

# BUILDING SERVICES ENGINEERING TRAILBLAZER APPRENTICESHIP STANDARD

## 1. Occupation

Building Services Engineering **Installer**

## 2. Occupational profile

Building Services Engineering makes buildings work. It is a specialist branch of engineering within the construction sector. Installers, **install components** of large-scale industrial and commercial systems such as heating, chilled water, hot water and cold water which are used for heating workplaces such as those found in industrial and commercial buildings like office blocks, factories, schools and hospitals. These engineering systems operate by moving temperature controlled water around the inside of buildings, providing heating and cooling, and utilise fossil fuels and sustainable energy systems.

Installers have a **basic knowledge** of the systems and how the components within systems relate to each other. They also, **under close but not constant supervision**:

- plan **allocated work tasks** to install system **components**;
- undertake **allocated work tasks** in testing system **components**;
- **assist in** pre-commission testing;
- undertake **allocated work tasks** in de-commissioning systems.

Installers are able to demonstrate competence in the health and safety, communication, quality control and environmental requirements appropriate to their scope of work.

Installers are able to work within new build construction sites and existing buildings **under close, but not constant, supervision** in the most efficient and economical manner. They must adhere to safe working practices without endangering themselves or others.

## 3. Requirements Knowledge, Skills and Behaviours

Knowledge	What is required
Working Safely	<ul style="list-style-type: none"> <li>• <b>Understand</b> safe working practices applying to themselves and others in building services engineering working environments.</li> </ul>
Working Sustainably	<ul style="list-style-type: none"> <li>• <b>Understand</b> basic scientific principles underpinning building services engineering industrial and commercial systems including measurement, force and pressure, heat and power, materials and electricity.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Understand</b> environmental protection measures within building services engineering for effective use of material resources, minimising wastage, the legislation surrounding the effective use of energy, gas and water resources.</li> </ul>
Planning and Preparing	<ul style="list-style-type: none"> <li>• <b>Understand</b> how to plan and organise <b>allocated component installation work tasks</b> including: how to interpret instructions correctly; how to organise the sequence of activities to be undertaken; how to ensure the necessary tools and components are available as required; when and how to involve other trades; how and when to report problems.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Understand</b> how to prepare work areas to undertake <b>allocated component installation work tasks</b> including: how to maintain safe access and egress for self and others; how to work with and alongside other trades; how and where to store tools, equipment and components to ensure safe and efficient work flow; and how to correctly identify mechanical services and electrical tool supply connections.</li> </ul>
Installing Components	<ul style="list-style-type: none"> <li>• <b>Understand</b> the <b>basic</b> operating principles, and <b>basic</b> installation, testing, pre-commissioning, commissioning and decommissioning processes of industrial and commercial cold water systems, hot water systems, heating systems, chilled water systems, compressed air and steam systems.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Understand</b> how system <b>components</b> relate to each other within each of the industrial and commercial systems, including the assembly, positioning, orientation and fixing requirements of storage vessels, heat emitters, pressure vessels, controls.</li> </ul>

Skills	What is required
Working Safely	<ul style="list-style-type: none"> <li>• <b>Apply</b> relevant safety legislation, codes of practice and safe working practices to self and others in building services engineering working environments.</li> </ul>
Planning, Preparing and Working Sustainably	<ul style="list-style-type: none"> <li>• <b>Plan, organise and undertake</b> the installation of industrial and commercial system components in ways which use resources effectively to complete <b>allocated work tasks</b>, effectively, safely and with consideration to environmental impact using industry recognised practices.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Prepare</b> work areas in new and existing sites to undertake <b>allocated component installation work tasks</b> ensuring: safe access and egress for self and others is maintained; components, tools and equipment are stored and positioned safely and to allow efficient workflow; mechanical supply services and electrical tool supply connections are correctly identified; and the need for other trades support is identified and arranged.</li> </ul>
Installing Components	<ul style="list-style-type: none"> <li>• <b>Apply</b> pipework fabrication, installation and jointing techniques for industrial and commercial <b>system components</b> to industry recognised standards. This includes prefabricated and/or modularised components and distribution systems, and including the assembly, positioning, orientation and fixing of storage vessels, heat emitters, pressure vessels, controls.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Undertake allocated work tasks</b> in the testing, pre-commissioning, commissioning and decommissioning of industrial and commercial cold water systems, hot water systems, heating systems and chilled water systems.</li> </ul>

Behaviours	What is required
Communicating Effectively	<ul style="list-style-type: none"> <li>• Use oral, written and electronic methods to communicate information with work colleagues, other tradespeople, clients representatives, supervisors, and other members of the building services engineering and wider construction team.</li> </ul>
Working Effectively and Efficiently	<ul style="list-style-type: none"> <li>• Work reliably and effectively <b>under close, but not constant</b> supervision to the appropriate industry recognised practices and be aware of the needs and concerns of others, especially where related to diversity and equality.</li> </ul>
	<ul style="list-style-type: none"> <li>• Solve problems <b>within their own scope of responsibility</b>, by applying technical and behavioural skills and knowledge to define the problem, identify, evaluate and select alternatives and implement solutions.</li> </ul>
Taking Responsibility	<ul style="list-style-type: none"> <li>• Accept responsibility for <b>their own work</b>.</li> </ul>
Working with Others	<ul style="list-style-type: none"> <li>• Work effectively with colleagues, other trades, clients, suppliers and the public.</li> </ul>
Continuing Personal Development	<ul style="list-style-type: none"> <li>• Maintain and enhance competence in own area.</li> </ul>
Working Ethically	<ul style="list-style-type: none"> <li>• Exercise responsibilities in an ethical manner.</li> </ul>

#### 4. Duration

Candidates entering this apprenticeship without previous experience will normally take 24 months to demonstrate competence in the standard.

#### 5. Qualifications

Individual employers will identify any relevant entry requirements in terms of previous qualifications, trainability tests, or other criteria. Most candidates will have English and Mathematics at level 2 and Information Communications Technology (ICT) level 1 on entry, and all will have achieved these levels by the end of the apprenticeship. Additionally, all apprentices must achieve the Level 2 Heating and Ventilating Installer qualification prior to undertaking the end-point synoptic assessment with an independent assessment organisation. This is currently under development.

**Level** – This is a level 2 Apprenticeship

**Review date** – This standard will be reviewed in 3 years