Level 2 NVQ Diploma in Tunnelling Operations (Construction)

Qualification Specification

Contents

Introduction

The ProQual Level 2 NVQ Diploma in Tunnelling Operations (Construction) qualification provides a nationally recognised qualification for those working in the construction and the built environment sector working across a broad range of areas. It is designed to assess occupational competence in the workplace where candidates are required to demonstrate skills and knowledge to a level required in the construction industry. There are 11 specialist pathways:

Pathway 1 – Hand Miner
Pathway 2 – Shaft Miner
Pathway 3 – Tunnelling Machine Operator
Pathway 4 – Machine Tunnelling Operative
Pathway 5 – Spoil Removal Conveyor Operative
Pathway 6 – Tunnelling Operative
Pathway 7 – Tunnel Fitter's or Tunnel Electrician's Mate
Pathway 8 – Sprayed Concrete Lining Tunnelling Nozzleman
Pathway 9 – Pipejacking or Micro-Tunnelling Operative
Pathway 10 – Separation Plant Operative
Pathway 11 – Tunnel Transport Operator

#The awarding body for this qualification is ProQual Awarding Body (www.proqualab.com) and the regulatory body is the Office of Qualifications and Examinations Regulation (Ofqual); It is also endorsed by the sector body for construction - CITB.

The qualification has been accredited onto the Regulated Qualifications Framework (RQF) and is published on Ofqual's Register of Qualifications.

Qualification Profile
Level 2 NVQ Diploma in Tunnelling Operations (Construction)

Qualification title	**ProQual Level 2 NVQ Diploma in Tunnelling Operations (Construction)**
Ofqual qualification number	603/0339/6
Level	2
Total Qualification Time	340 - 1470 hours (174 – 691 GLH)
Assessment	Pass or fail Internally assessed and verified by centre staff External quality assurance by ProQual verifiers
Qualification start date	29/08/16
Qualification end date	

Entry Requirements

There are no formal entry requirements for this qualification.

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

Qualification Structure

To achieve the qualification candidates must complete the three Mandatory units for all of the Pathways plus the required Mandatory Units from one of the Pathways.

Candidates may undertake the Additional Units relevant to their choice of pathway, but these will not count towards the qualification.

CITB references and credit values are provided in this document for information only.

Mandatory units for all Pathways (this information is also included in the details for each of the Pathways from page 6).

Mandatory Units for all Pathways			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
M/508/6537	Conforming to general health, safety and welfare in the workplace	1	*641*
T/508/6538	Conforming to productive working practices in the workplace	2	*642*
Y/508/6533	Moving, handling and storing resources in the workplace	2	*643*

Pathways

There are 11 Pathways, the Mandatory requirements for each are listed on the following pages.

Pathway 1 – Hand Miner
Pathway 2 – Shaft Miner
Pathway 3 – Tunnelling Machine Operator
Pathway 4 – Machine Tunnelling Operative
Pathway 5 – Spoil Removal Conveyor Operative
Pathway 6 – Tunnelling Operative
Pathway 7 – Tunnel Fitter's or Tunnel Electrician's Mate
Pathway 8 – Sprayed Concrete Lining Tunnelling Nozzleman
Pathway 9 – Pipejacking or Micro-Tunnelling Operative
Pathway 10 – Separation Plant Operative
Pathway 11 – Tunnel Transport Operator

Pathway 1 : Hand Miner

Candidates must complete 5 Mandatory units.

Mandatory Units			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
M/508/6537	Conforming to general health, safety and welfare in the workplace	1	*641*
T/508/6538	Conforming to productive working practices in the workplace	2	*642*
Y/508/6533	Moving, handling and storing resources in the workplace	2	*643*
K/615/1945	Building temporary or permanent tunnel linings in the workplace	2	*175v2*
M/615/1946	Excavating and profiling tunnels in the workplace	2	*177v2*

Pathway 2 : Shaft Miner

Candidates must complete 4 Mandatory units.

Mandatory Units			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
M/508/6537	Conforming to general health, safety and welfare in the workplace	1	*641*
T/508/6538	Conforming to productive working practices in the workplace	2	*642*
Y/508/6533	Moving, handling and storing resources in the workplace	2	*643*
T/615/1947	Constructing shafts for tunnelling operations in the workplace	2	*178v2*

Pathway 3 : Tunnelling Machine Operator

Candidates must complete 5 Mandatory units.

Mandatory Units			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
M/508/6537	Conforming to general health, safety and welfare in the workplace	1	*641*
T/508/6538	Conforming to productive working practices in the workplace	2	*642*
Y/508/6533	Moving, handling and storing resources in the workplace	2	*643*
M/615/1946	Excavating and profiling tunnels in the workplace	2	*177v2*
A/615/1948	Preparing and operating specialist tunnelling plant to form tunnels in the workplace	2	*390Tv4*

Pathway 4 : Machine Tunnelling Operative

Candidates must complete 6 Mandatory units.

Mandatory Units			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
M/508/6537	Conforming to general health, safety and welfare in the workplace	1	*641*
T/508/6538	Conforming to productive working practices in the workplace	2	*642*
Y/508/6533	Moving, handling and storing resources in the workplace	2	*643*
F/615/1949	Installing tunnelling services in the workplace	2	*174v2*
K/615/1945	Building temporary or permanent tunnel linings in the workplace	2	*175v2*
A/508/6587	Preparing and operating powered units, tools or pedestrian plant, machinery or equipment in the workplace	2	*400v2*

Pathway 5 : Spoil Removal Conveyor Operative

Candidates must complete 6 Mandatory units.

Mandatory Units			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
M/508/6537	Conforming to general health, safety and welfare in the workplace	1	*641*
T/508/6538	Conforming to productive working practices in the workplace	2	*642*
Y/508/6533	Moving, handling and storing resources in the workplace	2	*643*
F/615/1949	Installing tunnelling services in the workplace	2	*174v2*
T/615/1950	Operating spoil removal conveyor in the workplace	2	*176v2*
T/508/6524	Preparing to and directing and guiding the movement of vehicles, plant or machinery in the workplace	2	*396Cv1*

Pathway 6 : Tunnelling Operative

Candidates must complete 6 Mandatory units.

Mandatory Units			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
M/508/6537	Conforming to general health, safety and welfare in the workplace	1	*641*
T/508/6538	Conforming to productive working practices in the workplace	2	*642*
Y/508/6533	Moving, handling and storing resources in the workplace	2	*643*
F/615/1949	Installing tunnelling services in the workplace	2	*174v2*
T/508/6524	Preparing to and directing and guiding the movement of vehicles, plant or machinery in the workplace	2	*396Cv1*
A/508/6587	Preparing and operating powered units, tools or pedestrian plant, machinery or equipment in the workplace	2	*400v2*

Pathway 7 : Tunnel Fitter's or Tunnel Electrician's Mate

Candidates must complete 5 Mandatory units.

Mandatory Units			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
M/508/6537	Conforming to general health, safety and welfare in the workplace	1	*641*
T/508/6538	Conforming to productive working practices in the workplace	2	*642*
Y/508/6533	Moving, handling and storing resources in the workplace	2	*643*
F/615/1949	Installing tunnelling services in the workplace	2	*174v2*
A/615/1951	Carrying out routine maintenance of tunnelling plant, machinery and equipment in the workplace	2	*768v1*

Pathway 8 : Sprayed Concrete Lining Tunnelling Nozzleman

Candidates must complete 6 Mandatory units.

Mandatory Units			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
M/508/6537	Conforming to general health, safety and welfare in the workplace	1	*641*
T/508/6538	Conforming to productive working practices in the workplace	2	*642*
Y/508/6533	Moving, handling and storing resources in the workplace	2	*643*
F/615/1952	Preparing substrate for sprayed concrete in the workplace	2	*123v2*
J/615/1953	Applying sprayed concrete in the workplace	2	*124v3*
A/615/1948	Preparing and operating specialist tunnelling plant to form tunnels in the workplace	2	*390Tv4*

Pathway 9 : Pipejacking or Micro-Tunnelling Operative

Candidates must complete 5 Mandatory units.

Mandatory Units			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
M/508/6537	Conforming to general health, safety and welfare in the workplace	1	*641*
T/508/6538	Conforming to productive working practices in the workplace	2	*642*
Y/508/6533	Moving, handling and storing resources in the workplace	2	*643*
F/615/1949	Installing tunnelling services in the workplace	2	*174v2*
R/615/1955	Installing tunnels by pipejacking or micro-tunnelling operations in the workplace	2	*569v2*

Pathway 10 : Separation Plant Operative

Candidates must complete 6 Mandatory units.

Mandatory Units			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
M/508/6537	Conforming to general health, safety and welfare in the workplace	1	*641*
T/508/6538	Conforming to productive working practices in the workplace	2	*642*
Y/508/6533	Moving, handling and storing resources in the workplace	2	*643*
F/615/1949	Installing tunnelling services in the workplace	2	*174v2*
D/615/0114	Carrying out mud, slurry or fluid plant operations in the workplace	2	*233v2*
A/508/6587	Preparing and operating powered units, tools or pedestrian plant, machinery or equipment in the workplace	2	*400v2*

Pathway 11 : Tunnel Transport Operator

Candidates must complete 4 Mandatory units.

Mandatory Units			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
M/508/6537	Conforming to general health, safety and welfare in the workplace	1	*641*
T/508/6538	Conforming to productive working practices in the workplace	2	*642*
Y/508/6533	Moving, handling and storing resources in the workplace	2	*643*
D/615/1957	Preparing and operating specialist plant to receive, transport and discharge materials in a tunnelling environment	2	*391Tv4*

Additional Units

Candidates may complete Additional Units relevant to their choice of Pathway, but these will not count towards the qualification.

Additional Units – Pathways 1 and 2			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
A/615/1948	Preparing and operating specialist tunnelling plant to form tunnels in the workplace	2	*390Tv4*

Additional Units – All Pathways			***CITB reference provided for information only***
Unit Ref.	**Title**	**Level**	*CITB Internal Unit Ref.*
A/508/6525	Slinging and hand signalling the movement of suspended loads in the workplace	2	*402Av1*
H/615/1958	Carrying out structural waterproofing in the workplace	2	*492v2*

Centre Requirements

Centres must be approved to offer this qualification. If your centre is not approved please complete and submit form **ProQual Additional Qualification Approval Application**.

Staff
Staff delivering this qualification must be appropriately qualified and/or occupationally competent.

Assessors/Internal Quality Assurance
Assessors for each unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy.

Assessors and internal quality assurance verifiers for competence-based units or qualifications will normally need to hold appropriate assessor or internal quality assurance qualifications.

Support for Candidates

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

Links to National Standards / NOS mapping

National Occupational Standards (NOS) are owned by a Sector Skills Council or Standard Setting Body and they describe the skills, knowledge and understanding needed to undertake a particular task or job at different levels of competence.

The structure and units of this qualification are based on NOS for the construction sector developed by CITB.

Assessment

This qualification is competence-based, 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.

The qualifications must be assessed in a work environment and in accordance with the ConstructionSkills' Consolidated Assessment Strategy for Construction and the Built Environment, and it must be internally assessed by an appropriately experienced and qualified assessor.

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
- record of oral and written questioning
- Recognition of Prior Learning

Learning outcomes set out what a candidate is expected to know, understand or be able to do.

Assessment criteria specify the standard a candidate must meet to show the learning outcome has been achieved.

Learning outcomes and assessment criteria can be found from page 16.

Additional information for assessment and requirements for unit **endorsements** where relevant is included after all of the learning outcomes and assessment criteria for each unit.

Internal Quality Assurance

An internal quality assurance verifier confirms that assessment decisions made in centres are made by competent and qualified assessors, that they are the result of sound and fair assessment practice and that they are recorded accurately and appropriately.

Adjustments to Assessment

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.

Results Enquiries and Appeals

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

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 -

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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 certificates.

Title:	Conforming to general health, safety and welfare in the workplace.
Unit Number:	M/508/6537

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*	
1 Comply with all workplace health, safety and welfare legislation requirements.	1.1	Comply with information from workplace inductions and any health, safety and welfare briefings attended relevant to the occupational area.
	1.2	Use health and safety control equipment safely to carry out the activity in accordance with legislation and organisational requirements.
	1.3	Comply with statutory requirements, safety notices and warning notices displayed within the workplace and/or on equipment.
	1.4	State why and when health and safety control equipment, identified by the principles of protection, should be used relating to types, purpose and limitations of each type, the work situation, occupational use and the general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV).
	1.5	State how the health and safety control equipment relevant to the work should be used in accordance with the given instructions.
	1.6	State which types of health, safety and welfare legislation, notices and warning signs are relevant to the occupational area and associated equipment.
	1.7	State why health, safety and welfare legislation, notices and warning signs are relevant to the occupational area.
	1.8	State how to comply with control measures that have been identified by risk assessments and safe systems of work.
2 Recognise hazards associated with the workplace that have not been previously controlled and report them in accordance with organisational procedures.	2.1	Report any hazards created by changing circumstances within the workplace in accordance with organisational procedures.
	2.2	List typical hazards associated with the work environment and occupational area in relation to resources, substances, asbestos, equipment, obstructions, storage, services and work activities.
	2.3	List the current Health and Safety Executive top ten safety risks.

Title:	Conforming to general health, safety and welfare in the workplace.
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
2 continued	2.4 List the current Health and Safety Executive top five health risks.
	2.5 State how changing circumstances within the workplace could cause hazards.
	2.6 State the methods used for reporting changed circumstances, hazards and incidents in the workplace.
3 Comply with organisational policies and procedures to contribute to health, safety and welfare.	3.1 Interpret and comply with given instructions to maintain safe systems of work and quality working practices.
	3.2 Contribute to discussions by offering/providing feedback relating to health, safety and welfare.
	3.3 Contribute to the maintenance of workplace welfare facilities in accordance with workplace welfare procedures.
	3.4 Safely store health and safety control equipment in accordance with given instructions.
	3.5 Dispose of waste and/or consumable items in accordance with legislation.
	3.6 State the organisational policies and procedures for health, safety and welfare, in relation to: – dealing with accidents and emergencies associated with the work and environment – methods of receiving or sourcing information – reporting – stopping work – evacuation – fire risks and safe exit procedures – consultation and feedback.
	3.7 State the appropriate types of fire extinguishers relevant to the work.
	3.8 State how and when the different types of fire extinguishers are used in accordance with legislation and official guidance.

Title:	Conforming to general health, safety and welfare in the workplace.

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
4 Work responsibly to contribute to workplace health, safety and welfare whilst carrying out work in the relevant occupational area.	4.1 Demonstrate behaviour which shows personal responsibility for general workplace health, safety and welfare.
	4.2 State how personal behaviour demonstrates responsibility for general workplace health, safety and welfare, in relation to: – recognising when to stop work in the face of serious and imminent danger to self and/or others – contributing to discussions and providing feedback – reporting changed circumstances and incidents in the workplace – complying with the environmental requirements of the workplace.
	4.3 Give examples of how the behaviour and actions of individuals could affect others within the workplace.
5 Comply with and support all organisational security arrangements and approved procedures.	5.1 Provide appropriate support for security arrangements in accordance with approved procedures: – during the working day – on completion of the day's work – for unauthorised personnel (other operatives and the general public) – for theft.
	5.2 State how security arrangements are implemented in relation to the workplace, the general public, site personnel and resources.

Title:	Conforming to general health, safety and welfare in the workplace.
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment, in accordance with the ConstructionSkills' Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated.
Sector Subject Area	05.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	7

Title:	Conforming to productive working practices in the workplace
Unit Number:	T/508/6538

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
1 Communicate with others to establish productive work practices.	1.1 Communicate in an appropriate manner with line management, colleagues and/or customers to ensure that work is carried out productively.
	1.2 Describe the different methods of communicating with line management, colleagues and customers.
	1.3 Describe how to use different methods of communication to ensure that the work carried out is productive.
2 Follow organisational procedures to plan the sequence of work.	2.1 Interpret relevant information from organisational procedures in order to plan the sequence of work.
	2.2 Plan the sequence of work, using appropriate resources, in accordance with organisational procedures to ensure work is completed productively.
	2.3 Describe how organisational procedures are applied to ensure work is planned and carried out productively, in relation to: – using resources for own and other's work requirements – allocating appropriate work to employees – organising the work sequence – reducing carbon emissions.
	2.4 Describe how to contribute to zero/low carbon work outcomes within the built environment.
3 Maintain relevant records in accordance with the organisational procedures.	3.1 Complete relevant documentation according to the occupation as required by the organisation.
	3.2 Describe how to complete and maintain documentation in accordance with organisational procedures, in relation to: – job cards – worksheets – material/resource lists – time sheets.
	3.3 Explain the reasons for ensuring documentation is completed clearly and within given timescales.
4 Maintain good working relationships when conforming to productive working practices.	4.1 Carry out work productively, to the agreed specification, in conjunction with line management, colleagues, customers and/or other relevant people involved in the work to maintain good working relationships.

Title:	Conforming to productive working practices in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
	4.2 Apply the principles of equality and diversity and respect the needs of individuals when communicating and working with others.
	4.3 Describe how to maintain good working relationships, in relation to: – individuals – customer and operative – operative and line management – own and other occupations.
	4.4 Describe why it is important to work effectively with line management, colleagues and customers.
	4.5 Describe how working relationships could have an effect on productive working.
	4.6 Describe how to apply principles of equality and diversity when communicating and working with others.

Title:	Conforming to Productive Working Practices in the Workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment, in accordance with the ConstructionSkills' Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated.
Sector Subject Areas	05.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	10

Title:	Moving, handling and storing resources in the workplace	
Unit Number	Y/508/6533	
Learning outcomes *The learner will be able to:*		**Assessment criteria** *The learner can:*
1 Comply with given information when moving, handling and/or storing resources.		1.1 Interpret the given information relating to moving, handling and/or storing resources, relevant to the given occupation.
		1.2 Interpret the given information relating to the use and storage of lifting aids and equipment.
		1.3 Describe the different types of technical, product and regulatory information, their source and how they are interpreted.
		1.4 State the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
		1.5 Describe how to obtain information relating to using and storing lifting aids and equipment.
2 Know how to comply with relevant legislation and official guidance when moving, handling and/or storing resources.		2.1 Describe their responsibilities under current legislation and official guidance whilst working: – in the workplace, in confined spaces, below ground level, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
		2.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
		2.3 Explain what the accident reporting procedures are and who is responsible for making the reports.
		2.4 State the appropriate types of fire extinguishers relevant to the work.
		2.5 Describe how and when the different types of fire extinguishers, relevant to the given occupation, are used in accordance with legislation and official guidance.
3 Maintain safe working practices when moving, handling and/or storing resources.		3.1 Use health and safety control equipment safely to carry out the activity in accordance with legislation and organisational requirements when moving, handling and/or storing resources.
		3.2 Use lifting aids safely as appropriate to the work.

Title:	Moving, handling and storing resources in the workplace	
Learning outcomes *The learner will be able to:*		**Assessment criteria** *The learner can:*
3 continued		3.3 Protect the environment in accordance with safe working practices as appropriate to the work.
		3.4 Explain why and when health and safety control equipment, identified by the principles of protection, should be used, relating to moving, handling **and/or** storing resources, and the types, purpose and limitations of each type, the work situation, occupational use and the general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV).
		3.5 Describe how the health and safety control equipment relevant to the work should be used in accordance with the given instructions.
		3.6 State how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related hazards.
4 Select the required quantity and quality of resources for the methods of work to move, handle and/or store occupational resources.		4.1 Select the relevant resources to be moved, handled and/or stored, associated with own work.
		4.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the occupational resources in relation to: – lifting and handling aids – container(s) – fixing, holding and securing systems.
		4.3 Describe how the resources should be handled and how any problems associated with the resources are reported.
		4.4 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.
		4.5 Describe any potential hazards associated with the resources and methods of work.
5 Prevent the risk of damage to occupational resources and surrounding environment when moving, handling and/or storing resources.		5.1 Protect occupational resources and their surrounding area from damage in accordance with safe working practices and organisational procedures.
		5.2 Dispose of waste and packaging in accordance with legislation.

Title:	Moving, handling and storing resources in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
5 continued	5.3 Maintain a clean work space when moving, handling or storing resources.
	5.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	5.5 Explain why the disposal of waste should be carried safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
6 Complete the work within the allocated time when moving, handling and/or storing resources.	6.1 Demonstrate completion of the work within the allocated time.
	6.2 State the purpose of the work programme and explain why deadlines should be kept in relation to: – progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.
7 Comply with the given occupational resource information to move, handle **and/or** store resources to the required guidance.	7.1 Demonstrate the following work skills when moving, handling and/or storing occupational resources: – moving, positioning, storing, securing and/or using lifting aids and kinetic lifting techniques.
	7.2 Move, handle and/or store occupational resources to meet product information and organisational requirements relating to three of the following: – sheet material – loose material – bagged or wrapped material – fragile material – tools and equipment – components – liquids.
	7.3 Describe how to apply safe work practices, follow procedures, report problems and establish the authority needed to rectify them when moving, handling **and/or** storing occupational resources.
	7.4 Describe the needs of other occupations when moving, handling **and/or** storing resources.

Title:	Moving, handling and storing resources in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment, in accordance with the ConstructionSkills' Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated.
Sector Subject Areas	05.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	17

Title:	Building temporary or permanent tunnel linings in the workplace
Unit Number:	K/615/1945

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the work and resources when building temporary or permanent tunnel linings.	1.1 Interpret and extract relevant information from specifications, schedules, task briefings, risk assessments, method statements and manufacturers' information.
	1.2 Comply with information and/or instructions derived from risk assessments and method statements.
	1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
	1.4 Describe different types of information, their source and how they are interpreted in relation to: – drawings, specifications, schedules, method statements, task briefings, risk assessments, manufacturers' information, organisational procedures, official guidance and current regulations governing tunnelling.
2 Know how to comply with relevant legislation and official guidance when building temporary or permanent tunnel linings.	2.1 Describe their responsibilities regarding potential accidents, health hazards and the environment whilst working: – in the workplace, below ground level, at height, in confined spaces, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
	2.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
	2.3 Explain what the accident reporting procedures are and who is responsible for making reports.
	2.4 Describe the types of fire extinguishers available when building temporary or permanent tunnel linings and describe how and when they are used.
3 Maintain safe and healthy working practices when building temporary or permanent tunnel linings.	3.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with current legislation and organisational requirements when building temporary or permanent tunnel linings.

Title:	Building temporary or permanent tunnel linings in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
3 Continued	3.2 Demonstrate compliance with given information and relevant legislation when building temporary or permanent tunnel linings in relation to the following: – safe use of access equipment/systems – safe use, storage and handling of materials, tools and equipment – specific risks to health.
	3.3 Explain why and when health and safety control equipment, identified by the principles of prevention, should be used, relating to building temporary or permanent tunnel linings and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV)
	3.4 Describe how the relevant health and safety control equipment should be used in accordance with the given working instructions.
	3.4 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
4 Select the required quantity and quality of resources for the methods of work to build temporary or permanent tunnel linings.	4.1 Select resources associated with own work in relation to materials, components, fixings, tools and equipment.
	4.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources in relation to: – tunnel boring machine (TBM), timber, cast iron or precast linings, gaskets, fittings and fixings – hand tools, powered tools and equipment.
	4.3 Describe how to confirm that the resources and materials conform to the specification.
	4.4 Describe how the resources should be used correctly and how problems associated with the resources are reported.
	4.5 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.

Title:	Building temporary or permanent tunnel linings in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
4 continued	4.6 Describe any potential hazards associated with the resources and methods of work.
	4.7 Describe how to calculate quantity, length and area associated with the method/procedure to build temporary or permanent tunnel linings.
5 Minimise the risk of damage to the work and surrounding area when building temporary or permanent tunnel linings.	5.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
	5.2 Maintain a clean work space.
	5.3 Dispose of waste in accordance with current legislation.
	5.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	5.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
6 Complete the work within the allocated time when building temporary or permanent tunnel linings.	6.1 Demonstrate completion of the work within the allocated time.
	6.2 Describe the purpose of the work programme and explain why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.
7 Comply with the given contract information to build temporary or permanent tunnel linings to the required specification.	7.1 Demonstrate the following work skills when building temporary or permanent tunnel linings: – measuring, marking out, fitting, positioning, securing.
	7.2 Use and maintain hand tools, portable power tools and ancillary equipment

Title:	Building temporary or permanent tunnel linings in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment and in accordance with the ConstructionSkills 'Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated. This unit must be assessed against the endorsements detailed within the relevant NVQ structure. ProQual Level 2 NVQ Diploma in Tunnel Operations (Construction): One of the following endorsements required: Mechanised Traditional
Sector Subject Area	05.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	220

Title:	Excavating and profiling tunnels in the workplace	
Unit Number	M/615/1946	
Learning outcomes *The learner will be able to:*		**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the work and resources when excavating and profiling tunnels.		1.1 Interpret and extract relevant information from drawings/required evacuation support sheet (RESS), method statements, task briefings, risk assessments, and manufacturers' information.
		1.2 Comply with information and/or instructions derived from risk assessments and method statements.
		1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
		1.4 Describe different types of information, their source and how they are interpreted in relation to: – drawings/required evacuation support sheet (RESS), method statements, task briefings, risk assessments, manufacturers' information, organisational procedures, official guidance and current regulations governing tunnelling.
2 Know how to comply with relevant legislation and official guidance when excavating and profiling tunnels.		2.1 Describe their responsibilities regarding potential accidents, health hazards and the environment whilst working: – in the workplace, below ground level, at height, in confined spaces, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
		2.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
		2.3 Explain what the accident reporting procedures are and who is responsible for making reports.
		2.4 Describe the types of fire extinguishers available when excavating and profiling tunnels and describe how and when they are used.
3 Maintain safe and healthy working practices when excavating and profiling tunnels.		3.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with current legislation and organisational requirements when excavating and profiling tunnels.

Title:	Excavating and profiling tunnels in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
3 Continued	3.2 Demonstrate compliance with given information and relevant legislation when excavating and profiling tunnels in relation to the following: – safe use of access equipment/systems – safe use, storage and handling of materials, tools and equipment – specific risks to health.
	3.3 Explain why and when health and safety control equipment, identified by the principles pf prevention, should be used, relating to excavating and profiling tunnels, and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV)
	3.4 Describe how the relevant health and safety control equipment should be used in accordance with the given working instructions.
	3.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
4 Select the required quantity and quality of resources for the methods of work to excavate and profile tunnels.	4.1 Select resources associated with own work in relation to materials, components, tools and equipment.
	4.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources in relation to: – engineering controls (e.g. lasers, drill patterns, profile boards, string lines, square marks and software controls), hand, mechanical or drill and blast excavation equipment and ancillary equipment
	4.3 Describe how to confirm that the resources and materials conform to the specification.
	~~4.4~~ Describe how the resources should be used correctly and how problems associated with the resources are reported.

Title:	Excavating and profiling tunnels in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
4 continued	4.5 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.
	4.6 Describe any potential hazards associated with the resources and methods of work.
5 Minimise the risk of damage to the work and surrounding area when excavating and profiling tunnels.	5.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
	5.2 Maintain a clean work space.
	5.3 Dispose of waste in accordance with current legislation.
	5.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	5.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
6 Complete the work within the allocated time when excavating and profiling tunnels.	6.1 Demonstrate completion of the work within the allocated time.
	6.2 State the purpose of the work programme and explain why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.
7 Comply with the given contract information to excavate and profile tunnels to the required specification.	7.1 Demonstrate the following work skills when excavating and profiling tunnels: – excavating and profiling.
	7.2 Use and maintain ancillary equipment.
	7.3 Excavate and profile tunnels to given working instructions and engineering controls for at least one of the following operations: – sprayed concrete lining – hand mining – drilling and blasting – tunnel boring

Title:	Excavating and profiling tunnels in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
7 continued	7.4 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish the authority needed to rectify them, to: – follow engineering controls to excavate and profile tunnels for sprayed concrete lining, hand mining, drilling and blasting or tunnel boring operations – recognise and determine when specialist skills and knowledge are required and report accordingly – work with, around and in close proximity to plant and machinery – direct and guide the operations and movement of plant and machinery – use ancillary equipment – work at height – use access equipment/systems.
	7.5 Describe the needs of other occupations and how to communicate effectively within a team when excavating and profiling tunnels.
	7.6 Describe how to maintain the ancillary equipment used when excavating and profiling tunnels.

Title:	Excavating and profiling tunnels in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment and in accordance with the ConstructionSkills 'Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated. This unit must be assessed against the endorsements detailed within the relevant NVQ structure. <u>ProQual Level 2 NVQ Diploma in Tunnelling Operations (Construction):</u> One of the following endorsements required: Sprayed concrete lining Hand mining Drilling and blasting Tunnel boring
Sector Subject Area	05.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	410

Title:	Constructing shafts for tunnelling operations in the workplace	
Unit Number:	T/615/1947	
Learning outcomes *The learner will be able to:*		**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the work and resources when constructing shafts for tunnelling operations.		1.1 Interpret and extract relevant information from drawings, specifications, method statements, task briefings, risk assessments and manufacturers' information.
		1.2 Comply with information and/or instructions derived from risk assessments and method statements.
		1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
		1.4 Describe different types of information, their source and how they are interpreted in relation to: – drawings, specifications, method statements, task briefings, risk assessments, manufacturers' information, organisational procedures, official guidance and current regulations governing tunnelling.
2 Know how to comply with relevant legislation and official guidance when constructing shafts for tunnelling operations.		2.1 Describe their responsibilities regarding potential accidents, health hazards and the environment whilst working: – in the workplace, below ground level, at height, in confined spaces, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
		2.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
		2.3 Explain what the accident reporting procedures are and who is responsible for making reports.
		2.4 Describe the types of fire extinguishers available when constructing shafts for tunnelling operations and describe how and when they are used.
3 Maintain safe and healthy working practices when constructing shafts for tunnelling operations.		3.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with current legislation and organisational requirements when constructing shafts for tunnelling operations.

Title:	Constructing shafts for tunnelling operations in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
3 Continued	3.2 Demonstrate compliance with given information and relevant legislation when constructing shafts for tunnelling operations in relation to the following: – safe use of access equipment/systems – safe use, storage and handling of materials, tools and equipment – specific risks to health.
	3.3 Explain why and when health and safety control equipment, identified by the principles of prevention, should be used, relating to constructing shafts for tunnelling operations, and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV)
	3.4 Describe how the relevant health and safety control equipment should be used in accordance with the given working instructions.
	3.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
4 Select the required quantity and quality of resources for the methods of work to construct shafts for tunnelling operations.	4.1 Select resources associated with own work in relation to materials, components, fixings, tools and equipment.
	4.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources in relation to: – ground support systems (e.g. sheet piles, frames, segments, casts, timber), grout, lining materials and ancillary equipment – fall arrest equipment – hand tools, portable power tools and equipment.
	4.3 Describe how to confirm that the resources and materials conform to the specification.
	4.4 Describe how the resources should be used correctly, how problems associated with the resources are reported.
	4.5 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.

Title:	Constructing shafts for tunnelling operations in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
4 continued	4.6 Describe any potential hazards associated with the resources and methods of work.
	4.7 Identify quantity and length, associated with the method/procedure to construct shafts for tunnelling operations.
5 Minimise the risk of damage to the work and surrounding area when constructing shafts for tunnelling operations.	5.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
	5.2 Maintain a clean work space.
	5.3 Dispose of waste in accordance with current legislation.
	5.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	5.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
6 Complete the work within the allocated time when constructing shafts for tunnelling operations.	6.1 Demonstrate completion of the work within the allocated time.
	6.2 Describe the purpose of the work programme and explain why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.
7 Comply with the given contract information to construct shafts for tunnelling operations to the required specification.	7.1 Demonstrate the following work skills when constructing shafts for tunnelling operations: – measuring, marking out, positioning, excavating and securing.
	7.2 Use and maintain hand tools, portable power tools and ancillary equipment.

Title:	Constructing shafts for tunnelling operations in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
7 continued	7.3 Construct shafts for tunnelling operations, by at least one of the following methods, to given working instructions: – underpinning – caisson sinking – sprayed lining – sheet piles and frames
	7.4 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish the authority needed to rectify them, to: – identify types of shaft construction for ground conditions – construct shafts by underpinning, caisson sinking (wet, dry or wrap), sprayed lining, diaphragm walling, bored piles and sheet piles and frames – excavate spoil – manage ground water – locate and protect/divert underground utilities – be aware of the potential for buried structures/items (e.g. unexploded objects, burial grounds) – recognise and determine when specialist skills and knowledge are required and report accordingly – identify and follow the installation quality requirements – identify grouting methodology for the type of shaft being constructed – work with, around and in close proximity to plant and machinery – direct and guide the operations and movement of plant and machinery – use hand tools, portable power tools and equipment – work at height – use fall arrest equipment – use access equipment/systems.
	7.5 Describe the needs of other occupations and how to communicate effectively within a team when constructing shafts for tunnelling operations.
	7.6 Describe how to maintain the tools and equipment used when constructing shafts for tunnelling operations.

Title:	Constructing shafts for tunnelling operations in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment and in accordance with the ConstructionSkills 'Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated. This unit must be assessed against the endorsements detailed within the relevant NVQ structure. <u>ProQual Level 2 NVQ Diploma in Tunnelling Operations (Construction):</u> One of the following endorsements required: Sprayed concrete lining Hand mining Drilling and blasting Tunnel boring
Sector Subject Area	05.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	485

Title:	Installing tunnelling services in the workplace	
Unit Number:	F/615/1949	
Learning outcomes *The learner will be able to:*		**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the work and resources when installing tunnelling services.		1.1 Interpret and extract relevant information from method statements, task briefings, risk assessments, and manufacturers' information.
		1.2 Comply with information and/or instructions derived from risk assessments and method statements.
		1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
		1.4 Describe different types of information, their source and how they are interpreted in relation to: – drawings, specifications, schedules, method statements, task briefings, risk assessments, manufacturers' information, organisational procedures, official guidance and current regulations governing tunnelling.
2 Know how to comply with relevant legislation and official guidance when installing tunnelling services.		2.1 Describe their responsibilities regarding potential accidents, health hazards and the environment, whilst working: – in the workplace, below ground level, at height, in confined spaces, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
		2.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
		2.3 Explain what the accident reporting procedures are and who is responsible for making reports.
		2.4 Describe the types of fire extinguishers available when installing tunnelling services and describe how and when they are used.
3 Maintain safe and healthy working practices when installing tunnelling services.		3.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with current legislation and organisational requirements when installing tunnelling services.

Title:	Installing tunnelling services in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
3 Continued	3.2 Demonstrate compliance with given information and relevant legislation when installing tunnelling services in relation to the following: – safe use of access equipment/systems – safe use, storage and handling of materials, tools and equipment – specific risks to health.
	3.3 Explain why and when health and safety control equipment, identified by the principles of prevention, should be used, relating to installing tunnelling services, and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV)
	3.4 Describe how the relevant health and safety control equipment should be used in accordance with the given working instructions.
	3.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
4 Select the required quantity and quality of resources for the methods of work to install tunnelling services.	4.1 Select resources associated with own work in relation to materials, components, fixings, tools and equipment.
	4.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources in relation to: – ventilation systems, communication systems, pressurised systems, water supply systems, material handling systems, – hand tools, portable power tools and equipment.
	4.3 Describe how to confirm that the resources and materials conform to the specification.
	4.4 Describe how the resources should be used correctly and how problems associated with the resources are reported.
	4.5 Explain why the organisational procedures have been developed and how they are used for the selection of required resources

Title:	Installing tunnelling services in the workplace	
Learning outcomes *The learner will be able to:*		**Assessment criteria** *The learner can:*
4 continued		4.6 Describe any potential hazards associated with the resources and methods of work.
		4.7 Describe how to identify quantity and length, associated with the method/procedure to install tunnelling services.
5 Minimise the risk of damage to the work and surrounding area when installing tunnelling services.		5.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
		5.2 Maintain a clean work space.
		5.3 Dispose of waste in accordance with current legislation.
		5.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
		5.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
6 Complete the work within the allocated time when installing tunnelling services.		6.1 Demonstrate completion of the work within the allocated time.
		6.2 Describe the purpose of the work programme and explain why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.
7 Comply with the given contract information to install tunnelling services to the required specification.		7.1 Demonstrate the following work skills when installing tunnelling services: – measuring, fitting, positioning, connecting, checking and securing.
		7.2 Use and maintain hand tools, portable power tools and ancillary equipment.
		7.3 Install, use and remove the following tunnelling back-up services to given working instructions: – ventilation systems – pressurised systems – communication systems – water supply systems – materials handling systems (rail and/or conveyor and/or piped).

Title:	Installing tunnelling services in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
7 continued	7.4 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish the authority needed to rectify them, to: – position and install ventilation systems, pressurised systems, communication systems, water supply systems, material handling systems (rail conveyor and piped) and walkways – remove and dismantle ventilation systems, pressurised systems, communication systems, water supply systems, material handling systems (rail, conveyor and piped), walkways – check connection systems are ready for commissioning – recognise and determine when specialist skills and knowledge are required and report accordingly – identify and follow the installation quality requirements – work with, around and in close proximity to plant and machinery – direct and guide the operations and movement of plant and machinery – use hand tools, portable power tools and equipment – work at height – use access equipment/systems.
	7.5 Describe the needs of other occupations and how to communicate effectively within a team when installing tunnelling services.
	7.6 Describe how to maintain the tools and equipment used when installing tunnelling services.

Title:	Installing tunnelling services in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment and in accordance with the ConstructionSkills 'Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated.
Sector Subject Area	05.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	70

Title:	Preparing and operating specialist tunnelling plant to form tunnels in the workplace
Unit Number:	A/615/1948

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the preparation and use of specialist tunnelling plant to form tunnels.	1.1 Interpret and extract relevant information from drawings, specifications, schedules, risk assessments and manufacturers' information.
	1.2 Comply with information and/or instructions derived from risk assessments and method statements.
	1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
	1.4 Describe different types of information, their source and how they are interpreted in relation to: – drawings, specifications, schedules, method statements, risk assessments, manufacturers' information and current regulations governing the operation of tunnelling plant for forming tunnels.
2 Organise with others the sequence and operation in which forming tunnels using specialist tunnelling plant are to be carried out.	2.1 Organise the work according to given information or instructions.
	2.2 Describe how to communicate ideas between team members.
	2.3 Organise and communicate with team members and other associated occupations.
	2.4 Describe how to organise resources prior to and during tunnelling operations using specialist tunnelling plant.
3 Know how to comply with relevant legislation and official guidance when preparing to and forming tunnels using specialist tunnelling plant.	3.1 Describe their responsibilities regarding potential accidents, health hazards and the environment whilst working: – in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
	3.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
	3.3 Explain what the accident reporting procedures are and who is responsible for making reports.

Title:	Preparing and operating specialist tunnelling plant to form tunnels in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
4 Maintain safe and healthy working practices when preparing for and forming tunnels using specialist tunnelling plant.	4.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with legislation and organisational requirements during tunnelling operations.
	4.2 Demonstrate compliance with given information and relevant legislation when forming tunnels using specialist tunnelling plant in relation to two or more of the following: – safe use and storage of plant or machinery – safe use and storage of tools and equipment – specific risks to health.
	4.3 Explain why and when health and safety control equipment, identified by the principles of prevention, should be used, relating to tunnelling plant use, and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV).
	4.4 Describe how the relevant health and safety control equipment should be used in accordance with the given working instructions.
	4.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
5 Request and select the required quantity and quality of resources to prepare for and form tunnels using specialist tunnelling plant.	5.1 Request and select resources associated with specialist tunnelling plant in relation to consumables, materials, tools, ancillary equipment and/or accessories.
	5.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources, and how they should be used correctly, relating to: – consumables, lubricants and fuels – attachments and forming aids – hand tools, ancillary equipment and/or accessories.
	5.3 Describe how the resources should be used correctly and how problems associated with the resources are reported.

Title:	Preparing and operating specialist tunnelling plant to form tunnels in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
5 continued	5.4 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.
	5.5 Describe any potential hazards associated with the resources and methods of work.
	5.6 Describe how to identify weight, quantity, length and area associated with the method/procedures to form tunnels using specialist tunnelling plant.
6 Minimise the risk of damage to the work and surrounding area when preparing to and operating specialist tunnelling plant to form tunnels.	6.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
	6.2 Prevent damage and maintain a clean work space.
	6.3 Dispose of waste in accordance with current legislation.
	6.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	6.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
7 Complete the work within the allocated time when preparing to and forming tunnels.	7.1 Demonstrate completion of the work within the allocated time.
	7.2 Describe the purpose of the work programme and describe why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.

Title:	Preparing and operating specialist tunnelling plant to form tunnels in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
8 Comply with the given contract information to prepare and operate specialist tunnelling plant to form tunnels to the required specification.	8.1 Demonstrate the following work skills when preparing for and forming tunnels using specialist tunnelling plant: – checking, adjusting, communicating, manoeuvring, positioning, constructing and forming.
	8.2 Use and maintain hand tools, ancillary equipment and/or accessories.
	8.3 Prepare, set up, position and operate specialist tunnelling plant to form tunnels to given working instructions.
	8.4 Shut down and secure tunnelling plant.
	8.5 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish authority needed to rectify, to: – identify the characteristics of the specialist tunnelling plant used for tunnelling operations – carry out function checks for the tunnelling operation – identify the area of the tunnelling work – identify geological, environmental and material changes and report – prepare, set up and adjust for operational requirements – carry out pre-operational checks for obstructions, stability, safety and security of the work and surrounding area
	8.6 – check to avoid damage to structures and utilities service apparatus – form tunnels safely and securely – recognise and determine when specific skills and knowledge are required and report accordingly – complete construction and formation work – be on the public highway – shut down and secure the tunnelling plant and equipment – use hand tools, ancillary equipment and accessories.
	8.7 Describe the needs of other occupations and how to effectively communicate within a team when preparing for and operating specialist tunnelling plant to form tunnels.
	8.8 Describe how to maintain the plant and machinery, hand tools, ancillary equipment and/or accessories used to form tunnels with specialist tunnelling plant.

Title:	Preparing and operating specialist tunnelling plant to form tunnels in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment and in accordance with the ConstructionSkills' Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated. This unit must be assessed against the endorsements detailed within the relevant NVQ Structure. <u>ProQual Level 2 NVQ Diploma in Tunnelling Operations (Construction):</u> The following endorsement required (i.e. own area of work): Tunnelling operations Plus **one** of the following endorsements required: Construction plant or machines Formation plant or machines Receiving plant or machines Transporting plant or machines Plus **one** of the following endorsements required: Unshielded rock tunnel boring machine Shielded rock tunnel boring machine Shield mounted hydraulic excavating arm Road header above 50te Road header below 50te Road header bucket below 50te Pre vault method Drill rig (rail, gantry or truck mounted) Excavator Sprayed concrete plant and equipment Remote and/or pedestrian control operation
Sector subject area	5.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	247

Title:	Preparing and operating powered units, tools or pedestrian plant, machinery or equipment in the workplace
Unit Number:	A/508/6587

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the preparation and use of powered units, tools or pedestrian plant, machinery or equipment.	1.1 Interpret and extract relevant information from drawings, specifications, schedules, risk assessments, operating instructions and manufacturers' information.
	1.2 Comply with information and/or instructions derived from risk assessments and method statements.
	1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
	1.4 Describe different types of information, their source and how they are interpreted in relation to: – drawings, specifications, schedules, method statements, risk assessments, legislation, Codes of Practice, manufacturers' information and operating instructions.
2 Know how to comply with relevant legislation and official guidance to prepare and use powered units, tools or pedestrian plant, machinery or equipment.	2.1 Describe their responsibilities regarding potential accidents, health hazards and the environment whilst working: – in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
	2.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
	2.3 Explain what the accident reporting procedures are and who is responsible for making reports.

Title:	Preparing and operating powered units, tools or pedestrian plant, machinery or equipment in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
3 Maintain safe and healthy working practices when preparing for and using powered units, tools or pedestrian plant, machinery or equipment.	3.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with legislation and organisational requirements when using powered units, tools or pedestrian plant, machinery or equipment
	3.2 Demonstrate compliance with given information and relevant legislation when using powered units, tools or pedestrian plant, machinery or equipment in relation to two or more of the following: – safe use of access equipment – safe handling of materials – safe use and storage of materials, tools and equipment – specific risks to health.
	3.3 Explain why and when health and safety control equipment, identified by the principles of protection, should be used, relating to powered units, tools or pedestrian plant, machinery or equipment use, and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV).
	3.4 Describe how the relevant health and safety control equipment should be used in accordance with the given working instructions.
	3.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
4 Select the required quantity and quality of resources to prepare for and sustain powered units, tools or pedestrian plant, machinery or equipment.	4.1 Select resources associated with the type of work in relation to fuel/power source, lubricants and consumables.
	4.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources, and how they should be used correctly, relating to: – power source/fuels – consumables, lubricants.

Title:	Preparing and operating powered units, tools or pedestrian plant, machinery or equipment in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
4 Continued	4.3 Describe how the resources should be used correctly and how problems associated with the resources are reported.
	4.4 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.
	4.5 Describe any potential hazards associated with the resources and methods of work.
	4.6 Describe how to identify quantity, length, area and wastage associated with the method/procedures to operate powered units, tools or pedestrian plant, machinery or equipment.
5 Minimise the risk of damage to the work and surrounding area when preparing to and using powered units, tools or pedestrian plant, machinery or equipment.	5.1 Protect the work and its surrounding area from damage. in accordance with safe working practices and organisational procedures
	5.2 Prevent damage and maintain a clean work space.
	5.3 Dispose of waste in accordance with current legislation.
	5.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	5.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
6 Complete the work within the allocated time when preparing to and using powered units, tools or pedestrian plant, machinery or equipment.	6.1 Demonstrate completion of the work within the allocated time.
	6.2 Describe the purpose of the work programme and describe why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.

Title:	Preparing and operating powered units, tools or pedestrian plant, machinery or equipment in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*	
7 Comply with the given contract information to operate powered units, tools or pedestrian plant, machinery or equipment to the required specification.	7.1	Demonstrate the following work skills when using powered units, tools or pedestrian plant, machinery or equipment: – starting, stopping, replenishing, controlling and cleaning.
	7.2	Use and maintain powered units, tools and ancillary equipment.
	7.3	Operate and monitor powered units and tools or pedestrian plant, machinery or associated equipment to given working instructions relating to: – continual running – closing down – cleaning.
	7.4	Return powered unit, tools or pedestrian plant, machinery or equipment to a safe operational condition on completion of work.
	7.5	Disassemble and/or clean powered unit, tools or pedestrian plant, machinery or equipment.
	7.6	Describe how to apply safe and healthy work practices, follow procedures, report problems and establish authority needed to rectify, to: – prepare, position and set up for work – secure accessories and tool attachments – carry out pre-use and function checks to manufacturers' and suppliers' information~~/~~ and procedures – complete pre-start and post stop checks – recognise the characteristics of the plant, machinery and equipment – identify specific operating and safety requirements for the task and work – recognise and determine when specific skills and knowledge are required and report accordingly
	7.7	– operate, use and control – monitor and maintain – replenish consumables – close down and secure – disassemble and clean – use access equipment – transport and store.
	7.8	Describe the needs of other occupations and how to effectively communicate within a team when preparing for and using powered units, tools or pedestrian plant, machinery or equipment.
	7.9	Describe how to maintain the hand tools, portable power tools, powered units, pedestrian plant, machinery and ancillary equipment used for the work.

Title:	Preparing and operating powered units, tools or pedestrian plant, machinery or equipment in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment and in accordance with the ConstructionSkills' Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated. This unit must be assessed against the endorsements detailed within the relevant NVQ Structure. <u>ProQual Level 2 NVQ Diploma in Tunnelling Operations (Construction):</u> One of the following endorsements required: Generators Pumps Pedestrian operated plant or machines Mixers Compressors Self-powered tools
Sector subject area	5.2 Building and Construction
Availability for use	Shared unit
Unit credit value	7
Unit guided learning hours	23

Title:	Operating a spoil removal conveyor in the workplace	
Unit Number:	T/615/1950	
Learning outcomes *The learner will be able to:*		**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the work and resources when operating a spoil removal conveyor.		1.1 Interpret and extract relevant information from method statements, risk assessments, task briefings and manufacturers' information.
		1.2 Comply with information and/or instructions derived from risk assessments and method statements.
		1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
		1.4 Describe different types of information, their source and how they are interpreted in relation to: – method statements, task briefings, risk assessments, manufacturers' information, official guidance and current regulations governing tunnelling.
2 Know how to comply with relevant legislation and official guidance when operating a spoil removal conveyor.		2.1 Describe their responsibilities regarding potential accidents, health hazards and the environment, whilst working: – in the workplace, below ground level, at height, in confined spaces, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
		2.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
		2.3 Explain what the accident reporting procedures are and who is responsible for making reports.
		2.4 Describe the types of fire extinguishers available when operating a spoil removal conveyor and describe how and when they are used.
3 Maintain safe and healthy working practices when operating a spoil removal conveyor.		3.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with current legislation and organisational requirements when operating a spoil removal conveyor.

Title:	Operating a spoil removal conveyor in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
3 Continued	3.2 Demonstrate compliance with given information and relevant legislation when operating a spoil removal conveyor in relation to the following: – safe use of access equipment/systems – safe use, storage and handling of materials, tools and equipment specific risks to health
	3.3 Explain why and when health and safety control equipment, identified by the principles of prevention, should be used, relating to operating a spoil removal conveyor, and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV)
	3.4 Describe how the relevant health and safety control equipment should be used in accordance with the given working instructions.
	3.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
4 Select the required quantity and quality of resources for the methods of work to operate a spoil removal conveyor.	4.1 Select resources associated with own work in relation to materials, components, fixings, tools and equipment.
	4.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources in relation to: – spoil removal systems, (including belts, rollers, scrapers, spoilers), fittings and fixings – hand tools, portable power tools and equipment.
	4.3 Describe how to confirm that the resources and materials conform to the specification.
	4.4 Describe how the resources should be used correctly and how problems associated with the resources are reported.
	4.5 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.
	4.6 Describe potential hazards associated with the resources and methods of work.

Title:	Operating a spoil removal conveyor in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
5 Minimise the risk of damage to the work and surrounding area when operating a spoil removal conveyor.	5.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
	5.2 Maintain a clean work space.
	5.3 Dispose of waste in accordance with current legislation
	5.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	5.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
6 Complete the work within the allocated time when operating a spoil removal conveyor.	6.1 Demonstrate completion of the work within the allocated time.
	6.2 Describe the purpose of the work programme and explain why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.
7 Comply with the given contract information to operate a spoil removal conveyor to the required specification.	7.1 Demonstrate the following work skills when operating a spoil removal conveyor: – measuring, inspecting, operating, monitoring, maintaining, starting up, shutting down and cleaning.
	7.2 Use and maintain hand tools, portable power tools and ancillary equipment.
	7.3 Operate and monitor a spoil removal conveyor to given working instructions.

Title:	Operating a spoil removal conveyor in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
7 continued	7.4 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish the authority needed to rectify them, to: – inspect and identify defects – operate, monitor and maintain a spoil removal conveyor – carry out start up and shut down procedure – change rollers and scrapers – remove, clean and store spoil removal equipment – recognise and determine when specialist skills and knowledge are required and report accordingly – work with, around and in close proximity to plant and machinery – direct and guide the operations and movement of plant and machinery — use hand tools, portable power tools and equipment – work at height – use access equipment/systems.
	7.5 Describe the needs of other occupations and how to communicate effectively within a team when operating a spoil removal conveyor.
	7.6 Describe how to maintain the tools and equipment used when operating a spoil removal conveyor.

Title:	Operating a spoil removal conveyor in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment and in accordance with the ConstructionSkills 'Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated.
Sector Subject Area	05.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	40

Title:	Preparing to and directing and guiding the movement of vehicles, plant or machinery in the workplace
Unit Number:	T/508/6524

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
1 Interpret the given information relating to preparing to, and directing and guiding the movement of vehicles, plant or machinery.	1.1 Interpret and extract relevant information from drawings, specifications, schedules, risk assessments, plant and vehicle movement plans and manufacturers' information.
	1.2 Comply with information and/or instructions derived from risk assessments and method statements.
	1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
	1.4 Describe different types of information, their source and how they are interpreted in relation to: – drawings, specifications, schedules, method statements, risk assessments, plant and vehicle movement plans, manufacturers' information and Codes of Practice for the direction and guidance of vehicles, plant and machinery.
2 Organise with others the sequence and operation in which directing and guiding the movement of vehicles, plant or machinery is to be carried out.	2.1 Organise the work according to given information or instructions.
	2.2 Describe how to communicate ideas between team members.
	2.3 Organise and communicate with team members and other associated occupations.
	2.4 Describe how to organise resources prior to and during directing and guiding vehicles, plant or machinery.
3 Know how to comply with relevant legislation and official guidance when directing and guiding the movement of vehicles, plant or machinery.	3.1 Describe their responsibilities regarding potential accidents, health hazards and the environment whilst working: – in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
	3.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
	3.3 Explain what the accident reporting procedures are and who is responsible for making reports.

Title:	Preparing to and directing and guiding the movement of vehicles, plant or machinery in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
4 Maintain safe and healthy working practices when preparing to, directing and guiding the movement of vehicles, plant or machinery.	4.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with legislation and organisational requirements when directing and guiding vehicles, plant or machinery.
	4.2 Demonstrate compliance with given information and relevant legislation when directing and guiding the movement of vehicles, plant or machinery in relation to two or more of the following: – safe use and storage of tools – safe use and storage of equipment – specific risks to health.
	4.3 Explain why and when health and safety control equipment, identified by the principles of protection, should be used, relating to directing and guiding vehicles, plant or machinery, and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV).
	4.4 Describe how the relevant health and safety control equipment should be used in accordance with the given working instructions.
	4.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
5 Select the required quantity and quality of resources to prepare to, and direct and guide the movement of vehicles, plant or machinery.	5.1 Select resources associated with directing and guiding vehicles, plant or machinery in relation to hand tools, ancillary equipment and signalling and communication equipment.
	5.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources, and how they should be used correctly, relating to: – signalling and communication equipment – barriers, cones, signs – lighting equipment – hand tools and ancillary equipment.
	5.3 Describe how the resources should be used correctly and how problems associated with the resources are reported.

Title:	Preparing to and directing and guiding the movement of vehicles, plant or machinery in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
5 Continued	5.4 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.
	5.5 Describe any potential hazards associated with the resources and methods of work.
	5.6 Describe how to identify weight/bearing pressures, quantity, length and area associated with the method/procedures for directing and guiding the movement of vehicles, plant and machinery.
6 Minimise the risk of damage to the work and surrounding area when preparing to and directing and guiding the movement of vehicles, plant or machinery.	6.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
	6.2 Prevent damage and maintain a clean work space.
	6.3 Dispose of waste in accordance with current legislation.
	6.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	6.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
7 Complete the work within the allocated time when preparing to, and directing and guiding the movement of vehicles, plant or machinery.	7.1 Demonstrate completion of the work within the allocated time.
	7.2 Describe the purpose of the work programme and describe why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.

Title:	Preparing to and directing and guiding the movement of vehicles, plant or machinery in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
8 Comply with the given contract information to prepare to, and direct and guide the movement of vehicles, plant or machinery to the required specification.	8.1 Demonstrate the following work skills when preparing to, and directing and guiding vehicles, plant or machinery: – measuring, gauging, estimating, interpreting, judging, explaining, preparing, commanding, directing, guiding, indicating, informing, instructing, signing, positioning, moving, securing, signalling and relaying.
	8.2 Use and maintain hand tools, ancillary equipment and signalling equipment.
	8.3 Prepare to, and direct and guide the movement of loaded and unloaded vehicles, including articulated vehicles and plant or machinery (wheeled or tracked) to given working instructions, relating to the following: – hand signals – hand signalling equipment – verbal/electronic communication equipment.
	8.4 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish authority needed to rectify, to: – identify the differences between directing and guiding movement, directing and guiding operations and slinging and signalling – interpret a work management plan and vehicle movement plan – identify the hierarchy of traffic control measures and pedestrian separation – organise and ensure the maintenance of holding areas, routes, exclusion zones, markers and signs – assess and determine the movement of vehicles, plant and machinery, to include own position of safety, visibility, ground conditions and features, proximity hazards and weight limits
	8.5 – recognise and react to changing conditions, ground, environment, weather, light, numbers and types of vehicles, plant and machinery – liaise with, convey and collect information from and to, drivers and operators – recognise and utilise movement aids (camera's, mirrors, audio and visual warnings, etc.) – recognise blind-spots, potential crush zones and other limitations to driver visibility – recognise the requirements of directing and guiding the movement of vehicles, plant and machinery onto and from public highways – recognise the requirements of working on public highways

Title:	Preparing to and directing and guiding the movement of vehicles, plant or machinery in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
8 Continued	8.6 – direct and guide different vehicle types and size e.g. height, weight length, width, tracked, wheeled and articulated – assess and determine the movement of loads, including unloading, discharging and loading requirements – direct and guide vehicles, plant and machinery across rough or uneven terrain – check the integrity of load securing equipment and stability of loads, prior to commencement of movements and on arrival, prior to release – signal and communicate following recognised and agreed operational procedures – recognise and determine when specific skills and knowledge are required and report accordingly – use hand tools and ancillary equipment.
	8.7 Describe the needs of other occupations and how to effectively communicate within a team when preparing to and directing and guiding vehicles, plant or machinery.
	8.8 Describe how to maintain the hand tools, ancillary equipment, and signalling and communication equipment used to direct and guide vehicles, plant or machinery.

Title:	Preparing to and directing and guiding the movement of vehicles, plant or machinery in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment and in accordance with: – the Additional Requirements for Qualifications using the title NVQ in QCF – the ConstructionSkills' Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. This unit must be assessed against the endorsements detailed within the relevant NVQ Structure. <u>ProQual Level 2 NVQ Diploma in Tunnelling Operations (Construction):</u> One of the following endorsements required: Loco and rolling stock Underground bulk systems (explosives transportation)
Sector subject areas	5.2 Building and Construction
Availability for use	Shared unit
Unit review date	30/04/2019
Unit credit value	12
Unit guided learning hours	40

Title:	Carrying out routine maintenance of tunnelling plant, machinery and equipment in the workplace	
Unit Number:	A/615/1951	
Learning outcomes *The learner will be able to:*		**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the work and resources when carrying out routine maintenance of tunnelling plant, machinery and equipment.		1.1 Interpret and extract relevant information from method statements, task briefings, risk assessments and manufacturers' information.
		1.2 Comply with information and/or instructions derived from risk assessments and method statements.
		1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
		1.4 Describe different types of information, their source and how they are interpreted in relation to: – drawings, specifications, schedules, method statements, task briefings, risk assessments, manufacturers' information, organisational procedures, official guidance and maintenance authorisation procedures
2 Know how to comply with relevant legislation and official guidance when carrying out routine maintenance of tunnelling plant, machinery and equipment.		2.1 Describe their responsibilities regarding potential accidents, health hazards and the environment, whilst working: – in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting
		2.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
		2.3 Explain what the accident reporting procedures are and who is responsible for making reports.
		2.4 Describe the types of fire extinguishers available when carrying out routine maintenance of tunnelling plant, machinery and equipment.

Title:	Carrying out routine maintenance of tunnelling plant, machinery and equipment in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
3 Maintain safe and healthy working practices when carrying out routine maintenance of tunnelling plant, machinery and equipment.	3.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with current legislation and organisational requirements when carrying out routine maintenance of tunnelling plant, machinery and equipment.
	3.2 Demonstrate compliance with given information and relevant legislation when carrying out routine maintenance of tunnelling plant, machinery and equipment in relation the following: – safe use of access equipment – safe use, storage and handling of materials, tools and equipment – specific risks to health.
	3.3 Explain why and when health and safety control equipment, identified by the principles of prevention should be used, relating to carry out routine maintenance of tunnelling plant, machinery and equipment, and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV)
	3.4 Describe how the relevant health and safety control equipment should be used in accordance with the given working instructions.
	3.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.

Title:	Carrying out routine maintenance of tunnelling plant, machinery and equipment in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
4 Select the required quantity and quality of resources for the methods of work to carry out routine maintenance of tunnelling plant, machinery and equipment.	4.1 Select resources associated with own work in relation to consumables, components, fixings, tools and equipment.
	4.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources in relation to: – fixings, fittings and consumables – hand tools, portable power tools and equipment
	4.3 Describe how to confirm that the resources and materials conform to the specification.
	4.4 Describe how the resources should be used correctly and how problems associated with the resources are reported.
	4.5 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.
	4.6 Describe any potential hazards associated with the resources and methods of work.
	4.7 Identify quantity, length and wastage associated with the method and procedure to carry out routine maintenance of tunnelling plant, machinery and equipment.
5 Minimise the risk of damage to the work and surrounding area when carrying out routine maintenance of tunnelling plant, machinery and equipment.	5.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
	5.2 Maintain a clean work space.
	5.3 Dispose of waste in accordance with current legislation.
	5.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	5.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.

Title:	Carrying out routine maintenance of tunnelling plant, machinery and equipment in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*	
6 Complete the work within the allocated time when carrying out routine maintenance of tunnelling plant, machinery and equipment.	6.1	Demonstrate completion of the work within the allocated time.
	6.2	Describe the purpose of the work programme and explain why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.
7 Comply with the given contract information to carry out routine maintenance of tunnelling plant, machinery and equipment. to the required specification.	7.1	Demonstrate the following work skills when carrying out routine maintenance of tunnelling plant, machinery and equipment: – checking, measuring, replacing, adjusting, cleaning and securing
	7.2	Use and maintain hand tools, portable power tools and ancillary equipment.
	7.3	Check and complete routine maintenance tasks on tunnelling plant, machinery or equipment to given working instructions to include at least three of the following – cooling systems – oil(s) and lubricants – fuels – pressurised systems – ventilation/ducting systems – power cabling and equipment – electrical control systems – communication systems – lighting or signalling or monitoring equipment
	7.4	Report information
	7.5	Describe how to apply safe and healthy work practices, follow procedures, report problems and establish the authority needed to rectify them, to: – identify maintenance criteria – check tunnelling plant, machinery or equipment for operational serviceability – clean and prepare areas and components for maintenance – select appropriate materials, tools and consumables – carry out routine maintenance of tunnelling plant, machinery or equipment to organisational procedures – complete functional checks in accordance with operating and care and control procedures

Title:	Carrying out routine maintenance of tunnelling plant, machinery and equipment in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
7 continued	7.5 contd – recognise and report where maintenance activities cannot be fully met (arising from information, resources or maintenance methods and procedures) – identify and report defects outside of the planned schedule or area of responsibility – recognise and determine when specialist skills and knowledge are required and report accordingly – provide accurate information for the completion of records and reports – identify and follow any installation quality requirements – work with, around and in close proximity to plant and machinery – use hand tools, portable power tools and equipment – work at height – use access equipment/systems
	7.6 Describe the needs of other occupations and how to communicate effectively within a team when carrying out routine maintenance of tunnelling plant, machinery and equipment.
	7.7 Describe how to maintain the tools and equipment used when carrying out routine maintenance of tunnelling plant, machinery and equipment.

Title:	Carrying out routine maintenance of tunnelling plant, machinery and equipment in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment, in accordance with the ConstructionSkills' Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated.
Sector Subject areas	5.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	70

Title:	Preparing substrate for sprayed concrete in the workplace
Unit Number:	F/615/1952

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the work and resources when preparing substrate for sprayed concrete.	1.1 Interpret and extract relevant information from drawings, schedules, method statements, risk assessments and manufacturers' information.
	1.2 Comply with information and/or instructions derived from risk assessments and method statements.
	1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
	1.4 Describe different types of information, their source and how they are interpreted in relation to: – drawings, specifications, schedules, method statements, risk assessments, work instructions, electronic data, manufacturers' information, and current regulations.
2 Know how to comply with relevant legislation and official guidance when preparing substrate for sprayed concrete.	2.1 Describe their responsibilities regarding potential accidents, health hazards and the environment, whilst working: – in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
	2.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
	2.3 Explain what the accident reporting procedures are and who is responsible for making reports.
3 Maintain safe and healthy working practices when preparing substrate for sprayed concrete.	3.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with current legislation and organisational requirements when preparing substrate for sprayed concrete.
	3.2 Demonstrate compliance with given information and relevant legislation when preparing substrate for sprayed concrete in relation to three of the following: – safe use of access equipment – safe handling of materials – safe use and storage of materials, tools and equipment – specific risks to health

Title:	Preparing substrate for sprayed concrete in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
3 Continued.	3.3 Explain why and when health and safety control equipment, identified by the principles of protection, should be used, relating to preparing substrate for sprayed concrete, and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV).
	3.4 Describe how the relevant health and safety control equipment should be used in accordance with the given instructions.
	3.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
4 Select the required quantity and quality of resources for the methods of work to prepare substrate for sprayed concrete.	4.1 Select resources associated with own work in relation to materials, components, fixings, tools and equipment.
	4.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources in relation to: – temporary supports, screens, barriers, reinforcement, tying wire, pins, formwork – hand tools, portable power tools and equipment – jet washing and grit blasting equipment.
	4.3 Describe how the resources should be used correctly and how problems associated with the resources are reported.
	4.4 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.
	4.5 Describe any potential hazards associated with the resources and methods of work.
	4.6 Describe how to calculate quantity, length, area and wastage associated with the method/procedure to prepare substrate for sprayed concrete.

Title:	Preparing substrate for sprayed concrete in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
5 Minimise the risk of damage to the work and surrounding area when preparing substrate for sprayed concrete.	5.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
	5.2 Minimise damage and maintain a clean work space.
	5.3 Dispose of waste in accordance with current legislation.
	5.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	5.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
6 Complete the work within the allocated time when preparing substrate for sprayed concrete.	6.1 Demonstrate completion of the work within the allocated time.
	6.2 Describe the purpose of the work programme and explain why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.
7 Comply with the given contract information to prepare substrate for sprayed concrete to the required specification.	7.1 Demonstrate the following work skills when preparing substrate for sprayed concrete: – measuring, marking out, locating, protecting, supporting, breaking out, cleaning, profiling, tying, erecting, recording and reporting.
	7.2 Use and maintain hand tools, portable power tools and ancillary equipment
	7.3 Prepare substrates prior to receiving sprayed concrete to given working instructions relating to seven of the following: – locate and protect services – break out loose and de-bonded materials – roughen smooth surfaces – clear and clean – surface profile levels – tie and secure reinforcement bar and/or mesh – fit guide wires – fit depth pins – erect formwork – record and report work carried out.

Title:	Preparing substrate for sprayed concrete in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
7 Continued	7.4 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish the authority needed to rectify them, to: – locate and protect services (water, gas, electric and waste) – break out, profile, square cut, clean and prepare, – identify when substrate needs to be supported – confirm substrate is ready to receive sprayed concrete – position and secure reinforcement – apply corrosion protection
	7.5 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish the authority needed to rectify them, to: – erect and dismantle formwork – install guide wires and depth pins – record and report – recognise and determine when specific skills and knowledge are required and report accordingly – use hand tools, portable power tools and equipment – work at height – use access equipment.
	7.6 Describe the needs of other occupations and how to effectively communicate within a team when preparing substrate for sprayed concrete.
	7.7 Describe how to maintain the tools and equipment used when preparing substrate for sprayed concrete.

Title:	Preparing substrate for sprayed concrete in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment, in accordance with the ConstructionSkills' Consolidated Assessment Strategy for Construction and the Built Environment Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated.
Sector Subject Area	5.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	40

Title:	Applying sprayed concrete in the workplace
Unit Number:	J/615/1953

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the work and resources when applying sprayed concrete.	1.1 Interpret and extract relevant information from drawings, schedules, method statements, risk assessments and manufacturers' information.
	1.2 Comply with information and/or instructions derived from risk assessments and method statements.
	1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
	1.4 Describe different types of information, their source and how they are interpreted in relation to: – drawings, specifications, schedules, method statements, risk assessments, work instructions, electronic data, manufacturers' information, and current regulations.
2 Know how to comply with relevant legislation and official guidance when applying sprayed concrete.	2.1 Describe their responsibilities regarding potential accidents, health hazards and the environment, whilst working: – in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
	2.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
	2.3 Explain what the accident reporting procedures are and who is responsible for making reports.
3 Maintain safe and healthy working practices when applying sprayed concrete.	3.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with current legislation and organisational requirements when applying sprayed concrete.
	3.2 Demonstrate compliance with given information and relevant legislation when applying sprayed concrete in relation to three of the following: – safe use of access equipment – safe handling of materials – safe use and storage of materials, tools and equipment – specific risks to health

Title:	Applying sprayed concrete in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
3 Continued.	3.3 Explain why and when health and safety control equipment, identified by the principles of protection, should be used, relating to applying sprayed concrete, and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV).
	3.4 Describe how the relevant health and safety control equipment should be used in accordance with the given instructions.
	3.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
4 Select the required quantity and quality of resources for the methods of work to apply sprayed concrete.	4.1 Select resources associated with own work in relation to materials, components, fixings, tools and equipment.
	4.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources in relation to: – sand, aggregate, cements, water, additives, admixtures, structural concrete, curing membranes – working platforms – hand tools, portable power tools, spraying and testing equipment and ancillaries.
	4.3 Describe how the resources should be used correctly and how problems associated with the resources are reported.
	4.4 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.
	4.5 Describe any potential hazards associated with the resources and methods of work.
	4.6 Describe how to calculate quantity, length, area, volume and wastage associated with the method/procedure to apply sprayed concrete.

Title:	Applying sprayed concrete in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
5 Minimise the risk of damage to the work and surrounding area when applying sprayed concrete.	5.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
	5.2 Minimise damage and maintain a clean work space.
	5.3 Dispose of waste in accordance with current legislation.
	5.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions
	5.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
6 Complete the work within the allocated time when applying sprayed concrete.	6.1 Demonstrate completion of the work within the allocated time.
	6.2 Describe the purpose of the work programme and explain why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.
7 Comply with the given contract information to apply sprayed concrete to the required specification.	7.1 Demonstrate the following work skills when applying sprayed concrete: – measuring, marking out, assembling, checking, preparing, finishing, curing, protecting, testing, recording and reporting.
	7.2 Use and maintain concrete spraying machinery and compressor, hand tools, portable power tools and ancillary equipment
	7.3 Apply sprayed concrete by wet and/or dry methods to given working instructions for five of the following: – pre-wet surfaces for spraying – spray concrete to profile – produce samples for testing – cure and protect concrete – record and report on test – record and report on spraying – operate spraying nozzle – operate pump – clean pump – clear lines.

Title:	Applying sprayed concrete in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
7 Continued	7.4 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish the authority needed to rectify them, to: – assemble and check spray equipment (wet and/or dry application) – prepare substrates including wetting, depth guides and protection measures – maintain protection against overspray and rebounding materials – set up spray and pumping equipment – operate robotic spraying equipment – operate hand-held spraying equipment – spray in layers to agreed profile and depth
	7.5 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish the authority needed to rectify them, to: – apply specified finish – cure and protect concrete – provide samples for testing concrete (compression, tension, consistency and workability) – record and report – recognise and determine when specific skills and knowledge are required and report accordingly – operate spraying machines, compressors and pumps – maintain spraying machines, nozzles, hoses, compressors and pumps during operations – use hand tools, portable power tools and equipment – work at height – use access equipment.
	7.6 Describe the needs of other occupations and how to effectively communicate within a team when applying sprayed concrete.
	7.7 Describe how to maintain the tools and equipment used when applying sprayed concrete.

Title:	Applying sprayed concrete in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment, in accordance with the ConstructionSkills' Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated. This unit must be assessed against the endorsements detailed within the relevant NVQ Structure. <u>ProQual Level 2 NVQ Diploma in Tunnelling Operations (Construction):</u> **Five** of the following endorsements required: Pre-wet surfaces for spraying Spray concrete to profile Produce samples for testing Cure and protect concrete Record and report on test Record and report on spraying Operate spraying nozzle Operate pump Clean pump Clear lines
Sector Subject Areas	5.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	53

Title:	Installing tunnels by pipe-jacking or micro-tunnelling operations in the workplace
Unit Number:	R/615/1955

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the work and resources when installing tunnels by pipe-jacking or micro-tunnelling operations.	1.1 Interpret and extract relevant information from method statements, task briefings, risk assessments and manufacturers' information.
	1.2 Comply with information and/or instructions derived from risk assessments and method statements.
	1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
	1.4 Describe different types of information, their source and how they are interpreted in relation to: – drawings, specifications, schedules, method statements, task briefings, risk assessments, manufacturers' information, organisational procedures, official guidance and current regulations governing tunnelling.
2 Know how to comply with relevant legislation and official guidance when installing tunnels by pipe-jacking or micro-tunnelling operations.	2.1 Describe their responsibilities regarding potential accidents, health hazards and the environment, whilst working: – in the workplace, below ground level, at height, in confined spaces, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
	2.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
	2.3 Explain what the accident reporting procedures are and who is responsible for making reports.
	2.4 Describe the types of fire extinguishers available when installing tunnels by pipe-jacking or micro-tunnelling operations and describe how and when they are used.

Title:	Installing or excavating tunnels by pipe-jacking or micro-tunnelling operations in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
3 Maintain safe and healthy working practices when installing tunnels by pipe-jacking or micro-tunnelling operations.	3.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with current legislation and organisational requirements when installing tunnels by pipe-jacking or micro-tunnelling operations.
	3.2 Demonstrate compliance with given information and relevant legislation when installing tunnels by pipe-jacking or micro-tunnelling operations in relation to the following: – safe use of access equipment/systems – safe use, storage and handling of materials, tools and equipment – specific risks to health.
	3.3 Explain why and when health and safety control equipment, identified by the principles of prevention, should be used, relating to installing tunnels by pipe-jacking or micro-tunnelling operations, and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV)
	3.4 Describe how the relevant health and safety control equipment should be used in accordance with the given working instructions.
	3.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
4 Select the required quantity and quality of resources for the methods of work to install tunnels by pipe-jacking or micro-tunnelling operations.	4.1 Select resources associated with own work in relation to materials, components, fixings, tools and equipment.
	4.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources in relation to: – pipe-jacking or micro tunnelling systems – hand tools, portable powered tools and equipment.
	4.3 Describe how to confirm that the resources and materials conform to the specification.

Title:	Installing tunnels by pipe-jacking or micro-tunnelling operations in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
4 continued	4.4 Describe how the resources should be used correctly and how problems associated with the resources are reported.
	4.5 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.
	4.6 Describe any potential hazards associated with the resources and methods of work.
5 Minimise the risk of damage to the work and surrounding area when installing tunnels by pipe-jacking or micro-tunnelling operations.	5.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
	5.2 Maintain a clean work space.
	5.3 Dispose of waste in accordance with current legislation.
	5.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	5.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
6 Complete the work within the allocated time when installing tunnels by pipe-jacking or micro-tunnelling operations.	6.1 Demonstrate completion of the work within the allocated time.
	6.2 Describe the purpose of the work programme and explain why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.

Title:	Installing tunnels by pipe-jacking or micro-tunnelling operations in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
7 Comply with the given contract information to install tunnels by pipe-jacking or micro-tunnelling operations to the required specification.	7.1 Demonstrate the following work skills when installing tunnels by pipe-jacking or micro-tunnelling operations: – measuring, positioning, levelling, aligning, connecting, disconnecting, cleaning, checking and securing.
	7.2 Use and maintain hand tools, portable power tools and ancillary equipment
	7.3 Install tunnels to given working instructions by at least one of the following methods: – pipe-jacking – micro tunnelling
	7.4 Communicate work operations with other operatives.
	7.5 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish the authority needed to rectify them, to: – form tunnels by pipe-jacking or micro-tunnelling – launch and recover pipe-jacking or micro-tunnelling plant – connect and disconnect systems using safe isolation procedures for stored energy hazards – ensure work operations are communicated to all operatives involved with, and around, the operation – recognise and determine when specialist skills and knowledge are required and report accordingly – identify and follow the installation quality requirements – work with, around and in close proximity to plant and machinery – direct and guide the operations and movement of plant and machinery – use hand tools, portable power tools and equipment – work at height – use access equipment/systems.
	7.6 Describe the needs of other occupations and how to communicate effectively within a team when installing tunnels by pipe-jacking or micro-tunnelling operations.
	7.7 Describe how to maintain the tools and equipment used when installing tunnels by pipe-jacking or micro-tunnelling operations.

Title:	Installing tunnels by pipe-jacking or micro-tunnelling operations in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment and in accordance with the ConstructionSkills 'Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated. This unit must be assessed against the endorsements detailed within the relevant NVQ structure. <u>ProQual Level 2 NVQ Diploma in Tunnelling Operations (Construction):</u> One of the following endorsements required: Pipejacking Micro-tunnelling
Sector Subject Area	05.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	330

Title:	Carrying out mud, slurry or fluid plant operations in the workplace	
Unit Number:	D/615/0114	
Learning outcomes *The learner will be able to:*		**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the work and resources when carrying out mud, slurry or fluid plant operations.		1.1 Interpret and extract relevant information from method statements, task briefings, risk assessments, and manufacturers' information.
		1.2 Comply with information and/or instructions derived from risk assessments and method statements.
		1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
		1.4 Describe different types of information, their source and how they are interpreted in relation to: – method statements, task briefings, risk assessments, manufacturers' information, organisational procedures, official guidance and regulations associated with operating mud, slurry or fluid plant.
2 Know how to comply with relevant legislation and official guidance when carrying out mud, slurry or fluid plant operations.		2.1 Describe their responsibilities regarding potential accidents, health hazards and the environment whilst working: – in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
		2.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company, operative and vehicles.
		2.3 Explain what the accident reporting procedures are and who is responsible for making reports.
3 Maintain safe and healthy working practices when carrying out mud, slurry or fluid plant operations.		3.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with current legislation and organisational requirements when carrying out mud, slurry or fluid plant operations.

Title:	Carrying out mud, slurry or fluid plant operations in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
3 continued	3.2 Demonstrate compliance with given information and relevant legislation when carrying out mud, slurry or fluid plant operations in relation to the following: – safe use of access equipment/systems – safe use, storage and handling of materials, tools and equipment – specific risks to health
	3.3 Explain why and when health and safety control equipment, identified by the principles of prevention, should be used, relating to carrying out mud, slurry or fluid plant operations and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV)
	3.4 Describe how the relevant health and safety control equipment should be used in accordance with the given working instructions.
	3.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
4 Select the required quantity and quality of resources for the methods of work to carrying out mud, slurry or fluid plant operations.	4.1 Select resources associated with own work in relation to materials, components, tools, plant and ancillary equipment.
	4.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources in relation to: – additives and mud, slurry or fluid – mud, slurry or fluid plant – hand tools, portable power tools and equipment.
	4.3 Describe how to confirm that the resources and materials conform to the specification.
	4.4 Describe how the resources should be used correctly, how problems associated with the resources are reported.
	4.5 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.

Title:	Carrying out mud, slurry or fluid plant operations in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
4 continued	4.6 Describe any potential hazards associated with the resources and methods of work.
	4.7 Describe how to calculate Identify quantity, density and viscosity associated with the method/procedure to carry out mud, slurry or fluid plant operations.
5 Minimise the risk of damage to the work and surrounding area when carrying out mud, slurry or fluid plant operations.	5.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
	5.2 Maintain a clean work space.
	5.3 Dispose of waste in accordance with current legislation.
	5.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	5.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
6 Complete the work within the allocated time when carrying out mud, slurry or fluid plant operations.	6.1 Demonstrate completion of the work within the allocated time.
	6.2 Describe the purpose of the work programme and explain why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.
7 Comply with the given contract information to carry out mud, slurry or fluid plant operations to the required specification.	7.1 Demonstrate the following work skills when carrying out mud, slurry or fluid plant operations: – preparing, setting up, connecting, checking, maintaining, mixing, monitoring, testing, pumping, cleaning, adjusting, and recording.
	7.2 Use and maintain hand tools, portable power tools, plant and ancillary equipment.
	7.3 Install, operate and maintain mud, slurry or fluid plant to given working instructions in one of the following operations: – piling – tunnelling – drilling.

Title:	Carrying out mud, slurry or fluid plant operations in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
7 continued	7.4 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish the authority needed to rectify them, to: – prepare the area allocated for the plant and ancillary equipment – set up, assemble and check the integrity of plant and ancillary equipment, including the connection of hoses, valves and items of plant for delivery, extraction, recycling and disposal of mud, slurry or fluids – mix mud, slurry or fluids in accordance with manufacturer's recommendations – monitor the pumping process and make appropriate adjustments to maintain operational efficiency – test the viscosity and density of the mud, slurry or fluid – complete records of the process – clean equipment ready for reuse – recognise and determine when specialist skills and knowledge are required and report accordingly – identify and follow the installation quality requirements – work with, around and in close proximity to plant and machinery – direct and guide the operations and movement of plant and machinery – use hand tools, portable power tools, plant and ancillary equipment – work at height – use access equipment/systems
	7.5 Describe the needs of other occupations and how to communicate effectively within a team when carrying out mud, slurry or fluid plant operations.
	7.6 Describe how to maintain the tools, plant and equipment used when carrying out mud, slurry or fluid plant operations.

Title:	Carrying out mud, slurry or fluid plant operations in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment and in accordance with the ConstructionSkills 'Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated. This unit must be assessed against the endorsements detailed within the relevant NVQ structure. <u>ProQual Level 2 NVQ Diploma in Tunnelling Operations (Construction):</u> The following endorsement required (i.e. own area of work): Tunnelling operations
Sector Subject Area	05.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	110

Title*:*	Slinging and hand signalling the movement of suspended loads in the workplace
Unit Number:	A/508/6525

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the preparation for and the slinging and signalling of loads.	1.1 Interpret and extract relevant information from drawings, specifications, schedules, risk assessments, method statements (lift plans) and manufacturers' information.
	1.2 Comply with information and/or instructions derived from risk assessments and method statements.
	1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
	1.4 Describe different types of information, their source and how they are interpreted in relation to: – drawings, specifications, schedules, method statements, risk assessments, lift plans, work instructions, manufacturers' information, approved procedures and Codes of Practice.
2 Organise with others the sequence and operation in which the slinging and signalling of loads is to be carried out.	2.1 Organise the work according to given information or instructions.
	2.2 Describe how to communicate ideas between team members.
	2.3 Organise and communicate with team members and other associated occupations.
	2.4 Describe how to organise resources prior to and when slinging and signalling of loads.
3 Know how to comply with relevant legislation and official guidance to carry out slinging and signalling of loads.	3.1 Describe their responsibilities regarding potential accidents, health hazards and the environment whilst working: – in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
	3.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
	3.3 Explain what the accident reporting procedures are and who is responsible for making reports.

Title:	Slinging and hand signalling the movement of suspended loads in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
4 Maintain safe and healthy working practices when preparing for and slinging and signalling loads.	4.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with legislation and organisational requirements when slinging and signalling loads.
	4.2 Demonstrate compliance with given information and relevant legislation when carrying out the slinging and signalling of loads in relation to at least three of the following: – safe use and storage of tools and equipment – safe use, storage and handling of lifting accessories – safe use of access equipment – specific risks to health.
	4.3 Explain why and when health and safety control equipment, identified by the principles of protection, should be used, relating to slinging and signalling of loads, and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV).
	4.4 Describe how the relevant health and safety control equipment should be used in accordance with the given working instructions.
	4.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
5 Select the required quantity and quality of resources to prepare for and when slinging and signalling loads.	5.1 Select resources associated with slinging/signalling in relation to lifting accessories/aids, hand tools and ancillary equipment.
	5.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources, and how they should be used correctly, relating to: – lifting accessories – signalling and communication equipment – hand tools and ancillary equipment.
	5.3 Describe how the resources should be used correctly, and how problems associated with the resources are reported.

Title:	Slinging and hand signalling the movement of suspended loads in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
5 Continued	5.4 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.
	5.5 Describe any potential hazards associated with the resources and methods of work.
	5.6 Describe how to identify weight, quantity, length and area associated with the method/procedures to carry out slinging/signalling.
6 Minimise the risk of damage to the work and surrounding area when preparing to and slinging and signalling loads.	6.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
	6.2 Prevent damage and maintain a clean work space.
	6.3 Dispose of waste in accordance with current legislation.
	6.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	6.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
7 Complete the work within the allocated time when preparing to and slinging and signalling loads.	7.1 Demonstrate completion of the work within the allocated time.
	7.2 Describe the purpose of the work programme and describe why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.

Title:	Slinging and hand signalling the movement of suspended loads in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
8 Comply with the given contract information to prepare to and sling and signal suspended loads for movement to the required specification.	8.1 Demonstrate the following work skills when preparing to and slinging and signalling loads: – measuring, gauging, estimating, calculating, fitting, fixing, testing, balancing, interpreting, inspecting, judging, explaining, preparing, indicating, informing, instructing, signing, positioning, adjusting, configuring, moving, securing, signalling and relaying.
	8.2 Use and maintain lifting accessories, lifting aids and equipment.
	8.3 Inspect and prepare lifting accessories prior to slinging.
	8.4 Prepare to and attach suspended loads to lifting equipment, using appropriate lifting accessories and load securing methods, to given working instructions for three of the following: – balanced – unbalanced – loose – bundled – container – drum – a load where the machine operator cannot observe its full movement path.
	8.5 Guide, move and place suspended loads to specified destinations, using hand signals, to given working instructions for three of the following: – balanced – unbalanced – loose – bundled – container – drum – a load where the machine operator cannot observe its full movement path.
	8.6 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish authority needed to rectify, to: – identify the differences between: slinging and signalling, directing and guiding movement of vehicles, plant and machinery, and directing and guiding operations of plant and machinery not being used for lifting operations – confirm the authority, duties and responsibilities allocated – identify characteristics of lifting equipment and lifting accessories – identify and interpret valid certification for maintenance, inspection and thorough examination

Title:	Slinging and hand signalling the movement of suspended loads in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
8 Continued	8.7 – lift and transfer people – sling balanced, unbalanced, loose, live, bundled, container drum loads and loads that are blind to the equipment operator – communicate using hand signals, hand signalling equipment (lights, wands, fluorescent gloves, flags) and electronic communication equipment (loud hailers, radios) – confirm methods of communication – recognise blind-spots, potential crush zones and other limitations to driver visibility – consider the load characteristics including centre of gravity and lifting points to determine the method of slinging – determine and check the route of the load before and during the lift including distances, clearances and landing position
	8.8 – select, handle, inspect and use (assemble, set up and adjust) lifting accessories and aids – identify rejection criteria for removing lifting accessories from service – recognise and determine when specific skills and knowledge are required and report accordingly – attach lifting accessories and sling loads securely – ensure balance and stability of loads – attach and use load guidance equipment (tag lines) – guide and place suspended loads by recognised methods of communication and agreed operational procedures – land and position loads safely and securely – remove and store lifting accessories – use hand tools and ancillary equipment.
	8.9 Describe the needs of other occupations and how to communicate within a team when preparing to and slinging and signalling loads.
	8.10 Describe how to maintain the lifting accessories, lifting aids and signalling and communication equipment used to sling and signal loads.

Title:	Slinging and hand signalling the movement of suspended loads in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment and in accordance with the ConstructionSkills' Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated. This unit must be assessed against the endorsements detailed within the relevant NVQ Structure. <u>ProQual Level 2 NVQ Diploma in Tunnelling Operations (Construction):</u> The following endorsement required (i.e. own area of work): Slinger/signaller – tunnelling operations only
Sector subject areas	5.2 Building and Construction
Availability for use	Shared unit
Unit credit value	10
Unit guided learning hours	33

Title:	Carrying out structural waterproofing in the workplace
Unit Number:	H/615/1958

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
1 Interpret the given information relating to the work and resources when carrying out structural waterproofing.	1.1 Interpret and extract relevant information from drawings, design criteria, specifications, schedules method statements, risk assessments and manufacturers' information.
	1.2 Comply with information and/or instructions derived from risk assessments and method statements.
	1.3 Describe the organisational procedures developed to report and rectify inappropriate information and unsuitable resources and how they are implemented.
	1.4 Describe different types of information, their source and how they are interpreted in relation to: – drawings, specifications, schedules, method statement, risk assessments, manufacturers' information, current regulations governing buildings and official guidance associated with structural waterproofing.
2 Know how to comply with relevant legislation and official guidance when carrying out structural waterproofing.	2.1 Describe their responsibilities regarding potential accidents, health hazards and the environment whilst working: – in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement and storage of materials and by manual handling and mechanical lifting.
	2.2 Describe the organisational security procedures for tools, equipment and personal belongings in relation to site, workplace, company and operative.
	2.3 Explain what the accident reporting procedures are and who is responsible for making reports.
3 Maintain safe and healthy working practices when carrying out structural waterproofing.	3.1 Use health and safety control equipment safely and comply with the methods of work to carry out the activity in accordance with current legislation and organisational requirements when carrying out structural waterproofing.

Title:	Carrying out structural waterproofing in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
3 continued	3.2 Demonstrate compliance with given information and relevant legislation when carrying out structural waterproofing in relation to the following: – safe use of access equipment – safe use, storage and handling of materials, tools and equipment – specific risks to health
	3.3 Explain why and when health and safety control equipment, identified by the principles of prevention, should be used, relating to carrying out structural waterproofing, and the types, purpose and limitations of each type, the work situation and general work environment, in relation to: – collective protective measures – personal protective equipment (PPE) – respiratory protective equipment (RPE) – local exhaust ventilation (LEV)
	3.4 Describe how the relevant health and safety control equipment should be used in accordance with the given working instructions.
	3.5 Describe how emergencies should be responded to in accordance with organisational authorisation and personal skills when involved with fires, spillages, injuries and other task-related activities.
4 Select the required quantity and quality of resources for the methods of work to carry out structural waterproofing.	4.1 Select resources associated with own work in relation to materials, components, fixings, tools and equipment.
	4.2 Describe the characteristics, quality, uses, sustainability, limitations and defects associated with the resources in relation to: – setting out equipment – fixings, fittings, primers – waterproofing liquids, sheets, cavity drain membrane or cementitious concretes, screeds and renders – mixers, pumps, drainage, sumps and pumping ancillaries – testing equipment – finishing and protection materials – hand tools, portable power tools and equipment.
	4.3 Describe how the resources should be used correctly and how problems associated with the resources are reported.

Title:	Carrying out structural waterproofing in the workplace

Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
4 Continued	4.4 Explain why the organisational procedures have been developed and how they are used for the selection of required resources.
	4.5 Describe any potential hazards associated with the resources and methods of work.
	4.6 Describe the methods of calculating quantity, length, area and wastage associated with the method and procedure to carry out structural waterproofing.
5 Minimise the risk of damage to the work and surrounding area when carrying out structural waterproofing.	5.1 Protect the work and its surrounding area from damage in accordance with safe working practices and organisational procedures.
	5.2 Maintain a clean work space.
	5.3 Dispose of waste in accordance with current legislation.
	5.4 Describe how to protect work from damage and the purpose of protection in relation to general workplace activities, other occupations and adverse weather conditions.
	5.5 Explain why the disposal of waste should be carried out safely in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance.
6 Complete the work within the allocated time when carrying out structural waterproofing.	6.1 Demonstrate completion of the work within the allocated time.
	6.2 Describe the purpose of the work programme and explain why deadlines should be kept in relation to: – types of progress charts, timetables and estimated times – organisational procedures for reporting circumstances which will affect the work programme.
7 Comply with the given contract information to carry out structural waterproofing to the required specification.	7.1 Demonstrate the following work skills when carrying out structural waterproofing: – measuring, setting out, preparing, applying, securing, finishing, protecting and testing.
	7.2 Use and maintain hand tools, portable power tools and ancillary equipment.

Title:	Carrying out structural waterproofing in the workplace
Learning outcomes *The learner will be able to:*	**Assessment criteria** *The learner can:*
7 Continued	7.3 Carry out structural waterproofing to surfaces using liquid membrane (by spray, brush or roller), including resins or sheet membrane or drained cavity, concrete, screed or render to given working instructions, including: – joints – penetration points – service entries – terminations.
	7.4 Describe how to apply safe and healthy work practices, follow procedures, report problems and establish the authority needed to rectify them, to: – identify installation quality requirements – conform to agreed specification – confirm detail requirements – locate and check the preparation of surfaces and joints including movement, expansion, induced, toe-in, transition and floor-to-wall – prepare materials and equipment – mix multi pack systems – prime surfaces and apply liquid waterproofing – install sheet membranes – locate and fix sheets, ensuring overlaps, secure and seal joints including protrusions and penetrations – mix, handle and apply concretes, screeds and renders – install drained cavity systems – install drains, sumps, pumping ancillaries – recognise and apply curing and protection criteria for primers and liquid waterproofs, including resins, sheet joints, screeds and renders – visually inspect for defects – conduct flood and integrity tests – finish and protect waterproofing – repair structural waterproofing systems – recognise and determine when specialist skills and knowledge are required and report accordingly – use hand tools, portable power tools and equipment – work at height – use access equipment.
	7.5 Describe the needs of other occupations and how to effectively communicate within a team when carrying out structural waterproofing.
	7.6 Describe how to maintain the tools and equipment used when carrying out structural waterproofing.

Title:	Carrying out structural waterproofing in the workplace
Additional information about this unit	
Assessment Guidance	This unit must be assessed in a work environment and in accordance with the ConstructionSkills 'Consolidated Assessment Strategy for Construction and the Built Environment. Assessors for this unit must have verifiable, current industry experience and a sufficient depth of relevant occupational expertise and knowledge, and must use a combination of assessment methods as defined in the Consolidated Assessment Strategy. Workplace evidence of skills cannot be simulated.
Sector Subject Area	5.2 Building and Construction
Availability for use	Shared unit
Unit guided learning hours	60

ProQual Awarding Body
ProQual House
Annie Med Lane
South Cave
HU15 2HG

Tel: 01430 423822

www.proqualab.com

enquiries@proqualab.com