Qualification Specification

ProQual Level 5 Diploma in Construction Materials Technology

ProQual Level 5 Diploma in Construction Materials Technology

This qualification is part of ProQual's broad offer of qualifications in the Construction Sector.

To find out more about other qualifications in this, or any other sector, or for our latest fees; check our Fees Schedule via the QR code below:

Scan Here

Contents

Introduction

The ProQual Level 5 Diploma in Construction Materials Technology provides a nationally recognised qualification for technicians and practitioners working in construction materials testing, ground investigation, and geotechnical site work. It supports those seeking to build advanced technical knowledge and practical skills in materials analysis and construction testing environments.

The aims of this qualification are:

- To enhance technical and supervisory capabilities in construction materials testing and geotechnical investigation.
- To develop competence in the planning, execution, and reporting of advanced laboratory and field testing.
- To support career development within the construction and civil engineering sectors

The awarding body for this qualification is ProQual AB. This qualification has been approved for delivery in England. The regulatory body for this qualification is Ofqual, and this qualification has been accredited onto the Regulated Qualification Framework (RQF) and has been published in Ofqual's Register of Qualifications.

Qualification Profile

Qualification Title:	Level 5 Diploma in Construction Materials Technology
Qualification Number:	610/6899/8
Level:	5
Total Qualification Time (TQT):	780
Guided Learning Hours (GLH):	440
Assessment:	Pass/Fail
	Internally assessed and verified by centre staff
	Externally quality assured by ProQual verifiers
Qualification Start Date:	15/01/2026
Qualification Review Date:	15/01/2029

Learner Profile

Candidates who complete this qualification should hold:

- Level 3 Diploma in Construction Materials Technology.

OR

- Have successfully completed a Class 2 ME Construction Materials Technician course or equivalent qualification.

Centres should carry out an initial assessment of candidate skills and knowledge to identify any gaps and help plan the assessment.

Qualification Structure

This qualification consists of **7** mandatory units. Candidates must complete all mandatory units to complete this qualification.

Unit Number	Unit Title	Level	TQT	GLH
Mandatory Units – Candidates must complete **all** units in this group.				
D/651/8964	Planning and Managing CMT Operations	5	115	60
F/651/8965	Ground Investigation and Contamination Assessment	5	120	70
H/651/8966	Geotechnical Testing and Advanced Site Assessments	5	115	65
J/651/8967	Advanced Concrete Technology and Mix Design	5	100	50
K/651/8968	Operation, Testing, and Maintenance of CMT Equipment and Systems	5	100	55
L/651/8969	Quality Control and Engineering in CMT	5	100	60
T/651/8970	Construction Materials Design and Engineering Studies	5	130	80

Centre Requirements

Centres must be approved to deliver this qualification. If your centre is not approved to deliver this qualification, please complete and submit the **ProQual Additional Qualification Approval Form.**

Materials produced by centres to support candidates should:

- Enable them to track their achievements as they progress through the learning outcomes and assessment criteria.
- Provide information on where ProQual's policies and procedures can be viewed.
- Provide a means of enabling Internal and External Quality Assurance staff to authenticate evidence.

Centres must have the appropriate equipment to enable candidates to carry out the practical requirements of this qualification.

Certification

Candidates who achieve the requirements for this qualification will be awarded:

- A certificate listing all units achieved, and
- A certificate giving the full qualification title:

ProQual Level 5 Diploma in Construction Materials Technology

Claiming certificates

Centres may claim certificates for candidates who have been registered with ProQual and who have successfully achieved the qualification. All certificates will be issued to the centre for successful candidates.

Unit certificates

If a candidate does not achieve all of the units required for a qualification, the centre may claim a unit certificate for the candidate which will list all of the units achieved.

Replacement certificates

If a replacement certificate is required a request must be made to ProQual in writing. Replacement certificates are labelled as such and are only provided when the claim has been authenticated. Refer to the Fee Schedule for details of charges for replacement.

Assessment Requirements

Each candidate is required to produce a portfolio of evidence which demonstrates their achievement of all of the learning outcomes and assessment criteria for each unit.

Evidence can include:

- Observation report by assessor.
- Assignments/projects/reports.
- Professional discussion.
- Witness testimony.
- Candidate product.
- Worksheets.
- Knowledge tests.
- Photographic and/or video evidence of the candidate's practical work.
- Record of oral and written questioning.
- Candidate reflection on own practical work.
- Recognition of Prior Learning.

Candidates must demonstrate the level of competence described in the units. Assessment is the process of measuring a candidate's skill, knowledge and understanding against the standards set in the qualification.

An observation report and witness testimony are differentiated as follows:

- An **assessor's report** is completed by a qualified assessor who observes the candidate carrying out practical work. The assessor will make assessment decisions as they observe and record these in the report, alongside a commentary of what they observe.
- A **witness statement** is completed by a suitably qualified or experienced expert who observes the candidate carrying out practical work. The witness statement will contain **only** a commentary of what has been observed. An assessor must then use the witness statement, alongside any additional evidence to make assessment decisions.
- In all cases, an assessor's report is preferred as evidence over a witness statement as it is always better for an assessor to observe a candidate live.

Assessors may wish use to use a checklist or evidence matrix to organise and track the assessment outcomes that have been achieved, but these **do not,** in themselves, constitute evidence of achievement.

An assessor's report or witness statement alone is unlikely to be sufficient evidence of achievement. Reports and statements should always be accompanied by photographic and/or video evidence.

Where a knowledge-based assessment criteria is included within an otherwise competence-based learning outcome, it is expected that it be assessed within the context of the required practical competency.

A single piece of evidence may be used to cover multiple assessment criteria.

Evidence of practical skills may be demonstrated in a simulated environment, where appropriate.

Centre staff assessing this qualification must be **occupationally competent** and qualified to make assessment decisions. Assessors who are suitably qualified may hold a qualification such as, but not limited to:

- ProQual Level 3 Certificate in Teaching, Training and Assessment.
- ProQual Level 3 Award in Education and Training.
- ProQual Level 3 Award in Assessing Competence in the Work Environment.
- ProQual Level 3 Award in Assessing Vocational Achievement.

Candidate portfolios must be internally verified by centre staff who are **occupationally knowledgeable** and qualified to make quality assurance decisions. Internal verifiers who are suitably qualified may hold a qualification such as:

- ProQual Level 4 Award in the Internal QA of Assessment Processes and Practice.
- ProQual Level 4 Certificate in Leading the Internal QA of Assessment Processes and Practice.

Occupationally competent means capable of carrying out the full requirements contained within a unit. **Occupationally knowledgeable** means possessing relevant knowledge and understanding.

Enquiries, Appeals and Adjustments

Adjustments to standard assessment arrangements are made on the individual needs of candidates. ProQual's Reasonable Adjustments Policy and Special Consideration Policy sets out the steps to follow when implementing reasonable adjustments and special considerations and the service that ProQual provides for some of these arrangements.

Centres should contact ProQual for further information or queries about the contents of the policy.

All enquiries relating to assessment or other decisions should be dealt with by centres, with reference to ProQual's Enquiries and Appeals Procedures.

Units – Learning Outcomes and Assessment Criteria

Title:	Planning and Managing CMT Operations			Level:	5
Unit Number:	D/651/8964	TQT:	115	GLH:	60

Learning Outcomes *The learner will be able to:*		Assessment Criteria *The learner can:*	
1	Understand project and contract management principles in a military construction context.	1.1	Explain the key stages of project management and how tools are used to plan and monitor progress.
		1.2	Identify roles and responsibilities of personnel involved in the delivery of a CMT project.
		1.3	Explain the commercial processes and contractual considerations relevant to CMT operations.
		1.4	Interpret project plans in relation to: • Time. • Resource. • Logistical constraint.
		1.5	Analyse the benefits of applying project management approaches within CMT operations.
2	Apply mathematical techniques to support technical planning and decision-making in CMT operations.	2.1	Apply arithmetic, algebraic techniques, and formulae to solve technical CMT problems including: • Forces. • Areas. • Volumes. • Moment.
		2.2	Apply SI units and mathematical models to analyse forces and material behaviours in construction.

2	*Continued*	2.3	Interpret data through the collection and construction of graphs to support decision-making.
		2.4	Demonstrate how to evaluate, rearrange, and transpose formulas in a CMT context.
3	Utilise digital tools and documentation systems to plan and manage CMT operations effectively.	3.1	Apply advanced word processing and spreadsheet tools to develop professional project documentation and support resource management decisions.
		3.2	Demonstrate planning and scheduling techniques to optimise project flow and meet task tolerances.
		3.3	Apply appropriate methods to estimate and present resource requirements for complex projects.
		3.4	Utilise scheduling platforms to coordinate communication and monitor task progress effectively in CMT operations.
4	Apply supervisory and leadership skills to manage personnel, timelines, and quality in CMT projects.	4.1	Demonstrate time management techniques to set and coordinate realistic task timescales in CMT projects.
		4.2	Apply supervisory methods to enhance task quality and multi-trade team performance.
		4.3	Provide technical guidance to other CMT personnel in line with project needs.
		4.4	Explain key qualities of effective supervisors within CMT contexts.
5	Manage and supervise CMT laboratory operations and personnel within health, safety and professional boundaries.	5.1	Supervise and schedule laboratory operations to meet testing requirements.
		5.2	Apply health and safety procedures relevant to laboratory testing and equipment use.
		5.3	Monitor the completion and administration of laboratory documentation.
		5.4	Identify the capabilities and limitations of CMT technicians under supervision.
		5.5	Advise senior personnel on technician competence, training needs, and qualifications.

Additional Assessment Information

The aim of this unit is to equip learners to plan and manage key aspects of Construction Materials Testing (CMT) operations, including project management, technical calculations, and supervisory responsibilities. It covers contractual considerations, digital documentation, and laboratory oversight, with a focus on safety, quality, and operational efficiency.

Learning Outcome 1 is **knowledge based**. This means that candidate evidence is expected to take the form of candidate's written work and/or records of appropriate professional discussions.

Learning Outcome 2, 3, 4 and 5 are **competency based**. This means that the candidate is expected to perform the tasks, and demonstrate the level of competence, outlined in the assessment criteria.

Title:	Ground Investigation and Contamination Assessment			**Level:**	5
Unit Number:	F/651/8965	**TQT:**	120	**GLH:**	70

Learning Outcomes *The learner will be able to:*		**Assessment Criteria** *The learner can:*	
1	Understand the principles and planning of ground investigation.	1.1	Explain the purpose and scope of ground investigation and its application to different engineering works.
		1.2	Describe factors influencing ground investigation planning, including: • Geotechnical parameters. • Health and safety. • Site constraints.
		1.3	Compare investigation requirements for new, existing, and defective works.
		1.4	Outline the methods for assessing potential sources of construction materials.
		1.5	Discuss the use, advantages, and limitations of integrating different ground investigation techniques.
		1.6	Identify how planning considerations affect the design of a ground investigation strategy, including: • Receptors. • Hazards. • Contaminants. • Survey risks.
2	Carry out intrusive sampling and ground profiling activities.	2.1	Identify the principles, planning steps, and constraints related to intrusive sampling and ground profiling.
		2.2	Implement suitable mechanical and field techniques to obtain accurate soil and rock samples for analysis.
		2.3	Conduct ground profiling activities (e.g., soil resistivity survey) using suitable techniques and safe working practices.

2	*Continued*	2.4	Document field observations and profiling data using appropriate technical formats.
		2.5	Evaluate field results in relation to site conditions and task requirements.
3	Apply in-situ field testing techniques for site characterisation.	3.1	Identify the principles of in-situ resistivity and seismic soil testing.
		3.2	Identify the equipment, setup, and procedures for in-situ field testing.
		3.3	Conduct in-situ resistivity and seismic testing using standard procedures.
		3.4	Identify factors influencing field test results.
		3.5	Apply calculation techniques to evaluate and interpret field test results.
		3.6	Document in-situ field test findings using appropriate reporting methods and formats.
4	Assess the engineering suitability of in-situ materials.	4.1	Identify types and potential uses of in-situ construction materials.
		4.2	Evaluate in-situ materials for construction suitability based on field identification and testing.
		4.3	Estimate material availability and site accessibility considerations.
		4.4	Document material assessment outcomes using appropriate formats and standards.
5	Conduct ground contamination investigations.	5.1	Prepare for a ground contamination investigation, including: • Permissions. • Planning. • Safety documentation.
		5.2	Conduct preliminary investigation activities such as: • Desk studies. • Site reconnaissance. • Identification of potential hazards.
		5.3	Apply field sampling methods for soil, water, and gas using recognised safety and contamination control procedures.

5	*Continued*	5.4	Organise data from site investigations and field observations for effective analysis and reporting.
		5.5	Evaluate site findings to assess initial contamination risk based on observed conditions and collected data.
6	Apply detailed techniques to investigate contaminated land and groundwater.	6.1	Implement advanced intrusive and non-intrusive sampling strategies, including: • Boreholes. • Dynamic methods. • Geophysical.
		6.2	Apply appropriate groundwater sampling and monitoring methods based on site conditions and project requirements
		6.3	Evaluate contamination data using statistical and risk-based methods to derive robust interpretations and insights.
		6.4	Evaluate contamination migration, attenuation, and site-specific characteristics.
		6.5	Prepare reports and documentation aligned with contamination investigation standards, including: • Conceptual models. • Remediation recommendations.
7	Interpret and report ground investigation and contamination data.	7.1	Consolidate data from intrusive, non-intrusive, and contamination investigations into a coherent and structured format.
		7.2	Interpret test results using appropriate analytical and statistical methods.
		7.3	Identify patterns, anomalies, or inconsistencies within and between data sets.
		7.4	Evaluate site risks and material suitability based on integrated investigation findings.
		7.5	Formulate conclusions aligned with design requirements and environmental constraints.
		7.6	Prepare a technical report communicating findings using standard geotechnical and environmental reporting conventions.

Additional Assessment Information

The aim of this unit is to equip learners with the knowledge and technical skills required to plan, conduct, and report on ground investigation and contamination assessment activities. It covers the principles of intrusive and non-intrusive site investigations, field sampling techniques, in-situ testing, and contamination analysis.

Learners will develop competency in selecting appropriate investigation methods, evaluating geotechnical and contamination data, and applying industry-standard procedures for data interpretation and reporting. Emphasis is placed on health and safety, regulatory compliance, and integration of investigation findings to inform engineering decisions.

This unit supports learners in applying structured methodologies to assess ground conditions and material suitability, with a focus on environmental risk, construction feasibility, and remediation planning where required.

Learning Outcome 1 is **knowledge based**. This means that candidate evidence is expected to take the form of candidate's written work and/or records of appropriate professional discussions.

Learning Outcome 2, 3, 4, 5, 6 and 7 are **competency based**. This means that the candidate is expected to perform the tasks, and demonstrate the level of competence, outlined in the assessment criteria.

Title:	Geotechnical Testing and Advanced Assessments			Level:	5
Unit Number:	H/651/8966	TQT:	115	GLH:	65

Learning Outcomes *The learner will be able to:*		Assessment Criteria *The learner can:*	
1	Establish and interpret chemical analysis of soils and aggregates.	1.1	Evaluate the purpose of chemical testing in geotechnical investigations.
		1.2	Identify and use equipment and reagents for soil and aggregate chemical testing.
		1.3	Conduct appropriate chemical tests safely on: • Organic content. • Sulphates. • Chlorides. • Dissolved solids.
		1.4	Analyse and interpret test results using appropriate methods.
		1.5	Communicate test outcomes using appropriate engineering documentation.
2	Conduct and report laboratory permeability, consolidation, and compressibility tests.	2.1	Identify and set up equipment for permeability, consolidation, and durability testing.
		2.2	Prepare and test samples using triaxial, hydraulic, and relevant lab methods.
		2.3	Analyse permeability, collapse, and durability parameters against standards.
		2.4	Communicate findings to inform engineering and design decisions.
3	Determine soil shear strength using field and laboratory testing.	3.1	Evaluate shear strength principles and engineering applications.
		3.2	Identify procedures for a range of tests, for example: • Unconfined compression. • Vane. • Shear box. • Triaxial.

3	*Continued*	3.3	Conduct strength testing safely and accurately.
		3.4	Analyse data and determine shear stress values.
		3.5	Present results effectively for design and engineering application.
4	Conduct and interpret in-situ permeability and groundwater testing.	4.1	Explain the purpose and principles of in-situ permeability testing.
		4.2	Identify and set up appropriate field test procedures.
		4.3	Conduct field permeability tests (e.g., borehole soak).
		4.4	Accurately record and verify results accurately.
		4.5	Interpret and report findings with reference to site conditions.
5	Carry out in-situ ground bearing capacity testing.	5.1	Evaluate the principles and requirements for plate bearing tests.
		5.2	Plan, prepare, and conduct safe in-situ tests.
		5.3	Calculate subgrade strength and bearing values.
		5.4	Interpret test results, ensuring accuracy and verification.
		5.5	Prepare and communicate reports.
6	Perform and report Standard Penetration Tests (SPT).	6.1	Evaluate the purpose and process of SPT and its engineering applications.
		6.2	Conduct SPTs safely.
		6.3	Apply corrective factors and present data graphically.
		6.4	Communicate results to meet geotechnical design needs.
7	Apply advanced geotechnical testing methods for complex site conditions.	7.1	Select appropriate advanced testing methods based on task requirements.
		7.2	Conduct advanced lab or field tests, including: • Shear. • Well. • Dispersibility. • Frost heave testing.

7	*Continued*	7.3	Analyse test data for comparison with design requirements.
		7.4	Communicate verified and advanced test data to engineers.

Additional Assessment Information

This unit provides learners with the technical knowledge and applied skills required to carry out and report on advanced geotechnical testing activities in both laboratory and field environments. It covers chemical and physical analysis of soils and aggregates, including shear strength, permeability, compressibility, and bearing capacity testing. Learners will prepare and conduct a range of standard and advanced tests - such as triaxial, SPT, and in-situ plate bearing - while ensuring safe practice and accurate data handling. The unit emphasises the interpretation of test results in relation to engineering standards and site-specific conditions, supporting informed design decisions.

Learners will also develop the ability to communicate findings using professional documentation, bridging technical testing with geotechnical reporting and engineering application.

All Learning Outcomes are **competency based**. This means that the candidate is expected to perform the tasks, and demonstrate the level of competence, outlined in the assessment criteria.

Title:	Advanced Concrete Technology and Mix Design			Level:	5
Unit Number:	J/651/8967	TQT:	100	GLH:	50

Learning Outcomes *The learner will be able to:*		Assessment Criteria *The learner can:*	
1	Understand the design parameters and performance criteria for concrete mixes.	1.1	Explain the design parameters that guide concrete specifications.
		1.2	Describe the engineering properties relevant to concrete performance.
		1.3	Identify material requirements and mix proportioning criteria for specific applications.
		1.4	Evaluate risks associated with concrete mix design decisions.
2	Understand the quality and compliance requirements for concrete mixes.	2.1	Identify acceptance testing methods used to assess mix compliance.
		2.2	Explain quality assurance processes used throughout the concrete mix lifecycle.
		2.3	Interpret the concrete mix specification requirements in context of project demands.
		2.4	Discuss the responsibilities of CMT personnel in concrete specification and quality control.
3	Understand production processes and the impact on concrete mix design and execution.	3.1	Describe factors that influence concrete mix production processes.
		3.2	Describe how production elements affect final performance, including • Curing. • Placement. • Mixing. • Quality control testing.
		3.3	Identify links between production considerations and specification compliance.

4	Understand and apply statistical analysis techniques to evaluate concrete test data.	4.1	Explain the purpose and importance of statistical analysis in concrete mix evaluation.
		4.2	Interpret trial mix and production test data to assess concrete performance.
		4.3	Apply statistical methods to identify trends, variations, and compliance in concrete test results.
		4.4	Communicate findings using suitable analytical tools and formats.
		4.5	Formulate engineering actions based on data interpretation, especially in cases of non-compliance.
5	Understand and compare concrete mix types and their applications.	5.1	Identify the design characteristics of concrete mixes, including • Standard. • Prescribed. • Designed. • Designated mixes.
		5.2	Identify the mix constituents of concrete mixes.
		5.3	Identify the design requirements associated with each mix type.
		5.4	Analyse different concrete mix types in terms of their applications, performance and environmental suitability.
6	Communicate and document concrete mix designs.	6.1	Express mix design information using appropriate terminology, structure, and documentation formats.
		6.2	Analyse key elements of concrete mix specifications.
		6.3	Evaluate and address issues relating to incomplete, incorrect, or non-standard mix documentation.
7	Produce and justify concrete mix specifications.	7.1	Produce concrete mix specification documents for: • Standard. • Prescribed. • Designed. • Designated mixes.

7	*Continued*	7.2	Recommend mix specifications in response to performance data or site requirements.
		7.3	Justify specification decisions with reference to technical data, safety, or compliance factors.

Additional Assessment Information

The aim of this unit is to equip learners with the advanced knowledge and applied skills required to design, assess, and document concrete mixes for a range of engineering applications. It covers the principles of concrete performance, specification design, and quality compliance, with an emphasis on production variables, material properties, and mix optimisation.

Learners will develop the ability to evaluate engineering and environmental requirements, apply statistical analysis to test data, and produce mix specifications that align with industry standards and project demands. The unit also supports learners in resolving technical documentation issues and clearly communicating design decisions, ensuring quality and performance throughout the concrete lifecycle.

Learning Outcome 1, 2, 3, and 5 are **knowledge based**. This means that candidate evidence is expected to take the form of candidate's written work and/or records of appropriate professional discussions.

Learning Outcome 4, 6 and 7 are **competency based**. This means that the candidate is expected to perform the tasks, and demonstrate the level of competence, outlined in the assessment criteria.

Title:	Operation, Testing and Maintenance of CMT Equipment and Systems			Level:	5
Unit Number:	K/651/8968	TQT:	100	GLH:	55

Learning Outcomes *The learner will be able to:*		Assessment Criteria *The learner can:*	
1	Understand and identify specialist equipment and consumables used in construction and geotechnical testing.	1.1	Identify key components, controls, and user checks for geotechnical and aggregate testing equipment.
		1.2	Explain the operational principles and capabilities of geotechnical and material testing equipment.
		1.3	Identify application-specific consumables used in construction materials testing and related activities.
2	Understand how to establish the configuration and operational systems of mechanical drilling rigs and trailers.	2.1	Identify the limitations, capabilities, and safety features of drilling units.
		2.2	Describe the function and layout of rig systems including: • Automotive. • Electrical. • Hydraulic. • Control systems.
		2.3	Identify the bodywork, undercarriage, and trailer components, including • Braking. • Chassis. • Meters. • Lighting systems.
		2.4	Explain the purpose and use of: • Drilling equipment schedules. • Gauges. • Indicators. • Alarms. • Decals.

2	*Continued*	2.5	State general engineering principles as applied to drill rig configuration and performance.
3	Maintain and inspect drilling rigs and associated equipment in accordance with operational requirements.	3.1	Implement pre- and post-use rig preparation and reinstatement procedures.
		3.2	Conduct routine maintenance on hydraulic, engine, and running systems.
		3.3	Manage rigs operations during tasks, following operational procedure and safety protocols.
		3.4	Identify operator maintenance responsibilities and schedules.
		3.5	Inspect electrical systems and drilling components for function and safety.
		3.6	Apply appropriate lubrication procedures for key drilling rig systems.
4	Set up and operate drilling rigs for soil and rock sampling operations.	4.1	Prepare site and equipment for drilling.
		4.2	Identify key rig controls, components, and pre-use checks.
		4.3	Operate the drill rig and related systems in accordance with safety procedures.
		4.4	Describe drill trailer operations and site mobilisation procedures.
		4.5	Evaluate how to assess hazards and implement safe working procedures.
		4.6	Remotely operate the rig when required by site conditions, safety protocols, or operational needs.
5	Apply drilling techniques to extract and sample soil and rock materials.	5.1	Select appropriate drilling and sampling methods for site conditions.
		5.2	Follow procedures for sample recovery and post-drilling activities.
		5.3	Maintain drill rig systems during sampling operations.
		5.4	Evaluate how soil and rock types influence drilling method selection.
		5.5	Handle, clearly label, and store samples to maintain their 'integrity'.

6	Record and report technical data from drilling operations.	6.1	Document drilling performance and sample data accurately.
		6.2	Interpret drill log and extracted core/sampling data.
		6.3	Identify common issues affecting data quality during drilling operations.
		6.4	Describe communication protocols for reporting anomalies or drilling issues.
7	Operate, maintain, and interpret data from HWD pavement testing systems.	7.1	Assess the function, components, and system layout of HWD units.
		7.2	Identify and carry out HWD setup, pre-use checks, and site preparation.
		7.3	Operate the HWD and perform pavement deflection testing in accordance with procedures.
		7.4	Maintain HWD equipment during and after testing task.
		7.5	Apply safety protocols, PPE, and hazard controls during HWD operations.
		7.6	Analyse and transfer HWD test data accurately using standard formats.

Additional Assessment Information

The aim of this unit is to equip learners with the technical skills and knowledge required to operate, maintain, and manage Construction Materials Testing (CMT) equipment and systems used in geotechnical and pavement investigations. It covers the identification and configuration of specialist equipment, mechanical drilling rigs, and HWD systems, with a strong focus on operational safety, system integrity, and performance efficiency.

Learners will develop practical competencies in equipment maintenance, rig operation, and sampling methods for soil and rock materials, while also learning to document, interpret, and report technical data from both field and laboratory activities.

The unit emphasises accurate data handling, adherence to safety protocols, and compliance with engineering principles and industry standards. Through this unit, learners will build the capability to support complex site investigations and quality control procedures in both military and civilian construction environments.

Learning Outcome 1 and 2 are **knowledge based**. This means that candidate evidence is expected to take the form of candidate's written work and/or records of appropriate professional discussions.

Learning Outcome 3, 4, 5, 6 and 7 are **competency based**. This means that the candidate is expected to perform the tasks, and demonstrate the level of competence, outlined in the assessment criteria.

Title:	Quality Control and Engineering in CMT			Level:	5
Unit Number:	L/651/8969	TQT:	100	GLH:	60

Learning Outcomes *The learner will be able to:*		Assessment Criteria *The learner can:*	
1	Understand and apply the requirements, principles and standards for quality control.	1.1	Describe the key components of a CMT quality assurance strategy.
		1.2	Explain how quality control principles apply to field testing and sampling.
		1.3	Interpret relevant technical standards for CMT operations.
		1.4	Identify codes of practice relevant to CMT quality control.
		1.5	Evaluate quality control responsibilities for remedial works.
2	Apply quality control procedures in material testing and site operations.	2.1	Apply quality control to trade and testing activities.
		2.2	Interpret technical drawings and documentation to ensure quality.
		2.3	Apply quality control activities to ensure they comply with health and safety standards.
		2.4	Select and use appropriate tools, equipment, and materials.
		2.5	Contribute to quality control tests for remedial activities.
3	Establish appropriate methods for reporting geotechnical and material test data.	3.1	Analyse computerised geotechnical and material test data for use in reports.
		3.2	Present data clearly using accepted reporting formats.
		3.3	Communicate technical findings from geophysical data.
		3.4	Convert ground information into structured digital formats.

3	*Continued*	3.5	Develop reports using digital tools and structured test data.
4	Identity and interpret the key components of technical reports in ground investigation and material testing.	4.1	Identify the content and purpose of preliminary and field ground investigation reports.
		4.2	Explain the structure and reporting requirements for contaminated ground data.
		4.3	Analyse material test data in line with documentation and recording standards.
5	Produce technical reports based on ground investigation data.	5.1	Compile preliminary and field reports that meet project needs.
		5.2	Present geophysical and geotechnical findings clearly using diagrams and models.
		5.3	Evaluate summarised investigation results to inform decision making.

Additional Assessment Information

This unit equips learners with the knowledge and practical skills to implement, monitor, and maintain quality assurance systems within Construction Materials Testing (CMT). The unit emphasises the use of digital tools for data analysis and reporting, supporting the clear communication of complex engineering information. It bridges site-based testing with formal documentation practices, ensuring learners can translate on-site observations into actionable engineering outputs that meet industry and regulatory standards.

Learners will interpret and apply technical standards, integrate quality control procedures into field and laboratory activities, and produce accurate, well-structured reports based on material testing and ground investigation data.

Learning Outcome 1 and 4 are **knowledge based**. This means that candidate evidence is expected to take the form of candidate's written work and/or records of appropriate professional discussions.

Learning Outcome 2, 3 and 5 are **competency based**. This means that the candidate is expected to perform the tasks, and demonstrate the level of competence, outlined in the assessment criteria.

Title:	Construction Material Design and Engineering Studies			Level:	5
Unit Number:	T/651/8970	TQT:	130	GLH:	80

Learning Outcomes *The learner will be able to:*		Assessment Criteria *The learner can:*	
1	Describe the properties and behaviour of key construction materials.	1.1	Identify common construction materials and their engineering uses.
		1.2	Explain the factors influencing the mechanical performance of soils, aggregates, binders, and composites.
		1.3	Specify material types according to relevant standards or procedures.
2	Explain the principles and techniques of soil stabilisation.	2.1	Explain soil stabilisation and its engineering purposes.
		2.2	Compare treatment methods based on soil analysis for: • Lime. • Cement. • Mechanical. • Bitumen-based stabilisation.
		2.3	Describe the factors affecting stabilisation effectiveness and selection of treatment agents.
3	Conduct soil and material classification tests in the laboratory.	3.1	Apply appropriate techniques to prepare and process untreated and treated soil samples.
		3.2	Implement standard classification tests e.g., plasticity, particle size, moisture content.
		3.3	Apply safe operating procedures and use appropriate equipment.
		3.4	Evaluate the limitations of sources of error in laboratory test results.

4	Conduct laboratory and field testing on construction and stabilised materials.	4.1	Assess the engineering principles behind soil stabilisation and modification.
		4.2	Identify appropriate soil types, treatment agents, and stabilisation methods.
		4.3	Demonstrate the setup and execution of laboratory and field tests on construction and stabilised materials.
		4.4	Implement maintenance and troubleshooting procedures on equipment used in materials and stabilisation testing.
		4.5	Evaluate how stabilisation affects compaction, plasticity, strength, and classification.
		4.6	Analyse results from material and stabilisation tests and present findings using standard reporting formats.
		4.7	Apply quality control and safety procedures during testing activities.
5	Perform in-situ field tests and interpret results.	5.1	Conduct field tests such as SPT, moisture-density testing, and compaction trials in accordance with standard procedures.
		5.2	Produce field observations accurately using standard procedures.
		5.3	Identify site conditions that may influence test results.
		5.4	Apply correction factors and assess the reliability of field test data under varied site conditions.
6	Analyse and communicate material test data.	6.1	Calculate key test values e.g., plasticity index, compaction parameters, N-values.
		6.2	Compare results to design thresholds and tolerances.
		6.3	Specify findings in formats including: • Tables. • Reports. • Graphical summaries.
		6.4	Identify inconsistencies or outliers in data sets and explain their implications.

6	*Continued*	6.5	Justify material selection or rejection based on analysed results.
7	Evaluate site-specific factors influencing construction material selection.	7.1	Identify risks and constraints from slope geometry, groundwater, and soil types.
		7.2	Assess methods of slope and ground improvement.
		7.3	Evaluate materials suitable for stabilising or reinforcing specific site conditions.
8	Develop material specifications and test plans for roads and infrastructure.	8.1	State test selection criteria based on task and environment.
		8.2	Interpret standards to propose sampling and test plans for road construction.
		8.3	Specify construction materials for pavement applications.
		8.4	Recommend alternative materials or test strategies based on environmental or logistical constraints.
9	Describe military infrastructure design and material performance considerations.	9.1	Identify the components and materials used in military roads and airfields.
		9.2	Explain performance criteria for surfaces under tracked and wheeled vehicle loads.
		9.3	Discuss the design, drainage, and reinforcement needs for temporary and permanent military infrastructure.

Additional Assessment Information

The aim of this unit is to equip learners with the technical knowledge and applied skills required to assess, select, and test construction materials in both laboratory and field settings. It covers the engineering behaviour of key materials, soil stabilisation techniques, and performance evaluation, with a focus on safety, quality control and compliance.

Learners will develop the ability to plan and execute material classification and stabilisation tests, interpret test results using analytical methods, and specify appropriate materials for varied site and infrastructure conditions. The unit also addresses military infrastructure requirements, encouraging learners to evaluate material performance under specialised operational demands

Learning Outcome 1, 2 and 9 are **knowledge based**. This means that candidate evidence is expected to take the form of candidate's written work and/or records of appropriate professional discussions.

Learning Outcome 3, 4, 5, 6, 7 and 8 are **competency based**. This means that the candidate is expected to perform the tasks, and demonstrate the level of competence, outlined in the assessment criteria.

Appendix One – Command Verb Definitions

The table below explains what is expected from each **command verb** used in an assessment objective. Not all verbs are used in this specification

Apply	Use existing knowledge or skills in a new or different context.
Analyse	Break a larger subject into smaller parts, examine them in detail and show how these parts are related to each other. This may be supported by reference to current research or theories.
Classify	Organise information according to specific criteria.
Compare	Examine subjects in detail, giving the similarities and differences.
Critically Compare	As with compare, but extended to include pros and cons of the subject. There may or may not be a conclusion or recommendation as appropriate.
Describe	Provide detailed, factual information about a subject.
Discuss	Give a detailed account of a subject, including a range of contrasting views and opinions.
Explain	As with describe, but extended to include causation and reasoning.
Identify	Select or ascertain appropriate information and details from a broader range of information or data.
Interpret	Use information or data to clarify or explain something.
Produce	Make or create something.
State	Give short, factual information about something.
Specify	State a fact or requirement clearly and in precise detail.

ProQual Awarding Body
ProQual House
Unit 1, Innovation Drive
Newport, Brough
HU15 2GX

Tel: 01430 423 822
enquiries@proqualab.com
www.proqualab.com