

Unit 9: Construction Regulations for a Sustainable Society

Unit code:	M/504/4353
QCF level:	6
Credit value:	15

Aim

The aim of this unit is to give learners an understanding of the regulatory framework that exists to support sustainable developments. Learners will gain skills to devise sustainable development strategies and model best-fit solutions for sustainable assets, addressing longer term legacy issues.

Unit abstract

In this unit, learners will explore the regulatory framework that promotes sustainable communities. Learners will gain an understanding that best practice design strategies, along with best-fit technologies, must be considered within a regulatory framework. Learners will recognise that the varied environmental needs of both operators and users will lead to a set of spatial qualities and technological provision tailored to their specific requirements.

Learners will find that it is no longer acceptable for building design strategies to ignore legacy issues once the original building design life has expired. Sustainable communities need reassurance that suitable 'exit-strategies' are integrated during the design process to ensure buildings and their essential construction components and equipment are capable of adaptation, reuse or recycling.

Learning outcomes

On successful completion of this unit a learner will:

- 1 Understand the processes and procedures necessary for ensuring compliant design and building operations within regulatory and health and safety frameworks
- 2 Be able to devise compliant strategies for sustainable developments
- 3 Understand the impact of regulation upon the management of construction operations for maintenance
- 4 Be able to model best-fit solutions for sustainable assets and their legacy characteristics.

Unit content

1 Understand the processes and procedures necessary for ensuring compliant design and building operations within regulatory and health and safety frameworks

Management strategies: operational and hazard risk management; Environmental Management System (EMS); occupational health and safety accreditation standard; Watersafe Compliance Management System (WCMS); use of Building Information Modelling (BIM); compliance software systems

Compliant design: sector (residential, industrial, commercial, infrastructure, utilities); design, e.g. outline, scheme design, concept, Building Information Modelling (BIM); National Planning Policy Framework (NPPF) Technical Guidance; local plan compliance; design guidance for development in 'Designated Areas', e.g. National Parks, Areas of Outstanding Natural Beauty (AONB), conservation areas; National Planning Validation Requirements; Planning Obligations Statement; Design Scheme Proposals; Affordable Housing Statement; Ancillary Structure Plans; air quality assessment; ground contamination mitigation; biodiversity/ecology surveys and mitigation; Daylight/Sunlight Assessment; Environmental Statement/Environmental Impact Assessment; Engineering Works Details; Flood Risk Assessment; Green Belt Volume Calculations; Parking and Servicing Proposals; Retail Assessment; Heritage Statement; Contaminated Land Assessment/Desktop Study; External Lighting Assessment; Noise Impact Assessment; Site Waste Management Plan; Statement of Community Involvement; Structural Survey; Sustainability Statement; TV/radio Implications Assessment; Transport Survey and Assessment; Travel Plan; Archaeological Desk-based Assessment/Field Evaluation; Special Protection Area (SPA) Statement

Building operations: new build; conversion; adaptation; demolition; historic; conservation; landscape (hard, soft); infrastructure; utilities

Regulatory frameworks: land use; development (land, assets, infrastructure, utilities, residential, commercial, industrial); environmental (natural, built asset); waste (management; chemical; product; asset); climate; air; noise; administrative procedures (applications, approvals, notices; appeals); planning acts; building regulations; health, safety and welfare (construction design and management, operational, infrastructure; utilities, lifestyle); fire risk management

Compliance with regulations (for a sustainable society): building regulations (in particular low carbon-related legislation), planning legislation; environmental protection legislation; ecological impact assessments; UK biodiversity action plan surveys

Compliance with regulations (regarding construction operations): building regulations; workplace (health, safety and welfare) regulations; Construction Design and Management regulations, e.g. legal duties of 'duty holders', design risk assessments, notification F10 requirements; Construction Occupational Health Management Essentials (COHME); aspects of planning legislation, e.g. mitigation measures to minimise adverse environmental impact; statutory enforcement procedures; approved codes of practice for safe working on sites

Brownfield sites: typical locations; types of former site use; contamination potential; redevelopment strategies; post-development strategies; regulation-specific constraints and opportunities

Greenfield sites: e.g. typical locations; Green Belt status; infill development opportunities; protection of green space and avoidance of urban sprawl

Marginal or greyfield sites: e.g. cause and effect of building redundancy and/or site under-use, potential for sustainable reuse

2 **Be able to devise compliant strategies for sustainable developments**

Developments: planning principles, e.g. strong economy, town centre vitality, prosperous rural economy, sustainable transport, high-quality communications infrastructure, high-quality dwellings, aesthetic design, adequate provision for health and welfare, protection of green space, climate change mitigation, conservation of natural environment, conservation of historic built environment, sustainable use of materials; development planning procedures; application of statutory town planning processes

Criteria: application of relevant planning criteria, e.g. performance criteria, coordinated information resource databases, synthesis of ideas, qualitative assessment, analysis and evaluation of outcomes; building modelling, e.g. Building Information Management Systems (BIMS), 2-D plans and specs, 3-D visualisation and coordination, 4-D model-based schedule and phasing, 5-D model-based cost estimating, 6-D procurement and thermal properties analysis, 7-D operational applications lifestyle, 8-D integrated project delivery); assets, e.g. procurement - public and private; technical criteria; internal environment; external environment (built, natural); standards (ISO 14001 certified products; Waste Recycling and Action Programme (WRAP)

Sustainable development: strategic-planning-compliant issues, e.g. climatic and micro-climatic influences, weather factors, including wind and water flow, utility services availability and access, potential for energy from renewable sources, green spaces, the use of and accessibility to natural light, reduced air pollution in built-up areas, optimal building density, avoidance of urban sprawl, conservation of existing buildings, preservation or creation of sense of neighbourhood and community, the creation and development of community facilities including work and leisure facilities, as well as good public transport infrastructure, reduced private car use; statutory technical standards, e.g. use of zero or low carbon technologies, hot water safety and water efficiency, conservation of fuel and power, ventilation and airtightness, site preparation and resistance to contaminants and moisture; principles for strategies for sustainable development, e.g. people-centred, consensus on long-term vision, comprehensive and integrated, targeted with clear budgetary priorities, comprehensive and reliable analysis, coordinated monitoring, learning and improvement, country-led and nationally-owned, high-level government commitment and influential lead institutions, existing processes and strategies, effective participation

3 **Understand the impact of regulation upon the management of construction operations for maintenance**

Maintenance management: planned maintenance system; system requirements, e.g. reporting procedures, maintenance timing/frequency/intervals, procedural issues; planned preventive maintenance; condition based maintenance; statutory (health and safety compliance)

Construction operations management: maintenance types, e.g. planned preventive maintenance, emergency and corrective maintenance, condition-based maintenance, renovation, repair, refurbishment, conversion, change of use, modernisation, thermal upgrade, extensions and internal alterations, access upgrade works to historic buildings

Documentary evidence: evidence, e.g. equipment manufacturer requirements, inventory content, documentation and document flow charts, survey reports, historic data and job records, reference documentation (such as specialist calculations and energy performance targets, results, staged monitoring and trend investigation), document flow chart (such as planning cards, job cards, signing and authorising instructions), conditional planning and listed building consent notices, approved building control specifications and drawings, health and safety file, risk assessments, commissioning certificates

4 **Be able to model best-fit solutions for sustainable assets and their legacy characteristics**

Best-fit solutions: regulation compliant (operational, energy performance; user model and monitor, energy performance improvements, energy savings, whole-lifecycle); cost analysis; user satisfaction; optimal environmental performance;

Assets: new build; conversion; adaptation; demolition; historic; conservation; landscape (hard, soft); infrastructure; utilities

Design appraisal: building attributes characterisation; baseline design model; building orientation; building aspect; envelope insulation levels; wall and roof construction; passive thermal storage; glazing properties; shading strategies; lighting system designs; mechanical system design; rain/grey water recovery; variables that influence the energy performance and user comfort/productivity; regulatory issues, e.g. energy use and carbon assessment, energy performance goals, planning conditions, building regulations, BREEAM, EcoHomes; 'right sizing' of space and equipment, occupancy and use, whole-life costing +, value engineering, Building Information Modelling (BIM), carbon impact assessment modelling, fragility curves and risk-based concept, proof of concept, asset condition

Legacy characteristics: benchmarking; retro-commissioning capabilities; design dynamics (e.g. iterative modelling process, technical reappraisal, passive features, balanced facility and user perspectives, user friendly and synergistic controls), best-fit technologies, technical functionality, reliability in use, buildability, constructability, manageable controllability, climate and micro-climate compatibility, intelligent solutions, low carbon solutions, best practice standards, building and building-use specific

Learning outcomes and assessment criteria

Learning outcomes On successful completion of this unit a learner will:	Assessment criteria for pass The learner can:
LO1 Understand the processes and procedures necessary for ensuring compliant design and building operations within regulatory and health and safety frameworks	1.1 Summarise management strategies for construction site operations that are regulatory compliant 1.2 Justify the regulatory approval framework for a sustainable development on a redundant industrial site 1.3 Justify a design solution for a specific project on a greenfield site
LO2 Be able to devise compliant strategies for sustainable developments	2.1 Interpret planning regulations to produce a compliant solution for a sustainable development 2.2 Determine the technical criteria to achieve a compliant solution for a sustainable development 2.3 Devise a specific sustainable development proposal based on a design concept
LO3 Understand the impact of regulation upon the management of construction operations for maintenance	3.1 Assess the impact of regulation on construction operations for a specific maintenance project 3.2 Justify the documentary evidence required for a specific maintenance project proposal 3.3 Assess the impact of regulation on a maintenance management strategy for a new- build specific project
LO4 Be able to model best-fit solutions for sustainable assets and their legacy characteristics	4.1 Create a compliant building design simulated by changing building attributes 4.2 Appraise design solutions for best-fit compliance standards 4.3 Develop a model best-fit solution for a development opportunity which demonstrates a positive capability for addressing longer term legacy issues

Guidance

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

The learning outcomes associated with this unit are closely linked with:

Level 4	Level 5	Level 6
Unit 24: Design Procedures for Construction (A/601/1284)	Unit 19: Building Control Procedures and Legislation (K/601/1278)	Unit 1: Major Project (Y/503/7221)

Essential requirements

There are no special resources needed for this unit.

Delivery

All the learning outcomes can be delivered flexibly. In formal teaching sessions the tutor should identify and emphasise the essential theoretical information. Learners should be encouraged to undertake specific information searches individually and, when appropriate, as part of a team. For such a rapidly-evolving subject it is recommended that learners use the internet to obtain updates on the regulatory framework. This will also enable learners to appreciate the frequency and nature of trends occurring in this area and the debate behind the changes.

Learners can use this unit as a vehicle to build on the Level 5 units that cover the planning and building control system. This unit enables learners to focus on how the regulatory framework supports a sustainable society.

Using the skills, expertise and experience of professional practitioners as guest speakers will provide an essential 'reality check' for learners who might otherwise feel remote from the day-to-day impacts of the regulatory framework. To simulate professional activity a significant proportion of the learning is intended to involve structured role play and teamworking.

Tutors should ensure that up-to-date regulations and requirements are referenced.

Assessment

To complete this unit, learners must achieve all the assessment criteria.

For 1.1, 1.2 and 1.3, the learner should undertake project work to demonstrate design solutions for a sustainable development on brownfield and greenfield sites respectively. The work should involve both an individual effort and team submission which could include a peer assessment.

For 2.1, 2.2 and 2.3, the learner should undertake an appropriate information search and apply a modelling technique, such as BIM, to illustrate the resolution of integrated design issues which mitigate specific environmental impacts over the life of the final design solution.

For 3.1 and 3.2, the learner should prepare an independent piece of work which demonstrates the nature of the documentation required to support construction and maintenance activities as part of an overall refurbishment project.

For 4.1, 4.2 and 4.3, the learner should work as part of a small team to investigate essential attributes associated with a specific building proposal and contribute to a comprehensive group presentation which serves to highlight a compliant optimum design solution. Individual team members are expected to provide a folio of their specific input to the assignment.

Resources

Books

Department for Communities and Local Government – *Environmental Impact Assessment: A guide to procedures* (DCLG, 2000) ISBN 978-0727729606

Evans H – *Guide to the Building Regulations* (RIBA Publishing current edition 2011) ISBN 978-1859463543

Websites

www.atlasplanning.com	ATLAS – planning for large-scale development
www.planningportal.gov.uk	The Planning Portal
www.planningresource.co.uk	Planning resource for Development Control Services (DCS)