

# Diplomas in Network Construction Operations (Gas) at SCQF Level 5 (6228)

June 2014 Version 2.1



## Qualification at a glance

<b>Subject area</b>	Utilities
<b>City &amp; Guilds number</b>	6228
<b>Entry requirements</b>	All learners entering on the Diplomas in Network Construction Operations (Gas) at SCQF Level 5 must be network operatives employed on the gas distribution networks, either directly with an asset owner or through an outsourced operations company.
<b>Assessment</b>	<p>The knowledge and understanding of learners is assessed using a range of assessment strategies including:</p> <ul style="list-style-type: none"> <li>• inferred knowledge assessed as part of a performance assessment</li> <li>• project work</li> <li>• oral questioning by the assessor</li> </ul> <p>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.</p>
<b>Support materials</b>	Qualification handbook, assessment pack, candidate logbook
<b>Registration and certification</b>	Consult the Walled Garden/Online Catalogue for last dates

<b>Title and level</b>	<b>City &amp; Guilds number</b>
Diploma in Network Construction Operations (Gas) - Main layer at SCQF Level 5	6228-21
Diploma in Network Construction Operations (Gas) - Service layer at SCQF Level 5	6228-22

<b>Version and date</b>	<b>Change detail</b>	<b>Section</b>
V2.0 June 2014	Added elective units 613, 614, 615, 616, 706 and 708; withdrawn elective unit 612.	5 – Units
V2.1 Feb 2016	Changed Group Text	



## Contents

<b>1</b>	<b>Introduction</b>	<b>5</b>
	Structure	6
<b>2</b>	<b>Centre requirements</b>	<b>9</b>
	Approval	9
	Resource requirements	9
	Specific Assessor requirements	10
	Learner entry requirements	11
<b>3</b>	<b>Delivering the qualification</b>	<b>12</b>
	Initial assessment and induction	12
	Support materials	12
	Recording documents	12
<b>4</b>	<b>Assessment</b>	<b>14</b>
	Workplace observation	14
	Realistic Work Environment (RWE)	19
	New Roads and Streetworks Act (NRSWA) Observations	19
<b>5</b>	<b>Units</b>	<b>20</b>
<b>Unit 501</b>	<b>Create an efficient and effective environment in utilities network construction</b>	<b>23</b>
<b>Unit 502</b>	<b>Establish and maintain effective working relationships in utilities network construction</b>	<b>27</b>
<b>Unit 503</b>	<b>Locate and avoid supply apparatus for utilities network construction</b>	<b>30</b>
<b>Unit 504</b>	<b>Excavate and maintain holes and trenches for utilities network construction</b>	<b>36</b>
<b>Unit 505</b>	<b>Operate powered tools and equipment for routine and predictable requirements on utilities network construction</b>	<b>42</b>
<b>Unit 506</b>	<b>Install equipment for safe working on sites for utilities network construction</b>	<b>47</b>
<b>Unit 507</b>	<b>Joint materials by electrofusion processes on utilities network construction</b>	<b>51</b>
<b>Unit 508</b>	<b>Install equipment for safe working on the highway for utilities network construction</b>	<b>54</b>
<b>Unit 509</b>	<b>Reinstate excavation and pavement surfaces after utility network construction operations</b>	<b>59</b>
<b>Unit 510</b>	<b>Disconnection of meters</b>	<b>65</b>
<b>Unit 511</b>	<b>Joint materials by butt fusion processes on utilities network construction, up to 180mm</b>	<b>68</b>
<b>Unit 512</b>	<b>Joint materials by butt fusion processes above 180mm</b>	<b>71</b>

<b>Unit 601</b>	<b>Maintain a safe and secure working environment in gas network construction</b>	<b>74</b>
<b>Unit 602</b>	<b>Install gas services up to 63mm</b>	<b>79</b>
<b>Unit 603</b>	<b>Conduct specified testing of gas services</b>	<b>85</b>
<b>Unit 604</b>	<b>Restore gas network components to operational condition by repair</b>	<b>89</b>
<b>Unit 605</b>	<b>Assess and minimise risks to life, property and the environment during gas escapes</b>	<b>92</b>
<b>Unit 606</b>	<b>Conduct specified testing of gas networks associated with leakage location</b>	<b>96</b>
<b>Unit 607</b>	<b>Analyse and interpret the results of gas leakage surveys to determine the location of gas escapes</b>	<b>99</b>
<b>Unit 608</b>	<b>Install external service risers</b>	<b>102</b>
<b>Unit 609</b>	<b>Install gas engineering products or assets up to 180mm</b>	<b>107</b>
<b>Unit 610</b>	<b>Conduct specified testing of gas engineering products or assets - mains</b>	<b>113</b>
<b>Unit 611</b>	<b>Conduct specified connections to gas network mains and commissioning</b>	<b>117</b>
<b>Unit 613</b>	<b>Decommissioning and abandonment of mains and services 63mm and above</b>	<b>123</b>
<b>Unit 614</b>	<b>Install gas engineering products or assets above 180mm up to and including 355mm</b>	<b>128</b>
<b>Unit 615</b>	<b>Operate within the gas intermediate pressure range</b>	<b>133</b>
<b>Unit 616</b>	<b>Operate safely in emergency situations within the gas intermediate pressure range</b>	<b>139</b>
<b>Unit 706</b>	<b>Join materials by fusion processes on utilities network construction, above 180mm diameter</b>	<b>145</b>
<b>Unit 708</b>	<b>Install gas engineering products or assets above 355mm</b>	<b>149</b>
<b>Appendix 1</b>	<b>Relationships to other qualifications</b>	<b>156</b>
<b>Appendix 2</b>	<b>Sources of general information</b>	<b>157</b>



# 1 Introduction

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

Area	Description
Who are the qualifications for?	They are ideal for network operatives and engineers already employed on the gas distribution networks, either directly with an asset owner or through an outsourced operations company.
What do the qualifications cover?	These qualifications cover all aspects of gas 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.
Are the qualifications part of a framework or initiative?	These qualifications form part of the Modern Apprenticeship Framework.
Who did we develop the qualification with?	These qualifications were developed in association with Energy and Utility Skills.
What opportunities for progression are there?	On completion of a Diploma in Network Construction Operations (Gas) at SCQF Level 5, learners may progress as a gas network construction operative involved in main laying and service laying. Learners may also wish to progress onto the City & Guilds Diploma in Gas Network Construction Operations at SCQF Level 6.

## Structure

To achieve the **Diploma in Network Construction Operations (Gas) - Main layer at SCQF Level 5**, learners must achieve the following combination of units, depending on pathway chosen.

- Diploma in Network Construction Operations (Gas) – Main layer (Self lay) at SCQF Level 5
  - 49 credits from units 501 - 507, 511, 601, 609, 610
- Diploma in Network Construction Operations (Gas) – Main layer (Distribution) at SCQF Level 5
  - 56 credits from 501 - 508, 511, 601, 609 - 611
- Diploma in Network Construction Operations (Gas) – Main layer (Repair and Maintenance) at SCQF Level 5
  - 67 credits from 501 - 508, 511, 601, 604 - 607, 609 - 611

Units 509, 512, 613 - 616, 706 and 708 are elective and may be taken by learners; however credits gained will not contribute to the overall achievement of the qualification.

To achieve the **Diploma in Network Construction Operations (Gas) – Service layer at SCQF Level 5**, learners must achieve the following combination of units, depending on pathway chosen.

- Level 2 Diploma in Network Construction Operations (Gas) – Service layer (Self lay)
  - 41 credits from 501 - 507, 601 - 603
- Level 2 Diploma in Network Construction Operations (Gas) – Service layer (Distribution)
  - 45 credits from 501 - 508, 601 - 603
- Level 2 Diploma in Network Construction Operations (Gas) – Service layer (Repair and Maintenance)
  - 56 credits from 501 - 508, 601 - 607

Units 509, 510, 608, 613, 615 and 616 are elective and may be taken by learners; however credits gained will not contribute to the overall achievement of the qualification.

City & Guilds unit	Unit title	Mandatory/ elective for full qualification	Credit value
501	Create an efficient and effective environment in utilities network construction	Mandatory	4
502	Establish and maintain effective working relationships in utilities network construction	Mandatory	3
503	Locate and avoid supply apparatus for utilities network construction	Mandatory	4
504	Excavate and maintain holes and trenches for utilities network construction	Mandatory	5
505	Operate powered tools and equipment for routine and predictable requirements on utilities network construction	Mandatory	5

<b>City &amp; Guilds unit</b>	<b>Unit title</b>	<b>Mandatory/ elective for full qualification</b>	<b>Credit value</b>
506	Install equipment for safe working on sites for utilities network construction	Mandatory	3
507	Joint materials by electrofusion processes on utilities network construction	Mandatory	3
508	Install equipment for safe working on the highway for utilities network construction	Mandatory	4
509	Reinstate excavation and pavement surfaces after utility network construction operations	Elective	5
510	Disconnection of meters	Elective	2
511	Joint materials by butt fusion processes on utilities network construction, up to 180mm	Mandatory	3
512	Joint materials by butt fusion processes above 180mm	Elective	2
601	Maintain a safe and secure working environment in gas network construction	Mandatory	3
602	Install gas services up to 63mm	Mandatory	9
603	Conduct specified testing of gas services	Mandatory	2
604	Restore gas network components to operational condition by repair	Mandatory	2
605	Assess and minimise risks to life, property and the environment during gas escapes	Mandatory	3
606	Conduct specified testing of gas networks associated with leakage location	Mandatory	3
607	Analyse and interpret the results of gas leakage surveys to determine the location of gas escapes	Mandatory	3
608	Install external service risers	Elective	8
609	Install gas engineering products or assets up to 180mm	Mandatory	13
610	Conduct specified testing of gas engineering products or assets - mains	Mandatory	3
611	Conduct specified connection to gas network mains and commissioning	Mandatory	3

<b>City &amp; Guilds unit</b>	<b>Unit title</b>	<b>Mandatory/ elective for full qualification</b>	<b>Credit value</b>
613	Decommissioning and abandonment of mains and services 63mm and above	Elective	7
614	Install gas engineering products or assets above 180mm, up to and including 355mm	Elective	7
615	Operate within the gas intermediate pressure range	Elective	2
616	Operate safely in emergency situations within the gas intermediate pressure range	Elective	2
706	Joint materials by fusion processes on utilities network construction, above 180mm diameter	Elective	9
708	Install gas engineering products or assets above 355mm	Elective	9





## 2 Centre requirements

### Approval

Centres approved to offer the following City & Guilds NVQ in Gas Network Operations qualifications have **automatic approval** to offer these qualifications.

- 6029-01 Level 1 NVQ in Gas Network Operations
- 6029-02 Level 2 NVQ in Gas Network Operations (Main laying)
- 6029-03 Level 2 NVQ in Gas Network Operations (Service laying)

To offer these qualifications, **new centres** will need to gain both centre and qualification approval. Please refer to the *Centre Manual - Supporting Customer Excellence* for further information.

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

### Resource requirements

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

### Assessors and Internal Quality Assurer

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	EV	IA
Demonstrate a high level of interpersonal and communication skills	X	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	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	X	
Show experience and working knowledge of the assessment and verification processes relating to the context in which they are working	X	X	X	

Demonstrate relevant, current and credible experience and knowledge with a requirement for evidence of CPD and occupational skills	X	X	X	X
Show they are able to act as an emissary of City & Guilds and will be able to facilitate consistency across centres			X	
Have, or be working towards	X	X	X	
<ul style="list-style-type: none"> <li>Being qualified –Assessor or Verifier units plus CPD and operate to A and V standards (A or V units/D units)</li> <li>Qualifications/Training that has been mapped to A and V units</li> </ul>				
Demonstrate a commitment to continuing professional development and to keeping abreast of the changing environment and practices in their industry	X	X	X	X

### 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.

- 501 Create an efficient and effective environment in utilities network construction
- 502 Establish and maintain effective working relationships in utilities network construction
- 503 Locate and avoid supply apparatus for utilities network construction
- 504 Excavate and maintain holes and trenches for utilities network construction
- 505 Operate powered tools and equipment for routine and predictable requirements on utilities network construction
- 506 Install equipment for safe working on sites for utilities network construction
- 508 Install equipment for safe working on the highway for utilities network construction
- 509 Reinstate excavation and pavement surfaces after utility network construction operations
- 510 Disconnection of meters
- 511 Joint materials by butt fusion processes on utilities network construction, up to 180mm
- 512 Joint materials by butt fusion processes above 180mm
- 601 Maintain a safe and secure working environment in gas network construction
- 602 Install gas services up to 63mm
- 603 Conduct specified testing of gas services
- 604 Restore gas network components to operational condition by repair

- 605 Assess and minimise risks to life, property and the environment during gas escapes
- 606 Conduct specified testing of gas networks associated with leakage location
- 607 Analyse and interpret the results of gas leakage surveys to determine the location of gas escapes
- 608 Install external service risers
- 609 Install gas engineering products or assets up to 180mm
- 610 Conduct specified testing of gas engineering products or assets - mains
- 611 Conduct specified connection to gas network mains and commissioning

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.

### **Continuing professional development (CPD)**

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

### **Learner entry requirements**

All learners entering on the Diplomas in Network Construction Operations (Gas) at SCQF Level 5 must be network operatives employed on the gas 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 Delivering the qualification

#### Initial assessment and induction

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

- if the learner has any specific training needs,
- support and guidance they may need when working towards their qualifications
- any units they have already completed, or credit they have accumulated which is relevant to the qualification.

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

#### Support materials

The following resources are available for these qualifications:

Description	How to access
Leaner Logbook	Go to the <b>www.cityandguilds.com</b> and navigate to the 6228 web page. Passwords available on the Walled Garden.
Assessment packs	Go to the <b>www.cityandguilds.com</b> and navigate to the 6228 web page. Passwords available on the Walled Garden.

#### Recording documents

Candidates and centres may decide to use a paper-based or electronic method of recording evidence.

City & Guilds endorses several ePortfolio systems, including our own, **Learning Assistant**, an easy-to-use and secure online tool to support and evidence learners' progress towards achieving qualifications. Further details are available at: **www.cityandguilds.com/eportfolios**.

City & Guilds has developed a set of *Recording forms* including examples of completed forms, for new and existing centres to use as appropriate. *Recording forms* are available on the City & Guilds website.

Although new centres are expected to use these forms, centres may devise or customise alternative forms, which must be approved for use by the qualification consultant, before they are used by candidates and assessors at the centre. Amendable (MS Word) versions of the forms are available on the City & Guilds website.



## 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.

### 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.

#### **Diploma in Network Construction Operations (Gas) – Main layer at SCQF Level 5**

- Installation of at least one section of gas main (for each pipe size category forming part of the qualification) to a valve or capped point, with a standard connection to the network
- The testing and purging of a section of gas main

#### **Diploma in Network Construction Operations (Gas) – Service layer at SCQF Level 5**

- Installation of at least one gas service to a capped point, with a standard connection made to a main
- The testing and purging of a service installation

Further assessment guidance for these activities has been provided against the following corresponding units.

- Unit 602 - Install gas services up to 63mm
- Unit 603 - Conduct specified testing of gas services
- Unit 609 - Install gas engineering products or assets up to 180mm
- Unit 610 - Conduct specified testing of gas engineering products or assets - mains
- Unit 611 - Conduct specified connection to gas network mains and commissioning

## Assessment of ELR units

<b>6228-604 - Restore gas network components to operational condition by repair</b>			
<b>Unit assessment requirements</b> <ul style="list-style-type: none"> <li>Assessments must be carried out as documented in this table</li> <li>Learners must demonstrate sufficient evidence of competence through experience of satisfactorily undertaking the work activities documented across the full range. This shall be evidenced via the Learners Portfolio and be assessed as meeting the minimum documented requirements.</li> </ul>			
<b>RANGE</b>	<b>RWE ASSESSMENT</b>	<b>ASSESSMENT OF EXPERIENCE</b>	<b>WORKPLACE ASSESSMENT</b>
<b>Primary Range</b> <ul style="list-style-type: none"> <li>Gas Distribution Pipework</li> <li>Components</li> <li>Valves and Fittings</li> <li>Controlled Escape</li> <li>Uncontrolled Escape</li> </ul> <b>Secondary Range</b> <ul style="list-style-type: none"> <li>Metallic</li> <li>Non-Metallic</li> <li>≤ 75 mbar pressure</li> <li>&gt; 75 mbar pressure</li> <li>Temporary Repair</li> <li>Permanent Repair</li> </ul>	One Successful Assessment	<p>Evidence of experience undertaking the satisfactory response and action is required across both primary and secondary ranges.</p> <p>Sourced from a minimum of 5 <sup>1</sup> separate repairs, the Learner must satisfy some (but not necessarily all) of the Assessment Criteria on each occasion.</p> <p>The sum total of collected evidence must cover all the Primary and Secondary Ranges</p> <p>At least 3 <sup>1</sup> of the occasions generating evidence must be from the</p>	One Successful Assessment
<b>Table Notes:</b> <p><sup>1</sup> The documented numbers required to be evidenced do include the assessment occasions.</p>			

## 6228-605 - Assess and minimise risks to life, property and the environment during gas escapes

### Unit assessment requirements

- Assessments must be carried out as documented in this table
- Learners must demonstrate sufficient evidence of competence through experience of satisfactorily undertaking the work activities documented across the full range. This shall be evidenced via the Learners Portfolio and be assessed as meeting the minimum documented requirements.

RANGE	RWE ASSESSMENT	ASSESSMENT OF EXPERIENCE	WORKPLACE ASSESSMENT
<b>Primary Range:</b> <ul style="list-style-type: none"> <li>• Gas in Property</li> <li>• Persons at Risk</li> <li>• Environmental Risk</li> <li>• Controlled Escape</li> <li>• Uncontrolled Escape</li> </ul> <b>Secondary Range:</b> <ul style="list-style-type: none"> <li>• Evacuation</li> <li>• Ventilation</li> <li>• Forced Entry</li> <li>• Liaison with Third Parties</li> </ul>	One Successful Assessment	<p>Evidence of experience undertaking the satisfactory response and action is required across both primary and secondary ranges.</p> <p>Sourced from a minimum of 5 <sup>1</sup> separate occasions, the Learner must satisfy some (but not necessarily all) of the Assessment Criteria on each occasion.</p> <p>The sum total of collected evidence must cover all the Primary and Secondary Ranges</p> <p>At least 3 <sup>1</sup> of the occasions generating evidence must be from the workplace.</p>	One Successful Assessment

#### Table Notes:

- <sup>1</sup> The documented numbers required to be evidenced do include the assessment occasions.



**6228-606 - Conduct specified testing of gas networks associated with leakage location**

**Unit assessment requirements**

- Assessments must be carried out as documented in this table
- Learners must demonstrate sufficient evidence of competence through experience of satisfactorily undertaking the work activities documented across the full range. This shall be evidenced via the Learners Portfolio and be assessed as meeting the minimum documented requirements.

RANGE	RWE ASSESSMENT	ASSESSMENT OF EXPERIENCE	WORKPLACE ASSESSMENT
<b>Primary Range</b> <ul style="list-style-type: none"> <li>• Gas Mains</li> <li>• Gas Services</li> <li>• Valves and Fittings</li> <li>• Components</li> </ul> <b>Secondary Range</b> <ul style="list-style-type: none"> <li>• Metallic</li> <li>• Non-Metallic</li> <li>• <math>\leq 75</math> mbar pressure</li> <li>• <math>&gt; 75</math> mbar pressure</li> <li>• Barholing</li> <li>• Surveying</li> <li>• Decay Testing</li> </ul>	One Successful Assessment	<p>Evidence of experience undertaking the satisfactory response and action is required across both primary and secondary ranges.</p> <p>Sourced from a minimum of 5 <sup>1</sup> separate testing occasions, the Learner must satisfy some (but not necessarily all) of the Assessment Criteria on each occasion.</p> <p>The sum total of collected evidence must cover all the Primary and Secondary Ranges</p> <p>At least 3 <sup>1</sup> of the occasions generating evidence must be from the workplace.</p>	One Successful Assessment

Table Notes:

<sup>1</sup> The documented numbers required to be evidenced do include the assessment occasions.

## 6228-607 - Analyse and interpret the results of gas leakage surveys to determine the location of gas escapes

### Unit assessment requirements

- Assessments must be carried out as documented in this table
- Learners must demonstrate sufficient evidence of competence through experience of satisfactorily undertaking the work activities documented across the full range. This shall be evidenced via the Learners Portfolio and be assessed as meeting the minimum documented requirements.

RANGE	RWE ASSESSMENT	ASSESSMENT OF EXPERIENCE	WORKPLACE ASSESSMENT
<b>Primary Range:</b> <ul style="list-style-type: none"> <li>• Barhole Readings</li> <li>• Surveys</li> <li>• Decay Testing</li> <li>• Pressure Test Results</li> </ul> <b>Secondary Range:</b> <ul style="list-style-type: none"> <li>• Controlled Escape</li> <li>• Uncontrolled Escape</li> <li>• ≤ 75 mbar pressure</li> <li>• &gt; 75 mbar pressure</li> </ul>	One Successful Assessment	<p>Evidence of experience undertaking the satisfactory response and action is required across both primary and secondary ranges.</p> <p>Sourced from a minimum of 5 <sup>1</sup> separate occasions, the Learner must satisfy some (but not necessarily all) of the Assessment Criteria on each occasion.</p> <p>The sum total of collected evidence must cover all the Primary and Secondary Ranges</p> <p>At least 3 <sup>1</sup> of the occasions generating evidence must be from the workplace.</p>	One Successful Assessment

#### Table Notes:

- The documented numbers required to be evidenced do include the assessment occasions.

## **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.

## **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

### 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 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

### Summary of units

City & Guilds unit	Unit title	Mandatory/ elective for full qualification	Credit value
501	Create an efficient and effective environment in utilities network construction	Mandatory	4
502	Establish and maintain effective working relationships in utilities network construction	Mandatory	3
503	Locate and avoid supply apparatus for utilities network construction	Mandatory	4
504	Excavate and maintain holes and trenches for utilities network construction	Mandatory	5
505	Operate powered tools and equipment for routine and predictable requirements on utilities network construction	Mandatory	5
506	Install equipment for safe working on sites for utilities network construction	Mandatory	3
507	Joint materials by electrofusion processes on utilities network construction	Mandatory	3
508	Install equipment for safe working on the highway for utilities network construction	Mandatory	4

<b>City &amp; Guilds unit</b>	<b>Unit title</b>	<b>Mandatory/ elective for full qualification</b>	<b>Credit value</b>
509	Reinstate excavation and pavement surfaces after utility network construction operations	Elective	5
510	Disconnection of meters	Elective	2
511	Joint materials by butt fusion processes on utilities network construction, up to 180mm	Mandatory	3
512	Joint materials by butt fusion processes above 180mm	Elective	2
601	Maintain a safe and secure working environment in gas network construction	Mandatory	3
602	Install gas services up to 63mm	Mandatory	9
603	Conduct specified testing of gas services	Mandatory	2
604	Restore gas network components to operational condition by repair	Mandatory	2
605	Assess and minimise risks to life, property and the environment during gas escapes	Mandatory	3
606	Conduct specified testing of gas networks associated with leakage location	Mandatory	3
607	Analyse and interpret the results of gas leakage surveys to determine the location of gas escapes	Mandatory	3
608	Install external service risers	Elective	8
609	Install gas engineering products or assets up to 180mm	Mandatory	13
610	Conduct specified testing of gas engineering products or assets - mains	Mandatory	3
611	Conduct specified connection to gas network mains and commissioning	Mandatory	3
613	Decommissioning and abandonment of mains and services 63mm and above	Elective	7
614	Install gas engineering products or assets above 180mm, up to and including 355mm	Elective	7
615	Operate within the gas intermediate pressure range	Elective	2

<b>City &amp; Guilds unit</b>	<b>Unit title</b>	<b>Mandatory/ elective for full qualification</b>	<b>Credit value</b>
616	Operate safely in emergency situations within the gas intermediate pressure range	Elective	2
706	Joint materials by fusion processes on utilities network construction, above 180mm diameter	Elective	9
708	Install gas engineering products or assets above 355mm	Elective	9

## Unit 501

## Create an efficient and effective environment in utilities network construction

<b>Level:</b>	5
<b>Credit value:</b>	4
<b>GLH:</b>	10
<b>Relationship to NOS:</b>	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
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	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 recourses, the work area and requires an understanding of the work activity. It includes working efficiently and effectively with other personnel.

<b>Learning outcome</b>
The learner will: 1. be able to work efficiently and effectively
<b>Assessment criteria</b>
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.

<b>Learning outcome</b>
The learner will: 2. be able to organise their work and maintain standards to minimise hazards

Assessment criteria
<p>The learner can:</p> <ul style="list-style-type: none"> <li>2.1 organise work to comply with instructions and the agreed schedules</li> <li>2.2 coordinate own work with other personnel and related activities</li> <li>2.3 carry out activities to <b>approved procedures and practices</b></li> <li>2.4 carry out and confirm all work is in accordance with <b>standards and approved codes of practice</b></li> <li>2.5 check own work and that of other personnel to ensure compliance with specified standards</li> <li>2.6 confirm with a <b>designated person</b> on the steps to be taken throughout the <b>work process</b>.</li> </ul>

Range
<p><b>Approved procedures and practices:</b> use of appropriate work methods; optimise the use of time; remove and dispose of waste and surplus materials</p> <p><b>Standards and approved codes of practice:</b> the agreed standards and specification; the organisational policy; approved procedures and practices; statutory requirements</p> <p><b>Designated person:</b> specified within work and health and safety procedures</p> <p><b>Work process:</b> any work which may be detrimental to safety or the environment; suggestions for improvements to work methods; any deviations in standards or specification</p>

Learning outcome
<p>The learner will:</p> <ul style="list-style-type: none"> <li>3. be able to use and communicate data and information</li> </ul>
Assessment criteria
<p>The learner can:</p> <ul style="list-style-type: none"> <li>3.1 comply with operational and organisational procedures for communicating information to other people</li> <li>3.2 confirm records are maintained and exchanged in accordance with operational and organisational requirements</li> <li>3.3 confirm with designated personnel any circumstances where information appears incorrect</li> <li>3.4 use organisational information systems to record and store, data and information</li> </ul>

Learning outcome
<p>The learner will:</p> <ul style="list-style-type: none"> <li>4. be able to resolve problems that arise from work activities</li> </ul>
Assessment criteria
<p>The learner can:</p>



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.

<b>Learning outcome</b>	
The learner will:	
5.	know health and safety guidance and legislation in utilities network construction operations
<b>Assessment criteria</b>	
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 <ul style="list-style-type: none"> <li>a. any licensing, certification or inspection</li> <li>b. organisational and operational standards.</li> </ul>

<b>Learning outcome</b>	
The learner will:	
6.	understand how to create an efficient and effective environment in utilities network construction
<b>Assessment criteria</b>	
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 <b>approved procedures and practices</b> 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 <b>categories and uses</b> 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 <b>safe methods of handling and storing</b> the <b>range of materials</b> being used for the work
6.11	identify types of <b>packaging</b> 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
<p><b>Approved procedures and practices:</b> Environmental; organisational; regulatory; emergency; operational; company procedure</p> <p><b>Categories and uses:</b> materials used in carrying out the work; materials arising as a result of the work</p> <p><b>Safe methods of handling and storing:</b> disposal of residual or waste materials; recovery of reusable materials; approved reporting procedures</p> <p><b>Range of materials:</b> hazardous; non-hazardous</p> <p><b>Packaging:</b> loose; bagged; containerised; volume/weight of standard packages</p> <p><b>Tools and equipment:</b> hand tools; power tools; equipment for general and specific work activities</p> <p><b>Arrangements, designated places and working procedures:</b> 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</p> <p><b>Means of communication:</b> written; electronic; visual signals</p> <p><b>Company policy:</b> statutory; organisational; emergency</p> <p><b>Work activity and sequence of events:</b> how to collect information from plans, schedules, work programmes; the preparatory work required, including ensuring safety provisions are in place; the</p>

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 502      Establish and maintain effective working relationships in utilities network construction

<b>Level:</b>	5
<b>Credit value:</b>	3
<b>GLH:</b>	5
<b>Relationship to NOS:</b>	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
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills
<b>Aim:</b>	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.

<b>Learning outcome</b>
The learner will:
1. be able to establish and maintain productive working relationships
<b>Assessment criteria</b>
The learner can:
1.1 demonstrate how to deal with <b>working relationships</b> 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 <b>designated person</b> 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.

<b>Range</b>
<b>Working relationships:</b> colleagues, associates, managers, supervisors, customers, outside bodies and members of the general public
<b>Designated person:</b> those people specified within work and health and safety procedures

<b>Learning outcome</b>
The learner will:
2. be able to use and communicate data and information
<b>Assessment criteria</b>
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.

<b>Learning outcome</b>
The learner will:
3. be able to resolve problems that could damage effective working relationships
<b>Assessment criteria</b>
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
3.3 <b>designated person</b> using approved procedures.

<b>Range</b>
<b>Designated person:</b> people specified within work and health and safety procedures

<b>Learning outcome</b>
The learner will:
4. know health and safety guidance and legislation utilities in network construction operations
<b>Assessment criteria</b>
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.

<b>Learning outcome</b>	
The learner will:	
5.	understand how to establish and maintain effective working relationships in utilities network construction
<b>Assessment criteria</b>	
The learner can:	
5.1	describe how to create and maintain working relationships with different <b>types of personnel</b>
5.2	identify the range and roles of <b>other persons</b> 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 <b>methods of communication</b> 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.

<b>Range</b>
<p><b>Types of personnel:</b> work colleagues and associates, suppliers, contractors, other utilities, those working for statutory bodies, other organisations, other trades, representatives from statutory organisations</p> <p><b>Other persons:</b> other trades; representatives from statutory organisations</p> <p><b>Method of communication:</b> oral, written, electronic</p>

## Unit 503

## Locate and avoid supply apparatus for utilities network construction

<b>Level:</b>	5
<b>Credit value:</b>	4
<b>GLH:</b>	25
<b>Relationship to NOS:</b>	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
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	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.

<b>Learning outcome</b>
The learner will: 1. locate supply apparatus
<b>Assessment criteria</b>
The learner can: 1.1 use work instructions and interpret utility plans to determine the extent of the work site and to enable the <b>supply apparatus</b> 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

### Learning outcome

The learner will:

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

### Learning outcome

The learner will:

- 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.

### Learning outcome

The learner will:

- 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

### Learning outcome

The learner will:

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.

### Learning outcome

The learner will:

6. demonstrate general knowledge and understanding for utilities network construction operations

### 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:
  - a. size (diameter)
  - b. colour
  - c. material and its resistance to impact from excavation activities
  - d. methods of identification
- 6.3 describe the physical properties of the supply being carried by different types of **supply apparatus**, including where relevant:
  - a. ignition characteristics
  - b. density relative to air
  - c. electrocution risk
  - d. 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:

	<ul style="list-style-type: none"> <li>a. personal danger to the health or life of the operatives, or to others on site</li> <li>b. damage to the environment</li> <li>c. additional job costs in repair</li> <li>d. delay to job progress</li> </ul>
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 <b>supply apparatus</b>
6.10	describe the industry procedures and practices for confirming the location and marking of <b>supply apparatus</b>
6.11	give examples of different methods used to provide temporary and permanent support to protect <b>supply apparatus</b> exposed during site excavations.

<b>Range</b>
<b>Supply apparatus:</b> 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).

<b>Learning outcome</b>
The learner will:
7. demonstrate knowledge and understanding of equipment and techniques used for locating supply apparatus
<b>Assessment criteria</b>
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 <b>supply apparatus</b> , using: <ul style="list-style-type: none"> <li>a. markers</li> <li>b. signs and features</li> <li>c. existing records</li> </ul>
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: <ul style="list-style-type: none"> <li>a. costs</li> <li>b. loss of time</li> <li>c. material wastage</li> </ul>
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).

**Learning outcome**

The learner will:

8. demonstrate general knowledge and understanding for utilities network construction operations

**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 504

## Excavate and maintain holes and trenches for utilities network construction

<b>Level:</b>	5
<b>Credit value:</b>	5
<b>GLH:</b>	35
<b>Relationship to NOS:</b>	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
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	<p>This unit allows learners to show that they have the skills and knowledge to excavate holes and trenches for utilities network operations.</p> <p>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.</p>

<b>Learning outcome</b>
The learner will: 1. excavate on site to requirements
<b>Assessment criteria</b>

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 (e.g. foundations); the natural environment (e.g. tree roots, natural watercourses).

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

### Learning outcome

The learner will:

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:
  - a. the size of the excavation
  - b. 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 <b>approved procedures and practices</b>
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 <b>approved procedures and practices</b> and comply with statutory requirements throughout excavation operations.

<b>Range</b>
<b>Approved procedures and practices:</b> environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments.

<b>Learning outcome</b>
The learner will:
3. use and communicate data and information
<b>Assessment criteria</b>
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 <b>approved procedures and practices</b> 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.

<b>Range</b>
<b>Approved procedures and practices:</b> environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments

<b>Learning outcome</b>
The learner will:
4. resolve problems which could arise from excavation work
<b>Assessment criteria</b>
The learner can:
4.1 report any damage to <b>supply apparatus</b> 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.

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

<b>Learning outcome</b>
The learner will:
5. demonstrate general knowledge and understanding for utilities network construction operation
<b>Assessment criteria</b>
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.

<b>Learning outcome</b>
The learner will:
6. demonstrate general knowledge and understanding for utilities network construction operation
<b>Assessment criteria</b>
The learner can:
6.1 outline how <b>activities involved in excavation</b> 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 <b>activities involved in excavation</b> .

<b>Range</b>
<b>Activities involved in excavation:</b> 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

### Learning outcome

The learner will:

7. demonstrate general 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

### Learning outcome

The learner will:

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.

### Learning outcome



<p>The learner will:</p> <p>9. demonstrate knowledge and understanding of responsibilities to others during excavation work</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>9.1 list the different utility organisations that may own apparatus that could be affected by excavation activities</p> <p>9.2 describe how the different buried apparatus could be identified</p> <p>9.3 describe the potential environmental impact of excavation activities and the agencies responsible for environmental protection</p> <p>9.4 describe the potential consequences of not providing the necessary protection to underground apparatus and features</p> <p>9.5 describe the roles and responsibilities of people within the site or highways operations team</p> <p>9.6 explain the importance of referring problems outside their responsibility to the designated persons</p> <p>9.7 describe the procedures used to report and record the <b>detail of excavation activities</b>.</p>

<p><b>Range</b></p> <p><b>Detail of excavation activities:</b> job progress; problems; deviations from the programme of work</p>
----------------------------------------------------------------------------------------------------------------------------------

## Unit 505

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

<b>Level:</b>	5
<b>Credit value:</b>	5
<b>GLH:</b>	25
<b>Relationship to NOS:</b>	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.
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	<p>This unit allows learners to show that they have the skills and knowledge to operate powered tools and equipment during utilities construction operations.</p> <p>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.</p>

<b>Learning outcome</b>
The learner will: 1. prepare powered tools and equipment for routine and predictable use
<b>Assessment criteria</b>
The learner can: 1.1 use work instructions and specifications to confirm the operations requiring the use of <b>powered tools and equipment</b> 1.2 carry out a site specific risk assessment, and review in accordance with company procedures. 1.3 select and wear the designated <b>personal protective equipment (PPE)</b>

1.4	carry out pre-start inspections on the <b>powered tools and equipment</b>
1.5	record and report any defects of the <b>powered tools and equipment</b> and take out of service until rectified
1.6	confirm <b>powered tools and equipment</b> are safe, correct and read for use in accordance with the work requirement.

<b>Range</b>
<b>Powered tools and equipment:</b> power generation (including electric, pneumatic and hydraulic); cutting and grinding; pumping; compacting; pipe jointing <b>Personal protective equipment (PPE):</b> head; eyes; ears; respiratory system; hands; feet; body

<b>Learning outcome</b>
The learner will: 2. run and operate powered tools and equipment
<b>Assessment criteria</b>
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 <b>equipment</b> safely in accordance with specifications.

<b>Range</b>
<b>Equipment:</b> power generation (including electric, pneumatic and hydraulic); cutting and grinding; pumping; compacting; pipe jointing

<b>Learning outcome</b>
The learner will: 3. shut down and carry out post-stop checks on powered tools and equipment
<b>Assessment criteria</b>
The learner can: 3.1 stop <b>powered tools and equipment</b> safely 3.2 carry out post-stop checks in accordance with organisational and operational procedures 3.3 leave <b>powered tools and equipment</b> safe and secure.

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

<b>Learning outcome</b>
The learner will:

4. use and communicate data and information
<b>Assessment criteria</b>
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 <b>equipment</b> performance to the designated person
4.4 record and report the need for replacement tools and <b>equipment</b> 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.

<b>Range</b>
<b>Equipment:</b> power generation (including electric, pneumatic and hydraulic); cutting and grinding; pumping; compacting; pipe jointing

<b>Learning outcome</b>
The learner will:
5. resolve problems which arise from operating powered tools and equipment
<b>Assessment criteria</b>
The learner can:
5.1 report any damage to tools and <b>equipment</b> to the designated person
5.2 refer problems that are outside their responsibility to the designated person using approved procedures.

<b>Range</b>
<b>Equipment:</b> power generation (including electric, pneumatic and hydraulic); cutting and grinding; pumping; compacting; pipe jointing

<b>Learning outcome</b>
The learner will:
6. demonstrate general knowledge and understanding for utilities network construction operations
<b>Assessment criteria</b>
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.

<b>Learning outcome</b>
<p>The learner will:</p> <p>7. demonstrate knowledge and understanding of working with powered tools and equipment</p>
<b>Assessment criteria</b>
<p>The learner can:</p> <p>7.1 describe the <b>hazards</b> posed by <b>powered tools and equipment</b> and explain how the associated risks must be illuminated or controlled</p> <p>7.2 describe the full range of <b>personal protective equipment (PPE)</b> that must be worn when operating <b>powered tools and equipment</b></p> <p>7.3 describe the key features and characteristics of <b>powered tools and equipment</b>, including the type of work for which they are suitable</p> <p>7.4 outline how <b>powered tools and equipment</b> should be operated, including:</p> <ol style="list-style-type: none"> <li>starting and stopping routines</li> <li>operation to comply with all <b>approved procedures and practices</b></li> </ol> <p>7.5 describe the training certificates and license requirements for operating <b>powered tools and equipment</b></p> <p>7.6 outline the industry recognised practices for their specific trade occupation and general construction work activities, including current statutory requirements</p> <p>7.7 describe the manufacturer's recommendations for starting the <b>powered tools and equipment</b></p> <p>7.8 describe the operational safety procedures that must be observed when starting and stopping <b>powered tools and equipment</b></p> <p>7.9 describe the operational problems that can occur with the <b>powered tools and equipment</b> being used and how these might be resolved</p> <p>7.10 describe how to report problems with and damage to <b>powered tools and equipment</b></p> <p>7.11 explain the importance of maintaining tools in good working order, including the sharpening of cutting tools</p> <p>7.12 describe the routine and emergency operational procedures for the <b>powered tools and equipment</b> being used, including manufacturer's recommendations</p> <p>7.13 describe the pre- and post-use maintenance checks that should be carried out on <b>powered tools and equipment</b>, including those recommended by manufacturers and in operational and organisational procedures</p> <p>7.14 explain why it is important to report and to prevent the spread of spilled fuels and lubricants, in line with company policies.</p>
<b>Range</b>
<p><b>Hazards:</b> vibration; handling; fumes; dust; moving parts; heat; electricity; fuel; substances</p>

**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 506

## Install equipment for safe working on sites for utilities network construction

<b>Level:</b>	5
<b>Credit value:</b>	3
<b>GLH:</b>	20
<b>Relationship to NOS:</b>	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
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills
<b>Aim:</b>	<p>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.</p> <p>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.</p>

<b>Learning outcome</b>
The learner will: 1. prepare, segregate and protect the work site
<b>Assessment criteria</b>
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 <b>approved procedures and practices</b> .

- 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

#### Learning outcome

The learner will:

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.

#### Learning outcome

The learner will:

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 <b>approved procedures and practices</b> 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.

<b>Range</b>
<b>Approved procedures and practices:</b> environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments

<b>Learning outcome</b>
The learner will:
4. resolve problems which could arise from preparing the site and resource requirements
<b>Assessment criteria</b>
The learner can:
4.1 record and report to the designated person any shortages and defects of <b>materials and equipment</b>
4.2 refer <b>problems</b> and conditions outside their responsibility to the designated person using approved procedures

<b>Range</b>
<b>Materials and equipment:</b> backfill and reinstatement materials; spoil; digging and hand tools; road breaking and cutting equipment; compaction equipment.
<b>Problems:</b> traffic control; pedestrians; access to premises; equipment failure; materials shortage.

<b>Learning outcome</b>
The learner will:
5. demonstrate knowledge and understanding for utilities network construction operations
<b>Assessment criteria</b>
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.

<b>Learning outcome</b>
-------------------------

The learner will:

6. demonstrate knowledge and understanding for utilities network construction operations

#### **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 507

## Joint materials by electrofusion processes on utilities network construction

<b>Level:</b>	5
<b>Credit value:</b>	3
<b>GLH:</b>	10
<b>Relationship to NOS:</b>	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
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	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 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.

<b>Learning outcome</b>
The learner will: 1. be able to make joints using electrofusion jointing techniques
<b>Assessment criteria</b>
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 a. specified standard b. 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. |
|-----|--------------------------------------------------------------------------------------------------------------------------------|

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |    |                                                     |
|----|-----------------------------------------------------|
| 2. | be able to use and communicate data and information |
|----|-----------------------------------------------------|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |     |                                                                                                                 |
|-----|-----------------------------------------------------------------------------------------------------------------|
| 2.1 | comply with approved procedures, practices, statutory and regulatory requirements involved in the work activity |
| 2.2 | check with <b>designated personnel</b> any circumstances where information appears incorrect                    |
| 2.3 | use organisational information systems to record and store data and information.                                |

<b>Range</b>
--------------

<b>Designated personnel:</b> those people specified within work and health and safety procedures
--------------------------------------------------------------------------------------------------

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |    |                                                             |
|----|-------------------------------------------------------------|
| 3. | be able to resolve problems that arise during jointing work |
|----|-------------------------------------------------------------|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |     |                                                                                           |
|-----|-------------------------------------------------------------------------------------------|
| 3.1 | report to the <b>designated person</b> damage to supply apparatus                         |
| 3.2 | report to the <b>designated person</b> damage to jointing equipment                       |
| 3.3 | report to the <b>designated person</b> 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.                                              |

<b>Range</b>
--------------

<b>Designated person:</b> Those people specified within work and health and safety procedures
-----------------------------------------------------------------------------------------------

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |    |                                                                                              |
|----|----------------------------------------------------------------------------------------------|
| 4. | know health and safety guidance and legislation in utilities network construction operations |
|----|----------------------------------------------------------------------------------------------|

<b>Assessment criteria</b>
----------------------------

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.

<b>Learning outcome</b>	
The learner will:	
5.	understand jointing materials by electrofusion processes on utilities network construction
<b>Assessment criteria</b>	
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 <b>defects</b>
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.

<b>Range</b>
<b>Defects:</b> poor pipe restraint, poor pipe support, misalignment, contamination

## Unit 508

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

<b>Level:</b>	5
<b>Credit value:</b>	4
<b>GLH:</b>	25
<b>Relationship to NOS:</b>	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
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	<p>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.</p> <p>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.</p>

<b>Learning outcome</b>
The learner will: 1. set out temporary signing, lighting and guarding traffic control equipment in line with industry Codes of Practice and current legislation
<b>Assessment criteria</b>
The learner can: 1.1 locate the area for highway works and determine the <b>characteristics and conditions of the carriageway</b>

- 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.

### Learning outcome

The learner will:

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**.

<b>Range</b>
<b>Materials and equipment:</b> backfill and reinstatement materials; spoil; digging and hand tools; road breaking and cutting equipment; compaction equipment

<b>Learning outcome</b>
The learner will: 3. use and communicate data and information
<b>Assessment criteria</b>
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 <b>approved procedures and practices</b> throughout the work activity to ensure the work complies with statutory requirements. 3.3 check with <b>designated personnel</b> any circumstances where information appears incorrect. 3.4 use organisational information systems to record and store data and information.

<b>Range</b>
<b>Approved procedures and practices:</b> environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments.  <b>Designated personnel:</b> those people specified within work and health and safety procedures

<b>Learning outcome</b>
The learner will: 4. resolve problems which could arise from work on the highway
<b>Assessment criteria</b>
The learner can: 4.1 resolve <b>problems</b> which arise from work on the highway 4.2 record defects, replacements or additional equipment required and report them to the <b>designated person</b> 4.3 refer <b>problems</b> and conditions outside their responsibility to the <b>designated person</b> using approved procedures.

<b>Range</b>
<b>Problems:</b> traffic control; pedestrians; access to premises; equipment failure; materials shortage  <b>Designated person:</b> those people specified within work and health and safety procedures



<b>Learning outcome</b>
The learner will: 5. demonstrate general knowledge and understanding for utilities network construction operations
<b>Assessment criteria</b>
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.

<b>Learning outcome</b>
The learner will: 6. demonstrate knowledge and understanding of installing equipment for safe working on the highway
<b>Assessment criteria</b>
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
<b>Approved procedures and practices:</b> environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments

## Unit 509

## Reinstate excavation and pavement surfaces after utility network construction operations

<b>Level:</b>	5
<b>Credit value:</b>	5
<b>GLH:</b>	35
<b>Relationship to NOS:</b>	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.
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	<p>This unit allows learners to show that they have the skills and knowledge to reinstate excavations and pavement surfaces following utilities network construction operations.</p> <p>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.</p>

<b>Learning outcome</b>
The learner will:
1. prepare for reinstatement of excavation and pavement surface

Assessment criteria
<p>The learner can:</p> <ol style="list-style-type: none"> <li>1.1 confirm the location of the excavation and the holes and trenches, according to instructions and work specifications</li> <li>1.2 carry out a site-specific risk assessment, and review it according to company procedures</li> <li>1.3 select and wear the designated personal protective equipment (PPE)</li> <li>1.4 follow safe working practices for working in the vicinity of hazardous materials</li> <li>1.5 confirm that the <b>area for reinstatement</b> is in accordance with statutory and regulatory Codes of Practice</li> <li>1.6 carry out preparation procedures for reinstatement of the excavation in accordance with statutory and regulatory Codes of Practice</li> <li>1.7 protect <b>supply apparatus and sub-structures</b> in accordance with the relevant Codes of Practice</li> <li>1.8 select stored materials for reinstatement, according to the relevant Codes of Practice</li> <li>1.9 select hand tools, powered tools and equipment for reinstatement.</li> <li>1.10 confirm that tools and equipment are: <ol style="list-style-type: none"> <li>a. appropriate for the materials to be used in reinstatement</li> <li>b. in a suitable condition for use, according to manufacturer's specifications and operational requirements</li> </ol> </li> <li>1.11 report remedial work and defects in the excavation that are outside their responsibility, according to organisational and operational procedures</li> <li>1.12 work according to <b>approved procedures and practices</b> and comply with statutory requirements.</li> </ol>

Range
<p><b>Area for reinstatement:</b> flexible pavement construction; composite pavement construction; rigid pavement construction; modular pavement construction; verge/natural ground</p> <p><b>Supply apparatus and sub-structures:</b> supply apparatus for utilities and other agencies; above and below ground services; built structures (eg foundations); the natural environment (eg tree roots, natural watercourses)</p> <p><b>Approved procedures and practices:</b> environmental; statutory; regulatory; emergency; operational; health and safety; organisational and company procedures; risk assessments</p>

Learning outcome
<p>The learner will:</p> <ol style="list-style-type: none"> <li>2. carry out reinstatement of excavation and pavement surface</li> </ol>
Assessment criteria
<p>The learner can:</p> <ol style="list-style-type: none"> <li>2.1 confirm that materials to be used for reinstatement are fit for purpose and meet statutory and regulatory Codes of Practice, including:</li> </ol>

	<ul style="list-style-type: none"> <li>a. new and reusable materials for backfill, sub-base, road-base and pavement surface</li> <li>b. cold-lay materials</li> </ul>
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.

<b>Learning outcome</b>	
The learner will:	
3. use and communicate data and information	
<b>Assessment criteria</b>	
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.

<b>Learning outcome</b>	
The learner will:	
4. know and understand how to provide leadership	
<b>Assessment criteria</b>	
The learner can:	
4.1	report any damage to <b>supply apparatus and sub-structures</b> 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.

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

<b>Learning outcome</b>
The learner will: 5. demonstrate general knowledge and understanding for utilities network construction operations
<b>Assessment criteria</b>
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.

<b>Learning outcome</b>
The learner will: 6. demonstrate general knowledge and understanding of plant and equipment used for reinstatement activities
<b>Assessment criteria</b>
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.

<b>Learning outcome</b>
The learner will: 7. demonstrate general knowledge and understanding of legislation and best practice for reinstatement operations
<b>Assessment criteria</b>
The learner can: 7.1 outline the legal and operational responsibilities of the employer and employee in relation to <b>reinstatement activities</b>

- 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 operation.

### 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

### Learning outcome

The learner will:

- 8. demonstrate general 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.

<b>Range</b>
<p><b>Reinstatement surfaces:</b> flexible; composite; rigid; modular; cold-lay bituminous material; verge/natural ground</p> <p><b>Preparation procedures:</b> edge trimming; surface formation; removal of loose debris; repair information</p> <p><b>Types of materials:</b> backfill; sub-base; road-base; pavement surface</p> <p><b>Surface, sub-surface and general reinstatement materials:</b> 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.</p>

<b>Learning outcome</b>
<p>The learner will:</p> <p>9. demonstrate knowledge and understanding of other agencies, utilities, their apparatus and communication requirements</p>
<b>Assessment criteria</b>
<p>The learner can:</p> <p>9.1 describe the different types of <b>supply apparatus and sub-structures</b> for utilities and other agencies that may be encountered during reinstatement</p> <p>9.2 explain the methods used to protect each type of supply apparatus and sub-structure</p> <p>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.</p>

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



<b>Level:</b>	5
<b>Credit value:</b>	2
<b>GLH:</b>	10
<b>Relationship to NOS:</b>	This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC023 Disconnection of Gas Meters.
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	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 disconnect gas meters.

<b>Learning outcome</b>	
The learner will:	
1. be able to disconnect gas meters	
<b>Assessment criteria</b>	
The learner can:	
1.1	perform work activities safely at all times in accordance with <b>legislative and regulatory requirements</b>
1.2	carry out site specific risk assessment
1.3	select and wear designated PPE
1.4	prepare electronic gas detection equipment ready for use
1.5	prepare instant voltage tester (volt stick) ready for use
1.6	determine the pressure in the supply as being low or medium pressure, in line with approved procedures
1.7	determine the suitability of existing equipotential bonding, in line with approved procedures
1.8	determine the type of meter in use, in line with approved procedures
1.9	comply with industry standards and approved codes of practice when <ul style="list-style-type: none"> <li>installing temporary continuity bonding</li> <li>isolating the gas supply and appliances</li> <li>disconnecting components</li> <li>removing meter</li> <li>cap open ends of meter and internal supply</li> </ul>

<ul style="list-style-type: none"> <li>cap and secure the emergency control valve</li> </ul>
1.10 prevent damage to components, the meter and supply apparatus
1.11 confirm there is no damage or leakage to the supply apparatus
1.12 handle excess, waste materials and temporary attachments in line with approved and agreed procedures
1.13 comply with procedures where lone working is required.

<b>Range</b>
<b>Legislative and regulatory requirements:</b> Health, safety and environment requirements, legislation, industry standards, statutory requirements, company procedures, work instructions

<b>Learning outcome</b>
The learner will:
2. be able to use and communicate data and information
<b>Assessment criteria</b>
The learner can:
2.1 use organisational information systems to record and store data and information
2.2 complete work documentation accurately
2.3 record work documentation in the specified place or pass to a designated person
2.4 explain the types of records and documentation used when disconnecting meters.

<b>Learning outcome</b>
The learner will:
3. be able to resolve problems which arise during the disconnection of gas meters
<b>Assessment criteria</b>
The learner can:
3.1 report promptly to the designated person damage or defects to <b>resources</b> using approved procedures
3.2 report promptly to the designated person suspected theft of gas using approved procedures
3.3 handle problems within the limits of own responsibility
3.4 report to the designated person problems and conditions outside the responsibility of the job role.

<b>Range</b>
<b>Resources:</b> tools, equipment, materials

<b>Learning outcome</b>
The learner will:
4. Know health and safety guidance and legislation in utilities network construction operations
<b>Assessment criteria</b>

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 main responsibilities of employers and employees under working at height regulations
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	describe the safe use of a standard voltage meter and the limitations of use.

<b>Learning outcome</b>	
The learner will:	
5. understand how to disconnect gas meters	
<b>Assessment criteria</b>	
The learner can:	
5.1	explain the specific gravity of natural gas and its relationship to air
5.2	identify different types of meter
5.3	explain how to correctly handle different <b>types</b> of meters
5.4	describe effective methods for the prevention of dangerous concentrations of gas
5.5	describe potential ignition sources
5.6	explain equipotential bonding including <ul style="list-style-type: none"> <li>• risks where bonding is not used</li> <li>• cross sectional area</li> <li>• warning labels</li> <li>• distance from meter outlet</li> </ul>
5.7	identify situations where it is necessary to leave temporary continuity bonding in place on completion of the work
5.8	explain correct reporting procedures.

<b>Range</b>
<b>Types:</b> U6; E6; Quantum; U16

## Unit 511

## Joint materials by butt fusion processes on utilities network construction, up to 180mm

<b>Level:</b>	5
<b>Credit value:</b>	2
<b>GLH:</b>	10
<b>Relationship to NOS:</b>	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.
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	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

<b>Learning outcome</b>
The learner will: 6. be able to make joints using butt fusion techniques
<b>Assessment criteria</b>
The learner can: 6.1 carry out site specific risk assessment, and review in accordance with company procedures 6.2 select and wear the designated PPE 6.3 check that jointing and related equipment and consumables are as specified and fit for purpose 6.4 confirm there is adequate weather protection during the entire jointing cycle 6.5 carry out and monitor the machine operations to produce butt fusion joints of the required quality

6.6	confirm compliance with
	a. job instructions
	b. correct preparation
	c. specification
	d. specified dimensional accuracy
6.7	demonstrate how to de-bead and carry out approved quality assurance test on bead
6.8	confirm joint and bead are identifiable by marking in accordance with company procedures
6.9	confirm the equipment is in a safe condition on completion of jointing activities
6.10	handle excess and waste materials and temporary attachments, in line with approved and agreed procedures.

<b>Learning outcome</b>
The learner will:
7. be able to use and communicate data and information
<b>Assessment criteria</b>
The learner can:
7.1 comply with approved procedures and practices involved in the work activity
7.2 confirm with <b>designated personnel</b> any circumstances where information appears incorrect
7.3 use organisational information systems to record and store jointing data and information.

<b>Range</b>
<b>Designated personnel:</b> Those people specified within work and health and safety procedures

<b>Learning outcome</b>
The learner will:
8. be able to resolve problems which arise from jointing materials
<b>Assessment criteria</b>
The learner can:
8.1 report promptly to the <b>designated person</b> damage or defects to tools, equipment, materials
8.2 report promptly to the <b>designated person</b> matters outside the responsibility of the job role
8.3 resolve day to day problems within the responsibility of the job role
8.4 handle emergency situations as specified in approved procedures.

<b>Range</b>
<b>Designated person:</b> Those people specified within work and health and safety procedures

<b>Learning outcome</b>
The learner will: 9. know Health and Safety guidance and legislation in utilities network construction operations
<b>Assessment criteria</b>
The learner can: 9.1 State the main responsibilities of the employer and employee under the Health and Safety at Work Act 9.2 explain the health and safety guidance governing work in excavations 9.3 describe the safe procedures for handling hazardous materials 9.4 explain the organisational accident recording and reporting procedures 9.5 identify the range and use of personal protective equipment for the work 9.6 state the health, safety and environment legislation and environmental procedures relevant to the work activities.

<b>Learning outcome</b>
The learner will: 10. understand jointing materials by butt fusion processes on utilities network construction, up to 180mm diameter
<b>Assessment criteria</b>
The learner can: 10.1 apply the correct manual handling procedures 10.2 explain the industry codes of practice and company procedures 10.3 explain why only pipes of similar specifications can be joined together 10.4 interpret engineering specifications relevant to the engineering activity 10.5 describe the different stages that take place during the jointing process and the importance of allowing each phase to complete 10.6 explain the need for pipe support, alignment and the consequences of poor support and mis-alignment 10.7 explain the cause and effect of <b>defects and contaminations</b> 10.8 describe maintenance procedures 10.9 describe equipment calibration 10.10 outline the consequences of poor maintenance 10.11 identify different <b>quality assurance procedures</b> that can be applied in recognising defects 10.12 explain the correct reporting procedures.

<b>Range</b>
<b>Defects and contaminations</b> Split defects, inadequate bead, excessive bead, pipe specifications, compatibility, different types of materials and consumables <b>Quality assurance procedures</b> non-destructive and destructive testing

## Unit 512

## Joint materials by butt fusion processes above 180mm

<b>Level:</b>	5
<b>Credit value:</b>	2
<b>GLH:</b>	10
<b>Relationship to NOS:</b>	This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC011B Joint materials by butt fusion processes on Utilities Network Construction, above 180mm diameter
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills
<b>Aim:</b>	The purpose of this unit is to assess the competence of individuals to recognised national occupational standards. This unit supports workforce development and describes the competencies necessary to joint materials by butt fusion processes on Utilities Network Construction, above 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

<b>Learning outcome</b>
The learner will: 1. be able to make joints using butt fusion techniques
<b>Assessment criteria</b>
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

	<ul style="list-style-type: none"> <li>a. job instructions</li> <li>b. correct preparation</li> <li>c. specification</li> <li>d. specified dimensional accuracy</li> </ul>
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.

<b>Learning outcome</b>	
The learner will:	
2.	learning outcome 2 goes in here
<b>Assessment criteria</b>	
The learner can:	
2.1	comply with approved procedures and practices involved in the work activity
2.2	confirm with <b>designated personnel</b> any circumstances where information appears incorrect
2.3	use organisational information systems to record and store jointing data and information

<b>Range</b>	
<b>Designated personnel:</b> those people specified within work and health and safety procedures	

<b>Learning outcome</b>	
The learner will:	
3.	be able to resolve problems which arise from jointing materials
<b>Assessment criteria</b>	
The learner can:	
3.1	report promptly to the <b>designated person</b> damage or defects to tools, equipment, materials
3.2	report promptly to the <b>designated person</b> 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.

<b>Range</b>	
<b>Designated person:</b> those people specified within work and health and safety procedures	

<b>Learning outcome</b>	
-------------------------	--



The learner will:
4. know Health and Safety guidance and legislation in utilities network construction operations
<b>Assessment criteria</b>
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.

<b>Learning outcome</b>
The learner will:
5. understand jointing materials by butt fusion processes on utilities network construction, above 180mm diameter
<b>Assessment criteria</b>
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 <b>defects and contaminations</b>
5.8 describe maintenance procedures
5.9 describe equipment calibration
5.10 describe consequences of poor maintenance
5.11 identify different <b>quality assurance procedures</b> that can be applied in recognising defects
5.12 explain the correct reporting procedures.

<b>Range</b>
<b>Defects and contamination:</b> Split defects, inadequate bead, excessive bead, pipe specifications, compatibility, different types of material and consumables
<b>Quality assurance procedures:</b> non-destructive and destructive testing

## Unit 601

## Maintain a safe and secure working environment in gas network construction

<b>Level:</b>	6
<b>Credit value:</b>	3
<b>GLH:</b>	10
<b>Relationship to NOS:</b>	This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNCG002 Maintain a safe and secure working environment in Utilities Network Construction
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	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 maintain a safe and secure working environment in utilities network construction. It involves on-going monitoring during routine work. It requires taking steps to make safe any situations or work practices or referring them to designated people as specified in the work procedures. It includes being alert to, and assessing, risk or hazardous conditions, security breaches, the need to wear safety clothing, and an ability to follow procedures where emergencies arise.

<b>Learning outcome</b>
The learner will: 1. be able to maintain the health and safety of themselves and others
<b>Assessment criteria</b>
The learner can: 1.1 carry out site specific risk assessments for their area of work and review in accordance with company procedures 1.2 select and wear PPE in the site specific risk assessment and company procedures 1.3 ensure work activity is carried out in accordance with <b>approved practices and procedures</b>

1.4	monitor site conditions/work activities and their potential to harm
	<ul style="list-style-type: none"> <li>a. yourself</li> <li>b. other people</li> <li>c. the environment</li> </ul>
1.5	adjust working practices and other aspects of the workplace to ensure the safety of operatives
1.6	handle hazards, accidental breakages and spillages promptly in accordance with safe
1.7	<b>working practices</b> and organisational requirements
1.8	comply with emergency procedures in the event of an emergency.

<b>Range</b>
<b>Approved practices and procedures:</b> safe working practices; workplace policies; health and safety requirements
<b>Working practices:</b> any activities, procedures, use of materials or equipment and working techniques used in carrying out your job

<b>Learning outcome</b>
The learner will:
2. be able to maintain the safety and security of plant, equipment, and the working environment
<b>Assessment criteria</b>
The learner can:
2.1 <b>maintain</b> in accordance with health and safety specifications, site specifications and safe
2.2 working practices
<ul style="list-style-type: none"> <li>a. plant</li> <li>b. equipment</li> <li>c. hazardous locations</li> <li>d. safe access/egress</li> </ul>
2.3 store, maintain and use in accordance with safe <b>working practices</b> and organisational requirements safety clothing, PPE and health and safety equipment
2.4 handle unauthorised personnel in the workplace in accordance with organisational procedures
2.5 maintain site safety by routine health and safety checks.

<b>Range</b>
<b>Working practices:</b> any activities, procedures, use of materials or equipment and working techniques used in carrying out your job.

<b>Learning outcome</b>
The learner will:
3. be able to respond to emergencies
<b>Assessment criteria</b>

The learner can:
3.1 use the designated response procedures promptly in accordance with recognised safe practice and organisational policy
3.2 respond to all accidents and emergencies that are within own capability and responsibility and report promptly to a <b>designated person</b>
3.3 use emergency appliances in accordance with approved procedures and practices.

<b>Range</b>
<b>Designated person</b> Those people specified within work and health and safety procedures

<b>Learning outcome</b>
The learner will:
4. be able to use and communicate data and information
<b>Assessment criteria</b>
The learner can:
4.1 comply with procedures where operating as a lone worker
4.2 report promptly, to the designated people, <b>potential hazards</b>
4.3 report situations which have the potential to escalate and pose risks to people that emerge from visual inspections and monitoring data
4.4 maintain accurate and up-to-date records that conform to health and safety specifications and safe <b>working practices</b> on routine matters and emergencies
4.5 maintain audit trails of records for quality assurance purposes
4.6 comply with the organisation's confidentiality policies.

<b>Range</b>
<b>Potential hazards:</b> Unsafe plant, equipment, hazardous locations outside own area of responsibility, high risk hazards outside own responsibility, emergencies, breaches of security <b>Working practices:</b> any activities, procedures, use of materials or equipment and working techniques used in carrying out your job

<b>Learning outcome</b>
The learner will:
5. be able to resolve problems that could affect health and safety
<b>Assessment criteria</b>
The learner can:
5.1 handle unsafe behaviour in accordance with the responsibilities of the job role and workplace procedures
5.2 demonstrate how to resolve day-to-day problems within the responsibility of the job role
5.3 refer matters outside the responsibility of the job role to designated people.

<b>Learning outcome</b>
The learner will: 6. know health and safety guidance and legislation in utilities network construction operations
<b>Assessment criteria</b>
The learner can: 6.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act 6.2 explain the health and safety guidance governing work in excavations 6.3 describe the safe procedures for handling hazardous materials 6.4 explain the organisational accident recording and reporting procedures 6.5 identify the range and use of personal protective equipment for the work.

<b>Learning outcome</b>
The learner will: 7. understand how to use information and communicate efficiently in network construction operations
<b>Assessment criteria</b>
The learner can: 7.1 describe the organisational requirements for storing information and documentation 7.2 explain the importance of supplying accurate information in a fit-for purpose format 7.3 explain the importance of supplying information within identified timescales 7.4 explain the importance of checking information received for accuracy, validity and meaning 7.5 identify inaccurate information and resolve misunderstandings 7.6 identify ways of recording verbal, written, and computerised information 7.7 describe when verbal, written, and computerised information should be used 7.8 explain how to interpret data in text, tabular and graphical formats 7.9 explain how to use data storage systems 7.10 explain the importance of storing information and documentation in the correct location 7.11 explain the way information is utilised when operating the processing plant and the implications of its use.

<b>Learning outcome</b>
The learner will: 8. understand how to maintain a safe and secure working environment
<b>Assessment criteria</b>

The learner can:

- 8.1 describe duties for health and safety as defined by specific legislation covering job role, specific responsibilities and scope in job description
- 8.2 identify hazards that may exist in the workplace
- 8.3 explain the importance of remaining alert to the presence of hazards in the work place
- 8.4 describe own job scope and responsibility for correcting risks
- 8.5 explain the importance of dealing with risks and promptly, reporting risks
- 8.6 explain the procedures for dealing with risks beyond the scope of own responsibility
- 8.7 define the monitoring procedures for hazardous-area work
- 8.8 explain the dangers associated with working in a confined space
- 8.9 explain the emergency procedures to follow when working in a confined space
- 8.10 explain the danger of work activities that could turn a relatively safe excavation into a confined space
- 8.11 explain the workplace requirements and guidance on precautions.

## Unit 602

## Install gas services up to 63mm

<b>Level:</b>	6
<b>Credit value:</b>	9
<b>GLH:</b>	40
<b>Relationship to NOS:</b>	This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNCG013A Install Gas services up to 63mm.
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	<p>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 install gas services up to 63mm.</p> <p>It includes being alert to and assessing, risk or hazardous conditions, the need to wear suitable safety clothing and the ability to follow operational procedures. Each individual will need to demonstrate competence in a minimum of three different installation techniques. Self-Lay Operatives completing this unit can be excluded from demonstrating competence in the full range of installation techniques but will usually be able to gather evidence of installing gas services by open cut, soil displacement and by insertion through suitable ducting.</p>

<b>Learning outcome</b>
The learner will: 1. be able to interpret technical information for installing components of the system
<b>Assessment criteria</b>
The learner can: 1.1 produce <b>work details</b> for <b>component</b> installation use 1.2 from the technical information take off <ul style="list-style-type: none"><li>• dimensions</li></ul>

	<ul style="list-style-type: none"> <li>• lengths</li> <li>• widths</li> <li>• quantities</li> <li>• utilities plant</li> <li>• services</li> <li>• buildings</li> <li>• kerbs</li> <li>• boundaries</li> </ul>
1.3	demonstrate how to make corrections through drawings, records and work documents.

<b>Range</b>
<b>Work details:</b> Drawings, records, work documents, manuals, technical specifications <b>Components:</b> Metallic and non-metallic and all ancillary pipes and fittings

<b>Learning outcome</b>
The learner will: 2. be able to select components and resources for installation of the system
<b>Assessment criteria</b>
The learner can: 2.1 select the type of <b>components</b> in compliance with the work and quality specifications 2.2 comply with procedures to replace defective <b>components</b> 2.3 comply with procedures to replace non-match <b>components</b> 2.4 comply with procedures to replace sub-standard <b>components</b> 2.5 confirm the availability of sufficient <b>resources</b> 2.6 handle changes to the planned use of the <b>resource</b> 2.7 confirm <b>components</b> and installation equipment are operational.

<b>Range</b>
<b>Components:</b> Metallic and non-metallic and all ancillary pipes and fittings <b>Resources:</b> Labour, plant, equipment, materials, consumables

<b>Learning outcome</b>
The learner will: 3. be able to install components of the system
<b>Assessment criteria</b>
The learner can: 3.1 determine the <b>method</b> of installation to be used when installing components of the system 3.2 carry out a site-specific risk assessment and review in accordance with company policy



3.3	select and wear the designated PPE
3.4	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 manufactures instructions
3.6	assemble components to industry standards using mechanical and/or fusion welding techniques
3.7	carry out site-specific tasks appropriately to prevent <b>equipment</b> damage
3.8	position <b>components</b> in accordance with the specification
3.9	protect installed assets with fine fill in accordance with specification and approved codes of practice
3.10	maintain proximity distances from other utilities apparatus in accordance with approved codes of practice
3.11	connect to the existing system using in-line squeeze off, side entry or top entry tee in accordance with codes of practice
3.12	support and anchor installed assets in accordance with codes of practice
3.13	confirm that the quality of the installation complies with the specified standard
3.14	maintain the security and safety of the system and third parties where work is not complete or not to schedule
3.15	ensure work practices conform to safe working procedures throughout the work activity
3.16	comply with procedures where lone working is required.

<b>Range</b>
<b>Method:</b> Dead insertion, live insertion, soil displacement, open cut
<b>Equipment:</b> Components, tools
<b>Components:</b> Metallic and non-metallic and all ancillary pipes and fittings

<b>Learning outcome</b>
The learner will:
4. be able to use and communicate data and information
<b>Assessment criteria</b>
The learner can:
4.1 provide <b>instructions</b> to individuals who will be using technical information
4.2 confirm instructions have been understood by individuals using technical information
4.3 report to a designated person inaccuracies in the technical information sources used
4.4 complete work documentation accurately
4.5 record work documentation in the specified place or pass to a <b>designated person</b>
4.6 comply with procedures if working on a 'Permit to Work' designated activity.

<b>Range</b>
--------------

**Instructions:** Oral, written  
**Designated person:** Those people specified within work and health and safety procedures

**Learning outcome**

The learner will:

5. be able to resolve problems that arise from technical information and installation work

**Assessment criteria**

The learner can:

- 5.1 report to the designated person damage or defects to **resources** using approved procedures
- 5.2 report to the **designated person** work which is incomplete and not to schedule
- 5.3 report to the **designated person** problems and conditions outside the responsibility of the job role.

**Range**

**Resources:** Equipment, materials and tools

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

**Learning outcome**

The learner will:

6. know health and safety guidance and legislation in 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 explain the health and safety guidance governing work in excavations
- 6.3 describe the safe procedures for handling hazardous materials
- 6.4 explain the organisational accident recording and reporting procedures
- 6.5 identify the range and use of personal protective equipment for the work.

**Learning outcome**

The learner will:

7. understand how to install gas services up to 63mm

**Assessment criteria**

The learner can:

- 7.1 state the main responsibilities of employers and employees under the current working at height regulations
- 7.2 explain the importance of carrying out on-site risk assessments and the need for constant review

7.3	explain the importance of implementing a safe system of work (SSOW) document when working in excavations
7.4	explain the importance of obtaining necessary permissions for isolation of any part of utilities network
7.5	explain the importance of complying with current industry standards
7.6	state the organisation's policy and procedures for meeting the relevant <ul style="list-style-type: none"> <li>• statutory requirements</li> <li>• regulations</li> <li>• codes of practice</li> </ul>
7.7	explain the implications of not obtaining the correct authorisation
7.8	explain the implications of using incorrect plant, tools and materials
7.9	explain the implications of using incorrect system components
7.10	explain the actions to be taken where plant, tools, materials and system <b>components</b> fail to meet required specification
7.11	describe faults associated with the use of inappropriate installation methods and tools
7.12	identify potential dangers in excavations
7.13	describe the factors affecting, and means of confirming, the suitability of excavations
7.14	explain the dangers of taking actions that can create confined space risks in excavations
7.15	describe the range of isolation methods available and the rationale for their selection
7.16	explain the procedure for obtaining authorisation to proceed with connections
7.17	identify the range of actions to be taken if work cannot proceed to schedule
7.18	explain how to determine appropriate safe remedial action if for any reason work cannot proceed
7.19	identify methods of accessing information from different <b>sources</b>
7.20	identify types and causes of likely disruptions
7.21	identify methods of avoiding disruption
7.22	explain the dangers of inadequate handling and lifting procedure
7.23	describe the types and signs of defect likely to be present on sub-system and means of determining the appropriate safe action.

<b>Range</b>
<b>Components:</b> metallic and non-metallic and all ancillary pipes and fittings
<b>Sources:</b> Reference documents, regulations, codes of practice

## Unit 602                      Install gas services up to 63mm

### Supporting information

#### Evidence requirements

Learning outcome 3 **must** be evidenced through workplace observation by an assessor. Competence in testing **must** be evidenced on pressure ranges:

- up to and including 75 mb
- above 75 mb to a maximum of 4 bar.

At least **one** of these pressure ranges **must** be evidenced as part of workplace observed assessment; the other can be assessed in a RWE through an Assessor Observation Report.

At least **one** of the methods specified in the range **must** be evidenced as part of workplace observed assessment; the other can be assessed in a RWE through an Assessor Observation Report.

## Unit 603

## Conduct specified testing of gas services

<b>Level:</b>	6
<b>Credit value:</b>	2
<b>GLH:</b>	10
<b>Relationship to NOS:</b>	This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNCG015B Conduct specified testing of Gas services.
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills
<b>Aim:</b>	The purpose of the unit is to assess the competence of individuals to recognised national occupational standards. The Unit supports workforce development and describes the competencies necessary to conduct specified testing of gas services. It includes making sure the manner in which tests are conducted and recorded meets the standards of quality assurance set by the organisation. It requires an understanding of safety requirements that need to be followed and adopted when carrying out test activities and procedures.

<b>Learning outcome</b>
The learner will: 1. be able to perform test activities
<b>Assessment criteria</b>
The learner can: 1.1 perform tasks safely and ensure all work is carried out in accordance with <b>legislative and regulatory requirements</b> 1.2 carry out a site specific risk assessment 1.3 select and wear the designated ppe 1.4 protect the test site from third party interference and the consequences of test failure on third parties 1.5 comply with procedures in accordance with work instructions and manufacturers specifications when using tools and equipment 1.6 anchor cap ends to withstand test pressures 1.7 confirm equipment is functioning in accordance with system operating requirements and parameters.

<b>Range</b>
<b>Legislative and regulatory requirements:</b> Health and safety and environment regulations, legislation, company procedures, statutory procedures

<b>Learning outcome</b>
The learner will: 2. be able to use and communicate data and information
<b>Assessment criteria</b>
The learner can: 2.1 set up and carry out the test activities, within agreed timescales, following <b>agreed industry standards and approved codes of practice</b> 2.2 review test results to establish that the performance of the system is in accordance to specifications and performance parameters 2.3 record the results of test activities and complete test record documents following reporting systems 2.4 use documentation in accordance with company procedures and statutory requirements.

<b>Range</b>
<b>Agreed industry standards and approved codes of practice:</b> work instructions; approved procedures and practices; statutory and regulatory requirements; drawings; plans; specifications for the pressure testing of gas network mains and services

<b>Learning outcome</b>
The learner will: 3. be able to resolve problems which arise when performing test activities
<b>Assessment criteria</b>
The learner can: 3.1 handle problems within the limits of the responsibility of the job role 3.2 communicate problems outside the responsibilities of the job role to the <b>designated person</b>

<b>Range</b>
<b>Designated person:</b> Those people specified within work and health and safety procedures

<b>Learning outcome</b>
The learner will: 4. know health and safety guidance and legislation in utilities network construction operations
<b>Assessment criteria</b>

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.

### **Learning outcome**

The learner will:

- 5. understand specified testing of gas services

### **Assessment criteria**

The learner can:

- 5.1 outline the health, safety and environmental requirements relevant to this activity
- 5.2 explain the importance of adequate anchorage during the testing procedure
- 5.3 explain how to use various types of test, purging and commissioning specifications for gas services
- 5.4 describe how to use various types of test, purging and commissioning equipment
- 5.5 explain how to calibrate the relevant pressure gauges
- 5.6 describe why pressure gauges need calibrating
- 5.7 explain how to interpret test results against specifications and codes of practice
- 5.8 describe the effect of atmospheric pressure and temperature on test results on services
- 5.9 outline the potential consequences of test failure to the environment.

## Unit 603                      Conduct specified testing of gas services

### Supporting information

#### Evidence requirements

Learning outcome 2 **must** be evidenced through workplace observation by an assessor. Competence in testing **must** be evidenced on pressure ranges

- up to and including 75 mb
- above 75 mb to a maximum of 4 bar.

At least **one** of these pressure ranges **must** be evidenced as part of workplace observed assessment; the other can be assessed in a RWE through an Assessor Observation Report.



## Unit 604

## Restore gas network components to operational condition by repair

<b>Level:</b>	6
<b>Credit value:</b>	2
<b>GLH:</b>	10
<b>Relationship to NOS:</b>	This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC019 Restore gas components to operational condition by repair
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills
<b>Aim:</b>	The purpose of this unit is to assess the competence of individuals to recognised national occupational standards. This unit supports workforce development and is designed to assess the competence of individuals to carry out repairs to components on mains or services. It requires the installation of external mechanical fittings, both temporary and permanent.

<b>Learning outcome</b>
The learner will: 1. be able to restore components to operational condition
<b>Assessment criteria</b>
The learner can: 1.1 perform work activities in accordance with <b>legislative and regulatory practices</b> 1.2 carry out a site specific risk assessment in accordance with company procedures 1.3 select and wear the designated PPE and breathing apparatus 1.4 check and position a minimum of two fire extinguishers in suitable locations for the work activity 1.5 prepare the <b>component</b> for repair 1.6 carry out <b>repairs</b> in accordance with specifications and work instructions, to agreed timescale using approved materials and components 1.7 confirm the repaired component meets the specified operating conditions and parameters.

<b>Range</b>
<p><b>Legislative and regulatory practices:</b> Health and safety and environment regulations, legislation, statutory and regulatory requirements, company procedures, safe working practices</p> <p><b>Component:</b> metallic and non-metallic and all ancillary pipes and fittings</p> <p><b>Repairs:</b> Joints, horizontal and circumferential cracks and breaks, corrosion and interference damage</p>

<b>Learning outcome</b>
The learner will:
2. be able to use and communicate data and information
<b>Assessment criteria</b>
The learner can:
2.1 produce accurate and complete records of all <b>repair</b> work carried out.

<b>Range</b>
<b>Repair:</b> Joints, horizontal and circumferential cracks and breaks, corrosion and interference damage

<b>Learning outcome</b>
The learner will:
3. be able to resolve problems that arise when restoring components to operational condition
<b>Assessment criteria</b>
The learner can:
3.1 handle problems within the limits of own responsibility
3.2 communicate problems outside job responsibilities to <b>designated person.</b>

<b>Range</b>
<b>Designated person:</b> Those people specified within work and health and safety procedures

<b>Learning outcome</b>
The learner will:
4. know health and safety guidance and legislation in utilities network construction operations
<b>Assessment criteria</b>
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.

### Learning outcome

The learner will:

- 5. understand the restoration of gas network components to operational condition by repair

### Assessment criteria

The learner can:

- 5.1 state the health, safety and environment legislation, relevant to the work activities
- 5.2 state environmental procedures, relevant to the work activities
- 5.3 state codes of practice, relevant to the work activities
- 5.4 state company procedures, relevant to the work activities
- 5.5 describe how to select the **repair technique** to be used for the specification of the **component** to be repaired
- 5.6 identify various **components** in use on the gas network
- 5.7 identify types of tools and equipment to be used when restoring **components** to operating condition by repair
- 5.8 define the care and control procedures to be used to ensure compliance with live gas working
- 5.9 explain the need to deploy fire extinguishers at the scene of a gas escape
- 5.10 explain the need to wear breathing apparatus when working on a live gas repair
- 5.11 explain the types of records and documentation used to record maintenance activities
- 5.12 explain the reporting procedures to use.

### Range

**Components:** Metallic and non-metallic and all ancillary pipes and fittings

**Repair techniques:** mains and services; pressure ranges to include up to and including 75mb and above 75mb

## Unit 605

## Assess and minimise risks to life, property and the environment during gas escapes

<b>Level:</b>	6
<b>Credit value:</b>	3
<b>GLH:</b>	20
<b>Relationship to NOS:</b>	This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC020 Minimise risks to life, property and the environment during Gas escapes
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills
<b>Aim:</b>	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 to assess, prioritise and minimise risks and hazards to life, property and the environment during gas emergencies. It involves implementing the appropriate procedures and policies that must be followed to reduce or remove risks and hazards. It includes making sure all the work is carried out safely in accordance with industry specific operational procedures, and systems associated with risk reduction and/or removal.

<b>Learning outcome</b>
The learner will: 1. be able to assess risks to life, property and the environment during gas emergencies
<b>Assessment criteria</b>
The learner can: 1.1 perform work activities in accordance with <b>legislative and regulatory requirements</b> 1.2 carry out a site specific risk assessment, both inside and outside of properties 1.3 select and wear the designated PPE

- |     |                                                                    |
|-----|--------------------------------------------------------------------|
| 1.4 | assess the hazards and the level and severity of the risk involved |
| 1.5 | record the findings of hazard assessment.                          |

<b>Range</b>
--------------

<b>Legislative and regulatory requirements:</b> Health, safety and environment regulations, legislation, statutory and regulatory requirements, company procedures, safe working practices, risk assessments
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |    |                                                                                                       |
|----|-------------------------------------------------------------------------------------------------------|
| 2. | be able to minimise and prioritise risks to life, property and the environment during gas emergencies |
|----|-------------------------------------------------------------------------------------------------------|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |     |                                                                                                                                                                                                                    |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1 | prioritise hazards and minimise the risk to safeguard life, property and the environment, including evacuation and forced entry                                                                                    |
| 2.2 | make safe hazards that can be rectified safely                                                                                                                                                                     |
| 2.3 | make safe sources and potential sources of ignition                                                                                                                                                                |
| 2.4 | monitor the effectiveness of the risk control measures and take prompt additional action where it is required                                                                                                      |
| 2.5 | establish and maintain a safe working area                                                                                                                                                                         |
| 2.6 | demonstrate how to ventilate <ul style="list-style-type: none"> <li>a. property</li> <li>b. voids</li> <li>c. ducts</li> <li>d. drains</li> <li>e. other street furniture</li> </ul>                               |
| 2.7 | excavate to prevent underground tracking gas from entering <ul style="list-style-type: none"> <li>a. property</li> <li>b. voids</li> <li>c. ducts</li> <li>d. drains</li> <li>e. other street furniture</li> </ul> |
| 2.8 | recheck the site and ensure it is clear.                                                                                                                                                                           |

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |    |                                                            |
|----|------------------------------------------------------------|
| 3. | be able to use approved gas detection and safety equipment |
|----|------------------------------------------------------------|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |     |                                                                                                                                                                                                      |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.1 | confirm safety equipment is available for use in accordance with site specific risk assessment                                                                                                       |
| 3.2 | confirm that gas detection equipment meets <b>standards</b>                                                                                                                                          |
| 3.3 | take and record, high and low level atmosphere samples from <ul style="list-style-type: none"> <li>a. • internal spaces</li> <li>b. • external sources</li> <li>c. • no access properties</li> </ul> |

<ul style="list-style-type: none"> <li>d. • voids</li> <li>e. • bar holes</li> <li>f. • plant</li> <li>g. • street furniture</li> </ul>
3.4 check for gas ingress to properties and voids.

<b>Range</b>
<b>Standards:</b> Approved, in date, correctly calibrated

<b>Learning outcome</b>
The learner will:
4. be able to use and communicate data and information
<b>Assessment criteria</b>
The learner can:
4.1 maintain contact with the emergency call centre
4.2 communicate to individuals affected by the risk control measures which are in place
4.3 confirm information provided about safety systems is clear, accurate and concise
4.4 record the results of testing activities and steps taken, using company reporting systems and documentation.

<b>Learning outcome</b>
The learner will:
5. be able to resolve problems that arise when testing for escapes of gas
<b>Assessment criteria</b>
The learner can:
5.1 handle problems within the limits of the responsibility of the job role
5.2 communicate problems outside the responsibilities of the job role to the <b>designated person</b> .

<b>Range</b>
<b>Designated person:</b> Those people specified within work and health and safety procedures

<b>Learning outcome</b>
The learner will:
6. know health and safety guidance and legislation in utilities network construction operations
<b>Assessment criteria</b>
The learner can:
6.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
6.2 explain the health and safety guidance governing work in excavations

6.3	describe the safe procedures for handling hazardous materials
6.4	explain the organisational accident recording and reporting procedures
6.5	identify the range and use of personal protective equipment for the work.

<b>Learning outcome</b>	
The learner will:	
7.	understand how to minimise risks to life, property and the environment during gas escapes
<b>Assessment criteria</b>	
The learner can:	
7.1	state the order of priority to safeguard life, property and the environment
7.2	state the <b>reporting lines and procedures</b> to be used when dealing with gas emergencies
7.3	identify different types of hazards and risks that could occur during a gas emergency
7.4	state the properties of liquified petroleum gas (LPG)
7.5	explain the criticality of different types of risk
7.6	explain why it is important to reduce the risk quickly
7.7	describe the consequences of failure to control the risks to the public, property and the environment
7.8	identify the type of information on the risk which is important.

<b>Range</b>	
<b>Reporting lines and procedures:</b> Who should be kept informed of progress, the criteria to be used for forced entry into buildings, the criteria to be used for excavation of properties, the policy for dealing with media and emergency services during a gas emergency	

## Unit 606

## Conduct specified testing of gas networks associated with leakage location

<b>Level:</b>	6
<b>Credit value:</b>	3
<b>GLH:</b>	20
<b>Relationship to NOS:</b>	This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC021 Conduct specified testing of gas networks associated with leakage location
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills
<b>Aim:</b>	The purpose of the Unit is to assess the competence of individuals to recognised national occupational standards. This Unit supports workforce development and is designed to assess the competence of individuals to conduct tests to determine the location of gas leaks. It involves making sure all work is carried out safely in accordance with all health and safety requirements and regulations, industry standards, and standards set by the organisation

<b>Learning outcome</b>
The learner will: 1. be able to conduct specified testing of gas networks associated with leakage location
<b>Assessment criteria</b>
The learner can: 1.1 perform work activities safely at all times in accordance with <b>legislative and regulatory requirements</b> 1.2 carry out a site specific risk assessment and review in accordance with company procedures 1.3 select and wear the designated PPE 1.4 select and use the specified equipment for <b>testing</b> 1.5 use <b>testing</b> and purging tools and equipment in accordance with <b>industry standards and codes of practice</b>



- |     |                                                                                                                                                 |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.6 | determine the <b>testing</b> methods to be employed and procedure to be followed to locate the escape of gas in ducts and underground apparatus |
| 1.7 | set up and carry out the tests within agreed timescales.                                                                                        |

<b>Range</b>
--------------

<p><b>Legislative and regulatory requirements:</b> Health, safety and environment requirements, legislation, industry standards, statutory requirements, company procedures, work instructions</p>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p><b>Testing:</b> Bar hole and other leakage surveys, pressure tests, and decay testing</p>
----------------------------------------------------------------------------------------------

<p><b>Industry standards and codes of practice:</b> work instructions; health and safety regulations; codes of practice; equipment specifications</p>
-------------------------------------------------------------------------------------------------------------------------------------------------------

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |                                                        |
|--------------------------------------------------------|
| 2. be able to use and communicate data and information |
|--------------------------------------------------------|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |     |                                                                                                            |
|-----|------------------------------------------------------------------------------------------------------------|
| 2.1 | communicate to individuals affected by the risk control measures in place                                  |
| 2.2 | confirm information provided about safety systems is clear, accurate and concise                           |
| 2.3 | review the results of the test to make sure the type and precise location of the leak has been established |
| 2.4 | record the results of testing activities using company reporting systems and documentation.                |

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |                                                                               |
|-------------------------------------------------------------------------------|
| 3. be able to resolve problems that arise when testing gas networks for leaks |
|-------------------------------------------------------------------------------|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |     |                                                                                                     |
|-----|-----------------------------------------------------------------------------------------------------|
| 3.1 | handle problems within the limits of the responsibility of the job role                             |
| 3.2 | communicate problems outside the responsibilities of the job role to the <b>designated person</b> . |

<b>Range</b>
--------------

<p><b>Designated person:</b> those people specified within work and health and safety procedures</p>
------------------------------------------------------------------------------------------------------

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

4. know health and safety guidance and legislation in utilities network construction operations
<b>Assessment criteria</b>
<p>The learner can:</p> <p>4.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act</p> <p>4.2 explain the health and safety guidance governing work in excavations</p> <p>4.3 describe the safe procedures for handling hazardous materials</p> <p>4.4 explain the organisational accident recording and reporting procedures</p> <p>4.5 identify the range and use of personal protective equipment for the work.</p>

<b>Learning outcome</b>
<p>The learner will:</p> <p>5. Understand specified testing of gas networks associated with leakage location</p>
<b>Assessment criteria</b>
<p>The learner can:</p> <p>5.1 state the reporting lines and procedures to be used</p> <p>5.2 identify types of test procedures that can be used to locate leaks</p> <p>5.3 identify the correct and appropriate test procedure for a given situation</p> <p>5.4 interpret and follow test procedures and documentation</p> <p>5.5 explain how to calibrate the relevant pressure gauge</p> <p>5.6 explain why the relevant pressure gauge should be calibrated</p> <p>5.7 demonstrate bar holing, sampling and escape surveying techniques used on services and mains</p> <p>5.8 interpret test and purging results against specifications</p> <p>5.9 describe the consequences of test failures to the public, property and the environment</p> <p>5.10 identify various test records that are required</p> <p>5.11 describe the consequences of incorrectly recording and reporting test results in line with industry requirements.</p>

## Unit 607

## Analyse and interpret the results of gas leakage surveys to determine the location of gas escapes

<b>Level:</b>	6
<b>Credit value:</b>	3
<b>GLH:</b>	20
<b>Relationship to NOS:</b>	This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC022 Analyse and interpret the results of surveys to determine the location of gas escapes
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	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 analyse and interpret tests for escape location on services and mains operating at all relevant pressures. It includes the need to work safely to industry standards in accordance with health, safety and environment legislation, regulations and safe working practices, engineering specifications for the products, analysis methods and techniques.

<b>Learning outcome</b>
The learner will: 1. be able to analyse and interpret the results of surveys to determine the location of escapes
<b>Assessment criteria</b>
The learner can: 1.1 perform work activities safely in accordance with <b>legislative and regulatory requirements</b> 1.2 obtain the necessary <b>test data</b> on which to conduct the analysis 1.3 analyse data using specified methods in accordance quality assurance standards 1.4 check the data analysis is accurate, thorough and takes account of the test conditions

- |     |                                                                           |
|-----|---------------------------------------------------------------------------|
| 1.5 | compare the analysis against the product or asset specification           |
| 1.6 | identify faults and variations from specification                         |
| 1.7 | perform necessary actions based on the findings of the analysis activity. |

<b>Range</b>
--------------

<p><b>Legislative and regulatory requirements:</b> Health, safety and environment requirements, legislation, industry standards, statutory requirements, company procedures, work instruction</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p><b>Test data:</b> Results obtained from bar hole and other leakage surveys, pressure tests, and decay testing</p>
----------------------------------------------------------------------------------------------------------------------

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |                                                        |
|--------------------------------------------------------|
| 2. be able to use and communicate data and information |
|--------------------------------------------------------|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------|
| 2.1 record the results of the analysis in accordance with company communication and documentation systems            |
| 2.2 record actions taken as a result of the analysis in accordance with company reporting systems and documentation. |

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |                                                                                                  |
|--------------------------------------------------------------------------------------------------|
| 3. be able to resolve problems that arise when analysing and interpreting the results of surveys |
|--------------------------------------------------------------------------------------------------|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |                                                                                                         |
|---------------------------------------------------------------------------------------------------------|
| 3.1 resolve inconsistencies in the <b>test data</b> in accordance with company procedures               |
| 3.2 handle problems within the limits of the responsibility of the job role                             |
| 3.3 communicate problems outside the responsibilities of the job role to the <b>designated person</b> . |

<b>Range</b>
--------------

<p><b>Test data:</b> Results obtained from bar hole and other leakage surveys, pressure tests, and decay testing</p>
----------------------------------------------------------------------------------------------------------------------

<p><b>Designated person:</b> Those people specified within work and health and safety procedures</p>
------------------------------------------------------------------------------------------------------

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |                                                                                                 |
|-------------------------------------------------------------------------------------------------|
| 4. know health and safety guidance and legislation in utilities network construction operations |
|-------------------------------------------------------------------------------------------------|

<b>Assessment criteria</b>
----------------------------

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 requirements and regulations relating to the management of gas.

<b>Learning outcome</b>	
The learner will:	
5.	understand how to analyse and interpret the results of gas leakage surveys to determine the location of gas escapes
<b>Assessment criteria</b>	
The learner can:	
5.1	explain the engineering specifications for products and assets, including pressure gauge, pipe supply configurations, and location
5.2	describe how to use analysis methods and techniques, including comparison of standard conditions with <b>test data</b>
5.3	describe the various types of standard test documentation and procedures for survey completion
5.4	identify the measures to take in the event of an <b>escape</b> being located.

<b>Range</b>
<p><b>Test data:</b> Results obtained from bar hole and other leakage surveys, pressure tests, and decay testing</p> <p><b>Escape:</b> Controlled or uncontrolled release of gas from an engineering product or asset</p>

<b>Level:</b>	6
<b>Credit value:</b>	8
<b>GLH:</b>	50
<b>Relationship to NOS:</b>	This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNCG013G Install or replace external gas service risers.
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	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 interpret technical specifications and install or replace external gas service risers. It includes being alert to and assessing, risk or hazardous conditions, the need to wear suitable safety clothing and the ability to follow operational procedures.

<b>Learning outcome</b>
<p>The learner will:</p> <ol style="list-style-type: none"> <li>be able to interpret technical information for installing components of the system</li> </ol>
<b>Assessment criteria</b>
<p>The learner can:</p> <ol style="list-style-type: none"> <li>produce <b>work details</b> for <b>component</b> installation use</li> <li>from the technical information take off <ul style="list-style-type: none"> <li>dimensions</li> <li>lengths</li> <li>widths</li> <li>quantities</li> <li>utilities plant</li> <li>services</li> <li>buildings</li> <li>kerbs</li> <li>boundaries</li> </ul> </li> <li>demonstrate how to make corrections through drawings, records and work documents.</li> </ol>

<b>Range</b>
<p><b>Work details:</b> drawings, records, work documents, manuals, technical specifications</p> <p><b>Component:</b> metallic and non-metallic and all ancillary pipes and fittings</p>

<b>Learning outcome</b>
<p>The learner will:</p> <p>2. be able to select components and resources for installation of the system</p>
<b>Assessment criteria</b>
<p>The learner can:</p> <p>2.1 select the type of <b>components</b> in compliance with the work and quality specifications</p> <p>2.2 comply with procedures to replace defective <b>components</b></p> <p>2.3 comply with procedures to replace non-match <b>components</b></p> <p>2.4 comply with procedures to replace sub-standard <b>components</b></p> <p>2.5 confirm the availability of sufficient components and <b>resources</b></p> <p>2.6 handle changes to the planned use of the resource</p> <p>2.7 confirm <b>components</b> and installation equipment are operational.</p>

<b>Range</b>
<p><b>Components:</b> metallic and non-metallic and all ancillary pipes and fittings</p> <p><b>Resources:</b> labour, plant, equipment, materials, consumables</p>

<b>Learning outcome</b>
<p>The learner will:</p> <p>3. be able to install components of the system</p>
<b>Assessment criteria</b>
<p>The learner can:</p> <p>3.1 determine the <b>method</b> of installation to be used when installing <b>components</b> of the system</p> <p>3.2 carry out a site-specific risk assessment and review in accordance with company policy</p> <p>3.3 select and wear the designated PPE</p> <p>3.4 confirm the condition of the excavation conforms with instructions and specifications</p> <p>3.5 select, prepare and operate installation equipment in accordance with the specification and manufactures instructions</p> <p>3.6 assemble <b>components</b> to industry standards using mechanical and/or fusion welding techniques</p> <p>3.7 carry out site-specific tasks appropriately to prevent <b>equipment</b> damage</p> <p>3.8 position <b>components</b> in accordance with the specification</p> <p>3.9 protect installed assets with fine fill in accordance with specification and approved codes of practice</p>

3.10	maintain proximity distances from other utilities apparatus in accordance with approved codes of practice
3.11	connect to the existing system using in-line squeeze off, side entry or top entry tee in accordance with codes of practice
3.12	support and anchor installed assets in accordance with codes of practice
3.13	confirm that the quality of the installation complies with the specified standard
3.14	maintain the security and safety of the system and third parties where work is not complete or not to schedule
3.15	ensure work practices conform to safe working procedures throughout the work activity
3.16	comply with procedures where lone working is required.

<b>Range</b>
<b>Method:</b> Dead insertion, live insertion, new installation
<b>Equipment:</b> Components, tools
<b>Components:</b> Metallic and non-metallic and all ancillary pipes and fittings

<b>Learning outcome</b>
The learner will:
4. be able to use and communicate data and information
<b>Assessment criteria</b>
The learner can:
4.1 provide <b>instructions</b> to individuals who will be using technical information
4.2 confirm instructions have been understood by individuals using technical information
4.3 report to a designated person inaccuracies in the technical information sources used
4.4 complete work documentation accurately
4.5 record work documentation in the specified place or pass to a <b>designated person</b>
4.6 comply with procedures if working on a 'Permit to Work' designated activity

<b>Range</b>
<b>Instructions:</b> Oral, written
<b>Designated person:</b> Those people specified within work and health and safety procedures

<b>Learning outcome</b>
The learner will:
5. be able to resolve problems that arise from technical information and installation work
<b>Assessment criteria</b>
The learner can:
5.1 report to the <b>designated person</b> damage or defects to <b>resources</b> using approved procedures



5.2	report to the <b>designated person</b> work which is incomplete and not to schedule
5.3	report to the <b>designated person</b> problems and conditions outside the responsibility of the job role.

<b>Range</b>
<b>Designated person:</b> Those people specified within work and health and safety procedures
<b>Resources:</b> Materials, tools

<b>Learning outcome</b>
The learner will:
6. know health and safety guidance and legislation in utilities network construction operations
<b>Assessment criteria</b>
The learner can:
6.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
6.2 explain the health and safety guidance governing work in excavations
6.3 describe the safe procedures for handling hazardous materials
6.4 explain the organisational accident recording and reporting procedures
6.5 identify the range and use of personal protective equipment for the work.

<b>Learning outcome</b>
The learner will:
7. understand how to install or replace external gas service risers
<b>Assessment criteria</b>
The learner can:
7.1 state the main responsibilities of employers and employees under the current working at height regulations
7.2 explain the importance of carrying out on-site risk assessments and the need for constant review
7.3 explain the importance of implementing a safe system of work (SSOW) document when working in excavations
7.4 explain the importance of obtaining necessary permissions for isolation of any part of utilities network
7.5 explain the importance of complying with current industry standards
7.6 state the organisation's policy and procedures for meeting the relevant <ul style="list-style-type: none"> <li>• statutory requirements</li> <li>• regulations</li> <li>• codes of practice</li> </ul>
7.7 explain the implications of not obtaining the correct authorisation
7.8 explain the implications of using incorrect plant, tools and materials

7.9	explain the implications of using incorrect system <b>components</b>
7.10	explain the actions to be taken where plant, tools, materials and system <b>components</b> fail to meet required specification
7.11	describe faults associated with the use of inappropriate installation methods and tools
7.12	identify potential dangers in excavations
7.13	describe the factors affecting, and means of confirming, the suitability of excavations
7.14	explain the dangers of taking actions that can create confined space risks in excavations
7.15	describe the range of isolation methods available and the rationale for their selection
7.16	explain the procedure for obtaining authorisation to proceed with connections
7.17	identify the range of actions to be taken if work cannot proceed to schedule
7.18	explain how to determine appropriate safe remedial action if for any reason work cannot proceed
7.19	identify methods of accessing information from different <b>sources</b>
7.20	identify types and causes of likely disruptions
7.21	identify methods of avoiding disruption
7.22	explain the dangers of inadequate handling and lifting procedure
7.23	describe the types and signs of defect likely to be present on sub-system and means of determining the appropriate safe action.

<b>Range</b>
<b>Sources:</b> Reference documents, regulations, code of practice <b>Components:</b> Metallic and non-metallic and all ancillary pipes and fittings

## Unit 609

## Install gas engineering products or assets up to 180mm

<b>Level:</b>	6
<b>Credit value:</b>	13
<b>GLH:</b>	50
<b>Relationship to NOS:</b>	This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNCG013C Install gas engineering products or assets up to 180mm
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	<p>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 interpret technical specifications and install gas engineering products or assets up to and including 180mm.</p>

It includes being alert to and assessing, risk or hazardous conditions, the need to wear suitable safety clothing and the ability to follow operational procedures. Each individual will need to demonstrate competence in a minimum of three different installation techniques. Self-Lay Operatives completing this unit can be excluded from demonstrating competence in the full range of installation techniques but will usually be able to gather evidence of installing engineering products or assets by open cut, soil displacement and by insertion through suitable ducting.

<b>Learning outcome</b>
The learner will: 1. be able to interpret technical information for installing components of the system
<b>Assessment criteria</b>

<p>The learner can:</p> <ol style="list-style-type: none"> <li>1.1 produce <b>work details</b> for component installation use</li> <li>1.2 from the technical information take off: <ol style="list-style-type: none"> <li>a. dimensions</li> <li>b. lengths</li> <li>c. widths</li> <li>d. quantities</li> <li>e. utilities plant</li> <li>f. services</li> <li>g. buildings</li> <li>h. kerbs</li> <li>i. boundaries</li> </ol> </li> <li>1.3 demonstrate how to make corrections through drawings, records and work documents.</li> </ol>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

#### Range

**Work details:** Drawings, records, work documents, manuals, technical specifications

#### Learning outcome

The learner will:

2. be able to select components and resources for installation of the system

#### Assessment criteria

The learner can:

- 2.1 select the type of **components** in compliance with the work and quality specifications
- 2.2 comply with procedures to replace defective **components**
- 2.3 comply with procedures to replace non-match **components**
- 2.4 comply with procedures to replace sub-standard **components**
- 2.5 confirm the availability of sufficient **resources**
- 2.6 handle changes to the planned use of the resource
- 2.7 confirm **components** and installation equipment are operational.

#### Range

**Resources:** Labour, plant, equipment, materials, consumables

**Components:** Metallic and non-metallic and all ancillary pipes and fittings

#### Learning outcome

The learner will:

3. be able to install components of the system

#### Assessment criteria

The learner can:

- 3.1 determine the **method** of installation to be used when installing **components** of the system
- 3.2 carry out a site-specific risk assessment and review in accordance with company policy

- 3.3 select and wear the designated PPE
- 3.4 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 manufactures instructions
- 3.6 assemble components to industry standards using mechanical and/or fusion welding techniques
- 3.7 carry out site-specific tasks appropriately to prevent **equipment** damage
- 3.8 position **components** in accordance with the specification
- 3.9 protect installed assets with fine fill in accordance with specification and approved codes of practice
- 3.10 maintain proximity distances from other utilities apparatus in accordance with approved codes of practice
- 3.11 connect to the existing system using in-line squeeze off, side entry or top entry tee in accordance with codes of practice
- 3.12 support and anchor installed assets in accordance with codes of practice
- 3.13 confirm that the quality of the installation complies with the specified standard
- 3.14 maintain the security and safety of the system and third parties where work is not complete or not to schedule
- 3.15 ensure work practices conform to safe working procedures throughout the work activity
- 3.16 comply with procedures where lone working is required.

#### Range

**Method:** Dead insertion, live insertion, soil displacement, open cut

**Components:** Metallic and non-metallic and all ancillary pipes and fittings

**Equipment:** Components, tools

#### Additional Guidance

This outcome **must** be evidenced through workplace observation by an assessor.

At least **one** of the methods specified in the range **must** be evidenced as part of workplace observed assessment; the other can be assessed in a RWE through an Assessor Observation Report

#### Learning outcome

The learner will:

- 4. be able to use and communicate data and information

#### Assessment criteria

The learner can:

- 4.1 provide **instructions** to individuals who will be using technical information
- 4.2 confirm instructions have been understood by individuals using technical information

- 4.3 report to a **designated person** inaccuracies in the technical information sources used
- 4.4 complete work documentation accurately
- 4.5 record work documentation in the specified place or pass to a **designated person**
- 4.6 comply with procedures if working on a 'Permit to Work' designated activity.

#### Range

**Instructions:** Oral, written

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

#### Learning outcome

The learner will:

- 5. be able to resolve problems that arise from technical information and installation work

#### Assessment criteria

The learner can:

- 5.1 report to the **designated person** damage or defects to **resources** using approved procedures
- 5.2 report to the **designated person** work which is incomplete and not to schedule
- 5.3 report to the **designated person** problems and conditions outside the responsibility of the job role.

#### Range

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

**Resources:** Equipment, materials and tools

#### Learning outcome

The learner will:

- 6. know Health and Safety guidance and legislation in 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 explain the health and safety guidance governing work in excavations
- 6.3 describe the safe procedures for handling hazardous materials
- 6.4 explain the organisational accident recording and reporting procedures
- 6.5 identify the range and use of personal protective equipment for the work.

#### Learning outcome

<p>The learner will:</p> <p>7. understand how to install gas engineering products or assets up to 180mm</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>7.1 state the main responsibilities of employers and employees under the current working at height regulations</p> <p>7.2 explain the importance of carrying out on-site risk assessments and the need for constant review</p> <p>7.3 explain the importance of implementing a safe system of work (SSOW) document when working in excavations</p> <p>7.4 explain the importance of obtaining necessary permissions for isolation of any part of utilities network</p> <p>7.5 explain the importance of complying with current industry standards</p> <p>7.6 state the organisation's policy and procedures for meeting the relevant</p> <ul style="list-style-type: none"> <li>• statutory requirements</li> <li>• regulations</li> <li>• codes of practice</li> </ul> <p>7.7 explain the implications of not obtaining the correct authorisation</p> <p>7.8 explain the implications of using incorrect plant, tools and materials</p> <p>7.9 explain the implications of using incorrect system components</p> <p>7.10 explain the actions to be taken where plant, tools, materials and system components fail to meet required specification</p> <p>7.11 describe faults associated with the use of inappropriate installation methods and tools</p> <p>7.12 identify potential dangers in excavations</p> <p>7.13 describe the factors affecting, and means of confirming, the suitability of excavations</p> <p>7.14 explain the dangers of taking actions that can create confined space risks in excavations</p> <p>7.15 describe the range of isolation methods available and the rationale for their selection</p> <p>7.16 explain the procedure for obtaining authorisation to proceed with connections</p> <p>7.17 identify the range of actions to be taken if work cannot proceed to schedule</p> <p>7.18 explain how to determine appropriate safe remedial action if for any reason work cannot proceed</p> <p>7.19 identify methods of accessing information from different</p> <p><b>sources</b></p> <p>7.20 identify types and causes of likely disruptions</p> <p>7.21 identify methods of avoiding disruption</p> <p>7.22 explain the dangers of inadequate handling and lifting procedure</p> <p>7.23 describe the types and signs of defect likely to be present on sub-system and means of determining the appropriate safe action.</p>
<p><b>Range</b></p>
<p><b>Sources:</b> Reference documents, regulations, codes of practice</p>





## Unit 610

## Conduct specified testing of gas engineering products or assets - mains

<b>Level:</b>	6
<b>Credit value:</b>	3
<b>GLH:</b>	10
<b>Relationship to NOS:</b>	This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNCG015A Conduct specified testing of Gas network engineering products or assets – mains
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	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 conduct specified testing of gas mains. It includes making sure the manner in which tests are conducted and recorded meets the standards of quality assurance set by the organisation. It requires an understanding of safety requirements that need to be followed and adopted when carrying out test activities and procedures.

<b>Learning outcome</b>
The learner will: 1. be able to perform test activities
<b>Assessment criteria</b>
The learner can: 1.1 perform tasks safely and ensure all work is carried out in accordance with <b>legislative and regulatory requirements</b> 1.2 carry out a site specific risk assessment 1.3 select and wear the designated PPE 1.4 protect the test site from third party interference and the consequences of test failure on third parties 1.5 comply with procedures in accordance with work instructions and manufacturers specifications when using tools and equipment 1.6 anchor cap ends to withstand test pressures

- |                                                                                                       |
|-------------------------------------------------------------------------------------------------------|
| 1.7 confirm equipment is functioning in accordance with system operating requirements and parameters. |
|-------------------------------------------------------------------------------------------------------|

<b>Range</b>
--------------

<b>Legislative and regulatory requirements:</b> Health and safety and environment regulations, legislation, company procedures, statutory procedures
------------------------------------------------------------------------------------------------------------------------------------------------------

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |                                                        |
|--------------------------------------------------------|
| 2. be able to use and communicate data and information |
|--------------------------------------------------------|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1 set up and carry out the test activities, within agreed timescales, following <b>agreed industry standards and approved codes of practice</b> |
| 2.2 review test results to establish that the performance of the system is in accordance with specifications and performance parameters           |
| 2.3 record the results of test activities and complete test record documents following reporting systems                                          |
| 2.4 use documentation in accordance with company procedures and statutory requirements.                                                           |

<b>Range</b>
--------------

<b>Agreed industry standards and approved codes of practice:</b> work instructions; approved procedures and practices; statutory and regulatory requirements; drawings; plans; specifications for the pressure testing of gas network mains and services
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |                                                                            |
|----------------------------------------------------------------------------|
| 3. be able to resolve problems which arise when performing test activities |
|----------------------------------------------------------------------------|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |                                                                                                         |
|---------------------------------------------------------------------------------------------------------|
| 3.1 handle problems within the limits of the responsibility of the job role                             |
| 3.2 communicate problems outside the responsibilities of the job role to the <b>designated person</b> . |

<b>Range</b>
--------------

<b>Designated person:</b> Those people specified within work and health and safety procedures
-----------------------------------------------------------------------------------------------

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |                                                                                                 |
|-------------------------------------------------------------------------------------------------|
| 4. know health and safety guidance and legislation in utilities network construction operations |
|-------------------------------------------------------------------------------------------------|

<b>Assessment criteria</b>
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.



<b>Learning outcome</b>
The learner will: 5. understand specified testing of Gas network engineering products or assets - mains
<b>Assessment criteria</b>
The learner can: 5.1 outline the health, safety and environmental requirements relevant to this activity 5.2 explain the importance of adequate anchorage during the testing procedure 5.3 explain how to use various types of test, purging and commissioning specifications for gas mains 5.4 describe how to use various types of test, purging and commissioning equipment 5.5 explain how to calibrate the relevant pressure gauges 5.6 describe why pressure gauges need calibrating 5.7 explain how to interpret test results against specifications and codes of practice 5.8 describe the effect of atmospheric pressure and temperature on test results on mains 5.9 outline the potential consequences of test failure to the environment.

## Unit 610

## Conduct specified testing of gas engineering products or assets - mains

### Supporting information

#### Evidence requirements

Learning outcomes 1 and 2 **must** be evidenced through workplace observation by an assessor. Competence in testing **must** be evidenced on pressure ranges:

- up to and including 75 mb
- above 75 mb to a maximum of 4 bar.

At least **one** of these pressure ranges **must** be evidenced as part of workplace observed assessment; the other can be assessed in a RWE through an Assessor Observation Report.

## Unit 611

## Conduct specified connections to gas network mains and commissioning

<b>Level:</b>	6
<b>Credit value:</b>	3
<b>GLH:</b>	18
<b>Relationship to NOS:</b>	This unit is linked to the following Energy & Utility Skills National Occupational Standards (NOS) for Network Construction Operations: MUNC016 Conduct specified connections to gas network mains and commissioning
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	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 conduct specified connections to gas network mains and commissioning. It requires a high level of knowledge of the various types of connection techniques available, and the particular circumstances in which they can be used. It includes being alert to and assessing, risk or hazardous conditions, the need to wear suitable safety clothing and the ability to follow operational procedures.

<b>Learning outcome</b>
The learner will: 1. be able to interpret technical information for connecting engineering assets to the system
<b>Assessment criteria</b>
The learner can: 1.1 produce work details for the connection using technical <b>information</b> 1.2 use technical information to 'take off' <b>measurements</b> 1.3 identify where the connection is affected on <b>structures</b> .

<b>Range</b>
--------------

**Information:** Drawings, records, work documents, manuals and technical specifications

**Measurements:** Dimensions, lengths, widths, quantities

**Structures:** Other utilities plant, sub-structures, buildings, kerbs, boundaries

### Learning outcome

The learner will:

2. be able to select components and resources for the connection

### Assessment criteria

The learner can:

- 2.1 select the type of **components** in compliance with the work and specifications
- 2.2 comply with procedures to replace defective **components**
- 2.3 comply with procedures to replace non-match **components**
- 2.4 comply with procedures to replace sub-standard **components**
- 2.5 confirm the availability of sufficient **resources**
- 2.6 handle actual and predicted changes to the planned use of resources.

### Range

**Components:** Metallic and non-metallic and all ancillary pipes and fittings

**Resources:** Labour, plant, equipment, materials, consumables

### Learning outcome

The learner will:

3. be able to connect engineering products or assets to the system

### Assessment criteria

The learner can:

- 3.1 determine the method of connection to be used
- 3.2 carry out a site-specific risk assessment and review as job progresses, in accordance with company policy
- 3.3 select and wear the designated PPE
- 3.4 confirm the condition and size of the excavation is sufficient and conforms to instructions and specifications
- 3.5 install, test and configure bypass in accordance with approved codes of practice and organisational procedure
- 3.6 position fire extinguishers alongside the excavation
- 3.7 check fire extinguishers are in good working order
- 3.8 check sufficient sets of breathing apparatus are assembled ready for use
- 3.9 support and anchor installed engineering assets in accordance with approved codes of practice
- 3.10 comply with safe working procedures throughout the whole of the work activity
- 3.11 confirm the condition and size of the excavation is sufficient and conforms to instructions and specifications

3.12	confirm the availability of authorised job instructions, <b>operational procedures</b> and permits to work, prior to commencement of connection work
3.13	carry out site-specific tasks appropriately to prevent damage to <b>equipment</b>
3.14	use selected technique to connect to the existing system.

<b>Range</b>
<b>Operational procedures:</b> Routine; non-routine
<b>Equipment:</b> components and tools

<b>Learning outcome</b>
The learner will:
4. be able to commission new engineering products or assets
<b>Assessment criteria</b>
The learner can:
4.1 confirm that a written routine or non-routine operational procedure has been produced and authorised
4.2 carry out the commissioning in accordance with operational procedure document.

<b>Learning outcome</b>
The learner will:
5. be able to use and communicate data and information
<b>Assessment criteria</b>
The learner can:
5.1 provide <b>instructions</b> to individuals who will be using technical information
5.2 confirm instructions have been understood by individuals using technical information
5.3 report to a designated person inaccuracies in the technical information sources used
5.4 complete work documentation accurately.

<b>Range</b>
<b>Instructions:</b> oral; written

<b>Learning outcome</b>
The learner will:
6. be able to resolve problems that arise during assembly or sub-assembly replacement
<b>Assessment criteria</b>
The learner can:
6.1 report to the <b>designated person</b> damage or defects to <b>resources</b> using approved procedures
6.2 report to the <b>designated person</b> work which is incomplete and not to schedule, using approved procedures

6.3 report to the **designated person** problems and conditions outside the responsibility of the job role, using approved procedures.

### Range

**Resources:** Tools, equipment, materials

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

### Learning outcome

The learner will:

7. know health and safety guidance and legislation in utilities network construction operations

### Assessment criteria

The learner can:

- 7.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 7.2 explain the health and safety guidance governing work in excavations
- 7.3 describe the safe procedures for handling hazardous materials
- 7.4 explain the organisational accident recording and reporting procedures
- 7.5 identify the range and use of personal protective equipment for the work.

### Learning outcome

The learner will:

8. understand specified connections to gas network mains and commissioning

### Assessment criteria

The learner can:

- 8.1 state the organisation's policy and procedures for meeting the relevant
  - a. statutory requirements
  - b. regulations
  - c. codes of practice
- 8.2 explain the importance of compliance with current industry standards
- 8.3 explain the importance of obtaining necessary permissions for isolation of any part of network
- 8.4 explain the importance of carrying out on-site risk assessments and their constant review
- 8.5 explain the importance of wearing PPE
- 8.6 explain the procedure for obtaining authorisation to proceed with connections
- 8.7 explain the implications of not obtaining appropriate authorisation
- 8.8 explain the implications of using incorrect plant, tools, materials and system **components**



- 8.9 explain the actions to be taken where plant, tools, materials and system **components** fail to meet required specification
- 8.10 describe faults associated with the use of inappropriate installation methods and tools
- 8.11 identify potential dangers in excavations
- 8.12 describe the factors affecting, and means of confirming, the suitability of excavations
- 8.13 explain the dangers of taking actions that can create confined space risks in excavations
- 8.14 explain the dangers of inadequate handling and lifting procedure
- 8.15 describe the range of isolation methods available and the rationale for their selection
- 8.16 identify actions to be taken if work cannot proceed to schedule
- 8.17 explain how to determine appropriate safe remedial action if for any reason work cannot proceed
- 8.18 explain the organisation's reporting procedures
- 8.19 describe different methods of accessing information obtainable from different **sources**
- 8.20 identify types and causes of likely disruptions
- 8.21 identify methods of avoiding disruption.

<b>Range</b>
<b>Components:</b> Metallic and non-metallic and all ancillary pipes and fittings
<b>Sources:</b> Reference documents, regulations, codes of practice

## Unit 611                      Conduct specified connections to gas network mains and commissioning

### Supporting information

#### Evidence requirements

Learning outcome 4 **must** be evidenced through workplace observation by an assessor. Competence in testing **must** be evidenced on pressure ranges

- up to and including 75 mb
- above 75 mb to a maximum of 4 bar.

At least **one** of these pressure ranges **must** be evidenced as part of workplace observed assessment; the other can be assessed in a RWE through an Assessor Observation Report.

## Unit 613

## Decommissioning and abandonment of mains and services 63mm and above

<b>Level:</b>	6
<b>Credit value:</b>	7
<b>GLH:</b>	60
<b>Relationship to NOS:</b>	This unit is linked to NOS EUSMUNC25 Decommissioning and Abandonment of mains and services 63mm and above
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by EU Skills, the sector skills council for the gas, power, waste management and water industries.
<b>Aim:</b>	The aim of this unit is to provide the learner with the knowledge, understanding and skills to decommission and abandon mains and services 63mm and above.

<b>Learning outcome</b>
The learner will: 1. be able to conduct specified testing of gas networks associated with decommissioning
<b>Assessment criteria</b>
The learner can: 1.1 perform work activities safely at all times in accordance with legislative and regulatory requirements 1.2 carry out a site specific risk assessment and review in accordance with company procedures 1.3 select and wear the designated PPE 1.4 select and use the specified equipment for testing 1.5 use testing and purging tools and equipment in accordance with industry standards and codes of practice 1.6 purge system in accordance with industry standards and codes of practice 1.7 carry out mains decay tests in accordance with codes of practice 1.8 interpret decay test results to determine if asset in suitable condition for abandonment 1.9 take actions within your own level of responsibility 1.10 report results that require action that are outside your authority to authorised persons in accordance with codes of practice.

<b>Additional Guidance</b>
AC 1.1: Performing work activities safely must include the use of appropriate safety equipment.

AC 1.2: Company procedures to be interpreted as industry standards.  
 AC 1.5: 'Purging tools' can also be referred to as 'decommissioning tools'  
 AC 1.6: 'Purge system' can also mean 'decommission system'.  
 AC 4.2: Company procedures to be interpreted as industry standards.

### **Learning outcome**

The learner will:

2. be able to interpret technical information for decommissioning.

### **Assessment criteria**

The learner can:

- 2.1 produce work details for component installation use
- 2.2 from the technical information take off:
  - a. dimensions
  - b. lengths
  - c. widths
  - d. volumes
  - e. utilities plant
- 2.3 demonstrate how to make corrections through drawings, records and work documents.

### **Additional Guidance**

AC 2.1: Some work details would not necessarily need to be produced by the learner, such as SCO documentation.  
 AC 2.2: Pressure and purge rates must also be calculated.

### **Learning outcome**

The learner will:

3. be able to select components and resources for decommissioning.

### **Assessment criteria**

The learner can:

- 3.1 select the type of components in compliance with the work and quality specifications
- 3.2 comply with procedures to replace defective components
- 3.3 comply with procedures to replace non-match components
- 3.4 comply with procedures to replace sub-standard components
- 3.5 confirm the availability of sufficient resources
- 3.6 handle changes to the planned use of the resource
- 3.7 confirm components and decommissioning equipment are operational.

### **Additional Guidance**

AC 3.2-3.4: Compliance with procedures to be achieved through following manufacturer's instructions and industry standards.

### **Learning outcome**

The learner will:

4. be able to decommission the system.
<b>Assessment criteria</b>
<p>The learner can:</p> <ul style="list-style-type: none"> <li>4.1 determine the <b>method</b> for decommissioning when abandoning the system</li> <li>4.2 carry out a site-specific risk assessment and review in accordance with company policy</li> <li>4.3 select and wear the designated PPE</li> <li>4.4 confirm the condition of the excavation conforms with instructions and specifications</li> <li>4.5 select, prepare and operate decommissioning equipment in accordance with the specification and manufactures instructions</li> <li>4.6 assemble components to industry standards using mechanical and/or fusion welding techniques</li> <li>4.7 carry out site-specific tasks appropriately to prevent equipment damage</li> <li>4.8 position components in accordance with the specification</li> <li>4.9 disconnection of the existing system using flowstopping in accordance with codes of practice</li> <li>4.10 confirm that the decommissioning process is completed in accordance with codes of practice</li> <li>4.11 maintain the security and safety of the system and third parties where work is not complete or not to schedule</li> <li>4.12 ensure work practices conform to safe working procedures throughout the work activity.</li> </ul>

<b>Range</b>
<b>Method:</b> direct and indirect purging.

<b>Additional Guidance</b>
AC 4.2: Company procedures to be interpreted as industry standards.

<b>Learning outcome</b>
<p>The learner will:</p> <ul style="list-style-type: none"> <li>5. be able to use and communicate data and information</li> </ul>
<b>Assessment criteria</b>
<p>The learner can:</p> <ul style="list-style-type: none"> <li>5.1 provide instructions to individuals who will be using technical information</li> <li>5.2 confirm instructions have been understood by individuals using technical information</li> <li>5.3 report to a designated person inaccuracies in the technical information sources used</li> <li>5.4 complete work documentation accurately</li> <li>5.5 record work documentation in the specified place or pass to a designated person</li> <li>5.6 comply with procedures if working on a 'permit to work' designated activity.</li> </ul>

**Additional Guidance**

AC 5.6 'Permit to work' will fall under the remit of SCO; learners may not have an SCO qualification, but would be expected to comply with the procedures within the Permit to Work.

**Learning outcome**

The learner will:

6. be able to resolve problems that arise from technical information and decommissioning work

**Assessment criteria**

The learner can:

- 6.1 report to the designated person damage or defects to resources using approved procedures
- 6.2 report to the designated person work which is incomplete and not to schedule
- 6.3 report to the designated person problems and conditions outside the responsibility of the job role.

**Learning outcome**

The learner will:

7. Know health and safety guidance and legislation in utilities network construction operations..

**Assessment criteria**

The learner can:

- 7.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
- 7.2 explain the health and safety guidance governing work in excavations
- 7.3 describe the safe procedures for handling hazardous materials
- 7.4 explain the organisational accident recording and reporting procedures
- 7.5 identify the range and use of personal protective equipment for the work.

**Learning outcome**

The learner will:

8. understand how to decommission gas engineering products or assets.

**Assessment criteria**

The learner can:

- 8.1 state the main responsibilities of employers and employees under the current working at height regulations
- 8.2 explain the importance of carrying out on-site risk assessments and the need for constant review
- 8.3 explain the importance of implementing a Safe System of Work (SSOW) document when working in excavations

8.4	explain the importance of obtaining necessary permissions for isolation of any part of utilities network
8.5	explain the importance of complying with current industry standards
8.6	state the organisation's policy and procedures for meeting the relevant <ul style="list-style-type: none"> <li>a. statutory requirements</li> <li>b. regulations</li> <li>c. codes of practice</li> </ul>
8.7	explain the implications of not obtaining the correct authorisation
8.8	explain the implications of using incorrect plant, tools and materials
8.9	explain the implications of using incorrect system components
8.10	explain the actions to be taken where plant, tools, materials and system components fail to meet required specification
8.11	describe faults associated with the use of inappropriate installation methods and tools
8.12	identify potential dangers in excavations
8.13	describe the factors affecting, and means of confirming, the suitability of excavations
8.14	explain the dangers of taking actions that can create confined space risks in excavations
8.15	describe the range of isolation methods available and the rationale for their selection
8.16	explain the procedure for obtaining authorisation to proceed with decommissioning
8.17	identify the range of actions to be taken if work cannot proceed to schedule
8.18	explain how to determine appropriate safe remedial action if for any reason work cannot proceed
8.19	identify methods of accessing information from different sources
8.20	identify types and causes of likely <b>disruption</b>
8.21	identify methods of avoiding <b>disruption</b>
8.22	explain the dangers of inadequate handling and lifting procedure
8.23	explain the procedure for returning to work on an abandoned system

<b>Range</b>
<b>Disruption:</b> equipment failure, weather conditions, system load, ground conditions, lack of available resources , communication breakdown

<b>Additional Guidance</b>
AC 8.16: To include procedure following a decay test.

## Unit 614

## Install gas engineering products or assets above 180mm up to and including 355mm

<b>Level:</b>	6
<b>Credit value:</b>	7
<b>GLH:</b>	63
<b>Relationship to NOS:</b>	This unit is linked to NOS EUSMUNC27 Install gas engineering products or assets above 180mm up to and including 355mm.
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by EU Skills, the sector skills council for the gas, power, waste management and water industries.
<b>Aim:</b>	The aim of this unit is to provide the learner with the knowledge, understanding and skills to install gas engineering products or assets above 180mm up to and including 355mm.
<b>Assessment guidance</b>	Each individual organisation, such as Distribution Networks will have their own suite of policy and procedural documents. Accordingly, it is not deemed appropriate to name these although they would include for example Network Emergency Suite of Policies and Procedures. It is envisaged that whilst training is being conducted in separate Networks, individual Networks will ask training personnel to brief out these unique documents.

<b>Learning outcome</b>
The learner will: 1. be able to interpret technical information for installing components of the system.
<b>Assessment criteria</b>
The learner can: 1.1 produce <b>work details</b> for component installation use 1.2 from the technical information take off: a. dimensions b. lengths c. widths d. quantities e. utilities plant



f.	services
g.	buildings
h.	kerbs
i.	boundaries
1.3	demonstrate how to make corrections through drawings, records and work documents.

<b>Range</b>
<b>work details:</b> project file including installation method

<b>Learning outcome</b>
The learner will:
2. be able to select components and resources for installation of the system
<b>Assessment criteria</b>
The learner can:
2.1 select the type of <b>components</b> in compliance with the work and quality specifications
2.2 comply with procedures to replace defective components
2.3 comply with procedures to replace non-match components
2.4 comply with procedures to replace sub-standard components
2.5 confirm the availability of sufficient <b>resources</b>
2.6 confirm relevant authorisations and notices are in place to complete project
2.7 handle changes to the planned use of the resource
2.8 confirm components and installation equipment are operational.

<b>Range</b>
<b>Components:</b> pipes, fittings, pipe support, anchorage
<b>Resources:</b> gas networks engineering staff, contractors

<b>Learning outcome</b>
The learner will:
3. be able to install components of the system
<b>Assessment criteria</b>
The learner can:
3.1 determine the method of installation to be used when installing components of the system
3.2 carry out a site-specific risk assessment and review in accordance with company policy
3.3 select and wear the designated PPE
3.4 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 assemble components to industry standards using mechanical and/or fusion welding techniques

3.7	carry out site-specific tasks appropriately to prevent equipment damage
3.8	position components in accordance with the specification
3.9	protect installed assets with fine fill in accordance with specification and approved codes of practice
3.10	maintain proximity distances from other utilities apparatus in accordance with approved codes of practice
3.11	make connections to existing systems using in-line flowstopping and under pressure connections in accordance with codes of practice
3.12	support and anchor installed assets in accordance with codes of practice
3.13	confirm that the quality of the installation complies with the specified standard
3.14	maintain the security and safety of the system and third parties where work is not complete or not to schedule
3.15	ensure work practices conform to safe working procedures throughout the work activity
3.16	ensure all on-site personnel comply with relevant work specifications and complete tasks safely.

<b>Additional Guidance</b>
AC 3.11 to cover PE and metallic; assessment on metallic can be covered under RWE.

<b>Learning outcome</b>
The learner will:
4. be able to use and communicate data and information
<b>Assessment criteria</b>
The learner can:
4.1 provide instructions to individuals who will be using technical information
4.2 confirm instructions have been understood by individuals using technical information
4.3 report to a designated person inaccuracies in the technical information sources used
4.4 complete work documentation accurately
4.5 record work documentation in the specified place or pass to a designated person
4.6 comply with procedures if working on a 'permit to work' designated activity.

<b>Additional Guidance</b>
AC 4.6 Permit to work' will fall under the remit of SCO; learners may not have an SCO qualification, but would be expected to comply with the procedures within the Permit to Work.

<b>Learning outcome</b>
The learner will:

5. be able to resolve problems that arise from technical information and installation work
<b>Assessment criteria</b>
The learner can:
5.1 report to the designated person damage or defects to resources using approved procedures
5.2 report to the designated person work which is incomplete and not to schedule
5.3 report to the designated person problems and conditions outside the responsibility of the job role.

<b>Learning outcome</b>
The learner will:
6. know health and safety guidance and legislation in utilities network construction operations
<b>Assessment criteria</b>
The learner can:
6.1 state the main responsibilities of the employer under the Health and Safety at Work etc Act
6.2 state the main responsibilities of the employee under the Health and Safety at Work etc Act
6.3 explain the health and safety guidance governing work in excavations
6.4 describe the safe procedures for handling hazardous materials
6.5 explain the organisational accident recording and reporting procedures
6.6 identify the range and use of personal protective equipment for the work.

<b>Additional Guidance</b>
AC.6 4: Learners to refer to company COSHH assessment for each hazardous material.

<b>Learning outcome</b>
The learner will:
7. understand how to install gas engineering products or assets above 180mm up to and including 355mm
<b>Assessment criteria</b>
The learner can:
7.1 state the main responsibilities of employers and employees under the current Working at Height regulations
7.2 explain the importance of carrying out on-site risk assessments and the need for constant review
7.3 explain the importance of implementing a Safe System of Work (SSOW) document when working in excavations
7.4 explain the importance of obtaining necessary permissions for isolation of any part of utilities network
7.5 explain the importance of complying with current industry standards

7.6	state the organisation's policy and procedures for meeting the relevant:
a.	statutory requirements
b.	regulations
c.	codes of practice
7.7	explain the implications of not obtaining the correct authorisation
7.8	explain the implications of using incorrect plant, tools and materials
7.9	explain the implications of using incorrect system components
7.10	explain the actions to be taken where plant, tools, materials and system components fail to meet required specification.
7.11	describe faults associated with the use of inappropriate installation methods and tools
7.12	identify potential dangers in excavations
7.13	describe the factors affecting, and means of confirming, the suitability of excavations
7.14	explain the dangers of taking actions that can create confined space risks in excavations
7.15	describe the range of isolation methods available and the rationale for their selection
7.16	explain the procedure for obtaining authorisation to proceed with connections
7.17	identify the range of actions to be taken if work cannot proceed to schedule
7.18	explain how to determine appropriate safe remedial action if for any reason work cannot proceed
7.19	identify methods of accessing information from different sources
7.20	identify types and causes of likely <b>disruption</b>
7.21	identify methods of avoiding <b>disruption</b>
7.22	explain the dangers of inadequate handling and lifting procedure
7.23	explain the dangers of lifting operations to on-site personnel on site
7.24	describe the types and signs of defect likely to be present, and means of determining the appropriate safe action.

<b>Range</b>
<b>Disruption:</b> equipment failure, weather conditions, system load, ground conditions, lack of available resources, communication breakdown, traffic, public.

<b>Additional Guidance</b>
AC 7.12: Learners to be made aware of different trench support methods.
AC 7.14: Learners to be made aware of emergency rescue techniques.
AC 7.15: Learners need to demonstrate a background knowledge of all isolation methods ie squeeze off, valves, stopple, iris stopple, in-line flowstopping.

## Unit 615

## Operate within the gas intermediate pressure range

<b>Level:</b>	6
<b>Credit value:</b>	2
<b>GLH:</b>	23
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	The aim of this unit is to provide the learner with the knowledge, understanding and skills to operate in compliance with legislation, regulation, policies, procedures, instructions and guidance in the gas industry, specifically within the gas intermediate pressure range..

### Learning outcome

The learner will:

1. understand key documents that apply to working in the gas intermediate pressure range..

### Assessment criteria

The learner can:

- 1.1 list the **key legislative** and **industry standard documents** in relation to work in the gas intermediate pressure range
- 1.2 state the **consequences** of not complying with key legislative and industry standard documents
- 1.3 state employer responsibilities within the Health and Safety at Work etc Act
- 1.4 state employee responsibilities within the Health and Safety at Work etc Act.

### Range

**Key legislative documents:** Health & Safety at Work etc Act, Control of Substances Hazardous to Health (COSHH), Construction (Design and Management) Regulations, Dangerous Substances & Explosive Atmosphere Regulations, Gas Safety (Management) Regulations, Management of Health & Safety at Work Regulations, Pipeline Safety Regulations, Pressure Systems Safety Regulations, Gas Safety Regulations (Installations and Use) Regulations, The Lifting Operations & Lifting Regulations Equipment Regulations (LOLER), Provision & Use of Work Equipment Regulations (PUWER), Reporting on Injuries, Diseases and Dangerous Occurrences (RIDDOR).

**Industry standard documents:** External Documents: Health & Safety, Executive Approved Codes of Practice, Health & Safety Executive Guidance notes, Institute of Gas Engineers and Managers (IGEM) suite of documents applicable to work in the gas intermediate pressure range (IGEM/TD/1 – Handling, Transport and Storage of Steel Pipe, IGEM/TD/3 – Distribution Mains <16 bar, IGEM/TD/4 – Distribution Services <16 bar, IGEM/TD/13 – Pressure Regulating Installations, IGEM/GL/5 – Procedures for Managing New Works, Modifications and Repairs)

**Consequences:** injury or death, prosecution, prohibition and enforcement notices, disciplinary procedures.

#### Learning outcome

The learner will:

2. be able to comply with key legislation, organisational policies and procedures that apply to work instructions in the gas intermediate pressure range.

#### Assessment criteria

The learner can:

- 2.1 produce a detailed **work instruction**
- 2.2 comply with legislation according to information contained within a work instruction
- 2.3 comply with organisational policy and procedural information contained within a work instruction.

#### Range

**Work instruction:** SCO, site specific risk assessment, environmental risk assessment, generic risk assessment, industry standard documents.

#### Learning outcome

The learner will:

3. know how to evaluate hazards and risks associated with the gas intermediate pressure range

#### Assessment criteria

The learner can:

- 3.1 identify **hazards** associated with the gas intermediate pressure range
- 3.2 identify **risks** associated with the gas intermediate pressure range
- 3.3 identify **control measures** associated with the gas intermediate pressure range.

#### Range

**Hazards:** catastrophic failure of pipe wall and fittings, working at the parent main, disturbing anchorage of pipe, fittings and end caps, sudden release of pressure from a pressurised system, ignition of gas, potential escape at elevated pressure, working with elevated pressure

in the gas intermediate pressure range, lifting operations, trench collapse

**Risks:** fire, explosion, airborne/noise/water/land pollution, debris, environmental damage, asphyxiation, escape of gas, personal injury, loss of gas supply.

**Control measures:** staff competency, PPE, fire fighting equipment, breathing apparatus, lifting plan, mechanised lifting equipment, trench support, access and egress, emergency services, pressure reduction/isolation of supply, media coverage, evacuation and safeguarding of life and property, extinguish sources of ignition, effective communication, use of correct waste streams, Safe Control of Operations (SCO).

#### Learning outcome

The learner will:

4. know the correct personal protective equipment (PPE) used within the gas intermediate pressure range

#### Assessment criteria

The learner can:

- 4.1 list **personal protective equipment** (PPE) typically used in the gas intermediate pressure range
- 4.2 list **safety equipment** typically used in the gas intermediate pressure range.

#### Range

**Personal protective equipment:** full fire suit made from suitable fire retardant material, fire resistant clothing made from suitable fire retardant material, eye protection, safety headgear, ear defenders, reflective garments, gloves, safety footwear, dust masks, welding visors where appropriate.

**Safety equipment:** breathing apparatus with forced air available, personal alarm/gas monitor, fire extinguishers, intrinsically safe equipment.

#### Learning outcome

The learner will:

5. be able to identify and install pressure reduction equipment within the gas intermediate pressure range on services up to and including 63 mm or 2" diameter

#### Assessment criteria

The learner can:

- 5.1 identify locations for pressure regulating equipment
- 5.2 identify locations for emergency isolation valves
- 5.3 state housing requirements for pressure reduction equipment
- 5.4 select materials and equipment to be used in the gas intermediate pressure range sector
- 5.5 identify **jointing techniques** applicable to services up to and including 63 mm or 2" diameter
- 5.6 install pressure reduction equipment up to and including 63 mm or 2" diameter

5.7	test pressure reduction equipment up to and including 63 mm or 2" diameter
5.8	commission pressure reduction equipment up to and including 63 mm or 2" diameter
5.9	decommission pressure reduction equipment up to and including 63 mm or 2" diameter.

<b>Range</b>
<b>Joining techniques:</b> fillet weld joints for steel services, mechanical joining – flanged, electrofusion joints ,branch saddles for intermediate pressure services.

<b>Learning outcome</b>
The learner will:
6. understand how to comply with organisational procedures within the gas intermediate pressure range
<b>Assessment criteria</b>
The learner can:
6.1 explain the importance of quality assurance certification
6.2 identify the organisational procedures to be followed when incorrect materials are encountered in the gas intermediate pressure range

<b>Learning outcome</b>
The learner will:
7. be able to use cathodic protection within the gas intermediate pressure range
<b>Assessment criteria</b>
The learner can:
7.1 explain the purpose of cathodic protection on metallic systems
7.2 interpret design details for cathodic protection
7.3 explain the requirements for insulating joints
7.4 identify equipment for identifying exposed metallic pipework
7.5 select components used for cathodic protection
7.6 install cathodic protection within the gas intermediate pressure range

<b>Learning outcome</b>
The learner will:
8. be able to identify and install pressure reduction equipment within the gas intermediate pressure range to assets above 63 mm or 2" diameter
<b>Assessment criteria</b>
The learner can:
8.1 state the restrictions on <b>installation techniques</b> in the gas intermediate pressure range



8.2	describe typical valve arrangements in the gas intermediate pressure range
8.3	state approved flow stop methods in the gas intermediate pressure range
8.4	select materials and equipment to be used in the gas intermediate pressure range sector above 63 mm or 2" diameter
8.5	identify <b>jointing techniques</b> applicable to assets above 63 mm or 2" diameter
8.6	install pressure reduction equipment to assets above 63 mm or 2" diameter
8.7	test pressure reduction equipment to assets above 63 mm or 2" diameter
8.8	commission pressure reduction equipment to assets above 63 mm or 2" diameter
8.9	decommission pressure reduction equipment to assets above 63 mm or 2" diameter.

Range
<p><b>Installation techniques:</b> trenchless technology inserted systems, open cut</p> <p><b>Jointing techniques:</b> butt weld joints for steel mains, hot work at the parent main, mechanical jointing – flanged, butt fusion on polyethylene mains, electrofusion joints on mains, branch saddle connections on polyethylene parent main</p>

## **Unit 615                      Operate within the gas intermediate pressure range**

### **Supporting information**

#### **Evidence requirements**

For outcome 5 the learner will be required to partake in a practical assessment to demonstrate competence in the installation, commissioning and decommissioning of pressure reduction equipment up to and including 2" diameter. This is to be carried out through direct observation through realistic working environment (RWE) conditions.

For outcome 7 and 8 the learner will be required to partake in a practical assessment to demonstrate competence in the installation, commissioning and decommissioning assets above 63 mm or 2" diameter. This is to be carried out through either work based observation or through realistic working environment (RWE) conditions.

#### **Guidance**

Each individual organisation, such as Gas Networks will have their own suite of policy and procedural documents. Accordingly, it is not deemed appropriate to name these although they would include for example Network Emergency Suite of Policies and Procedures. It is envisaged that whilst training is being conducted in separate Networks, individual Networks will ask training personnel to brief out these unique documents

## Unit 616

## Operate safely in emergency situations within the gas intermediate pressure range

<b>Level:</b>	6
<b>Credit value:</b>	2
<b>GLH:</b>	16
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	The aim of this unit is to provide the learner with the knowledge, understanding and skills to operate in compliance with legislation, regulation, policies, procedures, instructions and guidance in the gas industry, specifically within the gas intermediate pressure range sector for emergency working.
<b>Entry requirements</b>	Learners must hold a relevant ELR/Repair and maintenance qualification.

### Learning outcome

The learner will:

1. understand key documents that apply to emergency situations when working in the gas intermediate pressure range

### Assessment criteria

The learner can:

- 1.1 list **the key legislative and industry standard documents** in relation to emergency situations when working in the gas intermediate pressure range
- 1.2 state the **consequences** of not complying with key legislative and industry standard documents
- 1.3 state employer responsibilities within the Health and Safety at Work etc Act
- 1.4 state employee responsibilities within the Health and Safety at Work etc Act.

### Range

**key legislative documents:** Health & Safety at Work etc Act , Control of Substances Hazardous to Health (COSHH), Dangerous Substances & Explosive Atmosphere Regulations, Gas Safety (Management) Regulations, Management of Health & Safety at Work Regulations Pipeline Safety Regulations, Pressure Systems Safety Regulations

Gas Safety Regulations (Installations and Use) Regulations, The Lifting Operations & Lifting Regulations Equipment Regulations (LOLER), Provision & Use of Work Equipment Regulations (PUWER), Reporting on Injuries, Diseases and Dangerous Occurrences (RIDDOR), Personal Protective Equipment (PPE) Regulations, Control of Noise at Work Regulations, Manual Handling Regulations

**Industry standard documents:** external Documents: Health & Safety Executive Approved Codes of Practice, Health & Safety Executive Guidance notes, Institute of Gas Engineers and Managers (IGEM) suite of documents applicable to work in the gas intermediate pressure range (IGEM/TD/1 – Handling, Transport and Storage of Steel Pipe, IGEM/TD/3 – Distribution Mains <16 bar, IGEM/TD/4 – Distribution Services <16 bar, IGEM/TD/13 – Pressure Regulating Installations, IGEM/GL/5 – Procedures for Managing New Works, Modifications and Repairs), Health and safety in construction (HSG 150), Health and Safety in Excavations (HSG 185)

**Consequences:** injury or death, prosecution, prohibition and enforcement notices, disciplinary procedures

### Learning outcome

The learner will:

2. be able to evaluate hazards and risks that apply to emergency situations in the gas intermediate pressure range sector

### Assessment criteria

The learner can:

- 2.1 identify **generic risks** and **hazards** that apply to work in emergency situations in the gas intermediate pressure range sector
- 2.2 evaluate **increased risks** that apply to work in emergency situations in the gas intermediate pressure range sector
- 2.3 describe **control measures** associated with emergency situations when working in the gas intermediate pressure range
- 2.4 produce a site specific risk assessment associated with emergency situations in the gas intermediate pressure range sector
- 2.5 explain risks to other team members that apply to work in emergency situations in the gas intermediate pressure range sector.

### Range

**Generic Risks:** elevated pressure, catastrophic failure of pipe wall and fittings, Anchorage of pipe, fittings and end caps, sudden release of pressure from a pressurised system, potential escape at elevated pressure, proximity to occupied property, public buildings, railways, roads, etc, potential for gas ingress to property over a wider than normal area, potential for gas ingress to underground apparatus over a wider than normal area, potential for ignition, personal injury, asphyxiation, loss of gas supply

**Hazards:** fire, catastrophic failure of pipe wall and fittings, working at the parent main, disturbing anchorage of pipe, fittings and end caps, sudden release of pressure from a pressurised system, ignition of gas

Potential escape at elevated pressure, working with elevated pressure in the gas intermediate pressure range, lifting operations, trench collapse

airborne/noise pollution, debris

**Increased Risks:** working with elevated pressure in the gas, intermediate pressure range, control measures for specialised equipment, control measures for specialised contractors, control measures differ from other pressure ranges, increased potential of an incident, differing requirements for Personal Protective Equipment (PPE)

Manual handling of materials and equipment, mechanised lifting

**Control measures:** staff competency, PPE, fire fighting equipment, breathing apparatus, lifting plan, mechanised lifting equipment, trench support, access and egress, emergency services, pressure reduction/isolation of supply, media coverage, evacuation and safeguarding of life and property, extinguish sources of ignition, effective communication, use of correct waste streams, Safe Control of Operations (SCO).

### Learning outcome

The learner will:

3. be able to evaluate environmental hazards and environmental risks that apply to emergency situations in the gas intermediate pressure range sector.

### Assessment criteria

The learner can:

- 3.1 identify **environmental hazards** that apply to emergency situations in the gas intermediate pressure range sector
- 3.2 identify **environmental risks** that apply to emergency situations in the gas intermediate pressure range sector
- 3.3 produce a site specific environmental risk assessment that applies to an emergency situation in the gas intermediate pressure range sector
- 3.4 explain environmental risks to other team members that apply to emergency situations in the gas intermediate pressure range sector
- 3.5 dispose of all waste in proper waste management streams in order to comply with ISO 14001 regulations.

### Range

**Environmental hazards:** noise pollution, airborne pollution, water pollution, land pollution

**Environmental risks:** contamination to the environment, failure to protect the health and safety of operatives and the general public, incorrect disposal of waste and excess hazardous materials.

### Learning outcome

The learner will:

4. know the importance of using the correct personal protective equipment and safety equipment when working in emergency situations in the gas intermediate pressure range sector.
<b>Assessment criteria</b>
The learner can:
4.1 list <b>personal protective equipment</b> (PPE) required when working in emergency situations in the gas intermediate pressure range sector
4.2 list <b>safety equipment</b> required when working in emergency situations in the gas intermediate pressure range sector.

<b>Range</b>
<b>Personal protective equipment (PPE):</b> full fire suit made from suitable fire retardant material, fire resistant clothing made from suitable fire retardant material, eye protection, safety headgear, ear defenders, reflective garments, gloves, safety footwear, dust masks, welding visors where appropriate, breathing apparatus with forced air available.
<b>Safety equipment:</b> air movers, personal alarm/gas monitor, fire extinguishers, intrinsically safe equipment.

<b>Learning outcome</b>
The learner will:
5. know how to set up a safety exclusion zone at the location of a gas escape within the gas intermediate pressure range sector for emergency working
<b>Assessment criteria</b>
The learner can:
5.1 explain the requirements for safety exclusion zones
5.2 state exclusion distances at different operational pressures
5.3 describe <b>support</b> to be given to personnel following emergency situations in the gas intermediate pressure range.

<b>Range</b>
<b>Support:</b> monitoring of gas levels, customer liaison, liaising with emergency services, incident control

<b>Learning outcome</b>
The learner will:
6. be able to identify and use repair methods and materials within emergency situations in the gas intermediate pressure range sector
<b>Assessment criteria</b>
The learner can:
6.1 explain the characteristics of differing valve types
6.2 explain the effect of strategic valve closure on a Gas Distribution Network in an emergency situation

- |     |                                                                                                                              |
|-----|------------------------------------------------------------------------------------------------------------------------------|
| 6.3 | comply with manufacturers instructions for valve operation and repair                                                        |
| 6.4 | select approved materials to Gas Industry Standards                                                                          |
| 6.5 | comply with organisational procedures when incorrect materials are encountered in the gas intermediate pressure range sector |
| 6.6 | explain the importance of compliance for approved methods of repair                                                          |
| 6.7 | explain the role of manufacturers in a repair process                                                                        |
| 6.8 | carry out an approved repair method on an intermediate pressure installation as used in an emergency situation.              |

## **Unit 616                      Operate safely with apparatus in the intermediate gas pressure range**

### **Supporting information**

#### **Guidance**

It is recommended that learners complete unit 310 (Operate within the gas intermediate pressure range) before taking this unit.

Each individual organisation, such as Distribution Networks will have their own suite of policy and procedural documents. Accordingly, it is not deemed appropriate to name these although they would include for example Network Emergency Suite of Policies and Procedures. It is envisaged that whilst training is being conducted in separate Networks, individual Networks will ask training personnel to brief out these unique documents.



## Unit 706

## Joint materials by fusion processes on utilities network construction, above 180mm diameter

<b>Level:</b>	7
<b>Credit value:</b>	9
<b>GLH:</b>	83
<b>Relationship to NOS:</b>	This unit is linked to NOS EUSMUNC24 Joint materials by fusion processes on Utilities Network Construction, above 180mm diameter.
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	The aim of this unit is to provide the learner with the knowledge, understanding and skills to joint materials by fusion processes on utilities network construction, above 180mm diameter for mains jointing only.
<b>Evidence requirements</b>	In accordance with EU Skills Assessment Strategy, assessment on both types of fusion is to be covered via both workplace and RWE.

### Learning outcome

The learner will:

1. be able to prepare for jointing

### 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.

### Range

**Jointing and related equipment:** electro fusion, butt fusion, peelable level pipe, trackstar

### Additional Guidance

AC1.1 Company procedures to be interpreted as industry standards be able to make joints using butt fusion techniques
AC1.2 The learner must select and wear the designated PPE as per company procedure
AC 1.3: Assessment should reflect type of pipe and equipment used in the candidates' own environment, i.e. peelable pipe, trackstar, yellow MDPE black core with yellow MDPE outer layer.

<b>Learning outcome</b>
The learner will: 2. be able to make joints using butt fusion techniques
<b>Assessment criteria</b>
The learner can: 2.1 carry out and monitor the machine operations to produce butt fusion joints of the required quality 2.2 confirm compliance with: a. job instructions b. correct preparation c. specification d. specified dimensional accuracy 2.3 demonstrate how to de-bead and carry out approved quality assurance test on bead 2.4 confirm joint and bead are identifiable by marking in accordance with company procedures 2.5 confirm the equipment is in a safe condition on completion of jointing activities 2.6 handle excess and waste materials and temporary attachments, in line with approved and agreed procedures 2.7 apply the correct manual handling procedures.

<b>Learning outcome</b>
The learner will: 3. be able to make joints using electrofusion techniques
<b>Assessment criteria</b>
The learner can: 3.1 use the correct electrofusion jointing technique to produce joints of the required quality and confirm compliance with the a. specified standard b. specified dimensional accuracy 3.2 confirm that on completion of jointing activities the equipment is shut down to a safe condition 3.3 confirm temporary attachments, excess and waste materials are dealt with promptly in line with approved and agreed procedures 3.4 apply the correct manual handling procedures.

<b>Learning outcome</b>
The learner will: 4. be able to use and communicate data and information.
<b>Assessment criteria</b>

The learner can:
4.1 comply with approved procedures and practices involved in the work activity
4.2 confirm with designated personnel any circumstances where information appears incorrect
4.3 use organisational information systems to record and store jointing data and information.

<b>Learning outcome</b>
The learner will:
5. be able to resolve problems which arise from jointing materials.
<b>Assessment criteria</b>
The learner can:
5.1 report promptly to the designated person damage or defects to tools, equipment, materials
5.2 report promptly to the designated person matters outside the responsibility of the job role
5.3 resolve day to day problems within the responsibility of the job role
5.4 handle emergency situations as specified in approved procedures.

<b>Learning outcome</b>
The learner will:
6. know health and safety guidance and legislation in utilities network construction operations
<b>Assessment criteria</b>
The learner can:
6.1 state the main responsibilities of the employer and employee under the Health and Safety at Work Act
6.2 explain the health and safety guidance governing work in excavations
6.3 describe the safe procedures for handling hazardous materials
6.4 explain the organisational accident recording and reporting procedures
6.5 identify the range and use of personal protective equipment for the work
6.6 state the health, safety and environment legislation and environmental procedures relevant to the work activities.

<b>Additional Guidance</b>
AC 6.3: Company COSHH assessment to be referred to for each material.

<b>Learning outcome</b>
The learner will:
7. understand jointing materials by fusion processes on utilities network construction, above 180mm diameter.
<b>Assessment criteria</b>

The learner can:

- 7.1 explain the industry codes of practice and company procedures
- 7.2 identify different types of **pipe materials**
- 7.3 explain why only pipes of similar specifications can be joined together
- 7.4 interpret engineering specifications relevant to the engineering activity
- 7.5 describe the different stages that take place during the **jointing process** and the importance of allowing each phase to complete
- 7.6 explain the need for pipe support, restraint, alignment and the consequences of poor support, restraint and mis-alignment
- 7.7 explain the cause and effect of defects and contaminations
- 7.8 describe equipment maintenance procedures
- 7.9 describe equipment calibration
- 7.10 describe consequences of poor equipment maintenance
- 7.11 identify different quality assurance procedures that can be applied in recognising defects
- 7.12 explain the correct reporting procedures.

<b>Range</b>
<b>Pipe materials:</b> PE80, PE100
<b>Jointing process:</b> electro fusion, butt fusion

## Unit 708

## Install gas engineering products or assets above 355mm

<b>Level:</b>	7
<b>Credit value:</b>	9
<b>GLH:</b>	86
<b>Relationship to NOS:</b>	This unit is linked to NOS EUSMUNC26 Install gas engineering products or assets above 355mm
<b>Support of the unit by a sector or other appropriate body:</b>	This unit is endorsed by Energy & Utility Skills.
<b>Aim:</b>	The aim of this unit is to provide the learner with the knowledge, understanding and skills to install gas engineering products or assets above 355mm.

<b>Learning outcome</b>
The learner will: 1. be able to interpret technical information for installing components of the system
<b>Assessment criteria</b>
The learner can: 1.1 carry out site specific risk assessment, and review in accordance with company procedures 1.2 from the technical information take off: a. dimensions b. lengths c. widths d. quantities e. utilities plant f. services g. buildings h. kerbs i. boundaries 1.3 demonstrate how to make corrections through drawings, records and work documents.

<b>Additional Guidance</b>
AC 1.1: work details to include project file including installation method.



<b>Learning outcome</b>
The learner will: 2. be able to select components and resources for installation of the system
<b>Assessment criteria</b>
The learner can: 2.1 select the type of <b>components</b> in compliance with the work and quality specifications 2.2 comply with procedures to replace defective components 2.3 comply with procedures to replace non-match components 2.4 comply with procedures to replace sub-standard components 2.5 confirm the availability of sufficient <b>resources</b> 2.6 confirm relevant authorisations and notices are in place to complete project 2.7 handle changes to the planned use of the resource 2.8 confirm components and installation equipment are operational.

<b>Range</b>
<b>Components:</b> pipes, fittings, pipe support, anchorage <b>Resources:</b> gas networks engineering staff, contractors

<b>Learning outcome</b>
The learner will: 3. Be able to install components of the system
<b>Assessment criteria</b>
The learner can: 3.1 determine the method of installation to be used when installing components of the system 3.2 carry out a site-specific risk assessment and review in accordance with company policy 3.3 select and wear the designated PPE 3.4 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 assemble components to industry standards using mechanical and/or fusion welding techniques 3.7 carry out site-specific tasks appropriately to prevent equipment damage 3.8 position components in accordance with the specification 3.9 install products or assets in accordance with the specification 3.10 protect installed assets with fine fill in accordance with specification and approved codes of practice 3.11 maintain proximity distances from other utilities apparatus in accordance with approved codes of practice 3.12 make connections to existing systems using in-line flowstopping and under pressure connections in accordance with codes of practice

- 3.13 support and anchor installed assets in accordance with codes of practice
- 3.14 confirm that the quality of the installation complies with the specified standard
- 3.15 maintain the security and safety of the system and third parties where work is not complete or not to schedule
- 3.16 ensure work practices conform to safe working procedures throughout the work activity
- 3.17 ensure all on-site personnel comply with relevant work specifications and complete tasks safely.

#### **Additional Guidance**

AC 3.1: To cover PE and metallic; assessment on metallic can be covered under RWE.

AC 3.3: Learners must select and wear the designated PPE as per company procedure.

#### **Learning outcome**

The learner will:

- 4. be able to use and communicate data and information

#### **Assessment criteria**

The learner can:

- 4.1 provide instructions to individuals who will be using technical information
- 4.2 confirm instructions have been understood by individuals using technical information
- 4.3 report to a designated person inaccuracies in the technical information sources used
- 4.4 complete work documentation accurately
- 4.5 record work documentation in the specified place or pass to a designated person
- 4.6 comply with procedures if working on a 'permit to work' designated activity.

#### **Additional Guidance**

AC 4.6: 'Permit to work' will fall under the remit of SCO; learners may not have an SCO qualification, but would be expected to comply with the procedures within the Permit to Work.

#### **Learning outcome**

The learner will:

- 5. be able to resolve problems that arise from technical information and installation work

#### **Assessment criteria**

The learner can:

- 5.1 report to the designated person damage or defects to resources using approved procedures
- 5.2 report to the designated person work which is incomplete and not to schedule



5.3 report to the designated person problems and conditions outside the responsibility of the job role.

### **Learning outcome**

The learner will:

6. Know health and safety guidance and legislation in 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 etc Act
- 6.2 explain the health and safety guidance governing work in excavations
- 6.3 describe the safe procedures for handling hazardous materials
- 6.4 explain the organisational accident recording and reporting procedures
- 6.5 identify the range and use of personal protective equipment for the work.

### **Additional Guidance**

AC 6.3 Refer to company COSHH assessment for each hazardous material.

### **Learning outcome**

The learner will:

7. Understand how to install gas engineering products or assets above 355mm

### **Assessment criteria**

The learner can:

- 7.1 state the organisation's policy and procedures for meeting the relevant:
  - a. statutory requirements
  - b. regulations
  - c. codes of practice
- 7.2 explain the importance of carrying out on-site risk assessments and the need for constant review
- 7.3 explain the importance of implementing a Safe System of Work (SSOW) document when working in excavations
- 7.4 explain the importance of obtaining necessary permissions for isolation of any part of utilities network
- 7.5 explain the importance of complying with current industry standards
- 7.6 explain the implications of not obtaining the correct authorisation
- 7.7 explain the implications of using incorrect plant, tools and materials
- 7.8 explain the implications of using incorrect system components
- 7.9 explain the actions to be taken where plant, tools, materials and system components fail to meet required specification
- 7.10 describe faults associated with the use of inappropriate installation methods and tools

7.11	state the main responsibilities of employers and employees under Working at Height Regulations
7.12	identify potential dangers in excavations
7.13	describe the factors affecting, and means of confirming, the suitability of excavations
7.14	explain the dangers of taking actions that can create confined space risks in excavations
7.15	explain the dangers of inadequate handling and lifting procedure
7.16	explain the dangers of lifting operations to on-site personnel on site
7.17	describe the types and signs of defect likely to be present, and means of determining the appropriate safe action.

<b>Additional Guidance</b>
AC 7.12: Learners to be made aware of different trench support methods.
AC 7.14: Learners to be made aware of emergency rescue techniques.

<b>Learning outcome</b>
The learner will: 8. Understand isolation and connection methods
<b>Assessment criteria</b>
The learner can: 8.1 describe the range of isolation methods available and the rationale for their selection 8.2 explain the procedure for obtaining authorisation to proceed with connections 8.3 identify the range of actions to be taken if work cannot proceed to schedule 8.4 explain how to determine appropriate safe remedial action if for any reason work cannot proceed 8.5 identify methods of accessing information from different sources 8.6 identify types and causes of likely <b>disruption</b> 8.7 identify methods of avoiding <b>disruption</b> .

<b>Range</b>
<b>Disruption:</b> equipment failure, weather conditions, system load, ground conditions, lack of available resources, communication breakdown, traffic, public.

<b>Additional Guidance</b>
AC 8.1: Learners need to demonstrate a background knowledge of all isolation methods, i.e. valves, stopple, iris stopple, in-line flowstopping.
AC 8.2: Obtaining authorisation will fall under the remit of SCO; learners may not have an SCO qualification, but would be expected to comply with the procedures within the Permit to Work.

## **Unit 708**

## **Install gas engineering products or assets above 355mm**

### **Supporting information**

#### **Guidance**

Each individual organisation, such as Distribution Networks will have their own suite of policy and procedural documents. Accordingly, it is not deemed appropriate to name these although they would include for example Network Emergency Suite of Policies and Procedures. It is envisaged that whilst training is being conducted in separate Networks, individual Networks will ask training personnel to brief out these unique documents.



## 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](http://www.euskills.co.uk)** for more details.



## 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](http://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

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

## **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 is a leader in global skills development. Our purpose is to help people and organisations to develop their skills for personal and economic growth. Made up of City & Guilds, City & Guilds Kineo, The Oxford Group and ILM, we work with education providers, businesses and governments in over 100 countries.

## **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* (see the City & Guilds 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.

Published by City & Guilds, a registered charity established to promote education and training

**City & Guilds**  
**1 Giltspur Street**  
**London EC1A 9DD**  
**[www.cityandguilds.com](http://www.cityandguilds.com)**