

Level 1 Certificate and Level 2 Diploma/Certificate in Network Construction Operations (Water) (6028)

Qualification Handbook for centres



www.cityandguilds.com
September 2011
Version 1.1

About City & Guilds

As the UK's leading vocational education organisation, City & Guilds is leading the talent revolution by inspiring people to unlock their potential and develop their skills. We offer over 500 qualifications across 28 industries through 8500 centres worldwide and award around two million certificates every year. City & Guilds is recognised and respected by employers across the world as a sign of quality and exceptional training.

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).

Equal opportunities

City & Guilds fully supports the principle of equal opportunities and we are committed to satisfying this principle in all our activities and published material. A copy of our equal opportunities policy statement is available on our website.

Copyright

The content of this document is, unless otherwise indicated, © The City and Guilds of London Institute and may not be copied, reproduced or distributed without prior written consent.

However, approved City & Guilds centres and candidates studying for City & Guilds qualifications may photocopy this document free of charge and/or include a PDF version of it on centre intranets on the following conditions:

- centre staff may copy the material only for the purpose of teaching candidates working towards a City & Guilds qualification, or for internal administration purposes
- candidates may copy the material only for their own use when working towards a City & Guilds qualification

The *Standard Copying Conditions* (which can be found on our website) also apply.

Please note: National Occupational Standards are not © The City and Guilds of London Institute. Please check the conditions upon which they may be copied with the relevant Sector Skills Council.

Publications

City & Guilds publications are available from our website or from our Publications Sales department, using the contact details shown below.

Every effort has been made to ensure that the information contained in this publication is true and correct at the time of going to press. However, City & Guilds' products and services are subject to continuous development and improvement and the right is reserved to change products and services from time to time. City & Guilds cannot accept liability for loss or damage arising from the use of information in this publication.

City & Guilds

1 Giltspur Street

London EC1A 9DD

T +44 (0)844 543 0000

F +44 (0)20 7294 2413

www.cityandguilds.com

centresupport@cityandguilds.com

Level 1 Certificate and Level 2 Diploma/Certificate in Network Construction Operations (Water) (6028)

Qualification Handbook for centres

Qualification title	Number	QAN
Level 1 Certificate in Network Construction Operations (Water)	6028-15	600/1533/0
Level 2 Diploma in Network Construction Operations (Water) - Main layer	6028-25	600/2670/4
Level 2 Certificate in Network Construction Operations (Water) - Service layer	6028-26	600/2669/8
Level 2 Diploma in Network Construction Operations (Water) – Repair and maintenance	6028-27	600/2668/6

City & Guilds
Believe you can



www.cityandguilds.com

Contents

1	Introduction to the qualifications	4
1.1	Qualification structure	4
1.2	Opportunities for progression	7
2	Centre requirements	8
2.1	Centre approval	8
2.2	Candidate entry requirements	8
3	Course design and delivery	9
3.1	Initial assessment and induction	9
3.2	Recommended delivery strategies	9
4	Assessment	10
4.1	Assessor/Verifier Requirements	10
4.2	Specific Assessor requirements	11
4.3	Workplace observation	12
4.4	Realistic Work Environment (RWE)	12
4.5	New Roads and Streetworks Act (NRSWA) Observations	12
5	Units	13
Unit 101	Assist in locating and avoiding supply apparatus and sub structures	14
Unit 102	Working under supervision, excavate holes and trenches in ground and pavement structures	19
Unit 103	Assist in preparing for reinstatement of excavation and pavement surfaces	23
Unit 106	Working under supervision, operate powered tools and equipment for network construction operations	26
Unit 107	Working under supervision, join polyethylene pipe by electrofusion welding	32
Unit 109	Assist in preparing resources and signing, lighting and guarding the area for highway works	35
Unit 110	Assist in preparing resources and signing and guarding the area for site works	40
Unit 111	Working under supervision, join polyethylene pipe by butt fusion welding	44
Unit 112	Working under supervision, contribute to an efficient and effective work environment	47
Unit 113	Working under supervision, contribute to health, safety and environment in the workplace including hygiene	53
Unit 114	Working under supervision, assemble components to meet specifications for water network construction operations	59
Unit 201	Create an efficient and effective environment in Utilities Network Construction	62
Unit 203	Establish and maintain effective working relationships in utilities network construction	70
Unit 204	Install equipment for safe working on the highway for utilities network construction	76

Unit 205	Install equipment for safe working on sites for utilities network construction	84
Unit 206	Locate and avoid supply apparatus for utilities network construction	91
Unit 207	Excavate and maintain holes and trenches for utilities network construction	100
Unit 208	Reinstate excavation and pavement surfaces after utility network construction operations	111
Unit 209	Operate powered tools and equipment for routine and predictable requirements on utilities network construction	122
Unit 210	Join materials by electrofusion processes on Utilities Network Construction	130
Unit 211	Joint materials by butt fusion processes on Utilities Network Construction, up to 180mm diameter	136
Unit 220	Maintain a safe and secure working environment in water network construction	142
Unit 221	Joint materials by butt fusion processes above 315mm for utilities network construction	154
Unit 222	Joint materials by butt fusion processes between 180mm and 315mm for utilities network construction	160
Unit 223	Joint materials by mechanical means on water network construction	166
Unit 224	Install water services up to 50mm nominal bore or 63mm polyethylene	172
Unit 225	Install water mains up to 150mm nominal bore or 180mm polyethylene	180
Unit 226	Install water mains from 150mm-300mm nominal bore or 180mm-315mm polyethylene	188
Unit 227	Install water mains above 300mm nominal bore or 315mm polyethylene	196
Unit 228	Conduct pressure and soundness testing of water network engineering products or assets	204
Unit 229	Restore water network components to operational condition by repair	210
Appendix 1	Relationships to other qualifications	216
Appendix 2	Sources of general information	217

1 Introduction to the qualifications

This document contains the information that centres need to offer the following qualifications:

Qualification title and level	City & Guilds qualification number	Qualification accreditation number	Registration and certification
Level 1 Certificate in Network Construction Operations (Water)	6028-15	600/1533/0	
Level 2 Diploma in Network Construction Operations (Water) - Main layer	6028-25	600/2670/4	Consult the Walled Garden/Online Catalogue for last dates
Level 2 Certificate in Network Construction Operations (Water) - Service layer	6028-26	600/2669/8	
Level 2 Diploma in Network Construction Operations (Water) – Repair and maintenance	6028-27	600/2668/6	

These qualifications cover all aspects of water network construction and will help to develop the learner's technical skills in areas such as excavating, welding, operating tools and machinery and installation, while maintaining safety standards. They are ideal for network operatives and engineers already employed on the water distribution networks, either directly with an asset owner or through an outsourced operations company.

Learners can choose the relevant qualification that demonstrates specialist knowledge and skills including

- excavating holes and trenches in ground and pavement structures
- operating powered tools
- electrofusion welding
- assembling components to meet specifications for gas network construction operations.

1.1 Qualification structure

To achieve the **Level 1 Certificate in Network Construction Operations (Water)**, learners must achieve **15 credits** in total. **11** credits must be taken from the mandatory units, a minimum of **2** credits from Optional Unit Group 1 and a minimum of **2** credits from Optional Group 2.

Unit accreditation number	City & Guilds	Unit title	Mandatory/ optional for full qualification	Credit value
F/502/9663	101	Assist in locating and avoiding supply apparatus and sub structures	Mandatory	2
L/502/9665	102	Working under supervision, excavate holes and trenches in ground and pavement structures	Mandatory	2

Unit accreditation number	City & Guilds	Unit title	Mandatory/ optional for full qualification	Credit value
Y/502/9670	106	Working under supervision, operate powered tools and equipment for network construction operations	Mandatory	2
Y/502/9667	112	Working under supervision, contribute to an efficient and effective work environment	Mandatory	2
D/502/9668	113	Working under supervision, contribute to health, safety and environment in the workplace including hygiene	Mandatory	2
D/502/9671	114	Working under supervision, assemble components to meet specifications for water network construction operations	Mandatory	1
Optional Group 1				
K/502/9673	109	Assist in preparing resources and signing, lighting and guarding the area for highway works	Optional	2
M/502/9674	110	Assist in preparing resources and signing and guarding the area for site works	Optional	2
Optional Group 2				
H/502/9672	107	Working under supervision, join polyethylene pipe by electrofusion welding	Optional	2
T/502/9675	111	Working under supervision, join polyethylene pipe by butt fusion welding	Optional	2
Elective units				
R/502/9666	103	Assist in preparing for reinstatement of excavation and pavement surfaces	Elective	2

Unit 103 is elective and may be taken by learners; however credits gained will not contribute to the overall achievement of the qualification.

To achieve the **Level 2 Diploma in Network Construction Operations (Water) - Main layer**, learners must achieve the following combination of units, depending on pathway chosen.

- Level 2 Diploma in Network Construction Operations (Water) – Main layer (Self lay)
 - 37 credits from units 201, 203, 205 - 207, 209 - 211, 220, 223, 225
- Level 2 Diploma in Network Construction Operations (Water) – Main layer (Distribution)
 - 41 credits from 201, 203 - 207, 209 - 211, 220, 223, 225

Units 208, 221 – 222 and 226 – 229 are elective units and may be taken by learners; however credits gained will not contribute to the overall achievement of the qualification.

To achieve the **Level 2 Certificate in Network Construction Operations (Water) – Service layer**, learners must achieve the following combination of units, depending on pathway chosen.

- Level 2 Certificate in Network Construction Operations (Water) – Service layer (Self lay)
 - 32 credits from 201, 203, 205 - 207, 209, 220, 223 - 224

- Level 2 Certificate in Network Construction Operations (Water) – Service layer (Distribution)
 - 36 credits from 201, 203 - 207, 209, 220, 223 - 224

Units 208, 210 and 229 are elective and may be taken by learners; however credits gained will not contribute to the overall achievement of the qualification.

To achieve the **Level 2 Diploma in Network Construction Operations (Water) – Repair and maintenance**, learners must achieve the following combination of units.

- Level 2 Diploma in Network Construction Operations (Water) – Repair and maintenance
 - 43 credits from 201, 203 - 207, 209 - 210, 220, 223 - 224, 229

Units 208, 211, 221 – 222 and 226 – 228 are elective and may be taken by learners; however credits gained will not contribute to the overall achievement of the qualification.

Unit accreditation number	City & Guilds unit	Unit title	Credit value
R/503/0316	201	Create an efficient and effective environment in Utilities Network Construction	3
A/503/0665	203	Establish and maintain effective working relationships in utilities network construction	2
A/503/0682	204	Install equipment for safe working on the highway for utilities network construction	4
F/503/0683	205	Install equipment for safe working on sites for utilities network construction	3
J/503/0684	206	Locate and avoid supply apparatus for utilities network construction	4
L/503/0685	207	Excavate and maintain holes and trenches for utilities network construction	5
R/503/0686	208	Reinstate excavation and pavement surfaces after utility network construction operations	5
Y/503/0687	209	Operate powered tools and equipment for routine and predictable requirements on utilities network construction	4
F/503/0666	210	Join materials by electrofusion processes on utilities network construction	2
J/503/0667	211	Joint materials by butt fusion processes on Utilities Network Construction, up to 180 mm diameter	2
D/503/1159	220	Maintain a safe and secure working environment on Water Network Construction	3
R/503/1160	221	Joint materials by butt fusion processes above 315 mm for utilities network construction	3
Y/503/1161	222	Joint materials by butt fusion processes between 180 mm and 315 mm for utilities network construction	3
D/503/1162	223	Join materials by mechanical means on Water Network Construction	4
H/503/1163	224	Install water services up to 50mm nominal bore or 63mm polyethylene	4

Unit accreditation number	City & Guilds unit	Unit title	Credit value
K/503/1164	225	Install water mains up to 150mm nominal bore or 180mm polyethylene	5
M/503/1165	226	Install water mains from 150 mm-300 mm nominal bore or 180 mm-315 mm polyethylene	5
T/503/1166	227	Install water mains above 300 mm nominal bore or 315 mm polyethylene	5
A/503/1167	228	Conduct pressure and soundness testing of water network engineering products or assets	4
F/503/1168	229	Restore water network components to operational condition by repair	5

1.2 Opportunities for progression

On completion of the Level 1 Certificate in Network Construction Operations (Water), learners may progress onto the Level 2 Diplomas/Certificate in Network Construction Operations (Water), specialising in main laying, servicing laying or repair and maintenance.

On completion of the Level 2 Diplomas in Network Construction Operations, learners may progress as a water network construction operative involved in main laying, service laying and repair and maintenance.

2 Centre requirements

2.1 Centre approval

There is no fast track approval for this qualification; therefore existing centres who wish to offer this qualification must use the **standard** Qualification Approval Process.

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.

2.2 Candidate entry requirements

There are no formal entry requirements for the Level 1 Certificate in Network Construction Operations (Water). However, centres must ensure that learners have the potential and opportunity to gain the qualifications successfully.

All learners entering on the Level 2 Diplomas in Network Construction Operations (Water) must be network operatives employed on the water distribution networks, either directly with an asset owner or through an outsourced operations company.

Age restrictions

These qualifications are not approved for use by learners under the age of 16, and City & Guilds cannot accept any registrations for learners in this age group.

3 Course design and delivery

3.1 Initial assessment and induction

Centres will need to make an initial assessment of each candidate prior to the start of their programme to ensure they are entered for an appropriate type and level of qualification.

The initial assessment should identify

- any specific training needs the candidate has, and the support and guidance they may require when working towards their qualifications. This is sometimes referred to as diagnostic testing.
- any units the candidate has already completed, or credit they have accumulated which is relevant to the qualifications they are about to begin.

City & Guilds recommends that centres provide an induction programme to ensure the candidate fully understands the requirements of the qualifications they will work towards, their responsibilities as a candidate, and the responsibilities of the centre. It may be helpful to record the information on a learning contract.

3.2 Recommended delivery strategies

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualifications before designing a course programme.

Centres may design course programmes of study in any way which:

- best meets the needs and capabilities of their learners
- satisfies the requirements of the qualifications.

When designing and delivering the course programme, centres might wish to incorporate other teaching and learning that is not assessed as part of the qualifications. This might include the following:

- literacy, language and/or numeracy
- personal learning and thinking
- personal and social development
- employability.

Where applicable, this could involve enabling the candidate to access relevant qualifications covering these skills.

4 Assessment

The knowledge and understanding of learners is assessed using a range of assessment strategies including:

- inferred knowledge assessed as part of a performance assessment
- project work
- oral questioning by the assessor

The performance skills of learners will be assessed primarily in the work place, with performance tasks undertaken in simulated work environments where a lack of opportunity exists or safety conditions cannot be met.

4.1 Assessor/Verifier Requirements

The necessary requirements for Assessors (A); Internal Verifiers (IV); External Verifiers (EV) and Internal Assessors (IA) as specified in the *Energy & Utility Skills Overarching Assessment Strategy* are listed in the table below.

	A	IV	IA
Demonstrate a high level of interpersonal and communication skills	X	X	
Have up-to-date knowledge of current practice and emerging issues within their industry and be aware there may be differences between the 4 UK countries	X	X	
Have a thorough understanding of the national occupational standards for the qualifications they are assessing or verifying and be able to interpret them and offer advice on assessment-related matters	X	X	
Show experience and working knowledge of the assessment and verification processes relating to the context in which they are working	X	X	
Demonstrate relevant, current and credible experience and knowledge with a requirement for evidence of CPD and occupational skills	X	X	X
Show they are able to act as an emissary of City & Guilds and will be able to facilitate consistency across centres			
Have, or be working towards <ul style="list-style-type: none"> • Being qualified –Assessor or Verifier units plus CPD and operate to A and V standards (A or V units/D units) • Qualifications/Training that has been mapped to A and V units 	X	X	
Demonstrate a commitment to continuing professional development and to keeping abreast of the changing environment and practices in their industry	X	X	X

4.2 Specific Assessor requirements

In addition, assessors who are assessing the units listed below, common to both water and gas network construction qualifications, must have experience in network construction in either the gas or water sector.

Level 1

- Unit 101 Assist in locating and avoiding supply apparatus and sub structures
- Unit 102 Working under supervision, excavate holes and trenches in ground and pavement structures
- Unit 103 Assist in preparing for reinstatement of excavation and pavement surface
- Unit 106 Working under supervision, operate powered tools and equipment for routing and predictable requirements during gas network operations
- Unit 107 Working under supervision, join polyethylene pipe by electrofusion welding
- Unit 109 Assist in preparing resources and segregating the area for highways works
- Unit 110 Assist in preparing resources and segregating the area for site works
- Unit 111 Working under supervision, join polyethylene pipe by butt fusion welding

Level 2

- Unit 201 Create an efficient and effective work environment in utilities network construction
- Unit 203 Establish and maintain effective working relationships in utilities network construction
- Unit 204 Install equipment for safe working on the highway for utilities network construction
- Unit 205 Install equipment for safe working on sites for utilities network construction
- Unit 206 Locate and avoid supply apparatus for utilities network construction
- Unit 207 Excavate and maintain holes and trenches for utilities network construction
- Unit 208 Reinstatement of excavation and pavement surfaces after utility network construction operations
- Unit 209 Operate powered tools and equipment for routine and predictable requirements on utilities network construction
- Unit 210 Join materials by electrofusion processes on Utilities Network Construction
- Unit 211 Joint materials by butt fusion processes on Utilities Network Construction, up to 180mm diameter
- Unit 212 Join materials by butt fusion processes on Utilities Network Construction, above 180mm diameter

Assessors who are assessing the units listed below, specific to Water network construction qualifications, must have experience in network construction in the gas sector.

Level 1

- Unit 112 Working under supervision, contribute to an efficient and effective work environment
- Unit 113 Working under supervision, contribute to health, safety and environment in the workplace including hygiene
- Unit 114 Working under supervision, assemble components to meet specifications

Level 2

- Unit 220 Maintain a safe and secure working environment on water network construction
- Unit 223 Joint materials by mechanical means on water network construction
- Unit 224 Install water services up to 50mm nominal bore or 63mm polyethylene
- Unit 225 Install water mains up to 150mm nominal bore or 180mm polyethylene
- Unit 226 Install water mains from 150 mm-300 mm nominal bore or 180 mm-315 mm polyethylene
- Unit 227 Install water mains above 300 mm nominal bore or 315 mm polyethylene
- Unit 228 Conduct pressure and soundness testing of water engineering products or assets
- Unit 229 Restore water components to operational condition by repair

Assessors are **not** eligible to assess learners for whom they have line management responsibility or any unit for which they have been involved in training that learner.

4.3 Workplace observation

These qualifications contain a number of units and both workplace experience and naturally occurring evidence are required for each. A combination of direct observation by an assessor, witness testimony from operationally competent persons and evidence gathered in realistic work environment (RWE) is acceptable to establish that the learner meets all the criteria within the units. However, the following essential activities must be directly assessed at least once through workplace observation by an assessor.

Level 2 Diploma in Network Construction Operations (Water) – Main layer

- Installing at least one water main and connecting to an existing network

Level 2 Certificate in Network Construction Operations (Water) – Service layer

- Installing at least one water service, making the connection to the main and connecting to the property

Level 2 Diploma in Network Construction Operations (Water) – Repair and maintenance

- Preparing and carrying out at least one repair and restoring it to an operable condition

4.4 Realistic Work Environment (RWE)

All units can be assessed using observation in RWE, however a mixture of evidence from RWE and the workplace must be supplied for achievement of the units.

Where the network is being simulated, the pipework must be pressurised to a level consistent with the workplace and contain a suitable substance which replicates that which is contained in the workplace network.

4.5 New Roads and Streetworks Act (NRSWA) Observations

NRSWA observations can be used as evidence to contribute towards achievement of these units, however additional evidence from the workplace is required.

5 Units

Availability of units

The units for these qualifications follow. The learning outcomes and assessment criteria are also viewable on the Register of Regulated Qualifications <http://register.ofqual.gov.uk/>

Structure of units

The units in these qualifications are written in a standard format and comprise the following:

- City & Guilds reference number
- title
- level
- credit value
- unit accreditation number (UAN)
- 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 101

Assist in locating and avoiding supply apparatus and sub structures

Level:	1
Credit value:	2
UAN:	F/502/9663

Unit aim

This unit allows learners to demonstrate competence in assisting with location and avoidance of supply apparatus and sub-structures on site. Working under supervision at all times, and reporting to a team leader, learners must use appropriate search techniques to locate underground apparatus, identifying and avoiding risks of damage to services and danger to personnel. Learners must contribute to keeping records updated, and must work according to industry standards and specifications, following safe working practices.

Learning outcomes

There are **three** learning outcomes to this unit. The learner will:

1. Identify, mark and confirm the location of supply apparatus and sub-structures
2. Maintain the safety and integrity of supply apparatus and sub-structures
3. Demonstrate knowledge and understanding of location and avoidance of supply apparatus and sub-structures

Guided learning hours

It is recommended that **8** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: NC0101 Assist in locating and avoiding supply apparatus and sub-structures.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 101

Assist in locating and avoiding supply apparatus and sub structures

Outcome 1

Identify, mark and confirm the location of supply apparatus and sub-structures

Assessment criteria

The learner can:

- 1.1 Identify the extent of the work site from the work instructions and plans
- 1.2 Check that the position and type of **supply apparatus and sub-structures** are:
 - accurately identified from records, surface evidence and **search techniques**
 - marked on the work site in line with work instructions and relevant **Codes of Practice**.
 - recorded in line with instructions and organisational requirements.
- 1.3 Report deviations in the position of equipment and identification of other structures according to instruction and organisational requirements.
- 1.4 Communicate the details of position and type of **supply apparatus and sub-structures** to relevant personnel in line with instruction and organisational requirements.
- 1.5 Refer problems and conditions outside their responsibility according to **approved procedures and practices**.
- 1.6 Carry out work to **approved procedures and practices** and in line with statutory requirements.

Range

Supply apparatus and sub-structures: the supply apparatus for utilities and other agencies; above ground services; built structures; the natural environment.

Search techniques: electronic location equipment; trial holes; visual examination; use of drawing and records.

Codes of Practice: statutory and regulatory as directed by the team leader.

Approved procedures and practices: Health, safety and environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures, within the remit of learners responsibility.

Unit 101

Assist in locating and avoiding supply apparatus and sub structures

Outcome 2

Maintain the safety and integrity of supply apparatus and sub-structures

Assessment criteria

The learner can:

- 2.1 Ensure that working practices on site avoid damage to **supply apparatus and sub-structures**.
- 2.2 Ensure that exposed **supply apparatus and sub-structures** are supported correctly, safely and securely, relevant to their specification and in accordance with approved procedures.
- 2.3 Ensure appropriate precautions are taken to protect personnel and equipment from the consequent effects of damage to **supply apparatus and sub-structures** in accordance with **approved procedures and practices**.
- 2.4 Promptly report damage to **supply apparatus and sub-structures** to the appropriate authority and make the area safe, in accordance with **approved procedures and practices**.
- 2.5 Refer problems and conditions outside their responsibility in accordance with **approved procedures and practices**.
- 2.6 Ensure work is carried out to **approved procedures and practices** and in compliance with statutory requirements.

Range

Supply apparatus and sub-structures: the supply apparatus for utilities and other agencies; above ground services; built structures; the natural environment.

Approved procedures and practices: Health, safety and environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures, within the remit of learners responsibility.

Unit 101

Assist in locating and avoiding supply apparatus and sub structures

Outcome 3

Demonstrate knowledge and understanding of location and avoidance of supply apparatus and sub-structures

Assessment criteria

The learner can:

- 3.1 Describe the different types of **supply apparatus and sub-structures** that may be encountered and exposed in excavation work.
- 3.2 Outline the key features of the medium being carried by the different types of supply apparatus (e.g. ignition characteristics, density relative to air, electrocution).
- 3.3 Describe the different types of natural and man-made features that may be encountered during excavation work, and the hazards associated with them.
- 3.4 Describe the different methods and markers, signs and features used to identify underground utilities and other agency apparatus and sub-structures.
- 3.5 Describe the basic **search techniques** for **supply apparatus and sub-structures**, including the use of:
 - electronic location equipment
 - trial holes
 - visual examination
 - drawings and records.
- 3.6 Describe how to ensure the accurate location of the required excavation by marking out.
- 3.7 Explain the possible outcomes of incorrect marking out of excavations, including:
 - costs
 - loss of time
 - material wastage.
- 3.8 Describe the precautions to be taken during excavation work to avoid damage to concealed supply apparatus or sub-structures.
- 3.9 Outline the risks associated with maintaining the safety and integrity of **supply apparatus and sub-structures**.
- 3.10 Describe the possible effects of damage to the supply apparatus.
- 3.11 Explain the implications of damaging supply apparatus, including:
 - personal danger to the personnel on site
 - risks to the environment
 - delays to job progress
 - additional costs in repair.
- 3.12 Explain the importance of protecting and supporting **supply apparatus and sub-structures** services exposed during excavation work.
- 3.13 Give examples of how to provide appropriate temporary and permanent support for **supply apparatus and sub-structures** exposed during site excavations.
- 3.14 Describe the possible outcomes of leaving exposed **supply apparatus and sub-structures** unsupported.
- 3.15 Explain the basic requirements of **Codes of Practice** and guidance notes for locating and avoiding **supply apparatus and sub-structures**.

- 3.16 Outline the **approved procedures and practices** for the locating, marking and maintaining the integrity of **supply apparatus and sub-structures**.
- 3.17 State the roles and responsibilities of people involved in locating and avoiding supply apparatus and sub-structures.
- 3.18 Describe the importance of referring problems outside their responsibility or experience to the team leaders.
- 3.19 State the procedures for reporting to team leaders and others.
- 3.20 Outline the procedures for recording and reporting job progress, problems and deviations to work programmes.
- 3.21 Outline the main responsibilities of the employer and employee under the Health and Safety at Work Act.
- 3.22 State the safe procedures for:
 - working in excavations
 - handling the range of location equipment
 - handling hazardous materials
- 3.23 Describe the legislative requirements and company procedures for recording and reporting accidents
- 3.24 List the different types of personal protective equipment used when locating and avoiding underground supply apparatus and sub-structures.

Range

Supply apparatus and sub-structures: the supply apparatus for utilities and other agencies; above ground services; built structures; the natural environment.

Search techniques: electronic location equipment; trial holes; visual examination; use of drawing and records.

Codes of Practice: statutory and regulatory as directed by the team leader.

Unit 102

Working under supervision, excavate holes and trenches in ground and pavement structures

Level: 1
Credit value: 2
UAN: L/502/9665

Unit aim:

This unit allows learners to demonstrate their competence in preparing and carrying out the excavation of holes and trenches in ground and pavement structures. Working under supervision at all times, and reporting to a team leader, learners must show that they can follow instructions to excavate on site. Learners must follow safe working practices and protect utility supply apparatus and sub-structures.

Learning outcomes

There are **two** learning outcomes to this unit. The learner will:

1. Carry out excavations on site
2. Demonstrate knowledge and understanding of excavation on site

Guided learning hours

It is recommended that **8** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: NC0102 Working under supervision, excavate holes and trenches in ground and pavement structures.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit will be assessed by:

- Portfolio of evidence.

Unit 102 Working under supervision, excavate holes and trenches in ground and pavement structures

Outcome 1 Carry out excavations on site

Assessment criteria

The learner can:

- 1.1 Identify the work site and area to be excavated from the work instructions and plans.
- 1.2 Determine which **excavation method** is suitable for the **surface and sub-surface** materials being removed and ensure it meets with relevant **Codes of Practice**.
- 1.3 Select **tools and equipment** and confirm they are suitable to the **excavation method**.
- 1.4 Confirm the position and **size of excavation** meets the requirements of instructions and the work specification.
- 1.5 Identify and select excavated materials, and segregate and store them in accordance with work instructions and relevant **Codes of Practice**.
- 1.6 Ensure the excavation is carried out in a manner that avoids damage to **supply apparatus and sub-structures**.
- 1.7 Ensure damage to the natural environment is minimised in line with the relevant technical guidance.
- 1.8 Identify, support and protect exposed **supply apparatus and sub-structures** in accordance with work instructions and relevant **Codes of Practice**.
- 1.9 Identify and report any damage to **supply apparatus and sub-structures** in accordance with work instructions and organisational procedures.
- 1.10 Ensure that surplus materials are removed in accordance with work instructions and requirements.
- 1.11 Confirm that the dimensions and condition of base of the excavation are in line with instructions and the works specification.
- 1.12 Ensure the work is carried out to **approved procedures and practices**.
- 1.13 Refer any problems and conditions outside their responsibility in line with **approved procedures and practices**.

Range

Excavation method: hand dig; machine dig

Surface and sub-surface: flexible; composite; rigid; modular; verge; natural ground

Codes of Practice: statutory and regulatory, as directed by the team leader

Tools and equipment: hand tools; powered tools; motorised equipment for excavation

Size of excavation: must be appropriate for the work activities being undertaken

Supply apparatus and sub-structures: supply apparatus for utilises and other agency apparatus and above ground services; built structures; the natural environment (eg foundations, tree roots, natural watercourses)

Approved procedures and practices: Health, safety and environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures, within the remit of learners' responsibility.

Unit 102 Working under supervision, excavate holes and trenches in ground and pavement structures

Outcome 2 Demonstrate knowledge and understanding of excavation on site

Assessment criteria

The learner can:

- 2.1 Outline the circumstances where ground support would be needed.
- 2.2 State the causes of instability in excavated areas.
- 2.3 Describe the circumstances where excavation supports must be installed.
- 2.4 Describe how to identify the different types of pavement surface.
- 2.5 List the types of sub-surface materials used for the different pavement surfaces.
- 2.6 Describe the main **excavation methods**, including hand and machine methods.
- 2.7 list the different types and range of **tools and equipment** used for hand and machine excavation, including:
 - hand tools
 - power tools
 - motorised equipment
- 2.8 Describe the hazards associated with working in excavations without natural or assisted ventilation
- 2.9 State when operator training or certification would be needed for the use of motorised excavation machinery.
- 2.10 Describe how to select, use and take care of hand and power tools.
- 2.11 State the essential maintenance required for hand and power tools.
- 2.12 List the types and function of the different **supply apparatus and sub-structures** that may be encountered during excavation work.
- 2.13 Describe how to identify the different types of supplies encountered during excavation work.
- 2.14 Identify the hazards associated with:
 - leaks or damaged supply apparatus
 - damage to electrical supply apparatus
- 2.15 Explain how failure to adequately support and protect **supply apparatus and sub-structures** can lead to:
 - damage to supply apparatus and sub-structures
 - the need for work to be re-done, with serious cost and operational implications
 - major safety hazards.
- 2.16 State the implications of using incorrect excavation practices, including:
 - types of damage to supply apparatus and sub-structures
 - possible risks to safety
 - possible cost implications.
- 2.17 Explain the implications of exceeding the minimum size for excavations, as determined by site requirements, including:
 - safety implications
 - costs of additional labour and materials for the job
 - inconvenience to the general public or customer.

- 2.18 Explain how the use of incorrect materials could lead to:
- damage to the supply apparatus or sub-structure
 - costs of re-doing work
 - delays in the job programme
 - costs of materials.
- 2.19 Explain why the incorrect storage of materials could make them unfit for use, and the related cost implications.
- 2.20 Explain the importance of economy when using powered or motorised equipment for excavation works.
- 2.21 Describe safe methods of storage or disposal of materials with a potential environmental hazard.
- 2.22 State the main requirements of Codes of Practice and guidance notes for excavation work in terms of:
- personal protection
 - excavation activities
 - the support of supply apparatus
 - the support of excavations.
- 2.23 State how site and resource requirements are determined in accordance with approved **procedures and practices**.
- 2.24 State the roles and responsibilities of people involved in carrying out and supervising excavation operations.
- 2.25 Explain the importance of referring problems outside their responsibility to appropriate people.
- 2.26 Describe the procedures for recording and reporting to team leaders and others regarding:
- work progress
 - problems
 - deviations to work programmes.
- 2.27 Outline the main responsibilities of the employer and employee under the Health and Safety at Work Act for work in excavations.
- 2.28 State the legislation that governs work in excavations.
- 2.29 Describe safe procedures for:
- handling the range of **tools and equipment** for excavation, including hand and power tools.
 - handling hazardous materials encountered during excavation work.
- 2.30 Outline the legislative requirements and company procedures for recording and reporting accidents.
- 2.31 List the personal protective equipment (PPE) used for excavation work.

Range

Excavation method: hand dig; machine dig

Tools and equipment: hand tools; powered tools; motorised equipment for excavation

Supply apparatus and sub-structures: supply apparatus for utilises and other agency apparatus and above ground services; built structures; the natural environment (eg foundations, tree roots, natural watercourses)

Approved procedures and practices: Health, safety and environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures, within the remit of learners' responsibility.

Unit 103

Assist in preparing for reinstatement of excavation and pavement surfaces

Level:	1
Credit value:	2
UAN:	R/502/9666

Unit aim

This unit allows learners to demonstrate their competence in assisting in preparing for the reinstatement of excavations and the surfaces of highway and footway pavements. Working under supervision at all times, and reporting to a team leader, learners must show that they can interpret and follow instructions to plan and organise reinstatement activities. Learners must ensure that the appropriate fine fill sub-grade, sub-base and road-base materials are used and that suitable surface materials are selected. Safe working practices must be followed at all times.

Learning outcomes

There are **two** learning outcomes to this unit. The learner will:

1. Assist in preparing for reinstatement of excavation and pavement surfaces
2. Demonstrate knowledge and understanding of reinstatement of excavation and pavement surfaces

Guided learning hours

It is recommended that **9** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: NC0103 Assist in preparing for reinstatement of excavation and pavement surfaces.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 103

Assist in preparing for reinstatement of excavation and pavement surfaces

Outcome 1

Assist in preparing for reinstatement of excavation and pavement surfaces

Assessment criteria

The learner can:

- 1.1 Carry out the work to **approved procedures and practices** and in compliance with statutory requirements.
- 1.2 Identify and confirm the location of the excavation and the **extent of reinstatement** in accordance with instructions and work specifications.
- 1.3 Identify the **area and type of structure** for reinstatement in accordance with the relevant **Codes of Practice**.
- 1.4 Carry out **preparation procedures** for the reinstatement of excavation in accordance with the relevant **Codes of Practice**.
- 1.5 Report remedial work and defects in the excavation which are outside their level of Responsibility, in accordance with organisational and operational procedures.
- 1.6 Identify and protect **supply apparatus and sub-structures** in accordance with the relevant **Codes of Practice**.
- 1.7 Identify, select, handle and store **materials** for reinstatement in accordance with relevant **Codes of Practice**.
- 1.8 Select and confirm that **tools and equipment** are appropriate for the **materials** to be used for reinstatement.
- 1.9 Identify that **tools and equipment** are in a condition suitable for use in accordance with the manufacturer's specifications and operational requirements.
- 1.10 Refer problems and conditions outside their responsibility in accordance with **approved procedures and practices**.

Range

Approved procedures and practices: Health, safety and environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures, within the remit of the learners responsibility

Extent of reinstatement: excavations appropriate to the work activity

Area and type of structure: appropriate to the work activity

Codes of Practice: statutory and regulatory as directed by the team leader

Preparation procedures: edge trimming; formation surface removal; removal of loose debris; repair of formation

Supply apparatus and sub-structures: the supply apparatus for utilities and other agencies; above ground services; built structures; the natural environment (eg foundations, tree roots, natural watercourses)

Materials: new and re-usable materials for fine fill, backfill, sub-base, road-base pavement surfaces (relative to the type of pavement)

Tools and equipment: hand tools; powered tools; equipment for excavation

Unit 103

Assist in preparing for reinstatement of excavation and pavement surfaces

Outcome 2

Demonstrate knowledge and understanding of reinstatement of excavation and pavement surfaces

Assessment criteria

The learner can:

- 2.1 Name the different types of pavement structure including flexible, composite, rigid and modular pavement construction, verge and natural ground.
- 2.2 State **preparation procedures** including edge trimming, formation surface removal, removal of loose debris, repair formation.
- 2.3 List the sub-surface requirements for each type of pavement surface.
- 2.4 Name the various types of excavation.
- 2.5 List the **materials** in excavations and possible defects.
- 2.6 State the remedial actions to take when defects are encountered including advising the team leader.
- 2.7 State the importance of complying with team leader's safety and procedural instructions.
- 2.8 List the types of **supply apparatus and sub-structures** that may be encountered including utilities and other agencies.
- 2.9 List the methods of protecting the different types of **supply apparatus and sub-structures**.
- 2.10 State the methods of segregating the different **materials** including new and re-usable **materials** for fine fill, backfill, sub-base, road base, and pavement surface.
- 2.11 Describe the methods of checking the condition of material that is to be reused.
- 2.12 State the main characteristics of surface, sub-surface and general reinstatement **materials** including:
 - suitable fine fill materials
 - suitable back-fill materials
 - granular sub-bases
 - road base materials
 - bituminous road base materials
 - surfacing materials
 - concrete
 - modular surfacing.

Range

Preparation procedures: edge trimming; formation surface removal; removal of loose debris; repair of formation

Supply apparatus and sub-structures: the supply apparatus for utilities and other agencies; above ground services; built structures; the natural environment (eg foundations, tree roots, natural watercourses)

Materials: new and re-usable materials for fine fill, backfill, sub-base, road-base pavement surfaces (relative to the type of pavement)

Unit 106

Working under supervision, operate powered tools and equipment for network construction operations

Level:	1
Credit value:	2
UAN:	Y/502/9670

Unit aim:

This unit allows learners to demonstrate their competence in operating powered tools and equipment for network construction operations for routine activities. Working at all times under supervision, and reporting to a team leader, learners must follow regular safe working practices and procedures. Whether dealing with powered static equipment, hand-operated powered tools or designated small mobile plant, learners must show that they can operate safely and in line with manufacturers' instructions and specifications.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Prepare powered tools and equipment for use
2. Run and operate powered tools and equipment
3. Shut down and carry out post-stop checks on powered tools and equipment
4. Demonstrate knowledge and understanding of operating powered tools and equipment

Guided learning hours

It is recommended that **7** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: NCO106 Working under supervision, operate powered tools and equipment for network construction operations.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 106 Working under supervision, operate powered tools and equipment for network construction operations

Outcome 1 Prepare powered tools and equipment for use

Assessment criteria

The learner can:

- 1.1 Ensure that **operations** requiring **powered tools and equipment** are identified and confirmed in accordance with the specifications and work instructions
- 1.2 Carry out pre-start inspections on the **powered tools and equipment** in line with **approved procedures and practices**
- 1.3 Ensure any defects of the **powered tools and equipment** are identified, recorded and appropriate action taken to correct them
- 1.4 Confirm the **powered tools and equipment** are safe, correct and ready for use to meet the work requirements and **approved procedures and practices**
- 1.5 Refer any problems and conditions outside their responsibility in line with **approved procedures and practices**
- 1.6 Carry out work to meet statutory requirements and **approved procedures and practices**.

Range

Operations: routine; predictable

Powered tools and equipment: hand operated; mobile and static (eg compressor, generator, water pump, vibro-tampers, vibrating plate, pavement and road saws); pneumatic or hydraulic breakers

Approved procedures and practices: Health, safety and environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures within the remit of the learners' responsibility

Unit 106 Working under supervision, operate powered tools and equipment for network construction operations

Outcome 2 Run and operate powered tools and equipment

Assessment criteria

The learner can:

- 2.1 Carry out start and stop procedures to confirm functions are in accordance with safe control and the manufacturers' operating instructions
- 2.2 Run and operate **powered tools and equipment** to meet the work requirement
- 2.3 Carry out **operations** safely in line with specifications and **approved procedures and practices**
- 2.4 Ensure that defects in performance are identified, recorded and reported to the appropriate person(s)
- 2.5 Ensure the work is carried out to meet statutory requirements and **approved procedures and practices**
- 2.6 Refer any problems and conditions outside their responsibility in line with **approved procedures and practices**

Range

Powered tools and equipment: hand operated; mobile and static (eg compressor, generator, water pump, vibro-tampers, vibrating plate, pavement and road saws); pneumatic or hydraulic breakers

Operations: routine; predictable

Approved procedures and practices: Health, safety and environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures within the remit of the learners' responsibility

Unit 106 **Working under supervision, operate powered tools and equipment for network construction operations**

Outcome 3 Shut down and carry out post-stop checks on powered tools and equipment

Assessment criteria

The learner can:

- 3.1 Safely stop **powered tools and equipment** in line with **approved procedures and practices**
- 3.2 Carry out post-stop checks in accordance with organisational and operational procedures
- 3.3 Ensure any defects and replacement needs identified after use are recorded and reported to the appropriate person(s)
- 3.4 Ensure the **powered tools and equipment** are left safe and secure in accordance with **approved procedures and practices**
- 3.5 Carry out the work to meet statutory requirements and **approved procedures and practices**
- 3.6 Refer any problems and conditions outside their responsibility in line with **approved procedures and practices**

Range

Powered tools and equipment: hand operated; mobile and static (eg compressor, generator, water pump, vibro-tampers, vibrating plate, pavement and road saws); pneumatic or hydraulic breakers

Approved procedures and practices: Health, safety and environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures within the remit of the learners' responsibility

Unit 106 **Working under supervision, operate powered tools and equipment for network construction operations**

Outcome 4 Demonstrate knowledge and understanding of operating powered tools and equipment

Assessment criteria

The learner can:

- 4.1 Describe the purpose of the power tools and how they are to be used with the specified work requirement (e.g. compaction, excavation, cutting, finishing surfaces and removing materials)
- 4.2 List the types of powered tools and equipment used within their job role and work activities
- 4.3 Describe the work to be done and how the equipment will be used in accordance with manufacturers' specifications
- 4.4 Outline the operational and safety procedures associated with using the tools and equipment and how to ensure the safety of the **operations** and the surrounding environment
- 4.5 State the manufacturers' recommendations and relevant organisational and operational procedures for:
 - routine checks
 - pre-start checks
 - requirements for the safety of the work and the surrounding environment
 - handling **powered tools and equipment**
 - starting and stopping the equipment
 - post-stop checks on equipment after use
 - routine and emergency shut down of equipment
 - storing equipment after use
- 4.6 Outline the main **approved procedures and practices** to follow when operating **powered tools and equipment**
- 4.7 List the training and certification requirements for operating tools and equipment
- 4.8 State their responsibilities under the Health and Safety at Work Act
- 4.9 Outline the recommended safety precautions before, during, and after **operations** for:
 - use of hats, ear protectors, eye protection, footwear, gloves and masks
 - recognising the implications of toxic fumes, dust and hazardous materials to other personnel, adjacent activities and surrounding environment
 - applying correct lifting and handling techniques.
- 4.10 Describe the operational safety procedures to observe when starting and stopping **powered tools and equipment**
- 4.11 Outline the manufacturers' recommendations and relevant company procedures when handling **powered tools and equipment**
- 4.12 Give examples of the different types of defects related to the types of tools and equipment being used

- 4.13 Outline the adjustments that can be made and how problems and damage are reported for operational problems with equipment, including
- broken or missing protective guards
 - worn securing pins
 - damaged hoses
 - incorrectly fitted blades
 - damaged power leads
 - fuel leaks
- 4.14 State your responsibilities under the Health, Safety and Environment at work for:
- lifting and handling techniques
 - use of personal protective equipment
 - handling hazardous substances
 - approved reporting procedures
- 4.15 Give examples of the typical types of damage and replacement needs for the **powered tools and equipment**

Range

Operations: routine; predictable

Powered tools and equipment: hand operated; mobile and static (eg compressor, generator, water pump, vibro-tampers, vibrating plate, pavement and road saws); pneumatic or hydraulic breakers

Approved procedures and practices: Health, safety and environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures within the remit of the learners' responsibility

Unit 107

Working under supervision, join polyethylene pipe by electrofusion welding

Level:	1
Credit value:	2
UAN:	H/502/9672

Unit aim:

This unit allows learners to demonstrate their competence in jointing polyethylene pipes by electrofusion welding. Working under supervision at all times, and reporting to a team leader, learners must show that they can follow instructions to make socket and saddle joints using appropriate materials and SDR rating, in vertical and horizontal planes, both in and out of excavations, and working in all weather conditions. Learners must work according to industry standards and specifications and follow safe working practices at all times.

Learning outcomes

There are **two** learning outcomes to this unit. The learner will:

1. Working under supervision, join polyethylene pipe by electrofusion welding
2. Demonstrate knowledge and understanding of electrofusion jointing

Guided learning hours

It is recommended that **7** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: NCO107 Working under supervision, join materials by electrofusion welding.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 107

Working under supervision, join polyethylene pipe by electrofusion welding

Outcome 1

Working under supervision, join polyethylene pipe by electrofusion welding

Assessment criteria

The learner can:

- 1.1 Comply with Health, Safety and Environment and other relevant regulations and guidelines.
- 1.2 Follow the relevant **jointing procedure** and job instructions.
- 1.3 Check that the joint preparation complies with the specification.
- 1.4 Check that **jointing and related equipment** and consumables are as specified and fit for purpose.
- 1.5 Make the **joints** as specified using the appropriate thermal jointing technique.
- 1.6 Produce **joints** of the required **quality** and of specified dimensional accuracy.
- 1.7 Shut down the **equipment** to a safe condition on completion of jointing activities.
- 1.8 Deal promptly with excess and waste materials and temporary attachments, in line with approved and agreed procedures.
- 1.9 Deal promptly and effectively with problems within your control and report those that cannot be solved.

Range

Jointing procedures: for services – electrofusion jointing up to and including 63 mm; for mains – electrofusion jointing up to and including 315 mm.

Jointing and related equipment: manual; automatic machines

Joints: socket; saddle

Quality: water industry standards; manufacturers' instructions and specifications; relevant company procedures; Codes of Practice; Health, Safety and Environment Compliance.

Unit 107

Working under supervision, join polyethylene pipe by electrofusion welding

Outcome 2

Demonstrate knowledge and understanding of electrofusion jointing

Assessment criteria

The learner can:

- 2.1 Outline the basic safety requirements for
 - lifting and handling
 - working in excavations
 - working beside excavations
 - working with electricity
 - working alongside other plant
 - working in gaseous atmospheres
 - hazards arising from jointing operations.
- 2.2 Describe the joint preparation techniques and the importance of preparation complying with specifications.
- 2.3 Outline the electrofusion jointing process and procedures.
- 2.4 Describe how to select the correct materials for the **joints**.
- 2.5 Describe how to inspect the completed **joints** for defects.
- 2.6 Explain how to connect, shut down and disconnect equipment.
- 2.7 Explain what to do if a problem occurs and to whom it should be reported.

Range

Joints: socket; saddle

Unit 109

Assist in preparing resources and signing, lighting and guarding the area for highway works

Level: 1
Credit value: 2
UAN: K/502/9673

Unit aim

This unit is designed to allow learners to demonstrate their competence in assisting with preparing resources and segregating the area for highways works. Working at all times under supervision, and reporting to a team leader, learners must show that they can interpret instructions, prepare materials, tools and equipment and install signs, lights and guards to segregate the work area in advance of site operations. Learners must follow safe working practices at all times and contribute to the protection of personnel, property and the working area.

Learning outcomes

There are **three** learning outcomes to this unit. The learner will:

1. Determine site and resource requirements for highway works
2. Install signs, lights and guarding requirements for work on the highway
3. Demonstrate knowledge and understanding of signing, lighting and guarding the work site

Guided learning hours

It is recommended that **8** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: NCO109 Assist in preparing resources and segregating the area for highway works.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 109 Assist in preparing resources and signing, lighting and guarding the area for highway works

Outcome 1 Determine site and resource requirements for highway works

Assessment criteria

The learner can:

- 1.1 Confirm the location and extent of the work site according to instructions and specified requirements.
- 1.2 Report any shortages and defects of **materials, tools and equipment** in accordance with operational and organisational procedures.
- 1.3 Set out the work area in accordance with the specified requirements.
- 1.4 Identify any hazards and risks and take appropriate action to provide for the safety of the work area and the natural environment.
- 1.5 Confirm that **materials** supplies and **tools and equipment** are correct for the work requirement, in accordance with instructions and organisational procedures.
- 1.6 Maintain the security of **materials, tools and equipment** in line with instruction and organisational requirements.
- 1.7 Report any problems and conditions outside their responsibility in accordance with **approved procedures and practices**.
- 1.8 Carry out the work to **approved procedures and practices** and in compliance with statutory requirements.

Range

Materials: required for work activity; correct quality and quantity; backfill and sub-courses

Tools and equipment: hand tools; powered tools; motorised equipment for excavation; protection equipment for excavations (signs, lights, guards).

Approved practices and procedures: Health, Safety and Environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures, within the remit of the learners' responsibility.

Unit 109 Assist in preparing resources and signing, lighting and guarding the area for highway works

Outcome 2 Install signs, lights and guarding requirements for work on the highway

Assessment criteria

The learner can:

- 2.1 Identify the safety and security requirements for the highways work site from the work instructions and specifications and in accordance with relevant **Codes of Practice**.
- 2.2 Set out and erect **protection equipment** in line with relevant **Codes of Practice**.
- 2.3 Confirm the positioning and condition of the **protection equipment** are satisfactory to the work requirement and meet the relevant **Codes of Practice**.
- 2.4 Ensure that the **traffic control equipment** is positioned, adjusted, maintained and controlled appropriate to the progress and changes of the work activity and in line with the work requirement and relevant **Codes of Practice**.
- 2.5 Report defective and damaged equipment to the appropriate person.
- 2.6 Remove **protection equipment** and **traffic control equipment** in accordance with relevant **Codes of Practice**.
- 2.7 Refer problems and conditions outside their responsibility in accordance with **approved procedures and practices**.
- 2.8 Carry out work to **approved procedures and practices** and in compliance with statutory requirements.

Range

Codes of Practice: statutory; regulatory, including New Roads and Street Works Act.

Protection equipment: signs; lights; guards

Traffic control equipment: warning signs; priority signs; Stop/Go boards; portable traffic signals

Approved practices and procedures: Health, Safety and Environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures, within the remit of the learners' responsibility.

Unit 109

Assist in preparing resources and signing, lighting and guarding the area for highway works

Outcome 3

Demonstrate knowledge and understanding of signing, lighting and guarding the work site

Assessment criteria

The learner can:

- 3.1 Describe the main materials encountered in excavation work including:
 - paving
 - sub-surface
 - general fill materials.
- 3.2 List the range of hand and powered tools used for excavations and reinstatement.
- 3.3 Describe the maintenance requirements for the range of hand and power tools used for excavation and reinstatement
- 3.4 Explain the importance of confirming that the work location has been correctly identified from verbal instructions
- 3.5 Describe the key requirements of an effective and safe work area
- 3.6 Identify common hazards in excavation and reinstatement work and appropriate safety precautions
- 3.7 Explain the methods of dealing with emergencies in excavations
- 3.8 Identify the range of safety equipment required for highways operations
- 3.9 Identify materials posing a health hazard and the appropriate methods of handling them safely
- 3.10 List the personal protective equipment for use in highways operations
- 3.11 Outline the main industry **approved procedures and practices** for preparing resources and signing, lighting and guarding the work site.
- 3.12 List the roles and responsibilities of persons within the highways operations team
- 3.13 State the roles and responsibilities of the different people on site
- 3.14 State the importance of referring to team leaders problems that are outside their area of responsibility.
- 3.15 Explain the importance of checking and reporting defects in signs, guards, lighting, and traffic control systems to the team leader
- 3.16 State the importance of complying with team leader's safety and procedural instructions
- 3.17 State the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 3.18 Outline the main Health, Safety and Environment responsibilities of employer and employee engaged in highways operations
- 3.19 Outline the employer's responsibilities for providing a safe place of work, including appropriate safety equipment
- 3.20 Explain the employee's responsibility for safety of themselves and others
- 3.21 Outline the safe procedures for handling the range of signing, guarding, and lighting equipment used for highways works
- 3.22 Outline safe procedures for handling hazardous materials
- 3.23 Describe the accident recording and reporting procedures
- 3.24 State the procedure for reporting and recording job progress, problems and deviations to work programmes to the immediate team leader

- 3.25 Explain the actions to take in the event of an accident or emergency during operations on the highway
- 3.26 Outline the procedure for summoning the emergency services
- 3.27 List the range and purpose of personal protective equipment used during highways operations
- 3.28 Explain the importance of checking and reporting defects in personal protective equipment to the team leader
- 3.29 State the reason for using equipment to protect highways works.
- 3.30 List the different types of **protection equipment** and **traffic control equipment**.
- 3.31 List the types of guards used to protect highways works and how to position them relative to the work
- 3.32 Outline how to position and operate traffic controls under supervision.
- 3.33 Confirm how to follow instructions from the team leader to ensure the correct sequences for erection and dismantling of traffic control arrangements.
- 3.34 State the importance of cleaning signs and lights in the immediate work area during the course of highways works

Range

Approved practices and procedures: Health, Safety and Environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures, within the remit of the learners' responsibility.

Protection equipment: signs, lights, guards

Traffic control equipment: warning signs, priority signs, Stop/Go boards, portable traffic signals.

Unit 110

Assist in preparing resources and signing and guarding the area for site works

Level:	1
Credit value:	2
UAN:	M/502/9674

Unit aim:

This unit is designed to allow learners to demonstrate their competence in assisting with preparing resources and segregating the area for site works. Working at all times under supervision, and reporting to a team leader, learners must show that they can interpret instructions and prepare materials, tools and equipment for site operations. They must check that the correct resources are available for site operations, and check that equipment and materials are stored safely and securely. Learners must follow safe working practise at all times and contribute to the protection of personnel, property and the working area.

Learning outcomes

There are **two** learning outcomes to this unit. The learner will:

1. Determine the site and resource requirements for site works
2. Demonstrate knowledge and understanding of signing and guarding the area for site works

Guided learning hours

It is recommended that **8** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: NCO110 Assist in preparing resources and signing and guarding the area for site works.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 110

Assist in preparing resources and signing and guarding the area for site works

Outcome 1

Determine the site and resource requirements for site works

Assessment criteria

The learner can:

- 1.1 Locate and confirm the area for site works according to instructions and specified requirements.
- 1.2 Report any shortages and defects of **materials** and **tools and equipment** in accordance with operational and organisational procedures.
- 1.3 Set out the area for the site works in accordance with the specified requirement.
- 1.4 Identify any hazards and risks and take appropriate action to provide for the safety of the work area and the natural environment.
- 1.5 Confirm that the supplies of **materials, tools and equipment** are correct for the work requirement, in line with instructions and organisational requirements.
- 1.6 Maintain the security of **materials** and **equipment** in accordance with instruction and organisational requirements.
- 1.7 Ensure any problems and conditions outside their responsibility are referred in accordance with **approved procedures and practices**.
- 1.8 Carry out work to **approved procedures and practices** and in compliance with statutory requirements.

Range

Materials: required for the work activity; correct quality and quantity; backfill and sub-courses.

Tools and equipment: hand tools; powered tools; motorised equipment for excavation; protection equipment for excavations (signs, lights, guards).

Approved practices and procedures: Health, Safety and Environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures, within the remit of the learners' responsibility.

Unit 110

Assist in preparing resources and signing and guarding the area for site works

Outcome 2

Demonstrate knowledge and understanding of signing and guarding the area for site works

Assessment criteria

The learner can:

- 2.1 Explain the importance of confirming that the work location is identified correctly from verbal instructions.
- 2.2 Describe the key requirements of an effective and safe work area.
- 2.3 List the main **materials** encountered in excavation work including paving, sub-surface and general fill materials.
- 2.4 List the different types and range of **tools and equipment** used for hand and machine excavation, including:
 - hand tools
 - power tools
 - motorised equipment
 - protection equipment for excavations.
- 2.5 State the essential maintenance required for hand and power tools.
- 2.6 Identify common hazards in excavation and reinstatement work and the appropriate safety precautions.
- 2.7 Describe how to deal with emergencies in excavations.
- 2.8 Identify the safety equipment required for site operations.
- 2.9 Give examples of materials which pose a health hazard and explain safe handling methods.
- 2.10 List the personal protective equipment (PPE) that would be required for site operations.
- 2.11 Explain the appropriate lifting and handling techniques for the **materials, tools and equipment** used.
- 2.12 Outline the **approved procedures and practices** for determining site and resource requirements.
- 2.13 List the people involved in site operations and their roles and responsibilities.
- 2.14 Outline the job control structures for site operations.
- 2.15 Describe the importance of referring problems outside their responsibility to team leaders.
- 2.16 Describe the procedures for recording and reporting to team leaders and others regarding:
 - work progress
 - problems
 - deviations to work programmes.
- 2.17 Outline the Health, Safety and Environment responsibilities of the employer and employees engaged in site operations.
- 2.18 Outline the employer's responsibilities for providing a safe place of work, including appropriate safety equipment.
- 2.19 Describe the employee's responsibility for their own safety and the safety of others.
- 2.20 Outline the legislative requirements and company procedures for recording and reporting accidents

Range

Materials: required for the work activity; correct quality and quantity; backfill and sub-courses.

Tools and equipment: hand tools; powered tools; motorised equipment for excavation; protection equipment for excavations (signs, lights, guards).

Approved practices and procedures: Health, Safety and Environmental compliance; regulatory; emergency; operational; organisational; relevant company procedures, within the remit of the learners' responsibility.

Unit 111

Working under supervision, join polyethylene pipe by butt fusion welding

Level:	1
Credit value:	2
UAN:	T/502/9675

Unit aim:

This unit allows learners to demonstrate their competence in jointing polyethylene pipe by butt fusion welding. Working under supervision at all times, and reporting to a team leader, learners must show that they can follow instructions to make butt fusion joints in different positions, both in-line and level, and working in all weather conditions. Learners must work according to industry standards and specifications and follow safe working practices at all times.

Learning outcomes

There are **two** learning outcomes to this unit. The learner will:

1. Working under supervision, join polyethylene pipe by butt fusion welding
2. Demonstrate knowledge and understanding of butt fusion welding

Guided learning hours

It is recommended that **5** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: NCO111 Working under supervision, join materials by butt fusion welding.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 111 Working under supervision, join polyethylene pipe by butt fusion welding

Outcome 1 Working under supervision, join polyethylene pipe by butt fusion welding

Assessment criteria

The learner can:

- 1.1 Work safely at all times, complying with Health, Safety and Environment and other relevant regulations and guidelines.
- 1.2 Follow the relevant **jointing procedure** and work instructions.
- 1.3 Confirm that the machine is set up and operating correctly, ready for the **jointing process** to be carried out.
- 1.4 Check that the polyethylene pipe, components, consumables and **joint** preparation comply with specifications.
- 1.5 Carry out and monitor the machine operations in accordance with specifications and job instructions.
- 1.6 Achieve joints of the required **quality** and specified dimensional accuracy.
- 1.7 Deal promptly and effectively with problems within your control and report those that you cannot solve.
- 1.8 Shut down the equipment to a safe condition on conclusion of the jointing activities.

Range

Jointing procedure/process: butt fusion; automatic and fully automatic appropriate to the company procedures

Joint: butt

Quality: manufacturers' instructions and specifications; relevant company procedures; Codes of Practice; Health, Safety and Environment Compliance; calibration.

Unit 111

Working under supervision, join polyethylene pipe by butt fusion welding

Outcome 2

Demonstrate knowledge and understanding of butt fusion welding

Assessment criteria

The learner can:

- 2.1 Explain the Health, Safety and Environment legislation and environmental procedures relevant to the work activities, manual handling, and company procedures including standard checklists and Codes of Practice.
- 2.2 State the basic safety requirements for
 - lifting and handling
 - working in excavations
 - working beside excavations
 - working with electricity
 - working alongside other plant
 - working in gaseous atmospheres
 - hazards arising from jointing operations.
- 2.3 Outline **joint** preparation techniques and the importance of preparation according to the specification.
- 2.4 Explain why only pipes of similar specifications (SDR) can be joined together.
- 2.5 Outline the **jointing process and procedures**.
- 2.6 Explain the cause and effect of defects and contamination, including:
 - misalignment split defects
 - inadequate bead
 - excessive bead.
- 2.7 Outline why pipe support, alignment and protection is needed and the consequences of not providing this.
- 2.8 Describe how to select the correct materials for the **joints**.
- 2.9 Describe how to inspect completed **joints** for defects.
- 2.10 Explain how to connect, shut down and disconnect equipment.
- 2.11 Explain what to do if a problem occurs and who to report it to.

Range

Jointing procedure/process: butt fusion; automatic and fully automatic appropriate to the company procedures

Joint: butt

Unit 112

Working under supervision, contribute to an efficient and effective work environment

Level: 2

Credit value: 2

UAN: Y/502/9667

Unit aim:

This unit allows learners to demonstrate their competence in contributing to an efficient and effective work environment, to support network construction operations. Learners will need to show that they exchange information and develop and maintain productive working relationships with colleagues, associates and visitors to the work site. Working at all times under supervision, and reporting to a team leader, they will also need to organise their own work, operating efficiently and effectively, to maintain work standards and to work as part of a team. Safe working practices must be followed at all times

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Contribute the efficiency in the workplace
2. Develop and maintain effective working relationships
3. Organise their work and maintain standards
4. Demonstrate knowledge and understanding of how to contribute to an efficient and effective work environment

Guided learning hours

It is recommended that **7** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: 019NNCO104 Working under supervision, contribute to an efficient and effective work environment.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 112

Working under supervision, contribute to an efficient and effective work environment

Outcome 1

Contribute to efficiency in the workplace

Assessment criteria

The learner can.

- 1.1 organise the work and operational area in an orderly way to minimise hazards
- 1.2 ensure the work materials are used and stored in accordance with the work activity and to **approved procedures and practices**
- 1.3 ensure the **tools and equipment** are maintained ready for use and stored in designated places when not required
- 1.4 ensure any restrictions to progress of work are communicated to the appropriate person(s) for appropriate action
- 1.5 carry out clear **communications** in accordance with operational and organisational procedures
- 1.6 refer any problems and conditions outside the responsibility of the job holder, in accordance with **approved procedures and practices**
- 1.7 ensure work is carried out to **approved procedures and practices** and in compliance with statutory requirements

Range

Approved procedures and practices: Health, safety and environmental compliance, regulatory, emergency, operational, organisational, relevant company procedures, within the remit of the learner's responsibility

Tools and equipment:: Hand tools and equipment

Communications: Oral, written, visual

Unit 112 Working under supervision, contribute to an efficient and effective work environment

Outcome 2 Develop and maintain effective working relationships

Assessment criteria

The learner:

- 2.1 treat work **colleagues and associates** in a manner that promotes goodwill and maintains good working practices
- 2.2 respond to reasonable working requests are responded to positively and willingly
- 2.3 support **colleagues and associates** who appear to be in work related difficulties
- 2.4 communicate effectively and respond to colleagues and associates
 - a. courteously
 - b. in a manner appropriate to the situation
 - c. in line with **approved procedures and practices**
- 2.5 refer any problems and conditions outside their responsibility in line with **approved procedures and practices**

Range

Colleagues and associates: working personnel on a day-to-day basis, occasional site users, team leader

Approved procedures and practices: Health, Safety and Environment Compliance, regulatory, emergency, operational, organisational, relevant company procedures, within the remit of the learner's responsibility

Unit 112

Working under supervision, contribute to an efficient and effective work environment

Outcome 3

Organise their work and maintain standards

Assessment criteria

The learner can:

- 3.1 ensure the work is organised to comply with instructions and the agreed schedules
- 3.2 carry out the work methods in accordance with **approved procedures and practices** and optimise the use of time
- 3.3 co-ordinate their own work with other relevant personnel and related activities as required
- 3.4 ensure any suggestions for improvements to work methods are referred in accordance with **approved procedures and practices** for confirmation and agreement on the action to be taken
- 3.5 carry out the work to the agreed **standards** and in accordance with specification and the organisational policy
- 3.6 refer to the team leader to:
 - a. confirm any deviations in **standards** or specifications
 - b. refer any work which may be detrimental to safety or the environment to the appropriate person(s) in accordance with organisational and operational procedures

Range

Approved procedures and practices: Health, Safety and Environment compliance, regulatory, emergency, operational, organisational, relevant company procedures, within the remit of the learner's responsibility

Standards: organisational, work specified, quality and quantity

Unit 112

Working under supervision, contribute to an efficient and effective work environment

Outcome 4

Demonstrate knowledge and understanding of how to contribute to an efficient and effective work environment

Assessment criteria

The learner can:

- 4.1 state the **approved procedures and practices** for the work activity as directed by the team leader
- 4.2 outline how to comply with the requirements of the Health and Safety at Work Act
- 4.3 describe how to safely lift and handle the range of tools, equipment and materials
- 4.4 give examples of hazardous materials and the precautions to take to deal with them
- 4.5 list the protective equipment appropriate to the range of work operations
- 4.6 outline **approved procedures and practices** for reporting
- 4.7 describe the different types of hand tools and equipment used for their work activities
- 4.8 describe how to store **tools and equipment**, including:
 - a. storage arrangements and procedures, with and without external security arrangements
 - b. the importance of locking up stores
- 4.9 describe the storage of materials, including:
 - a. appropriate storage methods for the nature and characteristics of materials
 - b. methods of checking materials into and out of storage
- 4.10 list the different materials used for the work processes
- 4.11 describe the main physical properties of the range of materials used in work operations
- 4.12 give examples of different types of packaging for the usual range of materials – loose, bagged, containerised – volume/weight of standard packages e.g. cement bags
- 4.13 explain how the range of materials may be affected by weather conditions
- 4.14 give examples of materials that pose a health hazard
- 4.15 describe the residual and waste materials that can arise from work operations
- 4.16 list the different ways of **communicating** during work activities
- 4.17 state the procedures for exchanging and recording information with and reporting problems to the team leader
- 4.18 give examples of the range and roles of others involved in the work activities, including:
 - a. other trades
 - b. management representatives
 - c. inspectorate
- 4.19 outline the responsibilities and authority of others who may visit or pass through the site
- 4.20 state how to organise work within the instructions advised by the team leader
- 4.21 list the different techniques used in work activities
- 4.22 outline industry best practice for the work activities
- 4.23 describe the type of preparatory work that is required, including ensuring safety provisions
- 4.24 describe the condition in which a finished work site should be left

4.25 state the organisational and operational **standards** that apply to the work activity and environment, including:

- a. national water hygiene
- b. National Joint Utilities Group (NJUG)
- c. New Road and Street Works Act (NRSWA)
- d. Environmental Act 1990
- e. Health and Safety at Work Act (HASAWA)

Range

Approved procedures and practices: Health, Safety and Environment compliance, regulatory, emergency, operational, organisational, relevant company procedures, within the remit of the learner's responsibility

Tools and equipment: Hand tools and equipment

Communications: Oral, written, visual

Standards: organisational, work specified, quality and quantity

Unit 113

Working under supervision, contribute to health, safety and environment in the workplace including hygiene

Level: 1

Credit value: 2

UAN: D/502/9668

Unit aim:

This unit allows learners to demonstrate their competence in contributing to health, safety, the environment and hygiene in the workplace during water network construction operations. Working at all times under supervision, and reporting to a team leader, learners must be able to identify hazards in the workplace, and deal with them appropriately, ensuring they are reported to the team leader or other relevant persons. Learners must be aware of their own responsibilities for health, safety and the environment in the workplace and must follow safe working and hygiene practices throughout their work activities. They must show that they have a basic understanding of emergency services and procedures and that they can respond appropriately to workplace emergencies. They must also contribute to workplace security procedures, and respond correctly to breaches of security involving damage or theft of plant, equipment materials and property.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Operate safely in the workplace
2. Respond to emergencies
3. Assist in maintaining the security of the workplace
4. Demonstrate knowledge and understanding of health, safety and environment in the workplace including hygiene

Guided learning hours

It is recommended that **12** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: 019NNCO105W Working under supervision, contribute to health, safety and environment in the workplace including hygiene.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 113 Working under supervision, contribute to health, safety and environment in the workplace including hygiene

Outcome 1 Operate safely in the workplace

Assessment criteria

The learner can:

- 1.1 ensure the work activities are carried out safely to avoid creating hazardous situations that may endanger workers and other personnel
- 1.2 identify and ensure that **hazards** and potential **hazards** in the workplace are dealt with appropriately within the responsibility and capability of the operator and reported promptly to the appropriate person(s)
- 1.3 ensure that **communications** are clear and information or instructions are confirmed as understood
- 1.4 ensure that all **tools and equipment** are used safely in accordance with organisational procedures, manufacturers' instructions and relevant statutory regulations
- 1.5 ensure that work materials and components are handled and stored in accordance with **approved procedures and practices**
- 1.6 ensure that manual handling is carried out safely using appropriate handling techniques
- 1.7 report accidents and incidents promptly in accordance with **approved procedures and practices**
- 1.8 ensure that appropriate personal protective equipment is used in compliance with safe working practices
- 1.9 ensure that work is carried out to **approved procedures and practices** and in compliance with statutory requirements

Range

Hazards: restrictions to access and egress, misuse of tools and equipment, faulty equipment, hazardous substances, interference with and from adjacent activities, obstructions, exposed apparatus, structures and services, flooding, wet or uneven surfaces, biological (infection), toxic, oxygen deficient and explosive atmospheres, working on pressurised water, risks from general public

Communications: oral, written, visual

Tools and equipment: hand tools and equipment, safety equipment required for work activities in hazardous areas

Approved procedures and practices: Health, Safety and Environment Compliance, including hygiene, regulatory (including Construction Management regulations, PUWER, LOLER, NRSWA, Control of Substances Hazardous to Health – COSHH), emergency, operational, organisational, relevant company procedures, within the remit of learners responsibility, Construction Management Regulations, PUWER, LOLER

Unit 113 Working under supervision, contribute to health, safety and environment in the workplace including hygiene

Outcome 2 Respond to emergencies

Assessment criteria

The learner can:

- 2.1 in the event of an **emergency** implement procedures promptly and correctly in accordance with recognised safe practice and organisational policy
- 2.2 promptly report and respond to accident(s) and incident(s) within the responsibility and capability of the work operator in accordance with **approved procedures and practices**
- 2.3 use **emergency** appliances in accordance with **approved procedures and practices**
- 2.4 ensure details of accident(s) and incident(s) are reported in accordance with **approved procedures and practices**
- 2.5 ensure that problems and conditions outside their responsibility are referred in accordance with **approved procedures and practices**

Range

Emergency: gas escapes, fire, toxic fumes, accidents, electrocutions, dangerous occurrences, explosion, gaseous atmospheres, flooding, pollution of the environment, structural or trench collapse, water contamination

Approved procedures and practices: Health, Safety and Environment Compliance, including hygiene, regulatory (including Construction Management regulations, PUWER, LOLER, NRSWA, Control of Substances Hazardous to Health – COSHH), emergency, operational, organisational, relevant company procedures, within the remit of learners responsibility, Construction Management Regulations, PUWER, LOLER

Unit 113 Working under supervision, contribute to health, safety and environment in the workplace including hygiene

Outcome 3 Assist in maintaining the security of the workplace

Assessment criteria

The learner can:

- 3.1 ensure that unauthorised personnel seen in the workplace are dealt with in accordance with organisational procedures and the appropriate person(s) advised
- 3.2 ensure that arrangements for **security** are observed and maintained in accordance with **approved procedures and practices**
- 3.3 ensure that potential risks to **security** are reported promptly to the appropriate person(s) and remedial action taken as necessary in accordance with organisational procedures
- 3.4 ensure that breaches of **security** are reported immediately in accordance with **approved procedures and practices**
- 3.5 ensure that problems and conditions outside their responsibility are referred in accordance with **approved procedures and practices**

Range

Security: personnel, property, the surrounding environment, operational area, plant and equipment

Approved procedures and practices: Health, Safety and Environment Compliance, including hygiene, regulatory (including Construction Management regulations, PUWER, LOLER, NRSWA, Control of Substances Hazardous to Health – COSHH), emergency, operational, organisational, relevant company procedures, within the remit of learners responsibility, Construction Management Regulations, PUWER, LOLER

Unit 113 **Working under supervision, contribute to health, safety and environment in the workplace including hygiene**

Outcome 4 Demonstrate knowledge and understanding of health, safety and environment in the workplace, including hygiene

Assessment criteria

The learner can:

- 4.1 list the **hazards** arising from the work activity and environment including:
 - a. traffic
 - b. activities or other trades
 - c. other services
 - d. working in confined spaces
- 4.2 state the definitions of a hazard and a risk
- 4.3 list the organisational and operational procedures for reporting **hazards** and reporting to the team leader
- 4.4 list the **tools and equipment** including safety equipment required for work activities in hazardous areas and pipe coil trailers
- 4.5 give examples of **tools and equipment** used in their work activity, including:
 - a. hand tools
 - b. powered **tools and equipment**
 - c. safety equipment for working in hazardous areas
 - d. safety equipment for working with pipe coil trailers
- 4.6 give examples of the types of materials used in the work operations, including:
 - a. disinfectant
 - b. fuel and chemicals
 - c. cement
 - d. bitumen
 - e. lubricants
- 4.7 give examples of the **approved procedures and practices** in their workplace relating to:
 - a. hygiene
 - b. health and safety (risk assessments, method statements)
 - c. environmental policy
 - d. company procedures
- 4.8 list the training and certification requirements for:
 - a. working on a water network
 - b. operating plant and equipment
- 4.9 state their responsibilities under the Health and Safety at Work Act
- 4.10 list the recommended safety precautions and checks before, during and after work operations
- 4.11 describe safe lifting and handling techniques for the range of **tools, equipment** and materials
- 4.12 state the appropriate protective equipment for the range of work operations
- 4.13 describe how to check personal protective equipment (PPE) for safe condition
- 4.14 describe how to identify hazardous materials including toxic fumes and dust, and the appropriate action to take

- 4.15 outline fire and **emergency** procedures, including those actions required to safeguard life and property
- 4.16 name the different classifications of fires and the appropriate extinguishers used for dealing with them in the workplace
- 4.17 state the procedures for reporting accidents and incidents
- 4.18 list the common types of personal accidents and health **emergencies** associated with the type of work to be carried out and the actions to take if they occur
- 4.19 describe the company **security** policy and procedures and how, where and when they should be applied
- 4.20 describe the actions to take in case of breaches of **security**, acts of vandalism and theft, including:
 - a. how to deal with them
 - b. who to inform
- 4.21 list the potential **security** risks to themselves, colleagues, personnel, materials, equipment and the environment , including risks of contamination
- 4.22 explain how to deal with unauthorised personnel and who should be informed
- 4.23 State their responsibilities under Health, Safety and Environment Act as it relates to their job role, including the importance of **security** of pipes and fittings

Range

Hazards: restrictions to access and egress, misuse of tools and equipment, faulty equipment, hazardous substances, interference with and from adjacent activities, obstructions, exposed apparatus, structures and services, flooding, wet or uneven surfaces, biological (infection), toxic, oxygen deficient and explosive atmospheres, working on pressurised water, risks from general public

Tools and equipment: hand tools and equipment, safety equipment required for work activities in hazardous areas

Approved procedures and practices: Health, Safety and Environment Compliance, including hygiene, regulatory (including Construction Management regulations, PUWER, LOLER, NRSWA, Control of Substances Hazardous to Health – COSHH), emergency, operational, organisational, relevant company procedures, within the remit of learners responsibility, Construction Management Regulations, PUWER, LOLER

Emergency: gas escapes, fire, toxic fumes, accidents, electrocutions, dangerous occurrences, explosion, gaseous atmospheres, flooding, pollution of the environment, structural or trench collapse, water contamination

Security: personnel, property, the surrounding environment, operational area, plant and equipment

Unit 114

Working under supervision, assemble components to meet specifications for water network construction operations

Level: 1
Credit value: 1
UAN: D/502/9671

Unit aim:

This unit is designed to allow learners to demonstrate their competence in assembling pipes and fittings according to work instructions. Working at all times under supervision, and reporting to a team leader, they will show that they can use various assembly methods and techniques, including cutting, electrofusion welding, drilling and tapping and mechanical jointing on metallic and polyethylene materials. They will also show that they can produce assemblies using bolt, screwed, compression and flanged joints, to industry standards and specifications. Safe working practices must be followed at all times.

Learning outcomes

There are **two** learning outcomes to this unit. The learner will:

1. Assemble components to meet specifications whilst working under supervision
2. Demonstrate knowledge and understanding of assembling components to meet specifications

Guided learning hours

It is recommended that **6** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: 019NNCO108W Working under supervision, assemble components to meet specifications.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 114 **Working under supervision, assemble components to meet specifications for water network construction operations**

Outcome 1 Assemble components to meet specifications whilst working under supervision

Assessment criteria

The learner can:

- 1.1 Work safely at all times, complying with Health, Safety and Environment requirements, technical guidance notes and other relevant regulations and guidelines
- 1.2 Follow the relevant instructions, assembly drawings and any other specifications
- 1.3 Ensure that the specified **components** are available and that they are in a useable condition
- 1.4 Use the appropriate **methods and techniques** to assemble the components in their correct positions
- 1.5 Secure the components using the specified connectors and securing devices
- 1.6 Check the completed **assembly** to ensure that all operations have been completed and the finished **assembly** meets the required specification
- 1.7 Deal promptly and effectively with problems within your control and report those that cannot be solved

Range

Components: pipes, fittings

Assembly: bolt, compression, flanged

Methods and techniques: as per work instructions, cutting, drilling and tapping, mechanical jointing on metallic polyethylene

Unit 114 **Working under supervision, assemble components to meet specifications for water network construction operations**

Outcome 2 Demonstrate knowledge and understanding of assembling components to meet specifications

Assessment criteria

The learner can:

- 2.1 State the Health, Safety and Environment legislation and environmental procedures, Codes of Practice and company procedures relevant to specific work activities, including:
 - a. hygiene
 - b. manual handling
 - c. use of equipment
- 2.2 explain and follow basic drawings and related specifications as explained by the team leader
- 2.3 describe basic **methods and techniques** associated with assembling **components**
- 2.4 explain the need for quality control procedures
- 2.5 describe the various types of handling equipment and procedures associated with the work activity
- 2.6 describe the correct preparation **techniques** for simple **joints**
- 2.7 outline the tools and equipment required to carry out specific work activities and the importance of looking after tools and equipment
- 2.8 explain what to do in the event of a problem occurring, how to report it and to whom

Range

Methods and techniques: as per work instructions, cutting, drilling and tapping, mechanical jointing on metallic and polyethylene

Components: pipes, fittings

Joints: in line and level, under all weather conditions, in accordance with specifications

Unit 201

Create an efficient and effective environment in Utilities Network Construction

Level: 2
Credit value: 3
UAN: R/503/0316

Unit aim:

The purpose of the unit is to assess the competence of individuals to recognised national occupational standards. This unit is designed to assess the competence of individuals required to create an efficient and effective work environment in Utilities Network Construction. It involves planning resources, the work area and requires an understanding of the work activity. It includes working efficiently and effectively with other personnel.

Learning outcomes

There are **six** learning outcomes to this unit. The learner will:

1. Be able to work efficiently and effectively
2. Be able to organise their work and maintain standards to minimise hazards
3. Be able to use and communicate data and information
4. Be able to resolve problems that arise from work activities
5. Know Health and Safety guidance and legislation in utilities network construction operations
6. Understand how to create an efficient and effective environment in utilities network construction

Guided learning hours

It is recommended that **10** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC001 Create an efficient and effective environment in utilities network construction.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 201 Create an efficient and effective environment in Utilities Network Construction

Outcome 1 Be able to work efficiently and effectively

Assessment criteria

The learner can:

- 1.1 Carry out a site-specific risk assessment and review in accordance with company procedures
- 1.2 Select and wear the designated PPE
- 1.3 Store, maintain and use tools, work materials and equipment in accordance with the work requirements, approved procedures and practices

Unit 201 **Create an efficient and effective environment in Utilities Network Construction**

Outcome 2 Be able to organise their work and maintain standards to minimise hazards

Assessment criteria

The learner can

- 2.1 Organise work to comply with instructions and the agreed schedules
- 2.2 Coordinate own work with other personnel and related activities
- 2.3 Carry out activities to **approved procedures and practices**
- 2.4 Carry out and confirm all work is in accordance with **standards and approved codes of practice**
- 2.5 Check own work and that of other personnel to ensure compliance with specified standards
- 2.6 Confirm with a **designated person** on the steps to be taken throughout the **work process**

Range

Approved procedures and practices: use of appropriate work methods; optimise the use of time; remove and dispose of waste and surplus materials

Standards and approved codes of practice: the agreed standards and specification; the organisational policy; approved procedures and practices; statutory requirements

Designated person: specified within work and health and safety procedures

Work process: any work which may be detrimental to safety or the environment; suggestions for improvements to work methods; any deviations in standards or specification

Unit 201

Create an efficient and effective environment in Utilities Network Construction

Outcome 3

Be able to use and communicate data and information

Assessment criteria

The learner can:

- 3.1 Comply with operational and organisational procedures for communicating information to other people
- 3.2 Confirm records are maintained and exchanged in accordance with operational and organisational requirements
- 3.3 Confirm with designated personnel any circumstances where information appears incorrect
- 3.4 Use organisational information systems to record and store, data and information

Unit 201

Create an efficient and effective environment in Utilities Network Construction

Outcome 4

Be able to resolve problems that arise from work activities

Assessment criteria

The learner can:

- 4.1 Report to a designated person any situations which require additional intervention
- 4.2 Communicate problems and conditions outside the responsibility of the job role using approved procedures

Unit 201

Create an efficient and effective environment in Utilities Network Construction

Outcome 5

Know Health and Safety guidance and legislation in utilities network construction operations

Assessment criteria

The learner can:

- 5.1 State the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 5.2 Explain the health and safety guidance governing work in excavations
- 5.3 Describe the safe procedures for handling hazardous materials
- 5.4 Explain the organisational accident recording and reporting procedures
- 5.5 State the legislative requirements relative to the work activity and the workplace environment, including
 - any licensing, certification or inspection
 - organisational and operational standards

Unit 201

Create an efficient and effective environment in Utilities Network Construction

Outcome 6

Understand how to create an efficient and effective environment in utilities network construction

Assessment criteria

The learner can:

- 6.1 Describe the industry practices and company requirements for the work activity within the remit of the occupation
- 6.2 Apply **approved procedures and practices** in the context of the operations, the work activity and the workplace environment
- 6.3 Describe the main physical properties of the range of materials used in work operations
- 6.4 Describe how the range of materials may be affected by weather conditions
- 6.5 Describe the **categories and uses** of materials used in the work activity
- 6.6 Describe the characteristics of work materials relevant to the work activity, both hazardous and non-hazardous
- 6.7 Identify materials used for the work which could pose a health hazard
- 6.8 Explain how to identify hazardous materials
- 6.9 Describe precautions to be taken when dealing with toxic fumes and dust
- 6.10 Explain **safe methods of handling and storing** the **range of materials** being used for the work
- 6.11 Identify types of **packaging** used for the range of materials
- 6.12 Identify types of **tools and equipment** used with the operation and work activity
- 6.13 Identify the range and use of personal protective equipment for the work activity
- 6.14 Describe the methods of checking PPE for good condition
- 6.15 State the operational and organisational requirements for storage
- 6.16 Describe the **arrangements, designated places and working procedures** for storing tools and equipment
- 6.17 Explain the safe lifting and handling techniques for tools, equipment and materials
- 6.18 Explain the emergency procedures and actions to take in the event of emergency
- 6.19 Describe **means of communication** used in utilities network construction
- 6.20 Explain the procedures for reporting problems in accordance with **company policy**
- 6.21 Outline the range of the **work activity and sequence of events** to achieve the intended job outcomes

Range

Approved procedures and practices: Environmental; organisational; regulatory; emergency; operational; company procedure

Categories and uses: materials used in carrying out the work; materials arising as a result of the work

Safe methods of handling and storing: disposal of residual or waste materials; recovery of reusable materials; approved reporting procedures

Range of materials: hazardous; non-hazardous

Packaging: loose; bagged; containerised; volume/weight of standard packages

Tools and equipment: hand tools; power tools; equipment for general and specific work activities.

Arrangements, designated places and working procedures: the need for securing high value/high risk equipment; storage compounds; security arrangements; lock up stores; methods of checking materials into and out of storage.

Means of communication: written; electronic; visual signals

Company policy: statutory; organisational; emergency

Work activity and sequence of events: how to collect information from plans, schedules, work programmes; the preparatory work required, including ensuring safety provisions are in place; the processes and work methods being used for the work activity; post-work activity to satisfactorily conclude the work activity; quality control being used for the work activity

Unit 203

Establish and maintain effective working relationships in utilities network construction

Level: 2
Credit value: 2
UAN: A/503/0665

Unit aim

The purpose of this unit is to assess the competence of individuals to recognised national occupational standards. The unit supports workforce development and describes the competencies necessary to establish and maintain effective working relationships in Utilities Network Construction. It includes working effectively with work colleagues, the general public, local authorities, other utilities, job management and emergency services.

Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Be able to establish and maintain productive working relationships
2. Be able to use and communicate data and information
3. Be able to resolve problems that could damage effective working relationships
4. Know Health and Safety guidance and legislation utilities network construction operations
5. Understand how to establish and maintain effective working relationships in utilities network construction

Guided learning hours

It is recommended that **5** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC003 Establish and maintain effective working relationships in Utilities Network Construction

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 203

Establish and maintain effective working relationships in utilities network construction

Outcome 1

Be able to establish and maintain productive working relationships

Assessment criteria

The learner can:

- 1.1 Demonstrate how to deal with **working relationships** appropriately
- 1.2 Demonstrate how to deal with requests positively and in a timely manner
- 1.3 Support colleagues and associates that may be in work-related difficulties
- 1.4 Communicate to the **designated person** all unresolved matters likely to result in a breakdown of working relationships
- 1.5 Work with others to find effective ways to deal with work problems.

Range

Working relationships: colleagues, associates, managers, supervisors, customers, outside bodies and members of the general public

Designated person: those people specified within work and health and safety procedures

Unit 203

Establish and maintain effective working relationships in utilities network construction

Outcome 2

Be able to use and communicate data and information

Assessment criteria

The learner can:

- 2.1 Comply with operational and organisational procedures for communicating information to other people
- 2.2 Comply with operational and organisational procedures when maintaining records
- 2.3 Confirm with designated personnel any circumstances where information appears to be incorrect
- 2.4 Use organisational information systems to record and store, data and information

Unit 203

Establish and maintain effective working relationships in utilities network construction

Outcome 3

Be able to resolve problems that could damage effective working relationships

Assessment criteria

The learner can:

- 3.1 Handle problems within the responsibility of the job role
- 3.2 Communicate problems and conditions outside the responsibility of the job role to the **designated person** using approved procedures

Range

Designated person: people specified within work and health and safety procedures

Unit 203

Establish and maintain effective working relationships in utilities network construction

Outcome 4

Know Health and Safety guidance and legislation in utilities network construction operations

Assessment criteria

The learner can:

- 4.1 State the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 4.2 Explain the health and safety guidance governing work in excavations
- 4.3 Describe the safe procedures for handling hazardous materials
- 4.4 Explain the organisational accident recording and reporting procedures
- 4.5 Identify the range and use of personal protective equipment for the work

Unit 203

Establish and maintain effective working relationships in utilities network construction

Outcome 5

Understand how to establish and maintain effective working relationships in utilities network construction

Assessment criteria

The learner can:

- 5.1 Describe how to create and maintain working relationships with different **types of personnel**
- 5.2 Identify the range and roles of **other persons** involved in the work activities
- 5.3 Explain how to deal with groups and individuals with diverse roles, responsibilities and business environments
- 5.4 Describe how to recognise and deal with problems effecting working relationships
- 5.5 State the lines of communications to be followed when communicating information to customers, clients and work colleagues
- 5.6 Explain the **methods of communication** used to communicate with others
- 5.7 Identify documentation to use when communicating information to individuals and groups
- 5.8 Describe ways to resolve problems that are affecting productivity and the achievement of work goals
- 5.9 State the legislative requirements including any licensing or certification for the work activities
- 5.10 State actions to be taken in the event of an emergency
- 5.11 State how to comply with the requirements of the Health and Safety at Work Act in respect of work activities.

Range

Types of personnel: work colleagues and associates, suppliers, contractors, other utilities, those working for statutory bodies, other organisations, other trades, representatives from statutory organisations

Other persons: other trades; representatives from statutory organisations

Method of communication: oral, written, electronic

Unit 204

Install equipment for safe working on the highway for utilities network construction

Level: 2
Credit value: 4
UAN: A/503/0682

Unit aim

This unit allows learners to show that they have the skills and knowledge to install equipment for safe working on the highway during utilities network construction operations.

The learner must select appropriate signing, lighting, guarding and traffic control equipment for the site, according to the current Codes of Practice and legislation. They must prepare the appropriate types and quantities of materials and equipment for the works and maintain their safety and security. Learners must also show that they can communicate information to the relevant people and organisations throughout the operation and must resolve or refer problems that arise during highways works in line with their job responsibility.

Learning outcomes

There are **six** learning outcomes to this unit. The learner will:

1. Set out temporary signing, lighting and guarding traffic control equipment in line with industry Codes of Practice and current legislation
2. Prepare resources for highway works
3. Use and communicate data and information
4. Resolve problems which could arise from work on the highway
5. Demonstrate general knowledge and understanding for utilities network construction operations
6. Demonstrate knowledge and understanding of installing equipment for safe working on the highway

Guided learning hours

It is recommended that **25** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC04 Install equipment for safe working on the highway for utilities network construction

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 204

Install equipment for safe working on the highway for utilities network construction

Outcome 1

Set out temporary signing, lighting and guarding traffic control equipment in line with industry Codes of Practice and current legislation

Assessment criteria

The learner can:

- 1.1 locate the area for highway works and determine the **characteristics and conditions of the carriageway**.
- 1.2 plan the works for minimum disruption and inconvenience to others in accordance with **approved procedures and practices**.
- 1.3 carry out a site-specific risk assessment to identify **hazards** and to determine the range of control signs and protection equipment necessary for the works.
- 1.4 select and wear the specified personal protective equipment (PPE), including high visibility vest or coat.
- 1.5 set out **control signs and protection equipment** in a safe manner, according to the risk assessment, industry **codes of practice** and current legislation.
- 1.6 remove all control equipment on completion of the works.
- 1.7 store and maintain control equipment in accordance with operational and organisational requirements.
- 1.8 work to **approved procedures and practices** and in compliance with statutory requirements.
- 1.9 maintain the security of the site where work is not completed.

Range

Characteristics and conditions of the carriageway: speed and volume of traffic; volume of pedestrian traffic; number and directions of lanes; proximity of other features such as junctions, railway crossings, pedestrian crossings, roundabouts, traffic lights.

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments.

Hazards: traffic; weather; other activities

Control signs and protection equipment: traffic signs; cones; lights; barriers; traffic lights; stop and go boards.

Codes of Practice: statutory; regulatory, including New Roads and Street Works Act.

Unit 204

Install equipment for safe working on the highway for utilities network construction

Outcome 2

Prepare resources for highway works

Assessment criteria

The learner can:

- 2.1 select the **materials and equipment** for the planned works in accordance with the work instructions and specifications.
- 2.2 confirm the **materials and equipment** supplies are correct for the work requirement and are of the quality and quantity required.
- 2.3 maintain in accordance with operational and organisational requirements:
 - (a) the **materials and equipment** in storage.
 - (b) the security of **materials and equipment**.

Range

Materials and equipment: backfill and reinstatement materials; spoil; digging and hand tools; road breaking and cutting equipment; compaction equipment

Unit 204

Install equipment for safe working on the highway for utilities network construction

Outcome 3

Use and communicate data and information

Assessment criteria

The learner can:

- 3.1 use the work instructions and specifications:
 - (a) to determine the safety and security requirements for the area of the highways works.
 - (b) to ensure compliance with current legislation.
- 3.2 use **approved procedures and practices** throughout the work activity to ensure the work complies with statutory requirements.
- 3.3 check with **designated personnel** any circumstances where information appears incorrect.
- 3.4 use organisational information systems to record and store data and information.

Range

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments.

Designated personnel: those people specified within work and health and safety procedures

Unit 204

Install equipment for safe working on the highway for utilities network construction

Outcome 4

Resolve problems which could arise from work on the highway

Assessment criteria

The learner can:

- 4.1 resolve **problems** which arise from work on the highway.
- 4.2 record defects, replacements or additional equipment required and report them to the **designated person**.
- 4.3 refer **problems** and conditions outside their responsibility to the **designated person** using approved procedures.

Range

Problems: traffic control; pedestrians; access to premises; equipment failure; materials shortage

Designated person: those people specified within work and health and safety procedures

Unit 204

Install equipment for safe working on the highway for utilities network construction

Outcome 5

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can:

- 5.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act.
- 5.2 state the health and safety guidance governing work in excavations.
- 5.3 describe the safe procedures for handling hazardous materials.
- 5.4 explain their organisational accident recording and reporting procedures.

Unit 204

Install equipment for safe working on the highway for utilities network construction

Outcome 6

Demonstrate knowledge and understanding of installing equipment for safe working on the highway

Assessment criteria

The learner can:

- 6.1 state the main sources of information on statutory requirements for the control of highways works.
- 6.2 give examples of the different types of signs, lights and guarding equipment.
- 6.3 give examples of the different types of traffic control equipment.
- 6.4 explain the importance of:
 - (a) checking and reporting defects in signs, guards, lighting and traffic control systems.
 - (b) ensuring that defective equipment is taken out of use.
- 6.5 state the implications of incorrect signing, lighting, guarding and traffic control.
- 6.6 describe the design and purpose of each of the signs used for protecting highways works.
- 6.7 explain the statutory positioning requirements for protection equipment relative to different highways environments and conditions, to cover:
 - (a) signs
 - (b) lights
 - (c) guards
 - (d) traffic controls.
- 6.8 describe guarding arrangements for highways works, including:
 - (a) the different types of guards used to protect highways works
 - (b) their positioning requirements relative to the work.
- 6.9 give examples of the different types and positioning of lighting required for highways works.
- 6.10 list the main road classifications, including single and dual carriageways.
- 6.11 outline the design, operation, and maintenance requirements for traffic controls including:
 - (a) warning signs
 - (b) priority signs
 - (c) stop/go boards
 - (d) portable traffic signals.
- 6.12 give examples of the different types of traffic control requirements for highways works in different road conditions.
- 6.13 explain the correct procedures and sequences for implementing traffic control equipment in different work locations.
- 6.14 explain the correct procedures for moving traffic controls as work progresses.
- 6.15 explain the importance of ensuring that signing, lighting, guarding and traffic control arrangements are checked and updated regularly as work progresses.
- 6.16 explain the importance of regular maintenance and cleaning of signs and lights throughout highways works.
- 6.17 describe the statutory requirements and recommendations for signing, lighting and guarding highways works on single and dual carriageways.
- 6.18 give examples of the range and purpose of personal protective equipment used during highways works.
- 6.19 explain the importance of checking and reporting defects in personal protective equipment.

- 6.20 state the main **approved procedures and practices** for determining site and resource requirements, within their job role.
- 6.21 list the steps that must be taken in the event of an accident or emergency on the highway.
- 6.22 state the procedures for summoning the emergency services.
- 6.23 list the persons and organisations with whom it is necessary to liaise on highways operations.

Range

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments.

Unit 205

Install equipment for safe working on sites for utilities network construction

Level:	2
Credit value:	3
URN	F/503/0683

Unit aim

This unit allows learners to show that they have the skills and knowledge to install equipment for safe working on site during utilities construction operations.

The learner must select appropriate safety equipment for the site, according to current Codes of Practice and legislation. They must prepare the appropriate types and quantities of materials and equipment for the works and maintain their safety and security. Learners must also show that they can communicate information to the relevant people and organisations throughout the operation and must resolve or refer problems that arise during site works in line with their job responsibility.

Learning outcomes

There are **six** learning outcomes to this unit. The learner will:

1. Prepare, segregate and protect the work site
2. Prepare resources for site works
3. Use and communicate data and information
4. Resolve problems which could arise from preparing the site and resource requirements
5. Demonstrate knowledge and understanding for utilities network construction operations
6. Demonstrate knowledge and understanding of installing equipment for safe working on site

Guided learning hours

It is recommended that **20** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC05 Install equipment for safe working on site for utilities network construction

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 205

Install equipment for safe working on sites for utilities network construction

Outcome 1

Prepare, segregate and protect the work site

Assessment criteria

The learner can:

- 1.1 locate and confirm the area for works according to instructions and specified requirements.
- 1.2 plan the work to minimise disruption and inconvenience to others in accordance with **approved procedures and practices**.
- 1.3 carry out a site-specific risk assessment to identify **hazards** and to determine the range of **control signs and protection equipment** necessary for the works.
- 1.4 review the risk assessment in accordance with company procedures.
- 1.5 select and wear the specified personal protective equipment (PPE), including high visibility vest or coat.
- 1.6 set out the area for the works in line with the specified requirements.
- 1.7 take steps to provide for the safety of the work area and the natural environment where hazards and risk are identified.
- 1.8 maintain the security of the site where work is not completed.

Range

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments.

Hazards: traffic; weather; other activities

Control signs and protection equipment: traffic signs; cones; lights; barriers; traffic lights; stop and go boards.

Unit 205

Install equipment for safe working on sites for utilities network construction

Outcome 2

Prepare resources for site works

Assessment criteria

The learner can:

- 2.1 select the **materials and equipment** for the planned works in accordance with the work instructions and specifications.
- 2.2 confirm the **materials and equipment** supplies are correct for the work requirement and are of the quality and quantity required.
- 2.3 maintain in accordance with operational and organisational requirements
 - (a) the **materials and equipment** in storage
 - (b) the security of **materials and equipment**.

Range

Materials and equipment: backfill and reinstatement materials; spoil; digging and hand tools; road breaking and cutting equipment; compaction equipment.

Unit 205

Install equipment for safe working on sites for utilities network construction

Outcome 3

Use and communicate data and information

Assessment criteria

The learner can:

- 3.1 use information in the work instructions and specified requirements to locate the work site.
- 3.2 use **approved procedures and practices** throughout the work activity to ensure the work complies with statutory requirements.
- 3.3 check with authorised personnel any circumstances where information appears incorrect.
- 3.4 use organisational information systems to record and store data and information.

Range

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments.

Unit 205

Install equipment for safe working on sites for utilities network construction

Outcome 4

Resolve problems which could arise from preparing the site and resource requirements

Assessment criteria

The learner can:

- 4.1 record and report to the designated person any shortages and defects of **materials and equipment**.
- 4.2 refer **problems** and conditions outside their responsibility to the designated person using approved procedures

Range

Materials and equipment: backfill and reinstatement materials; spoil; digging and hand tools; road breaking and cutting equipment; compaction equipment.

Problems: traffic control; pedestrians; access to premises; equipment failure; materials shortage.

Unit 205

Install equipment for safe working on sites for utilities network construction

Outcome 5

Demonstrate knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can:

- 5.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act.
- 5.2 state the health and safety guidance governing work in excavations.
- 5.3 describe the safe procedures for handling hazardous materials.
- 5.4 explain their organisational accident recording and reporting procedures.

Unit 205

Install equipment for safe working on sites for utilities network construction

Outcome 6

Demonstrate knowledge and understanding of installing equipment for safe working on site

Assessment criteria

The learner can:

- 6.1 describe the roles and responsibilities of people within the site operations team.
- 6.2 describe the site management structures for operations on site.
- 6.3 explain the importance of referring to designated persons problems that are outside their area of responsibility.
- 6.4 describe the recording and reporting procedures for:
 - (a) job progress
 - (b) problems
 - (c) deviations to work programmes.
- 6.5 explain the importance of confirming that the work location has been identified correctly.
- 6.6 describe the types of information contained in written instructions, specifications and drawings.
- 6.7 outline the key requirements of an effective site layout.
- 6.8 describe common hazards in site works, and fit-for-purpose safety precautions and hazard prevention methods that can be used.
- 6.9 describe how to deal with emergencies.
- 6.10 describe the range of safety equipment that is appropriate for site operations.
- 6.11 outline the main requirements of safety legislation governing site works.
- 6.12 describe the materials that may pose a health hazard on site, and how to handle them safely.
- 6.13 describe the personal protective equipment (PPE) that is used in site operations.
- 6.14 describe the lifting and handling techniques that are appropriate to the materials, tools and equipment used in site works.

Unit 206

Locate and avoid supply apparatus for utilities network construction

Level: 2
Credit value: 4
UAN: J/503/0684

Unit aim

This unit allows learners to show that they have the skills and knowledge to locate and avoid supply apparatus during utilities network construction operations. The learner will be able to use appropriate search and detection methods to identify the supply apparatus for utilities and other agencies, and to mark them on the site prior to excavation. Learners must identify and avoid risks of damage to services and danger to personnel and must follow safe working practices throughout the operation. Learners must also show that they can communicate information to the relevant people and organisations throughout location and avoidance activities, and must resolve or refer problems that arise during the work in line with their job responsibility.

Learning outcomes

There are **eight** learning outcomes to this unit. The learner will:

1. Locate supply apparatus
2. Maintain the safety and integrity of supply apparatus
3. Use and communicate data and information
4. Resolve problems which could arise from work on the highway
5. Demonstrate general knowledge and understanding for utilities network construction operations
6. Demonstrate knowledge and understanding of the different types of utility apparatus
7. Demonstrate knowledge and understanding of equipment and techniques used for locating supply apparatus
8. Demonstrate knowledge and understanding of roles, responsibilities and communication requirements for locating utilities apparatus

Guided learning hours

It is recommended that **25** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC06 Locate and avoid supply apparatus for utilities network construction.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 206

Locate and avoid supply apparatus for utilities network construction

Outcome 1

Locate supply apparatus

Assessment criteria

The learner can:

- 1.1 use work instructions and interpret utility plans to determine the extent of the work site and to enable the **supply apparatus** to be marked.
- 1.2 carry out site specific risk assessment, and review it in accordance with company procedures.
- 1.3 use appropriate **search techniques** to enable the identification and marking of **supply apparatus**.
- 1.4 mark the position and type of **supply apparatus** and sub-structures on the work site in accordance with work instructions and statutory and regulatory **Codes of Practice**.
- 1.5 mark risks of damage to **supply apparatus** and sub-structures in accordance with statutory and regulatory **Codes of Practice**.
- 1.6 record positions and types of **supply apparatus** and sub-structures in accordance with instructions and organisational requirements.
- 1.7 communicate details of the position and type of **supply apparatus** and sub-structures to personnel in accordance with instruction and organisational requirements.
- 1.8 report deviations in the position of equipment and identification of other structures in accordance with instruction and organisational requirements.
- 1.9 carry out all work to **approved procedures and practices** and comply with statutory requirements.

Range

Supply apparatus: relevant for utilities and other agencies including cables, metal pipes and non-metallic pipes; above and below ground services; built structures (eg foundations); the natural environment (eg tree roots, natural watercourses).

Search techniques: electronic location in following modes: with and without generator, induction, connection, radio, power; trial holes; visual examination; use of drawing and records.

Codes of Practice: statutory; regulatory, including New Roads and Street Works Act.

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments.

Unit 206

Locate and avoid supply apparatus for utilities network construction

Outcome 2

Maintain the safety and integrity of supply apparatus

Assessment criteria

The learner can:

- 2.1 maintain the position and condition of **supply apparatus** within the work site according to their specification and **Codes of Practice**.
- 2.2 ensure working practices on the site avoid damage to **supply apparatus**.
- 2.3 ensure that exposed **supply apparatus** are supported correctly in line with their specification and **approved procedures and practices**.
- 2.4 take precautions to protect personnel and equipment from the effects of damage to **supply apparatus** according to **approved procedures and practices**.
- 2.5 ensure that all work complies with:
 - (a) the latest specifications
 - (b) statutory regulations
 - (c) company **Codes of Practice**.

Range

Supply apparatus: relevant for utilities and other agencies including cables, metal pipes and non-metallic pipes; above and below ground services; built structures (eg foundations); the natural environment (eg tree roots, natural watercourses).

Codes of Practice: statutory; regulatory, including New Roads and Street Works Act.

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments.

Unit 206

Locate and avoid supply apparatus for utilities network construction

Outcome 3

Use and communicate data and information

Assessment criteria

The learner can:

- 3.1 check any circumstances where information appears incorrect with the designated personnel.
- 3.2 use organisational information systems to record and store data and information.
- 3.3 follow all required lone working procedures when working alone.

Unit 206

Locate and avoid supply apparatus for utilities network construction

Outcome 4

Resolve problems which could arise from work on the highway

Assessment criteria

The learner can:

- 4.1 report any damage to **supply apparatus** promptly to the designated person and make the area safe.
- 4.2 resolve day-to-day problems within their area of responsibility.
- 4.3 advise colleagues or managers where situations need them to intervene.
- 4.4 refer matters outside their responsibility to the designated people using **approved procedures**.

Range

Supply apparatus: relevant for utilities and other agencies including cables, metal pipes and non-metallic pipes; above and below ground services; built structures (eg foundations); the natural environment (eg tree roots, natural watercourses).

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments.

Unit 206

Locate and avoid supply apparatus for utilities network construction

Outcome 5

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can:

- 5.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act.
- 5.2 state the health and safety guidance governing work in excavations.
- 5.3 describe the safe procedures for handling hazardous materials.
- 5.4 explain their organisational accident recording and reporting procedures.
- 5.5 list the range and use of personal protective equipment for the work.

Unit 206

Locate and avoid supply apparatus for utilities network construction

Outcome 6

Demonstrate knowledge and understanding of the different types of utility apparatus

Assessment criteria

The learner can:

- 6.1 describe typical locations and depths of the usual range of underground **supply apparatus**.
- 6.2 state the key physical properties of the supply pipeline or components of **supply apparatus**, including:
 - size (diameter)
 - colour
 - material and its resistance to impact from excavation activities
 - methods of identification.
- 6.3 describe the physical properties of the supply being carried by different types of **supply apparatus**, including where relevant:
 - ignition characteristics
 - density relative to air
 - electrocution risk
 - risk of water damage.
- 6.4 describe the risks that arise when the safety and integrity of **supply apparatus** is not maintained.
- 6.5 describe the methods of marking and warning of the presence of underground **supply apparatus** (e.g. identification tape).
- 6.6 describe the possible effects of damage to the **supply apparatus**.
- 6.7 explain the implications of damage to the different types of **supply apparatus**, including where relevant:
 - personal danger to the health or life of the operatives, or to others on site
 - damage to the environment
 - additional job costs in repair
 - delay to job progress.
- 6.8 give examples of the types of hazards associated with different supplies and actions to take in the case of damage.
- 6.9 explain why it is important to provide adequate support and protection for **supply apparatus**.
- 6.10 describe the industry procedures and practices for confirming the location and marking of **supply apparatus**.
- 6.11 give examples of different methods used to provide temporary and permanent support to protect **supply apparatus** exposed during site excavations.

Range

Supply apparatus: relevant for utilities and other agencies including cables, metal pipes and non-metallic pipes; above and below ground services; built structures (eg foundations); the natural environment (eg tree roots, natural watercourses).

Unit 206

Locate and avoid supply apparatus for utilities network construction

Outcome 7

Demonstrate knowledge and understanding of equipment and techniques used for locating supply apparatus

Assessment criteria

The learner can:

- 7.1 describe the principles of operation and method of use of electronic detection equipment.
- 7.2 describe the safe procedures for handling the range of equipment necessary to carry out the task in hand.
- 7.3 explain how to interpret the results of readings from electronic detection equipment.
- 7.4 explain the possible effects of external influences on electronic detection equipment readings.
- 7.5 explain how to visually locate and identify underground **supply apparatus**, using:
 - markers
 - signs and features
 - existing records.
- 7.6 describe the situations where trial holes can be used to locate underground supplies.
- 7.7 describe how to mark the position of supply services on the surface to ensure accurate location of the excavation.
- 7.8 explain the consequences of marking out excavations incorrectly, including:
 - costs
 - loss of time
 - material wastage.
- 7.9 explain the importance of protecting supply apparatus exposed during excavation work.
- 7.10 state the precautions to be taken when locating supply apparatus, including statutory and regulatory requirements.

Range

Supply apparatus: relevant for utilities and other agencies including cables, metal pipes and non-metallic pipes; above and below ground services; built structures (eg foundations); the natural environment (eg tree roots, natural watercourses).

Unit 206

Locate and avoid supply apparatus for utilities network construction

Outcome 8

Demonstrate knowledge and understanding of roles, responsibilities and communication requirements for locating utilities apparatus

Assessment criteria

The learner can:

- 8.1 state the main sources of legislation relating to highways operations in the proximity of other **supply apparatus**.
- 8.2 name the persons or organisations who must be notified where there is damage to supply apparatus or other underground structures.
- 8.3 list the regulations that govern the location of supply apparatus where this exposes other services.
- 8.4 outline the requirements of the legislation that applies to new roads and street works.
- 8.5 explain why it is important to refer problems outside their area of job role responsibility to designated people.
- 8.6 describe the procedures for reporting and recording: job progress; problems; deviations to work programmes.
- 8.7 outline the roles and responsibilities of the various organisations involved location work and how to liaise with them effectively.

Range

Supply apparatus: relevant for utilities and other agencies including cables, metal pipes and non-metallic pipes; above and below ground services; built structures (eg foundations); the natural environment (eg tree roots, natural watercourses).

Unit 207

Excavate and maintain holes and trenches for utilities network construction

Level: 2
Credit value: 5
UAN: L/503/0685

Unit aim

This unit allows learners to show that they have the skills and knowledge to excavate holes and trenches for utilities network operations.

The learner will be able to confirm the requirements for excavation on site and select and use the most appropriate tools and equipment for the specified excavation activity. Learners must confirm the excavation requirements with the work specification and minimise damage to supply apparatus and the natural environment during the operation. The learner will be able to maintain the integrity of the excavation and maintain access and egress arrangements in line with safety requirements. Learners must also show that they can communicate information to the relevant people and organisations throughout excavation activities, and must resolve or refer problems that arise during the work in line with their job responsibility. Throughout the operation, the learner must follow the work specification and Codes of Practice, and must maintain safe working procedures.

Learning outcomes

There are **nine** learning outcomes to this unit. The learner will:

1. Excavate on site to requirements
2. Maintain the integrity of the excavation
3. Use and communicate data and information
4. Resolve problems which could arise from excavation work
5. Demonstrate general knowledge and understanding for utilities network construction operation
6. Demonstrate knowledge and understanding of how excavation work must be carried out to comply with legal and industry requirements
7. Demonstrate knowledge and understanding of excavating in a variety of situations using different techniques and equipment
8. Demonstrate knowledge and understanding of the tools and equipment used in the course of excavation activities
9. Demonstrate knowledge and understanding of responsibilities to others during excavation work

Guided learning hours

It is recommended that **35** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC07 Excavate holes and trenches for utilities network construction.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 207

Excavate and maintain holes and trenches for utilities network construction

Outcome 1

Excavate on site to requirements

Assessment criteria

The learner can:

- 1.1 determine the suitable excavation method for the **surface and sub-surface** materials being removed, and which meets with statutory and regulatory Codes of Practice.
- 1.2 carry out a site-specific risk assessment and review it according to company procedures.
- 1.3 select and wear the designated personal protective equipment (PPE).
- 1.4 select and use the most suitable tools and equipment for the excavation method to be used.
- 1.5 confirm the position and size of the excavation in accordance with instructions and the work specification.
- 1.6 excavate, identify, select, segregate and store materials in accordance with work instructions and Codes of Practice.
- 1.7 carry out the excavation in a manner that avoids damage to **supply apparatus**.
- 1.8 minimise damage to the natural environment according to technical guidance.
- 1.9 keep gullies and water courses clear at all times.
- 1.10 support and protect exposed **supply apparatus** in line with work instructions and relevant Codes of Practice.
- 1.11 remove surplus materials according to work instructions and requirements.
- 1.12 confirm the dimensions and condition of the excavation against the instructions and the work specification.
- 1.13 ensure work is carried out to **approved procedures and practices** and complies with statutory requirements.

Range

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments.

Supply apparatus: supply apparatus for utilities and other agencies; above and below ground services; built structures (eg foundations); the natural environment (eg tree roots, natural watercourses).

Surface and sub-surface: flexible, composite, rigid and modular pavement construction; verge; natural ground.

Unit 207

Excavate and maintain holes and trenches for utilities network construction

Outcome 2

Maintain the integrity of the excavation

Assessment criteria

The learner can:

- 2.1 confirm that the method used to support the excavation is fit for purpose to:
 - the size of the excavation
 - the nature of the ground conditions and adjacent structures.
- 2.2 install and remove support mechanisms according to instructions and relevant Codes of Practice.
- 2.3 maintain the condition of the excavation by adjusting support mechanisms and removing ground water as required.
- 2.4 monitor and maintain the condition of support mechanisms safely in accordance with operational and organisational safe working procedures.
- 2.5 resolve situations that require measures to deal with dangerous atmospheres, according to relevant Codes of Practice and safe working procedures.
- 2.6 establish arrangements for access to and egress from the excavation in line with statutory requirements and **approved procedures and practices**.
- 2.7 ensure that all relevant safety checks are undertaken before any entry into the excavation.
- 2.8 ensure that the site-specific risk assessment provides adequate safeguards in work practices to deal with the excavation becoming a confined space.
- 2.9 confirm that the condition of the ground area adjacent to the excavation is safe, in line with relevant Codes of Practice.
- 2.10 work to **approved procedures and practices** and comply with statutory requirements throughout excavation operations.

Range

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments.

Unit 207

Excavate and maintain holes and trenches for utilities network construction

Outcome 3

Use and communicate data and information

Assessment criteria

The learner can:

- 3.1 use the information in the work instructions and specification to determine the work site and the area to be excavated.
- 3.2 report detrimental conditions and defects in the excavation and support mechanisms that are outside their responsibility, according to relevant Codes of Practice.
- 3.3 use **approved procedures and practices** and statutory requirements to determine any requirements for excavation support.
- 3.4 check any circumstances where information appears to be incorrect with the designated personnel.
- 3.5 use organisational information systems to record and store data and information relating to excavation work.
- 3.6 follow all required lone working procedures when working alone.

Range

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments.

Unit 207

Excavate and maintain holes and trenches for utilities network construction

Outcome 4

Resolve problems which could arise from excavation work

Assessment criteria

The learner can:

- 4.1 report any damage to **supply apparatus** promptly to the designated person.
- 4.2 resolve day-to-day problems within the responsibility of their own job role.
- 4.3 advise colleagues or managers where situations need them to intervene.
- 4.4 refer matters that are outside their responsibility to the designated people using approved procedures.

Range

Supply apparatus: supply apparatus for utilities and other agencies; above and below ground services; built structures (eg foundations); the natural environment (eg tree roots, natural watercourses).

Unit 207

Excavate and maintain holes and trenches for utilities network construction

Outcome 5

Demonstrate general knowledge and understanding for utilities network construction operation

Assessment criteria

The learner can:

- 5.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act.
- 5.2 state the health and safety guidance governing work in excavations.
- 5.3 describe the safe procedures for handling hazardous materials.
- 5.4 explain their organisational accident recording and reporting procedures..

Unit 207

Excavate and maintain holes and trenches for utilities network construction

Outcome 6

Demonstrate knowledge and understanding of how excavation work must be carried out to comply with legal and industry requirements

Assessment criteria

The learner can:

- 6.1 outline how **activities involved in excavation work** can be carried out in compliance with legislative requirements and good industry practice.
- 6.2 outline the responsibilities of the employer and employee in relation to **activities involved in excavation**.

Range

Activities involved in excavation: assessment of risk; personal protection; excavation activities; the support of supply apparatus; the support of excavations; the competence of personnel; care for the environment; provision and use of equipment; reporting of accidents; dealing with hazardous materials and substances.

Unit 207

Excavate and maintain holes and trenches for utilities network construction

Outcome 7

Demonstrate knowledge and understanding of excavating in a variety of situations using different techniques and equipment

Assessment criteria

The learner can:

- 7.1 describe the safe procedures for handling the range of excavation support equipment.
- 7.2 describe the different **methods of excavation**, and how to decide which is appropriate.
- 7.3 describe the different types of surfaces and sub-surfaces that may require to be excavated.
- 7.4 explain why a competent banksman is needed when excavating by machine.
- 7.5 describe the **consequences and implications** of using incorrect excavation and reinstatement practices.
- 7.6 describe the requirements for selecting, storing and using backfill and reinstatement materials.
- 7.7 describe the requirements for disposing of surplus materials.
- 7.8 explain how to recognise when an excavation is or could become a confined space, and how to deal effectively with this.
- 7.9 describe the methods and principles of **excavation support systems**, and where their use is most appropriate.

Range

Methods of excavation: by hand; by machine

Consequences and implications: other utilities; cost of operation; time; customers; members of the public; colleagues and other workers; scale of activity.

Excavation support systems: timber; steel; mechanical

Unit 207

Excavate and maintain holes and trenches for utilities network construction

Outcome 8

Demonstrate knowledge and understanding of the tools and equipment used in the course of excavation activities

Assessment criteria

The learner can:

- 8.1 list the tools, equipment and machinery that are used for hand and machine excavation.
- 8.2 describe the criteria used to select the most appropriate tools, equipment and machinery for excavation activities.
- 8.3 explain the importance of economy in using powered or motorised equipment for excavations.

Unit 207

Excavate and maintain holes and trenches for utilities network construction

Outcome 9

Demonstrate knowledge and understanding of responsibilities to others during excavation work

Assessment criteria

The learner can:

- 9.1 list the different utility organisations that may own apparatus that could be affected by excavation activities.
- 9.2 describe how the different buried apparatus could be identified.
- 9.3 describe the potential environmental impact of excavation activities and the agencies responsible for environmental protection.
- 9.4 describe the potential consequences of not providing the necessary protection to underground apparatus and features.
- 9.5 describe the roles and responsibilities of people within the site or highways operations team.
- 9.6 explain the importance of referring problems outside their responsibility to the designated persons.
- 9.7 describe the procedures used to report and record the **detail of excavation activities**.

Range

Detail of excavation activities: job progress; problems; deviations from the programme of work

Unit 208

Reinstate excavation and pavement surfaces after utility network construction operations

Level: 2
Credit value: 5
UAN: R/503/0686

Unit aim

This unit allows learners to show that they have the skills and knowledge to reinstate excavations and pavement surfaces following utilities network construction operations.

The learner will be able to confirm the requirements and prepare for reinstating excavations and select and use the most appropriate tools, equipment and materials for the required reinstatement activity. They must confirm that all materials and equipment are fit for purpose and complete the reinstatement, replacing ironwork, kerbs and edge restraints in line with requirements. Learners must also show that they can communicate information to the relevant people and organisations throughout reinstatement activities and must resolve or refer problems that arise during the work in line with their job responsibility. Throughout the operation, the learner must follow the work specification and Codes of Practice, and must maintain safe working procedures.

Learning outcomes

There are **nine** learning outcomes to this unit. The learner will:

1. Prepare for reinstatement of excavation and pavement surface
2. Carry out reinstatement of excavation and pavement surface
3. Use and communicate data and information
4. Resolve problems which could arise from reinstatement work
5. Demonstrate general knowledge and understanding for utilities network construction operations
6. Demonstrate knowledge and understanding of plant and equipment used for reinstatement activities
7. Demonstrate knowledge and understanding of legislation and best practice for reinstatement operations
8. Demonstrate knowledge and understanding of reinstatement activities
9. Demonstrate knowledge and understanding of other agencies, utilities, their apparatus and communication requirements

Guided learning hours

It is recommended that **35** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC08 Reinstate excavation and pavement surfaces after utilities network construction.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit will be assessed by:

- Portfolio of evidence

Unit 208

Reinstate excavation and pavement surfaces after utility network construction operations

Outcome 1

Prepare for reinstatement of excavation and pavement surface

Assessment criteria

The learner can:

- 1.1 confirm the location of the excavation and the holes and trenches, according to instructions and work specifications.
- 1.2 carry out a site-specific risk assessment, and review it according to company procedures.
- 1.3 select and wear the designated personal protective equipment (PPE).
- 1.4 follow safe working practices for working in the vicinity of hazardous materials.
- 1.5 confirm that the **area for reinstatement** is in accordance with statutory and regulatory Codes of Practice.
- 1.6 carry out preparation procedures for reinstatement of the excavation in accordance with statutory and regulatory Codes of Practice.
- 1.7 protect **supply apparatus and sub-structures** in accordance with the relevant Codes of Practice.
- 1.8 select stored materials for reinstatement, according to the relevant Codes of Practice.
- 1.9 select hand tools, powered tools and equipment for reinstatement.
- 1.10 confirm that tools and equipment are:
 - (a) appropriate for the materials to be used in reinstatement
 - (b) in a suitable condition for use, according to manufacturer's specifications and operational requirements.
- 1.11 report remedial work and defects in the excavation that are outside their responsibility, according to organisational and operational procedures.
- 1.12 work according to **approved procedures and practices** and comply with statutory requirements

Range

Area for reinstatement: flexible pavement construction; composite pavement construction; rigid pavement construction; modular pavement construction; verge/natural ground

Supply apparatus and sub-structures: supply apparatus for utilities and other agencies; above and below ground services; built structures (eg foundations); the natural environment (eg tree roots, natural watercourses)

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments

Unit 208

Reinstate excavation and pavement surfaces after utility network construction operations

Outcome 2

Carry out reinstatement of excavation and pavement surface

Assessment criteria

The learner can:

- 2.1 confirm that materials to be used for reinstatement are fit for purpose and meet statutory and regulatory Codes of Practice, including:
 - (a) new and reusable materials for backfill, sub-base, road-base and pavement surface
 - (b) cold-lay materials.
- 2.2 confirm that the area and type of structure being reinstated meet statutory and regulatory Codes of Practice.
- 2.3 follow laying and compaction procedures for the material that meet statutory and regulatory Codes of Practice.
- 2.4 report defects and deficiencies in the laying and compaction of materials, that are outside their responsibility, in accordance with organisational and operational procedures.
- 2.5 maintain suitable conditions and the security of the excavation throughout reinstatement operations.
- 2.6 replace ironwork, kerbs and edge restraints in line with relevant Codes of Practice.
- 2.7 store and dispose of surplus materials in line with work instructions and statutory and regulatory Codes of Practice.
- 2.8 complete the work by checking and confirming that the quality and condition of the finished reinstatement and the work site conform to statutory and regulatory Codes of Practice.

Unit 208

Reinstate excavation and pavement surfaces after utility network construction operations

Outcome 3

Use and communicate data and information

Assessment criteria

The learner can:

- 3.1 use records to determine potential deep excavations, confined spaces and hazardous materials.
- 3.2 use information in the work instructions and specification to determine the work site and the area to be reinstated.
- 3.3 use approved procedures and practice and statutory requirements to determine the requirement for excavation support.
- 3.4 check any circumstances where information appears to be incorrect with the designated personnel.
- 3.5 use organisational information systems to record and store data and information relating to reinstatement work.
- 3.6 follow all required lone working procedures when working alone.

Unit 208

Reinstate excavation and pavement surfaces after utility network construction operations

Outcome 4

Resolve problems which could arise from reinstatement work

Assessment criteria

The learner can:

- 4.1 report any damage to **supply apparatus and sub-structures** promptly to the designated person.
- 4.2 resolve day-to-day problems within the responsibility of their own job role.
- 4.3 advise colleagues or managers where situations need them to intervene.
- 4.4 refer matters that are outside their responsibility to the designated people using approved procedures.

Range

Supply apparatus and sub-structures: supply apparatus for utilities and other agencies; above and below ground services; built structures (eg foundations); the natural environment (eg tree roots, natural watercourses)

Unit 208

Reinstate excavation and pavement surfaces after utility network construction operations

Outcome 5

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can:

- 5.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act in relation to reinstatement activities.
- 5.2 state the health and safety guidance governing work in excavations.
- 5.3 describe the safe procedures for handling hazardous materials.
- 5.4 explain their organisational accident recording and reporting procedures.
- 5.5 list the range and use of personal protective equipment for the work..

Unit 208

Reinstate excavation and pavement surfaces after utility network construction operations

Outcome 6

Demonstrate knowledge and understanding of plant and equipment used for reinstatement activities

Assessment criteria

The learner can:

- 6.1 list the hand tools, powered tools and motorised equipment that are used in reinstatement work.
- 6.2 describe safe procedures for handling reinstatement equipment.
- 6.3 describe the maintenance requirements for hand tools, powered tools and equipment used for reinstatement work.
- 6.4 describe the types of equipment used to compact materials, including hand and power tools and motorised equipment.
- 6.5 describe the methods used to compact reinstatement materials.
- 6.6 describe the maintenance requirements for compaction equipment used in reinstatement.

Unit 208

Reinstate excavation and pavement surfaces after utility network construction operations

Outcome 7

Demonstrate knowledge and understanding of legislation and best practice for reinstatement operations

Assessment criteria

The learner can:

- 7.1 outline the legal and operational responsibilities of the employer and employee in relation to **reinstatement activities**.
- 7.2 outline the legislation controlling the use of hand tools, powered tools and equipment.
- 7.3 outline the main industry **approved procedures and practices** for reinstatement work.
- 7.4 describe the roles and responsibilities of people within the site or highways operations team.
- 7.5 explain the importance of referring problems outside their responsibility to the designated persons.
- 7.6 describe the procedures used to **report and record details** of reinstatement work.
- 7.7 outline site management structures for site or highways operations.

Range

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments

Reinstatement activities: personal protection; handling and operating equipment; provision and use of equipment; working with hazardous substances; excavation and reinstatement

Report and record details: job progress, problems, deviations to work programmes.

Unit 208

Reinstate excavation and pavement surfaces after utility network construction operations

Outcome 8

Demonstrate knowledge and understanding of reinstatement activities

Assessment criteria

The learner can:

- 8.1 describe the different types of **reinstatement surfaces**.
- 8.2 describe the sub-surface requirements for each type of pavement surface.
- 8.3 describe the **preparation procedures** for reinstatement.
- 8.4 describe the **types of materials** that can be excavated, and defects that can arise with them.
- 8.5 state the remedial actions to be taken when defects are encountered.
- 8.6 explain how to segregate the different **types of materials** used in reinstatement.
- 8.7 describe how to check the condition of the reinstatement material that is to be used.
- 8.8 outline the specifications for **surface, sub-surface and general reinstatement materials**.
- 8.9 describe the methods used to store and protect excavated material to prevent deterioration.
- 8.10 describe the types of surface finishes used in reinstatement.
- 8.11 describe the common defects in reinstatement, including settlement and surface damage, and the appropriate remedial action to take.
- 8.12 state the specifications for materials in **reinstatement surface** structures.
- 8.13 explain why it is important to ensure that reinstatement materials are stored in the correct conditions.

Range

Reinstatement surfaces: flexible; composite; rigid; modular; cold-lay bituminous material; verge/natural ground

Preparation procedures: edge trimming; surface formation; removal of loose debris; repair information

Types of materials: backfill; sub-base; road-base; pavement surface

Surface, sub-surface and general reinstatement materials: fine fill materials; backfill materials; granular sub-bases; cement bound excavated material; road-base materials; bituminous road-based materials; surfacing materials; concrete footways; modular surfacing; cold lay

Unit 208

Reinstate excavation and pavement surfaces after utility network construction operations

Outcome 9

Demonstrate knowledge and understanding of other agencies, utilities, their apparatus and communication requirements

Assessment criteria

The learner can:

- 9.1 describe the different types of **supply apparatus and sub-structures** for utilities and other agencies that may be encountered during reinstatement.
- 9.2 explain the methods used to protect each type of supply apparatus and sub-structure.
- 9.3 explain why it is necessary to report any spillage from fuel and lubricants, and to safely prevent their spread, in line with company procedures.

Range

Supply apparatus and sub-structures: supply apparatus for utilities and other agencies; above and below ground services; built structures (eg foundations); the natural environment (eg tree roots, natural watercourses)

Unit 209

Operate powered tools and equipment for routine and predictable requirements on utilities network construction

Level: 2
Credit value: 4
UAN: Y/503/0687

Unit aim

This unit allows learners to show that they have the skills and knowledge to operate powered tools and equipment during utilities construction operations.

Learners must show that they can communicate information to the relevant people and organisations throughout reinstatement activities, and must resolve or refer problems that arise during the work in line with their job responsibility. Throughout the operation, the learner must follow the work specification and Codes of Practice, and must maintain safe working procedures.

Learning outcomes

There are **seven** learning outcomes to this unit. The learner will:

1. Prepare powered tools and equipment for routine and predictable use
2. Run and operate powered tools and equipment
3. Shut down and carry out post-stop checks on powered tools and equipment
4. Use and communicate data and information
5. Resolve problems which arise from operating powered tools and equipment
6. Demonstrate general knowledge and understanding for utilities network construction operations
7. Demonstrate knowledge and understanding of working with powered tools and equipment

Guided learning hours

It is recommended that **25** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC09 Operate powered tools and equipment for routine and predictable requirements on utilities network construction.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 209 Operate powered tools and equipment for routine and predictable requirements on utilities network construction

Outcome 1 Prepare powered tools and equipment for routine and predictable use

Assessment criteria

The learner can:

- 1.1 use work instructions and specifications to confirm the operations requiring the use of **powered tools and equipment**.
- 1.2 carry out a site specific risk assessment, and review in accordance with company procedures.
- 1.3 select and wear the designated **personal protective equipment (PPE)**.
- 1.4 carry out pre-start inspections on the **powered tools and equipment**.
- 1.5 record and report any defects of the **powered tools and equipment** and take out of service until rectified.
- 1.6 confirm **powered tools and equipment** are safe, correct and read for use in accordance with the work requirements.

Range

Powered tools and equipment: power generation (including electric, pneumatic and hydraulic); cutting and grinding; pumping; compacting; pipe jointing

Personal protective equipment (PPE): head; eyes; ears; respiratory system; hands; feet; body.

Unit 209 Operate powered tools and equipment for routine and predictable requirements on utilities network construction

Outcome 2 Run and operate powered tools and equipment

Assessment criteria

The learner can:

- 2.1 carry out start and stop procedures to confirm functions are in accordance with safe control and the manufacturers' operating instructions.
- 2.2 operate tools and **equipment** safely in accordance with specifications.

Range

Equipment: power generation (including electric, pneumatic and hydraulic); cutting and grinding; pumping; compacting; pipe jointing

Unit 209

Operate powered tools and equipment for routine and predictable requirements on utilities network construction

Outcome 3

Shut down and carry out post-stop checks on powered tools and equipment

Assessment criteria

The learner can:

- 3.1 stop **powered tools and equipment** safely.
- 3.2 carry out post-stop checks in accordance with organisational and operational procedures.
- 3.3 leave **powered tools and equipment** safe and secure.

Range:

Powered tools and equipment: power generation (including electric, pneumatic and hydraulic); cutting and grinding; pumping; compacting; pipe jointing

Unit 209 Operate powered tools and equipment for routine and predictable requirements on utilities network construction

Outcome 4 Use and communicate data and information

Assessment criteria

The learner can:

- 4.1 carry out all work to approved procedures and practice and in compliance with statutory and regulatory requirements.
- 4.2 carry out site-specific risk assessment, and review in accordance with company procedures.
- 4.3 record and report defects in tool and **equipment** performance to the designated person.
- 4.4 record and report the need for replacement tools and **equipment** to the designated person.
- 4.5 check any circumstances where information appears incorrect with the designated personnel.
- 4.6 use organisational information systems to record and store data and information.

Range

Equipment: power generation (including electric, pneumatic and hydraulic); cutting and grinding; pumping; compacting; pipe jointing

Unit 209

Operate powered tools and equipment for routine and predictable requirements on utilities network construction

Outcome 5

Resolve problems which arise from operating powered tools and equipment

Assessment criteria

The learner can:

- 5.1 report any damage to tools and **equipment** to the designated person.
- 5.2 refer problems that are outside their responsibility to the designated person using approved procedures.

Range

Equipment: power generation (including electric, pneumatic and hydraulic); cutting and grinding; pumping; compacting; pipe jointing

Unit 209

Operate powered tools and equipment for routine and predictable requirements on utilities network construction

Outcome 6

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can:

- 6.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act.
- 6.2 state the health and safety guidance governing work in excavations.
- 6.3 describe the safe procedures for handling hazardous materials.
- 6.4 explain their organisational accident recording and reporting procedures.

Unit 209 Operate powered tools and equipment for routine and predictable requirements on utilities network construction

Outcome 7 Demonstrate knowledge and understanding of working with powered tools and equipment

Assessment criteria

The learner can:

- 7.1 describe the **hazards** posed by **powered tools and equipment** and explain how the associated risks must be illuminated or controlled.
- 7.2 describe the full range of **personal protective equipment (PPE)** that must be worn when operating **powered tools and equipment**.
- 7.3 describe the key features and characteristics of **powered tools and equipment**, including the type of work for which they are suitable.
- 7.4 outline how **powered tools and equipment** should be operated, including:
 - (a) starting and stopping routines
 - (b) operation to comply with all **approved procedures and practices**.
- 7.5 describe the training certificates and license requirements for operating **powered tools and equipment**.
- 7.6 outline the industry recognised practices for their specific trade occupation and general construction work activities, including current statutory requirements.
- 7.7 describe the manufacturer's recommendations for starting the **powered tools and equipment**.
- 7.8 describe the operational safety procedures that must be observed when starting and stopping **powered tools and equipment**.
- 7.9 describe the operational problems that can occur with the **powered tools and equipment** being used and how these might be resolved.
- 7.10 describe how to report problems with and damage to **powered tools and equipment**.
- 7.11 explain the importance of maintaining tools in good working order, including the sharpening of cutting tools.
- 7.12 describe the routine and emergency operational procedures for the **powered tools and equipment** being used, including manufacturer's recommendations.
- 7.13 describe the pre- and post-use maintenance checks that should be carried out on **powered tools and equipment**, including those recommended by manufacturers and in operational and organisational procedures.
- 7.14 explain why it is important to report and to prevent the spread of spilled fuels and lubricants, in line with company policies.

Range

Hazards: vibration; handling; fumes; dust; moving parts; heat; electricity; fuel; substances

Powered tools and equipment: power generation (including electric, pneumatic and hydraulic); cutting and grinding; pumping; compacting; pipe jointing

Personal Protective Equipment (PPE): head; eyes; ears; respiratory system; hands; feet; body.

Approved procedures and practices: environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments; manufactures' instructions

Unit 210

Join materials by electrofusion processes on Utilities Network Construction

Level: 2
Credit value: 2
UAN: F/503/0666

Unit aim

The purpose of this unit is to assess the competence of individuals to recognised national occupational standards. This unit is designed to assess the competence of individuals required to join materials by electrofusion processes on Utilities Network Construction. It includes using non-automatic and automatic techniques. The jointing process may be carried out in all weather conditions in accordance with industry standards and specifications.

Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Be able to make joints using electrofusion jointing techniques
2. Be able to use and communicate data and information
3. Be able to resolve problems that arise during jointing work
4. Know Health and Safety guidance and legislation in utilities network construction operations
5. Understand jointing materials by electrofusion processes on Utilities Network Construction

Guided learning hours

It is recommended that **10** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC010 Join materials by electrofusion processes on Utilities Network Construction.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 210 Join materials by electrofusion processes on Utilities Network Construction

Outcome 1 Be able to make joints using electrofusion jointing techniques

Assessment criteria

The learner can:

- 1.1 Carry out site specific risk assessment, and review in accordance to company procedures
- 1.2 Select and wear the designated PPE
- 1.3 Check that jointing related equipment and consumables are as specified and fit for purpose
- 1.4 Use the correct electrofusion jointing technique to produce joints of the required quality and confirm compliance with the
 - specified standard
 - specified dimensional accuracy
- 1.5 Confirm that on completion of jointing activities the equipment is shut down to a safe condition
- 1.6 Confirm temporary attachments, excess and waste materials are dealt with promptly in line with approved and agreed procedures.

Unit 210 **Join materials by electrofusion processes on Utilities Network Construction**

Outcome 2 Be able to use and communicate data and information

Assessment criteria

The learner can:

- 2.1 Comply with approved procedures, practices, statutory and regulatory requirements involved in the work activity
- 2.2 Check with **designated personnel** any circumstances where information appears incorrect
- 2.3 Use organisational information systems to record and store data and information.

Range

Designated personnel: those people specified within work and health and safety procedures

Unit 210

Join materials by electrofusion processes on Utilities Network Construction

Outcome 3

Be able to resolve problems that arise during jointing work

Assessment criteria

The learner can:

- 3.1 Report to the **designated person** damage to supply apparatus
- 3.2 Report to the **designated person** damage to jointing equipment
- 3.3 Report to the **designated person** matters outside the responsibility of the job role
- 3.4 Demonstrate how to resolve day-to-day problems within the responsibility of the job role
- 3.5 Handle emergency situations when they arise

Range

Designated person

Those people specified within work and health and safety procedures

Unit 210

Join materials by electrofusion processes on Utilities Network Construction

Outcome 4

Know Health and Safety guidance and legislation in utilities network construction operations

Assessment criteria

The learner can:

- 4.1 State the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 4.2 Explain the health and safety guidance governing work in excavations
- 4.3 Describe the safe procedures for handling hazardous materials
- 4.4 Explain the organisational accident recording and reporting procedures
- 4.5 Identify the range and use of personal protective equipment for the work

Unit 210 Join materials by electrofusion processes on Utilities Network Construction

Outcome 5 Understand jointing materials by electrofusion processes on Utilities Network Construction

Assessment criteria

The learner can:

- 5.1 State the health, safety and environment legislation and environmental procedures relevant to the work activities
- 5.2 Apply the correct manual handling procedures
- 5.3 Explain the industry codes of practice and company procedures
- 5.4 Interpret engineering specifications relevant to the engineering activity
- 5.5 Describe the different stages that take place during the jointing process and the importance of allowing each phase to complete
- 5.6 Explain the need for pipe restraint, pipe support and pipe alignment
- 5.7 Explain the cause and effect of **defects**
- 5.8 Interpret pipe specifications
- 5.9 Explain pipe compatibility
- 5.10 Identify different types of pipe materials
- 5.11 Describe equipment maintenance procedures
- 5.12 Describe equipment calibration
- 5.13 State the consequences of poor equipment maintenance
- 5.14 Identify quality assurance procedures that can be applied in recognising defects
- 5.15 Explain the correct reporting procedures.

Range

Defects: poor pipe restraint, poor pipe support, misalignment, contamination

Unit 211

Joint materials by butt fusion processes on Utilities Network Construction, up to 180mm diameter

Level: 2
Credit value: 2
UAN: J/503/0667

Unit aim

The purpose of this unit is to assess the competence of individuals to recognised national occupational standards. This unit is designed to assess the competence of individuals required to joint materials by butt fusion processes using pipes with diameters up to and including 180mm diameter. It includes using non-automatic and automatic machines on parent materials with the same SDR rating and polymer type. The jointing process may be carried out in all weather conditions in accordance with industry standards and specifications

Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Be able to make joints using butt fusion techniques
2. Be able to use and communicate data and information
3. Be able to resolve problems which arise from jointing materials
4. Know Health and Safety guidance and legislation in utilities network construction operations
5. Understand jointing materials by butt fusion processes on utilities network construction, up to 180mm diameter

Guided learning hours

It is recommended that **10** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC011A Joint materials by butt fusion processes on Utilities Network Construction, up to 180mm diameter.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 211 Joint materials by butt fusion processes on Utilities Network Construction, up to 180mm diameter

Outcome 1 Be able to make joints using butt fusion techniques

Assessment criteria

The learner can:

- 1.1 Carry out site specific risk assessment, and review in accordance with company procedures
- 1.2 Select and wear the designated PPE
- 1.3 Check that jointing and related equipment and consumables are as specified and fit for purpose
- 1.4 Confirm there is adequate weather protection during the entire jointing cycle
- 1.5 Carry out and monitor the machine operations to produce butt fusion joints of the required quality
- 1.6 Confirm compliance with
 - job instructions
 - correct preparation
 - specification
 - specified dimensional accuracy
- 1.7 Demonstrate how to de-bead and carry out approved quality assurance test on bead
- 1.8 Confirm joint and bead are identifiable by marking in accordance with company procedures
- 1.9 Confirm the equipment is in a safe condition on completion of jointing activities
- 1.10 Handle excess and waste materials and temporary attachments, in line with approved and agreed procedures.

Unit 211 **Joint materials by butt fusion processes on Utilities Network Construction, up to 180mm diameter**

Outcome 2 Be able to use and communicate data and information

Assessment criteria

The learner can:

- 2.1 Comply with approved procedures and practices involved in the work activity
- 2.2 Confirm with **designated personnel** any circumstances where information appears incorrect
- 2.3 Use organisational information systems to record and store jointing data and information

Range

Designated personnel

Those people specified within work and health and safety procedures

Unit 211 **Joint materials by butt fusion processes on Utilities Network Construction, up to 180mm diameter**

Outcome 3 Be able to resolve problems which arise from jointing materials

Assessment criteria

The learner can:

- 3.1 Report promptly to the **designated person** damage or defects to tools, equipment, materials
- 3.2 Report promptly to the **designated person** matters outside the responsibility of the job role
- 3.3 Resolve day to day problems within the responsibility of the job role
- 3.4 Handle emergency situations as specified in approved procedures

Range

Designated person

Those people specified within work and health and safety procedures

Unit 211 Joint materials by butt fusion processes on Utilities Network Construction, up to 180mm diameter

Outcome 4 Know Health and Safety guidance and legislation in
utilities network construction operations

Assessment criteria

The learner can:

- 4.1 State the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 4.2 Explain the health and safety guidance governing work in excavations
- 4.3 Describe the safe procedures for handling hazardous materials
- 4.4 Explain the organisational accident recording and reporting procedures
- 4.5 Identify the range and use of personal protective equipment for the work
- 4.6 State the health, safety and environment legislation and environmental procedures relevant to the work activities

Unit 211 Joint materials by butt fusion processes on Utilities Network Construction, up to 180mm diameter

Outcome 5 Understand jointing materials by butt fusion processes on utilities network construction, up to 180mm diameter

Assessment criteria

The learner can:

- 5.1 Apply the correct manual handling procedures
- 5.2 Explain the industry codes of practice and company procedures
- 5.3 Explain why only pipes of similar specifications can be joined together
- 5.4 Interpret engineering specifications relevant to the engineering activity
- 5.5 Describe the different stages that take place during the jointing process and the importance of allowing each phase to complete
- 5.6 Explain the need for pipe support, alignment and the consequences of poor support and mis-alignment
- 5.7 Explain the cause and effect of **defects and contaminations**
- 5.8 Describe maintenance procedures
- 5.9 Describe equipment calibration
- 5.10 Outline the consequences of poor maintenance
- 5.11 Identify different **quality assurance procedures** that can be applied in recognising defects
- 5.12 Explain the correct reporting procedures.

Range

Defects and contaminations

Split defects, inadequate bead, excessive bead, pipe specifications, compatibility, different types of materials and consumables

Quality assurance procedures

non-destructive and destructive testing

Unit 220

Maintain a safe and secure working environment in water network construction

Level: 2

Credit value: 3

UAN: D/503/1159

Unit aim

This unit allows learners to show that they have the skills and knowledge to maintain a safe and secure working environment in water network construction. The learner will be able to ensure that the working environment is safe. It involves ongoing monitoring during routine work. They must take steps to make safe any situations or working practices that are within their responsibility, and must refer any problems to the designated people who are specified in work procedures. The learner must be alert to, and assess, risk or hazardous conditions, security breaches, and the need to wear safety clothing. They must show that they can follow the correct procedures when emergencies arise. The learner must follow the work specification and relevant Codes of Practice, and must maintain safe working and hygiene procedures.

Learning outcomes

There are **eleven** learning outcomes to this unit. The learner will:

1. Maintain the health and safety of themselves and others
2. Maintain the safety and security of plant, equipment and the working environment
3. Respond to emergencies
4. Use and communicate data and information
5. Resolve problems which could affect health and safety
6. Demonstrate general knowledge and understanding for utilities network construction operations
7. Demonstrate knowledge of legislation regulations, procedures and company policies relating to health and safety
8. Demonstrate knowledge and understanding of the principles and application of risk assessment
9. Demonstrate knowledge and understanding of maintaining the safety and security of plant, equipment and the working environment
10. Demonstrate knowledge and understanding of roles and responsibilities in maintaining safety
11. Demonstrate knowledge and understanding of the use and storage of information

Guided learning hours

It is recommended that **23** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC 002 Maintain a safe and secure working environment in utilities network construction.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 220

Maintain a safe and secure working environment in water network construction

Outcome 1

Maintain the health and safety of themselves and others

Assessment criteria

The learner can:

- 1.1 work in a way which ensures they do not endanger or risk themselves or other people
- 1.2 carry out site-specific assessments for their area of work and review them in accordance with company procedures
- 1.3 wear the personal protective equipment (PPE) that is identified in the site-specific risk assessment and in company procedures
- 1.4 change working practices and other aspects of the workplace that could harm themselves and other people
- 1.5 deal with hazards and make them safe in accordance with workplace policies and health and safety requirements
- 1.6 deal promptly with accidental breakages and spillages
- 1.7 monitor condition and make sure they remain safe and deal with situations that fall short of requirements
- 1.8 make sure that work activity is carried out to safe working practices and health, safety and hygiene requirements
- 1.9 monitor work activities and their potential to harm:
 - a. people
 - b. the environment
- 1.10 follow **emergency** procedures immediately in the event of an **emergency**

Range

Emergency: toxic fumes, accidents, major accidents, electrocutions, dangerous occurrences, flooding, environmental pollution, trench collapse

Unit 220

Maintain a safe and secure working environment in water network construction

Outcome 2

Maintain the safety and security of plant, equipment and the working environment

Assessment criteria

The learner can:

- 2.1 maintain plant, equipment and hazardous locations in line with health and safety specifications and safe working and hygiene practices
- 2.2 maintain entrances to, and exits from, hazardous locations according to site specifications
- 2.3 maintain health and safety equipment – assembled for use in a safe area – free from defects and deficiencies
- 2.4 deal with unauthorised personnel seen in the workplace in accordance with organisational procedures
- 2.5 store and use safety clothing and personal protective equipment (PPE) in accordance with safe working practices and organisational requirements
- 2.6 maintain site safety by routine health and safety checks

Unit 220

Maintain a safe and secure working environment in water network construction

Outcome 3

Respond to emergencies

Assessment criteria

The learner can:

- 3.1 in the event of an **emergency** implement the designated response procedures promptly and in accordance with recognised safe practices and organisational policy
- 3.2 respond to all accidents and emergencies that are within their capability and responsibility and report promptly to a designated person
- 3.3 use **emergency** appliances in accordance with approved procedures and practices

Range

Emergency: toxic fumes, accidents, major accidents, electrocutions, dangerous occurrences, flooding, environmental pollution, trench collapse

Unit 220

Maintain a safe and secure working environment in water network construction

Outcome 4

Use and communicate data and information

Assessment criteria

The learner can:

- 4.1 follow all lone working procedures where they are working alone
- 4.2 report promptly, to the designated people, unsafe plant, equipment and hazardous locations outside their area of responsibility
- 4.3 report high risk hazards outside their responsibility to the designated people
- 4.4 report **emergencies** immediately to the designated people
- 4.5 report situations that emerge from visual inspections or monitoring data which have the potential to escalate and pose risk to people
- 4.6 report breaches of **security** immediately to a designated person
- 4.7 keep accurate and up-to-date records on routine matters and **emergencies** to confirm to health and safety specifications and safe working and hygiene practices
- 4.8 maintain audit trails of records for quality assurance purposes

Range

Emergency: toxic fumes, accidents, major accidents, electrocutions, dangerous occurrences, flooding, environmental pollution, trench collapse

Security: Personnel, property, the surrounding environment, the operational area, plant and environment

Unit 220

Maintain a safe and secure working environment in water network construction

Outcome 5

Resolve problems which could affect health and safety

Assessment criteria

The learner can:

- 5.1 make safe and restore plant, equipment and hazardous locations to health and safety specifications and safe working and hygiene practices
- 5.2 deal with unsafe behaviour in accordance with the responsibilities of the job role and workplace procedures
- 5.3 resolve day-to-day problems within their responsibility
- 5.4 refer matters outside their responsibility to the designated people

Unit 220

Maintain a safe and secure working environment in water network construction

Outcome 6

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can:

- 6.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 6.2 state the health and safety guidance governing work in excavations
- 6.3 describe the safe procedures for handling hazardous materials
- 6.4 explain their organisational accident recording and reporting procedures
- 6.5 list the range and use of personal protective equipment (PPE) for the work

Unit 220

Maintain a safe and secure working environment in water network construction

Outcome 7

Demonstrate knowledge of legislation, regulations, procedures and company policies relating to health and safety

Assessment criteria

The learner can:

- 7.1 outline their duties for health and safety as defined by:
 - a. any specific legislation covering the job role
 - b. specific responsibilities and scope in their job description
- 7.2 outline the workplace policies and health and safety requirements for dealing with **potential risks**
- 7.3 outline the procedures to be followed in the event of an **emergency**
- 7.4 outline the information that is provided to other people relating to health, safety and hygiene
- 7.5 outline the organisation's confidentiality policies
- 7.6 outline the workplace policies and health and safety requirements for dealing with **potential risks**

Range

Potential risks: restrictions to access and egress, misuse of tools and equipment, faulty equipment, hazardous substances, interference with and from adjacent activities, obstructions and exposed apparatus, structures and services, flooding, wet or uneven surfaces, biological (infection), atmospheres – toxic, oxygen deficient and explosive

Emergency: toxic fumes, accidents, major accidents, electrocutions, dangerous occurrences, flooding, environmental pollution, trench collapse

Unit 220

Maintain a safe and secure working environment in water network construction

Outcome 8

Demonstrate knowledge and understanding of the principles and application of risk assessment

Assessment criteria

The learner can:

- 8.1 explain when to carry out health and safety checks
- 8.2 describe how to carry out and review site-specific risk assessments
- 8.3 explain the importance of remaining alert to the presence of hazards in the whole workplace
- 8.4 describe the hazards that may exist in their own workplace and how to assess them
- 8.5 describe how work activities can turn a relatively safe excavation into a confined space, and the implications of this
- 8.6 describe those aspects of the workplace that could harm themselves or others

Unit 220

Maintain a safe and secure working environment in water network construction

Outcome 9

Demonstrate knowledge and understanding of maintaining the safety and security of plant, equipment and the working environment

Assessment criteria

The learner can:

- 9.1 outline the requirements of health and safety specifications and safe working and hygiene practices for plant, equipment and the working environment
- 9.2 explain how to restore plant, equipment and hazardous locations to conform to health and safety specifications and safe working and hygiene practices
- 9.3 outline the site specifications for entrances to, and exits from, hazardous locations
- 9.4 describe typical and unusual defects and deficiencies with health and safety equipment
- 9.5 explain the procedures to follow when dealing with confined spaces
- 9.6 describe the dangers associated with working in a confined space
- 9.7 outline the monitoring procedures for work that is carried out in a hazardous area
- 9.8 outline the workplace requirements and guidance on precautions to be taken
- 9.9 describe safe working practices
- 9.10 explain how to identify and deal with unsafe behaviour
- 9.11 describe the requirements of the organisation for the safe storage and use of safety clothing and equipment (PPE)

Unit 220

Maintain a safe and secure working environment in water network construction

Outcome 10

Demonstrate knowledge and understanding of roles and responsibilities in maintaining safety

Assessment criteria

The learner can:

- 10.1 describe the roles and responsibilities of those involved in maintaining safety
- 10.2 describe their responsibility for correcting risks within the scope of their job role
- 10.3 describe the procedures for dealing with risks that they cannot correct
- 10.4 explain the importance of dealing with, or promptly reporting risks
- 10.5 describe how to resolve misunderstandings

Unit 220

Maintain a safe and secure working environment in water network construction

Outcome 11

Demonstrate knowledge and understanding of the use and storage of information

Assessment criteria

The learner can:

- 11.1 explain the importance of checking information received for accuracy, validity and meaning
- 11.2 explain why it is important to interpret instructions accurately
- 11.3 explain how to recognise information that is inaccurate
- 11.4 describe how and when to record verbal, written and computerised information
- 11.5 describe how and when to produce data in text, tabular and graphical formats
- 11.6 describe how to interpret data from text, tabular and graphical formats
- 11.7 explain how to use the required data storage systems
- 11.8 explain why it is important to store information and documentation in the correct location
- 11.9 outline the organisational requirements for storing information and documentation
- 11.10 explain the use of information during water network construction, including:
 - a. what types of information are used
 - b. the sources that they use in their role
 - c. how the information is used
 - d. the implications of its use
- 11.11 explain the importance of providing accurate information in a fit-for-purpose format, within identified timescales
- 11.12 explain the purpose of data audit trails, and how to use and maintain them

Unit 221

Joint materials by butt fusion processes above 315mm for utilities network construction

Level: 2

Credit value: 3

UAN: R/503/1160

Unit aim

This unit allows learners to show that they have the skills and knowledge to carry out butt fusion jointing on polyethylene pipes with a diameter of more than 315 mm (300 mm nominal bore). The learner must show that they can make butt fusion joints, using non-automatic and automatic machines, on parent materials with the same SDR rating and polymer type. They must be able to carry out butt fusion jointing in all weather conditions, according to industry standards and specifications.

The learner must show that they can communicate information to the relevant people and organisations throughout the operation, and must resolve or refer problems that arise during the work in line with your responsibility.

Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Make joints using butt fusion techniques on pipe with diameter over 315mm
2. Use and communicate data and information
3. Resolve problems which could arise from jointing materials
4. Demonstrate general knowledge and understanding for utilities network construction operations
5. Demonstrate knowledge and understanding of butt fusion jointing

Guided learning hours

It is recommended that **24** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC 011 Joint materials by butt fusion processes on utilities network construction.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 221 Joint materials by butt fusion processes above 315mm for utilities network construction

Outcome 1 Make joints using butt fusion techniques on pipe with diameter over 315mm

Assessment criteria

The learner can:

- 1.1 work safely and ensure compliance with health, safety, environment and other regulations and guidelines
- 1.2 carry out a site-specific risk assessment, and review it in accordance with company procedures
- 1.3 select and wear the designated personal protective equipment (PPE)
- 1.4 follow the job instructions and procedures accurately to prepare and make joints
- 1.5 check and confirm that joint preparation:
 - a. complies with the specification
 - b. meets quality requirements
- 1.6 check that the jointing and related equipment and consumables are as specified and fit for purpose
- 1.7 provide adequate weather protection during the entire jointing cycle
- 1.8 carry out and monitor the machine operations in line with specifications and job instructions
- 1.9 make butt joints of the required quality and specified dimensional accuracy
- 1.10 de-bead and carry out the approved quality assurance test on the bead
- 1.11 mark the joint and bead in line with company procedures to ensure that they are identifiable
- 1.12 shut down the equipment to a safe condition on completion of jointing activities
- 1.13 deal promptly with excess and waste materials and temporary attachments, in line with approved and agreed procedures

Unit 221 **Joint materials by butt fusion processes above 315mm for utilities network construction**

Outcome 2 Use and communicate data and information

Assessment criteria

The learner can:

- 2.1 follow all **approved procedures and practices** and statutory and regulatory requirements involved in the work activity
- 2.2 check with designated personnel any circumstances where information appears incorrect
- 2.3 use organisational information systems to record and store data and information
- 2.4 follow all lone working procedures when working alone

Range

Approved procedures and practices: environmental, statutory, regulatory, emergency, operational, health and safety, organisational and company procedures, risk assessments, lifting and handling

Unit 221

Joint materials by butt fusion processes above 315mm for utilities network construction

Outcome 3

Resolve problems which could arise from jointing materials

Assessment criteria

The learner can:

- 3.1 report damage to tools, equipment or materials promptly to the designated person
- 3.2 resolve day-to-day problems within their responsibility
- 3.3 refer matters that are outside their responsibility to the designated people using approved procedures
- 3.4 deal with emergency situations where they arise

Unit 221

Joint materials by butt fusion processes above 315mm for utilities network construction

Outcome 4

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can:

- 4.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 4.2 state the Health and Safety guidance governing work in excavations
- 4.3 describe the safe procedures for handling hazardous materials
- 4.4 explain their organisation accident recording and reporting procedures
- 4.5 state the range and use of personal protective equipment required for the work

Unit 221 Joint materials by butt fusion processes above 315mm for utilities network construction

Outcome 5 Demonstrate knowledge and understanding of butt fusion jointing

Assessment criteria

The learner can:

- 5.1 state the health, safety and environment legislation and environmental procedures that relate to the work activities
- 5.2 describe the correct manual handling procedures to be used during butt fusion jointing
- 5.3 outline the industry codes of practice and company procedures relating to butt fusion jointing
- 5.4 explain why only pipes of similar specifications can be joined together
- 5.5 explain how to interpret engineering specifications that are relevant to the jointing activity
- 5.6 describe the different stages that take place during the butt fusion jointing process
- 5.7 explain the importance of allowing each stage of the butt fusion process to complete
- 5.8 explain why pipe support and alignment are needed
- 5.9 describe the consequences of poor pipe support and misalignment
- 5.10 explain the causes and effects of defects and contamination, including:
 - a. misalignment split defects
 - b. inadequate bead
 - c. excessive bead
 - d. pipe specifications
 - e. compatability
 - f. different types of materials and consumables
- 5.11 describe the maintenance procedures that must be followed for butt fusion activities
- 5.12 describe how equipment must be calibrated for butt fusion activities
- 5.13 describe the consequences of poor maintenance
- 5.14 describe the different quality assurance procedures that can be applied to recognise jointing defects, including:
 - a. destructive testing
 - b. non-destructive testing
- 5.15 outline the correct reporting procedures used for butt fusion activities

Unit 222

Joint materials by butt fusion processes between 180mm and 315mm for utilities network construction

Level: 2

Credit value: 3

UAN: Y/503/1161

Unit aim

This unit allows learners to show that they have the skills and knowledge to carry out butt fusion jointing on polyethylene pipes with a diameter of between 180mm and 315 mm (150mm - 300mm nominal bore). The learner must show that they can make butt fusion joints, using non automatic and automatic machines, on parent materials with the same SDR rating and polymer type. They must be able to carry out butt fusion jointing in all weather conditions, according to industry standards and specifications. The learner must show that they can communicate information to the relevant people and organisations throughout the operation and must resolve or refer problems that arise during jointing in line with their job responsibility.

Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Make butt fusion joints on pipe with diameter between 180mm and 315mm
2. Use and communicate data and information
3. Resolve problems which could arise from jointing materials
4. Demonstrate general knowledge and understanding for utilities network construction operations
5. Demonstrate knowledge and understanding of butt fusion jointing

Guided learning hours

It is recommended that **24** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC 011 Joint materials by butt fusion processes on utilities network construction.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 222 Joint materials by butt fusion processes between 180mm and 315mm for utilities network construction

Outcome 1 Make butt fusion joints on pipe with diameter
between 180mm and 315mm

Assessment criteria

The learner can:

- 1.1 work safely and ensure compliance with health, safety, environment and other regulations and guidelines
- 1.2 carry out a site-specific risk assessment, and review it in accordance with company procedures
- 1.3 select and wear the designated personal protective equipment (PPE)
- 1.4 follow the job instructions and procedures accurately to prepare and make joints
- 1.5 check and confirm that joint preparation:
 - a. complies with specification
 - b. meets quality requirements
- 1.6 check that the jointing and related equipment and consumables are as specified and fit for purpose
- 1.7 provide adequate weather protection during the entire jointing cycle
- 1.8 carry out and monitor the machine operations in line with specifications and job instructions
- 1.9 make butt joints of the required quality and specified dimensional accuracy
- 1.10 de-bead and carry out the approved quality assurance test on the bead
- 1.11 mark the joint and bead in line with company procedures to ensure that they are identifiable
- 1.12 shut down the equipment to a safe condition on completion of jointing activities
- 1.13 deal promptly with excess and waste materials and temporary attachments, in line with approved and agreed procedures

Unit 222 Joint materials by butt fusion processes between 180mm and 315mm for utilities network construction

Outcome 2 Use and communicate data and information

Assessment criteria

The learner can:

- 2.1 follow all **approved procedures and practices** and statutory and regulatory requirements involved in the work activity
- 2.2 check with designated personnel any circumstances where information appears incorrect
- 2.3 use organisational information systems to record and store data and information
- 2.4 follow all lone working procedures when working alone

Range

Approved procedures and practices: environmental, statutory, regulatory, emergency, operational, health and safety, organisational and company procedures, risk assessments, lifting and handling

Unit 222

Joint materials by butt fusion processes between 180mm and 315mm for utilities network construction

Outcome 3

Resolve problems which could arise from jointing materials

Assessment criteria

The learner can:

- 3.1 report damage to tools, equipment or materials promptly to the designated person
- 3.2 resolve day-to-day problems within their responsibility
- 3.3 refer matters that are outside their responsibility to the designated people using approved procedures
- 3.4 deal with emergency situations where they arise

Unit 222

Joint materials by butt fusion processes between 180mm and 315mm for utilities network construction

Outcome 4

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can:

- 4.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 4.2 state the health and safety guidance governing work in excavations
- 4.3 describe the safe procedures for handling hazardous materials
- 4.4 explain their organisational accident recording and reporting procedures
- 4.5 state the range and use of personal protective equipment required for the work

Unit 222 Joint materials by butt fusion processes between 180mm and 315mm for utilities network construction

Outcome 5 Demonstrate knowledge and understanding of butt
fusion jointing

Assessment criteria

The learner can:

- 5.1 state the health, safety and environment legislation and environmental procedures that relate to the work activities
- 5.2 describe the correct manual handling procedures to be used during butt fusion jointing
- 5.3 outline the industry codes of practice and company procedures relating to butt fusion jointing
- 5.4 explain why only pipes of similar specifications can be joined together
- 5.5 explain how to interpret engineering specifications that are relevant to the jointing activity
- 5.6 describe the different stages that take place during the butt fusion jointing process
- 5.7 explain the importance of allowing each stage of the butt fusion process to complete
- 5.8 explain why pipe support and alignment are needed
- 5.9 describe the consequences of poor pipe support and misalignment
- 5.10 explain the causes and effects of defects and contamination
 - a. misalignment split defects
 - b. inadequate bead
 - c. excessive bead
 - d. pipe specifications
 - e. compatibility
 - f. different types of materials and consumables
- 5.11 describe the maintenance procedures that must be followed for butt fusion activities
- 5.12 describe how equipment must be calibrated for butt fusion activities
- 5.13 describe the consequences of poor maintenance
- 5.14 describe the different quality assurance procedures that can be applied to recognise jointing defects, including:
 - a. destructive testing
 - b. non-destructive testing
- 5.15 outline the correct reporting procedures used for butt fusion activities

Unit 223

Joint materials by mechanical means on water network construction

Level: 2

Credit value: 4

UAN: D/503/1162

Unit aim

This unit allows learners to show that they have the skills and knowledge to assemble pipes and fittings for water network construction operations, using mechanical joints. The learner will be able to use a variety of assembly methods and techniques, including cutting and mechanical jointing on metallic materials. They will also be able to cover transition jointing between metallic and polyethylene materials using mechanical fittings. They must also show that they can communicate information to the relevant people and organisations throughout mechanical jointing activities, and must resolve or refer problems that arise during the work in line with their job responsibility. Throughout the operation, the learner must follow the work specification and Codes of Practice, and must maintain safe working and hygiene procedures.

Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Joint materials by assembling
2. Use and communicate data and information
3. Resolve problems which arise when performing jointing activities
4. Demonstrate knowledge and understanding for utilities network construction operations
5. Demonstrate knowledge understanding of jointing materials by mechanical means

Guided learning hours

It is recommended that **25** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC 012 Joint materials by mechanical means on water network construction.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 223

Joint materials by mechanical means on water network construction

Outcome 1

Joint materials by assembling

Assessment criteria

The learner can:

- 1.1 work safely at all times in accordance with health, safety and environment requirements and legislation
- 1.2 carry out a site-specific risk assessment, and review in accordance with company procedures
- 1.3 select and wear the appropriate personal protective equipment (PPE)
- 1.4 assemble and position the **joint** components using and following assembly drawing and work instructions
- 1.5 ensure that the **joint** components to be assembled meet the manufacturer's specifications and operating and performance standards
- 1.6 secure the **joint** components using connectors and securing devices in accordance with component specifications and work instructions
- 1.7 check to make sure that the finished **joint** assembly is complete and meets its operating requirements
- 1.8 carry out work in accordance with company procedures

Range

Joint: flanged, flexible, metallic pipes, non-metallic pipes

Unit 223

Joint materials by mechanical means on water network construction

Outcome 2

Use and communicate data and information

Assessment criteria

The learner can:

- 2.1 follow all approved procedures and practices involved in the work activity
- 2.2 check with designated personnel any circumstances where information appears correct
- 2.3 use organisational information systems to record and store data and information
- 2.4 follow all lone working procedures when working alone

Unit 223

Joint materials by mechanical means on water network construction

Outcome 3

Resolve problems which arise when performing jointing activities

Assessment criteria

The learner can:

3.1 deal with problems within the limits of their responsibility

3.2 report problems that are outside the responsibility of their job role to the designated person

Unit 223

Joint materials by mechanical means on water network construction

Outcome 4

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can:

- 4.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 4.2 state the health and safety guidance governing work in excavations
- 4.3 describe the safe procedures for handling hazardous materials
- 4.4 explain their organisational accident recording and reporting procedures
- 4.5 list the range and use of personal protective equipment for the work

Unit 223

Joint materials by mechanical means on water network construction

Outcome 5

Demonstrate knowledge and understanding of jointing materials by mechanical means

Assessment criteria

The learner can:

- 5.1 outline the requirements of legislation, environmental procedures, Codes of Practice and company procedures relevant to the **specific work activities**
- 5.2 explain how to read and interpret basic drawings and specifications as specified in industry standards
- 5.3 describe the basic methods and techniques for assembling and jointing components
- 5.4 explain the purpose of quality control procedures
- 5.5 describe how to read and interpret quality control procedures
- 5.6 describe the handling equipment and procedures which should be used and followed for designated work activities
- 5.7 explain how to select preparation techniques for simple designated jointing activities
- 5.8 describe the tools and equipment that are required to carry out pipe jointing
- 5.9 explain why it is important to look after tools and equipment
- 5.10 describe typical problems that can occur during pipe jointing activities and explain possible remedial activities

Range

Specific work activities: manual handling, the provision and use of equipment, hygiene and health checks, working with or near hazardous materials, personal protection, accident reporting, working in excavations

Unit 224 Install water services up to 50mm nominal bore or 63mm polyethylene

Level: 2
Credit value: 4
UAN: H/503/1163

Unit aim

This unit allows learners to show that they have the skills and knowledge to install water services up to 50mm nominal bore (63mm PE). The learner will be able to interpret technical information and specifications and prepare the resources necessary to install the system, and must install the various components required in line with the specification and relevant company procedures. They must record and report information about the job to the relevant people, and must resolve or refer problems that arise during the work inline with their job responsibility. Throughout the operation, the learner must follow the work specification and Codes of Practice, and must maintain safe working and hygiene procedures.

Learning outcomes

There are **seven** learning outcomes to this unit. The learner will:

1. Interpret technical information for installing water services
2. Select water service components and resources for installation of the system
3. Install components of the systems
4. Use and communicate data and information
5. Resolve problems that arise from technical information and installation work
6. Demonstrate general knowledge and understanding for utilities network construction operations
7. Demonstrate knowledge and understanding of installing water services

Guided learning hours

It is recommended that **30** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC 013 Install engineering products or assets for utilities network construction.

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 224 **Install water services up to 50mm nominal bore or 63mm polyethylene**

Outcome 1 Interpret technical information for installing water services

Assessment criteria

The learner can:

- 1.1 use drawings, records, work documents, manuals and technical specifications to provide work details for **component** installation
- 1.2 use the **technical information** to confirm dimensions, lengths, widths and quantities required
- 1.3 use the **technical information** to determine the positions of utilities plant, services, buildings, kerbs and boundaries
- 1.4 where discrepancies occur, ensure that necessary corrections are made or communicated to those who need to know

Range

Component: ferrule or tapping tee, pipe, joints, meter

Technical information: job progress, discrepancies or deficiencies, work instructions, problems outside own responsibility

Unit 224

Install water services up to 50mm nominal bore or 63mm polyethylene

Outcome 2

Select water service components and resources for installation of the system

Assessment criteria

The learner can:

- 2.1 select the **components** in accordance with work and quality specifications
- 2.2 ensure **components** are in good condition and are fit for purpose
- 2.3 follow procedures to ensure that defective, non-matching or sub-standard **components** are replaced
- 2.4 ensure that sufficient quantities of suitable tools, plant and equipment are available, checked and fit for purpose
- 2.5 ensure there is sufficient competent labour to carry out the work effectively and safely
- 2.6 deal promptly and effectively with actual and predicted changes to the planned use of the resources

Range

Component: ferrule or tapping tee, pipe, joints, meter

Unit 224 Install water services up to 50mm nominal bore or 63mm polyethylene

Outcome 3 Install components of the system

Assessment criteria

The learner can:

- 3.1 determine the method to be used for installing **water services**
- 3.2 carry out a site-specific risk assessment and review in accordance with company policy
- 3.3 select and wear the designated personal protective equipment (PPE)
- 3.4 check and confirm the condition of the excavation conforms with instructions and specifications
- 3.5 select, prepare and operate installation equipment in accordance with the specification and manufacturer's instructions
- 3.6 position **components** in accordance with the specification
- 3.7 assemble **components** to industry standards using appropriate **jointing techniques**
- 3.8 take adequate precautions to prevent damage to **components**, tools and equipment during installation
- 3.9 protect installed assets and other utilities using appropriate **protective techniques**
- 3.10 make connect to the water main using appropriate drilling and tapping techniques and equipment
- 3.11 check the quality of the installation and confirm compliance with the specified standard
- 3.12 maintain the security and safety of the site, job and third parties at all times
- 3.13 ensure **safe working procedures** are followed throughout the work activities

Range

Water services: polyethylene (PE), iron, UPVC

Component: ferrule or tapping tee, pipe, joints, meter

Jointing techniques: mechanical, fusion, push-fit

Protective techniques: using particular types of backfill materials, support, thrust protection, re-routing activities

Safe working procedures: risk assessment, site safety and security, lone working, personal protection, working in excavations, working at height, provision and use of tools and equipment, permit to work systems, hygiene procedures, hazardous materials, accident reporting, lifting and handling

Unit 224

Install water services up to 50mm nominal bore or 63mm polyethylene

Outcome 4

use and communicate data and information

Assessment criteria

The learner can:

- 4.1 provide **technical information** using appropriate verbal and written **communication techniques**
- 4.2 ensure recipients have received and understood the information
- 4.3 report any inaccuracies in the **technical information** sources used to the designated person
- 4.4 complete work documentation accurately and record it in the specified place or pass to a designated person
- 4.5 follow the correct procedures if working on a 'Permit to Work' activity

Range

Technical information: job progress, discrepancies or deficiencies, work instructions, problems outside own responsibility

Communication techniques: written, spoken face to face, spoken via telephone

Unit 224

Install water services up to 50mm nominal bore or 63mm polyethylene

Outcome 5

Resolve problems that arise from technical information and installation work

Assessment criteria

The learner can:

- 5.1 report any damage or defects to tools, equipment or materials to the designated person
- 5.2 report work which is incomplete and not to schedule to the designated person
- 5.3 refer problems and conditions outside their responsibility to the designated person

Unit 224

Install water services up to 50mm nominal bore or 63mm polyethylene

Outcome 6

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can:

- 6.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 6.2 state the health and safety guidance governing work in excavations
- 6.3 describe the safe procedures for handling hazardous materials
- 6.4 explain their organisational accident recording and reporting procedures
- 6.5 list the range and use personal protective equipment for the work

Unit 224 **Install water services up to 50mm nominal bore or 63mm polyethylene**

Outcome 7 Demonstrate knowledge and understanding of installing water services

Assessment criteria

The learner can:

- 7.1 explain the importance of carrying out on-site risk assessments and implementing safe systems of work and the need for constant review
- 7.2 explain the importance of understanding and implementing a safe system of work (SSOW) document when working in excavations
- 7.3 outline the organisation's policy and procedure for meeting relevant statutory requirements, regulations and Codes of Practice
- 7.4 describe the factors that affects the suitability of excavations, and how to confirm that an excavation is suitable
- 7.5 describe situations where particular authorisations are required before undertaking work
- 7.6 explain the implications of not obtaining the required authorisations before undertaking work
- 7.7 explain the potential dangers of working in trenches and holes
- 7.8 outline the main responsibilities of employers and employees under the current working at height regulations
- 7.9 explain the dangers of taking actions that can create confined spaces risks in excavations
- 7.10 describe the implications of using incorrect plant, tools , materials and system **components**
- 7.11 state the actions to be taken where plant, tools, materials and system **components** fail to meet required specification
- 7.12 describe situations where service pipe installation can go wrong and suitable actions available rectify them
- 7.13 describe how to access information from reference documents, Regulations and Codes of Practice
- 7.14 describe the range of actions to be taken if work cannot proceed to schedule
- 7.15 explain how to determine appropriate safe remedial action if work cannot proceed
- 7.16 describe the types and causes of disruption that can occur when installing **water service** pipes, and how to avoid them
- 7.17 describe the dangers of using inadequate handling and lifting procedures
- 7.18 describe the types and signs of defect likely to be encountered when installing **water services**
- 7.19 explain how to determine the correct, and safe, action to take to resolve defects encountered during installation of **water services**
- 7.20 explain the importance of compliance with current industry standards

Range

Component: ferrule or tapping tee, pipe, joints, meter

Water services: polyethylene (PE), iron, UPVC

Unit 225

Install water mains up to 150mm nominal bore or 180mm polyethylene

Level: 2

Credit value: 5

UAN: K/503/1164

Unit aim

This unit allows learners to show that they have the skills and knowledge to install water mains up to 150mm nominal bore (180mm PE). The learner will be able to interpret technical information and specifications and prepare the resources necessary to install the system, and must install the various components required in line with the specification and relevant company procedures. They must record and report information about the job to the relevant people, and must resolve or refer problems that arise during the work in line with their job responsibility. Throughout the operation, the learner must follow the work specification and Codes of Practice, and must maintain safe working and hygiene procedures.

Learning outcomes

There are **seven** learning outcomes to this unit. The learner will:

1. Interpret technical information for installing water mains
2. Select water main components and resources for installation of the systems
3. Install components of the water main
4. Use and communicate data and information
5. Resolve problems that arise from technical information and installation work
6. Demonstrate general knowledge and understanding for utilities network construction operations
7. Demonstrate knowledge and understanding of installing water mains

Guided learning hours

It is recommended that **35** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC 013 Install engineering products or assets for utilities network construction

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 225 **Install water mains up to 150mm nominal bore or 180mm polyethylene**

Outcome 1 Interpret technical information for installing water mains

Assessment criteria

The learner can:

- 1.1 use drawings, records, work documents, manuals and technical specifications to provide work details for **component** installations
- 1.2 use the **technical information** to confirm dimensions, lengths, widths and quantities required
- 1.3 use the **technical information** to determine the positions of utilities plant, services, buildings, kerbs and boundaries
- 1.4 where discrepancies occur, ensure that necessary corrections are made or communicated to those who need to know

Range

Component: pipe: – coil and stick, joints, valves and hydrants

Technical information: job progress, discrepancies or deficiencies, work instructions, problems outside own responsibility, requirements for mains shut downs

Unit 225 **Install water mains up to 150mm nominal bore or 180mm polyethylene**

Outcome 2 Select water main components and resources for installation of the system

Assessment criteria

The learner can:

- 2.1 select the **components** in accordance with work and quality specifications
- 2.2 ensure **components** are in good condition and are fit for purpose
- 2.3 follow procedures to ensure that defective, non-matching or sub-standard **components** are replaced
- 2.4 ensure that sufficient quantities of suitable **tools, plant and equipment** are available, checked and fit for purpose
- 2.5 ensure there is sufficient competent labour to carry out the work effectively and safely
- 2.6 deal promptly and effectively with actual and predicted changes to the planned use of the resources

Range

Component: pipe: – coil and stick,, joints, valves and hydrants

Tools, plant and equipment: pipe cutting, pipe jointing, pumping

Unit 225 Install water mains up to 150mm nominal bore or 180mm polyethylene

Outcome 3 Install components of the water main

Assessment criteria

The learner can:

- 3.1 determine the mains installation method to be used
- 3.2 carry out a site-specific risk assessment and review in accordance with company policy
- 3.3 select and wear the designated personal protective equipment (PPE)
- 3.4 check and confirm the condition of the excavation conforms with instructions and specifications
- 3.5 select, prepare and operate installation equipment in accordance with the specification and manufacturer's instructions
- 3.6 position **components** in accordance with the specification
- 3.7 assemble **components** to industry standards using appropriate **jointing techniques**
- 3.8 take adequate precautions to prevent damage to **components**, tools and equipment during installation
- 3.9 protect installed assets and other utilities using appropriate **protective techniques**
- 3.10 make connections to the **existing water main** using appropriate connection techniques
- 3.11 complete the connection in the specified time frame
- 3.12 check the quality of the installation and confirm compliance with the specified standard
- 3.13 install all chambers covers and associated ancillary items in accordance with specifications
- 3.14 maintain the security and safety of the site, job and third parties at all times
- 3.15 ensure **safe working procedures** are followed throughout the work activities

Range

Component: pipe – coil and stick,, joints, valves and hydrants

Jointing techniques: mechanical flexible, mechanical flanged, butt fusion, electrofusion

Protective techniques: using particular types of backfill materials, support, thrust protection, re-routing activities

Existing water main: polyethylene (PE), iron, UPVC, asbestos cement

Safe working procedures: risk assessment, site safety and security, lone working, personal protection, working in excavations, working at height, provision and use of tools and equipment, permit to work systems, hygiene procedures, hazardous materials, accident reporting, lifting and handling

Unit 225

Install water mains up to 150mm nominal bore or 180mm polyethylene

Outcome 4

Use and communicate data and information

Assessment criteria

The learner can:

- 4.1 provide **technical information** using appropriate verbal and written **communication techniques**
- 4.2 ensure recipients have received and understood the information
- 4.3 report any inaccuracies in the technical information sources used to the designated person
- 4.4 complete work documentation accurately and record it in the specified place or pass to a designated person
- 4.5 follow the correct procedures if working on a 'Permit to Work' activity

Range

Technical information: job progress, discrepancies or deficiencies, work instructions, problems outside own responsibility, requirements for mains shut downs

Communication techniques: written, spoken face-to-face, spoken via telephone

Unit 225

Install water mains up to 150mm nominal bore or 180mm polyethylene

Outcome 5

Resolve problems that arise from technical information and installation work

Assessment criteria

The learner can:

- 5.1 report any damage or defects to tools, equipment or materials to the designated person
- 5.2 report work which is incomplete and not to schedule to the designated person
- 5.3 refer problems and conditions outside their responsibility to the designated person

Unit 225

Install water mains up to 150mm nominal bore or 180mm polyethylene

Outcome 6

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can:

- 6.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 6.2 state the health and safety guidance governing work in excavations
- 6.3 describe the safe procedures for handling hazardous materials
- 6.4 explain their organisational accident recording and reporting procedures
- 6.5 list the range and use of personal protective equipment for the work

Unit 225

Install water mains up to 150mm nominal bore or 180mm polyethylene

Outcome 7

Demonstrate knowledge and understanding of installing water mains

Assessment criteria

The learner can:

- 7.1 explain the importance of carrying out on-site risk assessments and implementing safe systems of work and the need for constant review
- 7.2 explain the importance of understanding and implementing a safe system of work (SSOW) document when working in excavations
- 7.3 outline the organisation's policy and procedures for meeting relevant statutory requirements, regulations and Codes of Practice
- 7.4 describe the factors that affect the suitability of excavations, and how to confirm that an excavation is suitable
- 7.5 describe situations where particular authorisations are required before undertaking work
- 7.6 explain the implications of not obtaining the required authorisations before undertaking work
- 7.7 explain the potential dangers of working in trenches and holes
- 7.8 outline the main responsibilities of employers and employees under the current working at height regulations
- 7.9 explain the dangers of taking actions that can create confined spaces risks in excavations
- 7.10 describe the implications of using incorrect plant, tools, materials and system **components**
- 7.11 state the actions to be taken where plant, tools, materials and system **components** fail to meet required specification
- 7.12 describe situations where main installation can go wrong and suitable actions available to rectify them
- 7.13 describe how to access information from reference documents, Regulations and Codes of Practice
- 7.14 describe the range of actions to be taken if work cannot proceed to schedule
- 7.15 explain how to determine appropriate safe remedial action if work cannot proceed
- 7.16 describe the types and causes of disruption that can occur when installing water mains, and how to avoid them
- 7.17 describe the dangers of using inadequate handling and lifting procedures
- 7.18 describe the types and signs of defect likely to be encountered when installing water mains
- 7.19 explain how to determine the correct, and safe, action to take to resolve defects encountered during installation of water mains
- 7.20 explain the importance of compliance with current industry standards

Range

Component: pipe: – coil and stick, joints, valves and hydrants

Unit 226

Install water mains from 150mm-300mm nominal bore or 180mm-315mm polyethylene

Level: 2

Credit value: 5

UAN: M/503/1165

Unit aim

This unit allows learners to show that they have the skills and knowledge to install water mains using pipes with diameters of 50-300mm nominal bore (180-315mm PE). The learner will be able to interpret technical information and specifications and prepare the resources necessary to install the system, and must install the various components required in line with the specification and relevant company procedures. They must record and report information about the job to the relevant people, and must resolve or refer problems that arise during the work inline with their job responsibility. Throughout the operation, the learner must follow the work specification and Codes of Practice, and must maintain safe working and hygiene procedures.

Learning outcomes

There are **seven** learning outcomes to this unit. The learner will:

1. Interpret technical information for installing water mains
2. Select water main components and resources for installation of the system
3. Install components of the water main
4. Use and communicate data and information
5. Resolve problems that arise from technical information and installation work
6. Demonstrate general knowledge and understanding for utilities network construction operations
7. Demonstrate knowledge and understanding of installing water mains

Guided learning hours

It is recommended that **35** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC 013 Install engineering products or assets for utilities network construction

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 226

Install water mains from 150mm-300mm nominal bore or 180mm-315mm polyethylene

Outcome 1

Interpret technical information for installing water mains

Assessment criteria

The learner can:

- 1.1 use drawings, records, work documents, manuals and technical specifications to provide work details for **component** installation
- 1.2 use the **technical information** to confirm dimensions, lengths. Widths and quantities required
- 1.3 use the **technical information** to determine the positions of utilities plant, services, buildings, kerbs and boundaries
- 1.4 where discrepancies occur, ensure that necessary corrections are made or communicated to those who need to know

Range

Component: pipe, joints, valves and hydrants

Technical information: job progress, discrepancies or deficiencies, work instructions, problems outside own responsibilities, requirements for mains shut downs

Unit 226

Install water mains from 150mm-300mm nominal bore or 180mm-315mm polyethylene

Outcome 2

Select water main components and resources for installation of the system

Assessment criteria

The learner can:

- 2.1 select the **components** in accordance with work and quality specifications
- 2.2 ensure **components** are in good condition and are fit for purpose
- 2.3 follow procedures to ensure that defective, non-matching or sub-standard components are replaced
- 2.4 ensure that sufficient quantities of suitable **tools, plant and equipment** are available, checked and fit for purpose
- 2.5 ensure there is sufficient competent labour to carry out the work effectively and safely
- 2.6 deal promptly and effectively with actual and predicted changes to the planned use of the resources

Range

Component: pipe, joints, valves and hydrants

Tools, plant and equipment: pipe cutting, pipe jointing, pumping, lifting, pipes and fittings

Unit 226

Install water mains from 150mm-300mm nominal bore or 180mm-315mm polyethylene

Outcome 3

Install components of the water main

Assessment criteria

The learner can:

- 3.1 determine the mains installation method to be used
- 3.2 carry out a site-specific risk assessment and review in accordance with company policy
- 3.3 select and wear the designated personal protective equipment (PPE)
- 3.4 check and confirm the condition of the excavation conforms with instructions and specifications
- 3.5 where lifting machinery is involved, ensure a safe system of work is in place and communicated
- 3.6 select, prepare and operate installation equipment in accordance with the specification and manufacturer's instructions
- 3.7 position **components** in accordance with the specification
- 3.8 assemble **components** to industry standards using appropriate **jointing techniques**
- 3.9 take adequate precautions to prevent damage to **components**, tools and equipment during installation
- 3.10 protect installed assets and other utilities using appropriate **protective techniques**
- 3.11 make connection to the **existing water main** using appropriate connection techniques
- 3.12 complete the connection in the specified time frame
- 3.13 check the quality of the installation and confirm compliance with the specified standard
- 3.14 install all chambers covers and associated ancillary items in accordance with specifications
- 3.15 maintain the security and safety of the site, job and third parties at all times
- 3.16 ensure **safe working procedures** are followed throughout the work activities

Range

Component: pipe, joints, valves and hydrants

Jointing techniques: mechanical flexible, mechanical flanged, butt fusion, electrofusion, push fit.

Protective techniques: using particular types of backfill materials, support, thrust protection, re-routing activities.

Existing water main: iron, UPVC, asbestos cement.

Safe working procedures: risk assessment, site safety and security, lone working, personal protection, working in excavations, working at height, provision and use of tools and equipment, permit to work systems, hygiene procedures, hazardous materials, accident reporting, lifting and handling.

Unit 226

Install water mains from 150mm-300mm nominal bore or 180mm-315mm polyethylene

Outcome 4

Use and communicate data and information

Assessment criteria

The learner can:

- 4.1 provide **technical information** using appropriate verbal and written **communication techniques**
- 4.2 ensure recipients have received and understood the information
- 4.3 report any inaccuracies in the **technical information** sources used to the designated person
- 4.4 complete work documentation accurately and record it in the specified place or pass to a designated person
- 4.5 follow the correct procedures if working on a 'Permit to Work' activity

Range

Technical information: job progress, discrepancies or deficiencies, work instructions, problems outside own responsibilities, requirements for mains shut downs

Communication techniques: written, spoken face to face, spoken via telephone hand signals.

Unit 226

Install water mains from 150mm-300mm nominal bore or 180mm-315mm polyethylene

Outcome 5

Resolve problems that arise from technical information and installation

Assessment criteria

The learner can:

- 5.1 report any damage or defects to tools, equipment and materials to the designated person
- 5.2 report work which is incomplete and not to schedule to the designated person
- 5.3 refer problems and conditions outside their responsibility to the designated person

Unit 226

Install water mains from 150mm-300mm nominal bore or 180mm-315mm polyethylene

Outcome 6

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can

- 6.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 6.2 state the health and safety guidance governing work in excavations
- 6.3 describe the safe procedures for handling hazardous materials
- 6.4 explain their organisational accidents recording and reporting procedures
- 6.5 list the range and use of personal protective equipment for the work

Unit 226

Install water mains from 150mm-300mm nominal bore or 180mm-315mm polyethylene

Outcome 7

Demonstrate knowledge and understanding of installing water mains

Assessment criteria

The learner can:

- 7.1 explain the importance of carrying out on-site risk assessments and implementing safe systems of work and the need for constant review
- 7.2 explain the importance of understanding and implementing a safe system of work (SSOW) document when working in excavations
- 7.3 outline the organisations policy and procedures for meeting relevant statutory requirements, regulations and Codes of Practice
- 7.4 describe the factors that affect the suitability of excavations, and how to confirm that an excavation is suitable
- 7.5 describe situations where particular authorisations are required before undertaking work
- 7.6 explain the implications of not obtaining the required authorisation before undertaking work
- 7.7 explain the potential dangers of working in trenches and holes
- 7.8 outline the main responsibilities of the employer and employees under the current working at height regulations
- 7.9 explain the dangers of taking actions that can create confined spaces risks in excavations
- 7.10 describe the implications of using incorrect plant, tools, materials and system **components**
- 7.11 state the actions to be taken where plant, tools, materials and system **components** fail to meet required specifications
- 7.12 describe situations where mains installation can go wrong and suitable actions available to rectify them
- 7.13 describe how to access information from reference documents, Regulations and Codes of Practice
- 7.14 describe the range of actions to be taken if work cannot proceed to schedule
- 7.15 explain how to determine appropriate safe remedial action if work cannot proceed
- 7.16 describe the types and causes of disruption that can occur when installing water mains, and how to avoid them
- 7.17 describe the dangers of using inadequate handling and lifting procedures
- 7.18 describe the types and signs of defect likely to be encountered when installing water mains
- 7.19 explain how to determine the correct, and safe, action to take to resolve defects encountered during installation of water mains
- 7.20 explain the importance of compliance with current industry standards

Range

Component: pipe, joints, valves and hydrants

Unit 227

Install water mains above 300mm nominal bore or 315mm polyethylene

Level: 2

Credit value: 5

UAN: T/503/1166

Unit aim

This unit allows learners to show that they have the skills and knowledge to install water mains using pipes above 300mm nominal bore (315mm PE). The learner will be able to interpret technical information and specifications and prepare the resources necessary to install the system, and must install the various components required in line with the specification and relevant company procedures. They must record and report information about the job to the relevant people, and must resolve or refer problems that arise during the work inline with their job responsibility. Throughout the operation, the learner must follow the work specification and Codes of Practice, and must maintain safe working and hygiene procedures.

Learning outcomes

There are **seven** learning outcomes to this unit. The learner will:

1. Interpret technical information for installing water mains
2. Select water main components and resources for installation of the system
3. Install components of the water main
4. Use and communicate data and information
5. Resolve problems that arise from technical information and installation work
6. Demonstrate general knowledge and understanding for utilities network construction operations
7. Demonstrate knowledge and understanding of installing water mains

Guided learning hours

It is recommended that **35** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC 013 Install engineering products or assets for utilities network construction

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 227

Install water mains above 300mm nominal bore or 315mm polyethylene

Outcome 1

Interpret technical information for installing water mains

Assessment criteria

The learner can:

- 1.1 use drawings, records, work documents, manuals and technical specifications to provide work details for **component** installation
- 1.2 use the **technical information** to confirm dimensions, lengths. Widths and quantities required
- 1.3 use the **technical information** to determine the positions of utilities plant, services, buildings, kerbs and boundaries
- 1.4 where discrepancies occur, ensure that necessary corrections are made or communicated to those who need to know

Range

Component: pipe, joints, valves and hydrants

Technical information: job progress, discrepancies or deficiencies, work instructions, problems outside own responsibilities, requirements for mains shut downs

Unit 227

Install water mains above 300mm nominal bore or 315mm polyethylene

Outcome 2

Select water main components and resources for installation of the system

Assessment criteria

The learner can:

- 2.1 select the **components** in accordance with work and quality specifications
- 2.2 ensure **components** are in good condition and are fit for purpose
- 2.3 follow procedures to ensure that defective, non-matching or sub-standard components are replaced
- 2.4 ensure that sufficient quantities of suitable **tools, plant and equipment** are available, checked and fit for purpose
- 2.5 ensure there is sufficient competent labour to carry out the work effectively and safely
- 2.6 deal promptly and effectively with actual and predicted changes to the planned use of the resources

Range

Component: pipe, joints, valves and hydrants

Tools, plant and equipment: pipe cutting, pipe jointing, pumping, lifting, pipes and fittings

Unit 227

Install water mains above 300mm nominal bore or 315mm polyethylene

Outcome 3

Install components of the water main

Assessment criteria

The learner can:

- 3.1 determine the mains installation method to be used
- 3.2 carry out a site-specific risk assessment and review in accordance with company policy
- 3.3 select and wear the designated personal protective equipment (PPE)
- 3.4 check and confirm the condition of the excavation conforms with instructions and specifications
- 3.5 where lifting machinery is involved, ensure a safe system of work is in place and communicated
- 3.6 select, prepare and operate installation equipment in accordance with the specification and manufacturer's instructions
- 3.7 position **components** in accordance with the specification
- 3.8 assemble **components** to industry standards using appropriate **jointing techniques**
- 3.9 take adequate precautions to prevent damage to **components**, tools and equipment during installation
- 3.10 protect installed assets and other utilities using appropriate **protective techniques**
- 3.11 make connection to the **existing water main** using appropriate connection techniques
- 3.12 complete the connection in the specified time frame
- 3.13 check the quality of the installation and confirm compliance with the specified standard
- 3.14 install all chambers covers and associated ancillary items in accordance with specifications
- 3.15 maintain the security and safety of the site, job and third parties at all times
- 3.16 ensure **safe working procedures** are followed throughout the work activities

Range

Component: pipe, joints, valves and hydrants

Jointing techniques: mechanical flexible, mechanical flanged, butt fusion, electrofusion, push fit.

Protective techniques: using particular types of backfill materials, support, thrust protection, re-routing activities.

Existing water main: iron, UPVC, asbestos cement.

Safe working procedures: risk assessment, site safety and security, lone working, personal protection, working in excavations, working at height, provision and use of tools and equipment, permit to work systems, hygiene procedures, hazardous materials, accident reporting, lifting and handling.

Unit 227

Install water mains above 300mm nominal bore or 315mm polyethylene

Outcome 4

Use and communicate data and information

Assessment criteria

The learner can:

- 4.1 provide **technical information** using **communication techniques** that are appropriate to the type of information provided and the way it will be used
- 4.2 use appropriate **communication techniques** on site where noise and visibility may be compromised
- 4.3 ensure recipients have received and understood the **technical information**
- 4.4 report any inaccuracies in the **technical information** sources used to the designated person
- 4.5 complete work documentation accurately and record it in the specified place or pass to a designated person
- 4.6 follow the correct procedures if working on a 'Permit to Work' activity

Range

Technical information: job progress, discrepancies or deficiencies, work instructions, problems outside own responsibilities, requirements for mains shut downs

Communication techniques: written, spoken face to face, spoken via telephone hand signals.

Unit 227

Install water mains above 300mm nominal bore or 315mm polyethylene

Outcome 5

Resolve problems that arise from technical information and installation work

Assessment criteria

The learner can:

- 5.1 report any damage or defects to tools, equipment and materials to the designated person
- 5.2 report work which is incomplete and not to schedule to the designated person
- 5.3 refer problems and conditions outside their responsibility to the designated person

Unit 227

Install water mains above 300mm nominal bore or 315mm polyethylene

Outcome 6

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can

- 6.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 6.2 state the health and safety guidance governing work in excavations
- 6.3 describe the safe procedures for handling hazardous materials
- 6.4 explain their organisational accidents recording and reporting procedures
- 6.5 list the range and use of personal protective equipment for the work

Unit 227

Unit 227 Install water mains above 300mm nominal bore or 315mm polyethylene

Outcome 7

Demonstrate knowledge and understanding of installing water mains

Assessment criteria

The learner can:

- 7.1 explain the importance of carrying out on-site risk assessments and implementing safe systems of work and the need for constant review
- 7.2 explain the importance of understanding and implementing a safe system of work (SSOW) document when working in excavations
- 7.3 outline the organisations policy and procedures for meeting relevant statutory requirements, regulations and Codes of Practice
- 7.4 describe the factors that affect the suitability of excavations, and how to confirm that and excavation is suitable
- 7.5 describe situations where particular authorisations are required before undertaking work
- 7.6 explain the implications of not obtaining the required authorisation before undertaking work
- 7.7 explain the potential dangers of working in trenches and holes
- 7.8 outline the main responsibilities of the employer and employees under the current working at height regulations
- 7.9 explain the dangers of taking actions that can create confined spaces risks in excavations
- 7.10 describe the implications of using incorrect plant, tools, materials and system **components**
- 7.11 state the actions to be taken where plant, tools, materials and system **components** fail to meet required specifications
- 7.12 describe situations where mains installation can go wrong and suitable actions available to rectify them
- 7.13 describe how to access information from reference documents, Regulations and Codes of Practice
- 7.14 describe the range of actions to be taken if work cannot proceed to schedule
- 7.15 explain how to determine appropriate safe remedial action if work cannot proceed
- 7.16 describe the types and causes of disruption that can occur when installing water mains, and how to avoid them
- 7.17 describe the dangers of using inadequate handling and lifting procedures
- 7.18 describe the types and signs of defect likely to be encountered when installing water mains
- 7.19 explain how to determine the correct, and safe, action to take to resolve defects encountered during installation of water mains
- 7.20 explain the importance of compliance with current industry standards

Range

Component: pipe, joints, valves and hydrants

Unit 228

Conduct pressure and soundness testing of water network engineering products or assets

Level: 2

Credit value: 4

UAN: A/503/1167

Unit aim

This unit allows learners to show that they have the skills and knowledge to remove excess air from the system, pressure test and flush mains or services in line with industry standards and requirements. The learner will be able to ensure that tests are conducted and recorded in line with the quality assurance requirements of the organisation. They must understand and apply the safety requirements needed to carry out test activities and procedures. They must record and report information about testing activities to the relevant people, and must resolve or refer problems that arise during the work in line with their job responsibility. Throughout the operation, the learner must follow the work specification, and must maintain safe working procedures.

Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Perform pressure testing activities
2. Use and communicate data and information
3. Resolve problems which arise from performing test activities
4. Demonstrate general knowledge and understanding for utilities network construction operations
5. Demonstrate knowledge and understanding of conducting specified testing on water engineering products or assets

Guided learning hours

It is recommended that **25** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC 014 Conduct specified testing of water network engineering products or assets

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 228

Conduct pressure and soundness testing of water network engineering products or assets

Outcome 1

Perform pressure testing activities

Assessment criteria

The learner can:

- 1.1 work safely in accordance with health and safety and environment regulations and legislation
- 1.2 carry out a site-specific risk assessment, and review it in accordance with company procedures
- 1.3 select and wear the designated personal protective equipment (PPE)
- 1.4 use all tools and equipment for pressure testing in accordance with work instructions and manufacturer's specifications
- 1.5 remove excess air from the system, and ensure that the system to be tested is isolated
- 1.6 set up the equipment and carry out pressure testing appropriate to the type of pipe material concerned
- 1.7 flush in line with work instructions
- 1.8 record and review test results to establish that the soundness of the system against the performance parameters
- 1.9 confirm that the equipment is functioning in line with system operating requirements and parameters
- 1.10 dispose of waste products in accordance with environmental standards
- 1.11 carry out all work to agreed timescales, and in line with company procedures and safe working and hygiene practices

Unit 228

Conduct pressure and soundness testing of water network engineering products or assets

Outcome 2

Use and communicate data and information

Assessment criteria

The learner can:

- 2.1 follow drawings, plans and specifications for the testing, pressure testing and flushing of engineering products and assets
- 2.2 follow all approved procedures and practices and statutory and regulatory requirements involved in test work activity
- 2.3 record the results of test activity using required reporting systems and documentation to meet company procedures and requirements

Unit 228

Conduct pressure and soundness testing of water network engineering products or assets

Outcome 3

Resolve problems which arise when performing test activities

Assessment criteria

The learner can:

- 3.1 report damage or defects to test equipment to the designated person
- 3.2 deal promptly and effectively with problems within their control and report those that cannot be solved
- 3.3 refer problems and conditions outside their responsibility to the designated person using approved procedures
- 3.4 deal with any emergencies that may arise

Unit 228

Conduct pressure and soundness testing of water network engineering products or assets

Outcome 4

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can:

- 4.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 4.2 state the health and safety guidance governing work in excavations
- 4.3 describe the main procedures for handling hazardous materials
- 4.4 explain the organisational accident recording and reporting procedures
- 4.5 list the range and use of personal protective equipment for the work

Unit 228

Conduct pressure and soundness testing of water network engineering products or assets

Outcome 5

Demonstrate knowledge and understanding of conducting specified testing of water engineering products or assets

Assessment criteria

The learner can:

- 5.1 describe how to carry out **testing activities** safely and in accordance with all legal and procedural requirements
- 5.2 explain how to interpret drawings, plans and specifications for different test activities and procedures
- 5.3 describe the lines and procedures for reporting problems associated with testing activities, including:
 - a. standard industry documentation
 - b. relevant company procedures
- 5.4 describe the different types of pressure tests and how they are carried out depending on the pipe materials concerned
- 5.5 describe how to carry out pre-use checks and set up pressure testing equipment
- 5.6 explain the actions required when faults or problems occur with pressure testing equipment or the test itself
- 5.7 explain how the results of the test are recorded and interpreted
- 5.8 explain how air can enter pipe systems and the methods of removing it
- 5.9 explain the calibration requirements for pressure testing equipment
- 5.10 explain the criteria for passing or failing a pressure test and the follow-up actions required in either case
- 5.11 explain the **consequence of test failure** and the likely remedial activities
- 5.12 explain the consequence of mechanical failures during testing due to the pressure ranges
- 5.13 describe the procedures to follow and documentation to be used to record test results

Range

Testing activities: personal protection, working in excavations, handling hazardous materials, provision and use of work equipment, accidental reporting

Consequences of test failure: the environment, operations, cost, time

Unit 229

Restore water network components to operational condition by repair

Level: 2

Credit value: 5

UAN: F/503/1168

Unit aim

This unit allows learners to show that they have the skills and knowledge to carry out repairs to components, including the replacement of a short section of main, and fitting external mechanical fittings, both temporary and permanent, on water mains or services. The learner must also show that they can communicate information to the relevant people and organisations throughout jointing operations, and that they can resolve or refer problems that arise during the work in line with their job responsibility. Appropriate hygiene procedures must be followed at all times, and the work must be undertaken in line with Codes of Practice, relevant legislation and regulations, and company procedures.

Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Restore components to operational condition
2. Use and communicate data and information
3. Resolve problems which arise when restoring components to operational condition
4. Demonstrate general knowledge and understanding for utilities network construction operations
5. Demonstrate knowledge and understanding of restoring components to operational condition

Guided learning hours

It is recommended that **35** hours should be allocated for this unit, although patterns of delivery are likely to vary.

Details of the relationship between the unit and relevant national standards

This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC 018 Restore water network components to operational condition by repair

Support of the unit by a sector or other appropriate body

This unit is endorsed by Energy & Utility Skills.

Assessment

This unit is assessed by:

- Portfolio of evidence

Unit 229

Restore water network components to operational condition by repair

Outcome 1

Restore components to operational condition

Assessment criteria

The learner can:

- 1.1 work in accordance with health, safety, environment and hygiene regulations and **legislation and procedures**
- 1.2 carry out a site specific risk assessment , and review it in accordance with company procedures
- 1.3 select and wear the designated personal protective equipment (PPE)
- 1.4 prepare **components** for repair
- 1.5 repair **components** in line with relevant specifications and work instructions
- 1.6 carry out the repairs to agreed timescales using approved materials and **components**
- 1.7 ensure that repaired **components** meet the specified operating conditions and parameters
- 1.8 carry out all work in accordance with company procedures

Range

Legislation and procedures: working in deep excavations, personal protection, working with or near hazardous substances, lifting and handling, water supply hygiene, recording and reporting accidents

Components: metallic, non-metallic, all ancillary pipes and fittings, taps and valves

Unit 229

Restore water network components to operational condition by repair

Outcome 2

Use and communicate data and information

Assessment criteria

The learner can:

- 2.1 produce accurate and complete records of all repair work carried out
- 2.2 communicate information in a way that meets the requirements of the recipient

Unit 229

Restore water network components to operational condition by repair

Outcome 3

Resolve problems which arise when restoring components to operational condition

Assessment criteria

The learner can:

- 3.1 deal promptly and effectively with problems within their control and report those that cannot be solved
- 3.2 refer problems and conditions outside the responsibility of the job to the designated person using approved procedures
- 3.3 deal with any emergencies that may arise when restoring **components** to operational condition

Range

Components: metallic, non-metallic, all ancillary pipes and fittings, taps and valves

Unit 229

Restore water network components to operational condition by repair

Outcome 4

Demonstrate general knowledge and understanding for utilities network construction operations

Assessment criteria

The learner can:

- 4.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 4.2 state the healthy and safety guidance governing work in excavations
- 4.3 describe the safe procedures for handling hazardous materials
- 4.4 explain their organisational accident recording and reporting procedures
- 4.5 list the range and use of personal protective equipment for the work

Unit 229

Restore water network components to operational condition by repair

Outcome 5

Demonstrate knowledge and understanding of restoring components to operational condition

Assessment criteria

The learner can:

- 5.1 outline the health, safety and environment legislation and environmental procedures that apply to restoring **components** to operational condition, including Codes of Practice and relevant company procedures
- 5.2 explain the importance of following all hygiene procedures
- 5.3 describe how to select the repair technique to use for the specification of the **component** to be repaired
- 5.4 describe the various **components** that are in use on the water network
- 5.5 describe the types of tools and equipment to be used when restoring **components** to operational condition by repair
- 5.6 describe the care and control procedures to be used to ensure compliance with hygiene regulations
- 5.7 state the different types of records and documentation that are used to record maintenance activities

Appendix 1 Relationships to other qualifications

Links to other qualifications

This qualification will be contained within the Energy and Utility Skills Apprenticeship framework. Please visit the EUSkills website www.euskills.co.uk for more details.

Literacy, language, numeracy and ICT skills development

These qualifications include opportunities to develop and practise many of the skills and techniques required for success in the following qualifications:

- Functional Skills (England) – see www.cityandguilds.com/functionalskills
- Essential Skills (Northern Ireland) – see www.cityandguilds.com/essentialskillsni
- Essential Skills Wales (from September 2010) – see www.cityandguilds.com/esw

Appendix 2 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.

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
- **Events:** dates and information on the latest Centre events
- **Online assessment:** information on how to register for e-assessment.

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: intcgc@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

Every effort has been made to ensure that the information contained in this publication is true and correct at the time of going to press. However, City & Guilds' products and services are subject to continuous development and improvement and the right is reserved to change products and services from time to time. City & Guilds cannot accept liability for loss or damage arising from the use of information in this publication.

If you have a complaint, or any suggestions for improvement about any of the services that we provide, email: feedbackandcomplaints@cityandguilds.com

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

**City & Guilds is a registered charity
established to promote education
and training**

WW-01-6028