SITE SAFETY PLUS

Scheme rules – Appendix O Tunnelling safety training scheme (TSTS)

Site Safety Plus

Tunnelling safety training scheme (TSTS)

Course appendix O

1. Introduction

The Tunnelling Safety Training Scheme (TSTS) is a one-day course designed for those who are involved in the tunnel construction industry as a member of the workforce, to help them understand a variety of different aspects of the industry, the associated working environment, and some of the potential hazards that they may face working on a tunnelling site.

2. Aims and objectives

2.1. Aims

To ensure the delegates gain an understanding of:

- how tunnels are constructed, and the operations conducted within the construction phase and their impact on the environment
- the health, safety and occupational health hazards and risks in the tunnelling environment
- legislation and standards relating to tunnelling and procedures to be adhered to in the tunnelling environment, including confined spaces, exclusion zones and emergencies
- risk assessment and risk management
- what is expected of them by way of safe conduct and behaviour whilst working in a tunnelling environment.

2.2. Objectives

At the end of the day delegates will:

- be aware of legislation and standards specific to tunnelling
- know the health, safety and occupational hazards and PPE requirements in the tunnelling environment
- be able to understand risk assessment principles and risk management practice in a tunnelling environment, and how these risks are identified and communicated
- know the generic operations taking place within portals, shaft top and pit bottom areas, and their relevance to the tunnelling operation
- appreciate the basic principles of tunnel construction, tunnelling methods, and their inherent risks, and how each method is influenced by ground types
- understand the hazards and the controls required with plant, equipment and services in tunnelling operations.

3. Entry requirements

There are no formal entry requirements for this course.

4. Assessment

Assessment will be by multiple-choice question paper at the end of the course. Delegates will also be expected to be interactive during the course.

5. Delegate numbers

The recommended number of delegates per course is 4. The mandatory maximum number of delegates per course is 20. The maximum delegate number is not subject to an appeal.

6. Course duration and attendance

6.1. Course duration and attendance

This is a one day course. Delegates are required to complete the full day (7.5 hours).

6.2. Certification

Successful delegates will be issued with a certificate which has a three-year life. It is the responsibility of the delegate to ensure they register to do another course to renew their certificate.

Certificates with expired dates will be null and void.

7. Progression

This course is an introduction to obtaining an understanding of health and safety in tunnelling and becoming aware of hazards and risks in the tunnelling environment.

Further health and safety related information on a variety of aspects of tunnelling can be gained by attending the annual BTS Health and Safety Course.

A number of tunnelling training programmes are available including:

- traineeships and apprenticeships
- Sprayed Concrete Lining training and assessment
- trailer mounted concrete pump/pressurised systems training and testing
- CPCS Loco: Training and testing
- Overhead gantry crane operator training and testing.

8. Course publications and supporting material

8.1. Recommended reading /website resources

BS6164:2011 Code of practice for health and safety in tunnelling in the construction industry

TunnelSkills: www.tunnelskills.org/

8.2. Supporting material

This course has a standardised presentation to support delivery. This will be issued to the centre upon approval.

80% of the presentation is mandatory content, up to 20% of the presentation may be changed to allow the trainer to use their own experiences in delivery, allowing for videos, pictures and examples to be changed.

9. Notes to training providers

Training providers must follow the course programme and other material may be added to meet delegate needs provided that the aims and objectives of the course are met.

Copies of any significant proposed programme changes, if any, must be submitted prior to course delivery.

The examination paper number will be notified when the course booking is accepted by CITB.

All trainers must adhere to the course note requirements

Trainers will develop detailed notes and case studies from the outline syllabus, suitably indexed and presented for the delegate to take away on completion. It is essential that the underlying theme of health and safety is present.

Notes will form a delegate pack to be issued on the day. These will be updated by the trainer as required to ensure they are contemporary.

The notes will be supplemented by hand-outs for exercises and the like.

Distribution and format

Notes should be issued at the commencement of the course and be hard copy, unless delegates have been notified prior to the course that electronic measures, for example USB sticks, will be handed out instead. Trainers should be aware that the latter option will require all delegates to have tablets or laptops in order not to be disadvantaged.

10. Suggested timetable

Time	Subject	Syllabus
08.30	1. Course registration and coffee	
08.45	2. Introductions and objectives	• Delegate introductions, backgrounds. • Course overview. • Aims and objectives of the course.
09.00	3. Tunnels - confined spaces	• Confined spaces, definition / overview • Hazards • Access and egress. *Exercise - Silo accident* • Tally systems • Communication • Gas monitoring systems • Gasses • Self-rescue sets • Summary of section (Hazards & Controls) *Exercise - Identify requirements for self-rescue equipment*
10.00	4. Surface works and shafts	• Storage • Unsafe working conditions • Summary of section (Hazards & Controls) *Exercise - list the hazards and controls associated with shafts*
11.00	Break	

11.15	5. Tunnel construction	• Tunnelling methods - overview • Hand mining - Hazards & Controls • Rock tunnelling - Hazards & Controls • Tunnel boring machines - Hazards & Controls • Pipe jacking - Hazards & Controls • Compressed air - Hazards & Controls • Spray concrete lining - Hazards & Controls • Summary of section *Exercise - Identify general hazards and controls associated with* a *specific method*
12.15	6. Tunnelling plant and equipment	• Tunnelling plant and equipment - overview. • Grouting - Hazards & Controls. Equipment. • Conveyors - Hazards & Controls. • Locomotives I track - Hazards & Controls. Services - Hazards & Controls. • Electricity - Hazards & Controls. *Exercise - Discuss the hazards and controls associated with services I*
13.00	Lunch	
13.30	7. Control of underground plant during tunnelling operations	• Plant movement - overview • Locomotive movements - Hazards & Controls • Adequate refuge space - Hazards & Controls • Track maintenance • Hot works • Summary of section - Hazards & Controls *Exercise - Identify controls for one of the specific plant movements I associated work*

14.30	8. Emergency arrangements	• Emergency arrangements - overview • Incidents highlighting need for emergency arrangements (China I HSE hydraulic oil video) *Exercise - Alarm sounded at face, what should you do?*
15.15	Break	
15.30	9. Occupational health	• Occupational health - description I overview • Silica dust (HSE website - use as tool) • Weil's Disease • Hazards & Controls *Exercise - identify the risk on health if not managed or controlled (noise, use of chemicals / HAVS / manual handling / different types of dust)* • PPE • First aid *Exercise - Scenario based. A person is trapped; list the actions you should I should not take*
16.15	10. Examination	Multiple-choice question paper.
16.45	11. Course review	Revisit course aims and objectives, course review sheets to be completed.
17.00	Close	

11. End of course examination rules

11.1. Exam details

The examination paper is compulsory and consists of 25 multiple-choice questions covering all aspects of the course selected by CITB.

It forms part of the overall assessment as to whether or not the delegate has successfully achieved a satisfactory level of tunnelling health and safety awareness for a certificate of achievement to be issued.

The examination lasts for 30 minutes and must be completed within this time.

The examination pass mark is 72%.

11.2. Re-sits procedure

Where a delegate has achieved 70% in the core exercises and the trainer's review, and gained between 64%–68% in the multiple-choice examination, the delegate may re-sit the multiple-choice examination by attending another course on the final day.

Subsequent arrangements will be at the delegate's own expense.

The training provider must make the arrangements with the delegate and ensure that the same examination is not used twice.

The delegate must re-sit the examination within 90 days of the last day previously attended. A charge may be made to the delegate; however, this fee is left entirely to the discretion of the training provider.

Should a delegate fail the re-sit, they will be required to take TSTS again or be offered an alternative course which is considered to match the delegate's level of knowledge and understanding of health and safety on site.

12. Trainer requirements

In addition to the minimum trainer requirements referenced in the Site Safety Plus Quality Assurance Requirements, trainers must have attended and achieved the Site Safety Plus Tunnelling Safety Training Scheme course and hold a current certificate. They must also hold ONE of the following competence qualifications:

- Level 2 NVQ in Tunnelling Operations
- Level 4 NVQ in Site Supervision – Tunnelling

As an alternative to the competence qualifications, trainers must be able to demonstrate verifiable experience through a CV showing at least 5 years' experience of working in the tunnelling and underground construction environment. Defined experience in the CV should relate directly to tunnel construction.*

** This CV will be reviewed by CITB as part of the approval process for centres and trainers*

In addition to the occupational specific trainer requirements, trainers must also hold one of the following qualifications:

- NEBOSH National Certificate in Construction Safety and Health
- Level 4 or 5 NVQ Diploma in Occupational Health and Safety Practice (or SVQ equivalent)*
- A Health and Safety degree
- NEBOSH Diploma in Occupational Safety and Health Part 2
- NEBOSH Units A, B, C & D
- IOSH Level 6 Diploma in Safety Management (or equivalent)

**Note: The Level 5 NVQ/SVQ in Occupational Health and Safety has replaced the Level 4 within the Qualifications and Credit Framework. Holders of the Level 4 qualification with a valid certificate will be accepted.*

13. List of abbreviations

BTS	British Tunnelling Society
CSCS	Construction Skills Certification Scheme
HFL	Highly Flammable Liquids
HSA	Health and Safety Awareness
HSE	Health and Safety Executive
HS&E	Health, Safety and Environment Test
ITC	Internet Test Centre
LPG	Liquid Petroleum Gas
PAT	Portable Appliance Testing
PPE	Personal Protective Equipment
QCF	Qualifications and Credit Framework
RPE	Respiratory Protective Equipment
SMSTS	Site Management Safety Training Scheme