

Level 3 Technicals in Constructing the Built Environment (6720-043)

Synoptic Assignment 2019 – V1.1

Version and date	Change detail	Section
1.1 13 May 2019	<ul style="list-style-type: none"> Percentage (%) added to AO4. 	Marking grids

PAST ASSIGNMENT (2019) – DO NOT USE FOR LIVE ASSESSMENT

General guidance for candidates

General guidance

This is a formal assessment that you will be marked and graded on. You will be marked on the quality and accuracy of your practical performance and the written work you produce. It is therefore important that you carry your work out to the highest standard you can. How well you know and understand the subject, and how you have used your knowledge and skills together to complete the tasks must be clear to the marker. This means you will have to explain your thinking and the reasons behind the way you have carried out the tasks and how/why you have made your decisions within your written work eg as part of your planning, reflections, or evaluations.

Plagiarism

This is an assessment of your abilities, so the work must be all your own work and carried out under the conditions stated. You will be asked to sign a declaration that you have not had any help with the assessment.

Your tutor is allowed to give you some help understanding the assignment instructions if necessary, but they will record any other guidance you need and this will be taken into account during marking.

Plagiarism is the failure to acknowledge sources properly and/or the submission of another person's work as if it were your own. Plagiarism is not allowed in this assignment.

Where research is allowed, your tutor must be able to identify which work you have done yourself, and what you have found from other sources. It is therefore important to make sure you acknowledge all sources and clearly reference any information taken from them.

Timings and planning

Where you have to plan your time, you should take care to make sure you have divided the time available between tasks appropriately. In some assignments, there are specified timings which cannot be changed and which need to be taken into account. You should check your plan is appropriate with your tutor.

If you have a good reason for needing more time, you will need to explain the reasons to your tutor and agree a new deadline date. Changes to dates will be at the discretion of the tutor, and they may not mark work that is handed in after the agreed deadlines.

Health and Safety

You must always work safely, in particular while you are carrying out practical tasks.

You must always follow any relevant Health and Safety regulations and codes of practice.

If your tutor sees you working in a way that is unsafe for yourself or others, they will ask you to stop immediately, and tell you why. Your tutor will not be able to continue the assessment until they are sure you are ready for assessment and can work safely.

Presentation of work

Presentation of work must be neat, legible and appropriate to the task.

You should make sure that each piece of evidence including any forms are clearly labelled with your name and the assignment reference.

All electronic files must be given a clear file name that allows your tutor to identify it as your work.

Written work eg reports may be word processed or hand written unless stated otherwise.

All sketches and drawings should be neat and tidy, to scale and annotated.

Calculations should be set out clearly, with all working shown, as well as any assumptions made. You should use appropriate units at all times, and answers must be expressed to a degree of accuracy, consistent with the requirements of the task.

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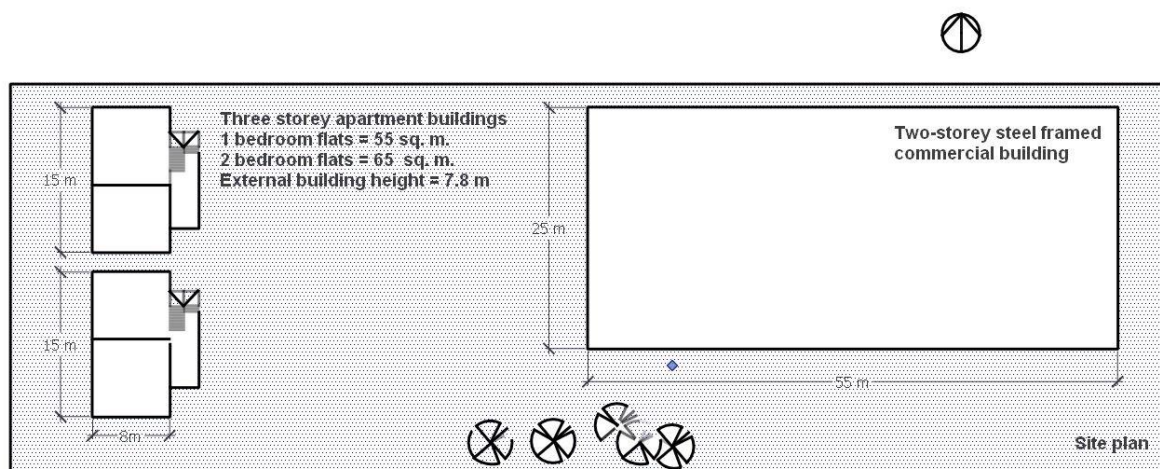
Assignment Brief

You work for a Building Design and Construction Company that has successfully tendered for a project to create residential and commercial buildings on a site that is in a town centre High Street location. The site currently includes a number of abandoned retail units, as well as units which are still in use. The local authority has decided to regenerate the area to promote the values of a town high street. All existing buildings are to be demolished and replaced by a new residential and commercial sector as part of a high street master plan.

Building project overview

All buildings on the existing site are to be demolished. The site is to be replaced with two separate apartment buildings and a commercial building structure, as shown in the site plan.

Site Plan



The site is 120 x 40 m in dimension. The new development will consist of two three-storey apartment buildings and a two-storey steel framed building for mixed retail units on the ground floor and office accommodation on the upper floor.

The apartment buildings consist of six flats each (two on each floor). Each floor will consist of a one and a two bedroom flat. The other rooms in the flats will consist of one living / dining room, a kitchen, a main bathroom and an en-suite bathroom. The flats will be built to meet the Building Regulations.

You are to review progress made on the proposed design and construction work, specifically focussing on the following key technical aspects:

- Demolition and site clearance; maximising the opportunity for re-using existing building materials, for example, concrete blocks, bricks, timber and metals.
- Project health and safety
- Project site set-up and management
- Project costs estimating
- Sustainable building construction:
 - Very low building fabric U-values
 - Airtight construction details to keep cold air draughts to a minimum
 - A guaranteed maximum heating energy demand measured in kWh/m².yr

- High performance glazing.
- New commercial building design and construction:
 - Concrete foundations
 - Steel frame construction to incorporate pad foundations
 - Flexible floor plan design on both storeys
 - External wall design: concrete blockwork, thermal insulation and a stone aesthetic external wall finish to match the site location.

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District Heating (DH) scheme to be used for all residential and commercial buildings in this project



DH pipework route from boiler house



DH pipework runs underground from a central boiler house and branches off into separate properties



DH pipework access point



Each property is metered for hot water demand

For additional case studies on District Heating installation, please go to the following website:

<https://www.vitalenergi.co.uk/>

Tasks

Task 1

Produce a specification report using a typical construction documentation style for the external wall structure of the proposed residential apartment buildings and a U value calculation for the external wall specification.

Conditions of assessment:

- You may carry out research and collect the information you want to use under unsupervised conditions.
- You may take into the assessment your research materials.
- You must carry out Task 1 on your own, under supervised conditions.
- You may use a scientific calculator but all workings out must be shown.
- You may have access to a computer with internet access to complete Task 1.

What you must produce for marking:

- A materials specification report for the external wall structure of the proposed residential apartment buildings to include the necessary construction details.
- A calculated U-value for your external wall specification is required to be completed to illustrate compliance with the Building Regulations energy efficiency standards.

Additional evidence of your performance that must be captured for marking:

- None for this task.

Task 2

Produce a report on the health and safety issues concerned with building reinforced concrete pad foundations for the commercial building, along with the associated risks and hazards in a risk assessment. Your report should include the excavation, formwork, steel fixing and concreting work required.

Conditions of assessment:

- You may carry out research and collect the information you want to use under unsupervised conditions.
- You may take into the assessment your research materials.
- You must carry out Task 2 on your own, under supervised conditions.
- You may have access to a computer with internet access to complete Task 2.

What you must produce for marking:

- A written health and safety report, describing all essential tasks for building reinforced concrete pad foundations for the commercial building (including the excavation, formwork, steel fixing and concreting work required).
- A completed risk assessment pro-forma and health and safety checklist, provided by your tutor.

Additional evidence of your performance that must be captured for marking:

- None for this task.

Task 3

Produce a report evaluating the installation of a woodchip biomass district heating scheme for all residential and commercial buildings. Your report should consider the environmental, technical and financial impact of using such a system compared to installing individual property gas boilers.

Conditions of assessment:

- You may carry out research and collect the information you want to use under unsupervised conditions.
- You may take into the assessment your research materials.
- You must carry out Task 3 on your own, under supervised conditions.
- You may use a scientific calculator but all workings out must be shown.
- You may have access to a computer with internet access to complete Task 3.

What you must produce for marking:

- An evaluative written report for the proposed woodchip biomass district heating scheme showing all calculations.
- Quantitative evidence and analysis including mathematical diagrams showing data associated with the environmental, technical and financial data of the proposed woodchip biomass district heating scheme compared to gas boilers in several separate properties
- A summary conclusion that includes positive and potential negative aspects of a woodchip biomass district heating scheme and individual property gas boilers.

Additional evidence of your performance that must be captured for marking:

- None for this task.

Task 4

Produce a spreadsheet **comparing** estimated quantities and materials costs for one of the apartment building's external walls to include as follows:

- a) Concrete blockwork, finished with cement rendering
- b) Hardwood timber cladding panels

Conditions of assessment:

- You may carry out research and collect the information you want to use under unsupervised conditions.
- You may take into the assessment your research materials.
- You must carry out Task 4 on your own, under supervised conditions.
- You may use a scientific calculator but all workings out must be shown.
- You may have access to a computer with internet access to complete Task 4.

What you must produce for marking:

- An approximate estimate of the total surface area of the external walls for **one** of the apartment buildings.
- A spreadsheet comparing estimated quantities and costs of:
 - External wall concrete blockwork and cement rendering
 - External wall hardwood timber cladding panels.

Additional evidence of your performance that must be captured for marking:

- None for this task.

Task 5

Produce a contour plan drawing, using the survey results provided in Appendix 2.

Conditions of assessment:

- You must carry out Task 5 on your own, under supervised conditions.
- You may use a scientific calculator but all workings out must be shown.
- You may have access to a computer with internet access to complete Task 5.

What you must produce for marking:

- A drawing of the survey area showing grid co-ordinate points levels and contour lines for the site plan.

Additional evidence of your performance that must be captured for marking:

- None for this task.

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Task instructions for centres

Resources

Candidates must have access to a suitable range of resources to carry out the tasks and, where appropriate, to have the opportunity to choose materials demonstrating the ability to select from a range of appropriate materials. Resources specific to the tasks are as follows:

- Candidates should be given access to a computer with internet access and adobe acrobat during the assessment.
- Candidates should be given access to a scientific calculator for Tasks 1, 3, 4 and 5.
- Where a drawing element is required for a task, either manual or using CAD software as detailed in the task specific guidance, the centre must supply the candidates with the following:
 - Manual drawing equipment which typically includes a drawing board with a T-square, set squares (60/30 and 45), a scale ruler, appropriately sized drawing paper (e.g. A3 and A4) and a pencil. The drawings must be done over using a drawing pen to allow the work to be visible when scanned into the Moderation Portal (additional time may be allowed to do this).
 - Access to a computer with any suitable CAD software, e.g. AutoCAD or SketchUp and access to a printer.

Tutors could refer to Passivhaus UK industry lead body for examples of low energy, low carbon building design and construction: <http://www.passivhaustrust.org.uk/>

Task specific guidance

- The assignment brief should be released **two** academic weeks before completing out Task 1.
- Candidates should be given access to **each** task and any specific technical information outlined in the task guidance below, **one** academic week before that specific task is to be completed under assessed conditions. This is to allow candidates time to undertake any research needed to complete the task.
- **Candidates must submit their research materials to the assessor for approval before candidates can complete each task.** This is to ensure that the notes are checked for security and authenticity of the candidates work. Please see the *Guidance and feedback* section below for further details.

Task 1

The centre must give candidates access to technical information on building materials specifications. This could be in paper or electronic format (pdf) and include, for example, relevant British Standards and building regulations Approved Documents. This will allow candidates to research and reference specifications that meet building design and construction requirements for the applications in this assignment brief.

Candidates are not required to draw their own construction details, these could be provided by the tutor to write the materials specification report.

Task 2

The centre must give candidates access to technical information on health and safety in construction: for demolition work, materials handling (including potentially hazardous materials), site clearance, site excavations, sub-structure and super-structure construction and site supervision of sub-contractors to ensure safe and efficient project work progress. This technical information could be in paper or electronic format (pdf) and include, for example, relevant HSE documentation and other industry best practice guidance, for example on toolbox talks and other site supervision responsibilities.

The risk assessment pro-forma in Appendix 1a and the Health and Safety Checklist in Appendix 1b must be provided to the candidate in order for this task to be completed.

Task 3

The centre must give candidates information on wood-based biomass and gas heating systems. Building-specific and district or community heating scheme references are also essential in this task. The task will be best done by reference to industry examples or to independent renewable energy advice organisations:

- The Energy Saving Trust: <http://www.energysavingtrust.org.uk/renewable-energy/heat/biomass>
- ofgem: <https://www.ofgem.gov.uk/environmental-programmes>
- Vitalenergi (District Heating systems): <https://www.vitalenergi.co.uk/>

Task 4

The centre must give candidates information on techniques for approximately estimating building materials quantities and costs for the external surface area of the walls, allowing a 10% deduction for windows and doors.

The centre must also provide candidates with information on approximate estimating unit prices for a number of relevant construction materials and finishes, e.g. from an architect's/builders price book. The candidate would then choose the most appropriate materials and finishes and calculate quantities to complete the task.

The candidates are only required to estimate the costs of the blockwork and cement rendering and timber panels. There is no in depth costing required for any other element of the construction.

The centre must provide candidates with spreadsheet software such as Excel.

Task 5

The centre must provide candidates with Appendix 2 in order for this task to be completed.

The centre must also give candidates access to drawing equipment.

Time

The following timings are provided to support centre planning.

Total – 12 hours.

Task 1 – 3 hours (recommended)

Task 2 – 2 hours (recommended)

Task 3 – 3 hours (recommended)

Task 4 – 2 hours (recommended)

Task 5 – 2 hours (recommended).

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Centre guidance

Guidance provided in this document supports the administration of this assignment. The following documents, available on the City & Guilds website, provide essential generic guidance for centres delivering Technical qualifications and **must** be referred to alongside this guidance:

- **Technical qualifications – marking**
- **Technical qualifications – moderation** (updated annually)
- **Technical qualifications – teaching, learning and assessment**

This synoptic assessment is designed to require the candidate to make use of their knowledge, understanding and skills they have built up over the course of their learning to tackle problems/tasks/challenges.

This approach to assessment emphasises to candidates the importance and applicability of the full range of their learning to practice in their industry area, and supports them in learning to take responsibility for transferring their knowledge, understanding and skills to the practical situation, fostering independence, autonomy and confidence.

Candidates are provided with an assignment brief. They then have to draw on their knowledge and skills and independently select the correct processes, skills, materials, and approaches to take to provide the evidence specified by the brief.

During the learning programme, it is expected that tutors will have taken the opportunity to set shorter, formative tasks that allow candidates to be supported to independently use the learning they have so far covered, drawing this together in a similar way, so they are familiar with the format, conditions and expectations of the synoptic assessment.

Candidates should be made aware during learning what the Assessment Objectives are and how they are implemented in marking the assignment, so they will understand the level of performance that will achieve them high marks.

Candidates should not be entered for the assessment until the end of the course of learning for the qualification so they are in a position to complete the assignment successfully.

Health and safety

Candidates should not be entered for assessment without being clear of the importance of working safely, and practice of doing so. The tutor must immediately stop an assessment if a candidate works unsafely. At the discretion of the tutor, depending on the severity of the incident, the candidate may be given a warning. If they continue to work unsafely however, their assessment must be ended and they must retake the assessment at a later date.

Compliance with timings

The timings provided are estimates to support centre planning. They refer to assessment time, not any additional setting up the centre needs to carry out to create an appropriate assessment environment.

It is the centre's responsibility to plan sufficient assessment sessions, under the appropriate conditions, within the assignment window, to allow candidates reasonable time to complete the assessment tasks.

Where candidates are required to plan their work they should have their plans confirmed for appropriateness in relation to the time allocated for each task.

Candidates should be allowed sufficient time to fully demonstrate the range of their skills, however this also needs to be reasonable and practicable. Candidates should be allowed to overrun their planned timings or professional service times (where they exist) in order for evidence of a range of their skills to be captured. If however, the time required exceeds reasonably set assessment periods, or the tolerance suggested for professional service times, the centre may stop the assessment and base the marking on the evidence up to that point, including the tutor's notes of how far over time the task has taken.

Observation evidence

Where the tutor is required to carry out observation of performance, detailed, descriptive notes must be recorded on the practical observation (PO) form provided. The centre has the flexibility to adapt the form, to suit local requirements (eg to use tablet, hand-written formats, or to ease local administration) as long as this does not change or restrict the type of evidence collected.

The number of candidates a tutor will be able to observe at one time will vary depending on:

- the complexity of evidence collection for the task
- local conditions eg layout of the assessment environment,
- amount of additional support available (eg to capture image/video evidence), staggered starts etc,
- whether there are any peak times where there is a lot of evidence to collect that will need additional support or any that are quieter.

It is advisable to trial the planned arrangements where possible during formative assessment, reviewing the quality of evidence captured and manageability. It is expected that for straight forward observations, (and unless otherwise specified) no more than eight candidates will be observed by a single tutor at one time, and the number will usually be fewer than this maximum. The key factor to consider is the logistics of collecting sufficient evidence.

As far as possible, candidates should not be distracted, or their performance affected by the process of observation and evidence collection.

Observation notes form part of the candidate's evidence and must describe **how well** the activity has been carried out, rather than stating the steps/ actions the candidate has taken. The notes must be very descriptive and focus on the **quality** of the performance in such a way that comparisons between performances can be made. They must provide sufficient, appropriate evidence that can be used by the marker (and moderator) to mark the performance using the marking grid.

Identifying what **is** about the performances that is **different** between candidates can clarify the qualities that are important to record. Each candidate is likely to carry out the same steps, so a checklist of this information would not help differentiate between them. However, qualitative comments on **how well** they do it, and quantitative records of accuracy and tolerances would.

The tutor should refer to the marking grid to ensure appropriate aspects of performance are recorded. These notes will be used for marking and moderation purposes and so must be **detailed, accurate and differentiating**.

Tutors should ensure that any required additional supporting evidence including eg photographs or video can be easily matched to the correct candidate, are clear, well-lit and showing the **areas of particular interest** in **sufficient detail** and **clarity** for assessment (ie taken at appropriate points in production, showing accuracy of measurements where appropriate).

If candidates are required to work as a team, each candidate's contribution must be noted separately. The tutor may intervene if any individual candidate's contribution is unclear or to ensure fair access (see below).

The **Technical qualifications guides on marking and moderation** are essential guidance documents and are available on the City & Guilds website. These provide further information on preparing for assessment, evidence gathering, standardisation, marking and moderation, and must be referred to when planning and carrying out assessment.

Minimum evidence requirements for marking and moderation

The sections in the assignment:

- **What you must produce for marking**, and
- **Additional evidence of your performance that must be captured for marking**

list the minimum requirements of evidence to be submitted for marking and the moderation sample.

Evidence produced during assessment above and beyond this may be submitted, as long as it provides useful information for marking and moderation and has been produced under appropriate conditions.

While technological methods which support the capturing or creating of evidence can be helpful, eg pinboard style websites for creating mood boards, the final evidence must be converted to a suitable format for marking and moderation which cannot be lost/ deleted or amended after the end of the assessment period (eg screen prints, pdf files). Considerations around tracking authenticity and potential loss of material hosted on such platforms during assessment is the centre's responsibility.

Where candidates have carried out some work as a group, the contribution of each candidate must be clear. It is not appropriate to submit identical information for each candidate without some way for the marker and moderator to mark the candidates individually.

Note: Combining candidates' individual pieces of evidence into single files or zip files may make evidence management during internal marking more efficient and will greatly simplify the uploading of the moderation sample.

Where the minimum requirements have **not been submitted** for the moderation sample by the final moderation deadline, or the **quality of evidence is insufficient** to make a judgement, the moderation, and therefore any subsequent adjustment, will be based on the evidence that *has been submitted*. **Where this is insufficient to provide a mark on moderation, a mark of zero may be given.**

Preparation of candidates

Candidates should be aware of which aspects of their performance (across the AOs) will give them good marks in assessment. This is best carried out through routinely pointing out good or poor performance during the learning period, and through formative assessment.

During the learning programme, direct tutor instruction in how to tackle practical tasks through modelling, support, guidance and feedback are critical. However gradual removal of this support is necessary in preparation for summative assessment. This, supported approach is **not** valid for summative assessment.

The purpose of summative assessment is to confirm the standard the candidate has reached as a result of participating in the learning process. Candidates should be encouraged to do the best they can and be made aware of the difference between these summative assessments and any formative assessments they have been subject to. Candidates may not have access to the full marking grids, as these may be misinterpreted

as pass, merit distinction descriptors. Refer to the **Technical qualifications – teaching, learning and assessment** centre guidance document, available on the City & Guilds website for further information on preparing candidates for Technical qualification assessment.

Guidance on assessment conditions

The assessment conditions that are in place for this synoptic assignment are to:

- ensure the rigour of the assessment process
- provide fairness for candidates
- give confidence in the outcome.

They can be thought of as the rules that ensure that all candidates who take an assessment are being treated fairly, equally and in a manner that ensures their result reflects their true ability.

The conditions outlined below relate to this summative synoptic assignment. These do not affect any formative assessment work that takes place, although it is advised that candidates are prepared for the conditions they will need to work under during summative assessment.

The evidence for the tasks that make up this synoptic assignment must be completed under the specified conditions. This is to ensure authenticity and prevent malpractice as well as to assess and record candidate performance for assessment in the practical tasks. Any aspect that may be undertaken in unsupervised conditions is specified. It is the centre's responsibility to ensure that local administration and oversight gives the tutor sufficient confidence to be able to confirm the authenticity of the candidate's work.

Security and authentication of candidate work

Candidate evidence must be kept secure to prevent unsupervised access by the candidate or others. Where evidence is produced over a number of sessions, the tutor must ensure learners and others cannot access the evidence without supervision. This might include storing written work or artefacts in locked cupboards and collecting memory sticks of evidence produced electronically at the end of each session.

Candidates are required to sign declarations of authenticity, as is the tutor. The relevant form is included in this assignment pack and must be signed after the production of all evidence.

Where the candidate or tutor is unable to, or does not confirm authenticity through signing the declaration form, the work will not be accepted at moderation and a mark of zero will be given. If any question of authenticity arises eg at moderation, the centre may be contacted for justification of authentication.

Accessibility and fairness

Where a candidate has special requirements, tutors should refer to the *Access arrangements and reasonable adjustments* section of the City & Guilds website.

Tutors can support access where necessary by providing clarification to **any** candidate on the requirements or timings of any aspect of this synoptic assignment. Tutors should **not** provide more guidance than the candidate needs as this may impact on the candidate's grade, see the guidance and feedback section below.

All candidates must be provided with an environment, time frame and resources that allows them reasonable access to the full range of marks available.

Where candidates have worked in groups to complete one or more tasks for this synoptic assessment, the tutor must ensure that no candidate is disadvantaged as a result of the performance of any other team member. If a team member is distracting or preventing another team member from fully demonstrating their skills or knowledge, the tutor must intervene.

Guidance and feedback

To support centre file management, tutors may specify a suitable file format and referencing format for evidence (unless otherwise specified eg if file naming is an assessment point for the assignment). Guidance must only support access to the assignment and must not provide feedback for improvement. The level and frequency of clarification & guidance must be

- recorded fully on the candidate record form (CRF),
- taken into account along with the candidate's final evidence during marking
- made available for moderation.

Tutors **must not** provide feedback on the quality of the performance or how the quality of evidence can be improved. This would be classed as malpractice.

Tutors **should** however provide general reminders to candidates throughout the assessment period to check their work thoroughly before submitting it, and to be sure that they are happy with their final evidence as it may not be worked on further after submission.

Candidates can rework any evidence that has been produced for this synoptic assignment during the time allowed. However, this must be as a result of their own review and identification of weaknesses and not as a result of tutor feedback. Once the evidence has been submitted for assessment, no further amendments to evidence can be made.

Tutors **should** check and be aware of the candidates' plans and designs to ensure management of time and resources is appropriate, and so any allowed intervention can take place at an appropriate time.

Tutors **should** ensure that candidates' plans for completion of the tasks distribute the time available appropriately and may guide candidates on where they should be up to at any point in a general way. Any excessive time taken for any task should be recorded and should be taken into account during marking if appropriate.

It is up to the marker to decide if the guidance the candidate has required suggests they are lacking in any AO, the severity of the issue, and how to award marks on the basis of this full range of evidence. The marker must record where and how guidance has had an impact on the marks given so this is available should queries arise at moderation or appeal.

What is, and is not, an appropriate level of guidance

A tutor **should intervene with caution** if a candidate has taken a course of action that will result in them not being able to submit the full range of evidence for assessment. However, this should **only** take place once the tutor has prompted the candidate to check that they have covered all the requirements. Where the tutor has to be explicit as to what the issue is, this is likely to demonstrate a lack of understanding on the part of the candidate rather than a simple error, and full details should be recorded on the CRF.

- The tutor **should not** provide guidance if the candidate is thought to be able to correct the issue without it, and a prompt would suffice. In other words, only the minimum support the candidate actually needs should be given, since the more tutor

guidance provided, the less of the candidate's own performance is being demonstrated and therefore the larger the impact on the marks awarded.

- A tutor **must not** provide guidance that the candidate's work is not at the required standard or how to improve their work. In this way, candidates are given the chance to identify and correct any errors on their own, providing valid evidence of knowledge and skills that will be credited during marking.
- The tutor **must not** produce any templates, pro-formas, work logs etc unless instructed to in the assignment guidance. Where instructed to do so, these materials must be produced as specified and contain no additional guidance. Templates provided as part of the assignment should be used as provided, and not adapted.

All specific prompts and details of the nature of any further guidance must be recorded on the relevant form and reviewed during marking and moderation.

Guidance on marking

Please refer to the **Technical qualifications – marking, and - moderation** centre guidance documents for further information on gathering evidence suitable for marking and moderation, and on using the marking grid and forms.

The candidate record form (CRF) is used to record:

- Details of any guidance or the level of prompting the candidate has received during the assessment period
- Rough notes bringing together relevant evidence from across tasks during marking.
- Summary justifications when holistically coming to an overall judgement of the mark.

The practical observation form (PO) is used to record:

- Descriptive information and evidence of candidate performance during an observation. Although descriptions of the quality of performance should support decisions against the AOs, the notes should follow the flow of the observation, rather than attempting to assign evidence against the AOs at this point.

Marking grid

For any category, 0 marks may be awarded where there is no evidence of achievement

%	Assessment Objective	Band 1 descriptor Poor to limited	Band 2 descriptor Fair to good	Band 3 descriptor Strong to excellent
20	AO1 Recall of knowledge relating to the qualification LOs <ul style="list-style-type: none"> Does the candidate seem to have the full breadth and depth of taught knowledge across the qualification to hand? How accurate is their knowledge? Are there any gaps or misunderstandings evident? How confident and secure does their knowledge seem? 	(1-4 marks) Recall shows some weaknesses in breadth and/or accuracy. Hesitant, gaps, inaccuracy	(5-8 marks) Recall is generally accurate and shows reasonable breadth. Inaccuracy and misunderstandings are infrequent and usually minor. Sound, minimal gaps	(9-12 marks) Consistently strong evidence of accurate and confident recall from the breadth of knowledge. Accurate, confident, complete, fluent, slick
		Examples of types of knowledge expected: identifying forms, elements, methods and materials used in construction; recognising traditional and modern methods of construction; recognising the methods used to construct commercial and industrial buildings; describing methods and techniques used in commercial and industrial buildings; identifying the sources of hazards in construction and describing the use of risk assessments and method statements; describing the supervision of labour and resources on site; recalling key elements of sustainable construction including human comfort, renewable energy, heating, electrical power supply, flood risk mitigation, enhanced wellbeing of occupants, natural light, natural and mechanical ventilation and control of sound transfer; identifying materials to be reclaimed; identifying properties-in-use of materials and describing failure mechanisms and their remediation and prevention; identifying the rules of measurement and describing bill production techniques and the terminology used in measurement, tendering and estimating; identifying surveying equipment and techniques and describing modern surveying software and the associated benefits; identifying environmental pollutants and describing waste management techniques; identifying mathematical techniques and formulae and using correct units in calculations.		

%	Assessment Objective	Band 1 descriptor Poor to limited	Band 2 descriptor Fair to good	Band 3 descriptor Strong to excellent
		<p>Bottom of band: The candidate has identified a limited number of methods, materials, techniques, practices and documents used in construction, but there is little detail or coherence. Some relevant images, tables, graphs, formulae and calculations have been identified, but used poorly.</p>	<p>Bottom of band: The candidate has described a wide range of methods, materials, techniques, practices and documents used in construction, and in good detail, with clear sketches and acceptable levels of coherence. Most relevant images, tables, graphs, formulae and calculations have been identified and used well, with some working shown but without units.</p>	<p>Bottom of band: The candidate has described a comprehensive range of methods, materials, techniques, practices and documents used in construction, in very good detail, with clear and accurate sketches and generally high levels of coherence. All relevant images, tables, graphs, formulae and calculations have been identified and used well with most working and units shown correctly.</p>
		<p>Top of band: The candidate has identified a limited number of methods, materials, techniques, practices and documents used in construction but with some detail and some coherence. Some relevant images, tables, graphs, formulae and calculations have been identified and used appropriately.</p>	<p>Top of band: The candidate has described a wide range of methods, materials, techniques, practices and documents used in construction, with good detail, clear and accurate sketches and good coherence. All relevant images, tables, graphs, formulae and calculations are identified and generally applied well with some working shown and some units.</p>	<p>Top of band: The candidate has described a comprehensive range of methods, materials, techniques, practices and documents used in construction in in-depth detail, with clear and accurate sketches and high levels of coherence. All relevant images, tables, graphs, formulae and calculations have been identified and used correctly with all working shown and with correct units.</p>

%	Assessment Objective	Band 1 descriptor Poor to limited	Band 2 descriptor Fair to good	Band 3 descriptor Strong to excellent
35	AO2 Understanding of concepts theories and processes relating to the LOs <ul style="list-style-type: none"> Does the candidate make connections and show causal links and explain why? How well theories and concepts are applied to new situations/the assignment? How well chosen are exemplars – how well do they illustrate the concept? 	<p align="center">(1-7 marks)</p> <p>Some evidence of being able to give explanations of concepts and theories. Explanations appear to be recalled, simplistic or incomplete.</p> <p>Misunderstanding, illogical connections, guessing,</p>	<p align="center">(8-14 marks)</p> <p>Explanations are logical. Showing comprehension and generally free from misunderstanding, but may lack depth or connections are incompletely explored.</p> <p>Logical, slightly disjointed, plausible,</p>	<p align="center">(15-21 marks)</p> <p>Consistently strong evidence of clear causal links in explanations generated by the candidate. Candidate uses concepts and theories confidently in explaining decisions taken and application to new situations.</p> <p>Logical reasoning, thoughtful decisions, causal links, justified</p>
		<p>Examples of understanding expected: explaining and comparing forms, elements, methods and materials used in construction and maintenance; explaining how domestic buildings perform in use; comparing the key aspects of sustainable buildings; specifying the reuse of materials reclaimed from demolition; explaining techniques used in the site preparation, substructure and superstructure of industrial and commercial buildings; comparing the different items of health and safety legislation used in construction; producing health and safety training and development materials; comparing the roles and responsibilities of site supervisors and using appropriate site documentation; explaining the generation, transmission and distribution of electrical power; preparing budget costs and building up tender figures; using and applying data for surveying and setting out purposes; explaining pollution control and waste management techniques and comparing sustainable construction methods; applying mathematical, graphical and statistical techniques to solve construction problems.</p>		

%	Assessment Objective	Band 1 descriptor Poor to limited	Band 2 descriptor Fair to good	Band 3 descriptor Strong to excellent
		Bottom of band: Some concepts are referred to, but explanations are typically weak. There is little evidence of the ability to show a chain of cause and effect or to explain the reasons for a specification.	Bottom of band: The candidate has shown a good range of understanding across the qualification and explanations are straightforward but secure.	Bottom of band: Explanations show some additional depth of thought and/or insight in places. Some understanding is being extrapolated to new contexts with some success and the understanding is clearly applied to the project in hand.
		Middle of band: The candidate has shown a somewhat limited range of understanding. Explanations are typically brief or simplistic and understanding is implied, rather than clearly evidenced.	Middle of band: There is good understanding shown across the qualification. Explanations are clear and often show good links between cause and effect. The reasons for the methods and materials specified are made clear.	Middle of band: Explanations are generally in-depth across the qualification. Application to new contexts is generally successful and relevant to the project in hand.
		Top of band: There is evidence of a range of understanding from across the qualification. Concepts are generally explained, in a limited way, with some areas being more secure than others.	Top of band: Understanding across the qualification is consistently good, with reasoning consistently coherent and well-explained.	Top of band: Concepts and understanding across the entire qualification are well-understood and can be applied consistently and effectively in new contexts. All the understanding demonstrated relates to the project in hand.

%	Assessment Objective	Band 1 descriptor Poor to limited	Band 2 descriptor Fair to good	Band 3 descriptor Strong to excellent
10	AO3 Application of practical/technical skills <ul style="list-style-type: none"> How practiced/fluid does hand eye coordination and dexterity seem? How confidently does the candidate use the breadth of practical skills open to them? How accurately/successfully has the candidate been able to use skills/achieve practical outcomes? 	<p align="center">(1-2 marks)</p> <p>Some evidence of familiarity with practical skills. Some awkwardness in implementation, may show frustration out of inability rather than lack of care.</p> <p>Unable to adapt, frustrated, flaws, out of tolerance, imperfect, clumsy.</p>	<p align="center">(3-4 marks)</p> <p>Generally successful application of skills, although areas of complexity may present a challenge. Skills are not yet second nature.</p> <p>Somewhat successful, some inconsistencies, fairly adept/capable.</p>	<p align="center">(5-6 marks)</p> <p>Consistently high levels of skill and/or dexterity, showing ability to successfully make adjustments to practice; able to deal successfully with complexity.</p> <p>Dextrous, fluid, comes naturally, skilled, practiced,</p>
		<p>Examples of skills expected: producing sketches and construction drawings; working with project documentation; determining quantities from drawings; producing estimates and tender documents; producing contour maps and traverses; producing waste management plans; calculating heat losses, lighting levels, regular and irregular areas and volumes and costs; preparing electronic presentations.</p>		
		<p>Processes can generally be carried out in an acceptable manner, up to a point, resulting in drawings and other practical outcomes that are basic and which may be somewhat inaccurate in places. All the tasks have been attempted and, even if not all are correct, they have been completed.</p>	<p>Familiar processes are carried out in a competent way resulting in consistently usable drawings, calculations and other practical tasks as appropriate. Complex situations are attempted well, and mostly effectively. All the tasks have been attempted and completed, and are substantially correct.</p>	<p>Drawings, calculations and other practical tasks are consistently produced to a high standard. Measurements are consistently accurate and within tolerance even in complex situations. All the tasks are attempted and completed, and are all correct. Where relevant, any working is shown and the correct units used throughout.</p>

%	Assessment Objective	Band 1 descriptor Poor to limited	Band 2 descriptor Fair to good	Band 3 descriptor Strong to excellent
20	AO4 Bringing it all together - coherence of the whole subject <ul style="list-style-type: none"> Does the candidate draw from the breadth of their knowledge and skills? Does the candidate remember to reflect on theory when solving practical problems? How well can the candidate work out solutions to new contexts/problems on their own? 	(1-4 marks) Some evidence of consideration of theory when attempting tasks. Tends to attend to single aspects at a time without considering implication of contextual information. Some random trial and error, new situations are challenging, expects guidance, narrow. Many need prompting.	(5-8 marks) Shows good application of theory to practice and new context, some inconsistencies. Remembers to apply theory, somewhat successful at achieving fitness for purpose. Some consolidation of theory and practice	(9-12 marks) Strong evidence of thorough consideration of the context and use of theory and skills to achieve fitness for purpose. Purposeful experimentation, plausible ideas, guided by theory and experience, fit for purpose, integrated, uses whole toolkit of theory and skills.
		Examples of bringing it all together: applying knowledge and understanding to a particular scenario or problem; justifying decisions made and approaches taken (e.g. materials, techniques, adapting practice to meet contextual challenges, reflecting on risk assessments and their use.		
		The candidate has used knowledge and understanding together in a few straightforward areas.	The candidate typically brings together knowledge, understanding and skills well, when solving problems that arise within the given context, although they may deal with these separately.	The candidate has made excellent use of knowledge, understanding and skills from across the qualification to inform the context of the assignment. Choices and decisions have been well-informed and considered, showing that the candidate appreciates the significance of the different units of the qualification in relation to each other.

%	Assessment Objective	Band 1 descriptor Poor to limited	Band 2 descriptor Fair to good	Band 3 descriptor Strong to excellent
15	AO5 Attending to detail/ perfecting <ul style="list-style-type: none"> Does the candidate routinely check on quality, finish etc and attend to imperfections/ omissions How much is accuracy a result of persistent care and attention (eg measure twice cut once)? Would you describe the candidate as a perfectionist and wholly engaged in the subject? 	<p align="center">(1-3 marks)</p> <p>Easily distracted or lack of checking. Insufficiently concerned by poor result; little attempt to improve. Gives up too early; focus may be on completion rather than quality of outcome.</p> <p>Careless, imprecise, flawed, uncaring, unfocussed, unobservant, unmotivated.</p>	<p align="center">(4-6 marks)</p> <p>Aims for satisfactory result but may not persist beyond this. Uses feedback methods but perhaps not fully or consistently.</p> <p>Variable/intermittent attention, reasonably conscientious, some imperfections, unremarkable.</p>	<p align="center">(7-9 marks)</p> <p>Alert, focussed on task. Attentive and persistently pursuing excellence. Using feedback to identify problems for correction.</p> <p>Noticing, checking, persistent, perfecting, refining, accurate, focus on quality, precision, refinement, faultless, meticulous.</p>
		<p>Examples of attending to detail: accuracy and detail of drawings and checking of same; thinking about and attending to specific requirements of the client; completeness and attention to usability of all relevant documentation; checking drawings and any calculations.</p>		
		<p>The candidate shows superficial attention to detail. The drawings and other practical outcomes show some inaccuracies or gaps. The client's needs are interpreted in a generic, rather than a personal, manner, with basic attention to their aims and requirements.</p>	<p>The candidate shows adequate attention to detail and drawings and other practical outcomes are accurate. Client's needs are considered sufficiently to meet their needs in the most straightforward and/or conventional way.</p>	<p>The candidate has been highly focused on the task showing extreme care in the accuracy and usability of drawings and other practical outcomes. They have been very attentive to the implied values of the client and thoughtful in using this insight in achieving an outcome that is highly client-centred.</p>

Appendix 1a

Task 2 – Risk Assessment Record in 3 x 3 (Likelihood x Severity) format

Likelihood (A) 1 = Highly unlikely occurrence; 2 = Unlikely occurrence; 3 = Likely occurrence

Severity (B) 1 = Minor severity; 2 = Moderate severity; 3 = Major severity

Risk rating (C) = A x B

1 ≤ 2 = Low risk; 3 ≤ 6 = Medium risk; 8 ≤ 9 = High risk

[illegible]

Appendix 1b

Task 2 – Health and Safety Checklist:

Site safety hazards	Control measures	Checklist (Add tick when control measures are in place)
<ul style="list-style-type: none">• Unfamiliar site• Industrial site• Heavy machinery working• Mechanical plant in general operation around the site• Significant noise from work operations	Safety footwear and hard hat	
	High viz. vest or jacket	
	Overalls	
	Ear protection	
	Eye protection	
	Gloves	
	Work supervisor advice on group movement	
	Viewing of work processes only to be done from a safe position	

Appendix 2

Task 5 – Area levelling contour survey results

BS	IS	FS	RISE / FALL	RL	Grid x, y co-ords.	Stations
1.070				50.000		TBM
	0.110		0.960	50.960	0, 0	A
	0.095		0.015	50.975	5, 0	B
	0.095		0.000	50.975	10, 0	C
	0.160		-0.065	50.910	15, 0	D
	0.180		-0.020	50.890	20, 0	E
	0.712		-0.532	50.358	0, 5	F
	0.785		-0.073	50.285	5, 5	G
	0.801		-0.016	50.269	10, 5	H
	0.813		-0.012	50.257	15, 5	I
	0.792		0.021	50.278	20, 5	J
	1.384		-0.592	49.686	0, 10	K
	1.455		-0.071	49.615	5, 10	L
	1.425		0.030	49.645	10, 10	M
	1.385		0.040	49.685	15, 10	N
	1.265		0.120	49.805	20, 10	O
	1.750		-0.485	49.320	0, 15	P
	1.810		-0.060	49.260	5, 15	Q
	1.825		-0.015	49.245	10, 15	R
	1.800		0.025	49.270	15, 15	S
	1.715		0.085	49.355	20, 15	T
	2.310		-0.595	48.760	0, 20	U
	2.410		-0.100	48.660	5, 20	V
	2.330		0.080	48.740	10, 20	W
	2.250		0.080	48.820	15, 20	X
	2.230		0.020	48.840	20, 20	Y
		1.070	1.160	50.000		TBM
CHECKS:		0.000	0.000	0.000		