T-LEVELS | Institute for Apprenticeships & Technical Education

T Level Technical Qualification in Building Services Engineering for Construction

Electrotechnical Engineering

Guide standard exemplification material

Distinction – Sample 2021

City & Guilds | eal

Version and date	Change detail	Section
June 2021 v1.0	Initial document.	All.
July 2021 v1.1	Transfer of existing content into updated document template.	All.

Contents

Introduction

The sample assessment materials within this document refers to the electrotechnical engineering sample occupational specialism assignment. The aim of these materials is to provide centres with examples of knowledge, skills and understanding that attests to distinction competence. In this document all exemplar evidence attests as examples of performance at the distinction grade boundary. 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. The distinction grade boundary will be based on a synoptic mark across all tasks.

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

Task

This section details the tasks that the candidate has been asked to carry out. What needs to be submitted for marking and any additional evidence required including any photograph/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 exemplars of candidate work, photographs of the work in production (or completed) and practical observation records of the assessment completed by centre assessors. This will be exemplar evidence that was captured as part of the assessment and then internally marked by the centre assessor.

Commentary

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

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 distinction, a candidate will be able to:

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

Demonstrate exemplary technical skills for installing components that is in line with industry standards. They will also demonstrate relevant and comprehensive knowledge and understanding of principles and processes through the tasks completed.

Work safely showing a high degree of understanding in the selection and use of tools, materials and equipment within the environments that they are working in.

Comprehensively interpret information and apply the technical skills to practical tasks and procedures to an exemplary standard as recognised by industry, producing an excellent quality of work that meets all acceptable tolerances, regulations and standards.

Confidently attempts complex tasks and the level of performance meets an exemplary level.

Locate and identify faults, diagnose their causes and have a thorough understanding and the skills to be able to repair and rectify them.

Consistently use accurate industry terminology in both written and verbal contexts.

Task 1 – Planning the installation

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

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

- Completed assessment of general characteristics form
- Completed lighting design schedule
- Completed materials take-off sheet
- Completed design grid

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

- Completed assessment of general characteristics form
- Completed lighting design schedule
- Completed materials take-off sheet
- Completed design grid

Candidate evidence

Completed assessment of general characteristics form

Chapter/regulation from BS 7671	What needs assessing specific to this installation	How this impact the installation
Chapter 31	Purpose of the installation	Is it suitable for the intended use
311.1	Maximum demand and diversity	The installation needs to be assessed as to the maximum demand and diversity applied with in thermal limits and voltage drop to ensure that cables mains cables are not over sized
312.3	Earthing system	The earthing system needs assessed to ensure that it is suitable for the installation, regarding loss of PME.
313.1	Supplies	The following items need to be determined by calculation, measurement, enquiry, or inspection • Nominal voltage (s) • Current and frequency • PSSC at origin • EFLI at origin • Suitability for the requirements of the installation and maximum demand • Type and rating of over current protective device at origin of the installation
314.1	Has the circuits been divided to provide for	The installation is divided into circuits to ensure: • Inconvenience in case of a fault i.e. more than one lighting circuit in a large office • Ease of inspection and testing i.e. being able to only isolate selected circuits while other circuits are available • Take into of hazards from failure of a single circuit. • Reduce unwanted tripping of RCD's due to high earth leakage, use RCBO on circuits or increasing the number of circuits used with less sockets on especially where there are many computers. • Prevent energising of a circuit that is intended to be isolated.
Chapter 32 Appendix 5	Classification of external influences	External influences (environment) should be checked to ensure that: • Correct IP codes used • Corrosion • Impact • Utilisation

		Thought should also be given to those who may use the building: • BA1 Ordinary persons • BA3 handicapped. • Classification code BE Materials with fire risk associated. Buildings classification codes require consideration: CA - codes is the building. CA1 - non-combustible. CA2 - combustible. CB - the building structure.
Chapter 33	Compatibility of characteristics	We need to ensure that equipment in the installation will not have harmful effects: • Earth leakage current from equipment not being electrically tested may operate RCD's. • Some equipment has DC feedback. therefore type AC RCD's will not operate under fault conditions, Type A, F or B RCD's may be required.
Chapter 34	Maintenance	The designer needs to consider the interval to the first periodic inspection and test.
Chapter 35	Safety services	Safety services require consideration as below: • Emergency lighting • Fire alarms • CO detection
Chapter 36	Assessment of continuity of service	Any alterations of circuits need to be checked to ensure that: • The earth system is safe, certain equipment outside cannot be connected to a PME. • Selection of devices to ensure selectivity, protective device closest to fault disconnects first. • Number of circuits. • Are they now multiple power supplies i.e. photovoltaic panels? • Are monitoring devices now needed i.e. dc monitoring for any added car charging units.

Commentary

The candidate demonstrates thorough knowledge and understanding in completing an assessment of general characteristics form with comprehensive regulations, assessed items and impact covered. Efficient use of research materials is evident through the understanding demonstrated of chapter 34 of BS7671 and considering the interval between the installation and the first periodic inspection and test. The explanations given are of a high standard. They have also has considered in detail the impact it has had on the installation.

Candidate evidence

Lighting design schedule

Room Index Calculation

The lighting design calculation is as follows:

$$\frac{L \times W \times E}{LDL \times uF \times mF}$$

L = length

W = width = The plan shows *two fittings*

E = Lux level required

LDL = Lumen output of each luminaire

uF = utilisation factor

mF = Maintenance factor (light loss factor).

Batten 6000 lumen

Bulkhead 1360 lumen

Area	Utilisation factor	Light loss factor	spacing	height	Required lux level	Calculation	Lumens required per luminaire
Workshop/print room	0.7	0.65	1.25m	2.4 m	500 lux	L = 5.25 m W = 3.75 m 5.25 x 3.75 x 500 6000 x 0.7 x 0.65 **= 3.6** To achieve 500 lux within this area 3.6 fittings are required therefore I would suggest installing 4 light fittings in the workshop/print area.	6000
Office sales area	0.75	0.8	2.8m	2.4 m	300 lux	Length 8.75 m Width 8.25 m 8.75 x 8.25 x 300 6000 x 0.75 x 0.80 **= 6.01** 6.01 fitting required so 6 lights are required.	6000

Commentary

The candidate shows excellent knowledge and understanding creating a lighting design schedule that is detailed and accurate with full consideration given to locations and justifications shown for all aspects of the design. The calculations provided are accurate with all factors considered and working out shown in detail. All units are nominated, and calculations are presented to a uniformed number of decimal places. Presentation of work is fully clear and accurate.

Candidate evidence

Materials take off sheet

Equipment/Materials	Quantity
4+4-way split load metal distribution board (that includes – 100/80 amp 30Ma RCD protection)	1
32amp mcb/rcbo type B	1
16amp mcb/rcbo type B	1
6amp mcb/rcbo type B	1
20mm PVC conduit	3/5 metres
20mm PVC saddles	2
20mm PVC adaptors/bush	3
20mm PVC tee-box	1
20mm PVC angle-box	1
PVC surface mounted switch boxes	2
100mm metallic tray	2 metres
100mm metallic tray bend	1
50x50mm steel trunking	2 metres
50x50mm steel trunking end caps	2
20mm steel conduit	2/3 metres
20mm steel conduit couplers	10
20mm steel conduit saddles	6
20mm brass bushes	12
Lighting LED Fluorescent	2
2-way PVC lighting switches	2
16amp isolator BSEN 60309 (Metal clad)	1
Metal clad switched double sockets	4
Single core cable 2.5mm (Brown)	15 metres
Single core cable 2.5mm (Blue)	15 metres
Single core cable 2.5mm (Green/Yellow)	15 metres
Single core cable 1.5mm (Brown)	10 metres
Single core cable 1.5mm (Blue)	2 metres
Single core cable 1.5mm (Green/Yellow)	4 metres
SWA (Steel wire armoured) cable 2-core 2.5mm	2 metres
SWA (Steel wire armoured) BW gland pack (20s)	1
Consumables (Fixings etc)	
Screws/plugs	Boxes
Cable ties (pack)	1
Conduit glue Tin	1
Tools and Plant	
Marking tool/Pencil	1
Tape measure	1
Conduit bending spring (20mm)	1
Conduit bending machine	1
Stock and die set (20mm)	1
Bush spanner 20mm	1
Power Drill (Battery/Mains)	1
Selection of drilling bits (Steel/Masonry) 6mm etc	1

20mm Hole cutter/saw	1
Hacksaw	1
Pipe Grips/footprints	2
Adjustable spanner	2
Selection of metal files (reamer)	2/3
Electricians Knife	1
Side cutters	1
Pliers	1
VDE Screwdriver Philips/Pozi small	1
VDE Screwdriver Philips/Pozi medium	1
VDE Screwdriver Philips/Pozi large (No.3)	1
VDE Screwdriver flat head small (No.1)	1
VDE Screwdriver flat head medium (No.2)	1
VDE Screwdriver flat head large	1
Cable/wire strippers	1
Hammer	1
Centre punch	1
Scriber	1
Spirt levels	2
Set square	1
Testing instrument (Multi-functional)	1
AVI (approved voltage indicator)	1
Clean cloths	2
PPE	
Overalls/protective clothing	
Steel toe capped boots	
Goggles/glasses	

Commentary

The candidate has demonstrated excellent knowledge and understanding in identifying all the resources, components, PPE and accurate quantities to carry out the tasks that meets the assignment brief requirements. The component selection within the materials take off is appropriate and clearly links to the quality and aesthetics of the finished installation.

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Candidate evidence

Design grid

Consumer unit located in workshop VOLTAGE DROP TO COMPLY WITH BS 7671		Nominal Voltage (U) 230 V		Earthing Arrangement TN-C-S		External Earth Fault Loop Impedance (Z_e) 0.3 Ω		
Circuit	1	2	3	4	5	6	7	8
Description	Ring-final office	Radial-final sockets workshop	Radial-sockets kitchen x2 twin	Boiler supply	Outbuilding DB	4.5 kW printing machine	Lighting office	Lighting workshop/kitchen/ toilets
No. outlets	6 x 2-gang	4 x 2-gang	2 x 2-gang	1	1	1	7	5
Type of wiring	70 ^{0}C thermoplastic single-core non-sheathed	70 ^{0}C thermoplastic single-core non-sheathed	70 ^{0}C thermoplastic single-core non-sheathed	70 ^{0}C thermoplastic multi-core flat profile	70 ^{0}C thermoplastic 3-core PVC SWA	70 ^{0}C thermoplastic 3-core PVC SWA	70 ^{0}C thermoplastic single-core non-sheathed	70 ^{0}C thermoplastic single-core non-sheathed
Design Current (I_b)	22 A	15 A	9 A	4 A	16 A	19.56 A	1.6 A	0.7 A
Type and Nominal rating (I_n)	32 A B	20 A B	20 A B	16 A B	16 A C	20 A B	6 A C	6 A C
Length (metres)	50 m loop	11 m	10 m	8 m	27 m	6	65	20 m
Installation method	B	B	B	B	C	C	C	B
Ambient temperature ^{0}C	25 ^{0}C	25 ^{0}C	25 ^{0}C	30 ^{0}C	30 ^{0}C	30 ^{0}C	30 ^{0}C	30 ^{0}C
Rating Factor	1.03	1.03	1.03	1	1	1	1	1

Ambient air temp. C_a								
Total circuits in group	2	2	2	1	1	1	2	2
Rating factor grouping C_g	0.80	0.80	0.80	1	1	1	0.80	0.80
Minimum current capacity (<I_t)	24.27each cable	24.27	24.27	16	16	20 A	7.5	7.5
mV/A/m	11	11	11	29	18	29	29	29
Actual Voltage drop	3.025	1.815	0.99	0.928	7.776	3.40	3.016	0.406
Minimum conductor csa mm^2	4.0	4	4	1.5	2.5	1.5	1.5	1.5

Design grid calculations

Design Calculations / Assumptions

Circuit 1, Ring final circuit in office area

This will be a mixture of conduit and dado trunking reference method B
Rating factor for 25 degrees 70°C from table 4B1 1.03
Grouping for 2 circuits method B, from table 4C1 0.80

a) Application of In 32 A= 32/1.03/0.8 = 38.83 A this is divided by 2 to give Iz of each cable 38.83/2 =19.41Table 4D1A column 4 =24A next size up is a 2.5mm^2

b) Taking account of regulation 433.1.204 derating factors are applied to In of 20 A for each cable, therefore 20 /1.03/0.8 =24.27 table 4D1A column 4 =32 A next size up is a 4mm conductor.

c) 4D1B Column 3 mv/A/m for 2.5mm is 18 and 4mm is 11

The voltage drop for 2.5mm ring final circuit is $\frac{22 \times 50 \times 18}{1000 \times 4} = 4.95$ V

The voltage drop for a 4.0mm cable is

$\frac{VD = Ib \times L \times mV/A/m}{1000 \times 4}$ $\frac{22 \times 50 \times 11}{1000 \times 4} = 3.025$ V

Voltage dropped is acceptable 5% of 230 V is 11.5 V

Circuit 2
Assuming floor to ceiling is 2.4 m in height
Assuming dado trunking is 0.75 m from finished floor level
From distribution board to last socket is 11 m
Rating factor for 25 degrees 70°C from table 4B1 1.03
Grouping for 2 circuits method B from table 4C1 0.80
In = 20A /1.03/0.8 = 24.27 A
table 4D1A column 4 = 4mm
4D1B Column 3 mV/A/m for 4mm is 11

Voltage drop is $\frac{VD = Ib \times L \times mV/A/m}{1000}$ $\frac{15 \times 11 \times 11}{1000} = 1.815$ V
Voltage drop acceptable 5% of 230 V is 11.5 V

Circuit 3
Rating factor for 25 degrees from table 4B1 1.03
Grouping for 2 circuits from table 4C1 0.80
In = 20A /1.03/0.8 = 24.27 A
table 4D1A column 4 = 4mm
4D1B Column 3 mv/A/m for 4mm is 11

Voltage drop is $\frac{VD = Ib \times L \times mV/A/m}{1000}$ $\frac{9 \times 10 \times 11}{1000} = 0.99$ V

Voltage drop acceptable 5% of 230 V is 11.5 V

Circuit 4

Voltage drop is $\frac{VD = Ib \times L \times mV/A/m}{1000}$ $\frac{4 \times 8 \times 29}{1000} = 0.982$ V

Voltage drop acceptable 5% of 230 V is 11.5 V

Circuit 5

Voltage drop is $\frac{VD = Ib \times L \times mV/A/m}{1000}$ $\frac{16 \times 27 \times 18}{1000} = 7.776$ V

Voltage drop acceptable 5% of 230 V is 11.5 V

Circuit 6
4.5 kW printer

$\frac{4500\ W}{230} = 19.56$ A

In = BS EN 60898 20 A type B
Height from floor to ceiling 2.4 m
Length is from DB to floor level 6 m

It is 20 A

mV/A/m is from table 4D4B column 3 is 29

Voltage drop is $\frac{VD = Ib \times L \times mV/A/m}{1000}$ $\frac{19.56 \times 6 \times 29}{1000} = 3.04$ V

Minimum conductor CSA from table 4D4A column 2.21A = 1.5mm

Voltage drop acceptable 5% of 230 V is 11.5 V

Circuit 7

The circuit length is 65 m

Installation method conduit trunking method B
Grouping for 2 circuits from table 4C1 0.80

mV/A/m table 4D1B column 3 = 29

Voltage drop is $\frac{VD = Ib \times L \times mV/A/m}{1000}$ $\frac{1.6 \times 65 \times 29}{1000} = 3.016$ V

Voltage drop acceptable 3% of 230 V is 6.9 V

Circuit 8

Installation method conduit trunking method B
mV/A/m table 4D1B column 3 = 29

Voltage drop is $\frac{VD = Ib \times L \times mV/A/m}{1000}$ $\frac{0.7 \times 20 \times 29}{1000} = 0.406$ V
Voltage drop acceptable 3% of 230 V is 6.9 V

Commentary

The candidate shows thorough knowledge and understanding of producing a design grid with calculations. The candidate has completed the design and has considered the requirement of each of the aspects needed to complete the task with a high attention to detail. The candidate did however make a minor error in regard to the installation method of circuit 7, the design grid states C but the calculation uses the correct installation method of B which is the correct method and does not affect the result of the calculation.

Efficient use of research materials and a good understanding of technical documents. For example, the candidate has correctly considered BS7671 regulation 433.1.204 derating factors whilst designing the ring final circuit and the use of correct formulas as required by BS7671 to inform their calculations.

Task 2 – Installation, commissioning and decommissioning

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

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

- Assessor observation of installation:
  - Safe isolation
  - Installation of cables and wiring systems
  - Inspection and testing
- Completed Electrical Installation Certificate
- Schedule of inspections
- Schedule of test results
- Copy of the Guidance for recipients

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

- Assessor observation of installation:
  - Safe isolation
  - Installation of cables and wiring systems
  - Inspection and testing
- Completed Electrical Installation Certificate
- Schedule of inspections
- Schedule of test results

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

- Copy of the Guidance for recipients

Photographic evidence:

Installation of cables and wiring systems

- Measuring and marking out **(photograph 1,2)**
- Conduit being cut, containment being installed and saddles **(photograph 3, 4, 5)**
- Installation of SWA and glanding **(photograph 5)**
- Cables being installed into the containment **(photograph 6)**
- Preparing terminations **(photograph 7)**
- Terminations being completed **(photograph 8, 9)**
- Final installation **(photograph 10)**

Inspection and testing

- Testing equipment being nulled/zeroed **(photograph 11&12)**
- R1+R2 and polarity being confirmed **(photograph 13)**
- Testing of final ring circuit **(photograph 14 – 16)**
- Insulation resistance tests **(photograph 17)**
- Reenergised installation **(photograph 18 – 22)**

Candidate evidence

Practical Observation – safe isolation

Assessment ID	Qualification number
8710-353	8710-33
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment theme**
City & Guilds	Health and safety, systems and components

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	Candidate was very confident in describing the industry requirements for the safe isolation procedure and how they planned to proceed with the task. They described the process in a clear logical sequence. Candidate correctly inspected the multifunction tester and its leads to ensure it was safe to use, they selected all the equipment required for the task, including correct PPE, voltage indicator, proving unit, lock off kit and correct signage. The candidate correctly checked the testing equipment and confirmed operation before continuing with tests to prove supply was dead. The candidate could clearly articulate the purpose of each step in ensuring the electrical supply was correctly isolated. Candidate correctly identified signage and placed notices to advise the system was isolated and tested. Candidate always retained the lock off key on their person whilst working on the circuit.

Assessor signature	Date
Assessor A	31/01/2021

Commentary

Candidate demonstrates a thorough understanding of the safe isolation process and carried out all the necessary steps in the safe isolation, lock off and tag out process correctly.

The safe isolation process was correct in method. The candidate used the correct terminology and reasoning whilst inspecting and using the testing equipment and explained what each check was proving before moving to next stage.

The candidate did not require any prompts and progressed correctly through each stage of the entire operation.

Candidate evidence

Practical Observation Form – Installation of cables and wiring systems

Assessment ID	Qualification number
8710-353	8710 – 33
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment theme**
City & Guilds	Health and safety, systems and components,

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

Task	Notes – *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
Installation	The candidate prepared the workspace with consideration to health and safety and good housekeeping, correct PPE was selected for use such as hard hat, boots, safety googles and Hi-Viz waistcoat. The candidate used their equipment & materials list during collection to ensure they had all the materials they needed; this contained accurate quantities were requested. All tools were used in a proficient and safe manner. The installation was safely isolated prior to the work commencing, the candidate was confident when approaching this and followed each required step in a professional manner. The workspace was maintained well in terms of tidiness of tools materials and equipment throughout the task. Candidate marked the wall out with a tape measure, level and pencil appropriately. The candidate progressed in a highly confident, logical manner. All critical alignments from the plan were all to a high standard. Sequencing was logical, for example, the installation was set out boxes installed, and the conduit was then cut prior to being installed to ensure accuracy. All equipment was installed to the required measurements. Ongoing use was made of the spirit level to check that containment and component installation were level / plumb. All components were installed in the locations detailed in the dimensioned drawing. The final installation did was neat and to industry

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.*
	standards, all cable ends were prepared and terminated correctly with no exposed conductors and no damage to the insulation. All devices were installed and connected as per the system design specification. The final work produced was of an excellent standard and aesthetically pleasing.

Photographic evidence

1.

Photograph 1

Marking out & measurements which show correct measurements

2.

Photograph 2,

Level being used to ensure back box is straight.

3. – 4.

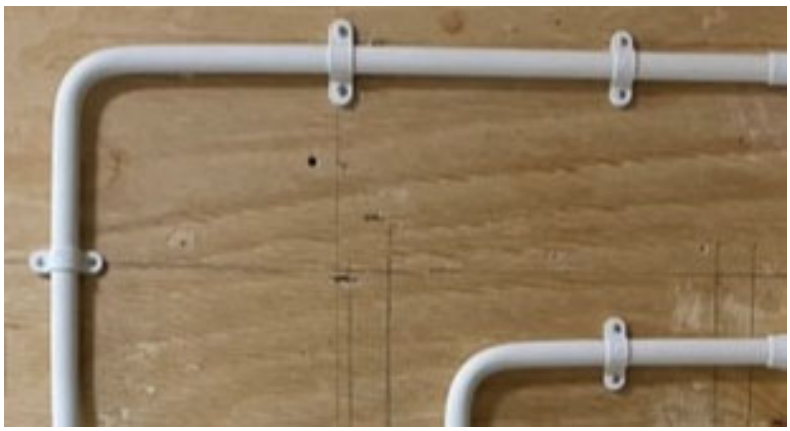
Photograph 3

Candidate using a hacksaw to cut the conduit. Conduit is secured in a vice.

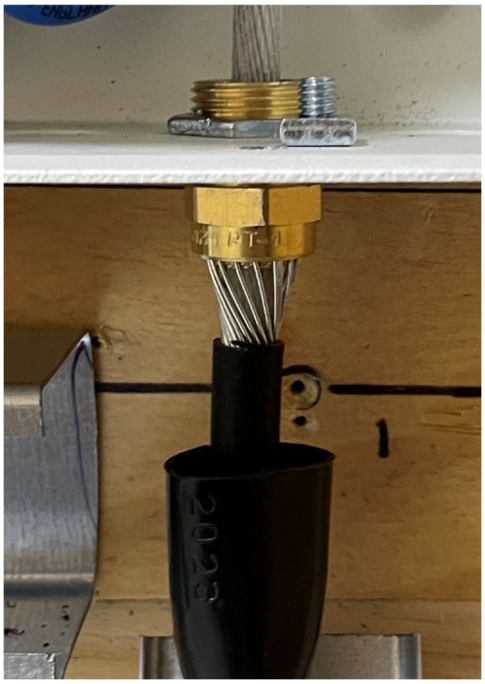
Photograph 4

Containment (conduit) being installed and saddles being to the required measurements in compliance with the plan.

4.



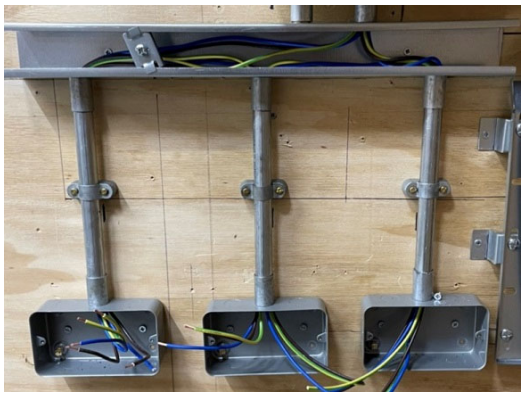
5.



Photograph 5

Installation of SWA and glanding installed neatly and associated glanding and earthing ring have been used

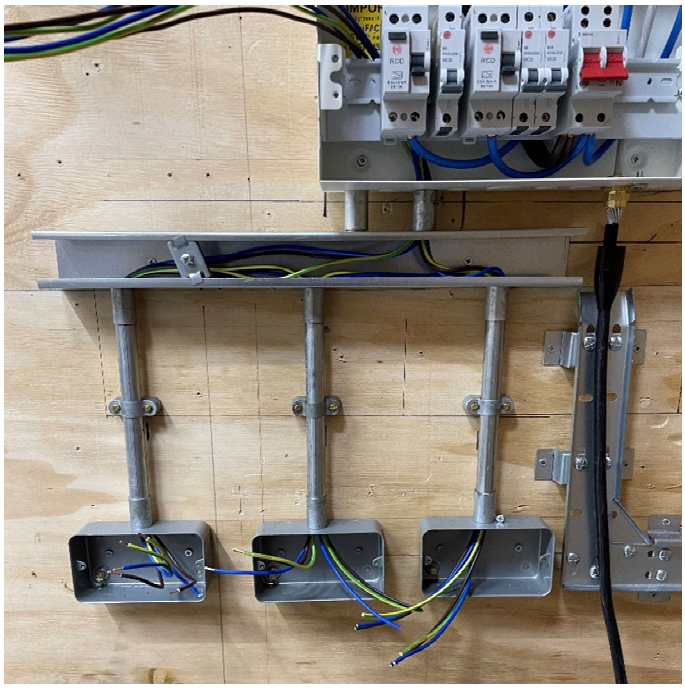
6.



Photograph 6

Cables being installed into the containment.

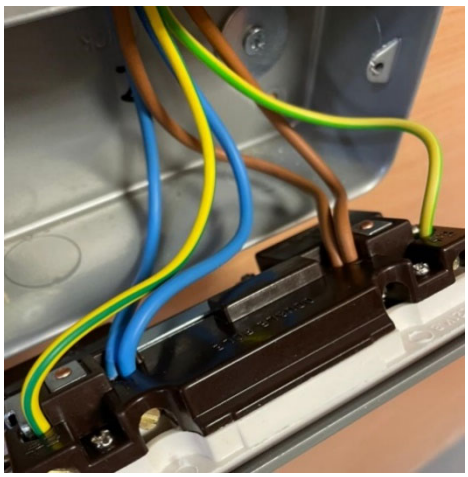
7.



Photograph 7

Terminations being prepared.

8.



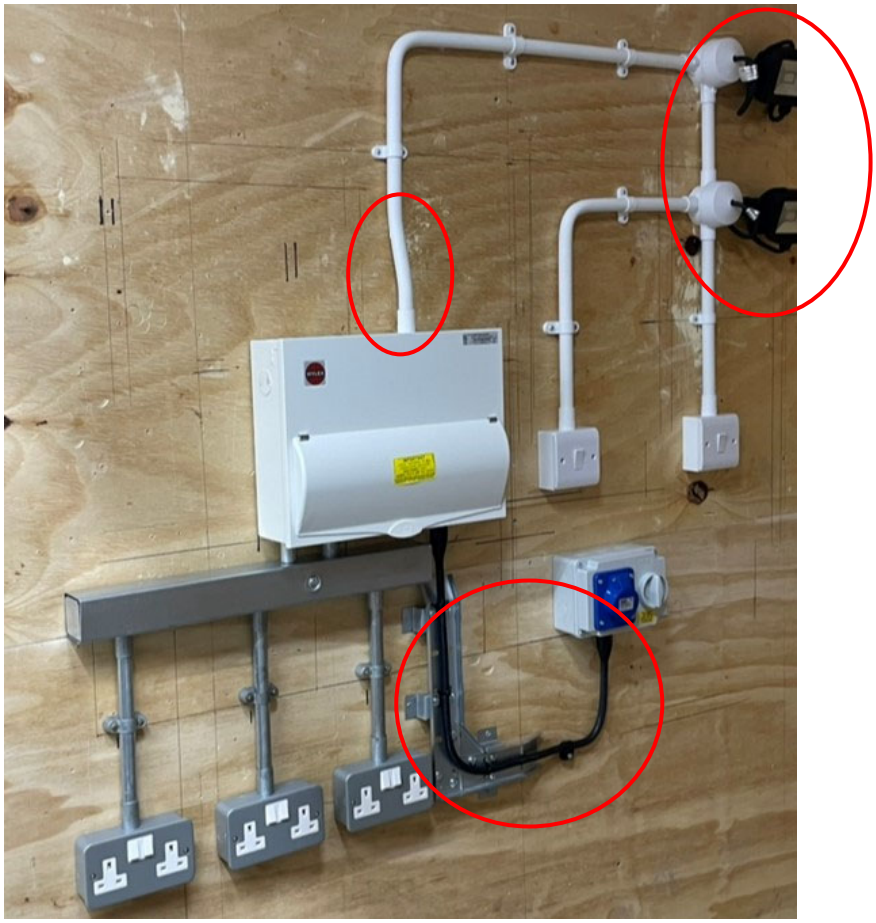
Photograph 8

Socket outlet showing completed terminations for the circuits installed showing no exposed copper with cables being dressed correctly into the back boxes.

9.

Photograph 9

Light switch showing completed terminations for the circuits installed showing no exposed copper with cables being dressed correctly into the back boxes.



Photograph 10

Final installation capturing a high standard of aesthetics in the completed installation

Commentary

The candidate demonstrated a comprehensive understanding and knowledge of the installation process. The installation was constantly within the main tolerances provided as required by BS7671. The finished work looks aesthetically pleasing and is to a high standard. The candidate has clearly demonstrated an ability to sequence tasks logically and was highly competent in the use of tools throughout the installation. This was evidenced through the prefabrication of all the containment types which were completed first time for a high-quality finish.

Candidate did not require reassurance and was highly focussed and assured when carrying out the installation ensuring health and safety measures in line with planning and risk assessments were adhered to at all times.

Candidate evidence

Practical Observation Form – Inspection and testing

Assessment ID	Qualification number
8710-353	8710 – 33
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment themes**
City & Guilds	Health and safety, systems and components, inspection and testing of systems and components

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

Task	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
Inspection & Testing.	All safety aspects were considered, for example the correct safe isolation procedures were undertaken prior to the inspection and testing being carried out. Inspection – The candidate has followed the correct process for completing the inspection of the installed circuits and reflected that within the electrical installation certificate. They have demonstrated an ability to sequence tasks logically and had a highly focused inspection technique showing extreme care in the accuracy in the work. Testing – The test instruments were correctly prepared prior to starting testing. The correct range was selected (ohms) and nulling of test leads for continuity testing was carried out. The candidate differentiated between method 1 and method 2 continuity tests, they went on to carry them out using method 1 (R1+R2) the candidate connected a link between the individual circuits line and CPC's and took the reading at the furthest point from the DB. Ring circuit continuity was completed to the requirements of guidance note 3, the candidate without any hesitation. Insulation resistance tests were carried out after all vulnerable equipment was removed.

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.*
	The circuit is correctly reenergised after gaining permission, polarity was taken correctly whilst carrying out the Ze at the origin with the main earth cable disconnected. PFC correctly carried out, polarity was observed prior to the Zs being measured all results were checked against table 41.3 of BS7671, the candidate explained the coloration between this and table B6 of the On-Site Guide. All RCD tests were completed in the correct manner. They followed the correct testing sequence with no prompting and with justification and explanation of action and potential consequences.

Assessor signature	Date
A. Assessor	26.02.21

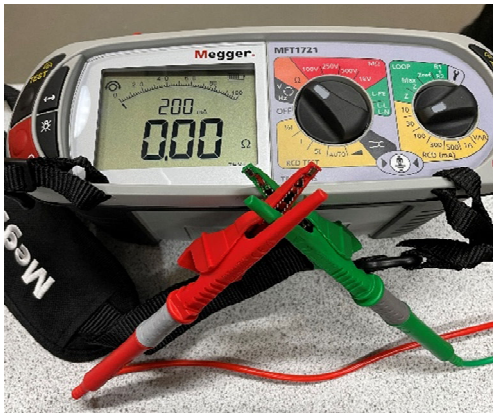
Photographic Evidence

11.

12.

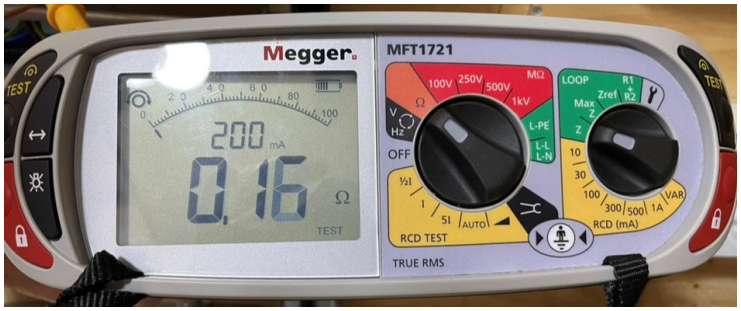
Photographs 11 and 12

Insert photo of testing equipment being nulled / zeroed correctly



13.

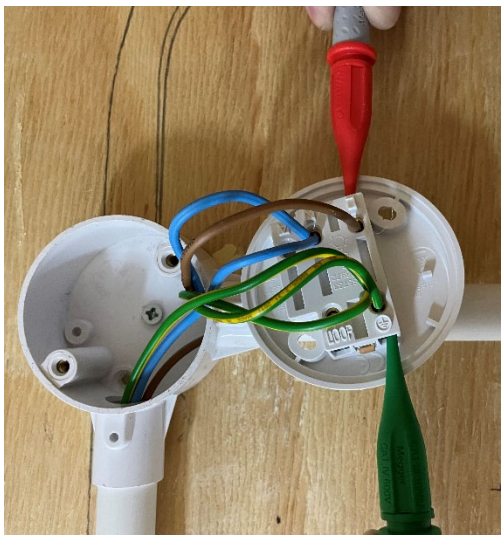
a.



Photograph 13 a. & b.

Method 1 continuity (R1+R2) and polarity being confirmed on the lighting circuit.

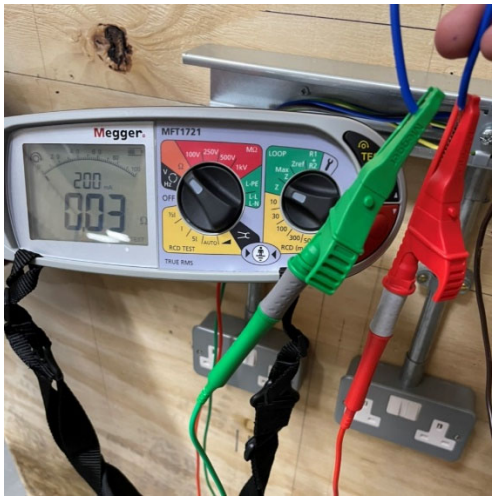
b.



14.

15.

16.



Photograph 14-16

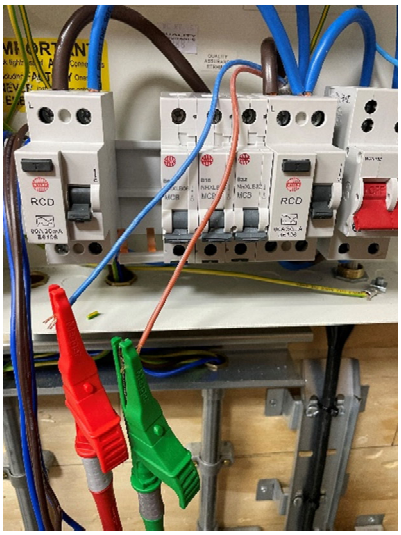
Ring final circuit being tested without any errors in practice

17.

Photographs 17 a-d

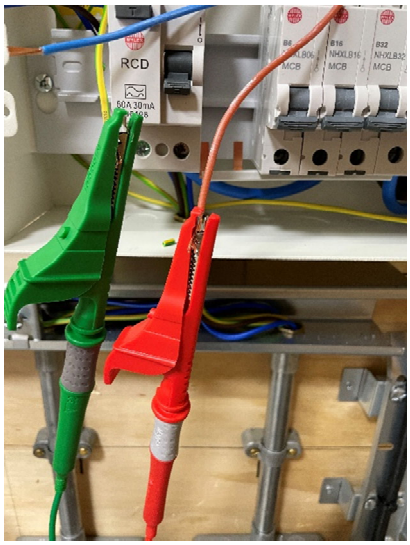
Insulation resistance tests being carried out, the candidate had isolated any vulnerable parts.

a.



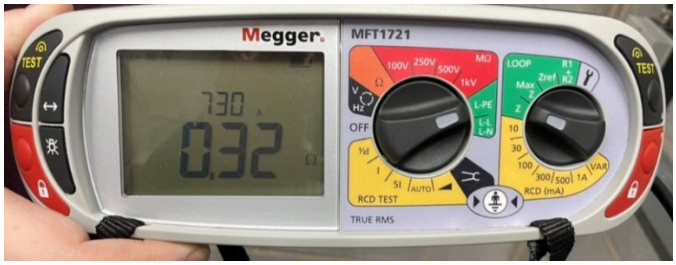
b.

c.

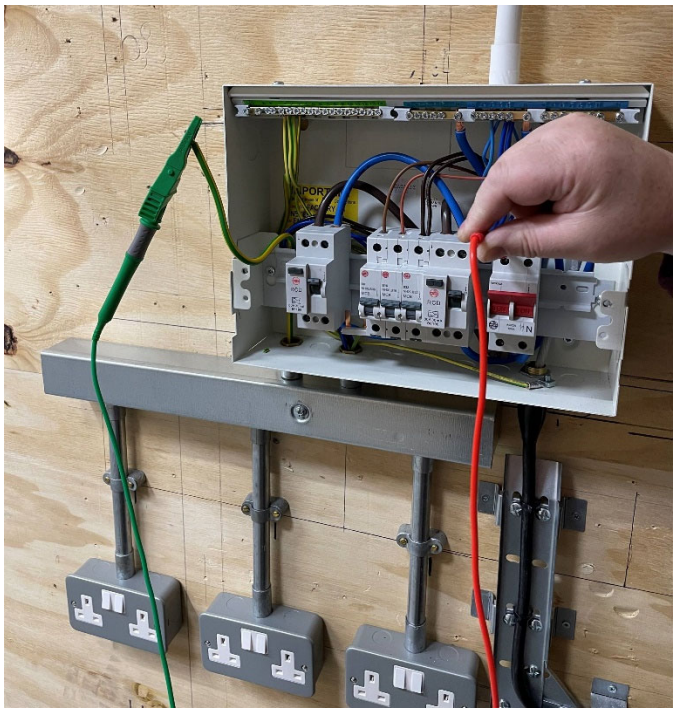


d.

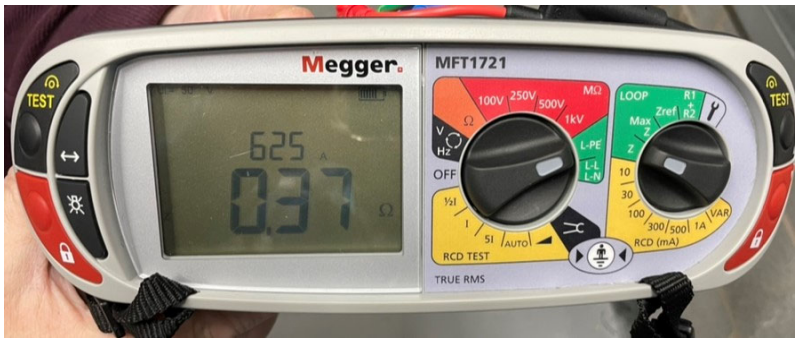
18.



19.



20.



Photograph 18-22

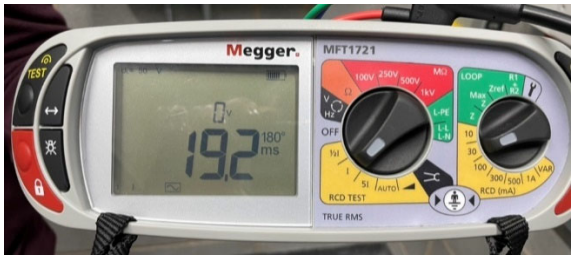
Re-energised installation being testing. Ze tested with MET disconnected to eliminate parallel paths

Photos also show PFC being taken, polarity being confirmed, earth fault loop impedance and

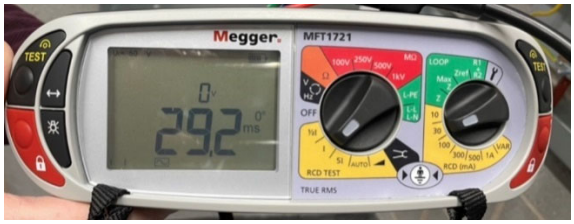
RCD tests being carried out.

21-25 (RCD Testing).

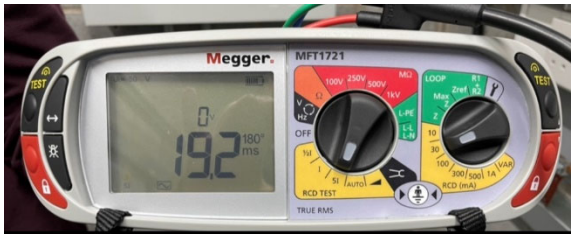
21.



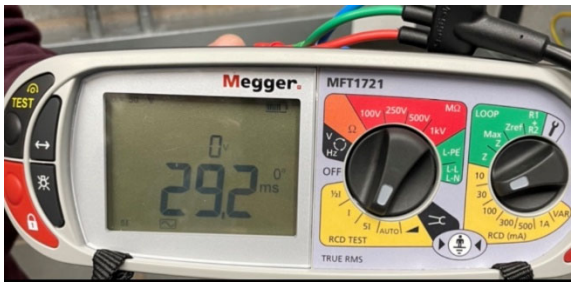
22.



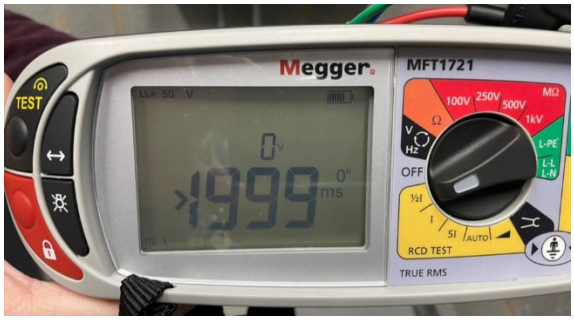
23.



24.



25.



Commentary

The candidate demonstrates comprehensive knowledge and understanding of electrical principles and processes in relation to the inspection and testing of the completed installations.

Excellent planning was demonstrated prior to the task commencing. The test instruments were correctly prepared by way of the visual inspecting of the multifunction tester and its associated test leads prior to starting testing. Reference was made to GS38 in relation to the test leads. They selected the correct range for each test without hesitation and correctly nulled the test leads for continuity testing. They measured earth fault loop impedance for each circuit and verified for each circuit by consulting Table 41.3 of BS7671 or Table B6 of the On-Site Guide.

Candidate evidence

Electrical Installation Certificate and schedule of inspections

(REQUIREMENTS FOR ELECTRICAL INSTALLATIONS - BS 7671 [IET WIRING REGULATIONS])

DETAILS OF THE CLIENT

Mr John James
22, Johnston Street, Seaton. AC30 1DC

INSTALLATION ADDRESS
22, Johnston Street, Seaton. AC30 1DC

DESCRIPTION AND EXTENT OF THE INSTALLATION
Description of installation**: Domestic/Commercial workshop, lighting and small power**

New installation ☑

Extent of installation covered by this Certificate**: All circuits installed as per the schedule of results. As well as the associated containment as per figure 2.**

Addition to an existing installation ☐

Alteration to an existing installation ☐

(Use continuation sheet if necessary) see continuation sheet No: .....

FOR DESIGN
I/We being the person(s) responsible for the design of the electrical installation (as indicated by my/our signatures below), particulars of which are described above, having exercised reasonable skill and care when carrying out the design and additionally where this certificate applies to an addition or alteration, the safety of the existing installation is not impaired, hereby CERTIFY that the design work for which I/we have been responsible is to the best of my/our knowledge and belief in accordance with BS 7671:2018, amended to ..**N/A**..... (date) except for the departures, if any, detailed as follows:

Details of departures from BS 7671 (Regulations 120.3, 133.1.3 and 133.5): **None**

Details of permitted exceptions (Regulation 411.3.3). Where applicable, a suitable risk assessment(s) must be attached to this Certificate. **None**

Risk assessment attached

The extent of liability of the signatory or signatories is limited to the work described above as the subject of this Certificate.

For the DESIGN of the installation: **(Where there is mutual responsibility for the design)

Signature: .**PC Jenkin** Date: **07/09/20** Name (IN BLOCK LETTERS): .**CLIVE JENKIN** Designer No 1
Signature: ..... Date: ..... Name (IN BLOCK LETTERS): ..... Designer No 2**

FOR CONSTRUCTION
I being the person responsible for the construction of the electrical installation (as indicated by my signature below), particulars of which are described above, having exercised reasonable skill and care when carrying out the construction hereby CERTIFY that the work for which I have been responsible is to the best of my knowledge and belief in accordance with BS 7671:2018, amended to **....N/A.....(**date) except for the departures, if any, detailed as follows:

Details of departures from BS 7671 (Regulations 120.3 and 133.5): **None**

The extent of liability of the signatory is limited to the work described above as the subject of this Certificate.

For CONSTRUCTION of the installation:

Signature: .**PC Jenkin** Date: **07/09/20** Name (IN BLOCK LETTERS): **CLIVE JENKIN** Constructor

FOR INSPECTION & TESTING
I being the person responsible for the inspection & testing of the electrical installation (as indicated by my signature below), particulars of which are described above, having exercised reasonable skill and care when carrying out the inspection & testing hereby CERTIFY that the work for which I have been responsible is to the best of my knowledge and belief in accordance with BS 7671:2018, amended to ....**N/A.....(**date) except for the departures, if any, detailed as follows:

Details of departures from BS 7671 (Regulations 120.3 and 133.5): **None**

The extent of liability of the signatory is limited to the work described above as the subject of this Certificate.

For INSPECTION AND TESTING of the installation:

Signature: **PC Jenkin** Date: **07/09/20** Name (IN BLOCK LETTERS): **CLIVE JENKIN** Inspector

NEXT INSPECTION
I/We the designer(s), recommend that this installation is further inspected and tested after an interval of not more than .5. years/~~months.~~

PARTICULARS OF SIGNATORIES TO THE ELECTRICAL INSTALLATION CERTIFICATE

Designer (No 1)

Name: **PC Jenkin** Company: **Honister Installation Ltd**
Address: **1 Grassmoor, Cockermouth**
..... Postcode: **CA99 1ER**. Tel No: **01234 567890**

Designer (No 2)
(if applicable)

Name: .....**N/A**..... Company:.....
Address: .....
..... Postcode: ..... Tel No: .....

Constructor

Name: **PC Jenkin** Company: **Honister Installation Ltd**
Address: **1 Grassmoor, Cockermouth**
..... Postcode: **CA99 1ER** Tel No: **01234 567890**

Inspector

Name: **PC Jenkin** Company: **Honister Installation Ltd**
Address: **1 Grassmoor, Cockermouth**
..... Postcode: **CA99 1ER** Tel No: **01234 567890**

SUPPLY CHARACTERISTICS AND EARTHING ARRANGEMENTS

Earthing arrangements	**Number and Type of Live Conductors**		**Nature of Supply Parameters**	**Supply Protective Device**
TN-C TN-S TN-C-S ✓ TT IT	AC 1-phase, 2-wire ✓ 2-phase, 3-wire 3-phase, 3-wire 3-phase, 4-wire	DC 2-wire 3-wire Other	Nominal voltage, U / U_0 (1) .400/230 V Nominal frequency, f (1) 50 Hz Prospective fault current, I_{pf} (2) 1.6 kA External loop impedance, Z_e (2) 0.14 Ω *(Note: (1) by enquiry* *(2) by enquiry or by measurement)*	BS (EN) ...88..... Type .....2..... Rated current ....100.. A
	Confirmation of supply polarity ☑			

Other sources of supply (as detailed on attached schedule**) N/A**

PARTICULARS OF INSTALLATION REFERRED TO IN THE CERTIFICATE

Means of Earthing	**Maximum Demand**
Distributor's facility	Maximum demand (load) .....60..... kVA / Amps Delete as appropriate
Installation earth electrode	**Details of Installation Earth Electrode** *(where applicable)* Type **N/A** (e.g. rod(s), tape etc) ..... Location ..... Electrode resistance to Earth ..... Ω

Main Protective Conductors

Earthing conductor	Material .....**CU**..... csa ...**16**..... mm^2	Connection / continuity verified ☑
Main protective bonding conductors (to extraneous-conductive-parts)	Material .....**CU**..... csa ....**10**..... mm^2	Connection / continuity verified ☑

To water installation pipes ☑	To gas installation pipes ☑	To oil installation pipes **N/A**	To structural steel **N/A**
To lightning protection **N/A**	To other Specify **N/A**		

Main Switch / Switch-Fuse / Circuit-Breaker / RCD

Location **Workshop**. ..... BS(EN) **60947-5** No of poles ***2***	Current rating **100.** A Fuse / device rating or setting **.N/A.** A Voltage rating **230.** V	**If RCD main switch** Rated residual operating current ($I_{\Delta n}$) **N/A...** mA Rated time delay ..... ms Measured operating time .... ms

COMMENTS ON EXISTING INSTALLATION (in the case of an addition or alteration see Regulation 644.1.2):

.....
.....**N/A.**.....
.....
.....
.....
.....
.....
.....

SCHEDULES

The attached Schedules are part of this document and this Certificate is valid only when they are attached to it. .1.....
Schedules of Inspections and ....1..... Schedules of Test Results are attached.
(Enter quantities of schedules attached).

SCHEDULE OF INSPECTIONS (for new installation work only) for

DOMESTIC AND SIMILAR PREMISES WITH UP TO 100 A SUPPLY

NOTE 1: This form is suitable for many types of smaller installation, not exclusively domestic.

All items inspected in order to confirm, as appropriate, compliance with the relevant clauses in BS 7671. The list of items and associated examples where given are not exhaustive.

NOTE 2: Insert ✓ to indicate an inspection has been carried out and the result is satisfactory, or N/A to indicate that the inspection is not applicable to a particular item.

Item No	DESCRIPTION	Outcome See Note 2
1.0	**EXTERNAL CONDITION OF INTAKE EQUIPMENT (VISUAL INSPECTION ONLY)**	
1.1	Service cable	☑
1.2	Service head	☑
1.3	Earthing arrangement	☑
1.4	Meter tails	☑
1.5	Metering equipment	☑
1.6	Isolator (where present)	N/A
2.0	**PARALLEL OR SWITCHED ALTERNATIVE SOURCES OF SUPPLY**	
2.1	Adequate arrangements where a generating set operates as a switched alternative to the public supply (551.6)	N/A
2.2	Adequate arrangements where a generating set operates in parallel with the public supply (551.7)	N/A
3.0	**AUTOMATIC DISCONNECTION OF SUPPLY**	
3.1	**Presence and adequacy of earthing and protective bonding arrangements:**	
	• Distributor's earthing arrangement (542.1.2.1; 542.1.2.2)	☑
	• Installation earth electrode (where applicable) (542.1.2.3)	N/A
	• Earthing conductor and connections, including accessibility (542.3; 543.3.2)	☑
	• Main protective bonding conductors and connections, including accessibility (411.3.1.2; 543.3.2; 544.1)	☑
	• Provision of safety electrical earthing/bonding labels at all appropriate locations (514.13)	☑
	• RCD(s) provided for fault protection (411.4.204; 411.5.3)	N/A
4.0	**BASIC PROTECTION**	
4.1	**Presence and adequacy of measures to provide basic protection (prevention of contact with live parts) within the installation:**	
	• Insulation of live parts e.g. conductors completely covered with durable insulating material (416.1)	☑
	• Barriers or enclosures e.g. correct IP rating (416.2)	☑
5.0	**ADDITIONAL PROTECTION**	
5.1	**Presence and effectiveness of additional protection methods:**	
	• RCD(s) not exceeding 30 mA operating current (415.1; Part 7), see Item 8.14 of this schedule	☑
	• Supplementary bonding (415.2; Part 7)	N/A
6.0	**OTHER METHODS OF PROTECTION**	
6.1	**Presence and effectiveness of methods which give both basic and fault protection:**	
	• SELV system, including the source and associated circuits (Section 414)	N/A
	• PELV system, including the source and associated circuits (Section 414)	N/A
	• Double or reinforced insulation i.e. Class II or equivalent equipment and associated circuits (Section 412)	N/A
	• Electrical separation for one item of equipment e.g. shaver supply unit (Section 413)	N/A

7.0	**CONSUMER UNIT(S) / DISTRIBUTION BOARD(S):**	
7.1	Adequacy of access and working space for items of electrical equipment including switchgear (132.12)	☑
7.2	Components are suitable according to assembly manufacturer's instructions or literature (536.4.203)	☑
7.3	Presence of linked main switch(es) (462.1.201)	☑
7.4	Isolators, for every circuit or group of circuits and all items of equipment (462.2)	☑
7.5	Suitability of enclosure(s) for IP and fire ratings (416.2; 421.1.6; 421.1.201; 526.5)	☑

Item No	DESCRIPTION	Outcome See Note 2
	CONSUMER UNIT(S) / DISTRIBUTION BOARD(S) continued	
7.6	Protection against mechanical damage where cables enter equipment (522.8.1; 522.8.5; 522.8.11)	☑
7.7	Confirmation that ALL conductor connections are correctly located in terminals and are tight and secure (526.1)	☑
7.8	Avoidance of heating effects where cables enter ferromagnetic enclosures e.g. steel (521.5)	☑
7.9	Selection of correct type and ratings of circuit protective devices for overcurrent and fault protection (411.3.2; 411.4, 411.5, 411.6; Sections 432, 433; 537.3.1.1)	☑
7.10	**Presence of appropriate circuit charts, warning and other notices:**	
	• Provision of circuit charts/schedules or equivalent forms of information (514.9)	☑
	• Warning notice of method of isolation where live parts not capable of being isolated by a single device (514.11)	N/A
	• Periodic inspection and testing notice (514.12.1)	☑
	• RCD six-monthly test notice; where required (514.12.2)	☑
	• AFDD six-monthly test notice; where required	N/A
	• Warning notice of non-standard (mixed) colours of conductors present (514.14)	N/A
7.11	Presence of labels to indicate the purpose of switchgear and protective devices (514.1.1; 514.8)	☑
8.0	**CIRCUITS**	
8.1	Adequacy of conductors for current-carrying capacity with regard to type and nature of the installation (Section 523)	☑
8.2	Cable installation methods suitable for the location(s) and external influences (Section 522)	☑
8.3	Segregation/separation of Band I (ELV) and Band II (LV) circuits, and electrical and non-electrical services (528)	☑
8.4	Cables correctly erected and supported throughout, with protection against abrasion (Sections 521, 522)	☑
8.5	Provision of fire barriers, sealing arrangements where necessary (527.2)	☑
8.6	Non-sheathed cables enclosed throughout in conduit, ducting or trunking (521.10.1; 526.8)	☑
8.7	Cables concealed under floors, above ceilings or in walls/partitions, adequately protected against damage (522.6.201, 522.6.202, 522.6.203; 522.6.204)	☑
8.8	Conductors correctly identified by colour, lettering or numbering (Section 514)	☑
8.9	Presence, adequacy and correct termination of protective conductors (411.3.1.1; 543.1)	☑
8.10	Cables and conductors correctly connected, enclosed and with no undue mechanical strain (Section 526)	☑
8.11	No basic insulation of a conductor visible outside enclosure (526.8)	☑
8.12	Single-pole devices for switching or protection in line conductors only (132.14.1; 530.3.3; 643.6)	☑
8.13	Accessories not damaged, securely fixed, correctly connected, suitable for external influences (134.1.1; 512.2; Section 526)	☑
8.14	Provision of additional protection/requirements by RCD not exceeding 30mA:	
	• Socket-outlets rated at 32 A or less, unless exempt (411.3.3)	☑
	• Supplies for mobile equipment with a current rating not exceeding 32 A for use outdoors (411.3.3)	N/A
	• Cables concealed in walls at a depth of less than 50 mm (522.6.202; 522.6.203)	N/A
	• Cables concealed in walls/partitions containing metal parts regardless of depth (522.6.202; 522.6.203)	N/A
	• Final circuits supplying luminaires within domestic (household) premises (411.3.4)	☑

8.15	**Presence of appropriate devices for isolation and switching correctly located including:**	
	• Means of switching off for mechanical maintenance (Section 464; 537.3.2)	☑
	• Emergency switching (465.1; 537.3.3)	N/A
	• Functional switching, for control of parts of the installation and current-using equipment (463.1; 537.3.1)	☑
	• Firefighter's switches (537.4)	N/A
9.0	**CURRENT-USING EQUIPMENT (PERMANENTLY CONNECTED)**	
9.1	Equipment not damaged, securely fixed and suitable for external influences (134.1.1; 416.2; 512.2)	☑
9.2	Provision of overload and/or undervoltage protection e.g. for rotating machines, if required (Sections 445, 552)	☑
9.3	Installed to minimize the build-up of heat and restrict the spread of fire (421.1.4; 559.4.1)	☑
9.4	Adequacy of working space. Accessibility to equipment (132.12; 513.1)	☑
10.0	**LOCATION(S) CONTAINING A BATH OR SHOWER (SECTION 701)**	
10.1	30 mA RCD protection for all LV circuits, equipment suitable for the zones, supplementary bonding (where required) etc.	N/A

11.0	**OTHER PART 7 SPECIAL INSTALLATIONS OR LOCATIONS**	
11.1	List all other special installations or locations present, if any. (Record separately the results of particular inspections applied)	N/A

Inspected by:

Name (Capitals) .CLIVE JENKINS.....Signature ....PC Jenkins.....Date 07/09/20

DRAFT

DISTINCTION – AM COMPLETED.

GENERIC SCHEDULE OF TEST RESULTS

DB reference no CU1
Location WORKSHOP
Z_s at DB (Ω) 0.14Ω
I_{pf} at DB (kA) 1.6KA ✓
Correct supply polarity confirmed ☑
Phase sequence confirmed (where appropriate) ☐ N/A

Details of circuits and/or installed equipment vulnerable to damage when testing
LOADS RUNNING IN.
LED LIGHTING, MACHINES

Details of test instruments used (state serial and/or asset numbers)
Continuity 116384-75.
Insulation resistance —"— N/A (116384-7c)
Earth fault loop impedance —"—
RCD N/A (116384-75)
Earth electrode resistance N/A

Tested by:
Name (Capitals) PC JENKIN
Signature C JENKIN. Date 07.09.2020

Circuit details											Test results													
		Protective device						Conductor details			Ring final circuit continuity (Ω)			Continuity (Ω) (R_1 + R_2) or R_2		Insulation Resistance Test Voltage	Insulation Resistance (MΩ)		Polarity	Z_s (Ω)	RCD		AFDD	Remarks (continue on a separate sheet if necessary)
Circuit number 1	Circuit Description 2	BS (EN) 3	type 4	rating (A) 5	breaking capacity (kA) 6	RCD $I_{\Delta n}$ (mA) 7	Maximum permitted Z_s (Ω*) 8	Reference Method 9	Live (mm²) 10	cpc (mm²) 11	r_1 (line) 12	r_n (neutral) 13	r_2 (cpc) 14	(R_1 + R_2) 15	R_2 16	V 17	Live - Live 18	Live - Earth 19	20	Maximum measured 21	Disconnection time (ms) 22	RCD test button operation 23	Manual AFDD test button operation 24	25
1	RING FINAL		B	32	6	30	1.37	B	2.5	1.5	0.6	0.6	0.97	0.38	N/A	500	>1000	>1000	✓	0.57	25	✓	N/A	
2	RADIAL CIRCUIT	50	B/C	16/20	6	–	2.37	E	2.5	1.5	N/A	N/A	N/A	0.29	N/A	500	>1000	>1000	✓	0.4	N/A	N/A	N/A	
3	LIGHTING	5	B	6	6	–	7.28	B	1.5	1.0	N/A	N/A	N/A	0.51	N/A	500	>1000	>1000	✓	0.71	N/A	N/A	N/A	
		6																						
		0																						
		9																						

61009 –

N-CPC >1000MΩ

* Where the maximum permitted earth fault loop impedance value stated in column 8 is taken from a source other than the tabulated values given in Chapter 41 of this Standard, state the source of the data in the appropriate cell for the circuit in the 'Remarks' column (column 25) of the schedule.

Commentary

The candidate demonstrates a thorough knowledge and understanding of the requirements for completing the Electrical Installation Certificate and the EIC documents produced show a good level of detail and contains very minor errors, such as distributor's facility not being ticked/shown as being acceptable on page 2.

The procedure required to effectively complete the Electrical Installation Certificate was undertaken correctly and efficiently and successfully interpreted the information gained from the inspection and testing and added into the Electrical Installation Certificate accurately.

The schedule of test results has been completed to correctly and show that they have taken extreme care in the inspection process and accurately added this to the Electrical Installation Certificate.

Task 3 – Carrying out maintenance

(Assessment themes: Health and safety, systems components, working with faults)

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

- Six completed report cards
- Assessor observations:
  - Fault diagnosis
  - Fault rectification

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

- A sample completed report card
- Assessor observations:
  - Fault diagnosis
  - Fault rectification

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

- Six completed report cards

Candidate evidence

Job card

Report sheet **One**	
Job card reference number: **RF 1 (Ring final)** (Needs to reflect the relevant fault reference, as stated in the award standards)	
Candidate name: **John James**	**Date of assessment:** **07.09.2020**

Description of work done/ tests carried out to locate fault (if any)

Carried out investigation work on the ring final circuit, as the client had informed me that the circuit protective device was not holding in the on position.
Having safely isolated the circuit, I carried out the appropriate inspection and testing procedures. Due to the nature of the fault condition, I presumed that the circuit had a short-circuit fault condition. I therefore carried out an insulation resistance test on the circuit. Before doing this, I consulted the appropriate literature (IET on-site-guide). I prepared the circuit for testing by removing all loads. Then, I set the multi-functional instrument to the correct range on the test instrument. The range set for performing insulation resistance testing MΩ.
I then undertook tests between line-neutral, line-circuit protective conductor and neutral-cpc. These tests were undertaken at the distribution board.
The following results were obtained. L-N 0.00MΩ L-CPC ≥1000MΩ N-CPC ≥1000MΩ
The results highlighted the circuit having a short circuit condition, between the line and neutral conductors.
I then had to split the ring final circuit, to try and locate the fault. Once located, I could look to rectify the faulty circuit condition.

The nature of the fault

Short-circuit condition between line and neutral conductors. Both conductors had been crushed together by the trunking lid.

Brief description including material if required to fix the fault.
Part of the ring final circuit had to be re-wired. New single-core 2.5mm cable Brown and Blue to be installed, to replace the faulty conductors. Approximately 8-10 metres.

Action required to ensure rectification is suitable.
Once the new conductors had been installed, I must conduct the following tests:
Ring final circuit continuity
Insulation resistance
Polarity
These tests must all have satisfactory results, before being able to energise the circuit and put it back into operational service.

Estimated the repairs would take approximately three days to rectify, this includes making good the after chasing out and subsequent inspection, testing and certification being issued.

Commentary

The candidate demonstrates a comprehensive knowledge and understanding of the requirements for completing a job card. The job card is clear and detailed. The process is accurate and supported by reasoning for the method taken to rectify the fault. Reporting on job cards is clear and accurate.

The candidate has made detailed logical judgements when deciding upon the best procedure based on symptoms of the fault. The procedures the candidate used are clear and methodical.

Candidate evidence

Practical Observation Form – Diagnosis and rectification of faults

Assessment ID	Qualification number
8710-353	8710 – 33
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment themes**
City & Guilds	Health and safety, systems and components, 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 –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
Fault diagnosis	Candidate used excellent interaction skills with the customer from the outset, good eye contact and body language used, and they used a strong questioning technique to gather the evidence to ascertain what may have happened to cause the circuit to fail. These included what was the last action prior to the circuit failing? Who was using the circuit? Was this how the circuit was normally used? Was any extra load added to the circuit causing it to fail? Did the fault occur when something was plugged in? Used equipment accurately and effectively to conduct electrical tests required to identify the faulty part of the circuit. Techniques carried out systematically included questioning and analysis of testing results which were completed in the correct order displaying accurate knowledge of fault-finding techniques.

Task	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
Fault rectification	Candidate implemented all the health and safety preparations required to take care of components and customer property. The candidate identified that the part of the ring final circuit required rewiring and was clearly documented what was required to carry this out. The approach to rectify the fault follows logical process and tool use was excellent resulting in a high-quality finish in repairing the fault error free and the system is operational and checked. Replaced components and materials were disposed of correctly.

Commentary

The candidate applied a high standard of knowledge and understanding when carrying out fault diagnosis and rectification. The candidate applied good interaction skills with the customer and used a strong questioning technique to help determine the cause of the fault demonstrating an excellent knowledge and understanding of electrical principles.

The candidate demonstrates a thorough understanding of the methods and techniques used to diagnose electrical faults and the diagnosis of the fault followed a logical sequence. Tests were carried out accurately first time and information interpreted correctly to rectify the fault.

The candidate shows excellent understanding of the techniques used to repair/rectify faults in relation to the component that has been identified as being faulty. They are able to select the correct tools for the task. The use of tools is excellent and re-installed components is of a high standard and is aesthetically pleasing.

The T Level is a qualification approved and managed by the Institute for Apprenticeships and Technical Education.