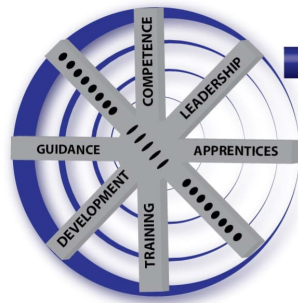




# Transforming Tunnelling Safety

Tunnel safety doesn't happen  
by accident



## TunnelSkills

National Specialist Training Group  
for the UK Tunnelling Industry

Skills

Knowledge

Attitude

Training

Experience

## SKATE Matrix

### October 2023 Edition

**SKATE [Skills, Knowledge, Attitude, Training, Experience] Competence Matrix for Tunnelling - October 2023 Edition**

For the traee roles listed below where filled by non-UK qualified persons, the Principal Contractor will be required to:  
(1) demonstrate in writing that Training and Experience elements are complied with via a Professional Review, in addition to (2) validation of the Skills, Knowledge and Attitude via a suitably competent person in an active working environment via provision of evidence

For specialist trade personnel not exclusively employed in the UK tunnelling construction industry, working less than 3 months duration: the Training requirements will not be required in lieu of the Principal Contractor providing site specific induction and full time supervision (supervisor to be fully compliant with SKATE)

| Role Family by Qualification Level | Roles  | S<br>Skills   | K<br>Knowledge   | A<br>Attitude   | T<br>Training   | E<br>Experience   | Comments   |
|------------------------------------|--|---|--|---|---|---|--|
| Visitors                           | Visitors and personnel who do not enter a tunnelling enclosed space regularly (i.e. fewer than three times entry in any 12 month period) | N/A   | N/A  | <p align="center"><b>Health, Safety and Wellbeing are core behavioural values.</b><br/>All are expected to:<br/><b>Have a sense of responsibility and ownership for day-to-day health, safety &amp; wellbeing</b></p>   | Visitor induction including current hazards and self-rescue equipment on every entry<br>Escorted by appropriately trained staff at all times while in tunnel enclosed space | N/A   | N/A  |
| Operative / Craft (Level 2)        | Tunnel Support Staff Cleaners, Tally persons, etc.   | Skills in line with employment task   | Knowledge in line with employment task   | <p align="center"><b>Many project Clients, Principal Contractors, Contractors, Employers and Designers within the sector have cultural development and/or behavioural based safety programmes</b></p> <p>Operatives at all levels should be engaged in any cultural development programmes and show willingness to take part by consistently demonstrating good practice and reporting positive events and by observing, correcting and recording unsafe conditions</p> <p align="center"><b>Health, Safety and Wellbeing are core behavioural values.</b><br/>All are expected to:<br/><b>Have a sense of responsibility and ownership for day-to-day health, safety &amp; wellbeing</b><br/>Strive to continuously improve and find more effective ways of working<br/><b>Actively collaborate with other team members and teams</b><br/><b>Communicate openly and effectively: share knowledge and experience, stop and ask questions and challenge behaviours, when required</b><br/><b>Show a willingness to learn new processes, methodologies, equipment, etc. that can have a positive dynamic impact on attitudes and behaviours</b></p> | TSTS<br><br><a href="#">C&amp;G 6151 [When working underground]</a><br><a href="#">CSCS Labourer Card</a><br><br>Health and Safety Awareness Certificate                    |   | Also required Project/Contract specific induction provided by the Principal Contractor |
| Operative / Craft (Level 2)        | TBM Miner/Ring Builder [Machine Tunnelling Operative]  | <p><b>Level 2 NVQ Diploma in Tunnelling Operations [Machine Tunnelling Operative pathway preferred]</b><br/>Interpret the given information relating to work and resources when excavating for and building temporary or permanent tunnel linings.<br/>Select the required quantity and quality of resources for the methods of work to complete the work in the allocated time and to the required specifications.</p> | <p><b>Level 2 NVQ Diploma in Tunnelling Operations [Machine Tunnelling Operative pathway preferred]</b><br/>Know the relevant legislation and official guidance when excavating for and building temporary or permanent tunnel linings whilst maintaining safe and healthy working practices.<br/>Understand how emergencies should be responded to and when and how health and safety control equipment should be used.</p> |   | <p align="center"><b>CSCS - Skilled Worker Card</b><br/><a href="#">TSTS</a><br/><a href="#">C&amp;G 6151 [When working underground]</a></p>                                | Familiar with specific TBM being used and method of tunnelling.   | Also required Project/Contract specific induction provided by the Principal Contractor |
| Operative / Craft (Level 2)        | Tunnelling Machine Operator [Plant operator involved in the excavation/formati on of the shaft/tunnel]                                   | <p><b>Level 2 NVQ Diploma in Tunnelling Operations [Tunnelling Machine Operator pathways preferred]</b><br/>Interpret the given information relating to work and resources when excavating for and building temporary or permanent tunnel linings.<br/>Select the required quantity and quality of resources for the methods of work to complete the work in the allocated time and to the required specifications.</p> | <p><b>Level 2 NVQ Diploma in Tunnelling Operations [Tunnelling Machine Operator pathways preferred]</b><br/>Know the relevant legislation and official guidance when excavating for and building temporary or permanent tunnel linings whilst maintaining safe and healthy working practices.<br/>Understand how emergencies should be responded to and when and how health and safety control equipment should be used.</p> |   | <p><a href="#">CSCS - Skilled Worker Card for Tunnelling Machine being TSTS</a><br/><a href="#">C&amp;G 6151</a></p>  | Familiar with specific tunnelling plant and equipment operation and method of tunnelling. Relevant plant categories held on a CPCS card, where applicable | Also required Project/Contract specific induction provided by the Principal Contractor |

| Role Family by Qualification Level | Roles   | Skills  | Knowledge   | Attitude  |   | Training  | Experience  | Comments  |
|------------------------------------|---|---|---|---|---|---|---|---|
| Operative / Craft (Level 2)        | Hand Miner, Shaft Miner   | <p>Level 2 NVQ Diploma in Tunnelling Operations [Hand Mining or Shaft Mining pathways preferred, as appropriate]</p> <p>Interpret the given information relating to work and resources when excavating for and building temporary or permanent tunnel linings.</p> <p>Select the required quantity and quality of resources for the methods of work to complete the work in the allocated time and to the required specifications.</p>  | <p>Level 2 NVQ Diploma in Tunnelling Operations [Hand Mining or Shaft Mining pathways preferred, as appropriate]</p> <p>Know the relevant legislation and official guidance when excavating for and building temporary or permanent tunnel linings whilst maintaining safe and healthy working practices.</p> <p>Understand how emergencies should be responded to and when and how health and safety control equipment should be used.</p> | <p>Many project Clients, Principal Contractors, Contractors, Employers and Designers within the sector have cultural development and/or behavioural based safety programmes</p> <p>Operatives at all levels should be engaged in any cultural development programmes and show willingness to take part by consistently demonstrating good practice and reporting positive events and by observing, correcting and recording unsafe conditions</p> | <p>Health, Safety and Wellbeing are core behavioural values.<br/>All are expected to:<br/>Have a sense of responsibility and ownership for day-to-day health, safety &amp; wellbeing<br/>Strive to continuously improve and find more effective ways of working<br/>Actively collaborate with other team members and teams<br/>Communicate openly and effectively: share knowledge and experience, stop and ask questions and challenge behaviours, when required<br/>Show a willingness to learn new processes, methodologies, equipment, etc. that can have a positive dynamic impact on attitudes and behaviours</p> | <p><a href="#">CSCS - Skilled Worker Card</a><br/><a href="#">TSTS</a><br/><a href="#">C&amp;G 6151</a></p>   | <p>Appropriate excavation and support setting techniques for different timber headings, shafts or ground conditions</p>                                   | <p>Also required Project/Contract specific induction provided by the Principal Contractor</p> <p>Hand Miners in timber headings should hold a relevant slinger/signaller qualification. Pit bosses/lead miners should hold an appropriate Appointed Person for Lifting or Crane Supervisor qualification where steel sections, etc. are being winched/lifted into position.</p>   |
| Operative / Craft (Level 2)        | SCL Nozzle Person   | <p>EFNARC C2 certificate - aligned to the 2020 updated training plan <a href="https://efnarc.org/s/ENC-C2-V11-20200128_ENG-93z2.pdf">https://efnarc.org/s/ENC-C2-V11-20200128_ENG-93z2.pdf</a> and</p> <p>Level 2 NVQ Diploma in Tunnelling Operations - Sprayed Concrete Lining Tunnelling Nozzleman pathway - Operating Robotic Spraying Equipment</p> <p>EFNARC C2 - Key practical skills and knowledge;</p> <ul style="list-style-type: none"> <li>- Recognise, Implement and Control safe systems for SCL works</li> <li>- Manage Quality Control and Assurance of SCL</li> <li>- Understand and manage the risks associated with the application of SCL</li> <li>- Recognise and implement current Standards and Specifications</li> <li>- Understand and operate to Inspection and Test Plans</li> <li>- Recognise Mix design and effect on quality</li> <li>- State correct pre to post application techniques and effect on safety and quality</li> <li>- Recognised key components and state the reasons for key components of SCL Equipment</li> <li>- Understand the reasons and procedures for early strength testing</li> <li>- State the requirements for Post application Quality Control and Assurance</li> <li>- List the reasons for and actions to be carried out in the event of concrete fall-outs</li> </ul> <p>NVQ - Key practical skills and knowledge:</p> <ul style="list-style-type: none"> <li>- Conforming to General Health, Safety and Welfare in the Workplace</li> <li>- Conforming to Productive Working Practices in the Workplace</li> <li>- Moving, Handling and Storing Resources in the Workplace</li> <li>- Preparing and operating specialist tunnelling plant to form tunnels in the workplace</li> <li>- Preparing substrate for sprayed concrete in the workplace</li> <li>- Applying sprayed concrete in the workplace</li> </ul> | <p>Operatives at all levels should be engaged in any cultural development programmes and show willingness to take part by consistently demonstrating good practice and reporting positive events and by observing, correcting and recording unsafe conditions</p>   |   |   | <p><a href="#">EFNARC C2 course</a><br/><a href="#">CSCS - Skilled Worker Card</a><br/><a href="#">TSTS</a><br/><a href="#">C&amp;G 6151</a></p>  | <p>Familiarity with ground conditions and familiarity of equipment being used.</p> <p>Relevant plant categories held on a CPCS card, where applicable</p> | <p>Also required Project/Contract specific induction provided by the Principal Contractor</p> <p>There is a transition period from EFNARC Certification to EFNARC C2.</p> <p>The EFNARC C2 certificate includes a five-day course, VR and practical assessment and evidence of at least 40 days of robotic spraying experience:</p> <p><a href="https://efnarc.org/information-efnarc2">https://efnarc.org/information-efnarc2</a></p> <p>Official EFNARC C2, training and certification plan:</p> <p><a href="https://efnarc.org/s/ENC-C2-V11-20200128_ENG-93z2.pdf">https://efnarc.org/s/ENC-C2-V11-20200128_ENG-93z2.pdf</a></p> |
| Operative / Craft (Level 2)        | SCL Hand sprayer  | <p>Level 2 NVQ Diploma in Tunnelling Operations - Sprayed Concrete Lining Tunnelling Nozzleman pathway - Operating Hand-held spraying equipment</p> <p>or</p> <p>L2 NVQ Diploma in Specialist Concrete Occupations (Construction) - Sprayed Concrete - Operating Hand-held spraying equipment</p> <p>NVQ - Key practical skills and knowledge:</p> <ul style="list-style-type: none"> <li>- Conforming to General Health, Safety and Welfare in the Workplace</li> <li>- Conforming to Productive Working Practices in the Workplace</li> <li>- Moving, Handling and Storing Resources in the Workplace</li> <li>- Preparing and operating specialist tunnelling plant to form tunnels in the workplace</li> <li>- Preparing substrate for sprayed concrete in the workplace</li> <li>- Applying sprayed concrete in the workplace</li> </ul>   | <p>Operatives at all levels should be engaged in any cultural development programmes and show willingness to take part by consistently demonstrating good practice and reporting positive events and by observing, correcting and recording unsafe conditions</p>   |   |   | <p><a href="#">CSCS - Skilled Worker Card</a><br/><a href="#">TSTS</a><br/><a href="#">C&amp;G 6151</a></p>   | <p>Familiarity with ground conditions. Hand spraying experience</p> <p>Relevant plant categories held on a CPCS card, where applicable</p>                | <p>Also required Project/Contract specific induction provided by the Principal Contractor</p>   |
| Operative / Craft (Level 2)        | Tunnelling Operative, Pipejacking or Micro-Tunnelling Operative, Spoil Removal Conveyor Operative, Separation Plant Operative | <p>Level 2 NVQ Diploma in Tunnelling Operations [Relevant pathway preferred to suit job role, as appropriate]</p> <p>Interpret the given information relating to work and resources for tunnelling activities specific and relevant to job role.</p> <p>Select the required quantity and quality of resources for the methods of work to complete the work in the allocated time and to the required specifications.</p>  | <p>Level 2 NVQ Diploma in Tunnelling Operations [Relevant pathway preferred to suit job role, as appropriate]</p> <p>Know the relevant legislation and official guidance for tunnelling activities specific and relevant to job role.</p> <p>Understand how emergencies should be responded to and when and how health and safety control equipment should be used.</p>   |   |   | <p>Operatives at all levels should be engaged in any cultural development programmes and show willingness to take part by consistently demonstrating good practice and reporting positive events and by observing, correcting and recording unsafe conditions</p> | <p><a href="#">CSCS - Skilled Worker Card</a><br/><a href="#">TSTS</a><br/><a href="#">C&amp;G 6151</a></p>   | <p>Relevant plant categories held on a CPCS card, where applicable</p>  |

| Role Family by Qualification Level | Roles                                      | Skills  | Knowledge  | Attitude   |  | Training   | Experience  | Comments   |
|------------------------------------|--|---|--|--|--|--|---|--|
| Operative / Craft (Level 2)        | SCL Pump Operator (above and below ground) | CPCS Technical Test A44 - Practical (mapped to the learning outcomes, achievement of a Red CPCS card follows successful completion of the full Technical Test)<br>or<br>Level 2 NVQ Diploma in Plant Operations (Construction) – Transporting Loads Plant (achievement of a Blue CPCS card follows achievement of NVQ)  | CPCS Technical Test A44 - Theory (mapped to the learning outcomes, achievement of a Red CPCS card follows the successful completion of the full Technical Test)<br>or<br>Level 2 NVQ Diploma in Plant Operations (Construction) – Transporting Loads Plant (achievement of a Blue CPCS card follows achievement of NVQ)  | <p style="text-align: center;"><b>Many project Clients, Principal Contractors, Contractors, Employers and Designers within the sector have cultural development and/or behavioural based safety programmes</b></p> <p>Operatives at all levels should be engaged in any cultural development programmes and show willingness to take part by consistently demonstrating good practice and reporting positive events and by observing, correcting and recording unsafe conditions</p> | <p style="text-align: center;"><b>Health, Safety and Wellbeing are core behavioural values.</b><br/>All are expected to:<br/>Have a sense of responsibility and ownership for day-to-day health, safety &amp; wellbeing<br/>Strive to continuously improve and find more effective ways of working<br/>Actively collaborate with other team members and teams<br/>Communicate openly and effectively: share knowledge and experience, stop and ask questions and challenge behaviours, when required<br/>Show a willingness to learn new processes, methodologies, equipment, etc. that can have a positive dynamic impact on attitudes and behaviours</p> | <a href="#">CPCS Card - Red or Blue</a><br>Training and authorisation to operate specific concrete pump<br><a href="#">TSTS</a><br><a href="#">C&amp;G 6151</a>  | Familiarity with specific pump operation/ method  | <p><b>Also required Project/Contract specific induction provided by the Principal Contractor</b></p> <p>Note 1: CPCS Red Trained Operator Card holders must register for the relevant Level 2 Plant Operations NVQ prior to the expiry of the card to upgrade to a Blue card.<br/>Note 2: Red Trained Operator cards are valid for two years.<br/>A CPCS Blue card via NVQ should infer a reasonable level of experience and that competence has been assessed.</p>  |
| Operative / Craft (Level 2)        | Loco Driver                                | CPCS Technical Test A67 - Practical (mapped to the learning outcomes, achievement of a Red CPCS card follows the successful completion of the full Technical Test)<br>or<br>Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Tunnel Transport Operator (achievement of a Blue CPCS card follows achievement of NVQ)  | CPCS Technical Test A67 - Theory (mapped to the learning outcomes, achievement of a Red CPCS card follows the successful completion of the full Technical Test)<br>or<br>Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Tunnel Transport Operator achievement of a Blue CPCS card follows achievement of NVQ  |  |  | <a href="#">CPCS Card - Red or Blue</a><br>Training and authorisation to operate specific tunnel loco<br><a href="#">TSTS</a><br><a href="#">C&amp;G 6151</a>  | Familiarity with specific tunnel loco operation/method  | <p><b>Also required Project/Contract specific induction provided by the Principal Contractor</b></p> <p>Note 1: CPCS Red Trained Operator Card holders must register for the relevant Level 2 Plant Operations NVQ prior to the expiry of the card to upgrade to a Blue card.<br/>Note 2: Red Trained Operator cards are valid for two years.<br/>A CPCS Blue card via NVQ should infer a reasonable level of experience and that competence has been assessed.<br/>Note 3: The CPCS A67 category includes endorsements for Electric and Diesel locomotives, up to 10 tonnes and all sizes, and Tandem locomotives. Operators must hold a CPCS card showing the correct relevant endorsement/s for the locomotive/s being operated.</p>  |
| Operative / Craft (Level 2)        | Multi Service Vehicle (MSV) Operator       | CPCS Technical Test A51<br>A: Articulated types (Multi Carriage)<br>B: Rigid Type Units (Single Carriage)<br>(mapped to the learning outcomes achievement of a Red (Trained) CPCS card follows the successful completion of the full Technical Test or Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Tunnel Transport Operator (achievement of a Blue (Competent) CPCS card follows achievement of NVQ) | CPCS A51 MSV Overview page<br><a href="https://www.nocnjobcards.org/help-and-support/cpcs-support-documents/revision-support-documents/">https://www.nocnjobcards.org/help-and-support/cpcs-support-documents/revision-support-documents/</a><br>Please note that to access the MSV A51 you will need to select the appropriate document. Once in this document you will land on the front page - click on the title of the category in the Category Description column which is hyperlinked to the MSV A51 relevant page. |  |  | <a href="#">CPCS Card Red or Blue</a><br><a href="#">Training and authorisation to operate specific Multi Service Vehicle MSV Manufacturers Awareness training</a><br><a href="#">TSTS</a><br><a href="#">C&amp;G 6151</a> | Familiarity with specific Multi Service Vehicle (MSV) and below ground plant and logistics operations | <p>Project Specific Tunnelling Safety Induction and specific tunnel logistics training.<br/>Must be trained to be familiar with manufacturer fitted and other retrospectively fitted safety controls and features.<br/>Must have specific training in the use of integrated and hand held fire suppression and extinguishing systems and emergency procedures.<br/>Note 1: CPCS Red Trained Operator Card holders must register for the relevant Level 2 Plant Operations NVQ prior to the expiry of the card to upgrade to a Blue card.<br/>Note 2: Red Trained Operator cards are valid for two years.<br/>A CPCS Blue card via NVQ should infer a reasonable level of experience and that competence has been assessed.<br/>Note 3: The CPCS A51 category includes endorsements for Electric and Diesel Multi Service Vehicles in category A (Articulated) and Category B (Rigid). Operators must hold a CPCS card showing the correct relevant endorsement for the MSV being operated.</p> |

| Role Family by Qualification Level                     | Roles                       | Skills  | Knowledge  | Attitude   |  | Training  | Experience   | Comments  |
|--|-----------------------------|---|--|--|--|---|--|---|
| Operative / Craft (Level 2)                            | Pit Top / Slinger Signaller | CPCS Technical Test A40 - Practical (mapped to the learning outcomes, achievement of a Red CPCS card follows the successful completion of the full Technical Test)<br>or<br>Level 2 NVQ Diploma in Controlling Lifting Operations - Slinger/Signaller (Construction) (achievement of a Blue CPCS card follows achievement of NVQ) | CPCS Technical Test A40 - Theory (mapped to the learning outcomes, achievement of a Red CPCS card follows the successful completion of the full Technical Test)<br>or<br>Level 2 NVQ Diploma in Controlling Lifting Operations - Slinger/Signaller (Construction) (achievement of a Blue CPCS card follows achievement of NVQ) | <p style="text-align: center;"><b>Many project Clients, Principal Contractors, Contractors, Employers and Designers within the sector have cultural development and/or behavioural based safety programmes</b></p> <p>Operatives at all levels should be engaged in any cultural development programmes and show willingness to take part by consistently demonstrating good practice and reporting positive events and by observing, correcting and recording unsafe conditions</p> | <p style="text-align: center;"><b>Health, Safety and Wellbeing are core behavioural values. All are expected to:</b></p> <p style="text-align: center;"><b>Have a sense of responsibility and ownership for day-to-day health, safety &amp; wellbeing</b></p> <p style="text-align: center;"><b>Strive to continuously improve and find more effective ways of working</b></p> <p style="text-align: center;"><b>Actively collaborate with other team members and teams</b></p> <p style="text-align: center;"><b>Communicate openly and effectively: share knowledge and experience, stop and ask questions and challenge behaviours, when required</b></p> <p style="text-align: center;"><b>Show a willingness to learn new processes, methodologies, equipment, etc. that can have a positive dynamic impact on attitudes and behaviours</b></p> | <a href="#">CPCS Card - Red or Blue TSTS</a>  | Log Book or similar record of Slinger/Signaller duties   | <p><b>Also required Project/Contract specific induction provided by the Principal Contractor</b></p> <p>Note 1: CPCS Red Trained Operator Card holders must register for the relevant Level 2 Plant Operations NVQ prior to the expiry of the card to upgrade to a Blue card.</p> <p>Note 2: Red Trained Operator cards are valid for two years.</p> <p>A CPCS Blue card via NVQ should infer a reasonable level of experience and that competence has been assessed.</p> |
| Operative / Craft (Level 2)                            | Pit Bottom                  | CPCS Technical Test A40 - Practical (mapped to the learning outcomes, achievement of a Red CPCS card follows the successful completion of the full Technical Test)<br>or<br>Level 2 NVQ Diploma in Controlling Lifting Operations - Slinger/Signaller (Construction) (achievement of a Blue CPCS card follows achievement of NVQ) | CPCS Technical Test A40 - Theory (mapped to the learning outcomes, achievement of a Red CPCS card follows the successful completion of the full Technical Test)<br>or<br>Level 2 NVQ Diploma in Controlling Lifting Operations - Slinger/Signaller (Construction) (achievement of a Blue CPCS card follows achievement of NVQ) |  |  | <a href="#">CPCS Card - Red or Blue TSTS</a><br><a href="#">C&amp;G 6151</a>          | Log Book or similar record of Slinger/Signaller duties   | <p><b>Also required Project/Contract specific induction provided by the Principal Contractor</b></p> <p>Note 1: CPCS Red Trained Operator Card holders must register for the relevant Level 2 Plant Operations NVQ prior to the expiry of the card to upgrade to a Blue card.</p> <p>Note 2: Red Trained Operator cards are valid for two years.</p> <p>A CPCS Blue card via NVQ should infer a reasonable level of experience and that competence has been assessed.</p> |
| Operative / Craft (Level 2)                            | Overhead Crane Operator     | CPCS Technical Test A64 - Practical (mapped to the learning outcomes, achievement of a Red CPCS card follows the successful completion of the full Technical Test)<br>or<br>Level 2 NVQ Diploma in Plant Operations - Cranes and Specialist Lifting (Construction) (achievement of a Blue CPCS card follows achievement of NVQ)   | CPCS Technical Test A64 - Theory (mapped to the learning outcomes, achievement of a Red CPCS card follows the successful completion of the full Technical Test)<br>or<br>Level 2 NVQ Diploma in Plant Operations - Cranes and Specialist Lifting (Construction) (achievement of a Blue CPCS card follows achievement of NVQ)   |  |  | <a href="#">CPCS Card - Red or Blue TSTS</a>  | Log Book or similar record of overhead crane operation activities  | <p><b>Also required Project/Contract specific induction provided by the Principal Contractor</b></p> <p>Note 1: CPCS Red Trained Operator Card holders must register for the relevant Level 2 Plant Operations NVQ prior to the expiry of the card to upgrade to a Blue card.</p> <p>Note 2: Red Trained Operator cards are valid for two years.</p> <p>A CPCS Blue card via NVQ should infer a reasonable level of experience and that competence has been assessed.</p> |
| Operative / Craft (Level 2) + Advanced Craft (Level 3) | Tunnel Fitter               | Relevant Apprenticeship at Level 2 or Level 3<br>or<br>Relevant Plant Maintenance Competence Qualification at Level 2 or Level 3  | Relevant Apprenticeship at Level 2 or Level 3<br>or<br>Relevant Plant Maintenance Knowledge Qualification at Level 2 or Level 3  |  |  | <a href="#">CSCS Skilled Worker or Gold Card TSTS</a><br><a href="#">C&amp;G 6151</a> | EngTech professional registration with IMechE or similar relevant professional body +<br>Record of ongoing CPD | <p><b>Also required Project/Contract specific induction provided by the Principal Contractor</b></p>  |

| Role Family by Qualification Level                     | Roles              | Skills  | Knowledge  | Attitude   |   | Training  | Experience   | Comments   |
|--|--------------------|---|--|--|---|---|--|--|
| Operative / Craft (Level 2) + Advanced Craft (Level 3) | Tunnel Welder      | Relevant Apprenticeship at Level 2 or Level 3<br>or<br>Relevant Welding Competence Qualification at Level 2 or Level 3  | Relevant Apprenticeship at Level 2 or Level 3<br>or<br>Relevant Welding Knowledge Qualification at Level 2 or Level 3  | <p>Health, Safety and Wellbeing are core behavioural values.</p> <p>All are expected to:</p> <ul style="list-style-type: none"> <li>Have a sense of responsibility and ownership for day-to-day health, safety &amp; wellbeing</li> <li>Strive to continuously improve and find more effective ways of working</li> <li>Actively collaborate with other team members and teams</li> <li>Communicate openly and effectively: share knowledge and experience, stop and ask questions and challenge behaviours, when required</li> <li>Show a willingness to learn new processes, methodologies, equipment, etc. that can have a positive dynamic impact on attitudes and behaviours</li> </ul> | <p>Many project Clients, Principal Contractors, Contractors, Employers and Designers within the sector have cultural development and/or behavioural based safety programmes</p> <p>Operatives at all levels should be engaged in any cultural development programmes and show willingness to take part by consistently demonstrating good practice and reporting positive events and by observing, correcting and recording unsafe conditions</p> | Gold Card<br>TSTS<br>C&G 6151   | Records of completing and achieving relevant Welding procedures qualification tests plus record of ongoing testing                         | Also required Project/Contract specific induction provided by the Principal Contractor |
| Operative / Craft (Level 2) + Advanced Craft (Level 3) | Tunnel Fabricator  | Relevant Apprenticeship at Level 2 or Level 3<br>or<br>Relevant Fabrication Competence Qualification at Level 2 or Level 3  | Relevant Apprenticeship at Level 2 or Level 3<br>or<br>Relevant Fabrication Knowledge Qualification at Level 2 or Level 3  |  |   | CSCS Skilled Worker or Gold Card<br>TSTS<br>C&G 6151  | Records of completing and achieving relevant Welding procedures qualification tests plus record of ongoing testing, where required H17:117 | Also required Project/Contract specific induction provided by the Principal Contractor |
| Advanced Craft (Level 3)                               | TBM Operator       | <p>Level 3 NVQ Diploma in Tunnelling Operations [Tunnel Boring Machine Operator]</p> <p>Team work and communication.</p> <p>Record and report information</p> <p>Identify the characteristics of Earth Pressure Balance and Slurry TBM used for the construction and formation of tunnels.</p> <p>Carry out function checks for the tunnelling operation and operate TBM hydraulic systems taking account of ground pressure and strata, geological, environmental and material changes.</p> <p>Interpret, analyse and process the TBM visual display and computer data systems to advance the TBM's operation and to identify alignment and rate of advance and adjust TBM settings to maintain alignment.</p> <p>Safely shut down and secure the TBM and record and report information.</p> | <p>Level 3 NVQ Diploma in Tunnelling Operations [Tunnel Boring Machine Operator]</p> <p>Know the relevant legislation and official guidance when building temporary or permanent tunnel linings whilst maintaining safe and healthy working practices.</p> <p>Understand how emergencies should be responded to and when and how health and safety control equipment should be used.</p> |  |   | CSCS - Gold Card<br>TBM manufacturer specific training<br>TSTS<br>C&G 6151                                  | Familiarity with specific TBM operation/method (for Slurry TBM's to include communication protocols with Separation Plant Operatives)      | Also required Project/Contract specific induction provided by the Principal Contractor |
| Advanced Craft (Level 3)                               | Tunnel Electrician | Relevant Apprenticeship at Level 3<br>or<br>Relevant Electrotechnical Competence Qualification at Level 2 or Level 3  | Relevant Apprenticeship at Level 3<br>or<br>Relevant Electrotechnical Knowledge Qualification at Level 2 or Level 3  |  |   | ECS Installation or Maintenance Electrician Card<br>18th Edition IEE Regs Qualification<br>TSTS<br>C&G 6151 | Hold ECS Registered Electrician Status + maintain record of ongoing CPD  | Also required Project/Contract specific induction provided by the Principal Contractor |

| Role Family by Qualification Level | Roles  | Skills   | Knowledge   | Attitude   |   | Training  | Experience   | Comments  |
|------------------------------------|--|--|---|--|---|---|--|---|
| Work Supervision (Level 3)         | Chargehand / Foreman Fitter                                | Hold relevant mechanical apprenticeship / competence / knowledge qualifications<br>+<br>Level 3 NVQ Diploma in Occupational Work Supervision (Construction)<br>+<br>Level 2 Certificate in Team Leading  |   | <p>Supervisors should support the programmes and be willing and engaged and should actively encourage involvement of the workforce. They should monitor activities for compliance with written systems of work and required standards and should consistently demonstrate, recognise and reward good practice and appropriate behaviours. Where any shortfalls are identified, a consistent respectful, fair and just approach to dealing with all personnel is required</p> <p>Many project Clients, Principal Contractors, Contractors, Employers and Designers within the sector have cultural development and/or behavioural based safety programmes</p> <p>Health, Safety and Wellbeing are core behavioural values.<br/>All are expected to:<br/>Have a sense of responsibility and ownership for day-to-day health, safety &amp; wellbeing<br/>Strive to continuously improve and find more effective ways of working<br/>Actively collaborate with other team members and teams<br/>Communicate openly and effectively: share knowledge and experience, stop and ask questions and challenge behaviours, when required<br/>Show a willingness to learn new processes, methodologies, equipment, etc. that can have a positive dynamic impact on attitudes and behaviours</p> | SSSTS<br>TSTS<br>C&G 6151   | EngTech professional registration with IMechE or similar relevant professional body<br>+<br>Record of ongoing CPD   | Also required Project/Contract specific induction provided by the Principal Contractor |   |
| Work Supervision (Level 3)         | Chargehand / Foreman Electrician                           | Hold relevant Electrotechnical apprenticeship / competence / knowledge qualifications<br>+<br>Level 3 NVQ Diploma in Occupational Work Supervision (Construction)<br>+<br>Level 2 Certificate in Team Leading  |   |  | ECS Technician Card<br>C+G 2391 Inspection and Testing Qualification<br>SSSTS<br>TSTS<br>C&G 6151 | Hold ECS Registered Electrician Status and/or EngTech professional registration with IET or similar relevant professional body + maintain record of ongoing CPD | Also required Project/Contract specific induction provided by the Principal Contractor |   |
| Work Supervision (Level 3)         | Lead Miner / Pit Boss Tunnelling Inspector / NEC Inspector | Hold relevant Tunnelling competence qualification<br>+<br>Level 3 NVQ Diploma in Occupational Work Supervision (Construction)<br>+<br>Level 2 Certificate in Team Leading  |   |  | SSSTS [SMSTS for Pit Bosses and Inspectors]<br>TSTS<br>C&G 6151                                   | EngTech professional registration with ICE or similar relevant professional body<br>+<br>Record of ongoing CPD  | Also required Project/Contract specific induction provided by the Principal Contractor |   |
| Supervisory (Level 4)              | Crane Supervisor   | CPCS Technical Test A62 - Practical (mapped to the learning outcomes, achievement of a Red CPCS card follows the successful completion of the full Technical Test)<br>or<br>Level 4 NVQ Diploma in Controlling Lifting Operations - Supervising (achievement of a Blue CPCS card follows achievement of NVQ) | CPCS Technical Test A62 - Theory (mapped to the learning outcomes, achievement of a Red CPCS card follows the successful completion of the full Technical Test)<br>or<br>Level 4 NVQ Diploma in Controlling Lifting Operations - Supervising (achievement of a Blue CPCS card follows achievement of NVQ) |  |   | CPCS Card - Red or Blue<br>TSTS<br>C&G 6151 [if working underground]  | Log Book or similar record of supervised lifts   | Also required Project/Contract specific induction provided by the Principal Contractor<br><br>Note 1: CPCS Red Trained Operator Card holders must register for the relevant Level 2 Plant Operations NVQ prior to the expiry of the card to upgrade to a Blue card.<br>Note 2: Red Trained Operator cards are valid for two years.<br>A CPCS Blue card via NVQ should infer a reasonable level of experience and that competence has been assessed. |

| Role Family by Qualification Level                     | Roles   | Skills  | Knowledge  | Attitude   |  | Training   | Experience   | Comments  |
|--|---|---|--|--|--|--|--|---|
| <b>Management (Level 5)</b>                            | Appointed Person for Lifting                              | CPCS Technical Test A61 - Practical (mapped to the learning outcomes, achievement of a Red CPCS card follows the successful completion of the full Technical Test)<br>or<br>Level 5 NVQ Diploma in Controlling Lifting Operations - Planning Lifts (achievement of a Blue CPCS card follows achievement of NVQ)   | CPCS Technical Test A61 - Theory (mapped to the learning outcomes, achievement of a Red CPCS card follows the successful completion of the full Technical Test)<br>or<br>Level 5 NVQ Diploma in Controlling Lifting Operations - Planning Lifts (achievement of a Blue CPCS card follows achievement of NVQ) | <p><b>Many project Clients, Principal Contractors, Contractors, Employers and Designers within the sector have cultural development and/or behavioural based safety programmes</b></p> <p>Those in Management and Leadership roles should actively promote and be fully engaged and committed to the programmes. They should set an exceptional personal example and commitment to achieving a positive outcome, and should champion and promote workforce engagement and, recognise and reward good practice and behaviours. They should ensure and monitor that adequate resources and appropriate expectations, targets, standards and requirements are set and adhered to. Managers and Leaders should ensure that all personnel are being treated with respect and engaged in a consistently fair and just manner</p> | <p><b>Health, Safety and Wellbeing are core behavioural values.</b><br/>All are expected to:</p> <p><b>Have a sense of responsibility and ownership for day-to-day health, safety &amp; wellbeing</b><br/><b>Strive to continuously improve and find more effective ways of working</b><br/><b>Actively collaborate with other team members and teams</b><br/><b>Communicate openly and effectively: share knowledge and experience, stop and ask questions and challenge behaviours, when required</b><br/><b>Show a willingness to learn new processes, methodologies, equipment, etc. that can have a positive dynamic impact on attitudes and behaviours</b></p> | <a href="#">SMSTS</a><br><a href="#">CPCS Card - Red or Blue</a><br><a href="#">TSTS</a><br><a href="#">C&amp;G 6151</a>   | Log Book or similar record of planned lifts  | <p><b>Also required Project/Contract specific induction provided by the Principal Contractor</b></p> <p>Note 1: CPCS Red Trained Operator Card holders must register for the relevant Level 2 Plant Operations NVQ prior to the expiry of the card to upgrade to a Blue card.<br/>Note 2: Red Trained Operator cards are valid for two years.<br/>A CPCS Blue card via NVQ should infer a reasonable level of experience and that competence has been assessed.</p> |
| <b>Supervisory and Management (Level 4 to Level 6)</b> | Tunnel Superintendent / Shift Manager / Agent / Sub Agent | ILM Level 3 Qualification in Leadership and Management Practice for the Construction and Built Environment Sector - Award, Certificate or Diploma to include Supervision in Tunnelling Environments<br>+<br>NVQ Level 4 in Construction Site Supervision – Tunnelling<br>or<br>Level 6 NVQ Diploma in Construction Site Management (should include the optional unit - Planning tunnelling activities in the workplace) |  |  |  | <a href="#">SMSTS</a><br><a href="#">CSCS Supervisor, Manager, AQP or PQP Card</a><br><a href="#">TSTS</a><br><a href="#">C&amp;G 6151</a>   | Appropriate level of professional registration with ICE or similar relevant professional body<br>+<br>Record of ongoing CPD  | <p><b>Also required Project/Contract specific induction provided by the Principal Contractor</b></p>  |
| <b>Management (Level 5 to Level 7)</b>                 | Tunnel Manager<br>Tunnel Project Manager                  | Competence qualification or educational base at Level 5-7<br>+<br>Relevant ILM Level 5 Qualification in Leadership and Management   |  |  |  | <a href="#">SMSTS</a><br><a href="#">CSCS Supervisor, Manager, AQP or PQP Card</a><br><a href="#">TSTS</a><br><a href="#">C&amp;G 6151</a>   | Appropriate level of professional registration with ICE or similar relevant professional body<br>+<br>Record of ongoing CPD<br>+<br>Tunnel experience relevant to the type of tunnel being managed | <p><b>Also required Project/Contract specific induction provided by the Principal Contractor</b></p>  |
| <b>Supervisory and Management (Level 3 to Level 7)</b> | Shift Engineer<br>Site Engineer<br>Section Engineer       | Competence qualification or educational base at Level 3-7;<br>e.g. Level 3 = A Levels/BTEC; Level 4 = HNC; Level 5 = Foundation Degree/HND, Level 6 = Ordinary Degree, Level 7 = Master's Degree  |  |  |  | <a href="#">SSSTS for Site/Shift Engineers</a><br><a href="#">SMSTS for Section Engineer and above</a><br><a href="#">CSCS AQP or PQP Card</a><br><a href="#">TSTS</a><br><a href="#">C&amp;G 6151</a> | Appropriate level of professional registration with ICE or similar relevant professional body<br>+<br>Record of ongoing CPD  | <p><b>Also required Project/Contract specific induction provided by the Principal Contractor</b></p>  |



| Role Family by Qualification Level                         | Roles   | Skills   | Knowledge  | Attitude   | Training  | Experience   | Comments   |  |
|--|---|--|--|--|---|--|--|--|
| Technical, Supervisory and Management (Level 3 to Level 7) | Tunnel support staff - surveyors, quality engineers, geotechnical engineers, etc. | Competence qualification or educational base at Level 3-7;<br>e.g. Level 3 = A levels/BTEC; Level 4 = HNC; Level 5 = Foundation Degree/HND, Level 6 = Ordinary Degree, Level 7 = Master's Degree |  |  |   | <p>CSCS Supervisor, Manager, AQP or PQP Card<br/> <a href="#">ISTIS C&amp;G 6151</a></p>                 | Appropriate level of professional registration with a relevant professional body + Record of ongoing CPD | Also required Project/Contract specific induction provided by the Principal Contractor |
| Design (Level 5 to Level 8)                                | Design engineers and design-related staff - Site and Office-based                 | Educational base at Level 5-8;<br>e.g. Level 5 = Foundation Degree/HND, Level 6 = Ordinary Degree, Level 7 = Master's Degree, Level 8 = PHD  | <p>Many project Clients, Principal Contractors, Contractors and Employers within the sector have cultural development and/or behavioural based safety programmes</p> <p>Designers should be fully engaged and committed to cultural development, behavioural programmes and CPD. This should include keeping up-to-date with best practise and lessons learned in tunnelling and underground construction worldwide.</p> | <p>Health, Safety and Wellbeing are core behavioural values. All are expected to:</p> <p>Have a sense of responsibility and ownership for day-to-day health, safety &amp; wellbeing<br/>         Strive to continuously improve and find more effective ways of working<br/>         Actively collaborate with other team members and teams<br/>         Communicate openly and effectively: share knowledge and experience, stop and ask questions and challenge behaviours, when required<br/>         Show a willingness to learn new processes, methodologies, equipment, etc. that can have a positive dynamic impact on attitudes and behaviours</p> | <p>For site-based staff - CSCS Supervisor, Manager, AQP or PQP Card</p> <p>For those working in or regularly visiting shafts and tunnels under construction -<br/> <a href="#">ISTIS C&amp;G 6151</a></p> | Appropriate level of professional registration with a relevant professional body + Record of ongoing CPD | Also required Project/Contract specific induction provided by the Principal Contractor                   |  |

## Guidance Notes

### Considerations when using the matrix:

|   |   |
|---|---|
| 1 | For non-UK qualifications, employers must map these qualifications against the UK qualifications and requirements defined in matrix tab, to evaluate suitability and currency and identify any skills gaps. Such academic equivalency checks can be carried out by <a href="https://www.enic.org.uk/">https://www.enic.org.uk/</a> This equivalency check will also simplify international personnel who would be seeking Professional Qualifications via UK Membership Institutions. |
| 2 | The matrix is a live document. It will be regularly updated based on any changes of context and new or updated qualifications and card schemes, as they become available. It will also take into account client and industry feedback.  |
| 3 | The matrix reflects the CLC recommendation on Industry Card Schemes published in December 2020 that specifies and promotes card schemes carrying the CSCS logo for recognised construction occupations, with no equivalents accepted. The bulk of the tunnelling occupations in the SKATE matrix are directly covered by the CSCS and CPCS card schemes.  |
| 4 | People can be enrolled on an NVQ but may not have completed it as it takes a period of time to complete the qualification and receive the certification. NVQs cannot be therefore be simply considered as a Y/N response, registration onto the qualification is also part of the process.  |
| 5 | There can be alternative routes to competence for each occupation. There should be ways available for people to demonstrate this so that alternative routes can be appropriately reviewed.  |
| 6 | If someone has completed a competence qualification a number of years ago, the currency of this qualification should be checked and assessed to understand if holders need any further support when starting a particular role. The client can ask for clarity of any qualification benchmarking processes used for this.   |
| 7 | Potential challenges to consider: shortage of NVQs assessors for particular qualifications, poor quality of training, etc. This can be discussed with organisations who are involved and other stakeholders such as Awarding Bodies, training providers, CITB and TunnelSkills.   |

## Competence & Qualification Levels

### **Competence:**

The information below has been taken from eCOTOOL in March 2020 - [https://www.simongrant.org/pubs/resources/eCOTOOL\\_High\\_Level\\_Competence\\_Model\\_Explanation\\_EN.pdf](https://www.simongrant.org/pubs/resources/eCOTOOL_High_Level_Competence_Model_Explanation_EN.pdf)

|                |  |
|----------------|--|
| <b>Level 1</b> | Abilities at level 1 recognise basic general knowledge and skills as well as the capacity to undertake simple and general tasks under supervision.   |
| <b>Level 2</b> | Abilities at level 2 recognise field-specific practical and theoretical knowledge and skills as well as the capacity to carry out tasks under direction.   |
| <b>Level 3</b> | Abilities at level 3 recognise broader theoretical and practical knowledge and skills as well as the capacity to apply knowledge and skills in developing strategic solutions to well-defined abstract and concrete problems.                    |
| <b>Level 4</b> | Abilities at level 4 recognise detailed theoretical and practical knowledge, skills and competences, some of which is at the forefront of the field.   |
| <b>Level 5</b> | Abilities at level 5 recognise highly specialised self-directed, theoretical and practical knowledge and skills as well as the capacity for critical analysis, evaluation and synthesis of new and complex ideas including substantial research. |

### **Qualifications:**

Explanations/Examples of qualifications at different level are available at the government website: <https://www.gov.uk/what-different-qualification-levels-mean/list-of-qualification-levels>

## Cards & Qualifications

| Title  | Details   | Link   |
|--|---|--|
| ROGEP  | Register of Ground Engineering Professionals  | <a href="https://www.ice.org.uk/careers-and-training/careers-advice-for-civil-engineers/specialist-professional-registers#RoGEP">https://www.ice.org.uk/careers-and-training/careers-advice-for-civil-engineers/specialist-professional-registers#RoGEP</a>  |
| EFNARC   | EFNARC Nozzleman Scheme   | <a href="https://efnarc.org/nozzleman-scheme-1">https://efnarc.org/nozzleman-scheme-1</a>  |
|  | EFNARC Nozzleman C2 Certificate   | <a href="https://efnarc.org/information-efnarc2">https://efnarc.org/information-efnarc2</a>  |
|  | EFNARC Examiner Certificate   | <a href="https://efnarc.org/examiner-certificate">https://efnarc.org/examiner-certificate</a>  |
| CSCS   | Construction Skills Certification Scheme  | <a href="https://www.cscs.uk.com/">https://www.cscs.uk.com/</a>  |
|  | Labourer  | <a href="https://www.cscs.uk.com/card-type/labourer/">https://www.cscs.uk.com/card-type/labourer/</a>  |
|  | Apprentice  | <a href="https://www.cscs.uk.com/card-type/apprentice/">https://www.cscs.uk.com/card-type/apprentice/</a>  |
|  | Experienced Technical Supervisor or Manager   | <a href="https://www.cscs.uk.com/card-type/experienced-technical-supervisor-or-manager/">https://www.cscs.uk.com/card-type/experienced-technical-supervisor-or-manager/</a>  |
|  | Experienced Worker  | <a href="https://www.cscs.uk.com/card-type/experienced-worker/">https://www.cscs.uk.com/card-type/experienced-worker/</a>  |
|  | Trainee   | <a href="https://www.cscs.uk.com/card-type/trainee-card/">https://www.cscs.uk.com/card-type/trainee-card/</a>  |
|  | Skilled Worker  | <a href="https://www.cscs.uk.com/card-type/skilled-worker/">https://www.cscs.uk.com/card-type/skilled-worker/</a>  |
|  | Advanced Craft  | <a href="https://www.cscs.uk.com/card-type/advanced-craft/">https://www.cscs.uk.com/card-type/advanced-craft/</a>  |
|  | Supervisor  | <a href="https://www.cscs.uk.com/card-type/supervisor/">https://www.cscs.uk.com/card-type/supervisor/</a>  |
|  | Manager   | <a href="https://www.cscs.uk.com/card-type/manager/">https://www.cscs.uk.com/card-type/manager/</a>  |
| AQP - Academically Qualified Person  | <a href="https://www.cscs.uk.com/card-type/academically-qualified-person/">https://www.cscs.uk.com/card-type/academically-qualified-person/</a>   |  |
| PQP - Professionally Qualified Person  | <a href="https://www.cscs.uk.com/card-type/professionally-qualified-person/">https://www.cscs.uk.com/card-type/professionally-qualified-person/</a>   |  |
| CPCS   | Construction Plant Competence Scheme - Scheme Booklet for Operators   | <a href="https://www.nocnjobcards.org/data/General_Downloads/CPCSSchemeBookletforOperators0320.pdf">https://www.nocnjobcards.org/data/General_Downloads/CPCSSchemeBookletforOperators0320.pdf</a>  |
|  | Plant Operator - Red Trained Operator Card  | <a href="https://www.nocnjobcards.org/CPCS/cpcs-red-trained-operator-card/">https://www.nocnjobcards.org/CPCS/cpcs-red-trained-operator-card/</a>  |
|  | Plant Operator - Blue Competent Operator Card   | <a href="https://www.nocnjobcards.org/CPCS/cpcs-blue-competent-operator-card/">https://www.nocnjobcards.org/CPCS/cpcs-blue-competent-operator-card/</a>  |
|  | Plant Tester  | <a href="https://www.nocnjobcards.org/CPCS/cpcs-tester-card/">https://www.nocnjobcards.org/CPCS/cpcs-tester-card/</a>  |
|  | Plant Tester - Scheme Booklet   | <a href="https://www.nocnjobcards.org/data/General_Downloads/CPCSSchemeBookletforTesters050620.pdf">https://www.nocnjobcards.org/data/General_Downloads/CPCSSchemeBookletforTesters050620.pdf</a>  |
| SSP  | Site Safety Plus - Principal Scheme Rules   | <a href="https://www.citb.co.uk/standards-and-delivering-training/site-safety-plus-ssp/">https://www.citb.co.uk/standards-and-delivering-training/site-safety-plus-ssp/</a>  |
| SSSTS  | Site Safety Plus - Site Safety Plus - Site Supervisors' Safety Training Scheme  | <a href="https://www.citb.co.uk/national-construction-college/health-safety-and-sustainability/courses/site-supervisors-safety-training-scheme-sssts/?id=82399">https://www.citb.co.uk/national-construction-college/health-safety-and-sustainability/courses/site-supervisors-safety-training-scheme-sssts/?id=82399</a>                |
| SMSTS  | Site Safety Plus - Site Managers' Safety Training Scheme  | <a href="https://www.citb.co.uk/national-construction-college/health-safety-and-sustainability/courses/site-management-safety-training-scheme-smsts/?id=82381">https://www.citb.co.uk/national-construction-college/health-safety-and-sustainability/courses/site-management-safety-training-scheme-smsts/?id=82381</a>                  |
| TSTS   | Site Safety Plus - Tunnelling Safety Training Scheme  | <a href="https://www.citb.co.uk/standards-and-delivering-training/site-safety-plus-ssp/courses-available/tunnelling-safety-training-scheme-tsts/?id=82437">https://www.citb.co.uk/standards-and-delivering-training/site-safety-plus-ssp/courses-available/tunnelling-safety-training-scheme-tsts/?id=82437</a>                          |
| SEATS  | Site Safety Plus - Site Environmental Training Scheme   | <a href="https://www.citb.co.uk/standards-and-delivering-training/site-safety-plus-ssp/courses-available/site-environmental-awareness-training-scheme/?id=82453">https://www.citb.co.uk/standards-and-delivering-training/site-safety-plus-ssp/courses-available/site-environmental-awareness-training-scheme/?id=82453</a>              |
| TWTC   | Site Safety Plus - Temporary Works Co-ordinator Training Course   | <a href="https://www.citb.co.uk/standards-and-delivering-training/site-safety-plus-ssp/courses-available/temporary-works-co-ordinator-training-course-twtc/?id=82429">https://www.citb.co.uk/standards-and-delivering-training/site-safety-plus-ssp/courses-available/temporary-works-co-ordinator-training-course-twtc/?id=82429</a>    |
| TWSTC  | Site Safety Plus - Temporary Works Supervisor Training Course   | <a href="https://www.citb.co.uk/standards-and-delivering-training/site-safety-plus-ssp/courses-available/temporary-works-supervisor-training-course-twstc/?id=82477">https://www.citb.co.uk/standards-and-delivering-training/site-safety-plus-ssp/courses-available/temporary-works-supervisor-training-course-twstc/?id=82477</a>      |
| City & Guilds 6151   | City & Guilds 6151 - Tunnel Entry and Associated Emergency Procedures   | <a href="https://www.cityandguilds.com/qualifications-and-apprenticeships/utilities/utilities/6151-tunnel-entry#tab=information">https://www.cityandguilds.com/qualifications-and-apprenticeships/utilities/utilities/6151-tunnel-entry#tab=information</a>  |
| NOCN   | National Open College Network   | <a href="https://www.nocn.org.uk/">https://www.nocn.org.uk/</a>  |
| NOCN Qualifications  | Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Sprayed Concrete Lining Tunnelling Nozzleman  | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-2-nvq-diploma-in-tunnelling-operations-construction-sprayed-concrete-lining-tunnelling-nozzleman">NOCN_Cskills Awards Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Sprayed Concrete Lining Tunnelling Nozzleman</a> |
|  | Level 2 NVQ Diploma in Specialist Concrete Occupations (Construction) - Sprayed Concrete  | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-2-nvq-diploma-in-specialist-concrete-occupations-construction-sprayed-concrete">NOCN_Cskills Awards Level 2 NVQ Diploma in Specialist Concrete Occupations (Construction) - Sprayed Concrete</a>                                     |
|  | Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Tunnelling Operative  | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-2-nvq-diploma-in-tunnelling-operations-construction-tunnelling-operative">NOCN Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Tunnelling Operative</a>  |
|  | Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Pipejacking/Micro-tunnelling Operative  | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-2-nvq-diploma-in-tunnelling-operations-construction-pipejacking-micro-tunnelling-operative">NOCN Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Pipejacking/Micro-tunnelling Operative</a>                            |
|  | Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Spoil Removal Conveyor Operative  | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-2-nvq-diploma-in-tunnelling-operations-construction-spoil-removal-conveyor-operative">NOCN Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Spoil Removal Conveyor Operative</a>  |
|  | Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Tunnel Transport Operator   | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-2-nvq-diploma-in-tunnelling-operations-construction-tunnel-transport-operator">NOCN Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Tunnel Transport Operator</a>  |
|  | Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Tunnelling Machine Operator   | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-2-nvq-diploma-in-tunnelling-operations-construction-tunnelling-machine-operator">NOCN Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Tunnelling Machine Operator</a>  |
|  | Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Machine Tunnelling Operative  | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-2-nvq-diploma-in-tunnelling-operations-construction-machine-tunnelling-operative">NOCN Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Machine Tunnelling Operative</a>  |
|  | Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Shaft Miner   | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-2-nvq-diploma-in-tunnelling-operations-construction-shaft-miner">NOCN Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Shaft Miner</a>  |
|  | Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Hand Miner  | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-2-nvq-diploma-in-tunnelling-operations-construction-hand-miner">NOCN_Cskills Awards Level 2 NVQ Diploma in Tunnelling Operations (Construction) - Hand Miner</a>   |
|  | Level 6 NVQ Diploma in Construction Site Management - Building and Civil Engineering  | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-6-nvq-diploma-in-construction-site-management-building-and-civil-engineering">NOCN Level 6 NVQ Diploma in Construction Site Management - Building and Civil Engineering</a>  |
|  | Level 4 NVQ Diploma in Construction Site Supervision - Tunnelling   | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-4-nvq-diploma-in-construction-site-supervision-tunnelling">NOCN_Cskills Awards Level 4 NVQ Diploma in Construction Site Supervision - Tunnelling</a>   |
|  | Level 3 NVQ Diploma in Tunnelling Operations - Tunnel Boring Machine Operator (Construction)  | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-3-nvq-diploma-in-tunnelling-operations-tunnel-boring-machine-operator-construction">NOCN_Cskills Awards Level 3 NVQ Diploma in Tunnelling Operations - Tunnel Boring Machine Operator (Construction)</a>                             |
|  | Level 2 NVQ Certificate in Plant Operations (Construction) - Cranes and Specialist Lifting  | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-2-nvq-certificate-in-plant-operations-construction-cranes-and-specialist-lifting">NOCN Level 2 NVQ Certificate in Plant Operations (Construction) - Cranes and Specialist Lifting</a>  |
|  | Level 2 NVQ Diploma in Controlling Lifting Operations - Slinger/Signaller (Construction)  | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-2-nvq-diploma-in-controlling-lifting-operations-slinger-signaller-construction">NOCN Level 2 NVQ Diploma in Controlling Lifting Operations - Slinger/Signaller (Construction)</a>  |
| Level 4 NVQ Diploma in Controlling Lifting Operations - Supervising Lifts (Construction) | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-4-nvq-diploma-in-controlling-lifting-operations-supervising-lifts-construction">NOCN Level 4 NVQ Diploma in Controlling Lifting Operations - Supervising Lifts (Construction)</a> |  |
| Level 5 NVQ Diploma in Controlling Lifting Operations - Planning Lifts (Construction)    | <a href="https://www.nocn.org.uk/qualifications-and-apprenticeships/construction/construction/level-5-nvq-diploma-in-controlling-lifting-operations-planning-lifts-construction">NOCN Level 5 NVQ Diploma in Controlling Lifting Operations - Planning Lifts (Construction)</a>       |  |
| ILM  | Institute of Leadership and Management  | <a href="https://www.i-l-m.com/">https://www.i-l-m.com/</a>  |
| ILM Qualifications   | Level 2 Certificate in Team Leading   | <a href="https://www.i-l-m.com/qualifications-and-apprenticeships/leadership-and-management/level-2-certificate-in-team-leading">ILM Level 2 Certificate in Team Leading</a>   |
|  | Level 3 Qualifications in Leadership and Management Practice for the Construction and Built Environment Sector  | <a href="https://www.i-l-m.com/qualifications-and-apprenticeships/leadership-and-management/level-3-qualifications-in-leadership-and-management-practice-for-the-construction-and-built-environment-sector">ILM Level 3 Qualifications in Leadership and Management Practice for the Construction and Built Environment Sector</a>       |
|  | Level 5 Qualifications in Leadership and Management   | <a href="https://www.i-l-m.com/qualifications-and-apprenticeships/leadership-and-management/level-5-qualifications-in-leadership-and-management">ILM Level 5 Qualifications in Leadership and Management</a>   |
| Professional Bodies  | ICE - Institution of Civil Engineers  | <a href="https://www.ice.org.uk/">https://www.ice.org.uk/</a>  |
|  | IOM3 - Institute of Materials, Minerals and Mining  | <a href="https://www.iom3.org/">https://www.iom3.org/</a>  |
|  | IMechE - Institution of Mechanical Engineers  | <a href="https://www.imeche.org/">https://www.imeche.org/</a>  |
|  | IET - Institution of Engineering and Technology   | <a href="https://www.theiet.org/">https://www.theiet.org/</a>  |
|  | CICES - Chartered Institution of Civil Engineering Surveyors  | <a href="https://www.cices.org/">https://www.cices.org/</a>  |
|  | RICS - Royal Institution of Chartered Surveyors   | <a href="https://www.rics.org/uk/">https://www.rics.org/uk/</a>  |
|  | CIOB - Chartered Institute of Building  | <a href="https://ciob.org">https://ciob.org</a>  |
| CIAT - Chartered Institute of Architectural Technologists                                | <a href="https://architecturaltechnologists.com/">https://architecturaltechnologists.com/</a>   |  |

## Attitudes & Behaviours

### Behavioural, Leadership and Management Courses

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|---|---|
| ILM Level 2 Diploma in Team Leading                                     | <a href="https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/level-2-diploma-in-team-leading-(combined-qualification)-ilm-q-card,-d-.pdf.ashx">https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/level-2-diploma-in-team-leading-(combined-qualification)-ilm-q-card,-d-.pdf.ashx</a>   |
| ILM Level 3 Diploma for Managers  | <a href="https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/level-3-diploma-for-managers-mapping-to-team-leader-supervisor-apprenticeship-behaviours,-d-.pdf.ashx">https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/level-3-diploma-for-managers-mapping-to-team-leader-supervisor-apprenticeship-behaviours,-d-.pdf.ashx</a>   |
| ILM Level 4 Qualifications in Leadership and Management                 | <a href="https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/level-4-qualifications-in-leadership-and-management-ilm-q-card,-d-.pdf.ashx">https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/level-4-qualifications-in-leadership-and-management-ilm-q-card,-d-.pdf.ashx</a>   |
| ILM Level 5 Diploma for Leaders and Managers                            | <a href="https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/level-5-diploma-for-leaders-and-managers-mapping-to-operations-departmental-manager-apprenticeship-behaviours,-d-.pdf.ashx">https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/level-5-diploma-for-leaders-and-managers-mapping-to-operations-departmental-manager-apprenticeship-behaviours,-d-.pdf.ashx</a> |
| ILM Level 6 Award and Diploma in Management                             | <a href="https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/level-6-award-and-diploma-in-management,-d-.pdf.ashx">https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/level-6-award-and-diploma-in-management,-d-.pdf.ashx</a>   |
| ILM Level 7 Qualifications in Leadership and Management                 | <a href="https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/ilm_17qim_v30517,-d-.pdf.ashx">https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/ilm_17qim_v30517,-d-.pdf.ashx</a>   |
| ILM Level 7 Certificate and Diploma in Executive Coaching and Mentoring | <a href="https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/level-7-certificate-and-diploma-in-executive-coaching-and-mentoring-ilm-q-card,-d-.pdf.ashx">https://www.i-l-m.com/-/media/ilm-website/sharepoint-documents/_published-documents/level-7-certificate-and-diploma-in-executive-coaching-and-mentoring-ilm-q-card,-d-.pdf.ashx</a>   |

**Many project Clients, Principal Contractors, Contractors, Employers and Designers within the sector have cultural development and/or behavioural based safety programmes.**

Operatives at all levels should be engaged in any cultural development programmes and show willingness to take part by consistently demonstrating good practice and reporting positive events and by observing, correcting and recording unsafe conditions

Supervisors should support cultural development programmes and be willing and engaged and actively encourage the involvement of all of the workforce. Supervisors should monitor activities for compliance with written systems of work and required standards and they should consistently demonstrate, recognise and reward good practice and appropriate behaviours. Where any shortfalls are identified, a consistent respectful, fair and just approach to dealing with all personnel is required.

Those in Management and Leadership roles should actively promote and be fully engaged and committed to cultural development programmes. They should set an exceptional personal example and commitment to achieving a positive outcome, and should champion and promote workforce engagement and, recognise and reward good practice and behaviours. They should ensure and monitor that adequate resources and appropriate expectations, targets, standards and requirements are set and adhered to. Managers and Leaders should ensure that all personnel are being treated with respect and engaged in a consistently fair and just manner.

Those in Design roles should be fully engaged and committed to cultural development, behavioural programmes and CPD. This should include keeping up-to-date with best practice and lessons learned in tunnelling and underground construction worldwide.