

# BUILDING SERVICES ENGINEERING TRAILBLAZER APPRENTICESHIP STANDARD

## 1. Occupation

Building Services Engineering **Craftsperson**

(Previously referred to as: Heating and Ventilating (H&V) Craftsman; H&V Fitter; H&V Fitter/Welder; H&V Pipefitter; Mechanical Services Fitter)

## 2. Occupational profile

Building Services Engineering makes buildings work. It is a specialist branch of engineering within the construction sector. Craftspersons **undertake the installation, testing, pre-commissioning, commissioning and decommissioning of large-scale engineering systems** 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.

Craftspersons have **detailed knowledge** of the system's operating principles. They also:

- set, identify and establish the requirements of the job, whether from drawings or client's other instructions;
- liaise and work with other trades, suppliers and clients, as appropriate;
- solve problems within the scope of the work they carry out;
- undertake work to comply with all relevant standards;
- plan and monitor work programmes for installing, testing, pre-commissioning, commissioning and decommissioning systems;
- contribute to adjusting the configuration of systems as they are installed.

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

Craftspersons are able to work within new build construction sites and existing buildings **on their own**, proficiently and **without 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> relevant safety legislation and 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> 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 utilise resources effectively within building services engineering including the roles and responsibilities of relevant people, how to oversee work; how to produce risk assessments and method statements and how to plan work programmes for self and small teams installing industrial and commercial systems.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Understand</b> the preparation requirements for work areas in new and existing building services engineering sites.</li> </ul>
Installing Pipework	<ul style="list-style-type: none"> <li>• <b>Understand</b> pipework fabrication and jointing techniques for industrial and commercial systems, including prefabricated and/or modularised components and distribution systems.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Understand</b> the preparation, procedures, process, standards and codes of practice required to undertake welding of industrial and commercial systems pipework.</li> </ul>
Installing Systems	<ul style="list-style-type: none"> <li>• <b>Understand</b> the design principles, layout, and operating principles, installation, testing, pre-commissioning, commissioning and decommissioning techniques for new and existing industrial and commercial cold water systems, hot water systems, heating systems, chilled water systems, compressed air systems and steam systems.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Understand</b> the principles and requirements of industrial and commercial gas, oil and solid fuel systems and mechanical sustainable energy systems.</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 the installation</b> of industrial and commercial systems in ways which use resources effectively to complete work, with consideration for cost, quality, safety, security and environmental impact, within relevant legislative requirements, codes of practice and industry recognised practices.</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Prepare</b> work areas in new and existing sites to undertake building services engineering industrial and commercial systems installation.</li> </ul>
Installing Pipework	<ul style="list-style-type: none"> <li>• <b>Apply</b> pipework fabrication and jointing techniques for industrial and commercial systems, including prefabricated and/or modularised components and distribution systems and natural gas distribution pipework.</li> </ul>
Installing Systems	<ul style="list-style-type: none"> <li>• <b>Apply</b> installation, testing, pre-commissioning, commissioning and decommissioning techniques for industrial and commercial; cold water systems; hot water systems, heating systems, 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 technical and other information effectively 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 without supervision, to the appropriate codes of practice 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 the work of self <b>and others under their control</b></li> </ul>
Managing Tasks	<ul style="list-style-type: none"> <li>• Accept allocate and supervise technical and other tasks.</li> </ul>
Working with Others	<ul style="list-style-type: none"> <li>• Work effectively with colleagues, the public, other tradespeople, clients representatives, supervisors, and other members of the building services engineering and wider construction team.</li> </ul>
	<ul style="list-style-type: none"> <li>• Support the learning and development of others through activities such as mentoring, and sharing professional expertise and knowledge.</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

It is unlikely that individuals entering this apprenticeship without previous experience will complete the apprenticeship in less than 36 months, and a typical completion time is likely to be 48 months.

#### 5. Qualifications

Individual employers will identify any relevant entry requirements in terms of previous qualifications, trainability tests, or other criteria. Typically, most candidates will have English and Mathematics at level 2 and Information Communications Technology (ICT) level 1 on entry. All will have achieved English at level 2, Mathematics at level 2 and ICT at level 1 by the end of the apprenticeship. Additionally, all apprentices must achieve the Level 3 Heating and Ventilating Craftsperson qualification prior to undertaking the end-point synoptic assessment with an independent assessment organisation. This is currently under development.

**Level** – This is a level 3 Apprenticeship

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