Unit 303: Understand health and safety and environmental legislation in the Building Services Engineering sector

# Delivery guide

Unit information

This unit covers the knowledge and understanding required for establishing and maintaining working practices and procedures across a specified range of building services engineering sector installation and/or maintenance activities that consider health and safety, the natural environment and the working environment. This would include identifying hazards and risks, applying appropriate procedures and working practices to protect yourself and others.

The learner will possess knowledge and understanding to be able to use building services engineering sector equipment, components, materials and substances effectively, efficiently, in accordance with the specification giving consideration to the natural environment and the working environment in terms of waste materials and if appropriate water usage.

Learners may be introduced to this unit by asking themselves questions such as:

* What are industry standards and regulations and how will these affect me?
* What are the different working practices used within BSE and what are the advantages and limitations of these practices?
* What harmful materials and substances could be encountered in BSE and how should they be dealt with?
* What is classed as a hazard or a risk?
* How do you safely transport and/or dispose of waste material, substances, and liquids?

Learning outcomes

1. Understand relevant industry standards and regulations
2. Know your responsibilities in accordance with organisational procedures
3. Understand the application, advantages and limitations of different working practices
4. How to recognise materials and substances that can potentially be harmful
5. Understand the documentation associated with the organisational procedures' requirements
6. Know how to deal with the presence of harmful materials and substances
7. How to locate relevant health and safety information needed to complete the installation and/or maintenance
8. Understand hazards and risks
9. Understand the methods for handling of hazardous materials and substances
10. Understand the safe use, maintenance, handling, transport and storage of resources
11. Understand the warning signs for hazardous materials and substances
12. Understand the methods for the safe transport and/or disposal of waste material, substances and liquids
13. Understand the procedures relevant to reporting issues

Suggested resources

Textbooks

* Maskrey, M., (2009) *The City & Guilds Textbook: Plumbing Book 1 for the Level 3 Apprenticeship (9189), Level 2 Technical Certificate (8202) & Level 2 Diploma (6035)*. London: Hodder Education.

ISBN 978-1-5104-1648-2

* Tanner, P. (2019) *Electrical Installations Book 1 for the Level 3 Apprenticeship (5357), Level 2 Technical Certificate (8202) & Level 2 Diploma (2365).* London: Hodder Education.

ISBN 978-1-5104-3224-6

Websites

* [Asbestos | Types of Asbestos](https://www.asbestos.com/asbestos/types/)
* [Alcumus | Top ten health and safety risks in construction](https://www.alcumus.com/blog/october-2014/top-ten-health-and-safety-risks-in-construction)
* [CHAS | What Are RAMS Documents in Health and Safety?](https://www.chas.co.uk/help-advice/risk-management-compliance/risk-assessment-introduction/method-statement-contents/)
* [CIBSE | Legislation & Recent Changes to Law](https://www.cibse.org/knowledge/knowledge-items/detail?id=a0q20000008JgW7AAK)
* [CIBSE | Legislation Including Building Regulations](https://www.cibse.org/knowledge/topic/legislation-including-building-regulations)
* [ConstructionWorld | Top 10 Tips for Preventing Accidents on Construction Sites](http://www.constructionworld.org/top-10-tips-preventing-accidents-construction-sites/)
* [HandsHQ | Free construction risk assessment and method statement template](https://www.handshq.com/resources/free-risk-assessment-method-statement-template)
* [LocalGov | Construction](https://www.localgov.co.uk/Construction)
* [SlidePlayer | Health and safety in building services engineering](https://slideplayer.com/slide/7821415/)
* [Small Business | The Hierarchy Structure of Construction Companies](https://smallbusiness.chron.com/hierarchy-structure-construction-companies-76972.html)
* [UNECE | About the GHS](https://unece.org/about-ghs)

Legislation

* [HSE | Legal Status of HSE Guidance and ACOPs](https://www.hse.gov.uk/legislation/legal-status.htm)
* [HSE | Health and Safety in the Construction Industry](https://www.hse.gov.uk/construction/index.htm)
* [HSE | Health and Safety at Work etc Act 1974](https://www.hse.gov.uk/legislation/hswa.htm)
* [HSE | Inspectors and the law](https://www.hse.gov.uk/toolbox/managing/law.htm)
* [HSE | Asbestos information, instruction and training](https://www.hse.gov.uk/asbestos/training.htm)
* [HSE | Common materials that may contain asbestos](https://www.hse.gov.uk/asbestos/common-materials.htm)
* [HSE | Control of Substances Hazardous to Health (COSHH)](https://www.hse.gov.uk/coshh/)
* [HSE | Electrical safety at work](https://www.hse.gov.uk/electricity/)
* [HSE | Provision and Use of Work Equipment Regulations 1998 (PUWER)](https://www.hse.gov.uk/work-equipment-machinery/puwer.htm)
* [HSE | Mobile elevating work platforms (MEWPs)](https://www.hse.gov.uk/construction/safetytopics/mewp.htm)
* [HSE | Excavation: What you need to know as a busy builder](https://www.hse.gov.uk/pubns/cis64.pdf)
* [HSE | Working in confined spaces](https://www.hse.gov.uk/toolbox/confined.htm)

| **Learning outcomes** | **Criteria** | **Delivery guidance** |
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| 1. Understand appropriate industry standards and regulations | * 1. Sources of information | * Learners to research and understand current Building Regulations and industry standards for Building Services Engineering (BSE). * Learners to research and understand legislation specific to building services. * Learners to research and understand approved code of practice, Health and Safety Executive (HSE) Guidance Notes for Building Services Engineering. * Learners to research and understand statutory regulations, Building Regulations, industry standards and manufacturer’s technical instructions. * Learners to research and understand general legislation, construction specific legislation, building services specific legislation. * Learners to research and understand non-statutory regulations, approved code of practice, Health and Safety Executive (HSE) Guidance Notes. |
| * 1. Health and safety/environmental legislation | * Learners to research and understand current health and safety/environmental legislation. * Learners to research, collaborate and discuss their work experience around: * The Health and Safety at Work etc. Act (HSWA) 1974 * The Electricity at Work (EAW) Regulations 1989 * The Management of Health and Safety at Work Regulations 1999 * Workplace (Health and Safety and Welfare) Regulations 1992 * Control of Substances Hazardous to Health (COSHH) Regulations 2002 * Working at Height Regulations (WAHR) 2005 * Personal Protective Equipment (PPE) at Work Regulations 1992 * Manual Handling Operations Regulations (MHOR) 1992 * Provision and Use of Work Equipment Regulations (PUWER) 1998 * Control of Asbestos (COAR) Regulations 2012 * Environmental Protection Act (EPA) 1990 * The Hazardous Waste (England and Wales) (Amendment) Regulations 2016 * Pollution Prevention and Control Act (PPCA) 1999 * Control of Pollution Act (CPA) 1974 * The Control of Noise at Work (CNW) Regulations 2005 * The Waste Electrical and Electronic Equipment (WEEE) Regulations 2013. |
| 1. Know your responsibilities in accordance with organisational procedures | * 1. Members of the construction team | * Learners to work in teams to draw a mind map of the hierarchy of control in a typical construction team. * Learners to present to peers on their own company hierarchy and explain individual roles. * Learners to research and discuss the construction team, employers (including employer representatives), designers, main contractors, sub-contractors, employees, self-employed (labour only), clients (customers). * Site management team includes: * architect * project manager * clerk of works * structural engineer * surveyor * building services engineer * quantity surveyor (QS) * buyer * estimator * contracts manager * site manager * health and safety manager. * Site operatives include: * sub-contractors * site supervisor * trade supervisor * bricklayer * joiner * plasterer * tiler * electrician * H&V fitter * gas fitter * decorator * round workers. |
| * 1. Enforcing authorities | * Learners to research and understand the Health and Safety Executive (HSE) and the Local Authority’s role in enforcing health and safety and the control measures of inspectors, including their role in providing advice and guidance * Learners to be able to identify appropriate responsible persons to whom health and safety and welfare-related matters should be reported such as the employer, supervisor, customer/client, safety officers, HSE inspectors, trades union representative and environmental health officers. |
| * 1. Control measures of inspectors | * Learners to research and discuss what powers and control measures inspectors have and to share any workplace experience of working with them. * Learners to have an understanding of the HSE Inspectors’ remit including: * improvement notice * prohibition notice * powers of prosecution * role in providing advice and guidance. |
| 1. Understand the application, advantages and limitations of different working practices | * 1. Working practices | * Learners to research and discuss their workplace experience of good working practices around activities such as: * competent persons * electrical safe isolation procedure * permits to work * selection and checking correct power tools * hand tools and portable electrical equipment * safe working practices with equipment and materials: portable power tools (e.g., cartridge gun, drills, grinders) signs and guarding, tools and materials storage facilities, dangerous substances (e.g., cutting compounds and adhesives). * Learners to research and discuss safe working practices within the BSE environment, how these are applied and some of the limitations and advantages to using specific practices. |
| 1. Know how to recognise materials and substances that can potentially be harmful | * 1. Common building materials and services components that may contain asbestos | * Learners to research and discuss asbestos awareness within the BSE and construction environment. * Learners to research and list areas and materials that may have asbestos contamination in them. * Learners to share and discuss any workplace experience of asbestos having been found on sites they have worked on. * Learners to research and understand how to report and safely dispose of asbestos found on working contracts. * Learners to research and understand components, materials and common substances that may contain asbestos such as: * flue * soil * rainwater pipes * gutters * tanks and cisterns * Artex * small gaskets and seals * bath panels/panelling * floor tiles * plaster and decorative finishes * electrical accessories (flash guards and matting in fuse carriers and on distribution board covers). |
| * 1. The types of asbestos | * Learners to research and discuss what types of asbestos they are likely to encounter on projects. * Learners to share any workplace Continuing Professional Development (CPD) knowledge they have if operatives have completed asbestos awareness courses. * Learners to research and discuss white asbestos (chrysotile), brown or grey asbestos (amosite), blue asbestos (crocidolite) and asbestos cement materials. |
| * 1. Commonly encountered substances | * Learners to be aware of commonly encountered substances that can potentially be harmful including: * lead (solid and fume) * solvents and lubricants * fluxes * jointing compounds * sealants * gases (Liquified Petroleum Gas) LPG, oxy-acetylene and carbon dioxide * petroleum * diesel fuels * cleaning agents. |
| 1. Understand the documentation associated with the organisational procedures' requirements | * 1. The strategies used to prevent accidents during work activities | * Learners to collaborate and discuss any workplace experience of induction/toolbox talks around strategies to prevent accidents during work activities. * Learners to research and discuss Risk Assessment Method Statements (RAMS) permit to work systems, safety notices, Construction Skills Certification Scheme (CSCS) card and CSCS affiliated cards. * Learners to complete RAMS documentation for a small job. |
| 1. Understand the organisational procedures for dealing with the presence of harmful materials and substances | * 1. The procedures that must be used to safely work with asbestos cement-based materials | * Learners to have an awareness of procedures that must be used to safely work with asbestos cement-based materials: * work activities for licensed and unlicensed work * licensing requirements for asbestos removal organisations * safe disposal requirements * protection of the workforce and members of the public. * Learners to collaborate and discuss any workplace experience of induction/toolbox talks around working with harmful materials and substances. * Learners to research Control of Substances Hazardous to Health (COSHH) Regulations 2002. |
| 1. Know where and how to locate relevant health and safety information needed to complete the installation and/or maintenance activity in accordance with organisational procedures | | * Learners to research and discuss the Health and Safety Executive (HSE). * Learners to collaborate and discuss workplace procedure, risk assessments, method statements, permit to work systems, safety notices, CSCS card for installation and maintenance and how it is implemented within their own organisations. |
| 1. Know what constitutes a hazard or risk | * 1. Site hazards | * Learners to complete RAMS documentation for a small job to include vehicle use. * Learners to collaborate and discuss common hazards occurring on construction sites (all property types), in industrial and commercial premises (occupied and unoccupied refurbishment), in dwellings (occupied and unoccupied refurbishment) and to link these to real-life jobs they have experience of. |
| * 1. Common electrical dangers encountered | * Learners to research HSE for working safely with electricity. * Learners to research Provision and Use of Work Equipment Regulations (PUWER) 1998. * Learners to research The Electricity at Work Regulations 1989. * Learners to research and discuss types of common electrical dangers such as: * faulty electrical equipment * signs of damaged or worn electrical cables (power tools and property hard wiring system) * trailing cables * proximity of cables to services pipework * buried/hidden cables * inadequate overcurrent protection devices * electric shock * burns * fires and explosions. * Learners to be aware of the requirements to carry out a visual inspection of a power tool for safe condition before use including: * valid Portable Appliance Testing (PAT) * visual checks for general condition. |
| * 1. General hazards | * Learners to collaborate and discuss hazards such as: * presence of dust and fumes * handling and transporting equipment or materials * contaminants and irritants * fire * working at height * hazardous malfunctions of equipment * improper use * maintenance and storage of tools and equipment * bacteria from vermin potentially leading to Weil’s disease * asbestos. * Learners to share any workplace experience of these hazards. |
| 1. Understand the methods for handling of hazardous materials and substances in accordance with organisational procedures | * 1. Commonly encountered substances | * Learners to research COSHH and relate it to substances that they are familiar with and have worked with previously including: * asbestos * lead (solid and fume) * solvents and lubricants * fluxes * jointing compounds * sealants * gases – LPG, oxy-acetylene and carbon dioxide * petroleum * diesel fuels * cleaning agents. |
| 1. Understand the organisational procedures, suppliers' and manufacturers' instructions for safe use, maintenance, handling, transport and storage of:  * tools, plant, and access equipment * equipment and components * materials and substances | * 1. Access equipment to permit work at heights | * Learners to engage in workshop tasks, working in teams, building and dismantling various types of access equipment such as: * step ladders * hop ups * mobile tower scaffolds * extension ladders * scissor lifts and * cherry pickers. * Learners to research Working at Height (WAH) Regulations 2005. * Learners to research Mobile Elevating Working Platforms (MEWP). * Learners to collaborate and discuss the use of Scaff Tags when using various access equipment. |
| * 1. Personal protective equipment (PPE) | * Learners to produce Risk Assessment Method Statements (RAMS) for the workshop tasks above and to include all necessary Personal Protective Equipment (PPE) required for the tasks. * Learners to collaborate and discuss when there is a need for harness protection to be used. * Learners to collaborate and discuss PPE such as: * clothing protection including high visibility * eye protection * hand protection * head protection * foot protection * hearing protection * respiratory protection * vibration protection * harnesses. * Learners to be able to identify the three elements of the fire triangle and how combustion takes place and to be able to identify the dangers of working with heat-producing equipment and how to prevent fires occurring. * Learners to know the procedures for dealing with small, localised fires and firefighting equipment including: * tackling fires to aid escape * types of extinguishers * selection of extinguisher by fire type * the method of use and the evacuation procedures. |
| * 1. Excavations and confined spaces | * Learners to research and discuss working safely around excavations and confined spaces and around protocol for no lone working and possible gas build ups and what to do in an emergency. * Learners to research and understand possible collapses of excavations and what to do in an emergency. * Learners to be able to identify situations where it may be necessary to work in excavations and confined spaces. * Excavations: * drainage systems * cold water mains * foundations. * Confined spaces: * plant rooms * main service duct-rooms * tanks * cylinders * boilers or cisterns * under suspended timber floors * roof spaces. * Learners to be able to state dangers associated with excavations and confined spaces including: * inadequate ventilation * inadequate lighting * flooding * obstruction of an escape route * explosion * collapse. * Learners to understand safety measures when working in excavations and confined spaces including: * warning signs * safety barriers. |
| 1. Understand the warning signs for hazardous materials and substances | * 1. How the hazards of some substances and mixtures can be identified from the labels on packaging | * Learners to undergo identification questions around hazardous materials commonly used to display knowledge of labels on packaging. * Learners to research and discuss Globally Harmonised System (GHS) and why this system is used. * Learners to be able to state how the hazards of some substances and mixtures can be identified from the labels on packaging. * Learners to understand the Globally Harmonised System (GHS) of the classification and labelling of hazardous substances and mixtures including categorisation, hazard classes and the following: * physical hazards including: * explosives * flammable gases * oxidising liquids * corrosive to metals * health hazards including: * acute toxicity * skin corrosion/irritation * eye damage/irritation * respiratory/skin sensitisation * environmental hazards including: * hazardous to the aquatic environment * presentation of information including: * GHS pictogram * signal word (Danger or Warning) * hazard statement (Causes serious eye damage, Toxic if swallowed, etc.) * precautionary statement (Wear eye protection, Do not eat, drink or smoke when using this product, etc.) |
| 1. . Understand the methods for the safe transport and/or disposal of waste material, substances and liquids in accordance with:  * organisational procedures * suppliers' and manufacturers' instructions | * 1. How to deal with commonly encountered substances | * Learners to research and understand the methods for the safe transport and/or disposal of waste material, substances and liquids that are commonly used. * Learners to research safe segregation and disposal of waste of particular substances and liquids referring to COSHH. |
| 1. Understand the organisational procedures relevant to reporting issues | * 1. The procedures for reporting issues relating to: * health and safety * harmful substances and material * emergencies on-site | * Learners to collaborate and discuss their own workplace experience around health and safety, harmful substances and emergencies on-site and to tie this in with any site inductions they have experienced. * Learners to collaborate and discuss how their own organisation in the workplace has procedures and reporting documentation in place for the above possibilities and to know the chain of command these procedures go through. * Learners to be able to describe the actions that should be taken when an accident or emergency is discovered. * Learners to understand the recording procedures for accidents and near misses at work including: * statutory requirements * accident books * details to be recorded on a simple accident/incident report form * Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013 reporting requirements and methods. |