



City & Guilds Level 3 Technical Occupational Entry in Electrical Installations (Diploma) (2366-03)

Version 1.1 (April 2026)

Design assignment: 2366-354

Candidate Pack (Sample)

Version and date	Change detail	Section
V1.0 March 2025	Initial version	All
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1. Assessment overview

This guidance contains assessment documentation for the Level 3 Technical Occupational Entry in Electrical Installations (Diploma) (2366-03).

The assignment consists of a scenario followed by four tasks. Learners are required to: plan works, prepare a design, design an installation and carry out an initial verification of electrical works.

The assessment may be carried out over more than one session. Assessment evidence must be handed in at the end of each session.

Supervised assessment conditions

This is a controlled assessment taken under supervised conditions.

Access arrangements and reasonable adjustments

Access arrangements are adjustments that allow candidates with disabilities, special educational needs and temporary injuries to access the assessment and demonstrate their skills and knowledge without changing the demands of the assessment. These arrangements must be made before assessment takes place.

The Equality Act 2010 requires City & Guilds to make reasonable adjustments where a disabled person would be at a substantial disadvantage in undertaking an assessment.

It is the responsibility of the centre to ensure at the start of a programme of learning that candidates will be able to access the requirements of the qualification.

Please refer to the *JCQ access arrangements and reasonable adjustments and Access arrangements - when and how applications need to be made to City & Guilds* for more information. Both are available on the City & Guilds website:

<http://www.cityandguilds.com/delivering-our-qualifications/centre-development/centre-document-library/policies-and-procedures/access-arrangements-reasonable-adjustments>

2. Candidate guidance

General task guidance

Please read **all** information carefully before the assessment.

This assignment covers content from Unit 301 Scientific principles, Unit 302 Inspection, testing and commissioning of electrotechnical systems and equipment, Unit 304 Electrical design practices and procedures and Unit 305 Organising and overseeing electrical work activities in buildings.

For this assignment – **Level 3 Technical Occupational Entry in Electrical Installations (Diploma) (2366-03) – Assignment** candidates are required to complete all tasks.

Timings

The total time for completion of this assignment is **20 hours** and is broken down in the following timings:

- Task 1 – Planning works: 2 hours
- Task 2 – Design preparation: 4 hours
- Task 3 – Design: 10 hours
- Task 4 – Initial verification: 4 hours.

Plagiarism

Plagiarism is the failure to acknowledge sources properly and/or the submission of another person's work as if it were your own. Plagiarism is **not** allowed in this assignment.

This assignment is an assessment of your abilities, so the work submitted must be all your own and carried out under the conditions stated. You will be asked to sign a declaration that you have not had any help with the assignment [can be deleted as it is mentioned in the resources]. Your assessor is allowed to give you general advice, ie clarification of the task instructions. However, general advice will not:

- include any specific advice on how to improve work to meet the required standard
- provide feedback on anything missing from your work
- intervene in any way that improves the standard or presentation of work.

If there is a need to provide more than general advice, your assessor will need to record the advice they have given and take it into account when marking the submitted work.

Where research is allowed, your assessor must be able to identify which work you have done yourself, and what you have found from other sources. It is therefore important to make sure you acknowledge sources used and clearly reference any information taken from them (eg providing as a minimum a list of web addresses/books/articles etc used).

Timings and planning

You are advised to study the details of the assessment before starting.

You should check with your assessor that you have all the relevant materials, equipment and information/data sources that you need before starting the assessment.

You should take care when planning to make sure you have divided the time available between parts of the assignment tasks appropriately. Timings for tasks are provided within this pack to support with planning and time allocation.

If you have a good reason for needing more time, you will need to explain the reasons to your assessor and agree a new time for the assessment to take place. Any changes will be at the discretion of the assessor and agreed by City & Guilds.

Presentation of work

Presentation of work must be appropriate to the task, including evidence required for submission.

You should make sure that each piece of evidence, including any forms, is clearly labelled with your name and the project reference.

All electronic files must be given a clear file name that allows your assessor to identify it as your work.

Written work may be word-processed or handwritten unless stated otherwise. Calculations should be set out clearly, with all working shown, as well as any assumptions made. You should use appropriate units at all times, consistent with the requirements of the assignment.

Resources

You are required to use the reference materials detailed below:

- BS 7671
- On-Site Guide

Permitted resources

- Internet access
- IET Guidance Notes

The assessment is 'open book', and internet access for research is encouraged.

This project should be undertaken in a classroom environment, on a computer with word-processing software and internet access. As this assessment is taken under controlled conditions, there will be control measures to ensure that the work provided is that of the candidate.

- This task must be undertaken individually under controlled conditions.

- The tutor/assessor will make sure you understand the task to be undertaken.
- Following the assessment, you will be required to sign a 'Candidate Declaration of Authenticity' to confirm the work produced is your own.

Within each task, you will find the following:

- **Resources:** This provides a list of equipment, documents or tools that you will have access to, to complete the task.
- **Timing:** The duration for each task.
- **Controlled conditions:** This will tell you the rules you must follow when completing each task, for example, you must not share or discuss your work with other candidates.
- **What must be produced for grading:** This describes the evidence you must submit when the task is completed. Be aware failure to submit any evidence requested can adversely affect your overall mark for the assessment.

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3. Assignment brief

Scenario

You are tasked with planning works, preparing a design, designing an installation and carrying out an initial verification of electrical works in a large care home.

Layout of the care home

The care home consists of a ground floor with:

- a large commercial sized kitchen
- large utility room consisting of commercial tumble dryers and five commercial washing machines
- a food hall with vaulted ceilings with exposed timbers and seating facing out onto the gardens
- a reception area with a lift to the first and second floors
- a caretaker's office.

There are two garages each with electric vehicle (EV) charging points positioned inside. Cars are charged there for approximately 6 hours per day. There is also a place to charge battery mobility-scooters.

The first and second floors consist of:

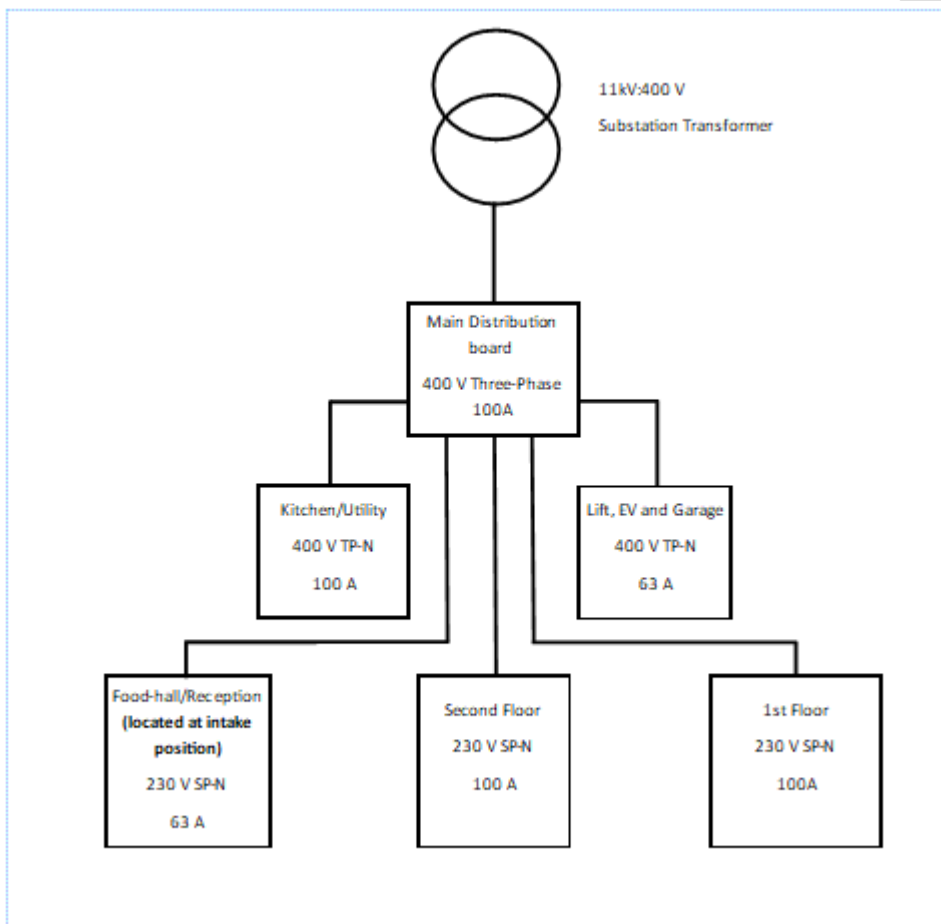
- bedrooms
- bathrooms
- smaller laundry rooms.

Electrical supply

The electrical supply is a three-phase and neutral TN-C-S 100 A per phase supply with a recorded $Z_e = 0.12 \Omega$ and a $I_{pf} = 3.3 \text{ kA}$. The incoming supply conductors are 35 mm^2 .

There are five sub-distribution circuits:

- single-phase 100 A distribution board to 1st floor
- single-phase 100 A distribution board to 2nd floor
- single-phase 63 A supplying the food hall, reception
- three-phase and neutral 63 A supplying the lift and EV and garages
- three-phase and neutral 100 A supplying the kitchen and utility rooms.



Job specification

You have been asked to plan the works, prepare a design, design an installation and carry out an initial verification of new circuits to supply the items below:

- a new three-phase mincing machine (8.5 kW) to replace a single-phase mincing machine
- a commercial three-phase dishwasher (12 kW)
- food holding unit (2 kW)
- electric Grill (3 kW)
- lighting in the food hall.

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4. Tasks

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Task 1 Planning works

You have been given the following work schedule for one of the stages of the project:

- Day 1 – site preparation for plumbers and electricians in the kitchen.
- Day 2 – first-fix tasks for plumbers and electricians.
- Day 3 – first-fix tasks for plumbers, gas installers and electricians.
- Day 4 – installation of mincing machine and dishwasher by their manufacturer.
- Day 5 – connections and second-fix for plumbers, electricians and gas installers.
- Day 6 – commissioning of equipment and circuits.

You are concerned that there is insufficient time allocated in the programme for you to complete the first-fix preparations and that you would need another half day (four hours).

Produce a report that contains:

- an explanation of the implications of this proposed delay to tasks during the project
- the factors that can influence the completion times of the project
- how any changes to the timescale during construction need to be documented
- why any changes to the timescale need to be correctly documented and communicated.

Resources

- Internet access

Timing for task

- The time allocated for this task is **two hours** (including preparation and reading time).

Controlled conditions

- This assessment is to be carried out individually, under supervised conditions.
- You must not share or discuss your work with other candidates.
- You must only work on your task in the allocated time.
- You are permitted to use the reference materials detailed above in the resources section.

What must be produced for grading

- Report

Task 2 Design preparation

(a) During the design preparation of the project, you have been asked to prepare a brief to help with the design process.

The energy bill for the site suggests a large amount of reactive power. A survey has found that the existing utilities and kitchen area had a power factor of 0.7.

The kitchen distribution board recorded the following currents during peak usage:

- $L_1 = 38 \text{ A}$
- $L_2 = 44 \text{ A}$
- $L_3 = 19 \text{ A}$

Produce a brief that:

- states the benefits of having a 400 V three-phase supply instead of a single-phase supply (this installation is a 100 A three-phase and neutral supply)
- identifies equipment that could cause the current to lag the voltage
- suggests ways of improving the power factor in the utilities and kitchen area
- describes the benefit of installing a mincing machine that is controlled via a direct-on-line starter
- explains how a direct-on-line starter is configured to provide undervoltage protection
- shows the calculation and the determination of the neutral current within the sub distribution circuit to the kitchen distribution board.

(b) You have been asked to help to explain the technical language used in relation to the refurbishment of the lighting in the food hall.

The existing lighting installation has halogen surface mounted directional spotlights with PAR30 lamps controlled by dimmer switches.

The manager has said they loved the light produced by these and described it as a 'warm glow'.

The manager also liked the smooth effect of the dimmer switches.

The proposal is to replace these with new LED fittings.

Produce a guide to:

- help understand the technical language, explaining any scientific principles behind the proposal, specifically luminance and luminous intensity
- give reasons for selecting the new LED fittings.

In the guide, you must consider:

- the relevant factors when selecting new LED fittings to achieve the same functions and light produced as the old PAR30 lamps
- whether the existing dimmers can be used with the new LED lighting and what problems may occur
- how the fitting is selected to get the correct colour output of light
- any other aspects that may help avoid glare
- the calculations used to work out Lux levels on surfaces in the room.

c) It has been mentioned that the lighting in the caretaker's office currently works for a few minutes and then trips off.

Produce an email explaining which part of the RCBO device is most likely operating and a possible cause of the problem.

Resources

- Internet access

Timing for task

- The time allocated for this task is **four hours** (including preparation and reading time).

Controlled conditions

- This assessment is to be carried out individually, under supervised conditions.
- You must not share or discuss your work with other candidates.
- You must only work on your task in the allocated time.
- You are permitted to use the reference materials detailed above in the resources section.

What must be produced for grading

- Brief
- Guide
- Email

Task 3 Design

As part of the electrical works of the care home, you need to produce a design plan for the following aspects of the project:

- a) mincing-machine circuit, to conform to BS 7671
- b) standard circuits
- c) determine the maximum demand of the existing sub-distribution circuit for the second floor.

a) Mincing machine circuit, to conform to BS 7671

- The characteristics of the mincing machine are:
 - 400 V three-phase and neutral
 - 8.5 kW
 - Power factor of 0.88
- The circuit will be wired in SWA 70 °C thermoplastic clipped direct with no grouping factors and ambient temperature is 35 °C. One internal core of the SWA will be used as the CPC
- Z_{db} for the kitchen distribution board is 0.14 Ω and I_{pf} at this board is 2.9 kA.
- The voltage drop for the sub-distribution circuit has been calculated at 1.40 V including the extra final circuit load.
- The cable will be installed horizontally on a concrete block wall from the distribution board, through the kitchen, at high level and will drop down vertically to a direct on-line starter, which will control the mincing machine.
- The length of this final circuit will be 18 m.

Design the circuit for the mincing machine in the kitchen. You should consider the following:

- suitable cable sizes, considering cost effectiveness
- circuit protective devices
- protection against shock risks
- load bearing and capacity of cable fixing
- manufacturers' recommendations
- accessibility for future maintenance
- bonding requirements for the installation
- selectivity between final circuit protective device and upstream circuit protection
- energy efficiency
- disposal of old mincing machine.

b) Standard circuits

In the food hall, the proposal is to use standard circuits from the On-Site Guide. The room dimensions are 15 m x 7 m with a vaulted wooden beam ceiling. The cables will be installed within the masonry walls using flat profile, 70°C thermoplastic twin and CPC cable.

- Design one circuit you could use to supply each of the following:
 - lighting
 - socket-outlets
 - 3 kW bain-marie
 - fire alarm panel
- Justify why you have chosen the specific circuits.

c) Determine the maximum demand of the existing sub-distribution circuit for the second floor.

The second-floor distribution board has the following circuits:

Circuit reference	Protective device rating	Circuit description
1L ₁	32 A	Ring final circuit bedrooms 1 to 4
1L ₂	32 A	Ring final circuit bedrooms 5 to 8
1L ₃	6 A	Lighting rooms 1 to 4 plus associated emergency lights
2L ₁	6 A	Lighting rooms 5 to 8 plus associated emergency lights
2L ₂	20 A	Panel heaters rooms 1 to 2
2L ₃	20 A	Panel heaters rooms 3 to 4
3L ₃	40 A	Panel heaters rooms 5 to 8

You must:

- calculate diversity using the On-Site Guide for this distribution board
- include the advantages and potential disadvantages of applying diversity factors, as given in the On-Site Guide.

Required material

- BS 7671
- On-Site Guide

Permitted resources

- Internet access
- IET Guidance Notes

Timing for task

- The time allocated for this task **10 hours** (including preparation and reading time).

Controlled conditions

- This assessment is to be carried out individually, under supervised conditions.
- You must not share or discuss your work with other candidates.
- You must only work on your task in the allocated time.
- You are permitted to use the reference materials detailed above in the resources section.

What must be produced for grading

- Design plan showing all workings, calculations and referencing.

Task 4 Initial verification

The final stage of initial verification now needs to be completed.

- a) Produce a guide that explains how to complete the initial verification of the mincing machine circuit.

You should consider:

- the purpose of initial verification in conformity to BS 7671
- the relevant statutory and non-statutory documents that could be referenced whilst undertaking the initial verification
- the test sequence
- the confirmation of readings
- the testing methods.

In the guide, produce a completed table, based on the one below, identifying **five** items that need to be inspected and what the item is being checked for:

Items to be inspected	What the item is being checked for

Required materials

- BS 7671
- On-Site Guide

Permitted resources

- Internet access
- IET Guidance Notes

Timing for the task

- The time allocated for this task is **four hours** (including preparation and reading time).

Controlled conditions

- This assessment is to be carried out individually, under supervised conditions.
- You must not share or discuss your work with other candidates.
- You must only work on your task in the allocated time.
- You are permitted to use the reference materials detailed above in the resources section.

What must be produced for grading

- Guide

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