

Level 2 NVQ in Installing Electrotechnical Systems

2356

Scheme information and assessment
requirements

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Introduction

Electrotechnical NVQs

This guide aims to provide information to centres and candidates for the administration and assessment of the Level 2 National Vocational Qualification (NVQ) for the Electrotechnical Sector. It provides details of the requirements specific to this NVQ qualification which includes

- the requirements for occupational competence for all those involved in assessing and verifying performance
- specific assessment requirements

The National Occupational Standards are included on this CD-ROM.

There are four sections to the Guide.

Section 1	Scheme information
Section 2	Assessment requirements
Section 3	National occupational standards
Section 4	Evidence profiles

The first section contains information on who will benefit from the awards and the structure and scope of the NVQ. The second section gives the specific information on assessment and evidence requirements.

This document is designed to be used in conjunction with:
the *NVQ Candidate Guide* (stock reference TS-11-0001) on this CD-ROM
and
the *NVQ Centre Guide* (stock reference EN-11-0001) on this CD-ROM.

Check the City & Guilds website: www.city-and-guilds.co.uk, for latest version.

Packs of multiple copies of the recording forms are also available from Publications Sales (Recording forms for NVQs, stock reference TS-22-0001).

In the case of any inconsistency between the *NVQ Centre Guide* or the *NVQ Candidate Guide* and this NVQ specific document, this document shall prevail.

For details of centre and scheme approval refer to the document: 'Providing City and Guilds qualifications' (stock code EN-00-1111) available free of charge from the Sales Department or your regional/national City & Guilds office (details in *Further information* section of this document).

Details of general regulations, administrative, registration and certification procedures and fees are included in the City & Guilds Directory of NVQ Awards. This information also appears on City & Guilds web site <http://www.city-and-guilds.co.uk>

The following documents also include information on policy and guidance on quality assurance within NVQs and assessors and verifiers should be aware of the contents.

- City & Guilds policy document '*Ensuring Quality*' – aimed at those involved in the assessment and verification of City & Guilds awards. Issued 3-4 times a year (available from Sales Department) NB Edition 12 – December 2001 summarises policy from all previous editions)
- *Joint Awarding Body Guidance on Internal Verification of NVQs*, issued November 2001, published by the DfES, also available on City & Guilds web site.

General NVQ information

Centres should refer to the City & Guilds *Centre Guide for NVQs*, included on this CD-ROM, for information on NVQs, the people involved, the assessment process and model recording forms.

Specific evidence profile forms

Specific evidence profile forms have been designed for this award. There is a separate form for each unit. The forms provide a convenient method of ensuring candidates have **all** the necessary evidence to achieve a unit. The forms follow the National Occupational standards in a separate document on this CD-ROM.

Section 1 – Scheme information

1.1 Scope of the award

NVQs for the Electrotechnical Sector are work-based qualifications designed to reflect the roles and responsibilities of ‘occupation operatives’ within the sector.

The Level 2 NVQ award is based on the national occupational standards developed for the industry by National Electrotechnical Training (NET). The award is composed of five mandatory units. It is intended provide recognition for the competencies associated with the installation of electrical wiring systems and equipment.

1.2 National Occupational Standards and Key/Core Skills

The full National Occupational Standards and key skills mapping are enclosed as a separate document on this CD-ROM.

1.3 Restrictions on entry

There are no restrictions on entry to this award, however, candidates should not register for this award if they hold or are registered with City & Guilds or another awarding body for a similar award at the same level.

1.4 Qualification structure

The qualification structure requires candidates to complete all five mandatory units. The certificate referred to in this guide is as follows

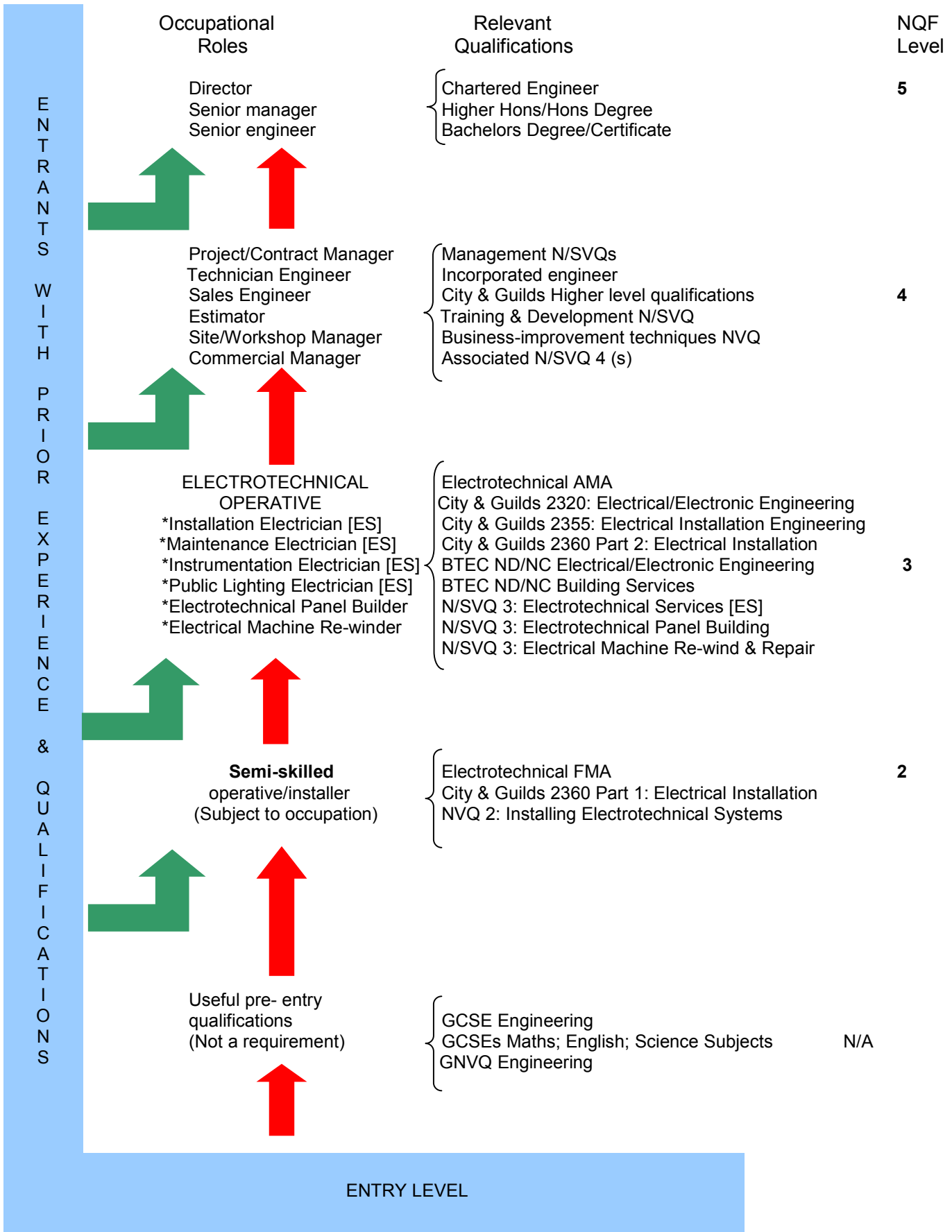
Level 2 NVQ in Installing Electrotechnical Systems

Candidates must achieve all FIVE units.

Units

- 201 Implement safe site working practices (NET unit 17)
- 202 Prepare to position and fix electrical wiring systems, wiring enclosures and equipment (NET unit 19)
- 203 Position and fix electrical wiring systems, wiring enclosures and equipment (NET unit 21)
- 204 Carry out specified connections on electrical wiring systems and equipment (NET unit 38)
- 304 Maintain a healthy and safe working environment (NET unit 81)

Electrotechnical Sector Progression Routes



Section 2 Assessment requirements

Assessment Guidance for Level 2 NVQ in Installing Electrotechnical Systems

2.1 Introduction

Assessment must be carried out in accordance with the requirements of National Electrotechnical Training's (NET) '*Assessment Strategy for Electrotechnical N/SVQs – 2001*', a summary of which is given below.

The strategy has set requirements for

- a external quality control
- b assessment of evidence
- c the competence requirements of Assessors and Verifiers

2.2 External Quality Control

The situation for candidates at level 2 is outlined within the national occupational standards documentation. These are repeated here for the purposes of assessment. The level 2 practical activities must

- Be approved in accordance with accepted industrial practice and standards
- Be to an appropriate specification as issued by the person responsible for the completion of the installation
- Not involve testing and commissioning of the installation and its constituent parts **THE LEVEL 2 CANDIDATE WILL NOT BE QUALIFIED TO UNDERTAKE THIS ACTIVITY**
- Have the authority to take decisions about the work they undertake such as the selection of suitable and safe access equipment, tools and equipment needed to complete the work they undertake
- Have the responsibility for ensuring the work they undertake, when completed is as specified and in accordance approved industrial practices and standards
- Relate to the candidates own work and show responsibility for identifying, communicating and co-operating as necessary, technical and non-technical persons when appropriate

2.3 Assessment of Evidence

Given the above (2.2) NET has designated that external quality control is undertaken through enhanced verification. This will apply to unit 204 **Carry out specified connections (NET unit 38)** and unit 304 **Maintain a healthy and safe working environment (NET unit 81)**

For these two units the Internal Verifier must always include within the sampling all the evidence for these two units.

Competent performance must be demonstrated consistently and supported by evidence from a variety of sources, including supplementary knowledge evidence. This should be in the form of candidate reports, or written log supported by oral or written questioning,– See Evidence Profile's 'Source of Evidence' (Key Words & Phrases)

All performance objectives identified in the Evidence Profile for each unit **must** be assessed. The 'Scope of Evidence' defines the evidence requirements for the 'Source of Evidence'.

Where performance evidence is not available for the 'Sources' not identified within the 'Scope', alternative evidence must be provided which shows that the whole of the range has been assessed.

2.4 Assessor and verifier requirements

All assessors and verifiers should be able to show that they possess formal recognition of achievement of the appropriate assessment and verification units of competence, the EMPNTO A and V units (or the previous D units), or show that they are working towards achieving these units of competence¹. In addition, NET also requires that assessors and verifiers have occupational experience, as explained below, regardless of which Electrotechnical NVQ they are assessing or verifying.

Both Assessors and Internal Verifiers must:

- possess a qualification relevant to the occupation and level of competence being assessed
- be at least 25 years old with a minimum of **three years'** experience as a qualified operative/practitioner in the electrotechnical sector
- possess a current health and safety qualification; for example, IOSH Working Safely certificate or an approved equivalent.

External Verifiers must:

- have had relevant experience of **occupational assessment**.

NET wishes to enhance measures for EVs, IVs and Assessors to assist with the assessment and verification system.

NET, therefore, requires that all parties must also have the following:

- a. a thorough understanding of the national occupational standards for electrotechnical qualifications.
- b. knowledge of current practice and emerging issues in the qualification area
- c. experience and a working knowledge of the operation and assessment processes specifically for Electrotechnical NVQs.

To help meet these requirements Awarding Bodies will:

- provide assessors and verifiers with opportunities to upgrade their professional development, particularly for relevant technical knowledge;
- monitor assessors' and verifiers' understanding of the relevant national occupational standards as well as their awareness of current practices and technologies by seeking feedback from appropriate sources, for example from employers;

¹ usually through an action plan which shows progress on achievement

- participate in sector briefings and activities, wherever feasible, to ensure a thorough understanding of latest practices.

2.5 Use of the national occupational standards

- NET requires that it is the responsibility of assessment centres to ensure that all assessors are using currently accredited national occupational standards
- All candidates being assessed should understand the national occupational standards to which they are being assessed in terms of the relationship with the qualification, relevant grading structures, technical competence and job roles/responsibilities
- Where assessors or verifiers believe that the national occupational standards could be reviewed to make them easier to understand or easier to assist in the assessment process, they have a responsibility to contact NET and suggest the change in wording. This should be done in writing or by email to info@net-works.org.uk.

2.6 Access to assessment

There are no entry qualifications or age limits required for these awards unless this is a legal requirement of the process of the environment.

Assessment is open to any candidate who has the potential to reach the standards laid down for this qualification.

Aids or appliances which are designed to alleviate disability may be used during assessment providing they do not compromise the standard required.

2.7 Further guidance

Further guidance to general procedures for the assessment of NVQs and sample recording forms is found in the *NVQ Centre Guide* (stock reference EN-11-0001) on this CD-ROM.

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Section 3 – National Occupational Standards

Supplied by NET

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UNIT 201 (NET Unit 17): Implement safe site working practices

UNIT OVERVIEW

This unit is for:

those preparing to undertake work on an installation site. They will implement safe working practices and this means confirming that the site is safe to start work, that it remains safe during work and is safe on completion of the job.

This unit is about:

monitoring the safety of the site at all times including at the end of the day and at the end of the work. It is also about assembling, positioning and operating access equipment in accordance with safe practices.

This is what you need to show:

You need to show that you can:

- ◆ follow correct procedures for safe site working and good housekeeping practices
- ◆ operate access equipment safely and correctly
- ◆ store all tools, equipment and materials safely and securely

What you need to do next:

look at the 'Key Words and Phrases' section. This explains some words and phrases which have been used in this unit, and will help you understand it more easily.

Note:

Persons using access equipment must be certified where appropriate that they have received the appropriate training and are competent to use access equipment.

UNIT 201 (NET Unit 17): Implement safe site working practices

KEY WORDS AND PHRASES

Site: immediate work area

Working conditions: this refers to the working conditions which exist at that point in time when the installation is due to take place, but they could vary. It could be, for example, that the installation is to take place outside, in which case you may need to take account of the weather conditions. Or, perhaps other (non-electrical) contractors come onto the site to start their work - their subsequent activities may cause the site to become hazardous.

Access equipment: these include: ladders, trestles, systems scaffolding, platforms, etc used to gain access to floors, walls, roof voids and roof heights.

Relevant people: these include: the foreman or the supervising electrician who could be the electrician in charge at the site.

UNIT 201 (NET Unit 17): Implement safe site working practices

PERFORMANCE OBJECTIVES

To meet the standard you must ensure that:

1. you seek confirmation from the relevant person that the site is safe to start work
2. you monitor regularly that the working conditions remain safe for work to occur
3. you check that warning notices and barriers to prevent unauthorised entry are installed in suitable positions
4. you confirm with the relevant person a programme of work which is safe and practical
5. you identify when it is appropriate to use approved access equipment for work sites
6. you operate the access equipment correctly and according to suppliers' instructions
7. you check that on completion of work all tools, equipment and materials on site are
 - removed, and
 - stored safely and securely
8. you check the work site is cleared after the work ends and left in a safe and satisfactory condition in accordance with health and safety regulations and good housekeeping practice

UNIT 201 (NET Unit 17): Implement safe site working practices

KNOWLEDGE REQUIREMENTS

In order to be able to implement safe site working practices

you should know and understand the following aspects relating to: Health and Safety:

See performance objective number
7, 8
5, 6
1, 2, 8
all POs but particularly 3, 5
3, 8
7

1. The regulatory requirements for correctly storing tools, equipment and materials
2. The regulatory requirements for using approved access equipment
3. When a worksite is safe for work to proceed or to leave when work finishes
4. Your legal responsibilities for health and safety as required by the Health and Safety at Work Act 1974 and the Electricity At Work Regulations of 1989 appropriate to site working
5. The need for safety, welfare and access arrangements to be in force at the site
6. Use, care and storage of substances covered by COSHH

And

you should know and understand the following aspects relating to: Working on site:

See performance objective number
8
all POs

7. The importance of 'housekeeping' procedures in relation to site working
8. The importance of following correct procedures to minimise damage to property, fabric and equipment.

UNIT 202 (NET Unit 19): Prepare to position and fix electrical wiring systems, wiring enclosures & equipment

UNIT OVERVIEW

This unit is for:

a person preparing to position and fix electrical wiring systems, wiring enclosures and equipment in accordance with instructions from the relevant person

This unit is about:

confirming that all the necessary preparations have been undertaken correctly before work commences and with the proper authorisation.

This is what you need to show:

You need to show that you can:

- follow correct procedures for preparing to start work on an installation before ultimately seeking authorisation from the relevant person.
- determine whether you have the right fixings, electrical wiring systems, wiring enclosures and equipment for the work
- follow instructions with regard to the equipment being used
- deal with people on site in the appropriate manner

This is what you need to do next:

turn to 'Key Words and Phrases', which explains how some words and phrases have been used in this unit, and will help you understand it more easily.

UNIT 202 (NET Unit 19): Prepare to position and fix electrical wiring systems, wiring enclosures & equipment

Key Words and Phrases:

- Relevant people:** these include: the foreman or the supervising electrician who could be the electrician in charge at the site
- Wiring Systems:** this includes: multi-core and single core cables with PVC, XLPE or LSF insulation and sheathing, M I cables with or without PVC/LSF sheathing and SWA cables with PVC, XLPE or LSF insulation and sheathing
- Wiring Enclosures:** this includes: PVC and Steel Conduit, PVC and Steel trunking, Cable tray and ladder systems, ducting systems
- Electrical Equipment:** this includes: electrical plant, components and accessories, motors and starters, switch gear and distribution panels, control systems and components, luminaires.
- Working conditions:** this refers, to the working conditions which exist at that point in time when the installation is due to take place, but they could vary. It could be, for example, that the installation is to take place outside, in which case you may need to take account of the weather conditions. Or, perhaps other (non-electrical) contractors come onto the site to start their work - their subsequent activities may cause the site to become hazardous.
- Working environment:** this refers to different types of the worksite where the installation is to take place. These include: domestic, agricultural, industrial, commercial, or leisure sites. The working environment is something you would not be able to change. The type of worksite will determine whether the working environment is hazardous which could affect the type of equipment installed.

UNIT 202 (NET Unit 19): Prepare to position and fix electrical wiring systems, wiring enclosures & equipment

PERFORMANCE OBJECTIVES

To meet the standard you must ensure that:

1. you gain authorisation to start work in accordance with accepted industrial practices and procedures, including where necessary relevant personnel.
2. you obtain confirmation from the relevant person before work starts that the building fabric has been checked for risks to health and safety,
3. you check at the outset, that the plans for positioning and fixing the identified wiring systems, wiring enclosures and electrical equipment meet the specification
4. when you identify any variances in the working conditions which might impact on the work to take place, you comply with the approved procedures for reporting, recording and taking corrective action.
5. you have the appropriate tools and equipment to carry out the work, and that they are safe and fit for purpose.
6. you have wiring systems, wiring enclosures and electrical equipment which are:
 - of the right type
 - appropriate for the working environment
7. you use fixings which are fit for purpose and appropriate for the site structure and building fabric,
8. you follow all appropriate manufacturers' instructions in the use of wiring systems, wiring enclosures and electrical equipment,
9. you liaise with, as appropriate, all technical and non-technical persons visiting or present at the site in a professional manner.

UNIT 202 (NET Unit 19): Prepare to position and fix electrical wiring systems, wiring enclosures & equipment

KNOWLEDGE REQUIREMENTS

In order to undertake the preparations to position and fix electrical wiring systems, wiring enclosures and equipment

you should know and understand the principles relevant to:	See Performance Objective number
1. the plans for the installation and what actual work is required	3,9
2. the common types, their advantages and limitations of wiring systems, wiring enclosures and electrical equipment	6
3. the materials which are recommended for use as electrical conductors and insulators	3, 4, 6
4. determining sizes, types and quantities of wiring systems, wiring enclosures and electrical equipment	6
5. the importance of having a schedule of quantities of all materials for an electrical installation	3, 6
6. determining whether a wiring system, wiring enclosure and equipment for installation in a particular environment is suitable	6, 7
7. determining the suitability of fixing methods to building fabric in the environment of the installation	7

With regard to Health and Safety you should know and understand	See Performance Objective number
8. the advantages and limitations of tools and equipment used for the positioning and fixing of wiring systems, wiring enclosures and electrical equipment.	5
9. the effects of installing into unknown building fabric	6
10. your legal responsibilities for health and safety as required by the Health and Safety at Work Act 1974 and the Electricity At Work Regulations of 1989 appropriate to site working	all POs but in particular 2
11. the importance of handling wiring systems, wiring enclosures and electrical equipment in the correct manner	7, 8, 9

With regard to Principles and theory you should know and understand	See Performance Objective number
12. IEE wiring regulations as specified in the BS7671, on-site Guide and relevant Guidance Notes appropriate to types and uses of wiring systems, wiring enclosures and equipment	all POs
13. Where to find out about the principles of electrical theory and installation which allow for the safe positioning and fixing of electrical wiring systems and equipment	all POs

Unit 203 (NET Unit 21): Position and Fix Electrical Wiring Systems, Wiring Enclosures and Equipment

UNIT OVERVIEW

This unit is for:

a person required to position and fix electrical wiring systems, wiring enclosures and equipment

This unit is about:

following the correct procedures and instructions received from the relevant person to position and fix wiring systems, wiring enclosures and equipment

This is what you need to show:

You need to show you can:

- position and fix wiring systems, wiring enclosures and equipment in accordance with regulations,
- position and fix wiring systems, wiring enclosures and equipment in accordance with requirements given by the supervising electrician or foreman
- confirm that the electrical supply is dead before installation takes place
- follow correct procedures when changes to the programme of work need to be undertaken and which may have implications for health and safety or cost

This is what you need to do next:

look through the 'Key Words and Phrases', as they explain how some words and phrases have been used in this unit, and will help you understand it more easily.

Unit 203 (NET Unit 21): Position and Fix Electrical Wiring Systems, Wiring Enclosures and Equipment

Key Words and Phrases

Competent person:	In the electrotechnical industry this is a person with sufficient knowledge, training and experience to prevent danger and the risk of injury by ensuring a safe system of work for undertaking safe isolation and be able to render electrical systems and equipment fit for purpose; this as a minimum must be a qualified electrician.
Wiring Systems:	This includes: multi-core and single core cables with PVC, XLPE or LSF insulation and sheathing, M I cables with or without PVC/LSF sheathing and SWA cables with PVC, XLPE or LSF insulation and sheathing
Wiring Enclosures:	This includes: PVC and Steel Conduit, PVC and Steel trunking, Cable tray, basket and ladder systems, ducting systems
Electrical Equipment:	This includes: electrical plant, components and accessories, motors and starters, switch gear and distribution panels, control systems and components, luminaires.
Site Services:	This includes: water, gas services, oil and air lines, air conditioning, alarms, and communication systems.
Relevant people:	these include: the foreman or the supervisor who could be the electrician in charge at the site
Electrical systems:	This includes: ELV and LV single and multiphase, power, lighting and controls

Unit 203 (NET Unit 21): Position and Fix Electrical Wiring Systems, Wiring Enclosures and Equipment

PERFORMANCE OBJECTIVES

To meet the standard you must ensure that:

1. you follow agreed procedures to ensure the co-ordination of site services and the activities of other trades
2. you confirm that safe isolation has been carried out in accordance with approved industry regulatory procedures and practices before undertaking to position and fix electrical wiring systems, wiring enclosures and equipment.
3. before working on electrical wiring systems and equipment you confirm that a supply is not present using industry approved methods.
4. you measure and mark out all locations for electrical wiring systems, wiring enclosures and equipment to meet the site specification and in accordance with relevant electrical regulations.
5. you position and fix the wiring systems, wiring enclosures and electrical equipment safely and in accordance with relevant electrical regulations, manufacturers' instructions and the site specification.
6. you report to the relevant people those variations to the planned programme of work that may have:
 - the potential to be dangerous,
 - have a cost implication.
7. you confirm that the work you have carried out meets the requirements of the specification
8. you use portable tools safely, in accordance with approved codes of practice and manufacturers instructions
9. the portable tools used are maintained and are fit for purpose.

Unit 203 (NET Unit 21): Position and Fix Electrical Wiring Systems, Wiring Enclosures and Equipment

KNOWLEDGE REQUIREMENTS

In order to position and fix electrical wiring systems, wiring enclosures and equipment

you should know and understand the following aspects relating to positioning and fixing electrical wiring systems, wiring enclosures and equipment see performance objective number

- | | |
|---|------|
| 1. the authority and procedures for co-ordinating information on electrical and non-electrical site services. | 1 |
| 2. the advantages, disadvantages and limitations of methods and equipment used for measuring, marking out and cutting wiring systems and wiring enclosures. | 4 |
| 3. the advantages, disadvantages and limitations of methods of positioning and fixing electrical wiring systems, wiring enclosures and equipment | 5 |
| 4. the advantages, disadvantages and limitations of methods of fabricating wiring enclosures. | 5 |
| 5. organisational procedures for reporting variations to work schedules and completed work | 6 |
| 6. methods of carrying out routine maintenance on portable tools | 8, 9 |

you should know and understand the following aspects relating to health and safety: see performance objective number

- | | |
|--|---------|
| 7. industry approved practices for confirming a supply is not present | 3 |
| 8. the importance of using safe appropriate tools for specific jobs | All POs |
| 9. the significance and role of the competent person | 2 |
| 10. the risks associated with positioning and fixing electrical equipment including lifting, handling and fixing | 5 |

You should know and understand the following aspects relating to principles and theory See performance objective number

- | | |
|---|---------|
| 11. IEE wiring regulations as specified in the BS7671, on-site Guide and relevant Guidance Notes appropriate to types and uses of wiring systems, wiring enclosures and equipment | all POs |
| 12. Where to find out about the principles of electrical theory and installation which allow for the safe positioning and fixing of electrical wiring systems and equipment | all POs |

Unit 204 (NET Unit 38): Carry out specified connections on electrical wiring systems and equipment

UNIT OVERVIEW

This unit is for:

a person carrying out connections on wiring systems and equipment as specified by the relevant person

This unit is about:

implementing the correct procedures for connecting wiring systems and equipment appropriate to an electrical system

This is what you need to show:

You need to show you can:

- ◆ connect wiring systems and equipment,
- ◆ carry out safe working practices, and
- ◆ identify the connections correctly and clearly.

This is what you need to do next:

Turn to the section on 'Key Words and Phrases'. This explains how some words and phrases have been used in this standard, and will help you understand it more easily.

Unit 204 (NET Unit 38): Carry out specified connections on electrical wiring systems and equipment

KEY WORDS AND PHRASES

Competent person:	In the electrotechnical industry this is a person with sufficient knowledge, training and experience to prevent danger and the risk of injury by ensuring a safe system of work for undertaking safe isolation and be able to render electrical systems and equipment fit for purpose; this as a minimum must be a qualified electrician.
Relevant person:	these include: the foreman or the supervising electrician who could be the electrician in charge at the site.
Safe working practices:	This means working to safe systems of work in accordance with the latest Electricity at work regulations.
Connections:	This includes: the connection of any item of electrical equipment and ensuring that every joint and connection be mechanically suitable for use and prevent danger.
Wiring Systems:	This includes: multi-core and single core cables with PVC, XLPE or LSF insulation and sheathing, M I cables with or without PVC/LSF sheathing and SWA cables with PVC, XLPE or LSF insulation and sheathing
Electrical Equipment:	This includes: electrical plant, components and accessories, motors and starters, switch gear and distribution panels, control systems and components, luminaires.

Unit 204 (NET Unit 38): Carry out specified connections on electrical wiring systems and equipment

PERFORMANCE OBJECTIVES

To meet the standard you must ensure that:

1. you check with the relevant person which electrical wiring systems and equipment to connect
2. you apply safe working practices including the identification of health and safety risks relating to the connection of electrical wiring systems and equipment
3. you identify the competent person authorised to undertake the electrical isolation prior to making connections
4. before undertaking connection activities you confirm that a supply is not present using industry approved methods
5. you make connections which comply with the IEE Wiring Regulations (BS7671)
6. you check that connections are fit for purpose (continuity only) and mechanically sound
7. you check that the connections are in accordance with the specification, correct and clearly identified
8. you complete any necessary documentation related to the work legibly, accurately and timely in accordance with organisational and regulatory requirements
9. you confirm that the work you have carried out meets the requirements of the specification

Unit 204 (NET Unit 38): Carry out specified connections on electrical wiring systems and equipment

KNOWLEDGE REQUIREMENTS

In order to carry out specified connections on electrical wiring systems and equipment

you should know and understand the following aspects relating to connections: see performance objective number

1. the main types, their advantages and limitations of different electrical connections 5, 6, 7
2. the procedures for the connection of single and multi-phase circuits 5, 6
3. how to interpret diagrams and drawings to facilitate the connection of wiring systems, wiring enclosures and electrical equipment 2, 5, 6, 7
4. the procedures for proving a connection is mechanically sound 6
5. methods of establishing that connections in circuits and protective conductors, including connections to terminals, are suitable for the purpose for which they are being used 6
6. the requirements of joints and connections to be of a capacity and conductance to allow for the passage of fault currents and to prevent corrosion 5, 6
7. the advantages, disadvantages and limitations of instruments used to confirm that electrical connections are fit for purpose (continuity only) and mechanically sound 6, 7
8. the importance of calibrating instruments at regular intervals 6, 7

you should know and understand the following aspects relating to health and safety See performance objective number

9. organisational procedures for seeking confirmation for the connection work, completion of necessary documentation and seeking confirmation that the work meets expectations 1, 8, 9
10. the importance of using personal protective equipment and safe appropriate tools for specific jobs all POs
11. isolation procedures before connection 3, 4
12. industry approved practices and instruments for confirming a supply is not present 3, 4
13. the procedures for reporting any potentially dangerous situations or incidents 1, 8, 9

you should know and understand the following aspects relating to principles and theory See performance objective number

14. IEE wiring regulations as specified in the latest British Standard for Electrical Installations relevant to types and uses of wiring systems, wiring enclosures and equipment all POs
15. Where to find out about the principles of electrical theory and installation which allow for the safe connection of electrical wiring systems and equipment all POs

Unit 304 (NET Unit 81): Maintain a healthy and safe working environment

UNIT OVERVIEW

This unit is for:

you whilst at work. The Health and Safety at Work Act, 1974, seeks to secure the health, safety and welfare of people whilst they work and protect other people against risks to health or safety arising from the activity of people at work.

Read 'important note' following overleaf:

This unit is about:

maintaining a healthy and safe working environment

This is what you need to show:

you need to show that you possess the skills and knowledge to:

- ensure that your own actions do not create any health and safety risks
- not ignore hazards with significant risk in your workplace,
- take sensible action to put things right

This is what you need to do next:

turn to the section on 'Key Words and Phrases'. This explains how some words and phrases have been used in this standard, and will help you understand it more easily.

Unit 304 (NET Unit 81): Maintain a healthy and safe working environment

KEY WORDS AND PHRASES

The Health and Safety Executive (HSE) is the body appointed to support and enforce health and safety law. They have defined two important concepts as follows:

Hazard	‘a hazard is something with potential to cause harm’
Risk	‘a risk is the likelihood of the hazard's potential being realised’
Emergencies	this includes: fire, explosions, toxic atmosphere, electrical shocks
Working conditions:	This refers, to the working conditions which exist at that point in time when the work is due to take place, but which could vary. It could be, for example, that the work is to take place outside, in which case you may need to take account of the weather conditions. Or, perhaps other (non-electrical) contractors come onto the site to start their work - their subsequent activities may cause the site to become hazardous.
Working environment:	This refers to different types of the worksite where the installation is to take place. These include: agricultural, industrial, commercial sites, or confined spaces or working near other machinery. The working environment is something you would not be able to change.
Relevant people:	These include: customers, clients, client representatives, charge-hands, supervisors, other contractors, colleagues.
Working practices:	This includes: activities, procedures, use of materials or equipment and working techniques used in carrying out your job.
Important Note :	According to the Health and Safety at Work Act:

Employers must safeguard so far as is reasonably practicable, the health, safety and welfare at work of all the people who work for them and ‘other persons’. This applies in particular to the provision and maintenance of safe plant and systems of work, and covers all machinery, equipment and substances used.

Employees also have a duty under the Act to take reasonable care to avoid harm to themselves or to others by their working practices, and to co-operate with employers and others in meeting statutory requirements. The Act also requires employees not to interfere with or misuse anything provided to protect their health, safety or welfare in compliance with the Act.

Unit 304 (NET Unit 81): Maintain a healthy and safe working environment

There is an array of health and safety regulations and codes of practice which affect people at work. There are regulations for those who, for example, work with electricity, or work on construction projects, as well as regulations covering noise at work, manual handling, working with VDUs, or dealing with substances hazardous to health, etc. The specific requirements for all or any of these can be obtained from HSE local offices.

The phrase 'the legal responsibilities for health and safety as defined by any specific legislation covering your job role' is intended to relate to those specific pieces of legislation important to your workplace and/or activities which you should be able to find out about.

The Health and Safety at Work Act 1974 is the main piece of legislation under which nearly all the other regulations are made. It is for this reason that only this piece of legislation is specifically referred to in this Unit.

Unit 304 (NET Unit 81): Maintain a healthy and safe working environment

PERFORMANCE OBJECTIVES:

You must ensure that:

1. you identify which workplace health and safety procedures are relevant to your working environment
2. you identify evacuation procedures and emergency exits before work commences
3. you review your working practices and your working environment for hazards which could cause serious harm
4. you control those health and safety hazards within your capability and job responsibility limits
5. you report those hazards which may present a high risk to the relevant persons responsible for health and safety in the workplace
6. your personal conduct around the workplace does not endanger the health and safety of yourself or other persons
7. you follow the workplace policies and suppliers' or manufacturers' instructions for the safe use of tools, plant and equipment
8. you follow agreed procedures in the event of an emergency
9. you follow correct procedures in the event of injuries to self and others

Unit 304 (NET Unit 81): Maintain a healthy and safe working environment

KNOWLEDGE REQUIREMENTS:

In order to maintain a healthy and safe working environment you should know and understand the following aspects relating to:

Health and Safety

	performance objective no
1. your legal duties for health and safety in the workplace as defined by the Health and Safety at Work Act 1974	1
2. your duties for health and safety as defined by any specific legislation covering your job role	1, 2
3. what hazards may exist in your workplace	3
4. the particular health and safety risks which may be present in your own job role	3
5. the importance of remaining alert to the presence of hazards in the whole work place	all POs
6. agreed workplace health and safety procedures <ul style="list-style-type: none">• including site evacuation procedures• and procedures for dealing with injured persons• emergency procedures	6, 7, 8, 9
7. responsibilities for health and safety in your job description	4
8. the responsible persons to whom to report health and safety matters	5

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ELECTROTECHNICAL NATIONAL OCCUPATIONAL STANDARDS INDEX FOR:

- LEVEL 2: Installing Electrotechnical Systems**

UNIT NET 17: Implement safe site working practices

UNIT NET 19: Prepare to position and fix electrical wiring systems, wiring enclosures & equipment

UNIT NET 21: Position and fix electrical wiring systems, wiring enclosures and equipment

UNIT NET 38: Carry out specified connections on electrical wiring systems and equipment

UNIT NET 81: Maintain a healthy and safe working environment

The Key Skills/ NOS matrix below identifies where a candidate has the opportunity to develop and provide evidence of particular Key Skills within the relevant NVQ 2 learning/assessment programme.

Please refer to NOS Unit Index for unit titles.

NET UNIT NUMBER	17	19	21	38	81														
KEY SKILL ELEMENTS																			
Communications [2]																			
Take part in discussions	#	#	#	#	#														
Give a short talk	#																		
Read & summarise information	#	#	#	#	#														
Writing of two different types of document	#	#	#	#	#														
Information Technology [1]																			
Find & develop information		#	#	#	#														
Present information			#	#															
Application of Number [2]																			
Interpret results and present findings		#	#	#	#														
Carry out calculations		#	#																
Interpret information	#	#	#	#															
Working with others	Opportunities to develop and provide evidence of these Key Skills are generic in all units																		
Improving own learning and performance																			

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Section 4 – Evidence Profiles

There is an evidence profile for EACH unit of the award. Candidates should use these to record their evidence to ensure all aspects of the standards are covered.

Unit 201

SCOPE OF EVIDENCE	SOURCE OF EVIDENCE									PERFORMANCE OBJECTIVES	EVIDENCE REF				
	Ladders	Trestles	System Scaffolding	Powered Platforms	Foreman	Supervisor	Chargehand	Inside	Outside		ASSESSMENT 1 (A1)	ASSESSMENT 2 (A2)	ASSESSMENT 3 (A3)		
Two different access systems										1. You seek confirmation from the relevant person that the site is safe to start work					
										2. You monitor regularly that the working conditions remain safe for work to occur					
Two different relevant people											3. You check that warning notices and barriers to prevent unauthorised entry are installed in suitable positions				
											4. You confirm with the relevant person a programme or work which is safe and practical				
All Working condition												5. You identify when it is appropriate to use approved access equipment for work sites			
												6. You operate the access equipment correctly and according to suppliers' instructions			
										7. You check that on completion of work all tools, equipment and materials on site are removed, and stored safely and securely					
										8. You check the work site is cleared after the work ends and left in a safe and satisfactory condition in accordance with health and safety regulations and good housekeeping practice					

Unit 202

SCOPE OF EVIDENCE	SOURCE OF EVIDENCE													PERFORMANCE OBJECTIVES	EVIDENCE REF						
	Inside	Outside	PVC Conduit	Steel Conduit	PVC Trunking	Steel Trunking	Cable Tray	Basket Systems	MIMS	PVC/SWA	PVC Singles	PVC Twin	Luminaires		Control Systems	Switchgear/Panels	Components	Electrical Plant	ASSESSMENT 1 (A1)	ASSESSMENT 2 (A2)	ASSESSMENT 3 (A3)
All working conditions																		1. You gain authorisation to start work in accordance with accepted industrial practices and procedures, including where necessary relevant personnel.			
Two different wiring enclosures																		2. You obtain confirmation from the relevant person before work starts that the building fabric has been checked for risks to health and safety			
																		3. You check at the outset, that the plans for positioning and fixing the identified wiring systems, wiring enclosures and electrical equipment meet the specification			
Two different wiring systems																		4. When you identify any variances in the working conditions which might impact on the work to take place, you comply with the approved procedures for reporting, recording and taking corrective action			
																		5. You have the appropriate tools and equipment to carry out the work, and that they are safe and fit for purpose			
Two types of equipment																		6. You have wiring systems, wiring enclosures and electrical equipment which are: Of the right type Appropriate for the working environment			
																		7. You use fixings which are fit for purpose and appropriate for the site structure and building fabric			
																		8. You follow all appropriate manufacturers' instructions in the use of wiring systems, wiring enclosures and electrical equipment			
																		9. You liaise with, as appropriate, all technical and non-technical persons visiting or present at the site in a professional manner			

Unit 203

SCOPE OF EVIDENCE	SOURCE OF EVIDENCE														PERFORMANCE OBJECTIVES	EVIDENCE REF								
	Lighting & control	Power	Multi-phase	ELV	LV Single-phase	PVC Conduit	Steel Conduit	PVC Trunking	Steel Trunking	Cable Tray	Basket System	MIMS	PVC Singles	PVC/SWA		PVC Twin	Luminaires	Control Systems	Switchgear/Panels	Components	Electrical Plant	ASSESSMENT 1 (A1)	ASSESSMENT 2 (A2)	ASSESSMENT 3 (A3)
Two electrical systems																					1. You follow agreed procedures to ensure the co-ordination of site services and the activities of other trades			
Two different Wiring enclosures																					2. You confirm that safe isolation has been carried out in accordance with approved industry regulatory procedures and practices before undertaking to position and fix electrical wiring systems, wiring enclosures and equipment			
																					3. Before working on electrical wiring systems and equipment you confirm that a supply is not present using industry approved methods			
Two different Wiring Systems																					4. You measure and mark out all locations for electrical wiring systems, wiring enclosures and equipment to meet the site specification and in accordance with relevant electrical regulations			
																					5. You position and fix the electrical wiring systems, wiring enclosures and equipment safely and in accordance with relevant electrical regulations manufacturers' instructions and the site specification			
Three types of equipment																					6. You report to the relevant people those variations to the planned programme of work that may have: the potential to be dangerous · have a cost implication			
																					7. You confirm that the work you have carried out meets the requirements of the specification			
																					8. You use portable tools safely, in accordance with approved codes of practice and manufacturers instructions			
																					9. The portable tools used are maintained and are fit for purpose			

Unit 204

SCOPE OF EVIDENCE	SOURCE OF EVIDENCE									PERFORMANCE OBJECTIVES	EVIDENCE REF		
	MIMS	PVC/SWA	PVC Singles	PVC Twin	Luminaires	Control Systems	Switchgear/Panels	Components	Electrical Plant		ASSESSMENT 1 (A1)	ASSESSMENT 2 (A2)	ASSESSMENT 3 (A3)
Two electrical systems										1. You check with the relevant person which electrical wiring systems and equipment to connect			
										2. You apply safe working practices including the identification of health and safety risks relating to the connection of electrical wiring systems and equipment			
Three types of equipment										3. You identify the competent person authorised to undertake the electrical isolation prior to making connections			
										4. Before undertaking connection activities you confirm that a supply is not present using industry approved methods			
										5. You make connections which comply with the IEE Wiring Regulations (BS7671)			
										6. You check that connections are fit for purpose (continuity only) and mechanically sound			
										7. You check that the connections are in accordance with the specification, correct and clearly identified			
										8. You complete any necessary documentation related to the work legibly, accurately and timely in accordance with organisational and regulatory requirements			
										9. You confirm that the work you have carried out meets the requirements of the specification			

Unit 304

SCOPE OF EVIDENCE	SOURCE OF EVIDENCE														PERFORMANCE OBJECTIVES	EVIDENCE REF				
	confined spaces	Commercial	Industrial	Agricultural	working near other machinery	Customers	Clients	Colleagues	Other contractors	Supervisors	Charge hands	Activities	Procedures	Working techniques		Use of materials or equipment	ASSESSMENT 1 (A1)	ASSESSMENT 2 (A2)	ASSESSMENT 3 (A3)	PRACT. PERF. ASSESS. (PPA)
Two Working environments																1. You identify which workplace health and safety procedures are relevant to your working environment				*
																2. You identify evacuation procedures and emergency exits before work commences				*
Two different relevant People																3. You review your working practices and your working environment for hazards which could cause serious harm				*
																4. You control those health and safety hazards within your capability and job responsibility limits				*
Two working practices																5. You report those hazards which may present a high risk to the relevant persons responsible for health and safety in the workplace				*
																6. Your personal conduct around the workplace does not endanger the health and safety of yourself or other persons				*
																7. You follow the workplace policies and suppliers' or manufacturers' instructions for the safe use of tools, plant and equipment				*
																8. You follow agreed procedures in the event of an emergency				*
																9. You follow workplace procedures in the event of injuries to self and others				*

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Further information

Further information regarding centre/scheme approval or any aspect of assessment of the NVQs should be referred to the relevant City & Guilds regional/national office:

Region	Telephone	Facsimile
City & Guilds London and South East	020 7294 8139	020 7294 2419
City & Guilds Southern	020 7294 2677	020 7294 2412
City & Guilds South West	01823 722200	01823 444231
City & Guilds East Anglia	01480 308300	01480 308325
City & Guilds East Midlands	01773 842900	01773 833030
City & Guilds West Midlands	0121 503 8900	0121 359 7734
City & Guilds North East	0191 402 5100	0191 402 5101
City & Guilds North West	01925 897900	01925 897925
City & Guilds Yorkshire	0113 380 8500	0113 380 8525
City & Guilds Northern Ireland	028 9032 5689	028 9031 2917
City & Guilds Scotland	0131 226 1556	0131 226 1558
City & Guilds Wales	02920 748600	02920 748625

City & Guilds Head Office – Customer Service Enquiry Unit	020 7294 2800	020 7294 2400
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Website <http://www.city-and-guilds.co.uk>

The National Occupational Standards have been produced by *National Electrotechnical Training (NET)* who can provide advice on learning, apprenticeships and careers within the industry.

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