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Health and safety in tunnelling in the construction industry – Code of practice

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Contents

	Page
Foreword	vii
1 Scope	1
2 Normative references	1
3 Terms and definitions	6
4 The control of risk	6
4.1 From hazard identification to safe systems of work	6
4.2 Planning for contingencies and emergencies (see Clause 14)	7
4.3 Types of accidents	8
4.4 Occupational health and welfare	8
<i>Table 1 — Accidents – Indicative examples of cause and prevention (not in order of priority)</i>	10
<i>Table 2 — Principal occupational health hazards</i>	13
5 Investigation and information gathering	17
5.1 General	17
5.2 Preliminary studies	17
5.3 Project-specific studies	19
5.4 Ground investigation during construction	23
6 Detailed planning for health and safety	24
6.1 Integral nature of design and construction	24
6.2 Pre-construction stage organization	24
6.3 Construction stage	24
6.4 Safety of permanent and temporary works	25
6.5 Recruitment of project personnel	30
6.6 Competence	30
6.7 Personal protective equipment	32
6.8 First aid provision and procedures	33
7 Excavation and control of ground movement	35
7.1 Management of risk in the tunnel construction process	35
7.2 Basic principles	35
7.3 Ground movement control	36
7.4 Ground characteristics	37
7.5 Tunnel excavation	40
7.6 Tunnelling machines	40
7.7 Control of ground movement when tunnelling in soft ground without a segmental lining	43
7.8 Tunnelling in rock	45
7.9 Hand excavation, headings and small tunnels	47
7.10 Pipe and box jacking	49
7.11 Soil conditioners	50
<i>Table 3 — Soil conditioners</i>	50
8 Permanent support	51
8.1 General	51
8.2 In-situ linings	51
8.3 Prefabricated linings	52
8.4 Construction of openings	54
8.5 Monitoring of loads and deformation	55
9 Management of groundwater	56
9.1 Control of groundwater	56
9.2 Geotechnical processes for water management and ground improvement	59
9.3 Compressed air	61

9.4	Drilling through the tunnel lining for dewatering, ground treatment or freezing	61
9.5	Risk from groundwater on entry to cutterhead	61
9.6	Handling of groundwater	62
10	Inundation	63
10.1	General	63
10.2	Reliance on geological information	63
10.3	Other potential sources of flooding	63
10.4	Precautions for probe drilling	64
10.5	Inundation during shaft and portal construction	64
10.6	Inundation of a tunnel constructed with open faces (including backshunts and foreshunts)	64
10.7	Inundation during Tunnel Boring Machine (TBM) launch	65
10.8	Inundation via the TBM during operation	65
10.9	Inundation during face inspections of closed face TBMs	65
10.10	Dealing with inundation	65
11	Compressed-air working	65
11.1	Physical effects of compressed air	66
11.2	Structural considerations	68
11.3	Shaft construction under compressed air (see also Clause 20)	70
11.4	TBMs and compressed air	71
11.5	Air supply	72
11.6	Bulkheads, airlocks and associated compressed-air equipment	73
11.7	Fires and rescue in compressed air	74
11.8	Inundation	77
11.9	High pressure compressed air	77
12	Explosive atmospheres	77
12.1	General	77
12.2	Occurrence	78
12.3	Explosion characteristics	79
12.4	Detection and monitoring	79
12.5	Action levels	81
12.6	Re-entry procedures	81
	<i>Table 4 — Action level summary table</i>	81
12.7	Sources of ignition	81
12.8	Explosion protection (see also 12.5)	82
12.9	Work in potentially explosive atmospheres	83
12.10	Other explosive gases	83
12.11	Methane occurrence on TBMs	83
12.12	Methane occurrence in slurry plant	83
12.13	Flammable dust	84
13	Fire and smoke	84
13.1	Sources of fuel and ignition	84
	<i>Table 5 — Provision of fire extinguishing equipment</i>	85
	<i>Table 6 — Portable fire extinguishing equipment</i>	86
13.2	Welding and cutting (burning)	88
13.3	Fire precautions	90
13.4	Fires involving electrical equipment	91
13.5	Water spray curtain	91
14	Response to emergencies	91
14.1	Escape routes	91
14.2	Emergency services and operational capacity	91

14.3	Emergency control facilities	92
14.4	Raising the alarm	93
14.5	Alarm procedures	94
14.6	Site training	95
14.7	Access	95
14.8	Lighting	95
14.9	Smoke control	95
14.10	Rescue facilities	95
14.11	Self-rescuers	96
14.12	Accounting for personnel	96
14.13	Refuge chamber	97
14.14	Escape and rescue in small tunnels	97
14.15	Response to inundation risk	97
14.16	Recovery of the situation following inundation	98
15	Ventilation	98
15.1	General	98
15.2	Guidelines for fresh air supply quantities	100
15.3	Quality of air	101
15.4	Atmospheric monitoring	101
	<i>Table 7 — Alarm settings and responses</i>	102
15.5	Unoccupied tunnels and stagnant areas	103
15.6	Hazardous gases	103
	<i>Table 8 — Summary of most commonly encountered atmospheric contaminants</i>	106
15.7	Ventilation systems and plant	111
15.8	Ventilation in drill and blast tunnelling	114
15.9	Cooling through ventilation	115
15.10	Ventilation of shafts	115
16	Dust, particulates and other contaminants	115
16.1	Importance of dust control	115
16.2	Effects of dust	115
16.3	Exposure limits for dust	117
16.4	Sampling	118
16.5	Control and removal of dust	118
16.6	Respiratory protective equipment (RPE)	119
16.7	Asbestos	119
16.8	Diesel particulate matter (DPM)	119
16.9	Fumes from cutting and welding	120
16.10	Spray-applied membranes	120
16.11	Other ground contaminants	120
16.12	Heat strain	122
17	Quality of illumination	122
17.1	General	122
17.2	Level of lighting	122
	<i>Table 9 — Mean lighting levels</i>	123
17.3	Type of lighting	123
17.4	Siting of luminaires	124
17.5	Emergency lighting	124
17.6	Fire hardening of wiring	125
17.7	Hand lamps and cap lamps	125
17.8	High visibility clothing	125

18	Operating communications	125
18.1	General	125
18.2	Communication systems	126
18.3	Signals	127
18.4	Closed-circuit television (CCTV)	128
18.5	Emergency response	128
19	Noise and vibration	129
19.1	General	129
19.2	Noise emission and exposure	129
19.3	Vibration	131
20	Shafts, pits and piles	132
20.1	General	132
20.2	Design	133
20.3	Locating shafts	133
20.4	Safety considerations relating to shaft construction	133
20.5	Shaft construction techniques and operation	135
20.6	Lifting in shafts	138
20.7	Protective structures in shafts	139
20.8	Pit bottom safety	139
20.9	Plant safety	139
20.10	Services in shafts	140
20.11	Inclined shafts and escalator shafts	140
20.12	Transport systems for inclined shafts	140
20.13	Disused shafts	141
20.14	Tunnel eye	142
20.15	Removal of temporary rings and panels of d-walls	142
20.16	Shaft top layout	142
20.17	Personnel access	143
20.18	Communication	144
21	Lifting equipment and operations	144
21.1	Lift plan	144
21.2	Cranes	144
21.3	Winches	146
21.4	Materials hoists	146
21.5	Communication	146
21.6	Lifting of persons	147
21.7	Arch and mesh installation	148
21.8	Lifting with excavators	149
21.9	Visual and/or audible alarms	149
22	Access	149
22.1	Walkways	149
22.2	Stair and ladder towers	150
22.3	Access for maintenance	150
22.4	Gradients	151
22.5	Temporary tunnels	151
22.6	Working at height in tunnels and shaft	151
23	Materials handling systems	151
23.1	Rail haulage	151
23.2	Operational considerations	154
23.3	Conveyors	162

23.4	Slurry transport systems	164
23.5	Personal protective equipment	167
23.6	Other haulage methods	168
23.7	Adits and inclines	168
23.8	Storage and disposal of excavated material	168
24	Tunnel plant	169
24.1	General	169
24.2	Separation of vehicles and pedestrians	171
24.3	Rubber-tyred free-steered vehicles	171
24.4	Crawler tracked plant	172
24.5	Pneumatically-powered plant and equipment	172
24.6	Hydraulically operated plant or equipment	172
24.7	Electrically-powered plant and equipment	173
24.8	Internal combustion engines	173
24.9	Battery power	173
24.10	Concreting plant	174
24.11	Water drainage pumps	176
24.12	Drilling and piling rigs	176
24.13	Grouting equipment	177
24.14	Earthmoving plant	178
24.15	MEWPs	178
25	Electrical	178
25.1	Company and site management hierarchy	178
25.2	Planning, management and control of the electrical system	179
25.3	The management system	179
25.4	Training and competence	179
25.5	Safe system of work	180
25.6	Mains supply connection	180
25.7	Site installations	181
	<i>Table 10 — Earth leakage protection</i>	185
25.8	Cables	187
25.9	Joints and terminations	190
25.10	Transformers and switchgear in tunnels	191
25.11	Electrical plugs and sockets	193
25.12	Lighting installations	193
25.13	Electric motors	194
25.14	Laser products	195
25.15	Generators	197
26	Maintenance, renovation and repair	197
26.1	General	197
26.2	Asset management	197
26.3	Preparation for renovation or repair	198
26.4	On-site procedures for renovation and repair	200
26.5	Work in shafts	200
26.6	Temporary works	201
26.7	Record of work	201
	Bibliography	202

Summary of pages

This document comprises a front cover, and inside front cover, pages i to viii, pages 1 to 205, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 October 2019. It was prepared by Technical Committee B/513, *Construction equipment and plant, and site safety*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 6164:2011, which is withdrawn.

Information about this document

This is a full revision of the standard, and introduces the following principal changes:

- reference to the current versions of European Standards relating to tunnelling machinery and manlocks;
- reference to the ITA guidelines for refuge chambers in tunnelling;
- setting out formal procedures for design checking including the resolution of differences between a designer and a design checker;
- [Clauses 23](#) and [24](#) have been extensively restructured and extended, particularly in respect of fire, MEWPs, use of plant underground and rail operations;
- recommendations for undertaking high pressure compressed air exposures;
- material on SCL and exclusion zones; and
- information on real time dust monitoring.

This publication can be withdrawn, revised, partially superseded or superseded. Information regarding the status of this publication can be found in the Standards Catalogue on the BSI website at bsigroup.com/standards, or by contacting the Customer Services team.

Where websites and webpages have been cited, they are provided for ease of reference and are correct at the time of publication. The location of a webpage or website, or its contents, cannot be guaranteed.

Use of this document

This British Standard takes into account the advances in technology and equipment that are available to the tunnelling industry. It also takes account of new techniques and the effect of changes in legislation and guidance relating to health and safety and environmental matters. These changes include the Construction (Design and Management) Regulations 2015 [1] and the guidance in the Work in Compressed Air Regulations 1996 [2]. The document is written for all involved in tunnelling projects and addresses the safety of both those engaged in the tunnelling process and those who could be affected by it.

The text follows the pattern established by BS 6164:2011. Clauses contain recommendations for and guidance on health and safety practices in shaft sinking and tunnelling. However, the text has been extensively updated to reflect current and developing best practices.

The International System of Units (SI) is followed in this British Standard, with the exception of the unit used for pressure, which is the bar.

NOTE 1 bar = 10⁵ N/m² = 10⁵ Pa.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and competent people, for whose use it has been produced.

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. “organization” rather than “organisation”).

The word “should” is used to express recommendations of this standard. The word “may” is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the Clause. The word “can” is used to express possibility, e.g. a consequence of an action or an event.

Notes and commentaries are provided throughout the text of this standard. Notes give references and additional information that are important but do not form part of the recommendations. Commentaries give background information.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

1 Scope

This British Standard makes recommendations for and gives guidance on health and safety practices in shaft sinking and tunnel construction.

The standard includes health and safety recommendations that are also relevant to cut-and-cover tunnelling, immersed tube tunnels and other forms of underground construction as well as to the construction aspects of maintenance, renovation and repair of shafts and tunnels.

The recommendations in this British Standard are not intended to apply to the construction of shafts or tunnels for the purpose of mineral extraction.

NOTE 1 The design, manufacture and use of plant and machinery are referred to only where safety considerations are affected. Various European Standards relating to the design of tunnel boring machines (TBMs) and machinery for use underground are currently under development or revision.

NOTE 2 Current legislation relating to occupational health and safety can be found at www.legislation.gov.uk.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Standards publications

BS 476-4, *Fire tests on building materials and structures – Part 4: Non-combustibility test for materials*

BS 476-20, *Fire tests on building materials and structures – Part 20: Method for determination of the fire resistance of elements of construction (general principles)*

BS 476-21, *Fire tests on building materials and structures – Part 21: Methods for determination of the fire resistance of loadbearing elements of construction*

BS 476-22, *Fire tests on building materials and structures – Part 22: Methods for determination of the fire resistance of non-loadbearing elements of construction*

BS 638-4, *Arc welding power sources equipment and accessories – Part 4: Specification for welding cables*

BS 638-5, *Arc welding power sources equipment and accessories – Part 5: Specification for accessories*

BS 638-7, *Arc welding power sources equipment and accessories – Part 7: Specification for safety requirements for installation and use*

BS 1129, *Specification for portable timber ladders, steps, trestles and lightweight stagings*

BS 4211, *Specification for permanently fixed ladders*

BS 4363, *Specification for distribution assemblies for reduced low voltage electricity supplies for construction and building sites*

BS 4727-1, *Group 01:1983, Glossary of electrotechnical, power, telecommunication, electronics, lighting and colour terms – Part 1: Terms common to power, telecommunications and electronics – Group 01: Fundamental terminology (now withdrawn)*

BS 5045 (all parts), *Transportable gas containers*

BS 5306-3, *Fire extinguishing installations and equipment on premises – Part 3: Commissioning and maintenance of portable fire extinguishers – Code of practice*