

TECHNICAL TRAINING SOLUTIONS

ELECTRICAL COURSES

INSTRUMENTATION COURSES

MECHANICAL COURSES



C&G 2391

ELECTRICAL INSPECTION AND TESTING

COURSE 340: 4 DAYS: Max 8 Candidates

Aimed at electrical personnel who either carry out or supervise the testing and inspection of installations, this course is designed for candidates who require the City & Guilds 2391 qualification. Most importantly, participants gain the skills and knowledge necessary to actually perform the inspection and testing procedures. The course also satisfies the NICEIC & ECA requirements for Qualified Supervisor status. The course incorporates a practical assessment and a theory examination.

PARTICIPANTS

Prospective candidates should have recently completed the IET Wiring Regulations (City & Guilds 2382) qualification, course 310.

COURSE PRESENTATION

The emphasis is on achieving success and Technical Training pride themselves on their success rate in the examinations. Participants are able to practice on purpose-built training rigs of simulated electrical installations. Full course documentation is provided.

PRACTICAL

During the course, candidates learn how to inspect and test using training rigs that simulate real electrical installations, using the test equipment provided or their own.

Candidates then complete the C&G practical assessment.

THEORY

During the course, candidates learn about the complex background technical information concerning the many issues associated with inspection and testing. Many practical examples of the types of questions that might come up in the examination are provided and advice on how these should be answered is provided.

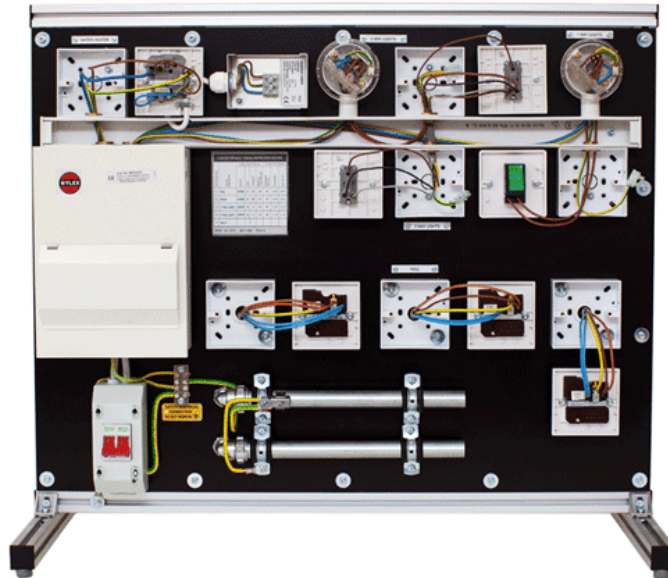
Candidates then complete the C&G theory examination.

Successful completion of the course leads to the City & Guilds 2391-52: Level 3 Award in the Initial & Periodic Inspection and Testing of Electrical Installations.

What do candidates on the 2391 Electrical Inspection and Testing courses actually do?

PRACTICAL INSPECTION AND TESTING

We begin by looking at how electrical installations should be visually inspected, bearing in mind the type of inspection (minor works, periodic, or initial verification) required. Candidates are provided with course notes to guide them. Candidates go through the long list of inspection items that should be checked, practicing this on demonstration boards that we have specially designed for the course.



One of the simulated electrical installations used on the course

The course then looks at the required testing, and again we have specially designed practice boards that the candidates perform the testing on. These boards are also used for the live tests.



One of the simulated electrical installations used on the course

In order to perform the tests we use a range of industrial test instruments. To begin with we prefer individual test instruments for the testing (rather than multifunction types) as we find the candidates get used to these more easily at this stage of their training.



One of the continuity and insulation resistance testers used on the course



One of the earth fault loop impedance testers used on the course



One of the RCD testers used on the course

As well as the above testers we also like to get the candidates to use other types, or even encourage them to bring their own testers along.

We're quite keen on multi-function testers although some candidates can find these a bit daunting to begin with so we allow the candidates to choose which types they feel most comfortable with.



One of the earth fault loop impedance testers used on the course



One of the Multi-Function testers used on the course

The candidates are also taught how to correctly complete the IET paperwork - an important part of the 2391 assessment - so we give them the opportunity to practice this too. Below is one of our voltage testers and proving units used on the 2391 course and an example of some of the IET paperwork that one of our candidates completed:

[illegible]

An example of one sheet of the IET paperwork that candidates on the electrical inspection and testing course complete

The half-day practical assessment takes place during the course (normally on the third day). The practical assessment is conducted on specially-designed rigs which simulate a real electrical installation. The following is the board used for this assessment, on which candidates have to safely isolate and test for dead, perform a full inspection and test (consisting of an initial verification and a periodic test) and complete all the necessary IET paperwork as they proceed:



The C&G approved assessment rig used for the practical assessment

The assessment rig is subdivided into two parts so that both scenarios (a new installation and an existing one) are covered by the assessment. The candidates therefore have to produce the certificates that relate to both initial verification and periodic inspection, and the accompanying inspection and test results schedules. These should all be completed in their correct context, so that for example, the visual inspection would produce C codes for any faults found in the periodic testing but no faults could be reported within the initial verification.

The other parts of the C&G 2391 practical assessment are 1) A series of 14 short answer written questions, which the candidates need to complete on their own, for example: "Describe what is meant by IP2X" and 2) A set of photographs depicting various electrical faults for which they need to identify the fault and allocate it the appropriate C coding: for example one is a photograph of a metal light fitting that doesn't appear to be earthed and they would be expected to identify the fault, describe the danger and allocate it the correct C code.

Our examination rigs (and all the practice boards shown above) are all specially constructed so that they can be moved around the UK and beyond to provide the inspection and testing course on employers' premises.

Below is one of our C & G assessment record sheets and an example of one of the candidates' completed test results schedules:

City & Guilds Assessment Record															
Technical Solutions		Centre Number (66095)		Course Ref/Number											
2011-102 Practical Application of the Application of the Inspection, Testing and Certification of Electrical Installations.															
		Candidate													
		1	2	3	4	5	6	7	8	9	10	11	12		
Practical 1	Insulation Inspection	P	P	P	P	P	P	P	P	P	P	P	P		
Practical 2	Insulation resistance test	P	P	P	P	P	P	P	P	P	P	P	P		
Practical 3	Phase earth loop impedance test	P	P	P	P	P	P	P	P	P	P	P	P		
Practical 4	Periodic inspection report	P	P	P	P	P	P	P	P	P	P	P	P		
Candidate Name	Candidate (Ref No)	Overall Result	Big Ref	Comments (feedback given to candidate, (Course overall)									Date		
1		P	P	A	S										
2		P	P	A	S										
3		P	P	A	S										
4		P	P	A	S										
5		P	P	A	S										
6		P	P	A	S										
7		P	P	A	S										
8		P	P	A	S										
9		P	P	A	S										
10		P	P	A	S										
11		P	P	A	S										
12		P	P	A	S										
Internal Verifier Comments	Date	External Verifier Comments									Date				

Form 1
SCHEDULE OF TEST RESULTS
 Component: TT2 electrical
 Test Date: 23/4/99
 Technician: Narvech /Hobbs
 Signature: MCSmith
 Method of protection against indirect contact: ET&BS
 Equipment vulnerable to testing: Domestic Air-Run consumer unit 2

Address: London
 Type of Supply: Ph & N
 Is an energy 0.6 area
 Why: 1.1
 Estimated
 New expenditure: £550/253
 Continuity: £540
 Protection: £390
 RCD tester: 12487

Description of test: 230V inspection & testing rig - distribution board 1.

Circuit Description	Overcurrent Device		Wiring Conditions	Test Results													
	Break circuit ampere 30 kA	Rating % A		Type	Insulation	Polarity	Continuity	Resistance	Earth Fault Loop Impedance	RCD	Functional Testing	Remarks					
													1	2	3	4	5
Washer heater	1	10	2.5	10	0.04	—	—	—	—	—	—	—	—	—	—	—	—
Switches	8	12	2.5	1.5	0.4	0.3	—	—	—	—	—	—	—	—	—	—	—
Consumer unit 2	8	3	32	32	0.02	—	—	—	—	—	—	—	—	—	—	—	—
3 phase washer heater	3	10	2.5	0.04	0.23	—	—	—	—	—	—	—	—	—	—	—	—

Insulations from Wiring Regulations and special rules:

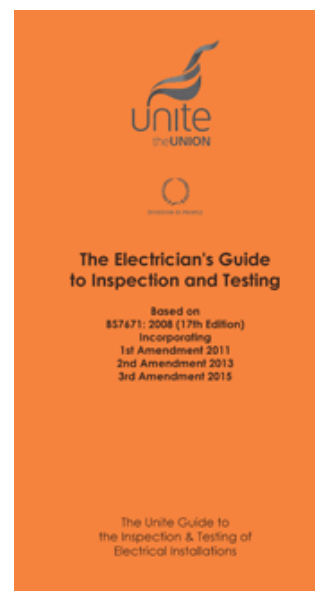
Notes

One of the IET forms completed by our candidates

The above assessment is quite a difficult task for many candidates (particularly those who do not have much practical experience of inspection and testing) but we find that our candidates do quite well in this assessment as they pick up all the necessary skills and understanding in the 2 days of the course that precede it.

During the practical part of the 2391 course, candidates are issued with the electricians guide to inspection and testing book and quick-reference 'crib' sheets.

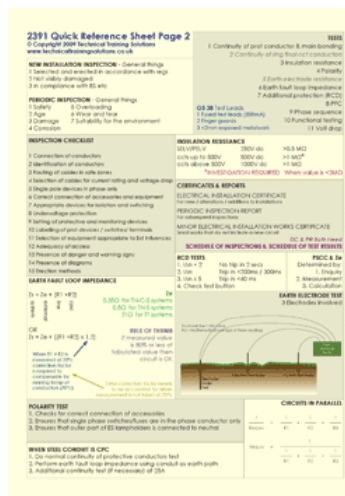
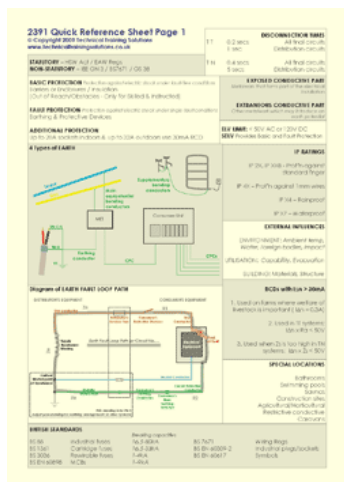
The electricians guide book contains all the most useful reference material about inspection and testing of electrical installations. The quick-reference crib sheets contain all the most important information that they need for the theory examinations.



Candidates on the course are given their own copy of our electricians guide book to keep

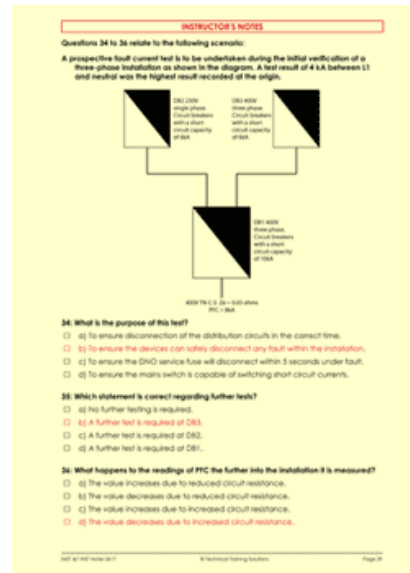
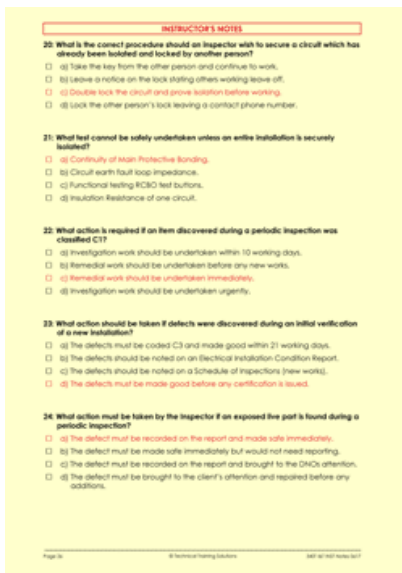
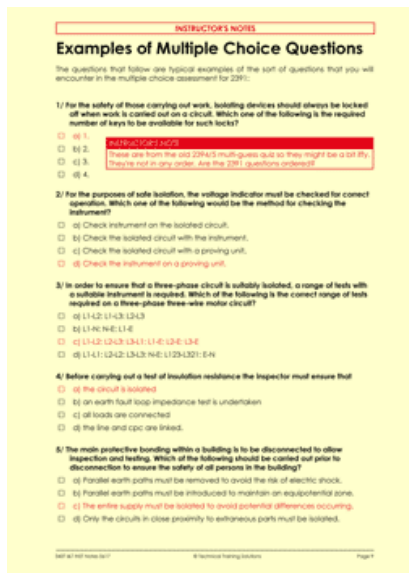
THEORY of INSPECTION AND TESTING

In this part of the course candidates are briefed on the quick reference sheets. These help them to revise for the examination. The following are examples of the quick-reference revision sheets.



The reference sheets which help to prepare candidates for the exam

We then work through the course notes which have several examples of recent C&G exam papers. We suggest the best possible answers that they can give whilst discussing the technical issues. To help prepare candidates for the theory examination we study a comprehensive set of typical questions that they may encounter. Some of these are shown in the following extracts from the course notes:



Some example pages from the course notes for the electrical inspection and testing course giving demo questions on the legal issues, calculations and formulae and measured values which candidates have to perform calculations on to determine if the circuits are compliant or not. These pages are from the instructor's version of the course notes so the correct answers are already marked (in red). Of course the candidates would have to select their own answers.

The theory examination usually takes place on the afternoon of the last day of the course. It is a computer-based multiple-choice examination. The candidates are allowed two hours and there are 60 questions. It's an open-book test, so the candidates can refer to the wiring regs or the on site guide books during the exam.

Some employers prefer that candidates learn about inspection and testing of electrical installations without having to undergo the City & Guilds examinations: Please call us if you would like to discuss this.

If you would like to see some of the equipment used on the electrical inspection and testing course for yourself, then please call us to arrange a visit to our offices in Kent. Alternatively, we can visit you anywhere in the British Isles.



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