



Unit title	Determine the Exact Location of Water Loss Using Acoustic Listening Techniques
SQA code	HC3W 04
SCQF level	5
SCQF credit points	10
SSC ref	DC04

History of changes

Publication date: March 2016

Version: 01

Version number	Date	Description	Authorised by

© Scottish Qualifications Authority 2016

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

Title	Determine the Exact Location of Water Loss Using Acoustic Listening Techniques	
Learning Outcomes		Assessment Criteria
The learner will:		The learner can:
1	Trace the route of water pipes and locate surface fittings.	<p>1.1 Select the appropriate tracing technique and equipment in accordance with the type of water pipe being traced.</p> <p>1.2 Confirm the condition of tracing equipment in accordance with organisational requirements.</p> <p>1.3 Identify the location of utility apparatus accurately to prevent safety problems during pipe tracing activities.</p> <p>1.4 Identify the position of the water pipe and surface fittings from records, surface evidence and tracing techniques.</p> <p>1.5 Trace water pipes over the required distance to within specified limits in line with organisational requirements.</p> <p>1.6 Mark the position of the water pipe and surface fittings on the work site in accordance with organisational requirements.</p> <p>1.7 Record and report deviations in the position of water pipes and surface fittings in accordance with organisational requirements.</p> <p>1.8 Follow safe working and hygiene practices in accordance with relevant specifications and procedures.</p>
2	Identify the location of the leak.	<p>2.1 Select appropriate equipment for the detection activity and confirm it is in working order and is safe to use.</p> <p>2.2 Set up the equipment to provide the hearing sensitivity needed to locate the leak.</p> <p>2.3 Identify and verify the location of the leak.</p>

Learning Outcomes	Assessment Criteria
<p>The learner will:</p>	<p>The learner can:</p> <p>2.4 Mark the position of the leak in accordance with organisational requirements.</p> <p>2.5 Dismantle, clean and return the equipment to storage in accordance with organisational requirements.</p> <p>2.6 Record and report the position of the leak in accordance with organisational requirements.</p> <p>2.7 Report relevant details to the required person for further investigation purposes where the location of the leak cannot be identified.</p> <p>2.8 Follow safe working and hygiene practices in accordance with relevant specifications and procedures.</p>
<p>3 Know and understand how to locate leaks by using acoustic listening.</p>	<p>3.1 Describe the different types of tracing equipment used for different tracing techniques and their limitations.</p> <p>3.2 Outline how to check and use tracing equipment.</p> <p>3.3 Explain the importance of locating cables and other utility apparatus.</p> <p>3.4 Describe how to interpret records, plans and surface evidence of route of mains.</p> <p>3.5 State the procedures to be used when tracing water pipes and locating surface fittings.</p> <p>3.6 Describe the procedures for marking the route of mains.</p> <p>3.7 State the specified limits for tracing water pipes.</p> <p>3.8 Describe organisational reporting requirements relating to leak location.</p>

Learning Outcomes	Assessment Criteria
<p>The learner will:</p>	<p>The learner can:</p> <p>3.9 Outline the safety and hygiene specifications and procedures for locating leaks using acoustic listening techniques.</p> <p>3.10 Describe the implications of tracing activities for water quality.</p> <p>3.11 State the implications of not tracing prior to leak investigation.</p> <p>3.12 Explain the importance of checking the equipment.</p> <p>3.13 Describe the limitations of acoustic listening equipment.</p> <p>3.14 Outline how to use hand-held listening tools to locate leaks.</p> <p>3.15 Explain the importance of verifying the location of the leak.</p> <p>3.16 State the procedures for marking the location of leaks.</p> <p>3.17 Describe the procedures for dismantling, cleaning and storing equipment.</p> <p>3.18 Outline the recording and reporting procedures for locating leaks using acoustic listening techniques.</p> <p>3.19 Explain why it could be impossible to locate the leak and who should be informed.</p>

Additional information about the Unit
Unit purpose and aim(s)
<p>This Unit allows learners to demonstrate their competence in using acoustic listening techniques to locate leaks on water mains and service pipes.</p> <p>Learners will need to show that they can trace metallic and non-metallic pipes over the required distance, using appropriate tracing techniques, and they must mark the position of the pipe on site. They must then select and use appropriate leakage detection equipment to identify and verify the position of the leak. Learners must record and report leakage details in line with organisational requirements, and must follow safe working and hygiene practices at all times.</p>
Details of the relationship between the Unit and relevant national occupational standards (if appropriate)
EUSDC04 — Determine the exact location of water loss (acoustic listening techniques)
Details of the relationship between the Unit and other standards or curricula (if appropriate)
N/A
Assessment requirements specified by a sector or regulatory body (if appropriate)
<p>Some terms, used in the Assessment Criteria, cover a range of situations, as follows:</p> <ol style="list-style-type: none"> 1 Tracing techniques include: <ol style="list-style-type: none"> (a) visual techniques (b) electronic techniques — induction, connection and radio (c) measurement techniques. 2 Water pipes are: <ol style="list-style-type: none"> (a) metallic (b) non-metallic. 3 Surface fittings are: <ol style="list-style-type: none"> (a) valve covers (b) hydrant covers (c) meter chamber covers. 4 Leakage detection equipment used is: <ol style="list-style-type: none"> (a) non-electronic (b) electronic.

Assessment requirements specified by a sector or regulatory body (if appropriate)

5 The learner can identify the **location of the leak** on:

- (a) service pipes
- (b) supply pipes
- (c) water mains
- (d) valves
- (e) hydrants
- (f) stop valves.

Assessment requirements

Assessor observation in a realistic working environment (RWE), agreed in advance with the EV, may contribute to the Unit evidence. Networks replicated in the RWE must be pressurised to a Level consistent with, and must contain a substance which replicates, the workplace network. The RWE must include metallic and non-metallic pipework, with a variety of surface fittings, including valve covers, hydrant covers and meter chamber covers. The RWE pipework must have various leak locations, which are set in different configurations with no pattern between and amongst any group of learners.

Assessment (evidence) Requirements**Workplace evidence**

The majority of evidence used for this Unit must come from the learner's own work activities, both in their own 'reporting base' and working on the water distribution network.

Knowledge and understanding

The knowledge and understanding requirements for this Unit must be covered in full. The learner may demonstrate considerable knowledge through their workplace performance and during observed assessments, but it is likely that some assessor questioning will be needed to confirm that all knowledge requirements are met. The centre may use oral and/or written questioning to cover the knowledge requirements.

Guidance on Instruments of Assessment

The evidence for this Unit is likely to be generated through a mixture of observation reports, assessor-guided discussions and questioning, workplace records, reports or documentation.