

8202-30 Level 3 Advanced Technical Certificate in Electrical Installation

2023

Qualification Report

Contents

Introduction.....	3
Qualification Grade Distribution	4
Theory Exam.....	5
8202-531 – Electrical Installation	5
Grade Boundaries	5
Chief Examiner Commentary	7
Synoptic Assignment	11
8202-032 – Electrical Installation	11
Grade Boundaries	11
Principal Moderator Commentary	12

Introduction

This document has been prepared by the Chief Examiner and Principal Moderator; it is designed to be used as a feedback tool for centres in order to enhance teaching and preparation for assessment. It is advised that this document is referred to when planning delivery and when preparing candidates for City & Guilds Technical assessments.

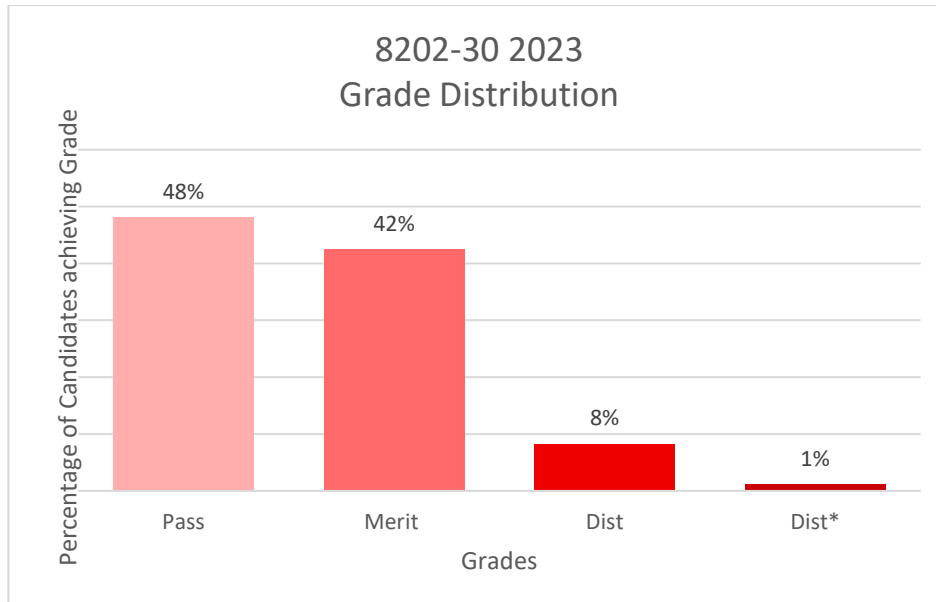
This report provides general commentary on candidate performance in both the synoptic assignment and theory exam. It highlights common themes in relation to the technical aspects explored within the assessment, giving areas of strengths and weakness demonstrated by the cohort of candidates who sat assessments in the 2023 academic year. It will explain aspects which caused difficulty and potentially why the difficulties arose.

The document provides commentary on the following assessments:

- 8202-531 – Level 3 Advanced Technical Diploma in Electrical Installation (Theory exam)
 - April 2023
 - June 2023
- 8202-032 – Level 3 Advanced Technical Diploma in Electrical Installation (Synoptic Assignment)

Qualification Grade Distribution

The approximate grade distribution for this qualification is shown below:



Please note City & Guilds will only report qualification grades for candidates who have achieved all of the required assessment components, including Employer Involvement, optional units and any other centre assessed components as indicated within the Qualification Handbook. The grade distribution shown above could include performance from previous years.

Theory Exam

8202-531 – Electrical Installation

Grade Boundaries

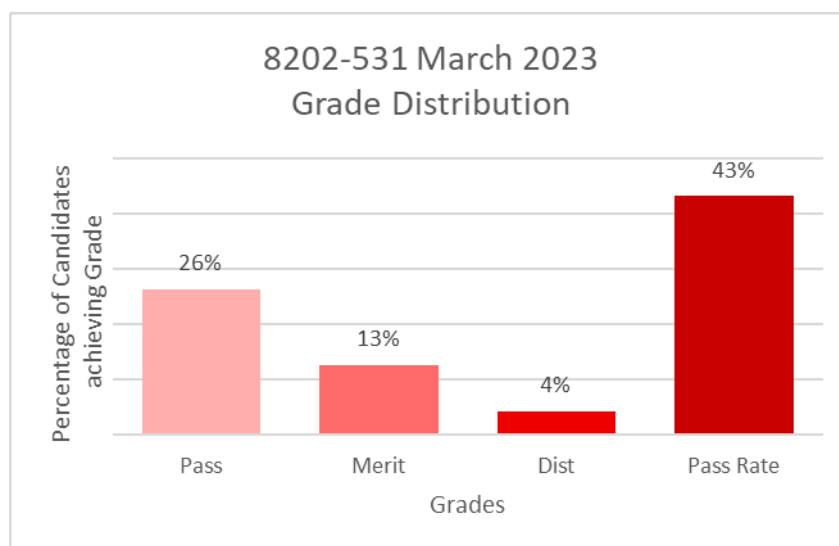
Assessment: **8202-531**

Series: **March 2023 (Spring)**

Below identifies the final grade boundaries for this assessment, as agreed by the awarding panel:

Total marks available	75
Pass mark	28
Merit mark	39
Distinction mark	50

The graph below shows the approximate distributions of grades and pass rate for this assessment:

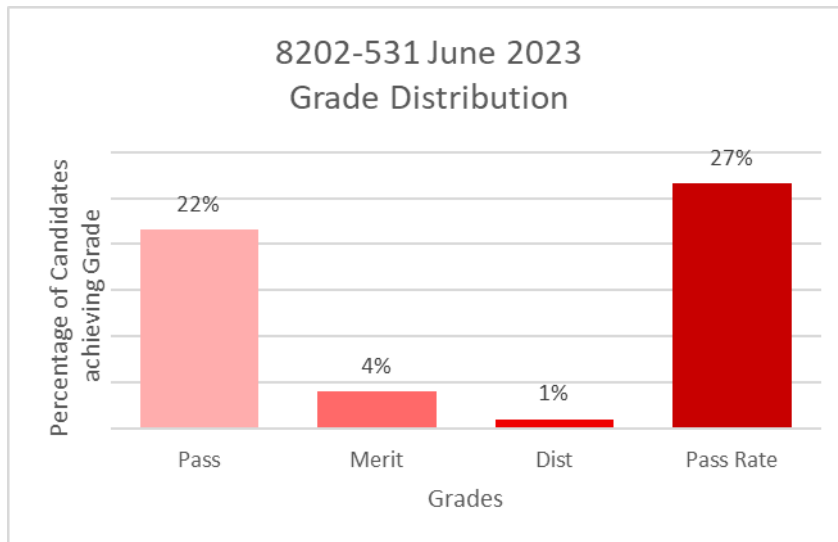


Assessment: **8202-531**
Series: **June 2023 (Summer)**

Below identifies the final grade boundaries for this assessment, as agreed by the awarding panel:

Total marks available	75
Pass mark	25
Merit mark	36
Distinction mark	47

The graph below shows the approximate distributions of grades and pass rate for this assessment:



Chief Examiner Commentary

8202-531 – Level 3 Electrical Installation – Theory Exam

Series 1 – March 2023

The March 2023 8202-531 written paper was very comparable to all series taken in 2022. The statistics indicate that overall performance of candidates for this series was below that of the spring 2022 series.

Some areas of recall were demonstrated well, but many questions requiring understanding did not score as well. It was evident however that the extended response question (ERQ) had been planned and practiced, but not always in the right way.

Most candidates were able to recall factors that cause delays to completion dates, as well as recalling instrument checks. In addition, many candidates were able to use permitted materials to research the meaning of regularly used industry acronyms. Centres should, however, remind candidates that GS 38 does not apply to a low resistance ohmmeter.

An area of recall that attracted mixed responses was on basic protection against electric shock. Candidates seemed distracted by the bathroom location given in the question and seemed to focus too much on environmental protection, such as the second number of an IP code, rather than basic protection methods.

When asked to recall types of motor controller, many responses listed types of AC motors or DC motors, so it appears that some candidates are not reading the question fully, or understanding the terminology, such as 'controller'. 'Controller' is the wording used in the scheme handbook for this topic, but it is a consideration that many may often refer to these devices as 'motor starters' instead.

Another area of recall attracting poor responses was related to the checks made to a dimmer switch as part of a functional test. Most candidates seemed to focus on either inspections carried out as part of an initial verification, such as cable insulation colours, or other tests, such as continuity. Centres are encouraged to remind candidates of keywords in questions.

Questions involving formula and calculations were generally answered very well, especially the resistance, inductance and capacitance (RLC) circuit question. Many attempted Pythagoras' theorem to determine the kVA_r of the power triangle with mixed success, mainly due to transposition.

Many candidates were able to calculate transformer ratios, but some did not score full marks for giving the answer in kilovolts as required by the question.

Candidates should be coached on aspects of examination technique such as identifying keywords and command verbs. As an example, when asked to explain the operating principle of a contactor, many candidates described where a contactor is used rather than how it operates. Had the question asked for candidates to describe uses for a contactor, or describe the purpose of a contactor, scores would have been much higher based on the responses given.

Phase sequence testing proved to be a major challenge to the majority of candidates with responses that were vague and not really relating to a motor, even though this was given in the question. Most responses were themed around polarity.

Some questions seeking understanding did attract some marks, but candidates did seem to wander off from the topic of the question. One example of this was a question relating to why clients should retain certification. Whilst many candidates vaguely mentioned future works, or some more specifically responded with them being required for periodic inspections, many

veered into giving answers such as law, without further explanation. Candidates should consider that the purpose of the certificate is to confirm aspects of that electrical installation, and what it is confirmed to.

One question asking candidates to explain why a consumer unit in a domestic installation should be made from non-combustible material such as metal scored low as many did not consider the type of building and provided answers consistent with industrial or commercial buildings. Few considered the risk of fire in dwellings specifically and factors that could make it a greater risk, such as it being in locations where people sleep, or building materials, amongst other risks that would have been accepted. Most did gain some marks for identifying that a consumer unit is an item of equipment that could cause fire due to the number and type of connections. Many responses were themed more to mechanical protection and protecting the cables.

The ERQ mainly scored band 1 and low to mid band 2 marks. The main reason for this is that candidates focussed mostly on showing a procedure from start to finish, that very little or no understanding was evidenced beyond this. It would be far better for candidates to demonstrate fuller understanding of part of a design, than showing little or no understanding of a full design. While conclusions are reached, they are often not justified, considered or evaluated. Following the procedure from start to finish involves basic recall, mainly from permitted materials, so it is important for candidates to extend beyond that.

Some responses indicated that candidates were unable to follow their prescribed set procedure as they did not have a power rating with which to calculate their design current from, or a particular load current. Instead, candidates were expected to work from an overall circuit rating of 63 A given in the drawing.

The majority of candidates also missed a major part of the question which required them to select and justify the type of cable used. Many selected a steel-wire armoured cable, as this was evident by the table used, but few stated why this would be a suitable cable. Candidates must be encouraged to read and respond to the question fully as this omission did lead to a reduction in overall marks.

Candidates must be encouraged to fully read questions before responding and to show understanding in all questions, especially ERQs, where candidates should justify why something is right or wrong by making comparisons.

Series 2 – June 2023

The June 2023 8202-531 written paper was very comparable to all series taken in 2022, as well as the March 2023 series. The statistics indicate that overall performance of candidates for this series was slightly lower than that of the spring 2023 series.

There was one item (Q4), worth three marks, that was deemed to not be in accordance with the test specification and, as a result, was omitted from the assessment. The base mark was lowered by 3 and this was taken into consideration when the grade boundaries were discussed and set.

Some areas of recall were demonstrated well, but many questions requiring understanding did not score as well. It was evident however that the ERQ had been planned and practiced, but again, not always in the right way.

Areas of strength included calculating neutral current values, calculating reactive power and power factor, recalling insulation resistance test values, as well as recalling hazardous waste materials. Although, with the latter, few were able to fully list three hazardous waste materials with most getting two correct before duplicating answers such as fluorescent tube and mercury. A common incorrect answer was “fuse” and it is assumed candidates were attempting to link asbestos to certain fuse carriers.

Some areas of recall were not responded to well and this included organisation competency cards as well as components in a UPS system.

Areas of recall that were particularly disappointing included listing examples of exposed conductive parts and listing reasons for omitting supplementary bonding from a bathroom as given in permitted materials.

Areas of understanding that were poorly demonstrated included operating principles of RCDs, principles of shaver outlets in bathrooms, and why polarity is checked in socket-outlet circuits. The question relating to polarity was not responded to well as many tried to explain how they are tested rather than why. Candidates should be encouraged to read the question at least twice and pay particular attention to the command verb in the question.

Areas of understanding that attracted particularly disappointing responses included types of circuit breaker and their uses, as well as the reason why an installation is isolated before removing the earthing conductor. These are areas of the test specification where understanding are essential skills for progression into industry. The latter example should also be particularly well understood through practical performance in centres given it is a high risk but essential activity.

One question that had five marks on offer related to arc fault detection devices (AFDDs). Generally, responses were poor for this item with most responses citing text from permitted materials rather than demonstrating understanding of the devices and how they operate. As this item was specific to the test specification relating to BS 7671 (207) rather than protective devices, the standard of responses was fully considered, given the number of marks on offer, when setting grade boundaries.

The extended response question (ERQ) was themed around a ring-final circuit supplied from a remote distribution board. The circuit was supplying a number of computers having an earth leakage current and utilised dado trunking as a containment system.

The question had several parts giving opportunities for candidates to display understanding across a wide range of the test specification but once again, the vast majority of candidates simply attempted to recite a design process. In doing so many were unable to apply correct data

or demonstrate a good understanding of circuitry. This led to most candidates being scored at band 1.

A very small number of candidates provided a discussion relating to the choice of circuit and these did show some understanding of ring-final circuits and responses linked to advantages and limitations. No candidate was able to make the link to the earth leakage and high integrity protective conductor arrangements as detailed in Section 543.7.2 in BS 7671 or section 7.5 in the IET On-site Guide.

Centres should be reminded that extended response questions are intended for candidates to display a level of understanding and simply recalling a design procedure will not attract many marks, especially when applied incorrectly, poorly justified or using incorrect data.

Candidates and Centres should also be reminded that there are strict controls on what is allowed within permitted materials for use in assessments. Clear instructions on what is permitted within publications are contained in the permitted materials document which can be downloaded from the 8202-qualification webpage here [electrotechnical permitted reference materials v2-1-pdf.ashx.pdf \(cityandguilds.com\)](https://www.cityandguilds.com/~/media/8202-qualification/8202-qualification-permitted-reference-materials-v2-1-pdf.ashx.pdf)

Synoptic Assignment

8202-032 – Electrical Installation

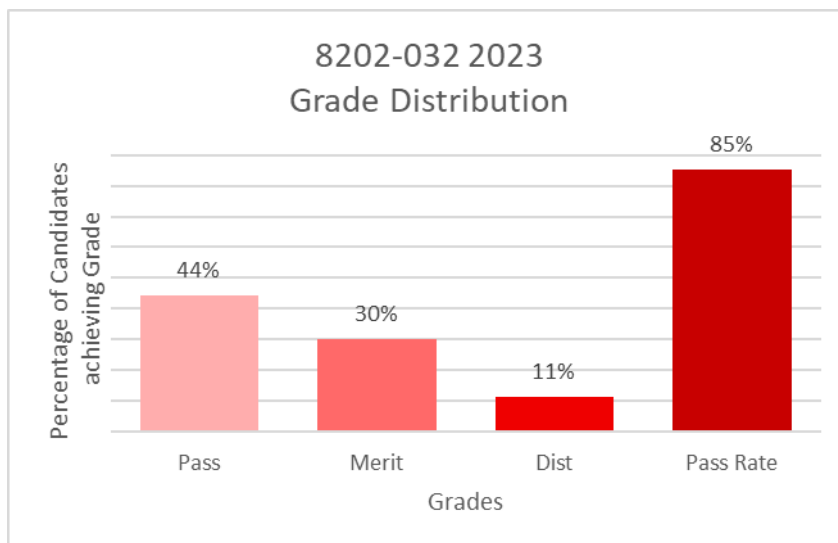
Grade Boundaries

Below identifies the final grade boundaries for this assessment, as agreed by the awarding panel:

Assessment: 8202-032
Series: 2023

Total marks available	60
Pass mark	27
Merit mark	38
Distinction mark	49

The graph below shows the approximate distributions of grades and pass rate for this assessment:



Principal Moderator Commentary

Performance of candidates, as a whole, was seen to improve this year and this is mainly due to better familiarity, recording evidence and marking by centres.

Candidates performed well across the assessment objectives (AOs) and the following points were noted:

- Materials take off sheets sometimes resembled materials lists and at times, contained costings. Even though a generic template was provided, centres or candidates chose to ignore this and produce something different from that which was required.
- Design grids were generally well attempted with generally good calculations supporting the data in the grids. Some candidates thought it necessary to change some of the pre-determined values in the grids and this is seen as acceptable, providing a justified reason and/or detailed assumption is provided.
- Methods of displaying emergency lighting was very wide ranging but this does provide good indications of candidates thought processes.
- The sub-task relating to arc fault detection devices (AFDDs) proved to be a good way to measure the research and reporting ability of candidates which can attribute towards AO1 and AO2 very well.
- Inspection and testing forms were generally well populated but there was an even split between centres using older model forms to those contained in amendment 2 of BS 7671.
- Fault reports were generally completed well, but still candidates use very poor technical terminology, referring to line conductors as lives and stating “broken wire” instead of open circuit. It was noted that some centres did not note the changes to forms this year requiring a reading where any tests were undertaken.

Centre generated evidence has vastly improved, and this is in part to familiarity and sharing good practices through centre visits by moderators. Area where improvements could be made includes the following:

- Performance observation (PO) forms still tend to state the obvious. As an example, it is common for observers to note things such as “the candidate undertook an insulation resistance test”. This is however obvious as the result is on the schedule of test results. What PO forms need to capture, as some examples, is how the candidate performed the test, i.e., was it confident (AO3), hesitant (AO3), indicating good recall (AO1) by knowing instinctively which terminals to test at or did the candidate require prompting (AO1 or AO2). Detail on PO forms need to relate to the AOs as this will vastly help marking once all tasks have been completed. PO forms for this series were different from previous series as they contained a section relating to behaviours and it was apparent that many centres had not noticed this and used older forms. Centres must always check for any changes to evidence requirements.
- Candidate record forms (CRFs) were again, often brief. The purpose of CRFs is to highlight all forms of evidence which is used to support marks against each AO. As an example, a CRF for AO could reference “good technical language in materials take-off sheet” as one item of evidence. By identifying various items of evidence on CRFs, a marker can make an informed decision on marks awarded and a moderator can also see the evidence that was used to support the marks.

It was still noticeable from some centres that marking by task is still being undertaken. This may be by aggregating marks on a spreadsheet per task or by allocating marks on PO forms. Centre must be reminded that **this must not be the method of marking** as it skews weightings per AO and disadvantages candidates through inaccurate marking and this ultimately can lead to regression of marks.