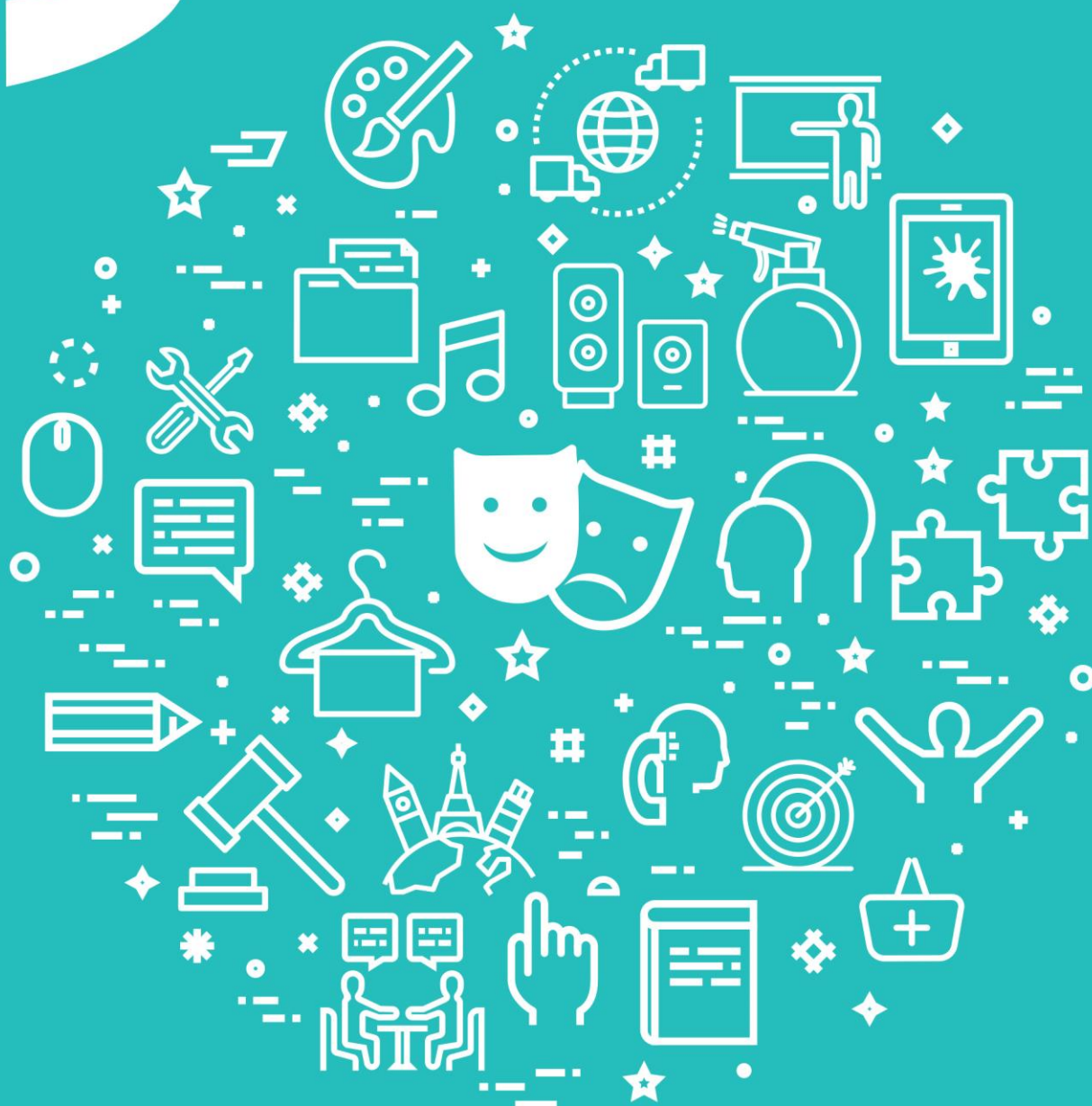


QUALIFICATION SPECIFICATION

 gateway
qualifications



Diploma in the Built Environment
with Building Information Modelling
(BIM) (Level 3)

Access to HE

Apprenticeships

Digital

Employability &
Enterprise

English & Maths

ESOL

Personal & Social
Development

Professional
Development

Vocational

This qualification specification covers the following qualification:

Qualification Number	Qualification Title
603/2738/8	Gateway Qualifications Level 3 Diploma in the Built Environment with Building Information Modelling

Version and date	Change detail	Section/Page Reference
1.0 (Jan 2020)	n/a	n/a
1.1 (June 2020)	Front, back covers and RPL statement updated.	n/a
1.2 (April 2021)	Qualification approval from Qualifications Wales removed.	Pg7, 8 and 9
1.3 (Nov 2022)	Removed address and changed back cover Funding section updated	Page 16 Page 9

About this qualification specification

This qualification specification is intended for tutors, assessors, internal quality assurers, centre quality managers and other staff within Gateway Qualifications recognised centres and/or prospective centres.

It sets out what is required of the learner in order to achieve the qualification. It also contains information specific to managing and delivering the qualification(s) including specific quality assurance requirements.

The specification should be read in conjunction with the Gateway Qualifications Centre Handbook and other publications available on the website which contain more detailed guidance on assessment and verification practice.

In order to offer this qualification you must be a Gateway Qualifications recognised centre.

If your centre is not yet recognised, please contact our Development Team to discuss becoming a Gateway Qualifications Recognised Centre:

Telephone: 01206 911211

Email: enquiries@gatewayqualifications.org.uk

Website: <https://www.gatewayqualifications.org.uk/advice-guidance/delivering-our-qualifications/become-recognised-centre/>

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1. Qualification Information

1.1. About the qualification

The qualification has been approved by the Office of Qualifications and Examinations Regulation (Ofqual) that regulates qualifications, examinations and assessments in England.

The primary purpose of this qualification is to provide learners with the knowledge, understanding and skills to progress to employment within organisations that use Building Information Modelling (BIM).

The qualification provides learners with knowledge and understanding of the core concepts of construction and civil engineering, the core concepts of infrastructure projects and the core concepts of BIM. They then apply this knowledge and understanding to complete a major project.

The qualification is graded Pass/Merit/Distinction. The grade for the qualification is derived from the Major Project unit; no other units are graded. For details of the grading criteria for this unit, see **7. Appendix** Unit Details.

This qualification will be restricted to Newcastle College Group until 31st August 2018. From 1st September 2018 it will be available to Gateway Qualifications' network of approved centres.

1.2. Objective

The objective of this qualification is to prepare for employment in a specific occupational area.

1.3. Key facts

Qualification Title	Total Qualification Time	Guided Learning	Credit Value
Gateway Qualifications Level 3 Diploma in the Built Environment with Building Information Modelling	400	198	40

Total Qualification Time is the number of notional hours which represents an estimate of the total amount of time that could be reasonably expected to be required for a Learner to achieve and demonstrate the achievement of the level of attainment necessary for the award of the qualification.

Total Qualification Time is comprised of the following two elements:

- the number of hours which an awarding organisation has assigned to a qualification for Guided Learning, and
- an estimate of the number of hours a Learner will reasonably be likely to spend in preparation, study or any other form of participation in education or training, including assessment, which takes place by – but, unlike Guided Learning, not under the Immediate Guidance or Supervision of – a lecturer, supervisor, tutor or other appropriate provider of education or training.

1.4. Achievement methodology

The qualification will be awarded to learners who successfully achieve the four mandatory units through a Portfolio of Evidence that has been successfully verified and monitored through Gateway Qualifications' Quality Assurance process.

Achievement is therefore determined by successful completion of unit assessment with no further requirement for additional/summative assessment.

1.5. Geographical coverage

This qualification has been approved by Ofqual to be offered in England.

If a centre based outside of England (including Scotland) would like to offer this qualification, they should make an enquiry to Gateway Qualifications.

1.6. Progression opportunities

This qualification has been developed in collaboration with a large FE college in response to the needs of the local area. It will support learners to progress to employment in organisations that use Building Information Modelling. It has the support of major employers including Space Group, NBS and Dynamo.

Alternatively, learners may use this qualification as the foundation to further study in the sector.

1.7. Funding

For information on potential sources of funding in England please visit the Education and Skills Funding Agency:

<https://www.gov.uk/government/organisations/education-and-skills-funding-agency>

<https://www.gov.uk/government/collections/qualifications-approved-for-public-funding>

<https://hub.fasst.org.uk/Pages/default.aspx>

1.8. Equality, diversity and inclusion

It is Gateway Qualifications' aim that there shall be equal opportunities within this organisation and in all the services it provides and within its recognised centres and via the services they provide and so meet the organisation's legal responsibilities to prevent discrimination.

In particular it is the organisation's intention that there should be no discrimination on the grounds of a protected characteristic including age, disability, gender assignment, marriage and civil partnership, pregnancy and maternity, race, religion and belief, sex, sexual orientation. It is acknowledged that this is not an exhaustive list.

2. Learner Entry Requirements

2.1. Age

The approved age range for these qualifications is 19+.

2.2. Prior qualifications

There is no requirement for learners to have achieved prior qualifications or units prior to undertaking this/these qualifications.

2.3. Prior skills/knowledge/understanding

There is no requirement for learners to have prior skills, knowledge or understanding prior to undertaking this qualification. However, centres should review the prior qualifications and experience of each learner and consider whether they provide the necessary foundations to undertake the programme of study at level 3.

2.4. Restrictions

There are no restrictions to entry.

2.5. Access to qualifications for learners with disabilities or specific needs

Gateway Qualifications and recognised centres have a responsibility to ensure that the process of assessment is robust and fair and allows the learner to show what they know and can do without compromising the assessment criteria.

Gateway Qualification has a duty to permit a reasonable adjustment where an assessment arrangement would put a disabled person at a substantial disadvantage in comparison to someone who is not disabled.

The following adaptations are examples of what may be considered for the purposes of facilitating access, as long as they do not impact on any competence standards being tested:

- adapting assessment materials;
- adaptation of the physical environment for access purposes;
- adaptation to equipment;
- assessment material in an enlarged format or Braille;
- assessment material on coloured paper or in audio format;
- British Sign Language (BSL);
- changing or adapting the assessment method;
- changing usual assessment arrangements;
- extra time, e.g. assignment extensions;

- language modified assessment material;
- practical assistant;
- prompter;
- providing assistance during assessment;
- reader;
- scribe;
- transcript;
- use of assistive software;
- using assistive technology;
- use of CCTV, coloured overlays, low vision aids;
- use of a different assessment location;
- use of ICT/responses using electronic devices.

It is important to note that not all of the adjustments (as above) will be reasonable, permissible or practical in particular situations. The learner may not need, nor be allowed the same adjustment for all assessments.

Learners should be fully involved in any decisions about adjustments/adaptations. This will ensure that individual needs can be met, whilst still bearing in mind the specified assessment criteria for a particular qualification.

A reasonable adjustment for a particular learner may be unique to that individual and may not be included in the list of available access arrangements specified above.

Special Considerations

Requests for special consideration should be submitted as soon as possible. Please refer to the [Reasonable Adjustments and Special Consideration Policy](#).

2.6. Additional requirements/guidance

There are no additional rules or guidance regarding learner entry requirements.

2.7. Recruiting learners with integrity

It is vital that centres recruit with integrity with regard to qualifications. Centres must ensure that learners have the correct information and advice on their selected qualification and that the qualification will meet their needs.

The recruitment process must include the centre assessing each potential learner and making justifiable and professional judgements about the learner's potential to successfully complete the assessment and achieve the qualification. Such an assessment must identify, where appropriate, the support that will be made available to the learner to facilitate access to the qualification.

3. Achieving the Qualification

3.1. Qualification structure

The knowledge, skills and understanding that will be assessed as part of the qualification are set out within the unit specifications. These include the learning outcomes and associated assessment criteria.

For information on Recognition of Prior Learning/Exempt and Equivalent units please see section **3.3 Recognition of Prior Learning (RPL)/Exemptions/Equivalencies**

Gateway Qualifications Level 3 Diploma in the Built Environment with BIM

Learners must achieve all units totalling 40 credits.

Mandatory Group

Unit Number	Unit Title	Level	Guided Learning	Credit Value
L/616/7619	Core Concepts of Construction and Civil Engineering	3	48	8
F/616/7620	Core Concepts of Infrastructure Projects	3	48	8
J/616/7621	Core Concepts of Building Information Modelling (BIM)	3	50	8
L/616/7622	Major Project	3	52	16

3.2. Achievement methodology

The qualification will be awarded to learners who successfully achieve an approved combination of units through a Portfolio of Evidence that has been successfully verified and monitored through Gateway Qualifications' Quality Assurance process. Achievement is therefore determined by successful completion of unit assessment with no further requirement for additional/summative assessment.

The assessments submitted by learners must achieve the learning outcomes and meet the standards specified by the assessment criteria for each unit as outlined below. To achieve a merit or distinction grade, the learners must demonstrate that they have achieved the criteria set for these grades.

This qualification is graded: Pass, Merit and Distinction.

The grade achieved will be derived from the grade awarded for Major Project unit.

3.3. Recognition of prior learning

Recognition of Prior Learning (RPL) provides learners and Centres with an alternative assessment method by which a learner's previous achievements can meet the assessment requirements for a unit/qualification through the knowledge, understanding or skills that they already possess and so, do not need to develop these through a course of learning.

It enables the recognition of achievement from a range of activities using any valid assessment methodology. Provided that the assessment requirements of a given unit or qualification have been met, the use of RPL is acceptable to contribute to a unit, units or a whole qualification according to the RPL criteria for a given qualification.

The process of Recognition for Prior Learning is not applicable to this qualification.

3.4. Links to other qualifications

There are no links to other qualifications.

4. Assessment and Quality Assurance

The following are in addition to the standard assessment and quality assurance requirements set out in the Gateway Qualifications Centre Handbook.

4.1. Method of assessment

The method of assessment for the qualification is through a portfolio of evidence.

4.2. Assessment language

This qualification is assessed in English only.

4.3. Assessment materials

There are no specific assessment materials provided for this qualification.

4.4. Assessment guidance

Additional guidance on units 1 to 3 is included in the specification.

4.5. Qualification-specific centre requirements

Centres must ensure that they have the appropriate resources in place when delivering performance units from vocational areas.

4.6. Qualification-specific tutor/assessor requirements

There are no additional internal/external quality assurance requirements for this qualification.

Tutor/Assessors must be fully qualified and experienced in the subject area in which they are delivering, details of which must be provided to Gateway Qualifications as part of the Qualification Approval application.

4.7. Qualification-specific quality assurance requirements

There are no additional internal/external quality assurance requirements for this qualification.

4.8. Additional requirements/guidance

Assessment of the Major Project unit is summative and synoptic. It should therefore be taken at the end of the course. It is expected that learners will draw on the knowledge, understanding and skills developed throughout the qualification as they plan, research, produce and reflect on their individual project.

5. What to do next

For existing centres please contact your named Development Manager or Development Officer.

Tel: 01206 911211

Email: enquiries@gatewayqualifications.org.uk

6. Gateway Qualifications

Gateway Qualifications, a not for profit registered charity, is an Awarding Organisation based in Colchester.

We work with learning providers and industry experts to design and develop qualifications that benefit the learner and the employer.

We support flexible, responsive and quality assured learning opportunities whether it's in the classroom, at work, in the community or through distance learning.

We are recognised by Ofqual, to design, develop and submit qualifications to the Regulated Qualifications Framework (RQF).

7. Appendices

7.1. Appendix 1 – Unit Details

Core Concepts of Construction and Civil Engineering

Level:	3
Credit Value:	8
GLH:	48
Unit Number:	L/616/7619
Unit Grading Structure:	The unit is graded at a Pass only
Unit Aim:	The aim of this unit is to provide learners with knowledge and understanding of the advances in technology that are currently being developed and applied to modern methods of construction (MMC). Learners will also consider the importance of sustainability and health and safety in relation to MMC.
Assessment Guidance:	<p>This unit will be assessed through a portfolio of evidence.</p> <p>Suggestions for portfolio – two assessments: the first could be built around a scenario that holistically covers the evidence required to test learners understanding of modern methods of construction and foundation design and construction. The second assessment could cover the environmental impact and health and safety risks. Tasks in both assessments could be written to reflect the scenario and if appropriate provide an opportunity for learners to introduce evidence from the workplace.</p>

This unit has 4 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS
The learner will:	The learner can:
1. Understand the modern methods of construction (MMC) used for both low rise and high rise commercial and domestic buildings.	1.1 Explain the term modern methods of construction. 1.2 Describe modern methods of construction for domestic applications 1.3 Compare domestic and commercial modern methods of construction.
2. Understand foundation design and construction methods.	2.1 Describe the factors that must be considered for the design of foundations 2.2 Propose a modern foundation construction for a domestic application 2.3 Propose with justification a foundation type for a given scenario for a commercial steel building.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS
The learner will:	The learner can:
3. Understand how the activities of the construction industry impact on the natural environment.	3.1 Describe the factors considered within an environmental impact assessment. 3.2 Produce an environmental impact assessment for a development proposal.
4. Understand the common health and safety factors encountered on site and how the design process can help to mitigate these risks.	4.1 Outline the common factors that affect health and safety on a construction site 4.2 Explain how the Construction Design and Management (CDM) Regulations reduce the potential risks of the construction phase.

Indicative Content: Core Concepts of Construction and Civil Engineering

Learning Outcome 1:

A range of modern methods of construction need to be illustrated for domestic and commercial applications along with a definition of what the term means and how it is applied in the construction and built environment sector. A comparison of methods used for domestic and commercial applications needs to be produced.

Modern methods of construction (MMC); definition of the term, its origins, application to regulations terminology, how it is applied.

Types of modern methods of construction:

- thin joint masonry
- timber framed construction
- structural insulated panels
- engineered timber products
- volumetric construction using steel channels
- 3D printed building technologies
- mass concrete thermal walls
- prefabricated components
- methods of jointing and connection
- sustainable features of each MMC and how these are achieved
- design details, cross sections and illustrations of components details
- comparison in terms of advantages and disadvantages for domestic and commercial applications.

Learning Outcome 2:

A range of factors must be described for the design of a foundation. A modern method of foundation construction for a domestic application must be proposed with illustrations drawn to scale. A steel portal frame of skeleton framed buildings foundation for a given scenario must be proposed with justification.

Factors that need to be considered for the safe design of a buildings foundation:

- moisture content of the soil
- water table level
- bearing capacity of soil
- pore water pressure
- made up ground
- soil characteristics
- proximity of trees
- topography.

Foundation design for a domestic application:

- precast concrete piles and precast foundation beams
- mass trench fill
- raft foundations
- strip foundation with trench blocks.

Indicative Content: Core Concepts of Construction and Civil Engineering

Foundation designs for commercial buildings:

- pad foundations with ground beams
- bored piles and caps.

Learning Outcome 3:

A range of local factors that have an impact upon the assessment must be described. The production of an environmental impact assessment should reflect current community and regulatory concerns.

Factors to be considered with an environmental impact assessment (EIA):

- loss of wildlife habitat
- drainage, absorption, run off, flood risk
- pollution, noise, light
- CO2 emissions and utilised carbon
- effect on green spaces
- loss of community areas, trees, landscaping
- size, shape, height, density
- incorporation of sustainable materials in the project
- production of waste during and post construction
- maintenance impact.

Production of an environmental impact assessment (EIA):

- reference to regulatory requirements
- a range of criteria considered with reference to the context
- formal written report for a planning permission submission.

Learning Outcome 4:

A range of factors covering physical and physiological should be considered in terms of their potential to cause harm. The Construction Design and Management (CDM) Regulations need explaining in terms of how they are applied to a design to reduce risks during the construction and maintenance phases.

The application of the Construction Design and Management Regulations to the design, construction and maintenance of a project through its life cycle.

Common factors that affect health and safety on a construction site:

- working at height
- training and qualification, experience
- complexity of activities
- supervision
- use of PPE
- access and egress
- type of work or activity undertaken
- organisation and management of risk
- working with plant and machinery
- working with chemicals.

Indicative Content: Core Concepts of Construction and Civil Engineering

The Construction Design and Management Regulations and their application:

- role and duties of the client
- principal designer's duties
- health and safety plan
- health and safety file.

Core Concepts of Infrastructure Projects

Level:	3
Credit Value:	8
GLH:	48
Unit Number:	F/616/7620
Unit Grading Structure:	The unit is graded at a Pass only
Unit Aim:	The aim of this unit is to give learners an understanding of major earthworks, drainage, bridges and tunnels and to understand how these are constructed and subsequently maintained, including use of different types and methods of construction and resources.
Assessment Guidance:	<p>This unit is assessed through a portfolio of evidence.</p> <p>Suggestions for portfolio. The unit could be assessed through two assessments.</p> <p>The first assessment could cover a scenario based around a mass excavation to form a road or railway embankment and the methods used to reinforce soil layers as the work progresses.</p> <p>The second assessment could cover the construction of bridges and tunnels and how they are maintained over their life cycle.</p>

This unit has 4 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS
The learner will:	The learner can:
1. Know how earthworks are constructed for infrastructure projects.	1.1 Describe the construction plant and equipment used for earthworks. 1.2 Describe techniques used for the excavation of infrastructure projects. 1.3 Explain the formation of earthwork embankments.
2. Understand the methods used to drain roads and railways.	2.1 Explain how surface water drainage operates effectively on carriageways. 2.2 Describe how a railway infrastructure is drained of surface water.
3. Understand how bridges and tunnels are constructed.	3.1 Describe the common methods of bridge design. 3.2 Explain the methods used to construct tunnels.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS
The learner will:	The learner can:
4. Understand the maintenance requirements of completed infrastructure projects.	4.1 Describe the maintenance of transport infrastructure (roads and railways).

Indicative Content: Core Concepts of Infrastructure Projects

Learning Outcome 1:

Large earth moving equipment should be described for excavation and transportation of earth. This should include excavation plant for isolated civil engineering earthworks and mass haul equipment for road construction and the formation of earthwork embankments.

Construction plant and equipment used for earthworks; types of excavators and earth movers:

- Hydraulic excavators;
 - drag line
 - trenching machine
 - multipurpose excavator
 - backactor
 - face shovels
- Earth Movement
 - motorised scrapers
 - towed scrapers
 - bull dozers
 - dumper trucks
 - hall waggons
 - loading shovels
- Earth Compaction
 - motorised graders
 - rollers, vibrating, sheep's foot
 - bull dozers tracking
- Excavation techniques
 - cut and fill, horizontal
 - vertical face excavation
 - basement excavation
 - caissons
 - road, top soil stripping and filling preparation
 - bridge, footing and abutment excavation
 - control of machines for depth, Bankserson, GPS
- Earthwork embankment formation techniques
 - cut and fill using motorised scrapers
 - formation and compaction of imported filling
 - drainage techniques to increase stabilisation.

Learning Outcome 2:

The installation of surface water drainage for a carriageway in terms of channels, road kerbs, road gullies and ditch drainage should be included. The drainage through layers of construction need to be described along with the installation of drainage pipes and /or ditches for cuttings.

Carriageway surface water drainage construction techniques:

Indicative Content: Core Concepts of Infrastructure Projects

- kerbs and gullies
- surface water channels
- drainage channel blocks
- sustainable urban drainage systems.

Embankment drainage:

- filter drainage techniques
- drainage layers
- drainage ditches
- geotextile drainage membranes.

Learning Outcome 3:

A range of bridge design methods of construction should be explored in terms of foot bridges or vehicular bridges. A range of methods used to construct tunnels should be evidenced.

Common methods of bridge design:

- suspension
- truss design
- cantilever
- beam bridges
- arch bridges
- cable stay.

Techniques used to construct tunnels:

- bored tunnel using a tunnelling machine
- cut and cover, bottom up or top down
- immersed tube underwater tunnelling
- pipe or box jacking
- formation of culverts.

Learning Outcome 4:

The maintenance of the surface of a carriageway and all the associated elements should be included along with drainage cleaning. The maintenance work associated with bridge decking, coatings and carriageway repairs should be described. The maintenance of tunnels in terms of keeping them safe should be covered across a range of items.

Maintenance of roadways and drainage:

- maintaining skid resistance, surface dressing, wearing course replacement, road planning
- self-healing roads
- emptying of road gully's
- drain rodding
- cutting of grassed verges
- clearing of drainage ditches
- pot hole repairs
- white line repairs

Indicative Content: Core Concepts of Infrastructure Projects

- reflectors repairs
- crash barrier repairs.

Maintenance of railways:

- maintaining tracks and repair
- ballast maintenance and compaction
- landscaping and drainage.

Core Concepts of Building Information Modelling (BIM)

Level:	3
Credit Value:	8
GLH:	50
Unit Number:	J/616/7621
Unit Grading Structure:	The unit is graded at a Pass only
Unit Aim:	The aim of this unit is to provide the learner with a detailed understanding of how Building Information Modelling (BIM) operates for the design of a construction project, including the way in which different stakeholders in the production of a BIM design are coordinated and controlled to produce a successful design for a client.
Assessment Guidance:	<p>This unit is assessed through a portfolio of evidence Suggestions for portfolio of evidence.</p> <p>The unit could be assessed through two assessments</p> <p>The first assessment could cover learning outcomes 1 and 2 and provide learners with an opportunity to describe what BIM is, how a BIM design is created and how it operates on a typical design project in construction and the built environment.</p> <p>The second assessment could cover learning outcomes 3 and 4 and provide the opportunity to demonstrate understanding of the importance of the collaborative process during the implementation phase and how multidisciplinary techniques are coordinated and reviewed.</p>

This unit has 4 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS
The learner will:	The learner can:
1. Understand digital construction using BIM methodologies	1.1 Define building information modelling concepts. 1.2 Describe the digital data sets used for building information modelling. 1.3 Define the differing BIM levels.
2. Understand building design and content creation.	2.1 Describe the stages of a digital building design for a project. 2.2 Explain how digital content is coordinated across disciplines. 2.3 Explain the various levels of BIM.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS
The learner will:	The learner can:
3. Understand implementation techniques of design and construction project collaboration.	3.1 Describe the role of a building information coordinator or manager. 3.2 Explain the process of clash detection through project collaboration.
4. Understand the common features of multidisciplinary coordination and review	4.1 Describe the common features of BIM design coordination. 4.2 Explain the design review process for all stakeholders.

Indicative Content: Core Concepts of Building Information Modelling (BIM)

Learning Outcome 1:

Building information modelling needs to be defined in terms of a definition that all stakeholders can understand. This can be referenced to any known standards for example 'Publicly Available Specifications'. What is BIM and how it operates needs to be described along with what types of data sets form the BIM model during its development and detailing. Referencing to 'levels' can be introduced at this stage.

Building Information Modelling; methodologies and concepts:

- definition of building information modelling (BIM)
- concept of combining all stakeholders designs into one model
- application across a building's lifecycle
- conflict detection
- reduction in design errors
- cost savings
- environmental and sustainable factors
- BIM software.

Digital data sets uploaded into building information modelling (BIM):

- structural steel framework designs
- substructure foundation designs
- infrastructure designs
- legal data
- health and safety
- specialist topographical/geophysical data
- suppliers and manufacturers data
- structural dimensional data
- designer/architectural data
- technical
- mechanical and electrical services
- fire detection and modelling.

Learning Outcome 2:

The stages of design related to pre-contract execution plans (BEP) and project implementation plans (PIP's) along with reference to the BIM overlay against the RIBA Plan of Work needs to be described. The coordination of all stakeholders needs to be evidenced. The BIM levels 0 to 3 need to be defined and explained in terms of the different requirements.

Stages of a BIM design; BIM overlay to RIBA 2013 Plan of Work:

- appraisal; define employer information requirements, benefits and outcomes, appointment of BIM manager, ownership of BIM model, define roles and responsibilities, contractual implications,
- design brief; define inputs required and outputs needed, commissioning of topographical / BIM surveys, input of survey, Data drop 1
- concept; BIM prestart meeting, model sharing, option choice by client/stakeholders, environmental performance, area/function analysis, identification of key model elements, access rights design data for BIM team, Data drop 2

Indicative Content: Core Concepts of Building Information Modelling (BIM)

- design development; sharing of data and coordination, data links between models, data analysis, clash detection, input for standard components, Planning Permission data export, Data drop 3
- technical design; detailed modelling, coordination of design team inputs, Building Control data analysis, data input from subcontractors/suppliers, production of detailed BIM model, specifications, final client approval and sign off,
- production information; tender production information, access arrangements for contractors, input from subcontractors, Data drop.

The coordination of BIM:

- data drops
- electronic transfer of information
- software compatibility between disciplines
- organising work flows
- time constraints.

The various levels of BIM and classifications

- Level 0: unmanaged CAD.
- Level 1: managed CAD in 2D or 3D.
- Level 2: managed 3D environment with data attached, but created in separate discipline models.
- Level 3: single, collaborative, online, project model with construction sequencing, cost and lifecycle management information.

Learning Outcome 3:

The role of the building information manager or coordinator needs to be described in terms of their function in ensuring that smooth collaboration occurs so that projects outcomes for a client can be met. The implementation and assembly of BIM in terms of submitted designs and their clash detection and resolution should be evidenced.

The role of the building information manager or coordinator:

- development of the BIM plan to meet the needs of a client
- production of design templates for disciplines' use
- set up of filing system
- integrity coordination of models
- guidance to the design team and disciplines
- ensures that project goals will be met to time and cost constraints
- provides access to the models
- imports data sets and coordinates BIM file exchanges
- ensure compliance with BIM management plan, monitor and maintain, revise and update
- secure data and control versions
- facilitates design meetings
- provides software training for disciplines/stakeholders.

Process of clash detection:

- definition of a clash
- models integration from each discipline
- formation of master model

Indicative Content: Core Concepts of Building Information Modelling (BIM)

- hard and soft clashes
- clash report
- collaboration, revised model, rerun clash report.

Learning Outcome 4:

A range of features of BIM coordination should be evidenced in terms of how a number of different stakeholders are engaged and controlled through to review and feedback into subsequent revisions of BIM designs.

Common features of BIM design coordination:

- compatible software models
- master dimensional grid established
- drawing standards agreed for all to apply to their models
- common data environment agreed and published to all
- lines of authority defined
- communication procedures agreed
- clear roles and responsibilities
- protocols
- regular team meetings and workshops
- continuous improvement procedures for all.

The design review process:

- data drops to client
- client feedback
- checking against employer information requirements documentation
- client/design team meetings
- client sign offs
- client shared areas of BIM
- authorised BIM gates
- archived information.

Major Project

Level:	3
Credit Value:	16
GLH:	52
Unit Number:	L/616/7622
Unit Grading Structure:	Pass/Merit/Distinction
Unit Aim:	To apply the knowledge skills and understanding from units 1-3 to the planning and implementation of a construction-related problem.
Assessment Guidance:	Please refer to the grading criteria.

This unit has 6 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS
The learner will:	The learner can:
1. Plan an approach to solving a construction-related problem.	1.1 Take into account legal, ethical, environmental, sustainability and social factors, when planning project approach. 1.2 Produce a plan to meet the brief which includes: <ul style="list-style-type: none"> • aims and objectives • tasks with deadlines • key performance indicators and milestones • roles and responsibilities.
2. Assess and manage risks associated with project.	2.1 Identify, categorise and qualify key risks. 2.2 Identify suitable controls to minimise risk and/or impact.
3. Apply relevant skills, knowledge and understanding in implementing project plan to solve the problem.	3.1 Apply appropriate technical knowledge and understanding to the problem. 3.2 Use technical skills including design, analysis, research, calculations, simulations and experimentation as appropriate to the brief.
4. Pay due regard to legislative requirements when solving the problem.	4.1 Work in a way that is consistent with health and safety legislation and building and environmental regulations.
5. Monitor and review project progress and evaluate project outcomes.	5.1 Apply appropriate monitoring strategies and tools. 5.2 Adjust approach where needed in order to deliver the project on time and to meet the brief. 5.3 Apply appropriate evaluation strategies and tools to assess the effectiveness of the solution against the original brief.

LEARNING OUTCOMES	ASSESSMENT CRITERIA - PASS
The learner will:	The learner can:
6. Pitch proposed solution(s) to stakeholders.	6.1 Use language and format appropriate for audience and purpose. 6.2 Apply a positive or persuasive approach in order to sell the solution.

MERIT
In addition to the pass criteria, the learner can:
<ul style="list-style-type: none"> i. Candidates make use of relevant ideas, theories or models, demonstrating a very good level of insight, analysis and/or creativity. ii. They generally select appropriate skills, techniques and methods and apply these with very good levels of confidence, precision and accuracy. iii. Candidates use a range of evaluation methods and demonstrate a very good level of analysis in assessing the effectiveness of their project. iv. Throughout the project, candidates make generally sound judgements about how to address the problem, in most cases initiating the actions required to meet the brief.

DISTINCTION
In addition to the pass and merit criteria, the learner can:
<ul style="list-style-type: none"> i. Candidates make use of a broad range of relevant ideas, theories or models, demonstrating an excellent level of insight, analysis and creativity. ii. They consistently select appropriate skills, techniques and methods, and apply these with excellent levels of confidence, precision and accuracy. They show creativity in adapting skills, techniques and methods to solve the problem. iii. Candidates select and apply a range of evaluation methods and demonstrate an excellent level of critical analysis in assessing the effectiveness of the project. iv. Throughout the project, candidates consistently make well-informed judgements about how to address the problem and independently initiate the actions required to meet the brief.



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