QUALIFICATION HANDBOOK

SVQ in Built Environment Design
at SCQF Level 6

Qualification reference number: **GM3H 46**

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1. Introduction

1.1 This qualification has been developed to seek to ensure that those that wish to seek employment within built environment design meet minimum requirements of technical competence and health and safety.

1.2 These requirements have been specified in the National Occupational Standards (NOS) developed by the Sector Skills Council (SSC) Construction Skills in liaison with employers and industry/ sector representatives. This qualification is based upon those NOS and incorporates the Qualification Structure approved by SQA Accreditation.

1.3 Successful completion of this qualification will allow candidates to show they have sufficient knowledge, understanding and skills to demonstrate competence in built environment design in relation to their chosen pathway.

1.4 This Handbook provides the information required to assist approved centres in delivering the qualification and preparing candidates for assessment. This includes some template forms that may be used / adapted by centres. Note that you are able to create your own, or use existing forms for this purpose. Alternatively QFI makes its E-Portfolio system available to its approved centres.

This document should be read in conjunction with QFI's policies and the Centre Handbook.

2. Qualification objective(s)

2.1 The qualification is suitable for apprentices / those already in employment that wish to develop their knowledge and skills in the design of the built environment.

2.2 In order to do this, the qualification covers technical and health and safety standards, and supports roles relating to the design of the built environment.

3. Progression

3.1 This qualification is primarily designed to allow candidates to progress to employment in roles relating to the design of the built environment. Successful completion of this qualification may therefore lead to employment in built environment design.

3.2 Candidates may complete a number of pathways from this qualification with regards to a range of techniques or machinery as follows:

Architecture; Civil and Structural Engineering.

3.3 Completion of a number of pathways will enable the candidate to become multi-skilled, which may increase employment/ progression opportunities.

3.4 Candidates achieving this qualification may also wish to progress to higher level qualifications such as those aimed at supervisory/ management roles, e.g.

- SVQ Built Environment Design Management at SQCF Level 9

3.5 Candidates may also choose to undertake qualifications in more generic subjects such as a health and safety in the workplace, e.g.

- Award in Health and Safety in a Construction Environment at SCQF level 4

4. Entry requirements

4.1 Candidates must be at least 18 years of age to be able to undertake this qualification.

4.2 Those that will be driving construction vehicles as part of their chosen pathway/ additional units must hold a full driving licence.

4.3 There are no other specific entry requirements, though the National Careers Service does recommend physical fitness.

4.4 Candidates taking this qualification must be made fully aware of what this entails. Centres must be satisfied that candidates have the experience and skills and will have sufficient assessment opportunities within their job role to provide evidence of competence for this qualification. Where this may not be the immediate case, candidates should check with their employer whether they are able to go out with departmental or immediate job role boundaries to gain the necessary assessment opportunities.

4.5 A sample induction checklist is included at Appendix 1.

5. Qualification structure

5.1 The structure for this qualification is set by the Sector Skills Council Construction Skills and approved by SQA Accreditation.

5.2 To achieve this qualification candidates must achieve:

- 4 mandatory units
- 1 mandatory unit from their chosen pathway
- 1 optional unit from their chosen pathway

Mandatory Units

All candidates must complete the following four units

SSC code	Title of mandatory unit (must complete all four units)	SCQF level	SCQF credits
COSBEDO 01	Produce and recommend detailed design solutions in built environment design	6	44
COSBEDO 02	Maintain professional relationships and practice in built environment design	6	12
COSBEDO 03	Investigate factors affecting project development in built environment design	6	12
COSBEDO 08	Prepare drawings and schedules in built environment design	6	15

Plus the following according to which Pathway/ Optional Route is chosen:

Architecture route mandatory unit

SSC code	Title of mandatory unit	SCQF level	SCQF credits
COSBEDO 09	Collate project information and prepare specifications in built environment design	6	12

Architecture route optional units – must complete one

SSC code	Title of mandatory unit (must complete one unit)	SCQF level	SCQF credits
COSBEDO 04	Plan, carry out and present measured surveys in built environment design	6	15
COSBEDO 05	Carry out and present condition surveys in built environment design	6	16
COSBEDO 06	Monitor tests and present reports in built environment design	6	15
COSBEDO 07	Report on and prepare applications to secure consents in built environment design	6	7
COSBEDO 10	Obtain and assess tenders in built environment design	6	12
COSBEDO 11	Prepare tenders in built environment design	6	15
COSBEDO 12	Monitor projects in built environment design	6	23

COSBEDO 13	Identify project energy efficiency and carbon minimisation requirements in built environment design	6	10
COSBEDO 14	Investigate and produce integrated conservation, repair and maintenance solutions in built environment design	6	10

Plus the following according to which Pathway/ Optional Route is chosen:

Civil and Structural Engineering route mandatory unit

SSC code	Title of mandatory unit	SCQF level	SCQF credits
COSBEDO 04	Plan, carry out and present measured surveys in built environment design	6	15

Civil and Structural Engineering route optional units – must complete <u>one</u>

SSC code	Title of mandatory unit (must complete one unit)	SCQF level	SCQF credits
COSBEDO 05	Carry out and present condition surveys in built environment design	6	16
COSBEDO 06	Monitor tests and present reports in built environment design	6	15
COSBEDO 07	Report on and prepare applications to secure consents in built environment design	6	7
COSBEDO 09	Collate project information and prepare specifications in built environment design	6	12
COSBEDO 10	Obtain and assess tenders in built environment design	6	12
COSBEDO 11	Prepare tenders in built environment design	6	15
COSBEDO 12	Monitor projects in built environment design	6	23
COSBEDO 13	Identify project energy efficiency and carbon minimisation requirements in built environment design	6	10
COSBEDO 14	Investigate and produce integrated conservation, repair and maintenance solutions in built environment design	6	10

All units are included in Appendix 2 of to this document.

6. Assessment

6.1 Roles and responsibilities

There are a number of people involved in the assessment process and the role of each needs to be clearly understood by each.

- Candidates – must familiarise themselves with the content of the units that they are taking and how these are to be assessed. They should co-operate with the assessment process, looking for opportunities to evidence the elements and gathering evidence where this arises. Candidates must take on board feedback from their assessor and work with their assessor to develop realistic plans for assessment. An Assessment Plan and Review template is included at Appendix 3.

- Assessors - must familiarise themselves with the content of the units that they are assessing and how these are to be assessed. They must assist candidates in identifying assessment opportunities, gathering, and presenting evidence. Assessors must assess all elements and record these assessments. Templates for recording elements, and for unit achievement, are at Appendix 4. Assessors must feedback and work with candidates to identify any gaps and develop realistic plans for assessment. They must also work with the Internal Verifier and External Verifier to ensure a common standard of assessment.

- Internal Verifiers – sometimes known as Internal Quality Assurers (IQAs), their role is to ensure that the assessment process is appropriate, consistent, fair and transparent; that assessors receive on-going support and that they are assessing to a common standard; and that awards are valid, reliable and consistent. IVs must develop a strategy that includes standardisation activities such as reviewing samples of evidence from each assessor, and countersigning the decisions of unqualified assessors.

- External Verifiers - sometimes known as External Quality Assurers (EQAs), are appointed by QFI and are independent of the centre. Their role is to check that internal processes are in place to ensure robust, consistent assessment. This includes sampling assessment evidence.

6.2 SCQF level 6 descriptors

This qualification is pitched at SVQ level 3/ SCQF level 6. The following are descriptions of what a candidate should be able to do or demonstrate at SCQF level 6. These are for guidance only – it is not expected that every point will be covered.

Knowledge and understanding

Demonstrateand/or work with: An appreciation of the body of knowledge that constitutes a subject/discipline/sector; A range of knowledge, facts, theories, ideas, properties, materials, terminology, practices and techniques about,and associated with, a subject/discipline/sector; Relating the subject/discipline/sector to a range of practical and/or commonplace applications.

Practice: Applied knowledge, skills and understanding

Apply knowledge, skills and understanding: In known, practical contexts; In using some of the basic, routine practices, techniques and/or materials associated with the subject/discipline/sector; In exercising these in routine contexts that may have non-routine elements; In planning how skills will be used to address set situations and/or problems and adapt these as necessary.

Generic cognitive skills

Obtain, organise and use factual, theoretical and/or hypothetical information in problem solving; Make generalisations and predictions; Draw conclusions and suggest solutions

Communication, IT and numeracy skills

Use a wide range of skills, for example: Produce and respond to detailed and relatively complex written and oral communication in both familiar and unfamiliar contexts; Select and use standard ICT applications to process, obtain and combine information; Use a wide range of numerical and graphical data in routine contexts which may have non-routine elements.

Autonomy, accountability and working with others

Take responsibility for carrying out a range of activities where the overall goal is clear, under non-directive supervision; Exercise some supervisory responsibility for the work of others and lead established teams in the implementation of routine work within a defined and supervised structure; Manage limited resources within defined and supervised areas of work; Take account of roles and responsibilities related to the tasks being carried out and take a significant role in the evaluation of work and the improvement of practices and processes.

6.3 The assessment process

Assessment for this qualification, and for individual units that comprise the qualification, must take place in accordance with '*Construction Skills Consolidated Assessment Strategy for Construction and the Built Environment: Craft, Supervisory, Technical,*

Managerial and Professional National Vocational Qualifications (NVQs) and Scottish Vocational Qualifications (SVQs)' (published December 2016, approved by ACG February 2017).

This document translates the requirements of the assessment strategy and gives guidance to ensure that centres meet these.

Centres delivering the qualification must ensure that assessors and Internal Verifiers are aware of the assessment strategy and how to access this. External Verifiers may check this requirement during monitoring visits to centres.

Assessment involves the following key stages: planning; producing evidence; assessing evidence; recording. Each of these is considered in more detail below.

6.3.1. Planning

The assessor must create an Assessment Plan with each candidate that he/ she will be assessing. The Assessment Plan will need to be reviewed as the candidate progresses through the units. A template for assessment planning and review is at Appendix 3 of this document.

A wide range of assessment methods exist that can be used to assess knowledge and skills. Methods of assessment that are commonly used for assessing competence based qualifications such as N/SVQs include the following:

- Product evidence – this relates to the outcome of the candidate's work, and the actual product that is generated as a result of their work.
- Direct observation – where an assessor (or credible witness) will directly observe the candidate undertaking certain tasks/ creating products that occur as part of their role. Observations must be referenced to the elements covered
- Question/ answer – these will often supplement the methods above, for example the assessor may ask the candidate a number of questions whilst they are undertaking a task. Questioning is a useful way to establish knowledge and to generate evidence of this
- Witness testimony – credible witnesses may be identified who can for example testify that the candidate can successfully undertake certain tasks
- Personal statement – declaration made by the candidate that should be referenced to elements

Centres should ensure that their Assessors use the methods above to assess candidates for this qualification.

Template assessment documents including an Assessor Report can be found at Appendix 3.

6.3.2 Producing evidence

The methods of assessment must generate evidence to demonstrate the candidates' competence. Evidence produced in the workplace is central to Construction Skills Consolidated Assessment Strategy. Workplace evidence is vital to ensuring that the candidate is competent to industry standards and a suitable way of recording this must be used.

The following indicates the type of evidence generated by the methods on the section above:

- Product evidence –Photographic or video evidence is often used to record this, or it may also be recorded via the method below. Labelled photographs and/or videos that clearly show the candidate are sources of evidence for this purpose.
- Direct observation –observations must be recorded via an Assessor or other report (e.g. witness statement)
- Question/ answer –both the questions and the candidate's responses to these must be recorded either in writing or via some audio or visual device (e.g. part of a video recording).
- Witness testimony – this may be written, audio or visual recordings
- Personal statement – the declaration made by the candidate must be recorded

All of the above must be referenced to the evidence that they cover

Templates that may be used for recording evidence are at Appendix 3.

Feedback should be given to the candidate on an on-going basis and where there are any gaps or shortfalls in evidence then these should be incorporated into the Assessment Plan.

Assessment must meet the requirements of the performance criteria, knowledge and understanding documented for each unit of assessment. Methods of assessment must ensure coverage of all elements, scope and range, and generate sufficient evidence to demonstrate competence.

A holistic approach towards the collection of evidence is encouraged. The focus should be on assessing activities generated by the whole work experience rather than focusing on specific tasks. This would show how evidence requirements could be met across the qualification to make the most efficient use of evidence.

Direct evidence produced through normal performance in the workplace is the primary source for meeting these requirements. This includes naturally occurring evidence, direct observation of activities and witness testimony as relevant, all of which must be recorded.

Workplace evidence must be supported by the required evidence of knowledge and understanding. This evidence may be identified by:

- questioning the candidate
- recognised industry education and training programme assessment or professional interview assessment that has been matched to NOS requirements
- performance evidence/ completed work

All of which must be recorded and made available for verification purposes.

Workplace evidence of skills cannot be simulated for this qualification.

6.3.3 Assessing evidence

Evidence must be assessed against the units/ elements to establish whether the candidate is competent with regards to their performance and knowledge. In order to achieve the qualification candidates must achieve a 'pass'. The evidence must show that

the candidate consistently (i.e. on more than one occasion) meets all of the elements across the scope/range of each unit.

If there is insufficient evidence to make this judgement then plans must be made as to how the candidate can produce further evidence in order to demonstrate competence.

Assessors must check that the evidence produced is sufficient in volume, relevant and current. They must also be confident that the evidence has been generated by the candidate. Assessors and candidates normally sign documentation to declare that the evidence produced is that of the candidate and no other.

6.3.4 Recording evidence

Evidence (or reference to where certain evidence is located) is normally kept in a portfolio. This may be paper-based or electronic. All evidence contained within the portfolio must be clearly referenced to the units and elements. Candidates' progress can therefore be tracked. Note that certain pieces of evidence can be recorded across more than a single element. Tracking is important to show where this is that case.

It is helpful to give each piece of evidence a number so that this can be mapped across elements. See the template forms at Appendix 4. Assessment decisions made against the evidence must also be recorded so that an IV or an EV can see these. All evidence must be kept for internal and external verification.

7. Assessors

7.1 The occupational competence of assessors is defined in '*Construction Skills Consolidated Assessment Strategy for Construction and the Built Environment: Craft, Supervisory, Technical, Managerial and Professional National Vocational Qualifications (NVQs) and Scottish Vocational Qualifications (SVQs)'* (published December 2016, approved by ACG February 2017).

7.2 The roles and responsibilities of assessors is outlined in the section above.
Assessors must competent to perform their role and either hold the qualifications needed to carry out assessment – or achieve within 18 months of commencing their role:

- D32 or D33
- A1
- Level 3 Award in Assessing Competence in the Work Environment
- Level 3 Award in Assessing Vocationally Related Achievement
- Level 3 Certificate in Assessing Vocational Achievement
- an appropriate Assessor qualification as identified by SQA Accreditation

Assessors must also:

- have a sound, in-depth knowledge of, and uphold the integrity of, the relevant NOS and Assessment Strategy to enable them to carry out assessment to the standards specified

- have the occupational expertise (craft/ trade specific) before commencing their role so they have up to date experience, knowledge and understanding of the particular aspects of work they are assessing
- only assess in their acknowledged area of occupational competence
- maintain the currency of this for the duration of their role
- know QFI's requirements for recording assessment decisions and maintaining assessment records

7.3 Holders of A1 and D32/33 must assess to the current National Occupational Standards (NOS) for Learning and Development.

7.4 Assessors must be registered with QFI. The **Centre Handbook** provides details.

7.5 The assessment decisions of unqualified assessors must be countersigned by the IV.

8. Internal verification

8.1 Centres' internal assessment processes and practices must be effective and support the integrity and consistency of the qualification. This is achieved through the internal quality assurance that is undertaken by the approved centre, and the external quality assurance that is undertaken by QFI. Centres must operate explicit, written internal quality assurance procedures to ensure:

- the accuracy and consistency of assessment decisions between assessors operating at the centre
- that assessors are consistent in their interpretation and application of the qualifications or unit(s) learning outcomes

8.2 Centres must appoint IVs who will be responsible for:

- regular sampling evidence of assessment decisions made by all assessors across all aspects of assessment for the qualification. Sampling must include direct observation of assessment practice
- maintaining up-to-date records of IV and sampling activity (what was evidence was sampled or assessors / IV observed where there is more than one) and ensuring that these are available for external quality assurance
- establishing procedures to ensure that all assessors interpret the learning outcomes in the same way
- monitoring and supporting the work of assessors
- facilitating appropriate staff development and training for assessors
- providing feedback to the EV on the effectiveness of assessment

- ensuring that any corrective action required by QFI is carried out within agreed timescales.

8.3 Centres must ensure that the decisions of unqualified IVs are checked, authenticated and countersigned by an IV who is appropriately qualified and occupationally expert. QFI will monitor a centre's compliance with these requirements through monitoring visits and certification claims.

8.4 The IV is also responsible and accountable for arranging the checking and countersigning process. IVs may verify only evidence that they did not assess themselves. Further guidance on internal quality assurance/verification is provided in the **Centre Handbook**. Appendix 5 of this document indicates suggested content for an IV strategy, and a template for sampling assessment evidence.

9. Internal verifiers

9.1 The occupational competence of IVs is defined in '*Construction Skills Consolidated Assessment Strategy for Construction and the Built Environment: Craft, Supervisory, Technical, Managerial and Professional National Vocational Qualifications (NVQs) and Scottish Vocational Qualifications (SVQs)'* (published December 2016, approved by ACG February 2017).

9.2 The roles and responsibilities of IVs is outlined above. IVs must competent to perform their role and either hold the qualifications needed to carry out internal verification – or achieve within 18 months of commencing their role:

- D34
- V1
- Level 4 Award in the Internal Quality Assurance of the Assessment Process and Practice
- Level 4 Certificate in Leading the Internal Quality Assurance of Assessment Process and Practice
- an appropriate Internal Verifier qualification as identified by SQA Accreditation

9.3 It is strongly recommended that IVs also hold assessor qualifications (see section above).

9.4 Holders of V1/D34 must quality assure to the current National Occupational Standards (NOS) for Learning and Development.

9.5 IVs must be registered with QFI. The **Centre Handbook** provides details.

10. External verification

10.1 External verification of this qualification ensures that the requirements are met for the '*Construction Skills Consolidated Assessment Strategy for Construction and the Built*

Environment: Craft, Supervisory, Technical, Managerial and Professional National Vocational Qualifications (NVQs) and Scottish Vocational Qualifications (SVQs)' (published December 2016, approved by ACG February 2017).

10.2 Centre visits will normally take place on an annual basis, though these could be more frequent if deemed necessary as a result of QFI's risk assessments. The **Centre Handbook** provides further details on external verification including to prepare for centre visits.

QFI's appointed External Verifiers meet the requirements of the assessment strategy.

11. Certification

11.1 Note that there is a lapsing period of two years for this qualification. This means that when the qualification expires, is withdrawn or replaced by a revised version, candidates registered have two years from the expiry date in which to complete the qualification. This will allow sufficient time for candidate's to compete and allow for currency of evidence.

12. Equality and diversity

12.1 This qualification must be assessed in English.

12.2 Assessment must be inclusive and where appropriate reasonable adjustments made to ensure equality of access in line with QFI's Equality and Diversity Policy. Full details are included in the QFI Centre Handbook**.**

12.3 Special consideration is not normally given for competence based qualifications as it is necessary for candidates to demonstrate that they have the necessary skills and knowledge to achieve the qualification and operate safely in the workplace.

12.4 Equality data will be collected at the point of registration. This is for monitoring purposes only and will include age, gender, ethnicity, and disability.

13. Fees

13.1 The current fees for this qualification, and for individual units, are included in the QFI Fees and Invoicing document. This document also details what is/ is not included in fees.

13.2 Fees may be broken down to a reasonable level upon request to QFI.

APPENDIX 1 - CANDIDATE TEMPLATE DOCUMENTS

Sample Form
Induction checklist

This document indicates what may be covered as part of a candidate's induction. This list is not exhaustive.

	Tick
Qualification information: • Units • Structure • Summary of assessment • Awarding body	
Roles and responsibilities: • Candidate • Assessor • Internal Verifier • External Verifier	
Training and assessment process: • Planning • Collection of evidence (including methods) • Review of evidence • Feedback on evidence • Verification of evidence • Certification	
Policies: • Complaints • Appeals • Malpractice • Data protection • Health and safety • Equality (including reasonable adjustments/ additional support)	
Forms: • Enrolment • Other	
I confirmation that I have received this induction and the associated documents: Candidate name: …….. Candidate signature: ……..… Date: ……	

APPENDIX 2

UNITS

MANDATORY UNITS

COSBEDO01
Produce and recommend detailed design solutions in built environment design

Overview:

This Unit recognises, in addition to your technical competence as a designer, the paramount importance of health, safety and welfare requirements and environmental sustainability issues. It is about ensuring that all aspects of the production and installation design are integrated. You must understand the overall design approach, and be able to apply agreed techniques that will produce a holistic design that is coherent and consistent. It is about deciding what materials, components and systems will make up the finished product. You must have a sound knowledge of the available options, and be able to make informed choices.
This unit will challenge your technical competence. It is about producing the details of the design. It is about agreeing with stakeholders what you have done so far. You must be able to report on progress to date, justify the decisions that you have taken, and gain the trust and support of stakeholders for the next phase of the work.

It is also about identifying the hazards arising from the design, eliminating them where possible, and minimising the risks arising from the residual hazards. For the purposes of this Unit, a hazard is something with the potential to cause harm, and a risk is the likelihood of harm being caused, and the degree of its severity. The strategy for managing risk uses a hierarchy of eliminate/reduce/inform/control. You must be able to identify hazards associated with the design, eliminate them where possible, and inform people about the residual risks

Performance criteria - you must be able to:

Confirm the purpose, methods and techniques for preparing detailed design solutions
P1 confirm the purpose of production and installation information and the format to be used appropriate to the project stage
P2 identify and confirm the aspects of the overall project design which interact with each other and which require production and installation information
P3 maintain coherence and consistency between the production and installation solutions and the overall design concept
P4 apply agreed techniques for investigating, calculating, testing, developing and specifying production and installation solutions

Confirm and select materials, components and systems
P5 investigate the production and installation requirements which are significant to the overall design
P6 confirm the priorities for the production and installation requirements of the agreed design relevant to the project stage
P7 select materials, components and systems which meet the identified production and installation requirements and standards and guidance
P8 assess whether existing design solutions which contain similar production and installation requirements might be relevant

P9 agree the solutions which best meet the significant production and installation requirements, and keep records of them for the project team

Produce and recommend detailed design solutions
P10 identify, and confirm the technical, environmental, production and installation factors and data which will influence the production and installation solutions, and seek guidance where required
P11 agree design parameters for selecting and producing production and installation solutions appropriate to the project stage
P12 produce production and installation solutions by applying agreed design parameters
P13 record the data from calculations, investigations and analyses and pass them on for checking
P14 check the production and installation solutions against relevant technical, environmental, production and installation factors
P15 justify the features and benefits of the recommended production and installation solutions
P16 provide decision makers with relevant and accurate information at the right time and agree production and installation solutions
P17 maintain records of production and installation solutions

Make design choices to address health and safety hazards and risks
P18 collaborate with interested parties to ensure the compliance of designs with relevant health and safety regulations and legal framework
P19 identify operations and individual activities that may give rise to hazards
P20 identify and prioritise the hazards arising from operations and individual activities
P21 obtain accurate information on any potential consequences resulting from the hazards
P22 assess the hazards to identify risks on an iterative basis throughout the development process
P23 eliminate identified hazards whilst developing and modifying production and installation solutions
P24 reduce identified levels of risk arising from hazards that are not eliminated when developing and modifying production and installation information
P25 identify collective and individual measures for reducing levels of risk record in design documentation any information needed by interested parties so that they can comply with their duties under relevant health and safety regulations

Knowledge and understanding - you need to know and understand:

Confirm the purpose, methods and techniques for preparing detailed designs
K1 how to confirm the purpose of production and installation information and the format to be used appropriate to the project stage (application)
K2 how to identify which aspects of the overall project design interact with each other and require production and installation information (understanding)
K3 how to confirm which aspects of the overall project design interact with each other and require production and installation information (application)
K4 how and why to maintain coherence and consistency between the production and installation solutions and the overall design concept (synthesis)
K5 how to apply agreed techniques for investigating, calculating, testing, developing and specifying production and installation solutions (application)

Confirm and select materials, components and systems
K6 how and why to investigate the production and installation requirements which are significant to the overall design (analysis)
K7 how to confirm the priorities for the production and installation requirements of the agreed design relevant to the project stage (application)

K8 how and why to select materials, components and systems which meet the identified production and installation requirements and standards and guidance (evaluation)
K9 how and why to assess whether existing design solutions which contain similar production and installation requirements might be relevant (analysis)
K10 how and why to agree the solutions which best meet the significant production and installation requirements (evaluation)
K11 how to keep records of solutions that best meet the significant production and installation requirements (application)

Produce and recommend detailed design solutions/production and installation solutions
K12 how to identify the technical, environmental, production and installation factors and data which will influence the production and installation solutions (understanding)
K13 how to confirm the technical, environmental, production and installation factors and data which will influence the production and installation solutions, and seek guidance where required (application)
K14 how and why to agree design parameters for selecting and producing production and installation solutions appropriate to the project stage (evaluation)
K15 how to produce production and installation solutions by applying the agreed design parameters (application)
K16 how to record and pass on the data from calculations, investigations and analyses (application)
K17 how to check the production and installation solutions against relevant factors (application)
K18 how and why to justify the features and benefits of the recommended production and installation solutions (evaluation)
K19 how to provide relevant and accurate information to decision makers (application)
K20 how and why to agree production and installation solutions (evaluation)
K21 how to maintain records of production and installation solutions (application)

Make design choices to address health and safety hazards and risks
K22 how and why to collaborate with interested parties to ensure the compliance of designs with relevant health and safety regulations and legal framework (synthesis)
K23 how to identify operations and individual activities that may give rise to hazards (understanding)
K24 how to identify as hazards arising from operations and individual activities (understanding)
K25 how and why to prioritise the hazards arising from operations and individual activities (analysis)
K26 how to obtain accurate information on any potential consequences resulting from the hazards (application)
K27 how and why to assess the hazards to identify risks on an iterative basis throughout the development process (analysis)
K28 how to eliminate identified hazards whilst developing and modifying production and installation solutions (application)
K29 how to reduce identified levels of risk arising from hazards that are not eliminated when developing and modifying production and installation information (application)
K30 how to identify collective and individual measures for reducing levels of risk (understanding)
K31 how to record in design documentation any information needed by interested parties so that they can comply with their duties under relevant health and safety regulations(application)

Additional information
Scope/range

Confirm the purpose, methods and techniques for preparing detailed designs solutions
1. Format: 1.1. in writing 1.2. graphically 1.3. electronically
2. Project stages: 2.1. Stage 4 (Design) 2.2. Stage 5 (Build and Commission)
3. Aspects of the overall project design: 3.1. location and size 3.2. assembly and construction 3.3. components and systems 3.4. environmental assessment objectives

4. Maintain coherence and consistency: 4.1. visual performance 4.2. technical performance 4.3. operation and maintenance 4.4. requirements of relevant legislation and codes 4.5. cost 4.6. health and safety 4.7. environmental quality and sustainability 4.8. buildability/disassembly 4.9. value management 4.10. concurrent design and construction 4.11. comparison of costs of new and renewable energy systems in buildings 4.12. building services systems & controls 4.13. minimise thermal bridging and air leakage 4.14. minimise emissions and waste 4.15. water usage 4.16. energy use (U Value Calculations, Building Energy Assessment, Carbon Rating) 4.17. protect archaeological and historically valuable resources 4.18. carbon footprint
5. Techniques: 5.1. data research 5.2. conformity with regulations 5.3. specialist guidance and good practice 5.4. relevant previous solutions and feedback 5.5. computer modelling 5.6. Building Information Modelling 5.7. survey and investigation 5.8. performance dynamic modelling

Confirm and select materials, components and systems
6. Production and installation requirements: 6.1. construction requirements and compatibility with site constraints 6.2. adaptation of existing structural elements 6.3. practicality, buildability and disassembly 6.4. standardisation and component co-ordination 6.5. production and installation processes, scheduling, lead-in times, construction programming/sequencing and quality control 6.6. expertise including experienced crafts people 6.7. fit and tolerances 6.8. production resources availability and performance (plant/equipment/people/skills) 6.9. materials, components and systems availability and capability 6.10. strategies to address interface issues on and off-site 6.11. access/transportation/traffic management 6.12. health and safety 6.13. system commissioning 6.14. operation and maintenance information
7. Project Stage: 7.1. Stage 4 (Design) 7.2. Stage 5 (Build and Commission)
8. Standards and guidance: 8.1. British Standards 8.2. Assessment Schemes 8.3. codes of practice 8.4. BBA Certificates 8.5. EU Standards 8.6. trade and industry advisory guidance publications 8.7. client standards

Produce and recommend detailed design solutions
9. Technical factors: 9.1. structural forms 9.2. materials and component performance standards and fitness for purpose (form, performance, appearance, availability, sustainability, efficiency of use, component life, durability) 9.3. available and projected technology (including renewable energy) 9.4. prefabricated components and system options 9.5. performance, quality, operation and maintenance requirements 9.6. building physics (energy performance of structures, insulation, fire protection) 9.7. materials form, performance, appearance, availability, sustainability, efficiency of use 9.8. building services integration and control
10. Environmental factors: 10.1. local ecology 10.2. hydrology (tides and currents and flood risk 10.3. water use 10.4. exposure/shelter/shading 10.5. heating, ventilation and cooling (solar gain, temperature range, natural ventilation, thermal and ventilation performance, thermal flows) 10.6. thermal properties (heat loss and SAP variables, U values, thermal bridging, air tightness) 10.7. daylight and illumination 10.8. acoustics 10.9. energy & natural resource use and management 10.10.interaction of users and buildings, 10.11.carbon (embodied and in-use) and carbon rating 10.12.resource/waste management 10.13.pollution risk and reduction of emissions and waste
11. Production and installation factors: 11.1. construction requirements and compatibility with site constraints 11.2. adaptation of existing structural elements 11.3. practicality, buildability and disassembly 11.4. standardisation and component co-ordination 11.5. production and installation processes, scheduling, lead-in times, construction programming/sequencing and quality control 11.6. expertise including experienced crafts people 11.7. fit and tolerances 11.8. production resources availability and performance (plant/equipment/people/skills) 11.9. materials, components and systems availability and capability 11.10.strategies to address interface issues on and off-site 11.11.access/transportation/traffic management 11.12.health and safety 11.13.system commissioning 11.14.operation and maintenance information
12. Data: 12.1. identified construction criteria 12.2. existing detailed design solutions
13. Design parameters: 13.1. client, user and community requirements, expectations, options and preferences 13.2. project type/purpose/use 13.3. site, location and surrounding environment 13.4. geology (seismology, ground movements and soil type) 13.5. transport and infrastructure 13.6. planning, urban & social integration 13.7. design form (architectural, structural, civil, services) 13.8. design quality (character/scale/aesthetics) 13.9.

function/spatial planning (occupancy/room information/access and egress incl. DDA, security) 13.10.programme budget 13.11.cost (including whole life) 13.12.development timetable 13.13.risk assessment and mitigation 13.14.cost planning (including life cycle cost) and value management 13.15.procurement 13.16.in-use performance 13.17.environmental quality and sustainability 13.18.environmental assessment/certification schemes 13.19.protection of archaeological, architectural, cultural and historically valuable resources (significance/status) 13.20.statutory, regulatory and legal constraints 13.21.standards and codes of practice 13.22.health and safety 13.23.form, function, materials, components and systems 13.24.loose fit design - for flexibility/adaptability/deconstruction/disassembly 13.25.buildability 13.26.operation and maintenance
14. Project Stage: 14.1. Stage 4 (Design) 14.2. Stage 5 (Build and Commission)
15. Calculations: 15.1. manual 15.2. computer aided
16. Investigations: 16.1. data research 16.2. survey 16.3. conformity with regulations 16.4. specialist guidance and good practice 16.5. relevant previous solutions and feedback 16.6. computer/simulation modelling 16.7. calculation 16.8. Building Information Modelling 16.9. computer aided analysis
17. Justify - by using: 17.1. sketches 17.2. drawings 17.3. physical models 17.4. computer models 17.5. diagrams 17.6. calculations 17.7. written reports 17.8. cost estimates 17.9. programming 17.10.specifications 17.11.outline approvals from regulatory authorities

Make design choices to address health and safety hazards and risks
18. Interested parties: 18.1. clients 18.2. CDM 18.3. HSE 18.4. other designers 18.5. project and construction managers 18.6. contractors and specialist contractors 18.7. operators and maintainers
19. Relevant health and safety regulations and legal framework: 19.1. CDM regulations and Approved Codes of Practice 19.2. current health, safety and welfare regulations 19.3. Construction and Building Regulations 19.4. civil law and criminal law 19.5. duty of care
20. Operations and individual activities: 20.1. survey and investigation 20.2. construction phase 20.3. operation and maintenance 20.4. altering 20.5. demolition/disassembly 20.6. commissioning and decommissioning
21. Hazards: 21.1. falls from height 21.2. slips, trips and falls 21.3. hit by falling or moving objects 21.4. manual handling 21.5. health issues 21.6. power sources 21.7. hazardous substances 21.8. trapped by something collapsing or overturning 21.9. confined spaces 21.10.fire 21.11.obstructions 21.12.moving vehicles 21.13.public access
22. Potential consequences: 22.1. injury 22.2. causing ill health 22.3. fatality 22.4. damaging property 22.5. adversely affecting the natural and built environment 22.6. contravening legislative requirements 22.7. litigation and prosecution 22.8. working conditions and circumstances 22.9. buildability
23. Assess: 23.1. likelihood of occurrence 23.2. severity of harm incurred
24. Risks: 24.1. high 24.2. medium 24.3. low
25. Develop and modify: 25.1. analysis 25.2. identifying interactions 25.3. calculation 25.4. testing 25.5. selecting materials, components and systems detailing and specifying consideration of costs and benefits (including whole life costing) 25.6. identifying project requirements 25.7. planning investigation 25.8. verifying competence and resources analysis 25.9. identifying interactions assessing buildability
26. Measures: 26.1. eliminate 26.2. reduce 26.3. inform 26.4. control
27. Design documentation: 27.1. drawings 27.2. specifications 27.3. calculations 27.4. Health and safety plans and files

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Relevant occupations: Civil engineers; graphic designers; architectural technologists; town planning technicians; draughtspersons, building surveyors
Suite: Built Environment Design
Key words: detailed design; production; installation; health; safety; hazards; risks

COSBEDO02
Maintain professional relationships and practice in built environment design

Overview:

This Unit is concerned with the integration of your personal and professional competence. It is about getting the best from your relationships with other people. This is about emotional competence; being confident about your own control of yourself, and relationships with the project team, so that you can deal with the concerns of others in a constructive way. It is about communicating technical information to other people, and ensuring that they understand it. You must be able to talk their language and maintain their trust in you and their support for your work. It is about practising ethically. It is about taking part in meetings. This means getting involved with the business of the meeting and making appropriate contributions. It is about your Continuing Professional Development (CPD) and reviewing your development needs, deciding how to meet them, carrying out your development plan and evaluating its success. This will lead on to an update of your needs review, and the process becomes on-going. You must be able to produce and explain your CPD plans and records.

Performance criteria - you must be able to:

Maintain relationships with other people
P1 maintain working relationships with people which promote good will, trust and respect
P2 inform people about work activities in an appropriate level of detail and with an appropriate degree of urgency
P3 offer advice and help to people about work activities with sensitivity and encourage questions, requests for clarification and comments
P4 clarify with people objections to proposals and resolve conflicts and differences of opinion in ways which minimise offence, and maintain good will, trust and respect

Exchange information and present advice on technical issues
P5 obtain information which is sufficiently detailed for the purpose
P6 present technical information and advice which is complete, summarised accurately and relevant to technical issues
P7 present technical recommendations which are clear, accurate and valid, and which represent the best advice possible given the information and resources available
P8 give technical instructions and guidance which are likely to be understood by the people who will follow them
P9 present technical information and advice using a style of communication which is appropriate to the purpose and people receiving information and advice
P10 adapt and modify technical information where people are having difficulties in understanding it

Operate within an ethical framework
P11 operate in accordance with recognised good practice
P12 identify the limits of your professional expertise and working within them
P13 take clear and unequivocal personal responsibility for personal decisions
P14 confirm the terms of reference and the expectations of the people involved in contracts

P15 review offers to see if they are illegal or may generate conflicts of interest and reject any that do

Organise and participate in meetings
P16 clarify the purpose of the meeting with the appropriate persons
P17 ensure that the agenda and other relevant documentation is prepared, produced and forwarded to the appropriate persons, within specified deadlines
P18 ensure that your contributions to the meeting are clear, concise and relevant
P19 ensure that contributions to the meeting help to clarify problems and also identify and assess possible action
P20 make accurate notes during meetings to the necessary level of detail
P21 produce clear and accurate records of meetings in the standard format including agreed action points and within agreed deadlines
P22 ensure that people receive records of meetings and decisions made, promptly

Undertake personal development
P23 identify your aims and objectives for undertaking personal development
P24 identify and contact sources of support and guidance for undertaking personal development
P25 agree relevant standards of competence against which personal development can be measured
P26 review the current personal level of performance against the identified standards of competence and identify personal development needs
P27 prepare a development plan for achieving identified development needs
P28 undertake development activities in accordance with the development plan, record them and review their effectiveness
P29 review achievement of identified development needs and record evidence of competence gained against the identified standards of competence
P30 review, revise and update aims and objectives to suit changing circumstances

Knowledge and understanding - you need to know and understand:

Maintain relationships with other people
K1 how to maintain working relationships with people which promote good will, trust and respect (application)
K2 how to inform people about work activities in an appropriate level of detail and with an appropriate degree of urgency (application)
K3 how and why to offer advice and help to people about work activities (synthesis)
K4 how to clarify with people objections to proposals (application)
K5 how and why to resolve conflicts and differences of opinion in ways which minimise offence, and maintain goodwill, trust and respect (synthesis)

Exchange information and present advice on technical issues
K6 how to obtain information which is sufficiently detailed for the purpose (application)
K7 how to present technical information and advice (application)
K8 how to present technical recommendations (application)
K9 how to give technical instructions and guidance (application)
K10 how to present technical information and advice using a style of communication which is appropriate to the purpose and people receiving information and advice (application)
K11 how to adapt and modify technical information where people are having difficulties in understanding it (application)

Operate within an ethical framework
K12 how to operate in accordance with recognised good practice (application)
K13 how to identify the limits of professional expertise and work within them (understanding)

K14 how and why to take personal responsibility for personal decisions (evaluation)
K15 how and why to confirm the terms of reference and the expectations of the people involved in contracts (application)
K16 how and why to review offers to see if they are illegal or may generate conflicts of interest (analysis)
K17 how and why to reject any offers that are illegal or may generate conflicts of interest (evaluation)

Organise and participate in meetings
K18 how to clarify the purpose of the meeting with the appropriate persons (application)
K19 how to ensure that the agenda and other relevant documentation is prepared, produced and forwarded to the appropriate persons, within specified deadlines (application)
K20 how to ensure that contributions to the meeting are clear, concise and relevant (application)
K21 how to ensure that contributions to the meeting help to clarify problems and also identify and assess possible action (application)
K22 how to make accurate notes during meetings to the necessary level of detail (application)
K23 how to produce clear and accurate records of meetings in the standard format and within agreed deadlines (application)
K24 how to ensure that people receive records of meetings and decisions made, promptly (application)

Undertake personal development
K25 how to identify aims and objectives for undertaking personal development (understanding)
K26 how to identify sources of support and guidance for undertaking personal development (understanding)
K27 how to contact sources of support and guidance for undertaking personal development (application)
K28 how and why to agree relevant standards of competence against which personal development can be measured (evaluation)
K29 how and why to review the current personal level of performance against the identified standards of competence (analysis)
K30 how to identify personal development needs (analysis)
K31 how and why to prepare a development plan for achieving identified personal development needs (synthesis)
K32 how to undertake development activities in accordance with the development plan and record them (application)
K33 how and why to review the effectiveness of development activities (analysis)
K34 how and why to review achievement of identified development needs (analysis)
K35 how to record evidence of competence gained against the identified standards of competence (application)
K36 how and why to review aims and objectives to suit changing circumstances (analysis)
K37 how to revise and update aims and objectives to suit changing circumstances (application)

Additional information
Scope/range

Maintain relationships with other people
1. People: 1.1. those to whom you report 1.2. other professional colleagues 1.3. those affected by your work 2. Good will, trust and respect:
2.1. demonstrating a duty of care 2.2. ethical relationships 2.3. professional independence 2.4. honouring promises and undertakings 2.5. open and honest relationships 2.6. constructive relationships 2.7. meeting equality/diversity legislation
3. Inform, offer advice and clarify: 3.1. orally 3.2. in writing 3.3. using graphics 3.4. electronically
4. Work activities: 4.1. progress 4.2. results 4.3. achievements 4.4. emerging threats 4.5. risks 4.6. opportunities
Exchange information and present advice on technical issues

5. Purpose: 5.1. sharing experience 5.2. issuing instructions 5.3. making decisions 5.4. increasing understanding 5.5. implementing a solution 5.6. clarification to avoid disputes 5.7. negotiation 5.8. proposing a solution
6. Present: 6.1. orally 6.2. in writing 6.3. graphically 6.4. electronically 7. People receiving information and advice: 7.1. same and other related occupations 7.2. clients and customers 7.3. technical and non-technical team members 7.4. craftspeople and operatives 7.5. senior and junior colleagues 7.6. members of the public 7.7. people with individual needs 7.8. central and local government agencies

Operate within an ethical framework
8. Recognised good practice: 8.1. codes of practice within the occupation, discipline or organisation 8.2. statute law 8.3. duty of care 9. Conflicts of interest: 9.1. offers which may result in adverse conditions to other individuals or the community 9.2. offers which involve the financial interest of the practitioner 9.3. giving unfair advantage to the practitioners family or friends 9.4. acceptance of bribes or inducements

Organise and participate in meetings
10. Purpose of meeting: 10.1. updating progress 10.2. decision making 10.3. presentation 11. Meetings: 11.1. team 11.2. internal to your organisation 11.3. external to your organisation

Undertake personal development
12. Aims and objectives: 12.1. preparation for career development 12.2. short and long term goals 12.3. intellectual challenge 12.4. need for updating 12.5. compliance with employer and professional requirements 12.6. promotion or job change 12.7. maintenance of existing competence 12.8. improvements to existing competence 12.9. commitment to professional excellence 12.10.developing personal networks 12.11.need to provide evidence of professional competence 12.12.record of vocational competence 12.13.awareness of development needs
13. Sources of support and guidance:
13.1. national/industry bodies 13.2. Professional Institutions 13.3. education and training providers 13.4. in-house 13.5. mentoring 13.6. national occupational standards 13.7. current publications
14. Standards of competence: 14.1. employer requirements 14.2. job descriptions and personal specification 14.3. professional institution requirement 14.4. industry national occupational standards
15. Development plan includes: 15.1. priorities 15.2. target dates 15.3. development activities
16. Development activities: 16.1. formal courses 16.2. research 16.3. work experience 16.4. personal study 16.5. work shadowing/secondments 16.6. workshops

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Suite: Built Environment Design
Key words: relationship; information; advice; technical; issues; ethical; framework; meetings; personal; development

COSBEDO03

Investigate factors affecting project development in built environment design

Overview:

This unit is concerned with gathering all the information that you will need for your work on design projects. It is about deciding what information you need, and how it will be collected, analysed and presented. You must be able to identify the parameters of the project, the data that you need to collect, where it will come from, and how you obtain it. It is about collating and evaluating the information that you have gathered. You must be able to assemble all this information, and present the findings of your research to colleagues

Performance criteria - you must be able to:

Identify investigation requirements
P1 collect information about the requirements for the project and identify any gaps and uncertainties
P2 identify the factors for investigation that may be significant for the planned development
P3 analyse and assess how accurate, up to date and complete the existing information is, and deciding what additional information is needed
P4 identify what data is needed, its source, how accurate the data needs to be and what information is required from investigation

Investigate data and present findings
P5 choose methods and techniques for the investigation which are valid, reliable and consistent with legal requirements
P6 collect and collate relevant data from identified sources of information
P7 accurately analyse and evaluate the investigation data which has been collected about all of the significant trends and factors affecting the project development
P8 identify and accurately record the opportunities and constraints for project development options
P9 identify and assess previous solutions which are similar to the current circumstances to see whether they are relevant and useful
P10 present accurate findings which are unambiguous, which clearly describe all the important factors, and which detail the implications for the project brief
P11 assemble any supporting data which is relevant to the study, but which is not included in the report, store it safely and index it clearly for future reference

Knowledge and understanding - you need to know and understand:

Identify investigation requirements
K1 how to collect information about the requirements for the project (application)
K2 how to identify any gaps and uncertainties in information about the requirements of the project (understanding)
K3 how to identify factors for investigation that may be significant for the planned development (understanding)
K4 how and why to analyse and assess how accurate, up to date and complete the existing information is (analysis)
K5 how and why to decide what additional information is needed (evaluation)
K6 how to identify what data is needed, its source, how accurate the data needs to be and what information is required from the investigation (understanding)

Investigate data and present findings
K7 how to choose methods and techniques for the investigation (evaluation)
K8 how to collect and collate relevant data from identified sources (application)
K9 how and why to analyse the investigation data which has been collected about all of the significant trends and factors affecting the project development (analysis)

K10 how and why to evaluate the investigation data which has been collected about all of the significant trends and factors affecting the project development (evaluation)
K11 what to identify as opportunities and constraints for project development options (understanding)
K12 how to record the opportunities and constraints for project development options (application)
K13 what previous solutions do you identify to see whether they are relevant and useful (understanding)
K14 how and why to assess previous solutions to see whether they are relevant and useful (analysis)
K15 how to present findings which describe all the important factors and detail implications for the brief (application)
K16 how to assemble, store and index any supporting data which is relevant to the study, but which is not included in the report (application)

Additional information
Scope/range

Identify investigation requirements
1. Requirements: 1.1. functional requirement 1.2. performance requirements 1.3. cost 1.4. time
2. Factors: 2.1. historical 2.2. conservation 2.3. social 2.4. visual and spatial 2.5. ecological and environmental 2.6. construction 2.7. measured survey 2.8. physical survey
3. Analyse and assess: 3.1. comparison with similar projects 3.2. standard checklists 3.3. reference to relevant comparative research
4. Sources: 4.1. client records 4.2. tenants 4.3. site owners 4.4. site managers 4.5. previous owners 4.6. local authorities 4.7. statutory authorities 4.8. public utilities 4.9. government departments 4.10. public and specialist libraries and archives 4.11. Internet

Investigate data and present findings
5. Methods and techniques: 5.1. comparison with similar projects 5.2. standard checklists 5.3. reference to relevant comparative research
6. Sources: 6.1. client records 6.2. tenants 6.3. site owners 6.4. site managers 6.5. previous owners 6.6. local authorities 6.7. planning and policy documents 6.8. building and construction regulations 6.9. statutory authorities 6.10. public utilities 6.11. government departments 6.12. public and specialist libraries and archives 6.13. original designs 6.14. contractors and suppliers 6.15. experts including experienced craftspeople 6.16. existing health and safety files 6.17. community consultations
7. Factors: 7.1. historical 7.2. conservation 7.3. social 7.4. visual and spatial 7.5. ecological and environmental 7.6. construction 7.7. infrastructure 7.8. measured survey 7.9. physical survey
8. Opportunities and constraints: 8.1. use/function 8.2. durability 8.3. legal and regulatory constraints 8.4. physical and technical constraints 8.5. health and safety 8.6. anticipated development timetable 8.7. environmental quality and sustainability 8.8. standardisation 8.9. purpose, location, cost and time 8.10. durability 8.11. occupancy 8.12. significance/status 8.13. community benefits 8.14. energy management 8.15. renewable energies technologies 8.16. waste management 8.17. water management
9. Present: 9.1. orally 9.2. in writing 9.3. graphically 9.4. electronically

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Suite: Built Environment Design
Key words: Investigation; requirements; investigate; data, present; findings

COSBEDO08

Overview:

This unit is concerned with producing drawings and schedules. You must be able to choose and use the standard drawing conventions, assemble the design information that you need, produce your drawings, have them checked and approved, and keep your registers and records up to date. It is also about producing schedules. You must be able to collect the information that you need, to check its accuracy, to prepare schedules, have them approved, and keep records up to date

Performance criteria - you must be able to:

Prepare drawings
P1 Produce drawings which are complete, accurate, and comply with the design requirements and are suitable for the purpose
P2 Select methods and media which are suitable for the drawings required, and which can be produced with the resources and time available
P3 use standard drawing conventions and identify and justify any deviations from them
P4 clarify any information to be included which is incomplete and inconsistent and make accurate amendments
P5 keep registers and records of drawings which are complete, accurate and up-to-date
P6 obtain necessary checks and approvals for the content and presentation of drawings
P7 use methods for producing drawings and record keeping consistent with quality assurance procedures

Prepare schedules
P8 select a format for the schedules which meets the requirements of the production process, the method of measurement used and the way in which the schedules will be used
P9 measure the dimensions accurately from the source documents and the site according to standard requirements
P10 check and confirm that the data is complete and reference the data, correctly, to the specification, drawings, manufacturer's references and other appropriate standards
P11 clarify any information to be included which is incomplete and inconsistent and make accurate amendments
P12 prepare schedules which include descriptions and quantities
P13 select methods and media which are suitable for the schedules required, and which can be produced with the resources and time available
P14 keep registers and records which are complete, accurate and up to date
P15 obtain necessary checks and approvals for the content and presentation of schedules
P16 use methods for production and record keeping which are consistent with quality assurance procedures

Knowledge and understanding - you need to know and understand:

Prepare drawings
K1 how to produce drawings which are suitable for purpose (application)
K2 how and why to select methods and media which are suitable for the drawings required (evaluation)
K3 how to use standard drawing conventions (application)
K4 how and why to justify any deviations from standard drawing conventions (evaluation)

K5 how to clarify any information to be included which is incomplete and inconsistent, and make accurate amendments (application)
K6 how to keep registers and records of drawings (application)
K7 how to obtain necessary checks and approvals for the content and presentation of drawings (application)
K8 how to use methods for production and record keeping which are consistent with quality assurance procedures (application)

Prepare schedules
K9 how and why to select a format for the schedules which meets the requirements of the production process, the method of measurement used and the way in which the schedules will be used (evaluation)
K10 how to measure the dimensions from source documents and the site (application)
K11 how to check and confirm that the data is complete (application)
K12 how to reference the data to the specification, drawings, manufacturer's references and other appropriate standards (application)
K13 how to clarify and make accurate amendments to any information to be included which is incomplete and inconsistent (application)
K14 how to prepare schedules which include descriptions and quantities (application)
K15 how and why to select methods and media which are suitable for the schedules required (evaluation)
K16 how to keep complete, accurate and up-to-date registers and records (application)
K17 how to obtain checks and approvals (application)
K18 how to use methods for production and record keeping which are consistent with quality assurance procedures (application)

Additional information
Scope/range

Prepare drawings
1. Drawings: 1.1. location, assembly, component 1.2. sketches 1.3. working drawings 1.4. presentation drawings 1.5. co-ordination drawings
2. Purpose (of drawing): 2.1. convey the design intent 2.2. co-ordination 2.3. discipline specific 2.4. interdisciplinary coordination 2.5. obtain consents 2.6. procurement 2.7. contract 2.8. production 2.9. as built/final issue 2.10. presentation 2.11. analysis 2.12. factory manufacture 2.13. site installation 2.14. sub-contract and specialist details
3. Methods and media: 3.1. manual 3.2. electronic
4. Drawing conventions: 4.1. detailing standards 4.2. codes of practice 4.3. current industry practice 4.4. methods of coordination (e.g. Common Arrangement)
5. Registers and records: 5.1. incoming and outgoing drawing and document registers 5.2. records of document approval and revision 5.3. quality assurance documentation
6. Checks and approvals cover:
6.1. format 6.2. presentation 6.3. accuracy 6.4. technical content 6.5. completeness 6.6. referencing 6.7. cross-referencing and correlation with associated documents 6.8. status 6.9. company standards 6.10. positioning 6.11. dimensions 6.12. tolerances 6.13. composition 6.14. fixing 6.15. annotation 6.16. symbols and conventions 6.17. interoperability 6.18. co-ordination 6.19. revision control

Prepare schedules
7. Schedules: 7.1. materials 7.2. construction elements 7.3. components 7.4. finishes 7.5. fixtures and furnishings 8.
Schedules will be used for: 8.1. obtaining consents 8.2. procurement 8.3. contract 8.4. production 8.5. record payments 8.6. presentation 8.7. as built/final issue 8.8. factory manufacture 8.9. site installation 8.10. sub-contract and specialist details 8.11. room data
9. Methods and media: 9.1. manual 9.2. electronic

10. Register and records: 10.1. incoming and outgoing drawing and document registers 10.2. records of document approval and revision
11. Checks and approvals cover: 11.1. format 11.2. presentation 11.3. accuracy 11.4. technical content 11.5. completeness 11.6. referencing 11.7. cross-referencing and correlation with associated documents and information 11.8. status 11.9. company standards 11.10.interoperability 11.11.co-ordination 11.12.non-duplication 11.13.revision control

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Key words: prepare; drawings; schedules

ARCHITECTURE PATHWAY/ OPTIONAL ROUTE

MANDATORY UNIT FOR THIS PATHWAY

COSBEDO09
Collate project information and prepare specifications in built environment design

Overview:

This unit covers two areas of competence. First it covers implementing systems for collating and checking project information for design projects. Second, it covers preparing design specifications. It is about implementing your information system to ensure a successful project. You must be able to assess the status and collate project information, identify discrepancies, obtain checks and approvals and keep people informed. It covers method specifications, identified from standard sources and modified as necessary. These describe how the finished products should be constructed. You must be able to produce specifications based on current information, check and cross-reference them, and have them certified.

Performance criteria - you must be able to:

Collate and check project information
P1 implement systems for monitoring and controlling the production of information throughout the project stages
P2 assess the status of the information and pass it on to people who need it
P3 collaborate with other members of the project team to achieve integrated project design information
P4 collate information when they have been produced and check them against the agreed criteria
P5 identify queries, discrepancies and inconsistencies in the information and refer them to other members of the project team
P6 collate revisions, requirements and additions to the design information and distribute them promptly to appropriate members of the project team
P7 obtain necessary checks and approvals of information when they are needed

P8 produce up-to-date and accurate information on progress and circulate it to the people who need the information

Prepare design specifications
P9 produce a specification to suit the project requirements which is based on identified, current source information which has been verified
P10 select, and where necessary amend technical clauses from standard sources, which define the quality, type and standard of the materials, components and finished work
P11 check that the specification is consistent with the currently agreed design and other associated design documentation, and update it promptly and accurately when the design changes
P12 format the specification so that it is referenced and cross-referenced accurately
P13 obtain necessary verification for the content and presentation of specifications

Knowledge and understanding - you need to know and understand:

Collate and check project information
K1 how to implement systems for monitoring and controlling the production of information throughout the project stages (application)
K2 how and why to assess the status of the information (analysis)
K3 how to pass on the status of the information (application)
K4 how and why to collaborate with other members of the project team to achieve integrated project design information (synthesis)
K5 how to collate information when they have been produced (application) K6 how to check information against the agreed criteria (application)
K7 what to identify as queries, discrepancies and inconsistencies in the information (understanding)
K8 how to refer queries, discrepancies and inconsistencies in the information to other members of the project team (application)
K9 how to collate revisions, requirements and additions to the design information and distribute them to responsible members of the design team (application)
K10 how to obtain necessary checks and approvals of information (application)
K11 how to produce and circulate information on progress (application)

Prepare design specifications
K12 how to produce a specification to suit the project requirements based on current source information (application)
K13 how and why to select technical clauses from standard sources, which define the quality, type and standard of the materials, components and finished work (evaluation)
K14 how to amend technical clauses from standard sources, which define the quality, type and standard of the materials, components and finished work (application)
K15 how to check that the specification is consistent with the current design and other design documentation and update the specification promptly and accurately when the design changes (application)
K16 how to format the specification (application)
K17 how to obtain necessary verification for the content and presentation of specifications (application)

Additional information
Scope/range

Collate and check project information
1. Systems: 1.1. incoming and outgoing drawing and document registers 1.2. records of document approval and revision 1.3. revision management 1.4. methods of coordination (e.g. common arrangement) 1.5. electronic data transfers 1.6. integration of interdisciplinary data 1.7. technical query resolution

2. Information: 2.1. digital models 2.2. electronic 2.3. graphical and non-graphical data files 2.4. specifications 2.5. drawings 2.6. bills of quantities 2.7. schedules 2.8. health and safety plans
3. Project stage: 3.1. Stage 2 (Concept) 3.2. Stage 3 (Definition) 3.3. Stage 4 (Design) 3.4. Stage 5 (Build and Commission)
4. Criteria: 4.1. format 4.2. presentation 4.3. accuracy 4.4. technical content 4.5. completeness 4.6. referencing 4.7. cross referencing and correlation with associated documents 4.8. status 4.9. project brief 4.10. contract conditions

Prepare design specifications
5. Project requirements: 5.1. to obtain consents 5.2. procurement 5.3. contract 5.4. production
6. Source information: 6.1. design information 6.2. statutory regulations 6.3. British and EU Standards 6.4. codes of practice 6.5. technical literature 6.6. company standards
7. Verification: 7.1. format (e.g. National Building Specification) 7.2. presentation 7.3. accuracy 7.4. technical content 7.5. completeness 7.6. referencing 7.7. cross-referencing and correlation with associated documents 7.8. status 7.9. current

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Suite: Built Environment Design
Key words: collate; check; project; documents; design; specifications

OPTIONAL UNITS FOR THIS PATHWAY

COSBEDO04
Plan, carry out and present measured surveys in built environment design in built environment design

Overview:

This Unit is concerned with carrying out measured surveys. This Unit will test your mathematical knowledge and your competence with surveying instruments. It is about making the preparations, finding out what needs to be surveyed, obtaining the suitable equipment and the spares, and briefing affected parties beforehand about the work. You must know what the survey consists of, what equipment you will need, and who will need the results. It is about doing the survey work accurately and recording and calculating observations and measurements. You will need to produce clear and accurate records of your work, and of the time you spent doing it. It is about checking your survey records, and collating and presenting them to those who need them. You must be able to analyse your field surveys, and present a report to those who need it.

Performance criteria - you must be able to:

Prepare for measured surveys
P1 confirm the extent of the measured survey and the survey method before starting work

P2 arrange for suitable equipment, and enough spares for on site maintenance, to be brought to the site and kept safely and securely
P3 check and adjust equipment so that it is accurate before it is used for taking measurements
P4 brief the people who will be involved in the survey about the survey arrangements and the safety arrangements
P5 check and confirm that signs, arrangements for personal safety, equipment and site access conform to good practice, legislation and regulation

Carry out measured surveys
P6 conform to safe working practices when on the site
P7 set accurate horizontal and vertical controls and record them
P8 take accurate observations and measurements using valid methods
P9 change work procedures and practices to allow for different circumstances and conditions
P10 record survey data clearly and accurately and store it securely for later analysis and inspection
P11 keep a clear and accurate record of the time spent on the survey and of any problems that arise
P12 maintain the equipment in operating condition and store it securely
P13 restore areas which have been opened up for access

Analyse and present measured surveys
P14 collect together enough survey information to allow an accurate analysis to be made
P15 check and verify the survey information
P16 analyse the survey information accurately
P17 present the survey information, the commentary and any support information accurately, clearly and in a format which is suitable for those who need to use it
P18 advise people who will be using the survey information on how to interpret it

Knowledge and understanding - you need to know and understand:

Prepare for measured surveys
K1 how to confirm the extent of the measured survey and the survey method before starting the work (application)
K2 how to arrange for suitable equipment, and enough spares for on site maintenance, to be brought to the site and kept safely and securely (application)
K3 how to check and adjust equipment (application)
K4 how to brief the people who will be involved in the survey about survey arrangements and the safety arrangements (application)
K5 how to check and confirm that signs, arrangements for personal safety, equipment and site access conform to good practice, legislation and regulations (application)

Carry out measured surveys
K6 how to conform to safe working practices when on the site (application)
K7 how to set and record accurate horizontal and vertical controls (application)
K8 how to take accurate observations and measurements (application)
K9 how to change work procedures and practices to allow for different circumstances and conditions (application)
K10 how to record and store survey data (application)
K11 how to keep a clear and accurate record of the time spent on the survey and of any problems that arise (application)
K12 how to maintain the equipment in operating condition and store securely (application)
K13 how do you restore areas which have been opened up for access (application)

Analyse and present measured surveys
K14 how to collect together enough survey information to allow an accurate analysis to be made (application)
K15 how to check and verify the survey information (application)
K16 how and why to analyse the survey information (analysis)
K17 how to present the survey information, the commentary and any support information accurately, clearly and in a format which is suitable for those who need to use it (application)
K18 how and why to advise people who will be using the survey information on how to interpret it (synthesis)

Additional information
Scope/range

Prepare for measured surveys
1. Method: 1.1. approximate measured 1.2. detailed measurement of all specified features
2. Equipment: 2.1. mechanical 2.2. optical 2.3. electronic
3. People 3.1. colleagues 3.2. external contractors 3.3. people and organisations who may be affected by the survey
4. Survey arrangements: 4.1. risk assessment 4.2. survey responsibilities 4.3. details of the survey method 4.4. the site 4.5. the equipment 4.6. calibration certificates
5. Safety: 5.1. personal safety 5.2. equipment and clothing 5.3. safe use of access equipment 5.4. health and safety practice and regulations 5.5. industry codes of practice 5.6. regulations applying to the survey site 5.7. signage 5.8. site access to working areas 5.9. traffic management 5.10. live services and equipment

Carry out measured surveys
6. Safe working practices: 6.1. personal safety 6.2. equipment and clothing 6.3. safe use of access equipment 6.4. health and safety practice and regulations 6.5. industry codes of practice 6.6. regulations applying to the survey site 6.7. signage 6.8. site access to working areas 6.9. traffic management 6.10. live services & equipment
7. Circumstances and conditions: 7.1. climatic (variations, tolerances and environmental risks) 7.2. live conditions (e.g. buildings and sites in use, services, roads, railways, runways) 7.3. unforeseen circumstances 7.4. emergency circumstances 7.5. topography 7.6. water 7.7. obstacles 7.8. planned circumstances 7.9. security
8. Equipment: 8.1. mechanical 8.2. optical

Analyse and present measured surveys
9. Survey information: 9.1. electronic 9.2. approximate measured 9.3. detailed measurement of all specified features 9.4. graphic
10. Present: 10.1. orally 10.2. in writing 10.3. graphically 10.4. digitally

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Suite: Built Environment Design
Key words: present; measured; surveys; analyse

COSBEDO05
Carry out and present condition surveys in built environment design

Overview:

This unit is concerned with undertaking condition surveys and presenting your reports. It is about actually doing the surveys. The asset could be a building, a highway, a bridge, a reservoir, or any loadbearing or defensive construction. You must be able to confirm the scope of the work, organise what you need to carry out the survey, obtain the necessary permissions, take the physical measurements and record the results. It is about collating the results of the survey and presenting them in a report. You must be able to demonstrate your analytical and report-writing skills, and your technical judgement (both quantitative and qualitative)

Performance criteria - you must be able to:

Inspect condition of assets
P1 confirm the objectives and purpose of the condition survey
P2 consult the condition survey brief, undertake risk assessment and obtain the equipment and resources and specialist advice that will be needed
P3 check and confirm, before starting the condition survey, that people who will be affected have given their permission
P4 take accurate observations and measurements which are necessary for the inspection and record them clearly, accurately and completely using agreed formats
P5 identify and record the need for further investigations when observations are inconsistent with existing data and expected findings

Prepare condition survey reports and records
P6 assemble and collate information on the condition survey
P7 analyse all relevant evidence and information using appropriate methods and techniques and make a summary of condition
P8 prepare a condition survey report which meets the requirement of the brief
P9 explain clearly where and why inspection and measurement has not been possible
P10 answer questions about the condition survey and give appropriate clarification
P11 maintain internal records which are clear, accurate and complete and conform to accepted professional and statutory requirements

Knowledge and understanding - you need to know and understand:

Inspect condition of assets
K1 how to confirm the objectives and purpose of the condition survey (application)
K2 how to consult the condition survey brief (application)
K3 how and why to underTake risk assessment (evaluation)
K4 how to obtain the equipment and resources and specialist advice that will be needed (application)
K5 how to check and confirm, before starting the condition survey, that people who will be affected have given their permission (application)
K6 how to take and record accurate observations and measurements which are necessary for the inspection, using agreed formats (application)
K7 how and why to identify the need for further investigation when observations are inconsistent with existing data and expected findings (analysis)
K8 how to record the need for further investigations when observations are inconsistent with existing data and expected findings (application)

Prepare condition survey reports and records

K9 how to assemble and collate information on the condition survey (application)
K10 how and why to analyse all relevant evidence and information using appropriate methods and techniques and make a summary of condition (analysis)
K11 how and why to prepare a condition survey report (synthesis)
K12 how to explain clearly where and why inspection and measurement has not been possible (application)
K13 how to answer questions about the condition survey and give appropriate clarification (application)
K14 how to maintain internal records (application)

Additional information

Scope/range

Inspect condition of assets

1. Purpose of condition survey: 1.1. stability 1.2. stock condition 1.3. maintenance 1.4. legal 1.5. refurbishment, alteration or extension 1.6. health and safety 1.7. environmental
2. Record: 2.1. written 2.2. graphical 2.3. electronic 2.4. photographic

Prepare condition survey reports and records

3. Information - sources: 3.1. inspection observations and measurements 3.2. photographs 3.3. maps 3.4. charts 3.5. drawings 3.6. digital data 3.7. archive records 3.8. legal documents 3.9. client records 3.10. tenants 3.11. site owners 3.12. site managers 3.13. previous owners 3.14. local authorities 3.15. statutory authorities 3.16. public utilities 3.17. government department consultative bodies (including heritage bodies) 3.18. investigation and research findings 3.19. industry standard and legislation 3.20. published technical data

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Suite: Built Environment Design
Key words: inspect; condition; survey; reports; records

COSBEDO06
Monitor tests and present reports in built environment design

Overview:

This unit is concerned with carrying out tests and presenting the results. It is about getting the tests done, and being responsible for them. You must be able to confirm the scope of the work and the methods that you will use, to obtain the necessary permissions, to prepare a plan for the testing, and to carry out the tests to plan and within budget. It is about presenting the test results and sharing the information. You must be able to process the test result to pull them together into a competent report, and to present the report to the stakeholders.

Performance criteria - you must be able to:

Confirm and monitor tests

P1 confirm the objectives and purpose of the testing
P2 collate existing information and identify where it meets the objectives and purpose of the testing

P3 confirm relevant test processes and methods
P4 seek and obtain permission to carry out the test from people who might be affected and from any legal authorities who have to be notified
P5 confirm suitable quality assurance standards and health and safety requirements
P6 prepare a plan for the test and schedule it to meet the objectives and purpose of the test
P7 monitor tests and recommend modifications to maintain compliance with test requirements

Present test results
P8 collect and verify results from tests
P9 process the results using the most appropriate methods of analysis and chart them in a format that will help people to use them
P10 use the test results to produce an accurate report which identifies development constraints, opportunities and feasibility
P11 present the report including a commentary on the results

Knowledge and understanding - you need to know and understand:

Confirm and monitor tests
K1 how to confirm the objectives and purpose of the testing (application)
K2 how to collate existing information (application)
K3 how and why to identify where existing information meets the objectives and purpose of testing (synthesis)
K4 how and why to confirm relevant test processes and methods (application)
K5 how to seek and obtain permission to carry out the test from people who might be affected and from any legal authorities who have to be notified (application)
K6 how to confirm suitable standards of quality assurance and health and safety requirements (application)
K7 how and why to prepare a plan for the test (synthesis)
K8 how and why to schedule a plan for the test (analysis)
K9 how to monitor tests (application)
K10 how and why to recommend modifications to tests to maintain compliance with test requirements (synthesis)

Present test results
K11 how to collect results from tests (application)
K12 how and why to verify results from tests (analysis)
K13 how to process the results using the most appropriate methods of analysis and chart them in a format that will help people to use it (analysis)
K14 how to use the test results to produce an accurate report which identifies development constraints, opportunities and feasibility (application)
K15 how to present the report and commentary (application)

Additional information
Scope/range

Confirm and monitor tests
1. Objectives: 1.1. geographical 1.2. structural 1.3. environmental 1.4. material
2. Purpose: 2.1. performance 2.2. routine 2.3. contingency
3. Test: 3.1. physical 3.2. condition 3.3. performance 3.4. destructive 3.5. non-destructive 3.6. qualitative 3.7. quantitative 3.8. environmental 3.9. materials
4. Processes: 4.1. as defined by relevant legislation 4.2. code of practice as accepted by recognised authorities in the field
5. Methods: 5.1. visual 5.2. approximate estimated 5.3. detailed assessment of specified features

6. Permission from: 6.1. client 6.2. site owner and occupiers 6.3. occupiers 6.4. adjoining owners and occupiers 6.5. notifiable authorities
7. Health and safety requirements: 7.1. personal safety equipment and clothing 7.2. safe use of access equipment (including ladders, tower scaffolds, hydraulic hoists) 7.3. industry codes of practice and regulations 7.4. identified by risk assessments
8. Plans - will include: 8.1. risk assessment 8.2. arrangements for waste disposal 8.3. dealing with contingencies 8.4. timescale 8.5. budget Present test results
9. Methods of analysis: 9.1. comparison with standard test results 9.2. referenced to accepted principles and practice
10. Present: 10.1. orally 10.2. in writing 10.3. graphically 10.4. electronically

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Suite: Built Environment Design
Key words: carry out; tests; present; results

COSBEDO07
Report on and prepare applications to secure consents in built environment design

Overview:

This unit is concerned with preparing applications to secure statutory consents. You must find out what the constraints are, identify design solutions that satisfy them, and produce a report. It is about actually preparing the applications. You must be able to show what requirements the relevant authorities seek and the timing thereof, to identify the processes and to gather further information if consent is refused

Performance criteria - you must be able to:

Prepare applications to secure statutory consents
P1 check and confirm with the relevant authorities the requirements, current procedures and likely timescale for statutory approvals and other consents
P2 forecast how long the submission and approval of applications for consent will take and how this will fit in with the project schedule
P3 prepare and assemble the information that will be needed for the application
P4 prepare and submit a clear and valid application for the consent
P5 gather and collate further information to develop alternatives where consent may be refused

Knowledge and understanding - you need to know and understand:
Prepare applications to secure statutory consents
K1 how to check and confirm with the relevant authorities the requirements, current procedures and likely timescale for statutory approvals and other consents (application)
K2 how and why to forecast how long the submission and approval of applications for consent will take and how this will fit in with the project schedule (analysis)

K3 how to prepare and assemble the information that will be needed for the application (application)
K4 how to prepare and submit a clear and valid application for the consent (application)
K5 how to gather and collate further information to develop alternatives where consent may be refused (application)

Additional information
Scope/range

Prepare applications to secure statutory consents
1. Statutory approvals: 1.1. development and use of land 1.2. structures 1.3. buildings and highways 1.4. renewal and clearance 1.5. health, safety and welfare 1.6. transport infrastructure 1.7. environmental sustainability 1.8. conservation 1.9. access (e.g. DDA)
2. Consents: 2.1. planning 2.2. building control 2.3. environmental 2.4. utilities 2.5. funding
3. Alternatives: 3.1. amending the brief 3.2. amending the proposal 3.3. appealing 3.4. withdrawing the application

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Relevant occupations: Civil engineers; graphic designers; architectural technologists; town planning technicians; draughtspersons, building surveyors
Suite: Built Environment Design
Key words: regulatory; constraints; prepare; applications; secure; statutory; consents

COSBEDO10
Obtain and assess tenders in built environment design

Overview:

This unit is concerned with obtaining tenders from contractors and subcontractors, and selecting the ones that you wish to action. The words estimate, bid and tender are all used in the industry, and are taken here to be synonymous. It is about sending the tender documents out to the bidders. You must be able to find out who will be bidding, prepare the tender documents, send them out, deal with any queries, and keep records up to date. It is about assessing the bids that you receive. You must be able to review the bids, check them for errors, agree any adjustments, and inform the bidders of the results.

Performance criteria - you must be able to:

Obtain tenders
P1 send tender enquiries to potential tenderers, in accordance with contract requirements, and invite them to provide evidence about their experience, capability and resources
P2 collate responses from potential tenderers and confirm and agree tender lists
P3 prepare tender documents which meet statutory regulations, codes of practice and your organisational policies
P4 issue tender documents to all the tenderers on the agreed list, following the agreed procedures

P5 investigate any errors, omissions and ambiguities which are reported by tenderers, amend the tender documents to correct them and pass the information to all the tenderers
P6 keep accurate records of tender documents issued, feedback, queries and information from tenderers
P7 store the tenders received in a secure place and open them at the agreed date and time in line with organisational procedures
P8 review the tenders against the criteria for acceptance, including checking for discrepancies, omissions and errors, and recommend appropriate action
P9 discuss and recommend any variations, adjustments and corrections with the successful tenderer and confirm them in writing, subject to contract

Knowledge and understanding - you need to know and understand:

Obtain tenders
K1 how to send tender enquiries to potential tenderers to invite evidence about their experience, capability and resources (application)
K2 how to collate responses from potential tenderers and confirm tender lists (application)
K3 how and why to agree tender lists (evaluation)
K4 how and why to prepare tender documents (synthesis)
K5 how to issue tender documents to all tenderers on the agreed tender list (application)
K6 how and why to investigate any errors, omissions and ambiguities which are reported by tenderers (analysis)
K7 how to amend the tender documents to correct any errors, omissions or ambiguities which are reported by tenderers (application)
K8 how to pass on to all the tenderers the information relating to amendments to tender documents (application)
K9 how to keep accurate records of tender documents issued, feedback, queries and information from tenderers (application)
K10 how to store and open the tenders received in line with organisational procedures (application)
K11 how and why to review the tenders (analysis)
K12 how to check for any discrepancies, omissions and errors (application)
K13 how and why to recommend appropriate action (synthesis)
K14 how and why to discuss and recommend any variations, adjustments and corrections with the successful tenderer (synthesis

Additional information
Scope/range
Obtain tenders
1. Tenderers: 1.1. contractors 1.2. sub/works/trade contractors 1.3. suppliers 1.4. consultants
2. Tender documents: 2.1. invitation to tender 2.2. form of tender 2.3. returns procedure 2.4. surveys 2.5. specifications 2.6. drawings 2.7. schedules 2.8. bills of quantities 2.9. health and safety plans 2.10. scope of services 2.11. terms and conditions 2.12. schedules of rates
3. Queries and information about: 3.1. price 3.2. quantity 3.3. quality 3.4. standards 3.5. carriage and delivery 3.6. completion 3.7. maintenance 3.8. after sales service 3.9. method of payment 3.10. terms of payment 3.11. contract conditions 3.12. survey information 3.13. time 3.14. contractual 3.15. administrative 3.16. technical 3.17. warranties
4. Appropriate action: 4.1. accept for evaluation 4.2. invite clarification or amendment 4.3. reject
5. Variations, adjustments and corrections: 5.1. price 5.2. quantity 5.3. quality 5.4. time

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Suite: Built Environment Design
Key words: obtain tenders; assess tenders

COSBEDO11
Prepare tenders in built environment design

Overview:

This unit is concerned with securing contracts with clients to carry out design work for them. The words estimate, bid and tender are all used in the industry, and are taken here to be synonymous. It is about deciding how design function will be carried out. You must be able to get all the information that you need, decide the best way of working, produce a method statement, and agree this with the project team. It is about deciding how much the design work will cost. You must be produce a working programme, decide what resources are needed, calculate the costs, and discuss them with the project team.

Performance criteria - you must be able to:

Evaluate and recommend work methods
P1 assess the available project data and summarise it to enable decisions on construction, installation and work methods to be made
P2 obtain more information from relevant sources in cases where the available project data is insufficient
P3 identify work methods which will make the best use of resources and which meet project, statutory and contractual requirements
P4 evaluate the work methods against relevant technical and project criteria and recommend the one which best meets the criteria
P5 prepare an outline method statement which is accurate, clear, concise and acceptable to all the people involved

Estimate the resource requirements and costs within a tender
P6 develop a proposed plan of work and draft programme which meet the tender rules, project requirements and phasing
P7 estimate what resources will be needed, their sources, availability and costs
P8 modify the cost to take into account any relevant external factors
P9 produce the overall estimate of costs and check that it is complete, accurate and in a form which is suitable for a judgment to be made
P10 explain and clarify the tender assumptions to support the projected costs
P11 collate, arrange and submit tender offer information in accordance with tender instructions
P12 collate together all the tender information, record it, store it securely and only pass it on to people who have the authority to receive it

Knowledge and understanding - you need to know and understand:

Evaluate and recommend work methods
K1 how and why to assess the available project data (analysis)

K2 how to summarise project data to enable decision on construction, installation and work methods to be made (application)
K3 how to obtain more information from relevant sources in cases where the available project data is insufficient (application)
K4 what to identify as work methods which will make the best use of resources and which meet project, statutory and contractual requirements (understanding)
K5 how and why to evaluate the work methods against relevant technical and project criteria (evaluation)
K6 how and why to recommend the method which best meets the criteria (synthesis)
K7 how and why to prepare an outline method statement (application)

Estimate the resource requirements and costs within a tender
K8 how and why to develop a proposed plan of work and draft programme which meet the tender rules, project requirements and phasing (synthesis)
K9 how and why to estimate what resources will be needed, their sources, availability and costs (analysis)
K10 how to modify the costs to take into account any relevant external factors (application)
K11 how and why to produce the overall estimate of costs (analysis)
K12 how to check that the overall estimate of costs is complete, accurate and in a form which is suitable for a judgment to be made (application)
K13 how to explain and clarify the tender assumptions to support the projected costs (application)
K14 how do you collate, arrange and submit tender offer information (application)
K15 how to collate together all the tender information (application) K16 how to record, store and pass on all the tender information (application)

Additional information
Scope/range

Evaluate and recommend work methods
1. Project data: 1.1. contractual obligations and scope and scale of works 1.2. specifications 1.3. detailed drawings 1.4. health and safety plans
2. Construction, installation and work methods: 2.1. sequencing and integration of work operations 2.2. construction and installation techniques 2.3. prefabrication and standardisation 2.4. working conditions (health, safety and welfare)
3. Relevant sources: 3.1. project team 3.2. regulatory authorities 3.3. technical/trade literature 3.4. standard lists and procedures
4. Technical criteria: 4.1. materials and components performance and availability 4.2. health, safety and welfare 4.3. access 4.4. plant and equipment performance and availability 4.5. sustainability 4.6. buildability 4.7. site conditions
5. Project criteria: 5.1. cost/value 5.2. client and user needs 5.3. contract requirements for time, quantity and quality
Estimate the resource requirements and costs within a tender
6. Tender rules: 6.1. invitation to tender 6.2. form of tender 6.3. procedures for submitting tenders
7. Project requirements: 7.1. construction 7.2. installation and maintenance work 7.3. supply of goods and materials 7.4. consultancy services
8. Phasing: 8.1. technology required 8.2. planning 8.3. design 8.4. procurement 8.5. construction
9. Estimate: 9.1. cost based on a quotation 9.2. unit cost built up from basic data 9.3. internal and historical cost data 9.4. published cost data
10. Resources: 10.1. people (in-house, external) 10.2. plant and equipment 10.3. materials 10.4. finance 10.5. time 11. External factors: 11.1. location 11.2. contractual requirements 11.3. special working conditions and methods 11.4. resourcing conditions

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Suite: Built Environment Design
Key words: relationship; information; advice; technical; issues; ethical; framework; meetings; personal; development

COSBEDO12
Monitor projects in built environment design

Overview:

This unit applies to designers who go onto site and get involved in monitoring the construction process and health and safety requirements. It is about ensuring the quality of the work. You must be able to confirm what quality you want, implement systems for carrying out the work to the agreed standards, deal with contingencies and non-compliance, and gather feedback to identify what can be improved. It is about working to programme. You must be able to implement systems for monitoring progress, to deal with resource problems, delays and disruptions, and to continually seek ways of improving progress. It is about controlling costs and organising payments. You must be able to implement cost control systems; deal with variations, identify cost savings; and prepare information for instructions and certificates

Performance criteria - you must be able to:

Monitor health and safety requirements in your area of responsibility
P1 identify your personal responsibilities and liabilities under health and safety legislation
P2 ensure that your organisation's written health and safety policy statement is clearly communicated to all people in your area of responsibility and other relevant parties
P3 ensure that the health and safety policy statement is put into practice in your area of responsibility and is subject to review as situations change and at regular intervals and the findings passed to the appropriate people for consideration
P4 ensure regular consultation with people in your area of responsibility or their representatives on health and safety issues
P5 seek and make use of specialist expertise in relation to health and safety issues
P6 ensure that a system is in place for identifying hazards and assessing risks in your area of responsibility and that prompt and effective action is taken to eliminate or control identified hazards and risks
P7 ensure that systems are in place for effective monitoring, measuring and reporting of health and safety performance in your area of responsibility
P8 show continuous improvement in your area of responsibility in relation to health and safety performance.
P9 make health and safety a priority area in terms of informing planning and decision-making in your area of responsibility.
P10 demonstrate that your own actions reinforce the messages in your organisation's health and safety policy statement.
P11 ensure that sufficient resources are allocated across your area of responsibility to deal with health and safety issues.
P12 develop a culture within your area of responsibility which puts health and safety first.

Monitor contracts against agreed quality standards
P13 identify quality standards from available information and pass them to people responsible for their implementation, before they start work
P14 confirm the responsibilities which individuals have for maintaining quality standards
P15 implement systems for inspecting and controlling the quality of work and record the outcomes
P16 check, regularly, that work conforms to the design requirements and the specified quality standards
P17 identify work which fails to meet the requirements and specified quality standards and recommend corrective action
P18 inform people responsible about significant variations in quality standards, programme and safety implications, and suggest the decisions which they need to make and actions they need to take
P19 identify improvements from feedback received and recommend them to people responsible

Monitor contract progress against agreed programmes
P20 implement systems to monitor and record the progress of the contract against the agreed programmes
P21 identify inadequately and inappropriately specified resources and inform people responsible
P22 identify and quantify any deviations from planned progress which have occurred, or which may occur, and which could disrupt the programme
P23 investigate the circumstances of any deviations thoroughly and recommend appropriate corrective action
P24 recommend options which are most likely to minimise increases in cost and time and help the contract progress, and pass these on to people responsible
P25 regularly inform people responsible about progress, changes to the operational programme and resource needs
P26 identify improvements from feedback received and recommend them to people responsible

Monitor contract costs and information for certification
P27 implement appropriate contract cost control systems which are able to provide early warning of problems
P28 ensure that accurate quantities and cost data is calculated and presented in an agreed format to the people responsible
P29 identify and investigate any variations thoroughly and recommending appropriate action with people responsible
P30 develop and implement systems and processes for identifying opportunities for cost savings and recommend them to people responsible
P31 inspect and check work against the contract requirements, record any variations and review for a certification decision to be made

Knowledge and understanding - you need to know and understand:

Monitor health and safety requirements in your area of responsibility
K1 how to identify personal responsibilities and liabilities under health and safety legislation (understanding)
K2 how to ensure that your organisation's written health and safety policy statement is clearly communicated to all people in your area of responsibility and other relevant parties (application)
K3 how to ensure that the health and safety policy statement is put into practice in your area of responsibility and is subject to review as situations change and at regular intervals and the findings passed to the appropriate people for consideration (application)
K4 how to ensure regular consultation with people in your area of responsibility or their representatives on health and safety issues (application)
K5 how to seek and make use of specialist expertise in relation to health and safety issues (application)
K6 how to ensure that a system is in place for identifying hazards and assessing risks in your area of responsibility and that prompt and effective action is taken to eliminate or control identified hazards and risks (application)

K7 how to ensure that systems are in place for effective monitoring, measuring and reporting of health and safety performance in your area of responsibility (application)
K8 how to show continuous improvement in your area of responsibility in relation to health and safety performance (application)
K9 how and why to make health and safety a priority area in terms of informing planning and decision-making in your area of responsibility (analysis)
K10 how and why to demonstrate that your own actions reinforce the messages in your organisation's health and safety policy statement (synthesis)
K11 how to ensure that sufficient resources are allocated across your area of responsibility to deal with health and safety issues (application)
K12 how and why to develop a culture within your area of responsibility which puts health and safety first (synthesis)

Monitor contracts against agreed quality standards
K13 how to identify quality standards from available information (understanding)
K14 how to pass quality standards on to people responsible for implementing them before they start work (application)
K15 how to confirm the responsibilities which individuals have for maintaining quality standards (application)
K16 how to implement systems for inspecting and controlling the quality of work and record the outcomes (application)
K17 how to check that work conforms to the design requirements and the specified quality standard (application)
K18 how to identify work which fails to meet the requirements and specified quality standards (understanding)
K19 how and why to recommend corrective action where work fails to meet the requirements and specified quality standards (synthesis)
K20 how to inform people responsible about significant variations in quality standards, programme and safety implications (application)
K21 how and why to suggest the decisions which people responsible need to make about significant variations in quality standards and the actions they need to take (synthesis)
K22 how to identify improvements from feedback received (understanding)
K23 how and why to recommend improvements to people responsible (synthesis)

Monitor contract progress against agreed programmes
K24 how to implement systems to monitor and record the progress of the contract against the agreed programmes (application)
K25 how to identify inadequately and inappropriately specified resources (understanding)
K26 how to inform people responsible about inadequately and inappropriately specified resources (application)
K27 how to identify any deviations from planned progress which have occurred, or which may occur, and which could disrupt the programme (understanding
K28 how and why to quantify any deviations from planned progress (analysis)
K29 how and why to investigate the circumstances of any deviations (analysis)
K30 how and why to recommend corrective action (synthesis)
K31 how and why to recommend options which are most likely to minimise increases in cost and time and help the contract progress (synthesis)
K32 how to pass on options which are most likely to minimise increases in cost and time and help the contract progress (application)
K33 how do you regularly inform people responsible about progress, changes to the operational programme and resource needs (application)
K34 how to identify improvements from feedback received (understanding)
K35 how and why to recommend improvements from feedback received to people responsible (synthesis)

Monitor contract costs and information for certification
K36 how to implement appropriate contract cost control systems which are able to provide early warning of problems (application)
K37 how to ensure that accurate quantities and cost data is calculated and presented to people responsible (application)
K38 how to identify as variations in quantities and cost data (understanding)
K39 how and why to investigate any variations (analysis)
K40 how and why to recommend appropriate action with people responsible (synthesis)
K41 how and why to develop systems and processes for identifying opportunities for cost savings (synthesis)
K42 how to implement systems and processes for identifying opportunities for cost savings (application)
K43 how and why to recommend opportunities for cost savings to people responsible (synthesis)
K44 how and why to inspect work against contract requirements and record any variations (analysis)
K45 how to check work against contract requirements and record any variations (application)
K46 how and why to review work for a certification decision to be made (analysis)

Additional information
Scope/range

Monitor health and safety requirements in your area of responsibility
1. Liabilities under health and safety legislation: 1.1. CDM regulations and Approved Codes of Practice 1.2. current health, safety and welfare regulations 1.3. Construction and Building Regulations 1.4. civil law and criminal law 1.5. duty of care
2. Relevant parties: 2.1. clients 2.2. CDM 2.3. HSE 2.4. other designers 2.5. project and construction managers 2.6. contractors and specialist contractors 2.7. operators and maintainers
3. Hazards: 3.1. falls from height 3.2. slips, trips and falls 3.3. hit by falling or moving objects 3.4. manual handling 3.5. health issues 3.6. power sources 3.7. hazardous substances 3.8. trapped by something collapsing or overturning 3.9. confined spaces 3.10. fire 3.11. obstructions 3.12. moving vehicles 3.13. public access

Monitor contracts against agreed quality standards
4. Quality standards: 4.1. project specifications 4.2. British, European international Standards 4.3. Codes of Practice 4.4. organisation standards 4.5. trade advisory guidance and best practice 4.6. environmental standards 4.7. client standards 4.8. certification and accreditation of products, systems, personnel 4.9. dimensional control criteria
5. People responsible: 5.1. the client 5.2. contractors 5.3. consultants 5.4. sub-contractors 5.5. suppliers
6. Systems: 6.1. visual inspection 6.2. comparison with design requirements 6.3. comparison with standard documentation 6.4. checking manufacturers documentation 6.5. checking materials supply 6.6. sampling and mock-ups 6.7. testing 6.8. site inspection reports 6.9. contractors reports 6.10. meetings 6.11. checking delivery notes 6.12. dimension checks
7. Work: 7.1. materials and components and their use 7.2. methods of construction 7.3. completed elements

Monitor contract progress against agreed programmes
8. Systems to monitor and record: 8.1. visual inspection 8.2. resource records 8.3. site inspection reports 8.4. contractors' reports 8.5. written, graphical and electronic records of actual work against programmed work 8.6. site meetings 8.7. organisational procedures 8.8. comparison with project requirement
9. Programmes: 9.1. bar charts 9.2. critical path 9.3. method statements 9.4. meeting records
10. Resources: 10.1. people 10.2. plant and equipment 10.3. materials and components 10.4. time 10.5. specialist services
11. People responsible: 11.1. the client 11.2. contractors 11.3. consultants 11.4. sub-contractors 11.5. suppliers
12. Deviations: 12.1. resource shortages and delivery times 12.2. design problems and constraints 12.3. lack of essential construction information 12.4. construction errors 12.5. scope of work 12.6. inclement weather

12.7. physical constraints 12.8. environmental 12.9. force majeure 13. Corrective action: 13.1. restore progress in accordance with agreed programme 13.2. agree new completion dates 13.3. securing additional resources 13.4. altering planned work

Monitor contract costs and information for certification
14. Quantities and cost data: 14.1. materials 14.2. completed work 14.3. dayworks 14.4. periodic valuations
15. Appropriate action: 15.1. agree cost changes 15.2. agree quality changes 15.3. agree programme changes
16. Opportunities for cost saving: 16.1. waste minimisation 16.2. resource management and logistics 16.3. applications of new technologies and materials 16.4. alternative sources and types of materials 16.5. standardisation
17. People responsible: 17.1. the client 17.2. line managers 17.3. contractors 17.4. consultants 17.5. sub-contractors 17.6. suppliers

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Relevant occupations: Civil engineers; graphic designers; architectural technologists; town planning technicians; draughtspersons, building surveyors
Suite: Built Environment Design
Key words: contracts; quality standards; health and safety; programmes; certification

COSBEDO13
Identify project energy efficiency and carbon minimisation requirements in built environment design

Overview:
This unit is about identifying the optimum energy efficiency and carbon minimisation measures for developments and reporting your findings to decisions makers

Performance criteria - you must be able to:

P1 confirm energy efficiency and carbon minimisation goals and priorities for potential developments, when in-use both currently and in the future
P2 confirm legislation, regulations and standards relevant to energy efficiency and carbon minimisation when developments are in-use
P3 identify the factors that need to be considered in choosing the optimum energy efficiency and carbon minimisation measures for developments
P4 report findings to decision makers in order that optimum energy efficiency and carbon minimisation measures can be selected

Knowledge and understanding - you need to know and understand:

K1 how to confirm energy efficiency and carbon minimisation goals and priorities for potential developments, when in- use both currently and in the future (application)

K2 how to confirm legislation, regulations and standards relevant to energy efficiency and carbon minimisation when developments are in use (application)
K3 how to identify the factors that need to be considered in choosing the optimum energy efficiency and carbon minimisation measures for developments (understanding)
K4 how to report findings to decision makers in order that optimum energy efficiency and carbon minimisation measures can be selected (application)

Additional information
Scope/range
1. Energy efficiency and carbon minimisation:
1.1. low energy consumption 1.2. low carbon targets
2. Development: 2.1. new build 2.2. adaptation 2.3. alteration 2.4. refurbishment/upgrading 2.5. conservation 2.6. demolition/decommission 2.7. relocation
3. Factors: 3.1. energy sources and infrastructure 3.2. energy distribution mechanisms efficiency and costs 3.3. energy delivery mechanisms efficiency and costs 3.4. energy controls efficiency and costs 3.5. environmental impact and sustainability level of energy demand 3.6. installation 3.7. maintenance 3.8. quality (including design) 3.9. cost (including whole life costs/return on investment) 3.10. time 3.11. energy and low carbon standards and strategies 3.12. development phases (design, procurement, construction, installation, operation, maintenance, demolition/decommissioning) 3.13. short, medium and long-term implications

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Suite: Built Environment Design
Key words: energy efficiency; carbon

COSBEDO14
Investigate and produce integrated conservation, repair and maintenance solutions

Overview:

This unit is about researching information relevant to the conservation, repair and maintenance of assets. This includes researching the potential impact of modern technology and repair methods on assets and identifying possible situations where incompatibility of the use of materials can be detrimental to the future of the asset. You will also need to provide decision makers with relevant information to enable them to agree a detailed design solution

Performance criteria - you must be able to:

P1 obtain information relevant to the conservation, repair and maintenance briefs and identify the relevant solutions
P2 obtain alternative sources of information and solutions, where existing approaches do not meet the parameters of the brief, which have the potential to offer alternative approaches
P3 research the potential impact of modern technology and repair methods on factors relating to assets

P4 identify possible situations where incompatibility of the use of materials can be detrimental to the future of the asset
P5 provide decision makers with enough relevant and accurate information at the right time to enable them to agree a detailed solution seeking guidance from experts where necessary

Knowledge and understanding - you need to know and understand:

K1 how to obtain information relevant to the conservation, repair and maintenance briefs (application)
K2 what to identify as the relevant solutions (understanding)
K3 how to obtain alternative sources of information and solutions, where existing approaches do not meet the parameters of the brief, which have the potential to offer alternative approaches (application)
K4 how and why to research the potential impact of modern technology and repair methods on factors relating to assets (analysis)
K5 what to identify as possible situations where incompatibility of the use of materials can be detrimental to the future of the asset (understanding)
K6 how to provide decision makers with enough relevant and accurate information at the right time to enable them to agree a detailed solution (application)

Additional information
Scope/range
1. Identify:
1.1. relevant processes and procedures 1.2. investigative research 1.3. official bodies to be consulted
2. Alternative sources of information and solutions: 2.1. previous knowledge and experience of similar work 2.2. solutions proposals by others to similar problems 2.3. specialists including experienced craftspeople & conservators 2.4. industry, academic, scientific research and innovation
3. Factors: 3.1. physical 3.2. technical 3.3. environmentally induced decay 3.4. social pressures use 3.5. aesthetic & spatial 3.6. assessments of cultural significance and value 3.7. protection of archaeological, architectural, cultural and historically valuable resources 3.8. cost budgeting 3.9. time programming 3.10. health and safety 3.11. resources (people, skills, finance, materials, plant, knowledge) 3.12. relevant quality standards and codes of practice 3.13. materials sourcing & matching 3.14. fitness of purpose

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Suite: Built Environment Design
Key words: conservation; repair; maintenance; design

CIVIL AND STUCTURAL ENGINEERING PATHWAY/ OPTIONAL ROUTE

MANDATORY UNIT FOR THIS PATHWAY

COSBEDO04
Plan, carry out and present measured surveys in built environment design in built environment design

Overview:

This Unit is concerned with carrying out measured surveys. This Unit will test your mathematical knowledge and your competence with surveying instruments. It is about making the preparations, finding out what needs to be surveyed, obtaining the suitable equipment and the spares, and briefing affected parties beforehand about the work. You must know what the survey consists of, what equipment you will need, and who will need the results. It is about doing the survey work accurately and recording and calculating observations and measurements. You will need to produce clear and accurate records of your work, and of the time you spent doing it. It is about checking your survey records, and collating and presenting them to those who need them. You must be able to analyse your field surveys, and present a report to those who need it.

Performance criteria - you must be able to:

Prepare for measured surveys
P1 confirm the extent of the measured survey and the survey method before starting work
P2 arrange for suitable equipment, and enough spares for on site maintenance, to be brought to the site and kept safely and securely
P3 check and adjust equipment so that it is accurate before it is used for taking measurements
P4 brief the people who will be involved in the survey about the survey arrangements and the safety arrangements
P5 check and confirm that signs, arrangements for personal safety, equipment and site access conform to good practice, legislation and regulation

Carry out measured surveys
P6 conform to safe working practices when on the site
P7 set accurate horizontal and vertical controls and record them
P8 take accurate observations and measurements using valid methods
P9 change work procedures and practices to allow for different circumstances and conditions
P10 record survey data clearly and accurately and store it securely for later analysis and inspection
P11 keep a clear and accurate record of the time spent on the survey and of any problems that arise
P12 maintain the equipment in operating condition and store it securely
P13 restore areas which have been opened up for access

Analyse and present measured surveys
P14 collect together enough survey information to allow an accurate analysis to be made
P15 check and verify the survey information
P16 analyse the survey information accurately
P17 present the survey information, the commentary and any support information accurately, clearly and in a format which is suitable for those who need to use it
P18 advise people who will be using the survey information on how to interpret it

Knowledge and understanding - you need to know and understand:

Prepare for measured surveys
K1 how to confirm the extent of the measured survey and the survey method before starting the work (application)
K2 how to arrange for suitable equipment, and enough spares for on site maintenance, to be brought to the site and kept safely and securely (application)
K3 how to check and adjust equipment (application)
K4 how to brief the people who will be involved in the survey about survey arrangements and the safety arrangements (application)
K5 how to check and confirm that signs, arrangements for personal safety, equipment and site access conform to good practice, legislation and regulations (application)

Carry out measured surveys
K6 how to conform to safe working practices when on the site (application)
K7 how to set and record accurate horizontal and vertical controls (application)
K8 how to take accurate observations and measurements (application)
K9 how to change work procedures and practices to allow for different circumstances and conditions (application)
K10 how to record and store survey data (application)
K11 how to keep a clear and accurate record of the time spent on the survey and of any problems that arise (application)
K12 how to maintain the equipment in operating condition and store securely (application)
K13 how do you restore areas which have been opened up for access (application)

Analyse and present measured surveys
K14 how to collect together enough survey information to allow an accurate analysis to be made (application)
K15 how to check and verify the survey information (application)
K16 how and why to analyse the survey information (analysis)
K17 how to present the survey information, the commentary and any support information accurately, clearly and in a format which is suitable for those who need to use it (application)
K18 how and why to advise people who will be using the survey information on how to interpret it (synthesis)

Additional information
Scope/range

Prepare for measured surveys
1. Method: 1.1. approximate measured 1.2. detailed measurement of all specified features
2. Equipment: 2.1. mechanical 2.2. optical 2.3. electronic
3. People 3.1. colleagues 3.2. external contractors 3.3. people and organisations who may be affected by the survey
4. Survey arrangements: 4.1. risk assessment 4.2. survey responsibilities 4.3. details of the survey method 4.4. the site 4.5. the equipment 4.6. calibration certificates
5. Safety: 5.1. personal safety 5.2. equipment and clothing 5.3. safe use of access equipment 5.4. health and safety practice and regulations 5.5. industry codes of practice 5.6. regulations applying to the survey site 5.7. signage 5.8. site access to working areas 5.9. traffic management 5.10. live services and equipment

Carry out measured surveys
6. Safe working practices: 6.1. personal safety 6.2. equipment and clothing 6.3. safe use of access equipment 6.4. health and safety practice and regulations 6.5. industry codes of practice 6.6. regulations applying to the survey site 6.7. signage 6.8. site access to working areas 6.9. traffic management 6.10. live services & equipment

7. Circumstances and conditions: 7.1. climatic (variations, tolerances and environmental risks) 7.2. live conditions (e.g. buildings and sites in use, services, roads, railways, runways) 7.3. unforeseen circumstances 7.4. emergency circumstances 7.5. topography 7.6. water 7.7. obstacles 7.8. planned circumstances 7.9. security
8. Equipment: 8.1. mechanical 8.2. optical

Analyse and present measured surveys
9. Survey information: 9.1. electronic 9.2. approximate measured 9.3. detailed measurement of all specified features 9.4. graphic
10. Present: 10.1. orally 10.2. in writing 10.3. graphically 10.4. digitally

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Suite: Built Environment Design
Key words: present; measured; surveys; analyse

OPTIONAL UNITS FOR THIS PATHWAY

COSBEDO05
Carry out and present condition surveys in built environment design

Overview:

This unit is concerned with undertaking condition surveys and presenting your reports. It is about actually doing the surveys. The asset could be a building, a highway, a bridge, a reservoir, or any loadbearing or defensive construction. You must be able to confirm the scope of the work, organise what you need to carry out the survey, obtain the necessary permissions, take the physical measurements and record the results. It is about collating the results of the survey and presenting them in a report. You must be able to demonstrate your analytical and report-writing skills, and your technical judgement (both quantitative and qualitative)

Performance criteria - you must be able to:

Inspect condition of assets
P1 confirm the objectives and purpose of the condition survey
P2 consult the condition survey brief, undertake risk assessment and obtain the equipment and resources and specialist advice that will be needed
P3 check and confirm, before starting the condition survey, that people who will be affected have given their permission
P4 take accurate observations and measurements which are necessary for the inspection and record them clearly, accurately and completely using agreed formats
P5 identify and record the need for further investigations when observations are inconsistent with existing data and expected findings

Prepare condition survey reports and records
P6 assemble and collate information on the condition survey
P7 analyse all relevant evidence and information using appropriate methods and techniques and make a summary of condition
P8 prepare a condition survey report which meets the requirement of the brief
P9 explain clearly where and why inspection and measurement has not been possible
P10 answer questions about the condition survey and give appropriate clarification
P11 maintain internal records which are clear, accurate and complete and conform to accepted professional and statutory requirements

Knowledge and understanding - you need to know and understand:

Inspect condition of assets
K1 how to confirm the objectives and purpose of the condition survey (application)
K2 how to consult the condition survey brief (application)
K3 how and why to underTake risk assessment (evaluation)
K4 how to obtain the equipment and resources and specialist advice that will be needed (application)
K5 how to check and confirm, before starting the condition survey, that people who will be affected have given their permission (application)
K6 how to take and record accurate observations and measurements which are necessary for the inspection, using agreed formats (application)
K7 how and why to identify the need for further investigation when observations are inconsistent with existing data and expected findings (analysis)
K8 how to record the need for further investigations when observations are inconsistent with existing data and expected findings (application)

Prepare condition survey reports and records
K9 how to assemble and collate information on the condition survey (application)
K10 how and why to analyse all relevant evidence and information using appropriate methods and techniques and make a summary of condition (analysis)
K11 how and why to prepare a condition survey report (synthesis)
K12 how to explain clearly where and why inspection and measurement has not been possible (application)
K13 how to answer questions about the condition survey and give appropriate clarification (application)
K14 how to maintain internal records (application)

Additional information
Scope/range
Inspect condition of assets
1. Purpose of condition survey: 1.1. stability 1.2. stock condition 1.3. maintenance 1.4. legal 1.5. refurbishment, alteration or extension 1.6. health and safety 1.7. environmental
2. Record: 2.1. written 2.2. graphical 2.3. electronic 2.4. photographic

Prepare condition survey reports and records
3. Information - sources: 3.1. inspection observations and measurements 3.2. photographs 3.3. maps 3.4. charts 3.5. drawings 3.6. digital data 3.7. archive records 3.8. legal documents 3.9. client records 3.10. tenants 3.11. site owners 3.12. site managers 3.13. previous owners 3.14. local authorities 3.15. statutory authorities 3.16. public utilities 3.17. government department consultative bodies (including heritage bodies) 3.18. investigation and research findings 3.19. industry standard and legislation 3.20. published technical data

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Suite: Built Environment Design
Key words: inspect; condition; survey; reports; records

COSBEDO06
Monitor tests and present reports in built environment design

Overview:

This unit is concerned with carrying out tests and presenting the results. It is about getting the tests done, and being responsible for them. You must be able to confirm the scope of the work and the methods that you will use, to obtain the necessary permissions, to prepare a plan for the testing, and to carry out the tests to plan and within budget. It is about presenting the test results and sharing the information. You must be able to process the test result to pull them together into a competent report, and to present the report to the stakeholders.

Performance criteria - you must be able to:

Confirm and monitor tests
P1 confirm the objectives and purpose of the testing
P2 collate existing information and identify where it meets the objectives and purpose of the testing
P3 confirm relevant test processes and methods
P4 seek and obtain permission to carry out the test from people who might be affected and from any legal authorities who have to be notified
P5 confirm suitable quality assurance standards and health and safety requirements
P6 prepare a plan for the test and schedule it to meet the objectives and purpose of the test
P7 monitor tests and recommend modifications to maintain compliance with test requirements

Present test results
P8 collect and verify results from tests
P9 process the results using the most appropriate methods of analysis and chart them in a format that will help people to use them
P10 use the test results to produce an accurate report which identifies development constraints, opportunities and feasibility
P11 present the report including a commentary on the results

Knowledge and understanding - you need to know and understand:

Confirm and monitor tests
K1 how to confirm the objectives and purpose of the testing (application)
K2 how to collate existing information (application)
K3 how and why to identify where existing information meets the objectives and purpose of testing (synthesis)
K4 how and why to confirm relevant test processes and methods (application)
K5 how to seek and obtain permission to carry out the test from people who might be affected and from any legal authorities who have to be notified (application)

K6 how to confirm suitable standards of quality assurance and health and safety requirements (application)
K7 how and why to prepare a plan for the test (synthesis)
K8 how and why to schedule a plan for the test (analysis)
K9 how to monitor tests (application)
K10 how and why to recommend modifications to tests to maintain compliance with test requirements (synthesis)

Present test results
K11 how to collect results from tests (application)
K12 how and why to verify results from tests (analysis)
K13 how to process the results using the most appropriate methods of analysis and chart them in a format that will help people to use it (analysis)
K14 how to use the test results to produce an accurate report which identifies development constraints, opportunities and feasibility (application)
K15 how to present the report and commentary (application)

Additional information
Scope/range

Confirm and monitor tests
1. Objectives: 1.1. geographical 1.2. structural 1.3. environmental 1.4. material
2. Purpose: 2.1. performance 2.2. routine 2.3. contingency
3. Test: 3.1. physical 3.2. condition 3.3. performance 3.4. destructive 3.5. non-destructive 3.6. qualitative 3.7. quantitative 3.8. environmental 3.9. materials
4. Processes: 4.1. as defined by relevant legislation 4.2. code of practice as accepted by recognised authorities in the field
5. Methods: 5.1. visual 5.2. approximate estimated 5.3. detailed assessment of specified features
6. Permission from: 6.1. client 6.2. site owner and occupiers 6.3. occupiers 6.4. adjoining owners and occupiers 6.5. notifiable authorities
7. Health and safety requirements: 7.1. personal safety equipment and clothing 7.2. safe use of access equipment (including ladders, tower scaffolds, hydraulic hoists) 7.3. industry codes of practice and regulations 7.4. identified by risk assessments
8. Plans - will include: 8.1. risk assessment 8.2. arrangements for waste disposal 8.3. dealing with contingencies 8.4. timescale 8.5. budget Present test results
9. Methods of analysis: 9.1. comparison with standard test results 9.2. referenced to accepted principles and practice
10. Present: 10.1. orally 10.2. in writing 10.3. graphically 10.4. electronically

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Suite: Built Environment Design
Key words: carry out; tests; present; results

COSBEDO07
Report on and prepare applications to secure consents in built environment design

Overview:

This unit is concerned with preparing applications to secure statutory consents. You must find out what the constraints are, identify design solutions that satisfy them, and produce a report. It is about actually preparing the applications. You must be able to show what requirements the relevant authorities seek and the timing thereof, to identify the processes and to gather further information if consent is refused

Performance criteria - you must be able to:

Prepare applications to secure statutory consents
P1 check and confirm with the relevant authorities the requirements, current procedures and likely timescale for statutory approvals and other consents
P2 forecast how long the submission and approval of applications for consent will take and how this will fit in with the project schedule
P3 prepare and assemble the information that will be needed for the application
P4 prepare and submit a clear and valid application for the consent
P5 gather and collate further information to develop alternatives where consent may be refused

Knowledge and understanding - you need to know and understand:
Prepare applications to secure statutory consents
K1 how to check and confirm with the relevant authorities the requirements, current procedures and likely timescale for statutory approvals and other consents (application)
K2 how and why to forecast how long the submission and approval of applications for consent will take and how this will fit in with the project schedule (analysis)
K3 how to prepare and assemble the information that will be needed for the application (application)
K4 how to prepare and submit a clear and valid application for the consent (application)
K5 how to gather and collate further information to develop alternatives where consent may be refused (application)

Additional information
Scope/range

Prepare applications to secure statutory consents
1. Statutory approvals: 1.1. development and use of land 1.2. structures 1.3. buildings and highways 1.4. renewal and clearance 1.5. health, safety and welfare 1.6. transport infrastructure 1.7. environmental sustainability 1.8. conservation 1.9. access (e.g. DDA)
2. Consents: 2.1. planning 2.2. building control 2.3. environmental 2.4. utilities 2.5. funding
3. Alternatives: 3.1. amending the brief 3.2. amending the proposal 3.3. appealing 3.4. withdrawing the application

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Relevant occupations: Civil engineers; graphic designers; architectural technologists; town planning technicians; draughtspersons, building surveyors
Suite: Built Environment Design
Key words: regulatory; constraints; prepare; applications; secure; statutory; consents

COSBEDO09
Collate project information and prepare specifications in built environment design

Overview:

This unit covers two areas of competence. First it covers implementing systems for collating and checking project information for design projects. Second, it covers preparing design specifications. It is about implementing your information system to ensure a successful project. You must be able to assess the status and collate project information, identify discrepancies, obtain checks and approvals and keep people informed. It covers method specifications, identified from standard sources and modified as necessary. These describe how the finished products should be constructed. You must be able to produce specifications based on current information, check and cross-reference them, and have them certified.

Performance criteria - you must be able to:

Collate and check project information
P1 implement systems for monitoring and controlling the production of information throughout the project stages
P2 assess the status of the information and pass it on to people who need it
P3 collaborate with other members of the project team to achieve integrated project design information
P4 collate information when they have been produced and check them against the agreed criteria
P5 identify queries, discrepancies and inconsistencies in the information and refer them to other members of the project team
P6 collate revisions, requirements and additions to the design information and distribute them promptly to appropriate members of the project team
P7 obtain necessary checks and approvals of information when they are needed
P8 produce up-to-date and accurate information on progress and circulate it to the people who need the information

Prepare design specifications
P9 produce a specification to suit the project requirements which is based on identified, current source information which has been verified
P10 select, and where necessary amend technical clauses from standard sources, which define the quality, type and standard of the materials, components and finished work
P11 check that the specification is consistent with the currently agreed design and other associated design documentation, and update it promptly and accurately when the design changes
P12 format the specification so that it is referenced and cross-referenced accurately
P13 obtain necessary verification for the content and presentation of specifications

Knowledge and understanding - you need to know and understand:

Collate and check project information
K1 how to implement systems for monitoring and controlling the production of information throughout the project stages (application)

K2 how and why to assess the status of the information (analysis)
K3 how to pass on the status of the information (application)
K4 how and why to collaborate with other members of the project team to achieve integrated project design information (synthesis)
K5 how to collate information when they have been produced (application) K6 how to check information against the agreed criteria (application)
K7 what to identify as queries, discrepancies and inconsistencies in the information (understanding)
K8 how to refer queries, discrepancies and inconsistencies in the information to other members of the project team (application)
K9 how to collate revisions, requirements and additions to the design information and distribute them to responsible members of the design team (application)
K10 how to obtain necessary checks and approvals of information (application)
K11 how to produce and circulate information on progress (application)

Prepare design specifications
K12 how to produce a specification to suit the project requirements based on current source information (application)
K13 how and why to select technical clauses from standard sources, which define the quality, type and standard of the materials, components and finished work (evaluation)
K14 how to amend technical clauses from standard sources, which define the quality, type and standard of the materials, components and finished work (application)
K15 how to check that the specification is consistent with the current design and other design documentation and update the specification promptly and accurately when the design changes (application)
K16 how to format the specification (application)
K17 how to obtain necessary verification for the content and presentation of specifications (application)

Additional information
Scope/range

Collate and check project information
1. Systems: 1.1. incoming and outgoing drawing and document registers 1.2. records of document approval and revision 1.3. revision management 1.4. methods of coordination (e.g. common arrangement) 1.5. electronic data transfers 1.6. integration of interdisciplinary data 1.7. technical query resolution
2. Information: 2.1. digital models 2.2. electronic 2.3. graphical and non-graphical data files 2.4. specifications 2.5. drawings 2.6. bills of quantities 2.7. schedules 2.8. health and safety plans
3. Project stage: 3.1. Stage 2 (Concept) 3.2. Stage 3 (Definition) 3.3. Stage 4 (Design) 3.4. Stage 5 (Build and Commission)
4. Criteria: 4.1. format 4.2. presentation 4.3. accuracy 4.4. technical content 4.5. completeness 4.6. referencing 4.7. cross referencing and correlation with associated documents 4.8. status 4.9. project brief 4.10. contract conditions

Prepare design specifications
5. Project requirements: 5.1. to obtain consents 5.2. procurement 5.3. contract 5.4. production
6. Source information: 6.1. design information 6.2. statutory regulations 6.3. British and EU Standards 6.4. codes of practice 6.5. technical literature 6.6. company standards
7. Verification: 7.1. format (e.g. National Building Specification) 7.2. presentation 7.3. accuracy 7.4. technical content 7.5. completeness 7.6. referencing 7.7. cross-referencing and correlation with associated documents 7.8. status 7.9. current

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Relevant occupations: Civil engineers; graphic designers; architectural technologists; town planning technicians; draughtspersons, building surveyors
Suite: Built Environment Design
Key words: collate; check; project; documents; design; specifications

COSBEDO10
Obtain and assess tenders in built environment design

Overview:

This unit is concerned with obtaining tenders from contractors and subcontractors, and selecting the ones that you wish to action. The words estimate, bid and tender are all used in the industry, and are taken here to be synonymous. It is about sending the tender documents out to the bidders. You must be able to find out who will be bidding, prepare the tender documents, send them out, deal with any queries, and keep records up to date. It is about assessing the bids that you receive. You must be able to review the bids, check them for errors, agree any adjustments, and inform the bidders of the results.

Performance criteria - you must be able to:

Obtain tenders
P1 send tender enquiries to potential tenderers, in accordance with contract requirements, and invite them to provide evidence about their experience, capability and resources
P2 collate responses from potential tenderers and confirm and agree tender lists
P3 prepare tender documents which meet statutory regulations, codes of practice and your organisational policies
P4 issue tender documents to all the tenderers on the agreed list, following the agreed procedures
P5 investigate any errors, omissions and ambiguities which are reported by tenderers, amend the tender documents to correct them and pass the information to all the tenderers
P6 keep accurate records of tender documents issued, feedback, queries and information from tenderers
P7 store the tenders received in a secure place and open them at the agreed date and time in line with organisational procedures
P8 review the tenders against the criteria for acceptance, including checking for discrepancies, omissions and errors, and recommend appropriate action
P9 discuss and recommend any variations, adjustments and corrections with the successful tenderer and confirm them in writing, subject to contract

Knowledge and understanding - you need to know and understand:

Obtain tenders
K1 how to send tender enquiries to potential tenderers to invite evidence about their experience, capability and resources (application)
K2 how to collate responses from potential tenderers and confirm tender lists (application)
K3 how and why to agree tender lists (evaluation)
K4 how and why to prepare tender documents (synthesis)

K5 how to issue tender documents to all tenderers on the agreed tender list (application)
K6 how and why to investigate any errors, omissions and ambiguities which are reported by tenderers (analysis)
K7 how to amend the tender documents to correct any errors, omissions or ambiguities which are reported by tenderers (application)
K8 how to pass on to all the tenderers the information relating to amendments to tender documents (application)
K9 how to keep accurate records of tender documents issued, feedback, queries and information from tenderers (application)
K10 how to store and open the tenders received in line with organisational procedures (application)
K11 how and why to review the tenders (analysis)
K12 how to check for any discrepancies, omissions and errors (application)
K13 how and why to recommend appropriate action (synthesis)
K14 how and why to discuss and recommend any variations, adjustments and corrections with the successful tenderer (synthesis

Additional information

Scope/range

Obtain tenders
1. Tenderers: 1.1. contractors 1.2. sub/works/trade contractors 1.3. suppliers 1.4. consultants
2. Tender documents: 2.1. invitation to tender 2.2. form of tender 2.3. returns procedure 2.4. surveys 2.5. specifications 2.6. drawings 2.7. schedules 2.8. bills of quantities 2.9. health and safety plans 2.10. scope of services 2.11. terms and conditions 2.12. schedules of rates
3. Queries and information about: 3.1. price 3.2. quantity 3.3. quality 3.4. standards 3.5. carriage and delivery 3.6. completion 3.7. maintenance 3.8. after sales service 3.9. method of payment 3.10. terms of payment 3.11. contract conditions 3.12. survey information 3.13. time 3.14. contractual 3.15. administrative 3.16. technical 3.17. warranties
4. Appropriate action: 4.1. accept for evaluation 4.2. invite clarification or amendment 4.3. reject
5. Variations, adjustments and corrections: 5.1. price 5.2. quantity 5.3. quality 5.4. time

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Suite: Built Environment Design
Key words: obtain tenders; assess tenders

COSBEDO11
Prepare tenders in built environment design

Overview:

This unit is concerned with securing contracts with clients to carry out design work for them. The words estimate, bid and tender are all used in the industry, and are taken here to be synonymous. It is about deciding how design function will be carried out. You must be able to get all the information that you need, decide the

best way of working, produce a method statement, and agree this with the project team. It is about deciding how much the design work will cost. You must be produce a working programme, decide what resources are needed, calculate the costs, and discuss them with the project team.

Performance criteria - you must be able to:

Evaluate and recommend work methods
P1 assess the available project data and summarise it to enable decisions on construction, installation and work methods to be made
P2 obtain more information from relevant sources in cases where the available project data is insufficient
P3 identify work methods which will make the best use of resources and which meet project, statutory and contractual requirements
P4 evaluate the work methods against relevant technical and project criteria and recommend the one which best meets the criteria
P5 prepare an outline method statement which is accurate, clear, concise and acceptable to all the people involved

Estimate the resource requirements and costs within a tender
P6 develop a proposed plan of work and draft programme which meet the tender rules, project requirements and phasing
P7 estimate what resources will be needed, their sources, availability and costs
P8 modify the cost to take into account any relevant external factors
P9 produce the overall estimate of costs and check that it is complete, accurate and in a form which is suitable for a judgment to be made
P10 explain and clarify the tender assumptions to support the projected costs
P11 collate, arrange and submit tender offer information in accordance with tender instructions
P12 collate together all the tender information, record it, store it securely and only pass it on to people who have the authority to receive it

Knowledge and understanding - you need to know and understand:

Evaluate and recommend work methods
K1 how and why to assess the available project data (analysis)
K2 how to summarise project data to enable decision on construction, installation and work methods to be made (application)
K3 how to obtain more information from relevant sources in cases where the available project data is insufficient (application)
K4 what to identify as work methods which will make the best use of resources and which meet project, statutory and contractual requirements (understanding)
K5 how and why to evaluate the work methods against relevant technical and project criteria (evaluation)
K6 how and why to recommend the method which best meets the criteria (synthesis)
K7 how and why to prepare an outline method statement (application)

Estimate the resource requirements and costs within a tender
K8 how and why to develop a proposed plan of work and draft programme which meet the tender rules, project requirements and phasing (synthesis)
K9 how and why to estimate what resources will be needed, their sources, availability and costs (analysis)
K10 how to modify the costs to take into account any relevant external factors (application)
K11 how and why to produce the overall estimate of costs (analysis)
K12 how to check that the overall estimate of costs is complete, accurate and in a form which is suitable for a judgment to be made (application)

K13 how to explain and clarify the tender assumptions to support the projected costs (application)
K14 how do you collate, arrange and submit tender offer information (application)
K15 how to collate together all the tender information (application) K16 how to record, store and pass on all the tender information (application)

Additional information
Scope/range

Evaluate and recommend work methods
1. Project data: 1.1. contractual obligations and scope and scale of works 1.2. specifications 1.3. detailed drawings 1.4. health and safety plans
2. Construction, installation and work methods: 2.1. sequencing and integration of work operations 2.2. construction and installation techniques 2.3. prefabrication and standardisation 2.4. working conditions (health, safety and welfare)
3. Relevant sources: 3.1. project team 3.2. regulatory authorities 3.3. technical/trade literature 3.4. standard lists and procedures
4. Technical criteria: 4.1. materials and components performance and availability 4.2. health, safety and welfare 4.3. access 4.4. plant and equipment performance and availability 4.5. sustainability 4.6. buildability 4.7. site conditions
5. Project criteria: 5.1. cost/value 5.2. client and user needs 5.3. contract requirements for time, quantity and quality
Estimate the resource requirements and costs within a tender
6. Tender rules: 6.1. invitation to tender 6.2. form of tender 6.3. procedures for submitting tenders
7. Project requirements: 7.1. construction 7.2. installation and maintenance work 7.3. supply of goods and materials 7.4. consultancy services
8. Phasing: 8.1. technology required 8.2. planning 8.3. design 8.4. procurement 8.5. construction
9. Estimate: 9.1. cost based on a quotation 9.2. unit cost built up from basic data 9.3. internal and historical cost data 9.4. published cost data
10. Resources: 10.1. people (in-house, external) 10.2. plant and equipment 10.3. materials 10.4. finance 10.5. time 11. External factors: 11.1. location 11.2. contractual requirements 11.3. special working conditions and methods 11.4. resourcing conditions

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Suite: Built Environment Design
Key words: relationship; information; advice; technical; issues; ethical; framework; meetings; personal; development

COSBEDO12
Monitor projects in built environment design

Overview:

This unit applies to designers who go onto site and get involved in monitoring the construction process and health and safety requirements. It is about ensuring the quality of the work. You must be able to confirm what quality you want, implement systems for carrying out the work to the agreed standards, deal with contingencies and non-compliance, and gather feedback to identify what can be improved. It is about working to programme. You must be able to implement systems for monitoring progress, to deal with resource problems, delays and disruptions, and to continually seek ways of improving progress. It is about controlling costs and organising payments. You must be able to implement cost control systems; deal with variations, identify cost savings; and prepare information for instructions and certificates

Performance criteria - you must be able to:

Monitor health and safety requirements in your area of responsibility
P1 identify your personal responsibilities and liabilities under health and safety legislation
P2 ensure that your organisation's written health and safety policy statement is clearly communicated to all people in your area of responsibility and other relevant parties
P3 ensure that the health and safety policy statement is put into practice in your area of responsibility and is subject to review as situations change and at regular intervals and the findings passed to the appropriate people for consideration
P4 ensure regular consultation with people in your area of responsibility or their representatives on health and safety issues
P5 seek and make use of specialist expertise in relation to health and safety issues
P6 ensure that a system is in place for identifying hazards and assessing risks in your area of responsibility and that prompt and effective action is taken to eliminate or control identified hazards and risks
P7 ensure that systems are in place for effective monitoring, measuring and reporting of health and safety performance in your area of responsibility
P8 show continuous improvement in your area of responsibility in relation to health and safety performance.
P9 make health and safety a priority area in terms of informing planning and decision-making in your area of responsibility.
P10 demonstrate that your own actions reinforce the messages in your organisation's health and safety policy statement.
P11 ensure that sufficient resources are allocated across your area of responsibility to deal with health and safety issues.
P12 develop a culture within your area of responsibility which puts health and safety first.

Monitor contracts against agreed quality standards
P13 identify quality standards from available information and pass them to people responsible for their implementation, before they start work
P14 confirm the responsibilities which individuals have for maintaining quality standards
P15 implement systems for inspecting and controlling the quality of work and record the outcomes
P16 check, regularly, that work conforms to the design requirements and the specified quality standards
P17 identify work which fails to meet the requirements and specified quality standards and recommend corrective action
P18 inform people responsible about significant variations in quality standards, programme and safety implications, and suggest the decisions which they need to make and actions they need to take
P19 identify improvements from feedback received and recommend them to people responsible

Monitor contract progress against agreed programmes
P20 implement systems to monitor and record the progress of the contract against the agreed programmes
P21 identify inadequately and inappropriately specified resources and inform people responsible

P22 identify and quantify any deviations from planned progress which have occurred, or which may occur, and which could disrupt the programme
P23 investigate the circumstances of any deviations thoroughly and recommend appropriate corrective action
P24 recommend options which are most likely to minimise increases in cost and time and help the contract progress, and pass these on to people responsible
P25 regularly inform people responsible about progress, changes to the operational programme and resource needs
P26 identify improvements from feedback received and recommend them to people responsible

Monitor contract costs and information for certification
P27 implement appropriate contract cost control systems which are able to provide early warning of problems
P28 ensure that accurate quantities and cost data is calculated and presented in an agreed format to the people responsible
P29 identify and investigate any variations thoroughly and recommending appropriate action with people responsible
P30 develop and implement systems and processes for identifying opportunities for cost savings and recommend them to people responsible
P31 inspect and check work against the contract requirements, record any variations and review for a certification decision to be made

Knowledge and understanding - you need to know and understand:

Monitor health and safety requirements in your area of responsibility
K1 how to identify personal responsibilities and liabilities under health and safety legislation (understanding)
K2 how to ensure that your organisation's written health and safety policy statement is clearly communicated to all people in your area of responsibility and other relevant parties (application)
K3 how to ensure that the health and safety policy statement is put into practice in your area of responsibility and is subject to review as situations change and at regular intervals and the findings passed to the appropriate people for consideration (application)
K4 how to ensure regular consultation with people in your area of responsibility or their representatives on health and safety issues (application)
K5 how to seek and make use of specialist expertise in relation to health and safety issues (application)
K6 how to ensure that a system is in place for identifying hazards and assessing risks in your area of responsibility and that prompt and effective action is taken to eliminate or control identified hazards and risks (application)
K7 how to ensure that systems are in place for effective monitoring, measuring and reporting of health and safety performance in your area of responsibility (application)
K8 how to show continuous improvement in your area of responsibility in relation to health and safety performance (application)
K9 how and why to make health and safety a priority area in terms of informing planning and decision-making in your area of responsibility (analysis)
K10 how and why to demonstrate that your own actions reinforce the messages in your organisation's health and safety policy statement (synthesis)
K11 how to ensure that sufficient resources are allocated across your area of responsibility to deal with health and safety issues (application)
K12 how and why to develop a culture within your area of responsibility which puts health and safety first (synthesis)

Monitor contracts against agreed quality standards
K13 how to identify quality standards from available information (understanding)

K14 how to pass quality standards on to people responsible for implementing them before they start work (application)
K15 how to confirm the responsibilities which individuals have for maintaining quality standards (application)
K16 how to implement systems for inspecting and controlling the quality of work and record the outcomes (application)
K17 how to check that work conforms to the design requirements and the specified quality standard (application)
K18 how to identify work which fails to meet the requirements and specified quality standards (understanding)
K19 how and why to recommend corrective action where work fails to meet the requirements and specified quality standards (synthesis)
K20 how to inform people responsible about significant variations in quality standards, programme and safety implications (application)
K21 how and why to suggest the decisions which people responsible need to make about significant variations in quality standards and the actions they need to take (synthesis)
K22 how to identify improvements from feedback received (understanding)
K23 how and why to recommend improvements to people responsible (synthesis)

Monitor contract progress against agreed programmes
K24 how to implement systems to monitor and record the progress of the contract against the agreed programmes (application)
K25 how to identify inadequately and inappropriately specified resources (understanding)
K26 how to inform people responsible about inadequately and inappropriately specified resources (application)
K27 how to identify any deviations from planned progress which have occurred, or which may occur, and which could disrupt the programme (understanding
K28 how and why to quantify any deviations from planned progress (analysis)
K29 how and why to investigate the circumstances of any deviations (analysis)
K30 how and why to recommend corrective action (synthesis)
K31 how and why to recommend options which are most likely to minimise increases in cost and time and help the contract progress (synthesis)
K32 how to pass on options which are most likely to minimise increases in cost and time and help the contract progress (application)
K33 how do you regularly inform people responsible about progress, changes to the operational programme and resource needs (application)
K34 how to identify improvements from feedback received (understanding)
K35 how and why to recommend improvements from feedback received to people responsible (synthesis)

Monitor contract costs and information for certification
K36 how to implement appropriate contract cost control systems which are able to provide early warning of problems (application)
K37 how to ensure that accurate quantities and cost data is calculated and presented to people responsible (application)
K38 how to identify as variations in quantities and cost data (understanding)
K39 how and why to investigate any variations (analysis)
K40 how and why to recommend appropriate action with people responsible (synthesis)
K41 how and why to develop systems and processes for identifying opportunities for cost savings (synthesis)
K42 how to implement systems and processes for identifying opportunities for cost savings (application)
K43 how and why to recommend opportunities for cost savings to people responsible (synthesis)
K44 how and why to inspect work against contract requirements and record any variations (analysis)
K45 how to check work against contract requirements and record any variations (application)
K46 how and why to review work for a certification decision to be made (analysis)

Additional information
Scope/range

Monitor health and safety requirements in your area of responsibility
1. Liabilities under health and safety legislation: 1.1. CDM regulations and Approved Codes of Practice 1.2. current health, safety and welfare regulations 1.3. Construction and Building Regulations 1.4. civil law and criminal law 1.5. duty of care
2. Relevant parties: 2.1. clients 2.2. CDM 2.3. HSE 2.4. other designers 2.5. project and construction managers 2.6. contractors and specialist contractors 2.7. operators and maintainers
3. Hazards: 3.1. falls from height 3.2. slips, trips and falls 3.3. hit by falling or moving objects 3.4. manual handling 3.5. health issues 3.6. power sources 3.7. hazardous substances 3.8. trapped by something collapsing or overturning 3.9. confined spaces 3.10. fire 3.11. obstructions 3.12. moving vehicles 3.13. public access

Monitor contracts against agreed quality standards
4. Quality standards: 4.1. project specifications 4.2. British, European international Standards 4.3. Codes of Practice 4.4. organisation standards 4.5. trade advisory guidance and best practice 4.6. environmental standards 4.7. client standards 4.8. certification and accreditation of products, systems, personnel 4.9. dimensional control criteria
5. People responsible: 5.1. the client 5.2. contractors 5.3. consultants 5.4. sub-contractors 5.5. suppliers
6. Systems: 6.1. visual inspection 6.2. comparison with design requirements 6.3. comparison with standard documentation 6.4. checking manufacturers documentation 6.5. checking materials supply 6.6. sampling and mock-ups 6.7. testing 6.8. site inspection reports 6.9. contractors reports 6.10. meetings 6.11. checking delivery notes 6.12. dimension checks
7. Work: 7.1. materials and components and their use 7.2. methods of construction 7.3. completed elements

Monitor contract progress against agreed programmes
8. Systems to monitor and record: 8.1. visual inspection 8.2. resource records 8.3. site inspection reports 8.4. contractors' reports 8.5. written, graphical and electronic records of actual work against programmed work 8.6. site meetings 8.7. organisational procedures 8.8. comparison with project requirement
9. Programmes: 9.1. bar charts 9.2. critical path 9.3. method statements 9.4. meeting records
10. Resources: 10.1. people 10.2. plant and equipment 10.3. materials and components 10.4. time 10.5. specialist services
11. People responsible: 11.1. the client 11.2. contractors 11.3. consultants 11.4. sub-contractors 11.5. suppliers
12. Deviations: 12.1. resource shortages and delivery times 12.2. design problems and constraints 12.3. lack of essential construction information 12.4. construction errors 12.5. scope of work 12.6. inclement weather 12.7. physical constraints 12.8. environmental 12.9. force majeure 13. Corrective action: 13.1. restore progress in accordance with agreed programme 13.2. agree new completion dates 13.3. securing additional resources 13.4. altering planned work

Monitor contract costs and information for certification
14. Quantities and cost data: 14.1. materials 14.2. completed work 14.3. dayworks 14.4. periodic valuations
15. Appropriate action: 15.1. agree cost changes 15.2. agree quality changes 15.3. agree programme changes
16. Opportunities for cost saving: 16.1. waste minimisation 16.2. resource management and logistics 16.3. applications of new technologies and materials 16.4. alternative sources and types of materials 16.5. standardisation
17. People responsible: 17.1. the client 17.2. line managers 17.3. contractors 17.4. consultants 17.5. sub-contractors 17.6. suppliers

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Suite: Built Environment Design
Key words: contracts; quality standards; health and safety; programmes; certification

COSBEDO13
Identify project energy efficiency and carbon minimisation requirements in built environment design

Overview:
This unit is about identifying the optimum energy efficiency and carbon minimisation measures for developments and reporting your findings to decisions makers

Performance criteria - you must be able to:

P1 confirm energy efficiency and carbon minimisation goals and priorities for potential developments, when in-use both currently and in the future
P2 confirm legislation, regulations and standards relevant to energy efficiency and carbon minimisation when developments are in-use
P3 identify the factors that need to be considered in choosing the optimum energy efficiency and carbon minimisation measures for developments
P4 report findings to decision makers in order that optimum energy efficiency and carbon minimisation measures can be selected

Knowledge and understanding - you need to know and understand:

K1 how to confirm energy efficiency and carbon minimisation goals and priorities for potential developments, when in- use both currently and in the future (application)
K2 how to confirm legislation, regulations and standards relevant to energy efficiency and carbon minimisation when developments are in use (application)
K3 how to identify the factors that need to be considered in choosing the optimum energy efficiency and carbon minimisation measures for developments (understanding)
K4 how to report findings to decision makers in order that optimum energy efficiency and carbon minimisation measures can be selected (application)

Additional information
Scope/range
1. Energy efficiency and carbon minimisation:
1.1. low energy consumption 1.2. low carbon targets
2. Development: 2.1. new build 2.2. adaptation 2.3. alteration 2.4. refurbishment/upgrading 2.5. conservation 2.6. demolition/decommission 2.7. relocation
3. Factors: 3.1. energy sources and infrastructure 3.2. energy distribution mechanisms efficiency and costs 3.3. energy delivery mechanisms efficiency and costs 3.4. energy controls efficiency and costs 3.5. environmental impact and sustainability level of energy demand 3.6. installation 3.7. maintenance 3.8. quality (including design) 3.9. cost (including whole life costs/return on investment) 3.10. time 3.11. energy and low carbon

standards and strategies 3.12. development phases (design, procurement, construction, installation, operation, maintenance, demolition/decommissioning) 3.13. short, medium and long-term implications

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Suite: Built Environment Design
Key words: energy efficiency; carbon

COSBEDO14
Investigate and produce integrated conservation, repair and maintenance solutions

Overview:

This unit is about researching information relevant to the conservation, repair and maintenance of assets. This includes researching the potential impact of modern technology and repair methods on assets and identifying possible situations where incompatibility of the use of materials can be detrimental to the future of the asset. You will also need to provide decision makers with relevant information to enable them to agree a detailed design solution

Performance criteria - you must be able to:

P1 obtain information relevant to the conservation, repair and maintenance briefs and identify the relevant solutions
P2 obtain alternative sources of information and solutions, where existing approaches do not meet the parameters of the brief, which have the potential to offer alternative approaches
P3 research the potential impact of modern technology and repair methods on factors relating to assets
P4 identify possible situations where incompatibility of the use of materials can be detrimental to the future of the asset
P5 provide decision makers with enough relevant and accurate information at the right time to enable them to agree a detailed solution seeking guidance from experts where necessary

Knowledge and understanding - you need to know and understand:

K1 how to obtain information relevant to the conservation, repair and maintenance briefs (application)
K2 what to identify as the relevant solutions (understanding)
K3 how to obtain alternative sources of information and solutions, where existing approaches do not meet the parameters of the brief, which have the potential to offer alternative approaches (application)
K4 how and why to research the potential impact of modern technology and repair methods on factors relating to assets (analysis)
K5 what to identify as possible situations where incompatibility of the use of materials can be detrimental to the future of the asset (understanding)
K6 how to provide decision makers with enough relevant and accurate information at the right time to enable them to agree a detailed solution (application)

Additional information

Scope/range

1. Identify:

1.1. relevant processes and procedures 1.2. investigative research 1.3. official bodies to be consulted

2. Alternative sources of information and solutions: 2.1. previous knowledge and experience of similar work 2.2. solutions proposals by others to similar problems 2.3. specialists including experienced craftspeople & conservators 2.4. industry, academic, scientific research and innovation

3. Factors: 3.1. physical 3.2. technical 3.3. environmentally induced decay 3.4. social pressures use 3.5. aesthetic & spatial 3.6. assessments of cultural significance and value 3.7. protection of archaeological, architectural, cultural and historically valuable resources 3.8. cost budgeting 3.9. time programming 3.10. health and safety 3.11. resources (people, skills, finance, materials, plant, knowledge) 3.12. relevant quality standards and codes of practice 3.13. materials sourcing & matching 3.14. fitness of purpose

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Relevant occupations: Civil engineers; graphic designers; architectural technologists; town planning technicians; draughtspersons, building surveyors
Suite: Built Environment Design
Key words: conservation; repair; maintenance; design

APPENDIX 3 - ASSESSMENT TEMPLATE DOCUMENTS

3A: Sample Form
Assessment plan and review

Candidate name:	
Employer/location:	Date:
Qualification: Unit(s): Elements:	
Assessor:	
Period of Review: (should not normally exceed 12 weeks)	Proposed Date for next review:

Part 1 – **<u>Activities / Tasks / Learning / Training</u>** undertaken since last review:
Part 2a – '**<u>Progress to date'</u>** specifying units/elements/modules achieved to date (the progress recorded **must** tie in with the associated '**Summary of Achievement Record'**):

Part 2b – Identified **barriers** to progress (please detail here any issues relating to the programme delivery, which have impacted negatively on progress e.g. attendance times, learning difficulties, suitability of training/learning materials, physical barriers to participation, health issues, attitude etc):

*

Part 2c – Solutions proposed to address the above barriers:

-

Part 3 – Agreed '**assessment planning'** & action required for the next review (proposed methods of evidence collection must be recorded & proposed assessment methods must be selected): ***N.B.*** *Methods of evidence collection may include: either hard copy records or electronic records such as audio recordings, scanned documents, photographs etc.*	Element: Proposed Assessment Methods/Sources of Evidence:							
	CrossRef	RPL	OBS	Questioning	PS	WR	D	WT

Key: Assessment Methods/Sources of Evidence

CrossRef = Cross Referencing **RPL**= Recognition of Prior Learning

OBS = Observation **PS** = Personal Statement

WR = Work Record **D** = Discussion

WT= Witness Testimony

Part 4 – Additional comments / issues (e.g. health & safety issues):
Part 5 – Candidate comments/feedback/evaluation:
Part 6 – Employer comments on progression and achievement noted in **Part 2a**:
Part 7 – Assessor Feedback/Assessment Judgements/Decisions/Outcome

Candidate Signature: ..... Date: .....

Assessor Signature: ..... Date: .....

Employer Signature (where present): ..... Date: .....

Employer Name and position: .....

3B: Sample Form
Assessor report

Qualification:	
Candidate:	
Assessor:	
Date:	
Unit/ element:	
Location/ circumstance:	
Details of observation/ question/ answers/ discussion	**Ref**
Details of observation/ question/ answers/ discussion	**Ref**
Details of observation/ question/ answers/ discussion	**Ref**
Assessors comments (state whether candidate is competent)	
Assessor signature	
Candidate signature	

3C: Sample Form
Witness testimony

Qualification: ……

Unit: ……

Element(s): ……

Candidate Name: ……

Witness Name: ……

Witness Contact Details: ……

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Describe your construction and any assessment qualifications/ experience:

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Describe your relationship with the candidate:

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Date of evidence: ……

Testimony and comment on candidate's performance

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Witness Signature & Date: ……

Candidate Signature & Date: ……

Assessor Signature & Date: ……

3D: Sample Form
Candidate personal statement

Qualification:		
Candidate name:		
Element(s)	**Date**	**Statement / evidence**
Candidate's signature:		
Assessor's signature: Date:		

APPENDIX 4 - ASSESSOR TEMPLATE DOCUMENTS

4A: Sample Form
Element achievement record

Candidate name:													
Qualification:													
Unit title: **Element(s):**													
Assessor:													
Evidence ref:	**Evidence description ***	**Location ****	**Performance criteria**					**Knowledge and understanding**					

***Key: Assessment Methods/Sources of Evidence**

CrossRef = Cross Referencing **RPL**= Recognition of Prior Learning **OBS**= Observation
Q&A= Questioning **PS**= Personal Statement **WR** = Work Record **D**= Discussion
WT= Witness Testimony

***Should refer to whether the evidence can be found in the portfolio ('PF') or elsewhere, if so state location of evidence*

4B: Sample Form
Unit progress record

Qualification:		
Unit title:		
I confirm that the candidate has been assessed as competent for this unit		
Assessor name	Assessor signature	Date
I confirm that I have been assessed as competent and that the evidence produced is from work that is all mine		
Candidate name	Candidate signature	Date
I confirm that I have internally verified this unit and confirm that the candidate is competent (this section must be completed where the assessor is unqualified)		
IV name	IV signature	Date

APPENDIX 5 - INTERNAL VERIFIER TEMPLATE DOCUMENTS

5A: Sample Internal verification Strategy

This document indicates what may be covered as part of an internal verifier's strategy. An effective internal verification strategy ensures:

- A forum for discussion of borderline cases
- Assessor networking and sharing of good practice
- Valid, reliable and consistent training and/or assessment
- Recorded assessment decisions which are appropriate, consistent, fair, transparent and equitable
- Clarity for candidates about assessment requirements
- Effective preparation and presentation for external verification
- Reduction in level of direct external verification scrutiny

To underpin the IV/ verification process a plan of internal activity should be developed indicating

- what will happen
- when it will happen
- who will be involved

New instructors/assessors must:

a) be supplied with assessment and materials
b) clearly understand assessment requirements and procedures

All assessors must:

a) know the name of the person who will manage the IV process and the name of the IV
b) know how IV/ verification will happen, when it will happen and who will be involved
c) be informed about issues raised through previous internal and external quality assurance

On Course Monitoring

The IV should:

a) Sample assessments to ensure that:
   - feedback to candidates is clear and constructive
   - teaching and assessment activities are standard and appropriate
   - assessment decisions are fair and consistent
   - teaching and assessment records are clear
b) Undertake standardisation activities
c) Ensure candidates understand assessment requirements

d) Provide advice and support for Assessors and share good practice
e) Identify good assessment practice
f) Record internal verification activities and findings, list action points and report to instructors/assessors and the EV
g) Liaise with the EV as necessary

End of Course Checking

The IV should:

a) monitor progress against previous action points
b) ensure assessment records are complete and accurate
c) ensure evidence of achievement is appropriate and standardised
d) record internal verification activities and findings, list action points, and report these to assessors and the EV

Guidance on Sampling and Record Keeping

What do IVs/IVs sample and why?

IVs are responsible for monitoring the quality of assessment, hence the need for them to sample assessment practices and decisions. It is not usually possible or necessary to verify every aspect of assessment at each internal verification. A properly selected representative sample should identify any issues with assessment practices and decisions.

Selecting a sample

To select a representative sample, IVs must take account of factors which may impact on the quality of assessment. These factors are used to define a sampling strategy that determines the size of the sample and enables judgements to be made.

Key factors to consider are:

- Sites of delivery
- Number and experience of Assessors
- Number of courses/assessments
- Previous IV actions/recommendations
- Assessment methods
- Special arrangements
- EV recommendations
- Borderline cases
- Anything else that you think might impact on assessment decisions

The sample should include an element of random selection by the IV. It is not necessary to sample across every aspect of the programme at each event but the plan should seek to cover everything over a period of time, e.g. 3 years.

Which records should be kept?

Records of internal quality assurance/ verification must be kept and made available to the EV during monitoring visits. These should demonstrate that the internal verification procedures have been carried out. IVs should record two sets of information:

1. The sample taken by the IV
2. The comments and feedback to the Assessor following the sampling exercise, showing any recommendations or action required and how this was resolved.

There is a sample form shown below that you may use or adapt to suit your own requirement.

5B: Sample Form
Internal verification - sampling assessment decisions

Unit/qualification:

Location:
Assessor name:

Candidate Name	Sampling element[1]	Was the assessment method appropriate?	Is there sufficient evidence that outcomes have been met?	Is the evidence appropriate for the level?	Comments
Comments					

Signed: **(IV)** **Date:**

Signed: **(Assessor)** **Date:**

[1] *Was this a learning outcome across candidates, or a whole unit or one method of assessment?*

5C: Sample Form
Internal verification – observation of assessors

Internal Verifier's Name: ……

Assessor's Name: ……

Candidate's Name: ……

Qualification Title: ……

Unit Assessed: ……

Element Assessed: ……

Date of Observation: ……

Location of Assessment: ……

Prior to the assessment had the Assessor:	**Yes**	**No**	**Comments:**
Developed a written Assessment Plan for the candidate			
Checked that the facilities, resources and information required for the assessment were available and ready for use			
Briefed the candidate on how the assessment would take place and what would be assessed			

During the assessment did the Assessor:	Yes	No	Comments:
Conduct the assessment unobtrusively without interfering with the candidate's performance			
Encourage the candidate to satisfy the specified Assessment Criteria			
Ask questions clearly in an encouraging tone and manner without leading the candidate			
Ensure that sufficient questions were asked and that they were justifiable and relevant to the Unit assessed			

During the assessment did the Assessor (continued):	Yes	No	Comments:
Ensure that the atmosphere created during the assessment was pleasant and conducive			
Clarify and resolve any concerns that the candidate had during the assessment			
Clearly inform the candidate of the assessment decision i.e. 'achieved' or 'requires further practice'			
After the assessment did the Assessor:	**Yes**	**No**	**Comments:**

Provide feedback that was clear, constructive, met the candidate's needs and was appropriate to his/her level of confidence			
Encourage the candidate to comment on the assessment decision and how he/she was assessed			
Complete the Unit assessment documentation and ensure it was fully signed and dated			

Overall feedback to Assessor:

Assessor's comments on the IV's feedback:

Assessor's Signature: ……

Date:……

Internal Verifier's Signature: ……

Date:……