

Tunnelling Operative Level 2 Apprenticeship Assessment Plan

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Assessment Plan

Tunnelling Operative Apprenticeship

Introduction

The Tunnelling Apprenticeship standard has been designed to operate as the professional standard for people working as Tunnelling Operatives at Level 2 across the sector.

The assessment plan is to accompany the standard and will ensure that the completion of a Tunnelling Operative Apprenticeship meets the requirements of the standard in terms of Knowledge, Skills and Behaviours.

On completion of the Apprenticeship, the individual will be recognised as competent to perform in the role of Tunnelling Operative across the sector. This will be achieved by passing the End Point Assessment.

This plan outlines the End Point Assessment that apprentices must successfully complete to achieve their apprenticeship.

On-program Activity:

**STRUCTURED PROGRAMME OF LEARNING
+
COLLECT PORTFOLIO OF EVIDENCE**

Assessment Gateway:

**ACHIEVE LEVEL 1 IN ENGLISH AND MATHEMATICS AND TAKE THE TEST
FOR LEVEL 2
+
COMPLETION OF PORTFOLIO OF EVIDENCE
+
ACHIEVEMENT CERTIFICATE for the
Level 2 NVQ in Tunnelling Operations (Construction)**

End Point Assessment:

Knowledge Test

**Practical
Assessment**

**Technical
Interview**

On-programme activities:

Activity	Timescale	Requirement
A recommended structured programme of learning and assessment will be defined in the occupational brief.	Before the EPA	Recommended
Collection of a portfolio of evidence for the Level 2 NVQ Diploma in Tunnelling Operations – Tunnelling Operative. This portfolio of evidence will have a dual purpose; it will also provide the basis for the structured discussion during the Technical Interview element of the End Point Assessment	Before the EPA	Mandatory
Achieve Level 1 in English and Mathematics and take the test for Level 2 in English and Mathematics	Before completion of the apprenticeship	Mandatory
Documented development reviews to ensure progress to achieve standard. Carried out by the employer and training providers.	Duration of Apprenticeship – 3 monthly intervals recommended	Mandatory; review details to be included in the Portfolio

Assessment Methods for End Point Assessment

Method	Coverage	Assessed	Grading	Grade Weighting
Knowledge Test	Technical Knowledge	RoEPAO approved body	Fail/Pass/Merit/Distinction	30%
Practical Assessment	Synoptic/Applied practical	RoEPAO approved body	Fail/Pass/Merit/Distinction	30%
Technical Interview	Competencies and Behaviours Synoptic	RoEPAO approved body	Fail/Pass/Merit/Distinction	40%

On-programme Activities

A robust process of on-programme learning activities will ensure that apprentices make good progress towards the end point assessment, which itself will be of sufficient quality to attest to the level of skills, knowledge and behaviours required in the Tunnelling Operative standard.

Employers may wish to use their normal performance management processes to monitor the progress of the apprentice, provide feedback and guide development.

- Training providers may wish to support this by ensuring that the requirements of the apprenticeship are reflected in these processes and by filling any gaps through their work with apprentices.

- Employers and training providers must carry out joint reviews of progress at 3 monthly intervals, involving apprentices, line managers and others directly involved e.g. mentors, workplace coaches, etc.
- There is a mandatory Portfolio that the Apprentice will, during the course of their apprenticeship, create and maintain in order to provide supporting evidence that will be needed to supplement the KSBs observed by the Independent Assessor at the End Point Assessment. This mandatory Portfolio will contain evidence, such as videos, photographs and other examples of training, practical skills and experience that has been gained during the apprenticeship. The Portfolio will be used in the Technical Interview to provide evidence of the Skills that may not be observed at the time of the Practical Assessment, due to seasonal or other restrictions.

End Point Assessment Gateway

Employers must satisfy themselves that apprentices are ready for their end point assessment following a minimum of 12 months of training. Apprentices must demonstrate that they meet the following criteria:

- Achieved a minimum level 1 English and maths and taken the tests at level 2
- Satisfactory completion of the structured training agreed with the apprentice by the employer
- Achievement of the Level 2 NVQ Diploma in Tunnelling Operations with sufficient evidence in the form of a completed portfolio to allow the apprentice to consistently demonstrate the knowledge, skills and behaviours as described in the standard.

Although the apprentice should only be recommended for end point assessment when they are ready, employers should have a remediation process in place to support any apprentice who does not meet the conditions of the end point assessment.

End Point Assessment Timings and Activities

It is suggested that the process of setting up the End Point Assessment, as recommended and outlined in the table below, should begin around 3 months before the completion of the apprenticeship.

Timescale	Who	Activity
On-program	Apprentice /Employer/ Training Providers on the ESFA register	<ul style="list-style-type: none"> • Engage in a structured programme of learning and assessment. • Keep a portfolio of evidence of completed tasks in the workplace (e.g. logbooks of work completed, performance review records, learning/training evidence) covering competencies, behaviours and performance on occupational tasks • Review progress and ensure the apprentice is on track as part of regular tracking of progress • Achieve Level 1 in English and Mathematics and take the test for Level 2 English and Mathematics • Completion of portfolio of evidence • Completion of Level 2 NVQ Diploma in Tunnelling Operations • Employer and Training Provider to identify any gaps and produce a plan for the final 3 months

Up to 3 months prior completion	Employer	Employer to decide timing of the end assessment based on the outcomes of the on-program training and progress demonstrated in the apprentice's portfolio of evidence.
EPA	End-point Assessment Organisation on RoEPAO	The EPA pulls together all activities which have taken place during the apprenticeship and provides the overall final decision as to the competence of the apprentice following the End Point Assessment.

End-Point Assessment

End-point assessment must be undertaken by an independent end-point assessment organisation that is on the Education Skills Funding Agency Register of End-point Assessment Organisations. Assessment organisations must appoint appropriately qualified and experienced assessors. Assessors must be independent i.e. have no connection with the apprentice, their training provider or employer.

The end point assessment may be completed over a two month period to accommodate work scheduling and cost effective planning of resources. The EPA will normally be done over a two day period.

Successful achievement of the end point assessment will lead to final certification of the apprenticeship and demonstrate that the apprentice is a fully competent Tunnelling Operative.

The EPA uses the following three components and should be undertaken in this order:

- Knowledge Test (weighting 30%); this will cover areas of underpinning and applied Knowledge
- Practical Assessment (weighting 30%); an observation of practical Skills in which the Apprentice will demonstrate their Skills, Behaviours and underlying Knowledge, as required by the Standard
- Technical Interview (weighting 40%); this will take the form of a professional discussion and Portfolio review that builds on the evidence seen in the previous elements as well as exploring those Skills that are not demonstrated at the time of the Practical Assessment.

See Appendix 1 for details of which assessment method will be used to assess each element of the standard. Further details on each assessment element are provided below.

Knowledge Test (Stage 1)

Apprentices will be required to complete a standardised scenario based Knowledge Test consisting of 40 questions, taken under examination conditions in a controlled environment. The questions will be a combination of multiple choice and labelling & diagrammatical type questions. The test will be made up of 32 multiple choice questions and 8 labelling & diagrammatical type questions. Multiple choice questions will have four response options with one correct option. Questions will cover knowledge elements detailed in the Core Technical Knowledge shown in Appendix 1 applied to the work environment. There are 20 topics covered in the Core Technical Knowledge in Appendix 1. Each topic will have 5 questions in a shared question bank; 20 of the total bank of questions will be labelling &

diagrammatical type questions. The questions will be set, held and moderated by the End-Point Assessment Organisation and made freely available. The Knowledge Test will ensure that at least 2 questions are asked on each topic from the Core Technical Knowledge in Appendix 1.

The assessment will be a 75 minute electronic or paper-based question paper and will enable apprentices to demonstrate core technical knowledge across the Tunnelling Operative standard, as detailed in Appendix 1. The Knowledge Test will take place on Day 1 of the EPA. The questions will be determined and standardised by the end-point assessment organisations in consultation with representative employers.

The apprentice will take the knowledge test in a suitably controlled environment recommended by the end-point assessment organisation and employer in the presence of an invigilator. The invigilator will be sourced by the end-point assessment organisation.

The test will be marked by an independent assessor appointed by an end-point assessment organisation, following a marking guide produced by the end-point assessment organisation. Independent assessors must be currently working in the industry and be occupationally competent.

The Knowledge Test will be marked out of 100 marks. The 40 questions in the test will each have a mark of 2.5 for every correct answer given; a minimum of 60 marks will be needed to pass. The Knowledge Test marks and associated grades are shown at the top of Table 2. The Knowledge Test mark will provide a percentage score towards the overall apprentice grade when the weighting for this assessment method is applied i.e. Knowledge Test mark x 0.3 [Knowledge Test 30% weighting] = Knowledge Test percentage score towards overall apprenticeship grading

Practical Assessment (Stage 2)

Apprentices will complete a practical assessment, typically to match the tasks described in the Practical Assessment Table 1 below and the associated Performance Criteria. During completion of the tasks in a real work environment, apprentices will be expected to demonstrate the knowledge, skills and behaviours they have learnt through completion of the apprenticeship process through;

- Communicating with team members and others
- Demonstrating appropriate behaviour expected in the workplace
- Working to agreed methods

If, during the practical assessment the opportunities to assess all the required KSBs do not naturally arise, the technical interview should be used to give the apprentice the opportunity to demonstrate those KSBs that may not have been observed during the practical assessment.

The duration of the Practical Assessment will be three hours in length. The Practical Assessment will take place on Day 2 of the EPA. The Practical Assessment can only be undertaken if the candidate has passed the Knowledge Test. The Practical Assessment will be dependent on what is happening at the apprentice's place of work at that time. Where practicable, arrangements will be made across the apprenticeship employer group to make one another's facilities available for the observation of practical assessment tasks.

The Practical Assessment will be managed and marked by an independent assessor appointed by the independent end-point assessment organisation, this should be the same independent assessor who conducts the Technical Interview – see below. The independent assessor must be currently working in the industry and occupationally competent.

Assessors will have freedom to ask questions in support of the tasks being observed. End-Point Assessment organisations will provide a standard template upon which to record the assessment outcome.

This Practical Assessment will provide the opportunity for the apprentice to synoptically demonstrate core and specific KSBs as detailed in Appendix 1 in a realistic work situation. This will offer the opportunity to bring together and apply their learning. Apprentices will be assessed to confirm that they can apply their knowledge to safely perform operational tunnelling activities with minimum supervision.

The Practical Assessment will be marked out of 100 marks; a minimum of 60 marks will be needed to pass. Criteria for marking and grading the practical assessment are shown in Table 2. The Practical Assessment mark will provide a percentage score towards the overall apprentice grade when the weighting for this assessment method is applied i.e. Practical Assessment mark x 0.3 [Practical Assessment 30% weighting] = Practical Assessment percentage score towards overall apprenticeship grading

Table 1

Practical Assessment	
Carry out processes for handling tunnelling resources and extending and removing tunnelling services	The Practical Assessment is about undertaking activities in a working tunnel, moving and handling tunnelling resources, extending services and then removing the services on completion of the work. This should include carrying out tasks to identify and remove defective equipment and extend supply systems, including compressed air, rail track and ventilation ducting. The apprentice will plan the work and operate machinery and tools safely and efficiently.
Performance criteria	
Check that the apprentice competently achieves the following;	
<ul style="list-style-type: none"> • Demonstrate the roles and responsibilities of a tunnelling operative • Prepare for work; pre-start briefing incl. Risk Assessment/Method Statements, permits, manufacturers requirements, selection of tools and equipment for the task incl. pre-use checks and communication • Apply safe working techniques to prepare, move and handle materials resources and components manually and mechanically • Travel and manoeuvre; position and guide tunnelling plant and vehicles • Off load and load vehicles used in the tunnelling environment • Set up for work; position and configuration • Carry out tunnelling tasks; ensure the tunnelling tasks are completed to specification, comply with signals and instructions, maintain safety (exclusion zones) • Supply information on the activities and progress of the work they are undertaking independently or as part of a team 	

Technical Interview (Stage 3)

As the final stage of the end point assessment process, an independent assessor will conduct a Technical Interview. This will be a structured interview between the Apprentice and the independent assessor. It will take place after the Knowledge Test and Practical Assessment and will clarify and build on the results of the other two Assessment Methods. Any independent assessors appointed by the independent end-point assessment organisation must be currently working in the industry and be occupationally competent.

This interview will be used to assess the Tunnelling Operative on:

- Skills not covered by the practical assessment
- Confirm knowledge, skills and behaviours using the apprentice's portfolio of evidence as a basis for the discussion.

The Technical Interview will be a structured discussion between the apprentice and independent assessor and can also focus on any gaps identified during the Practical Assessment or completion of the Knowledge Test. It will also cover apprentices' achievements, the standard of their work and their approach. This will enable the assessment to cover a broad range of knowledge and understanding, skills and behaviours, such as:

- Structured problem solving.
- Evidence of operator maintenance of equipment, plant and machinery.
- Working with others.
- Risk perception.

During the Technical Interview, the Tunnelling Operative apprentice's overall skills, knowledge and behaviours will be orally examined. The NVQ Portfolio of Evidence will be used to inform questioning during the interview. In the Portfolio, the apprentice will document evidence collected from written work, small projects, progress review information, earlier workplace observations, videos, photographs and supervisor/client comments. Because the Portfolio must be reviewed by the Independent Assessor, it will be submitted one month before the agreed date of the Practical Observation and Technical Interview. The Portfolio will primarily be in an online format to allow ease of submission, but guidance for the format and contents of the portfolio will be available as part of the Assessment Tools provided by the End-Point Assessment Organisations.

The interview will also test the currency, validity and coverage of the evidence presented in the portfolio in relation to the knowledge, skills and behaviours shown in Appendix 1. The independent assessor will use standardised questions from an agreed set of questions; a template of 60 questions will be set, held and moderated by each End-Point Assessment Organisation and made freely available [2 per topic in the TI (Technical Interview) column in the Core Knowledge, Skills and Behaviours Tables in Appendix 1]. The End-Point Assessment Organisation will be responsible for keeping tests relevant. Follow-up questions may be used to probe further into the detail in order to satisfy the independent assessor of the apprentices' depth of knowledge and skills. This Technical Interview will be conducted under controlled conditions. The apprentice responses will be documented by the independent assessor and this document will be added to the portfolio of evidence. The duration of the Technical Interview will be one hour. A structured brief will be provided in the Assessment Tools, to be used by the independent assessor during the Technical

Interview. This will ensure that a consistent approach is taken and that all key areas are appropriately explored. The Technical Interview will be carried out face-to-face following the Practical Assessment. The location for the Technical Interview will be agreed between the apprentice, employer and the end-point assessment organisation. The Technical Interview will normally take place on Day 2 of the EPA and would be undertaken following successful completion the Practical Test. The Technical Interview must be conducted by the same independent assessor that has reviewed the results of the Knowledge Test, the Portfolio and carried out the Practical Observation.

The Technical Interview will be marked out of 100 marks; a minimum of 60 marks will be needed to pass. Criteria for marking and grading the Technical Interview are shown in Table 2. The Technical Interview mark will provide a percentage score towards the overall apprentice grade when the weighting for this assessment method is applied i.e. Technical Interview mark x 0.4 [Technical Interview 40% weighting] = Technical Interview percentage score towards overall apprenticeship grading

Marking Criteria

Table 2 below outlines the marking criteria that will be applied for each assessment method; detailed guidance will be developed by the end-point assessment organisations. Appendix 1 on Page 16 shows which elements of the standard will be assessed by each assessment method in the End Point Assessment.

In order to achieve the End Point Assessment and complete the apprenticeship, all pass criteria needs to be reached. Merit criteria build on the knowledge, skills and behaviour demonstrated to reach the pass criteria; distinction criteria build on both pass and merit.

Table 2

End Point Assessment Element	Distinction Criteria	Merit Criteria	Pass Criteria	Fail
Knowledge Test	Score ≥ 85	Score 75-84	Score 60-74	Score ≤ 59
Practical Assessment (100 Marks)	Score 85-100 <ul style="list-style-type: none"> • Complete the practical assessment activities detailed in the pass criteria column and further expanded in the merit criteria column • Take additional responsibility and autonomy to achieve high performance outcomes • Demonstrate health & safety performance as defined in the 	Score 75-84 <ul style="list-style-type: none"> • Complete the practical assessment activities detailed in the pass criteria column and work with others to identify areas for improvement and follow through on any agreed implementation • Demonstrate health & safety performance as defined in the pass criteria column 	Score 60-74 <ul style="list-style-type: none"> • Adequately complete the practical assessment activities <ul style="list-style-type: none"> ○ Move and handle materials ○ Direct, guide and control the movement and operation of tunnelling plant ○ Off load and load vehicles ○ Operate powered tools and equipment 	Score ≤ 59 <ul style="list-style-type: none"> • Does not provide sufficient evidence to meet skill and behavioural requirements

	<p>pass criteria column, identify any health & safety deficiencies and provide solutions</p> <ul style="list-style-type: none"> • Consult and involve people from the team and any other areas to achieve higher performance and time management • Communicate with authority • Pre-empt risks prior to task commencement and put actions in place to prevent them occurring 	<ul style="list-style-type: none"> • Effectively contribute to team success and suggest valid ideas for improvement • Demonstrate a positive professional relationship with other team members • Adapt the method and style of communications to changing circumstances and needs. • Consistently demonstrate compliance with safe systems of work and make suggestions to reduce risks 	<ul style="list-style-type: none"> ○ Install and remove tunnelling plant ○ Install and support the installation of back-up service systems • Apply general workplace health, safety and welfare requirements and work safely when undertaking tunnelling activities • Effectively contribute to team success • Complete work in a timely manner and manage time efficiently • Speak confidently when communicating, listen to others and take required action • Consistently demonstrate compliance with safe systems of work • Proactively identify workplace hazards 	
	Score 85-100	Score 75-84	Score 60-74	Score ≤59
Technical Interview (100 Marks)	<ul style="list-style-type: none"> • Justify the application of operational practices, processes and procedures covering 5 out of the 6 different tunnelling methods Describe the technical requirements and use of appropriate technologies associated with 5 	<ul style="list-style-type: none"> • Explain in detail, with supporting evidence, the range of required skills, knowledge and behaviours of the team in the tunnelling environment Describe the relevant operational practices, processes and procedures covering 3 out of 	<ul style="list-style-type: none"> • Provide correct information to describe their understanding of skills, knowledge and behaviours required to undertake their role competently in the tunnelling environment with particular emphasis on understanding and describing the 	Does not provide sufficient evidence to meet skill, knowledge and behavioural requirements

	out of the 6 different tunnelling methods <ul style="list-style-type: none"> • Provide evidence of an in depth understanding of the relevant tunnelling processes and principles relative to their occupation • Provide evidence of an in depth knowledge of industry health, safety and environmental working practices and an ability to assess the impact of poor behaviour in the tunnelling environment 	the 6 different tunnelling methods <ul style="list-style-type: none"> • Demonstrate an ability to explain, evaluate and apply industry health, safety and environmental working practices and regulations 	impact of their actions <ul style="list-style-type: none"> • Describe how they comply with all company health, safety and environmental processes and policies as well as regulatory requirements • Describe the impact of their actions on plant, equipment and others • Describe their role as part of the tunnelling team 	
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Re-takes and/or re-sits

Re-takes and/or re-sits will only be available to apprentices who do not achieve an end point assessment element(s) i.e. they are not offered to apprentices wishing to move from pass to distinction. Apprentices may re-take and/or re-sit one or more elements within the two-month end point assessment period. Re-take and/or re-sit outside of the three-month end point assessment period would require all elements to be re-assessed. Apprentices must have a supportive action plan to prepare for the re-take and/or re-sit. Further re-take and/or re-sit would be at the discretion of the employer following a 1:1 review with the apprentice to determine the suitability of the apprentice for further testing.

Final Grade Decision

The independent assessor will combine the moderated grades from the Knowledge Test, Practical Assessment and Technical Interview to determine the overall apprenticeship grade in line with the grading criteria below.

Grading Criteria

The apprenticeship will be graded distinction, merit, pass or fail. The final grade will be determined by collective performance in the three assessment methods of the End Point Assessment i.e. Knowledge Test percentage score + Practical Assessment percentage score + Technical Interview percentage score = overall percentage score. The three assessment grades will be weighted as per the table on page 3.

Overall Distinction: 85% – 100%
Overall Merit: 75% – 84%
Overall Pass: 60 – 74%
Overall Fail: 59% or less. Apprentices also fail if they fail any element of the End Point Assessment.

End-Point Assessment Organisations

All end-point assessment organisations must be on the Education Skills Funding Agency's Register of End Point Assessment Organisations (RoEPAO). It is recommended that independent end-point assessment organisations work collaboratively to ensure standardisation in delivery of assessment services for the standard. End-Point assessment organisations must ensure their assessors can demonstrate:

- 3-5 years relevant experience of working in the tunnelling environment
- vocational competence to assess the Tunnelling Operative apprenticeship validated by an appropriate assessment qualification
- relevant experience in assessment and validation

End-Point assessment organisations must:

- Provide end point assessment guidance, where required and appropriate, to apprentices, employers and training providers in relation to the requirements of the knowledge test, practical assessment, technical interview and marking of the end point assessment elements
- Develop and maintain a single set of assessment tools that are used by all to carry out assessments
- Ensure independent assessors make consistent and reliable assessment and grade judgements through moderation
- Develop knowledge tests to meet the needs of the specialised role. End-point assessment organisations must consult with representative industry experts when developing the knowledge test. End-point assessment organisations must ensure that there is consistency and comparability in terms of the breadth and depth of the knowledge test, to ensure assessments are reliable, robust and valid and ensure competency are consistent across the industry
- Develop compensatory assessment for learners with special requirements to allow reasonable adjustments to be made to assess the knowledge, skills and competence of the apprentice through alternative assessment techniques. Whilst, these will remove barriers to participation, they must be designed to ensure judgements are not compromised to health and safety and legal requirements
- Appoint and approve independent assessors for the purposes of conducting the practical assessment and technical interviews and grading, based on a check of knowledge, experience and independence
- Appoint and approve independent assessors to mark the knowledge test and provide the marking guidance, based on a check of knowledge, experience and independence
- Provide training for independent assessors in terms of the requirements of the operation and marking of the assessment tools and grading
- Provide training for independent assessors in undertaking fair and impartial assessment and making judgements about performance and the application of knowledge and behaviours within a workplace setting
- Provide documentation and guidance in relation to the end point assessment i.e. making reasonable adjustment, eligibility to enter end point assessment and conflict of interest
- Hold bi-annual standardisation events for assessors to ensure consistent application of the guidance

- Ensure end-point assessment organisation moderators are trained in assessment and assurance processes and undertake regular continuing professional development
- Develop and manage a complaints and appeals procedure
- Report to the employer/training provider on any issues that arise in relation to the apprenticeship assessment process

Quality Assurance – Internal

To meet the expected internal quality assurances for EPA, End-Point assessment organisations must have in place the following procedures and guidance:

- Demonstrable and on-going consultation process with current industry and occupational experts in 'live' project site environments. Proposed strategy to maintain this engagement and cascade relevant information through standardisation meetings to the network of appointed assessors.
- Maintenance procedures for all EPA material(s) to reflect or reference current, legislation, safety, techniques, codes of practice and specific industry or sector or project requirements.
- Demonstrable procedure and process to account for and track the progress of each learner through the EPA cycle, the 'learner assessment journey' must be the principle consideration of these procedures.
- Traceable network of communication and a viable proposal to manage the communication between the training provider, employer; apprentice and Apprenticeship Certification Body. If absent, a suitable implementation strategy should be proposed along with benchmarked accepted standards and timeframes through a service level agreement system.
- A suitable mechanism to manage the output, within realistic timeframes, of all dependencies to the certification of each individual attempting the EPA i.e. relevant Awarding Organisations for the mandatory qualification; lead or main training provider; EPA assessors; Apprenticeship Certification body etc.
- The required liaison with the relevant industry bodies or organisations to appoint occupationally competent assessors.
- Policies and procedures to manage escalated appeals or disputes.
- Guidance, policies and procedures that describe the suitable conditions for the location(s) of each stage of the assessment.
- Policies and procedures for standardisation of assessment criteria.
- Capacity to establish procedures to conform to the proposed external quality assurance process.

End-point assessment organisations will undertake moderation of independent assessor decisions through observations and examination of documentation on a risk sampling basis, i.e. a minimum of 20% for experienced assessors and 100% for new assessors or where inconsistencies have been identified or where the independent assessor has been recruited from the employer due to site requirements. Results cannot be confirmed until moderation has been completed.

Quality Assurance – External

The responsibility for external quality assurance of the end point assessments will rest with a representative (non-profit) board convened by the Construction Industry Training Board (CITB). The board will consist of a representative group of Tunnelling employers.

Affordability

The cost of the end-point assessment will be no more than 20% of the overall apprenticeship. The funding band is awaiting confirmation.

Manageability/Feasibility of the Standard and Assessment Plan

While we envisage a three year 'approval' cycle we also acknowledge that we need to be prepared to monitor and evaluate early adopters' reactions and performance to ensure manageability/feasibility.

It is expected that there would be in the region of 24 new starts per year initially. This will need the support of approximately 4 qualified and registered assessors.

APPENDIX 1**Assessment Method by Element of the Standard – Tunnelling Operative**

Key	Assessment Method
TI	Technical Interview
KT	Knowledge Test
PA	Practical Assessment

Where elements have both assessment methods identified, it means that both assessment methods will be used to ensure a synoptic approach is achieved

Core Technical Knowledge	EPA	
The principles of health, safety, welfare and environmentally responsible work practices and how they must be applied in relation to the work, to others and to personal and occupational health	TI	KT
The different tunnelling processes and/or methods; hand tunnelling, machine tunnelling, pipejacking, sprayed concrete lining, shaft sinking and drill and blast; inherent hazards and associated risks	TI	KT
Modern technologies linked to different tunnelling processes and/or methods		KT
Sustainable practices in tunnelling and the environmental impact associated with tunnelling operations and the different tunnelling methodologies	TI	KT
The responsibilities under current legislation, (including Health and Safety at Work Act, Provision and Use of Workplace Equipment, Working at Height Regulations, Lifting Operations and Lifting Equipment Regulations, Manual Handling Operations Regulations) and official guidance, (risk assessments, method statements and manufacturers guidance), to undertake work	TI	KT
The different products and chemicals used in tunnelling operations, where to obtain the relevant information regarding safe use and disposal and the need to follow COSHH assessments	TI	KT
How to communicate with others and follow organisational procedures to conform to productive work practices including sustainability	PA	KT
How to support tunnelling operations including the duties and responsibilities of other members of the tunnelling team	TI	KT
How to interpret types of information, drawings, method statements, risk assessments, manufacturers' information, briefings, work schedules and specifications particularly when assembling and positioning resources and components including loading and off-loading vehicles	TI	KT
How building information modelling supports tunnelling operations		KT

How to direct, guide and control the movement and operation of tunnelling plant, machinery and vehicles	TI	KT
The safe techniques to move, lift, handle and store tunnelling materials, resources and components		KT
The specific requirements for conducting lifting operations and how to check associated plant, machinery, lifting accessories and equipment and deal with unserviceable plant, machinery and equipment	TI	KT
How to comply with quality requirements associated with tunnelling operations	TI	KT
How to install, operate, maintain and remove tunnelling plant, machinery and equipment	TI	KT
How to identify excavated soils and soil types and recognise changes in geology while tunnelling	TI	KT
The principles and practices of working at height and the use of access equipment	TI	KT
How to react in a tunnelling emergency including self-rescue or escape to a refuge using breathing and re-breathing apparatus	TI	KT
Occupational health risks in the tunnelling environment	TI	KT

Core Skills	EPA	
Apply general workplace health, safety and welfare requirements when undertaking tunnelling activities	TI	PA
Work safely underground, follow safe tunnel entry systems and react appropriately in an emergency following the correct emergency escape procedures	TI	PA
Interpret and work to specifications including Control of Substances Hazardous to Health [COSHH] assessments, construction information and briefings		PA
Plan and undertake work productively	TI	PA
Communicate with others and follow organisational procedures to conform to productive work practices		PA
Supply information on the activities and progress of the work they are undertaking independently and as part of a team	TI	PA
Comply with environmentally responsible work practices and contribute to sustainable practices in tunnelling operations		PA
Follow the technical requirements, at an operative level, associated with the different tunnelling processes and/or methods for one of the following; hand tunnelling, machine tunnelling (loco operator), pipejacking, sprayed concrete lining, shaft sinking and drill and blast, plan and use appropriate technologies associated with the different processes and/or methods	TI	PA
Apply safe working techniques for moving and handling materials, resources and components by mechanically assisted or manual means	TI	PA
Direct, guide and control the movement and operation of tunnelling plant, machinery and vehicles		PA
Off load and load vehicles used in the tunnelling environment		PA

Operate powered units, tools and pedestrian plant, machinery and equipment specific to tunnelling operations (e.g. pumps, generators, compressors, agitators, grouting equipment, segment-handling equipment)	TI	PA
Work individually and as part of a team, to install and remove tunnelling plant, components, machinery and equipment		PA
Install and support the installation of back-up service systems for ventilation, pressurisation, communication, water supply, walkways and materials handling (rail, conveyor and piped)	TI	PA

Core Behaviours	EPA	
Health and Safety – follows health and safety policies and procedures and be prepared to challenge unsafe behaviour using appropriate techniques to ensure the protection of people and property when working alone and/or with appropriate supervision	TI	PA
Effective communication – oral, written, electronic, listening, body language and presentation.	TI	PA
Respect – apply equality, diversity and inclusion in dealing with others.		PA
Team work – work effectively and safely with others under minimum supervision.		PA
Independent working – take responsibility for safe completion of your own work.	TI	PA
Logical thinking – use clear and valid reasoning when making decisions to undertake the work instructions.	TI	PA
Problem Solving – use generic or improvised methods, in an orderly manner, to find solutions to problems.	TI	PA
Risk Perception – be able to make the correct decision regarding risk identification and safe working particularly in the enclosed, underground and tunnel environment.	TI	PA
Working effectively – undertake the work in a reliable, safe and productive manner.		PA
Time management – use own time effectively to complete the work instructions to schedule.		PA
Adaptability – be able to adjust to changes to the work instructions.		PA
Assertiveness and confidence – be able to resist pressures to follow unsafe work practices.	TI	PA