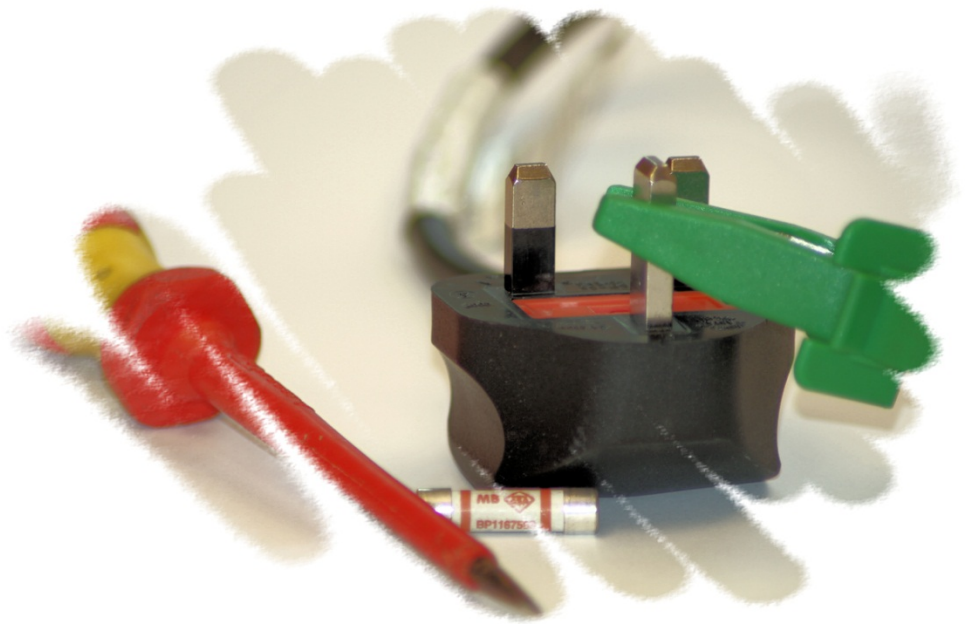


Level 3 Awards in the In-Service Inspection and Testing of Electrical Equipment (PAT) and the Management Requirements for the Maintenance of Electrical Equipment (2377)

V2.0 December 2013





Qualification at a glance

Subject area	Construction and the Built Environment
City & Guilds number	2377
Age group approved	18+
Assessment	Online Multiple Choice Test Practical Test
Fast track	Automatic Approval is available in certain cases.
Support materials	Centre handbook Assessment pack
Registration and certification	Consult the Walled Garden/Online Catalogue for last dates

Title and level	City & Guilds number	Accreditation number
Level 3 Award in the In-Service Inspection and Testing of Electrical Equipment (PAT)	2377-22	600/3597/3
Level 3 Award in the Management Requirements for the Maintenance of Electrical Equipment	2377-32	600/3528/6

Version and date	Change detail	Section
1.1 Mar 2012	Amended UAN for Unit 101/102	Structure and Units
1.2 June 2012	Clarification of test specification	Assessments
1.3 April 2013	Approved age group changed	Qualification at a glance
	Minor amendment to assessment criteria 2.1 in unit 101/102	Units
1.4 October 2013	New UAN and new Unit number for Unit 101/102, now unit 301/302	Structure and Units
	Test specification for Unit 101/102 amended, now unit 301/302	Assessments
	Range has been amended for AC 3.1 in 301/302	Units
	AC 5.11 has been taken out in 301/302	Units
2.0 December 2013	Change City & Guilds unit numbers 301 and 302 to 601 and 602.	Structure and Units



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1 Introduction

This document tells you what you need to do to deliver the qualifications:

Area	Description
Who are the qualifications for?	These qualifications are aimed at those with administrative responsibilities for the maintenance of electrical equipment and for those undertaking practical inspection and testing of electrical equipment. It also allows those with an administrative responsibility for the testing and inspection of electrical equipment to gain a qualification suitable to their job role.
What do the qualifications cover?	They allow candidates to learn, develop and practise the skills required to test portable electrical appliances with the Code of Practice for In-Service Inspection and Testing of Electrical Equipment. If you already work as an electrician it will add another string to your bow and can help you move up in the industry.
Who did we develop the qualification with?	The qualifications are endorsed by SummitSkills the Sector Skills Council for the building services engineering sector.
What opportunities for progression are there?	They allow candidates to progress into employment or to the following City & Guilds qualifications: <ul style="list-style-type: none">• Level 3 Award in the Requirements Electrical Installations BS 7671 (2382)• Level 3 Award in the Initial Verification and Certification of Electrical Installations (2394)• Level 3 Award in the Periodic Inspection, Testing and Certification of Electrical Installations (2395)• Level 4 Award in the Design and Verification of Electrical Installations (2396)

Structure

To achieve the **Level 3 Award in the In-Service Inspection and Testing of Electrical Equipment (PAT)**, learners must achieve **4** credits from the **mandatory** unit 601/602.

Unit accreditation number	City & Guilds unit	Unit title	Credit value
K/505/0183	601/602	In-service inspection and testing of electrical equipment (PAT)	4

To achieve the **Level 3 Award in the Management Requirements for the Maintenance of Electrical Equipment**, learners must achieve **4** credits from the **mandatory** unit 201.

Unit accreditation number	City & Guilds unit	Unit title	Credit value
A/503/5347	201	Management requirements for the maintenance of electrical equipment	4



2 Centre requirements

Approval

If your Centre is approved to offer the qualification Level 3 Certificate in Management of Electrical Equipment Maintenance (2377-11) you will receive automatic approval to run the Level 3 Award in the Management Requirements for the Maintenance of Electrical Equipment (2377-32). If you are approved to run the Level 3 Certificate for the Inspection and Testing of Electrical Equipment (2377-12), you will receive automatic approval to run the Level 3 Award in the In-service Inspection and Testing of Electrical Equipment (PAT) (2377-22).

To offer these qualifications, new centres will need to gain both centre and qualification approval. Please refer to the *Centre Manual - Supporting Customer Excellence* for further information. Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualifications before designing a course programme.

Resource requirements

Physical resources

Centres must adhere to the most recent version of the IEE Code of Practice for In-Service Inspection and Testing of Electrical Equipment published by the Institute of Engineering and Technology (IET) when delivering these qualifications.

The candidate should also have access to the following equipment:

- Portable appliance equipment
- A minimum of one Class 1 (eg. iron, traditional kettle, toaster) and one Class 2 (eg. vacuum cleaner, double insulated electric drill) piece of equipment to be tested.
- Standard electrician toolkit.

Centre staffing

Staff delivering these qualifications must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be technically competent in the areas for which they are delivering training and/or have experience of providing training. This knowledge must be to the same level as the training being delivered
- hold qualifications in the management and competence in inspection and testing.
- have credible experience of providing training.

Centre staff may undertake more than one role, eg tutor and assessor or internal verifier, but cannot internally verify their own assessments.

Assessors and internal verifiers

Assessor/Verifier (A/V) units are valued as qualifications for centre staff, but they are not currently a requirement for the qualifications.

Continuing professional development (CPD)

Centres must support their staff to ensure that they have current knowledge of the occupational area, that delivery, mentoring, training, assessment and verification is in line with best practice, and that it takes account of any national or legislative developments.

Candidate entry requirements

City & Guilds does not set entry requirements for these qualifications. However, centres must ensure that candidates have the potential and opportunity to gain the qualifications successfully.

It is expected that candidates attempting either qualification should be familiar with electrical systems and hazards of electricity in order to satisfactorily complete these qualifications.

Level 3 Electrotechnical NVQ is the qualification that indicates to industry an individual is qualified. These qualifications are designed to provide expertise and focus on IEE's Code of Practice for In-Service Inspection and Testing of Electrical Equipment.

Without evidence of formal qualifications, candidates must be able to demonstrate adequate prior knowledge and expertise to ensure they have the potential to successfully gain the qualifications. Centres are required to conduct a practical test to evaluate the candidate's ability to undertake electrical inspection and testing in a competent manner for the inspection and testing qualifications.

Age restrictions

City & Guilds cannot accept any registrations for candidates under 18 as these qualifications are not approved for under 18s.



3 Delivering the qualification

Initial assessment and induction

An initial assessment of each candidate should be made before the start of their programme to identify:

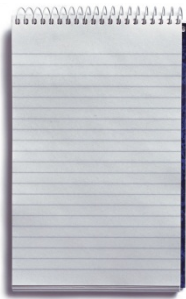
- if the candidate has any specific training needs
- support and guidance they may need when working towards their qualification
- the appropriate type and level of qualification.

We recommend that centres provide an induction programme so the candidate fully understands the requirements of the qualifications, their responsibilities as a candidate, and the responsibilities of the centre. This information can be recorded on a learning contract.

Support materials

The following resources are available for these qualifications:

Description	How to access
Exam Success IEE Code of Practice	learningmaterials@cityandguilds.com



4 Assessment

Candidates must:

- successfully complete one online multiple choice test for each mandatory unit
- successfully complete one practical test covering learning outcome 7 of the in-service inspection and testing of Electrical Equipment

City & Guilds has written the following assessments to use with this qualification:

- online multiple choice tests, using e-volve
- practical test

Test specifications

The way the knowledge is covered by each test is laid out in the table[s] below:

Test 1: Unit 601/602 (Online multiple choice)

Duration: 1 hour 45 mins

Unit	Outcome	Number of questions	%
601/602	1 Understand the statutory and non-statutory requirements relevant to the management of electrical equipment maintenance	6	12
	2 Understand the electrical units of measurement associated with in-service inspection and testing of electrical equipment	3	6
	3 Understand how equipment construction and classification reduces the risk of electric shock	11	22
	4 Understand the procedures for the in-service inspection and testing of electrical equipment	8	16
	5 Understand how to carry out combined inspection and testing	18	36
	6 Understand the information contained in documentation in-service inspection and testing of electrical equipment	4	8
	Total	50	100

Test 1: Unit 201 (Online multiple choice)

Duration: 1 hour 20 mins

Unit	Outcome	Number of questions	%
201	1 Understand the statutory and non-statutory requirements relevant to the management of electrical equipment maintenance	11	27.5
	2 Understand how equipment construction and classification reduces the risk of electric shock	11	27.5
	3 Understands the requirements for the inspection and testing procedures for electrical equipment	8	20
	4 Understand the audit and documentation procedures for the management and in-service inspection and testing of electrical equipment	5	12.5
	5 Understand the training that is required for managers, inspectors and users of electrical equipment	5	12.5
	Total	40	100

Please note that the online tests are open book. Learners are permitted to take the following into the test:

- IET code of practice for In-Service Inspection and Testing of Electrical Equipment.
- A non-programmable calculator.



5 Units

Availability of units

They are also on The Register of Regulated Qualifications:
<http://register.ofqual.gov.uk/Unit>

Structure of units

These units each have the following:

- City & Guilds reference number
- unit accreditation number
- title
- level
- credit value
- guided learning hours
- unit aim
- relationship to NOS, other qualifications and frameworks
- endorsement by a sector or other appropriate body
- information on assessment
- learning outcomes which are comprised of a number of assessment criteria

Unit 601/602 In-service inspection and testing of electrical equipment (PAT)

UAN:	K/505/0183
Level:	3
Credit value:	4
GLH:	35
Endorsement by a sector or regulatory body:	This unit is endorsed by SummitSkills the Sector Skills Council for the building services engineering sector.
Aim:	The aim of this unit is to enable the candidate to undertake practical inspection and testing of electrical equipment

Learning outcome
The learner will: 1. understand the statutory and non-statutory requirements relevant to the management of electrical equipment maintenance
Assessment criteria
The learner can: 1.1 specify the requirements of statutory and non-statutory acts and regulations in relation to maintenance of electrical equipment 1.2 state the scope of legislation with regard to the system voltage 1.3 identify premises to which the Acts and Regulations apply 1.4 identify the guidance given by the Health and Safety Executive relating to electrical equipment 1.5 explain the legal requirement to maintain electrical equipment in a safe condition 1.6 state the reasons for inspecting and testing electrical equipment and systems 1.7 identify the scope of the code of practice for the in service inspection and testing of electrical equipment

Learning outcome
The learner will: 2. understand the electrical units of measurement associated with in-service inspection and testing of electrical equipment
Assessment criteria
The learner can: 2.1 identify SI units of measurement in relation to electrical equipment inspection and testing 2.2 identify the multiples and sub multiples of SI units

Learning outcome

The learner will:

3. understand how equipment construction and classification reduces the risk of electric shock.

Assessment criteria

The learner can:

- 3.1 Identify the **types** of electrical equipment:
- 3.2 state the **classification** of equipment construction:
- 3.3 identify relevant construction and identification marks
- 3.4 state how electric shock occurs
- 3.5 state **methods** used to reduce the risk of electric shock from equipment
- 3.6 state how equipment construction protects against electric shock
- 3.7 explain the **effects** of conductor resistance
- 3.8 identify **situations** that require the use of RCDs

Learning outcome

The learner will:

4. understand the procedures for the in service inspection and testing of electrical equipment

Assessment criteria

The learner can:

- 4.1 identify the **types** of in-service inspection and testing
- 4.2 state the **factors** which determine the initial frequency of inspecting and testing
- 4.3 identify the initial frequencies of inspection and testing of equipment
- 4.4 specify what needs to be considered when carrying out a **formal visual inspection.**

Learning outcome

The learner will:

5. understand how to carry out combined inspection and testing

Assessment criteria

The learner can:

- 5.1 identify tests that are suitable for the different types and classifications of in service equipment
- 5.2 identify the range of test instruments that can be used for testing electrical equipment
- 5.3 explain the need for test instruments to be calibrated and in good working order
- 5.4 calculate the resistance of the flexible cable conductors and protective conductors
- 5.5 specify how to carry out **earth continuity testing**
- 5.6 specify how to carry out insulation resistance testing
- 5.7 specify how to carry out the protective conductor/touch current test
- 5.8 specify how to carry out polarity checks.
- 5.9 specify how to carry out functional and load checks

<p>5.10 describe the requirement for testing RCDs incorporated into extension leads and multi-way adaptors</p> <p>5.11 specify the requirements for testing appliance cord sets</p> <p>5.12 specify the particular requirements for equipment that has a high protective conductor current.</p> <p>5.13 interpret results that come from testing</p>
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Learning outcome
The learner will:
6. understand the information contained in documentation in-service inspection and testing of electrical equipment.
Assessment criteria
The learner can:
6.1 explain the purpose of in service inspection and testing documentation
6.2 specify the actions to be taken with damaged or faulty equipment
6.3 state why records should be kept throughout the lifetime of the equipment

Learning outcome
The learner will:
7. be able to inspect and test items of electrical equipment.
Assessment criteria
The learner can:
7.1 inspect and test items of hand held or portable electrical equipment to current industry standards
<ul style="list-style-type: none"> • Class I • Class II incorporating unearthed metal
7.2 complete appropriate documentation
<ul style="list-style-type: none"> • VI.1 Equipment register • VI.2 Equipment formal visual and combined inspection and test record. • label

Range
Statutory and non-statutory acts and regulations
The Health and Safety at Work Act, The Management of Health and Safety at Work Regulations, The Provision and Use of Work Equipment Regulations, The Electricity at Work Regulations, The Workplace (Health, safety & welfare) Regulations, BS7671
Units of measurement
Ohm (Resistance and Impedance), Watt (Power), Hertz (Frequency), Currency (Ampere), Volt
Units
Mega, kilo, milli

Types (LO3)

Portable, moveable/transportable, hand held, stationary, fixed, built in, I.T, extension leads and RCD extension leads, multi-way adaptors and RCD adaptors,

Classifications

Class I, Class II, Class III, Class O, Class OI

Method

Insulation, barriers and enclosures, earthing of equipment, over current protection, RCDs, SELV

Effects

CSA, length, disconnection times

Situations

In relation to:

Equipment, appliances, extension leads, multi-way adaptors

Types (LO4)

User checks – including items which the user should check before use

Formal visual inspection, combined inspection and testing

Factors

The environment, the users handling, equipment construction, the equipment type

Formal visual inspection

- preliminary inspection procedures
- suitability of electrical equipment for the environment (including IP coding)
- suitability of the electrical equipment for its intended use
- evidence of care and correct use of the equipment and connecting cable or lead
- isolation of the equipment from the supply prior to inspection including:
 - the means of isolation is accessible
 - isolating of certain items of equipment (such as: IT and uninterruptible power supplies UPS)
- adequacy of the fixed installation to supply the electrical appliance:
 - damaged/overloaded accessories – socket outlets etc
 - advise on the needs to have fixed installation regularly inspected
- requirements for inspecting BS1363 plugs including the two general BS1362 fuse sizes (3A and 13A)
- the general condition of the equipment and connecting cable or lead (overheating etc)
- particular requirements of cables, leads and extension leads

including the correct cross sectional area (CSA) mm²

- ensuring the requirements of the Plugs and Sockets etc (Safety) Regulations 1994 are met

Earth continuity testing

Using the 'hard and soft' test methods

Documentation

- an equipment register
- an equipment formal visual and combined inspection and test record
- equipment labels
- repair register
- faulty equipment register
- interpretation of results

Actions

Calibration, test instrument records

Unit 201

Management requirements for the maintenance of electrical equipment

UAN:	A/503/5347
Level:	3
Credit value:	4
GLH:	35
Endorsement by a sector or regulatory body:	This unit is endorsed by SummitSkills the Sector Skills Council for the building services engineering sector.
Aim:	This unit gives those with responsibilities for the maintenance of electrical equipment an understanding of the practical application of their safety obligations

Learning outcome
The learner will: 1. understand the statutory and non-statutory requirements relevant to the management of electrical equipment maintenance
Assessment criteria
The learner can: 1.1 specify the requirements of statutory and non statutory acts and regulations in relation to maintenance of electrical equipment 1.2 state the scope of legislation with regard to the system voltage 1.3 identify premises to which the Acts and regulations apply. 1.4 identify the guidance given by the Health and Safety Executive relating to electrical equipment 1.5 explain the legal requirement to maintain electrical equipment in a safe condition 1.6 state the reasons for inspecting and testing electrical equipment and systems 1.7 identify the scope of the code of practice for the in service inspection and testing of electrical equipment

Learning outcome
The learner will: 2. understand how equipment construction and classification reduces the risk of electric shock
Assessment criteria
The learner can: 2.1 identify the types of electrical equipment 2.2 state the classification of equipment construction 2.3 identify relevant construction and identification marks 2.4 state how electric shock occurs 2.5 state how basic and fault protection is used to prevent electric shock 2.6 state how equipment construction protects against electric shock

Learning outcome
The learner will: 3. understand the requirements for the inspection and testing procedures for electrical equipment
Assessment criteria
The learner can: 3.1 identify the types of in-service inspection and testing 3.2 identify the factors which determine the initial frequency of inspecting and testing 3.3 identify the in-service inspections and tests that are required. 3.4 identify instruments that are suitable for testing electrical equipment

Learning outcome
The learner will: 4. understand the audit and documentation procedures for the management and in-service inspection and testing of electrical equipment
Assessment criteria
The learner can: 4.1 explain the purpose of in service inspection and testing documentation 4.2 explain the reason for maintaining test instruments 4.3 specify the actions to be taken with damaged or faulty equipment 4.4 state the action to be taken with repaired equipment prior to being returned to service 4.5 state why records should be kept throughout the lifetime of equipment

Learning outcome
The learner will: 5. understand the training that is required for managers, inspectors and users of electrical equipment.
Assessment criteria
The learner can: 5.1 identify the training requirements for users of equipment 5.2 identify the training requirements for managers 5.3 state the level of competency required for inspectors

Range
<p>Statutory and non-statutory acts and regulations The Health and Safety at Work Act, The Management of Health and Safety at Work Regulations, The Provision and Use of Work Equipment Regulations, The Electricity at Work Regulations, The Workplace (Health, safety & welfare) Regulations, BS7671</p> <p>Types Portable, moveable/transportable, hand held, stationary, fixed, built in, I.T, extension leads and RCD extension leads, multi-way adaptors and RCD adaptors, microwave ovens</p> <p>Classifications Class I, Class II, Class III, Class O, Class OI</p> <p>Documentation An equipment register; and having a control system for electrical equipment in the workplace, an equipment formal visual and combined inspection and test record, equipment labels, faulty equipment register</p> <p>Reason Calibration, test instrument records</p> <p>Training requirements for users of equipment Visually inspecting the equipment prior to use, checking the suitability of the equipment for the environment and the job, reporting faults or suspected faults, the safe use of equipment</p> <p>Training requirements for managers Undertake risk assessment in the workplace, maintain records of electrical maintenance, interpret the results of electrical tests</p>



Appendix 1 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on **www.cityandguilds.com**.

Centre Manual - Supporting Customer Excellence contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification, as well as updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document includes sections on:

- The centre and qualification approval process
- Assessment, internal quality assurance and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Management systems
- Maintaining records
- Assessment
- Internal quality assurance
- External quality assurance.

Our Quality Assurance Requirements encompasses all of the relevant requirements of key regulatory documents such as:

- Regulatory Arrangements for the Qualifications and Credit Framework (2008)
- SQA Awarding Body Criteria (2007)
- NVQ Code of Practice (2006)

and sets out the criteria that centres should adhere to pre and post centre and qualification approval.

Access to Assessment & Qualifications provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information such on such things as:

- **Walled Garden:** how to register and certificate candidates on line
- **Qualifications and Credit Framework (QCF):** general guidance about the QCF and how qualifications will change, as well as information on the IT systems needed and FAQs
- **Events:** dates and information on the latest Centre events
- **Online assessment:** how to register for e-assessments.

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Useful contacts

UK learners General qualification information	T: +44 (0)844 543 0033 E: learnersupport@cityandguilds.com
International learners General qualification information	T: +44 (0)844 543 0033 F: +44 (0)20 7294 2413 E: intcg@cityandguilds.com
Centres Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: centresupport@cityandguilds.com
Single subject qualifications Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 F: +44 (0)20 7294 2404 (BB forms) E: singlesubjects@cityandguilds.com
International awards Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: intops@cityandguilds.com
Walled Garden Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: walledgarden@cityandguilds.com
Employer Employer solutions, Mapping, Accreditation, Development Skills, Consultancy	T: +44 (0)121 503 8993 E: business@cityandguilds.com
Publications Logbooks, Centre documents, Forms, Free literature	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413

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City & Guilds Group

The City & Guilds Group operates from three major hubs: London (servicing Europe, the Caribbean and Americas), Johannesburg (servicing Africa), and Singapore (servicing Asia, Australia and New Zealand). The Group also includes the Institute of Leadership & Management (management and leadership qualifications), City & Guilds Land Based Services (land-based qualifications), the Centre for Skills Development (CSD works to improve the policy and practice of vocational education and training worldwide) and Learning Assistant (an online e-portfolio).

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City & Guilds
1 Giltspur Street
London EC1A 9DD
T +44 (0)844 543 0000
F +44 (0)20 7294 2413
www.cityandguilds.com

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