawell	New Instantion	¥
xtent of installation covered by this Certificate:		Addition to an	E
Cull 'ast-llaban		existing installation	
FUIL DRAVIANCE	Care another sheet No:	Alteration to an existing installation	E
Jse continuation sheet if necessary)	See continuation sheet No.		_
OR DESIGN We, being the person(s) responsible for the design of the electrical installation (which are described above, having exercised reasonable skill and care whe hat the design work for which I/we have been responsible is to the best of my S 7671:2018, amended to	n (as indicated by my/our signatures belo n carrying out the design, hereby CERTI /our knowledge and belief in accordance ny, detailed as follows:	w), particulars FY with	
etails of departures from BS 7671 (Regulations 120.3, 133.1.3 and 133.5):	N/A		
Details of permitted exceptions (Regulation 411.3.3). Where applicable, a suit	able risk assessment(s) must be attached	to this Certificate.	
None		Risk assessment attache	ed
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Signature:       Date: 13/14/24       Name (IN E         Signature:       Date:       Name (IN E         FOR CONSTRUCTION       Date:       Name (IN E         I, being the person responsible for the construction of the electrical installation which are described above, having exercised reasonable skill and care when the construction work for which 1 have been responsible is to the best of my h         BS 7671:2018, amended to       2022 (date) except for the departures, if         Details of departures from BS 7671 (Regulations 120.3 and 133.5):       M         The extent of liability of the signatory or signatories is limited to the work destrict of my h       Name (IN E         For CONSTRUCTION of the installation:       Date: 19/14/17/17/14       Name (IN E         Signature:       Date: 19/14/17/17/14       Name (IN E         For INSPECTION AND TESTING       I, being the person responsible for the inspection & testing of the electrical in of which are described above, having exercised reasonable skill and care with the work for which I have been responsible is to the best of my knowled BS 7671:2018, amended to       M	n (as indicated by my signature below), p carrying out the construction hereby CEF inowledge and belief in accordance with any, detailed as follows:	articulars of RTIFY that cate. Constructor elow), particulars rereby CERTIFY	
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Signature:       Date: 13/14/24       Name (IN E         Signature:       Date:       Date:       Name (IN E         FOR CONSTRUCTION       I, being the person responsible for the construction of the electrical installation which are described above, having exercised reasonable skill and care when the construction work for which 1 have been responsible is to the best of my best of 2023	n (as indicated by my signature below), p carrying out the construction hereby CEF inowiedge and belief in accordance with any, detailed as follows: A cribed above as the subject of this Certific BLOCK CAPITALS): istallation (as indicated by my signature b then carrying out the inspection & testing the ge and belief in accordance with any, detailed as follows:	elow), particulars elow), particulars icate.	
Signature:       Date: 13/14/24       Name (IN E         Signature:       Date:       Name (IN E         FOR CONSTRUCTION       Date:       Name (IN E         I, being the person responsible for the construction of the electrical installation which are described above, having exercised reasonable skill and care when the construction work for which 1 have been responsible is to the best of my H         BS 7671:2018, amended to       20.22       (date) except for the departures, if         Details of departures from BS 7671 (Regulations 120.3 and 133.5):       M         The extent of liability of the signatory or signatories is limited to the work des         For CONSTRUCTION of the installation:       Date: 12/14/1744         Signature:       Date: 12/14/1744       Name (IN E         FOR INSPECTION AND TESTING       I. being the person responsible for the inspection & testing of the electrical in of which are described above, having exercised reasonable skill and care with that the work for which 1 have been responsible is to the best of my knowled BS 7671:2018, amended to	A     A	articulars of RTIFY that cate. cate. cate. cate. cate.	
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Other seures	et euro	Confirmation of	supply pol	larity		ie. (1) by writing	(2) by enquiry or by	measurementy		
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Main Protect         Earthing condu         Main protective         bonding condu         To water instal         To other S         Main switch         Location         BS (EN)         No of poles         Schedule of         em No.         1.0       Condu         (Visu)         2.0       Paral         N.0       Prote         Autor         .0       Basic         .0       Prote         .0       Additi         .0       Distriti	tuctor e uctors llation p specify f <b>Inspe</b> diltion of f <b>Inspe</b> diltion of t <b>Inspe</b> c protect c protect f <b>Inspe</b>	Materi Materi Materi ipes X To // / / / / / / / / / / / / / / / / /	al	Ation pipes { Ation pipes { Current Fuse / dr Voltage i Nent s of supply DS)	Contracting Contra	sa		mm² Conn mm² Conn structural steel Rec Type Rated residual C Rated time delay Measured opera Description ibution and Final) switching equipment connected) and notices installations or loc w voltage electrica	ection / continu ection / continu To lightning switch ///// yperating currer y sting time shower ations	ity verified ity verified g protection f

Certificate/Report No.: .... GENERIC SCHEDULE OF CIRCUIT DETAILS Distribution board details Bay 3 Meter Supplied from: Location: DB reference: Distribution circuit OCPD: BS (EN): Rating/Setting: Type: SPD Details: Type(s)\*: T1 T2 T3<sup>1</sup> N/A **CIRCUIT DETAILS** RCD Conductor details Overcurrent protective device §(U) Number & size (KA) N Ser tted ť icity points meth of wiring cap per B Rating (A) (mm<sup>2</sup>)  $(mm^2)$ (Y 90 đ In Circuit description E g (EN) (EN) (mA) Der Rating Circuit r Type Type Type Refe ive cbc BS BS \_8 12 ä ź A 40 B B 32 6 61003 30 60399 1.1 D 3 1.50 SOCKETS A 13 16 61003 30 30 D 13 6 1 1 .Smm2 2.5mm2 60891 2.2 FUSE SWITCH 2 B 61008 A 30 5.87 1,5mm2 6 6 30 17 13 1,5mm 6089 3 lights NI ,1/A NI N 11/A 11/ NIA NIA 11 4 11 NIA NIA 1 JA 1)1 NI 111 NI 5 NIA NIA 11/1 NIA 111 11 NIA NA 11/A 11 NIA 6 N/ 11/A NIA NIA NIA NIA NI 7 1/A NIA 11/4 NIA NA 11 1/1A NIA 8 NIA AL/A 1) NIA NI 11/A 11/0 1/1A 9 NA NI 11/A NIA NIA 111 NIA 10 N/A NIA NA NIA NIA N NI 11 NIA NIA NIA 11/P N A U/ NIA NIA NIA NIA NA 1/14 7 CODES FOR TYPES OF WIRING 0 G Н C D Е F В A Other - please state Thermosetting Thermoplastic cables in Thermoplastic Thermoplastic cables in Mineral insulated cables Thermoplastic insulated/ Thermoplastic cables in Thermoplastic cables in SWA cables metallic trunking non-metallic trunking SWA cables non-metallic conduit metallic conduit sheathed cables

\* SPD Type. Where a combined T1 + T2 or T2 + T3 device is installed, indicate by ticking both Type boxes.

† Where a T3 SPD is installed to protect sensitive equipment, enter details in 'Remarks', column 31, of the Schedule of Test Results. (See Section 534 of BS 7671:2018+A2:2022.)

‡ See Table 4A2 of Appendix 4 of BS 7671:2018+A2:2022.

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GENERIC SCHEDULE OF TEST RESULTS Certificate/Report No.: .... Distribution board details Details of test instruments used (serial and/or asset numbers) DB reference: Multifunction: Z Ω L ..... kA Continuity: Confirmed: Correct polarity I Phase sequence Insulation resistance: SPD: Earth fault loop impedance: Operational status confirmed N/A RCD: Earth electrode resistance: TEST RESULT DETAILS Continuity (Q) Insulation resistance AFDD Ζ. (Ω) RCD Ring final circuit (R, + R,) or R, rection time (ms)" Remarks measured g Include details of circuits and/or installed equipment k Live - Live (MΩ) Live - Earth (MΩ) utton S oper vulnerable to damage when testing voltage est bu (line)  $(\Omega)$ cuit num (neutral) button Maximum ñ (continue on a separate sheet if necessary) Polarity<sup>®</sup> (cpc) Disconn 10 + Test fest 17 0 Ľ 18 -19 -20 -" Ľ Ma ī 0.03 0,03 500 0.03 0103 NIA >999 >997 ~ 2 NIA NIA NI 7.05 NIA 500 >999 >499 V 3 NIA NIA 1.15 N/4 257 2949 2999 4 M/A NIA NIA NIA NIA 111 NIA A11A NIA NIA NIA NIA SIS NIA NIA NIA NIA NIA NIA NIANIANIANIANIANIA 6 NIA NI/A 11/4 1111 NIA 11/ INA NIA NIA .1/A 7 NIA NIA NIA NIA NIA NI NIA 1114 8 NIA NIA NIA NIA 11/4 111 NIA ILA 7 NIANIANIA 1114 NIA 111 1114 NIA 1111 NIANI 10 N/AN/AN/A NIA 1114 NIA MIANIANIA 1114 NIA 11 NIA NIA N'A NIANIA NICA NICA NIA 111A NIA NIA NIA 12 Tested by name (Capitals): Signature: Date:

¶ Not all SPDs have visible functionality indication.

# An X', denoting incorrect polarity, cannot be entered on to this schedule when issued with an Electrical Installation Certificate.

\*\* RCD effectiveness is verified using an alternating current test at rated residual operating current (I<sub>te</sub>).

## Photographic evidence



























## Practical Observation (PO) Form (Task 2)

8710-33 T Level Technical Qualification in Building Services Engineering for Construction

#### 8710-353 Electrotechnical Engineering (Summer 2024)

Candidate name	<first name=""> <surname></surname></first>
City & Guilds candidate No.	ABC1234
Date	DD/MM/YY
Provider name	<provider name=""></provider>
City & Guilds Provider No.	999999a

#### Task 2 assessment themes:

- Health and safety
- Systems and components
  - Documentation
  - Technical information
- Reports and information
- Inspecting and testing of systems and components
- Handover and communication

Record observation notes below to inform internal marking and external moderation. Notes must be detailed, accurate and differentiating which use terminology from the mark grid along with specific examples observed. Notes must identify areas of strength and weakness, distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.

Assessment theme	Assessor observation notes
Health and safety	Health and safety is followed during preparation and throughout tasks and all work completed safely. Risks and hazards that occur during the tasks are correctly mitigated against as they arise.

Systems and components (Installation)	Installation to a good standard and does follow some logic in process. Component selection mostly appropriate. Installation mostly meets plan with some errors apparent due to lack of skills and confidence. Selection of tools appropriate throughout. Use of tools is good but some tasks require numerous attempts. Candidate follows manufacturer's instructions at most stages of the installation. Measurement wiring and associated components is to a sound standard with clear attempts to meet industry levels, resulting in an install that has few errors from the proposed installation plan. Produced a good standard of work however went over time allocation, therefore was unable to complete live tests and the evidence required.
Systems and components (Decommissioning)	Consideration of most implications of sequence for dismantling, minimising damage to parts that could be recycled. Some use of removal techniques to salvage as much materials as possible for recycling. Majority of removed materials and equipment suitably designated and categorised for disposal as required.
Reports and information	Reports and information provided contain technical language and reasoned rectification solutions. Certification and schedules completed with minimal but accurate detail in all aspects.
Inspecting and testing of systems and components	Demonstrates a good range of knowledge from across the qualification which is sound. Seeks minimal guidance or reassurance in the completion of tasks. Most safety aspects considered, and correct safe isolation procedures undertaken with minimal prompting before dismantling commences. Displays clear care in planning commissioning tasks. Demonstrates good, consistent skills, which meets industry standards. Work is well planned following a logical sequence and is completed in a timely manner. Works within tolerances. Complex situations are attempted well and mostly effectively. Regularly confirms outcomes with use of good supporting reference materials. Good links between knowledge and practice giving consideration to aspects such as the number of cores required. Follows correct testing sequence with no prompting. Unable to complete live tests and the evidence required.
Handover and communication	Handover with assessor/client and other communication covers the minimum required information with little explanation or elaboration

Any other aspects

Internal assessor signature		Date
X		DD/MM/YY
If completing electronically, double click new record is <b>finalised</b> .	κt to the 'Χ' to add an electronic si	gnature once the

## Task 3 – Carrying out maintenance

Assessment number (eg 1234-033)	8710-353
Assessment title	Electrotechnical Engineering Occupational specialism
Candidate name	<first name=""> <surname></surname></first>
City & Guilds candidate No.	ABC1234
Provider name	<provider name=""></provider>
City & Guilds provider No.	999999a

Task(s)	3
Evidence title / description	Six completed report cards
Date submitted by candidate	DD/MM/YY

## Task

#### Assessment themes:

- Health and safety
- Systems and components
  - Documentation
  - Technical information
- Reports and information
- Handover and communication
- Working with faults

Candidates must carry out the following for a **minimum** of **six** faults. All work must be undertaken with the installation fully isolated.

For each fault, candidates must:

- Select a job card from the range offered by the tutor/assessor
- Copy the job card reference number onto the blank report sheet in Figure 8
- Identify, from the range of equipment given, necessary items that will be required in order to prepare and diagnose the fault description provided
- Carry out checks to test equipment prior to using it
- Locate the fault, using a logical process
- Complete the report sheet to evidence the following:
- Description of work done to find fault.
- Tests carried out to locate the fault, including readings (if any)
- The nature of the fault
- Brief description of actions required, including materials and time required to rectify the fault
- Further actions required to ensure rectification is suitable.
- Communicate orally the requirements to rectify the fault

All work **must** be to current standards and carried out in accordance with **all** health and safety requirements. Any unsafe actions will result in termination of assessment.

#### What the candidate must produce for marking:

• Six completed report cards.

#### Additional evidence of candidate performance that must be captured for marking:

- Tutor/assessor feedback on performance of diagnostic techniques
- Tutor/assessor observations.

## Candidate evidence

#### Figure 8 - Fault Report Sheet

Task 3 Fault Report Sheet	
rusk of duit Report Oneet	
Job card reference number:	
OA6	
Candidate name:	Date of assessment:
<first name=""> <surname></surname></first>	DD/MM/YY
Description of work done/ tests carried or	It to locate fault (if any)
Insulation registence on cocket ring PCPO	
The nature of the fault	
Ingulation resistance same	THA DE OFFICE 'Sockets.
CHOSED CIPCATT ON A	CDO OF OF OF O
meaning carin Fourth	
Drief description including metaricle regulation	ined to fix the feult
Rewire the sockets so that they're in the corr	ect place.
Actions required to ensure rectification is	suitable
Re-test doing another insulation resistance te	est

Task 3 Fault Report Sheet		
Job card reference number:		
WK7		
Candidate name:	Date of assessment:	
<first name=""> <surname></surname></first>	DD/MM/YY	
Description of work done/ tests carried ou	t to locate fault (if any)	
Insulation resistance test on ring final		
The nature of the fault		
Short circuit between Line and neutral at board		
Brief description including materials requ	ired to fix the fault	
Rewire so that all wires are in correct place		
Actions required to ensure rectification is	suitable	
Re-test by doing another insulation resistance test		

Task 3 Fault Report Sheet	
Job card reference number:	
Candidate name:	Date of assessment:
<first name=""> <surname></surname></first>	DD/MM/YY
Description of work done/ tests ca	rried out to locate fault (if any)
Continuity test (R <sub>2</sub> ) at fused connect	ion
The nature of the fault	
Open circuit at CPC in the fused unit	
Brief description including materia	Is required to fix the fault
Replace CPC with a new wire	
Actions required to ensure rectific	ation is suitable
Re-test with another R <sub>2</sub> test	

Task 3 Fault Report Sheet	
Job card reference number:	
OA5	
Candidate name:	Date of assessment:
<first name=""> <surname></surname></first>	DD/MM/YY
Description of work done/ tests carried ou	it to locate fault (if any)
Continuity test (R <sub>2</sub> ) on CPC on water heater	
The nature of the fault	
Water heater – open circuit on CPC	
Brief description including materials requ	ired to fix the fault
Since there's no continuity in the CPC on the	water heater, it'll need replacing.
Actions required to ensure rectification is	suitable
You would re-test with an R₂ test.	

Task 3 Fault Report Sheet	
Job card reference number:	
WK2	
Candidate name:	Date of assessment:
<first name=""> <surname></surname></first>	DD/MM/YY
Description of work done/ tests	carried out to locate fault (if any)
Continuity test on live.	
The nature of the fault	
No continuity on live at motor switc	h.
Brief description including mate	rials required to fix the fault
Will have to replace wires.	
Actions required to ensure rectif	fication is suitable
Po tost with some test	
ווכ-וכסו שונוז סמוזוכ וכסו.	

Task 3 Fault Report Sheet	
Job card reference number:	
BH6	
Candidate name:	Date of assessment:
<first name=""> <surname></surname></first>	DD/MM/YY
Description of work done/ tests carried or	ut to locate fault (if any)
Insulation resistance test between live – neu	tral on RCBO of the ring-final circuit.
The nature of the fault	
Earth fault on Ring-Final circuit.	
Brief description including materials requ	ired to fix the fault
Rewire on Ring-Final	
Actions required to ensure rectification is	suitable
Re-test with insulation resistance.	

## Practical Observation (PO) Form (Task 3)

8710-33 T Level Technical Qualification in Building Services Engineering for Construction

#### 8710-353 Electrotechnical Engineering (Summer 2024)

Candidate name	<first name=""> <surname></surname></first>
City & Guilds candidate No.	ABC1234
Date	DD/MM/YY
Provider name	<provider name=""></provider>
City & Guilds Provider No.	999999a

#### Task 3 assessment themes:

- Health and safety
- Systems and components
  - Documentation
  - Technical information
- Reports and information
- Handover and communication
- Working with faults

Record observation notes below to inform internal marking and external moderation. Notes must be detailed, accurate and differentiating which use terminology from the mark grid along with specific examples observed. Notes must identify areas of strength and weakness, distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.

Assessment theme	Assessor observation notes
Health and safety	Health and safety is followed during preparation and throughout tasks and all work completed safely. Risks and hazards that occur during the tasks are correctly mitigated against as they arise.

Systems and components (related to working with faults)	Basic faults were identified, but the candidate struggled with more complex issues. Often missed underlying problems due to a lack of thorough testing and analysis. Confidently selected and used appropriate tools and test instruments. Calibration and nulling were generally performed correctly, though some minor errors were noted. Demonstrated good manual dexterity and understanding of equipment functions.
Working with faults	Fault-finding techniques carried out with some success demonstrating appropriate knowledge of fault finding techniques. Candidate follows manufacturer's instructions at most stages of the task Rectification of faults follows a logical process and the systems operational.
Reports and information	Reports and information provided contain technical language and reasoned rectification solutions. Certification and schedules completed with minimal but accurate detail in all aspects.
Handover and communication	Handover considered and well organised/ structured and all elements explained.

# Any other aspects

Internal assessor signature	Date
X	

If completing electronically, double click next to the 'X' to add an electronic signature once the record is **finalised**.



#### 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.

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