

Appendix C

Summaries for Geoguide 1 (2nd Edition): Guide to Retaining Wall Design

Table C1 - Summary of Current British Standard References and Replacement Eurocodes

| BS Status | Relevant Updated Code for Citation | ID No. | Page no. | Existing Content of Technical Guidance Document | General Comments to define Scope of Updating / Specific Clauses in EN (s) / UK NA(s) | Scope of Updating |
|---|--|-------------|----------|---|---|-------------------|
| Technical Clauses in Report | | | | | | |
| BS 5400:Part 2:1978 Steel, Concrete and Composite Bridges. Part 2 - Specification for Loads | | | | | | |
| Superseded, Withdrawn | BS EN 1990:2002+A1:2005 BS EN 1991-2:2003 | GEO1:5400-2 | 71 | In Hong Kong, public highway and railway structures are generally designed for the loads given in the Civil Engineering Manual Volume V (EDD, 1983), which makes reference to BS 5400:Part 2 (BSI, 1978) for highway loading . Retaining walls and bridge abutments which form part of a highway, as well as retaining walls for railways, should in general be designed for 45 units of type HB loading. Highway structures spanning less than 15 m and situated along rural roads other than trunk or main roads may be designed for type HA loading only. Where special conditions indicate that a smaller load would be appropriate, the agreement of the relevant authorities should first be obtained. | 1978; Informative; GEO1:5400-2; The citation is ambiguous because it is used to support an obsolescent document. In the context of Geoguide 1, the reference to 'Civil Engineering Manual Volume V (EDD, 1983)' is dated and should be updated to the 'Structures Design Manual for Highways and Railways' (2013 Edition) prepared by the Highways Department. BS5400 has been superseded completely by the introduction of BS EN 1990 and its subsidiary documents; the part relevant to Geoguide 1 in particular being superseded by BS EN 1991-2:2003 Eurocode 1: Actions on structures - Part 2: Traffic loads on bridges. The traffic loading on retaining structures should be determined in accordance with the Structures Design Manual for Highways and Railways' (2013 Edition). | 5 |
| Superseded, Withdrawn | Structures Design Manual for Highways and Railways (2013 Edition) | GEO1:5400-3 | 151 | Highway structures ⁽³⁾ (a) HA Loading 10 kPa (b) HB Loading (45 units) 20 kPa | The equivalent uniformly distributed load for HA and HB loading (45 units) are given in BS 5400:Part2:1978, and the revised BS 5400-2:1990. BS 5400 has been superseded completely by the introduction of BS EN 1990 and its subsidiary documents. The part relevant to Geoguide 1 in particular being superseded by BS EN 1991-2:2003 Eurocode 1: Actions on structures - Part 2: Traffic loads on bridges, which does not provide such equivalent uniformly-distributed load for traffic loadings. The traffic loading on retaining structures should be determined in accordance with the Structures Design Manual for Highways and Railways (2013 Edition). The existing nominal HA and HB loadings are no longer relevant and loads should be determined on a case by case basis with reference to the Structures Design Manual (2013) | 5 |
| BS 8110:Part 1:1985 Structural Use of Concrete. Part 1 - Code of Practice for Design and Construction | | | | | | |
| Superseded, Withdrawn | BS 8500-1:2006+A1:2012 BS 8500-2:2006+A1:2012 BS EN 206-1:2000 | GEO1:8110-2 | 91 | (1) <i>Concrete</i> . Concrete of adequate durability should be specified. Where sulphates are present in soil and groundwater, reference may be made to BS 8110:Part 1 (BSI, 1985) for guidance on the selection of cement type and mix proportions to ensure durability . In situations where the soil or groundwater is found to be particularly aggressive to concrete, adequate protection to the back of the wall should be provided. Examples of such protection include installation of a suitable form of lining (e.g. polyethylene sheeting) and application of a surface coating (e.g. using asphalt, chlorinated rubber, epoxy or polyurethane materials). | 1985; Normative; GEO1:8110-2; BS EN 206-1:2000 applies to concrete for structures cast in situ, precast structures and structural precast products for buildings and civil engineering structures. It specifies requirements for the constituent materials of concrete, properties of fresh and hardened concrete and verification of these properties, limitations for concrete composition, specification of concrete, delivery of fresh concrete, production control procedures and conformity criteria and evaluation of conformity. BS 8500-1:2006+A1:2012 and BS 8500-2:2006+A1:2012 complement BS EN 206-1. BS 8500-1:2006+A1:2012 describes methods of specifying concrete and gives guidance for the specifier. BS 8500-2:2006+A1:2012 specifies constituent materials and concrete. They also cover materials, methods of testing and procedures that are outside the scope of BS EN 206-1. | 4a |
| BS 8004:1986 Code of Practice for Foundations | | | | | | |
| Superseded, Withdrawn, but contains NCCI | BS 8004:1986 (NCCI) | GEO1:8004-2 | 20 | Some guidance on how concrete, steel and timber can be expected to deteriorate in different circumstances is given in BS 8004 (BSI, 1986a) , which also indicates some of the steps which may be taken to prolong the life of these materials when used. | 1986a; Informative; GEO1:8004-2; The requirements for durability are covered by material specific Eurocodes. The citation makes it clear that guidance is provided by BS8004:1986 on how deterioration occurs and how it can be mitigated. This is NCCI to BS EN 1997-1:2004 as defined in UK NA to BS EN 1997-1:2004. Consequently there is no need to change the reference document in this instance. | 1 |
| Superseded, Withdrawn, but contains NCCI | BS 8004:1986 (NCCI) | GEO1:8004-3 | 21 | Also, the backfill should not be chemically aggressive, e.g. the presence of excessive sulphate in soils can cause accelerated deterioration of concrete and steel (BSI, 1986a) . | 1986a; Informative; GEO1:8004-3; The requirements for durability are covered by material specific Eurocodes. The citation makes it clear that guidance is provided by BS8004:1986 on how deterioration occurs and how it can be mitigated. This is NCCI to BS EN 1997-1:2004 as defined in UK NA to BS EN 1997-1:2004. Consequently there is no need to change the reference document in this instance. | 1 |

Table C1 - Summary of Current British Standard References and Replacement Eurocodes

| BS Status | Relevant Updated Code for Citation | ID No. | Page no. | Existing Content of Technical Guidance Document | General Comments to define Scope of Updating / Specific Clauses in EN (s) / UK NA(s) | Scope of Updating |
|--|------------------------------------|-------------|----------|---|--|-------------------|
| Superseded, Withdrawn, but contains NCCI | BS 8004:1986 (NCCI) | GEO1:8004-4 | 27 | Groundwater levels may be controlled by dewatering. The dewatering method chosen should ensure the stability of the excavation and the safety of nearby structures. Reference may be made to Terzaghi & Peck (1967), NAVFAC (1982b), BS 8004 (BSI, 1986a) and Somerville (1986) for guidance on techniques of dewatering. | 1986a; Informative; GEO1:8004-4; Dewatering is discussed in BS8004:1986 in general terms. It is not provided as a design standard. This is NCCI to BS EN 1997-1:2004 as defined in UK NA to BS EN 1997-1:2004. Consequently there is no need to change the reference document in this instance. | 1 |
| Superseded, Withdrawn, but contains NCCI | BS 8004:1986 (NCCI) | GEO1:8004-5 | 53 | For a rock mass containing discontinuities, the insitu modulus is generally much smaller than the laboratory modulus of the intact rock, E_i . BS 8004 (BSI, 1986a) gives the following equation which relates E_m , to E_i through a 'mass factor' j : | 1986a; Informative; GEO1:8004-5; The 'j' factor is an arbitrary nomenclature in BS8004:1986. In BS8004:1986 it is applied to the Young's Modulus of intact rock to obtain the Young's Modulus of a rock mass in Appendix A for derivation of charts for the determination of allowable bearing pressure on weak and broken rocks. BS EN 1997-1:2004 is silent on specifics of rock mass assessment and the 'j' factor. However, similar charts for presumed bearing resistance are contained in Annex G of BS EN 1997-1:2004. Therefore, the information in BS8004:1986 is NCCI as defined in UK NA BS EN 1997-1:2004. | 1 |
| Superseded, Withdrawn, but contains NCCI | BS 8004:1986 (NCCI) | GEO1:8004-6 | 53 | For reasonably tight discontinuities, BS 8004 (BSI, 1986a) suggests that j may be taken as numerically equal to the average discontinuity spacing expressed in metres, with an upper limit of unity. | 1986a; Normative; GEO1:8004-6; The 'j' factor is an arbitrary nomenclature in BS8004:1986. In BS8004:1986 it is applied to the Young's Modulus of intact rock to obtain the Young's Modulus of a rock mass in Appendix A for derivation of charts for the determination of allowable bearing pressure on weak and broken rocks. BS EN 1997-1:2004 is silent on specifics of rock mass assessment and the 'j' factor. However, similar charts for presumed bearing resistance are contained in Annex G of BS EN 1997-1:2004. Therefore, the information in BS8004:1986 is NCCI as defined in UK NA BS EN 1997-1:2004. | 1 |
| BS 1052:1986 Specification for Mild Steel Wire for General Engineering Purposes | | | | | | |
| Confirmed, Current | BS 1052:1980 | GEO1:1052-2 | 98 | The wires used for the wire-mesh should be mild steel wire to BS 1052 (BSI, 1986b) , with a minimum tensile strength of 350 N/mm ² . For permanent applications, the wires should be at least 2.7 mm in diameter and galvanized. For hexagonal wire-mesh the wires should be galvanized to BS 443 (BSI, 1990b) before weaving. For welded mesh, the mesh panels should be hot dip galvanized to BS 729 (BSI, 1986c) after welding. The making of panels with galvanized wires welded together is not recommended as the welds are left unprotected. | 1986b; Normative; GEO1:1052-2; The reference document is current, having been last confirmed by BSI on 01 January 2011. It should be noted, however, that the date cited is incorrect. The correct date for the reference document is 1980. Consequently updating' of the citation is required. | 3a |
| BS 729:1986 Specification for Hot Dip Galvanized Coatings on Iron and Steel Articles | | | | | | |
| Superseded, Withdrawn | BS EN ISO 1461:1999 | GEO1:729-2 | 98 | The wires used for the wire-mesh should be mild steel wire to BS 1052 (BSI, 1986b), with a minimum tensile strength of 350 N/mm ² . For permanent applications, the wires should be at least 2.7 mm in diameter and galvanized. For hexagonal wire-mesh the wires should be galvanized to BS 443 (BSI, 1990b) before weaving. For welded mesh, the mesh panels should be hot dip galvanized to BS 729 (BSI, 1986c) after welding. The making of panels with galvanized wires welded together is not recommended as the welds are left unprotected. | 1986c; Normative; GEO1:729-2; The reference document has been superseded. The current standard is contained in BS EN ISO 1461:1999. It should be noted that the citation and reference date appears to be incorrect. The original standard was published in 1971. It is assumed that 1986 has erroneously been cited from a periodic BSI confirmation carried out at that time. BS EN ISO 1461 is identified in Table 1 of BS EN 14475:2006 as the appropriate current standard for galvanizing welded steel mesh. | 4a |
| BS 8007:1987 Code of Practice for Design of Concrete Structures for Retaining Aqueous Liquids | | | | | | |
| Superseded, Withdrawn | BS EN 1992-3:2006 | GEO1:8007-2 | 92 | BS 8007 (BSI, 1987a) provides guidance on details of expansion, contraction and other movement joints, as well as their spacings. | 1987a; Informative; GEO1:8007-2; BS8007:1997 has been replaced by BS EN 1992-3:2006 The citation in Geoguide 1 refers to two separate items in BS8007:1987; descriptions of movement joints and spacing of movement joints. The description of movement joints is not reproduced in the current replacement standards. The spacing of movement joints is covered by Clause 3.1.5.1 of BS8007:1987. The advice given is consistent with that in the principal replacement document: BS EN 1992-3:2006. The information contained in BS EN 1992-3:2006 can be | 5 |

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|---|--|-------------|----------|---|---|-------------------|
| BS 5750:Parts 0 to 3:1987 Quality Systems | | | | | | |
| Superseded, Withdrawn | BS EN ISO 9000 family of standards | GEO1:5750-2 | 117 | Only those aspects of construction control which are directly related to verification of the geotechnical design assumptions are covered in this Chapter. Detailed guidance on the general duties of site staff, project management and quality assurance principles are outside the scope of this Geoguide. For these aspects, reference should be made to specialist literature such as the ASCE Manual of Professional Practice: Quality in the Constructed Project (ASCE, 1988) and British Standards in the BS 5750 series (BSI, 1987b) . | 1987b; Informative; GEO1:5750-2; The context of the citation make it clear that a very broad reference is required. BS5750 has been superseded, as have many of the standards which followed. Guidance on the current BSI quality management system is now contained in the BS EN ISO 9000 family of standards. | 4b |
| BS 1377:Part 8:1990 Methods of Test for Soils for Civil Engineering Purposes. Part 8 - Shear Strength Tests (Effective Stress) | | | | | | |
| Confirmed, Current | Geospec 3 | GEO1:1377-2 | 42 | Both triaxial compression and direct shear tests can be used to determine the shear strength parameters of a fill material. Guidance on methods for carrying out such tests and on the interpretation of test results can be found in the Geotechnical Manual for Slopes (GCO, 1984), Head (1986) and BS 1377:Part 8 (BSI, 1990a) . A detailed description of a direct shear test procedure suitable for a range of fill materials is given in Geospec 2:Model Specification for Reinforced Fill Structures (GCO, 1989a). It should be noted that the test conditions, including specimen size, method and time of soaking or saturation, as well as the stress path, rate of shearing and drainage conditions, can affect the | 1990a; Normative; GEO1:1377-2; BS1377-8:1990 is the current standard for effective stress testing of soils in the UK. In Hong Kong practice, however, it has been replaced by clause 14 of Geospec 3. Consequently, it would be reasonable to update the reference and citation to show this practice. | 4a |
| BS 443:1990 Specification for Testing Zinc Coatings on Steel Wire and for Quality Requirements | | | | | | |
| Superseded, Withdrawn | BS EN 10244-1:2009 BS EN 10244-2:2009 | GEO1:443-2 | 98 | The wires used for the wire-mesh should be mild steel wire to BS 1052 (BSI, 1986b), with a minimum tensile strength of 350 N/mm ² . For permanent applications, the wires should be at least 2.7 mm in diameter and galvanized. For hexagonal wire-mesh the wires should be galvanized to BS 443 (BSI, 1990b) before weaving. For welded mesh, the mesh panels should be hot dip galvanized to BS 729 (BSI, 1986c) after welding. The making of panels with galvanized wires welded together is not recommended as the welds are left unprotected. | 1990b; Normative; GEO1:443-2; The reference document has been superseded. The current standard is contained in BS EN 10244-1:2009 and BS EN 10244-2:2009, which are identified in Table 1 of BS EN 14475:2006 as the appropriate standards for galvanization of woven steel wire in gabions. | 4a |
| BS 4102:1990 Specification for Steel Wire and Wire Products for Fences | | | | | | |
| Revised, Withdrawn (Partially replaced) | BS EN 10245-1:2011 BS EN 10245-2:2011 | GEO1:4102-2 | 98 | The soil and water with which the gabion wall is to be in contact should be assessed. Guidance on soil and water properties that are aggressive to galvanized steel is given in Geospec 2 : Model Specification for Reinforced Fill Structures (GCO, 1989a). If the soil and water conditions are aggressive, PVC (polyvinylchloride) coating should be provided to the wires. The PVC coating should be at least 0.5 mm thick and should meet the requirements of BS 4102 (BSI, 1990c) . For hexagonal woven mesh, the PVC coating may be applied by hot dipping or by extrusion onto the galvanized wire before weaving. For welded mesh, it is usually applied electrostatically onto the panels. The PVC should be bonded sufficiently to the wire core to prevent capillary flow of water between the wire and the PVC, which | 1990c; Normative; GEO1:4102-2; The reference document has been superseded. The current standard is contained in BS EN 10245-1:2011 and BS EN 10245-2:2011. BS EN 10245-2 is identified in Table 1 of BS EN 14475:2006 as the appropriate standard for PVC coated steel mesh, however BS EN 10245-1 provides the general information on which BS EN 10245-2 depends. | 4a |
| BS 410-1:2000, ISO 3310-1:2000 Test sieves. Technical requirements and testing. Test sieves of metal wire cloth | | | | | | |
| Current | BS 410-1:2000, ISO 3310-1:2000 | GEO1:410-2 | 142 | In Table 4: Requirement column: "% Passing 63 microns BS Sieve Size" | 2000; Normative; GEO1:410-2; The term 'BS Sieve Size' is not accompanied by any citation to a reference. There is also no BSI reference in Geoguide 1 referring to sieve standards. For completeness, a note should be added to the table and an appropriate reference added to the publication. | 4b |
| Reference Section of Report | | | | | | |
| Superseded, Withdrawn | BS EN 1990:2002+A1:2005 | GEO1:5400-1 | 126 | BSI (1978). Steel, Concrete and Composite Bridges. Part 2 - Specification for Loads (BS 5400:Part 2:1978). British Standards Institution, London, 46 p. | 1978; Reference; GEO1:5400-1; There is a single informative citation of the reference document. This reference has become obsolete with the issue of SDM 2013. Consequently the entire reference can be removed and reference made instead to the SDM (HyD 2013). | 5 |
| Superseded, Withdrawn | BS 8500-1:2006+A1:2012 BS 8500-2:2006+A1:2012 BS EN 206-1:2000 | GEO1:8110-1 | 126 | BSI (1985). Structural Use of Concrete. Part 1 - Code of Practice for Design and Construction (BS 8110:Part 1:1985). British Standards Institution, London, 124 p. | 1985; Reference; GEO1:8110-1; There is a single normative citation of the reference document. The reference document has been superseded by numerous new standards. Those relevant to the citation are the material standards relating to concrete and its specification and testing. These are primarily BS 8500-1:2006+A1:2012, Concrete. Complementary British Standard to BS EN 206-1. Method of specifying and guidance for the specifier. BS 8500-2:2006+A1:2012 Concrete. Complementary British Standard to BS EN 206-1. Specification for constituent materials and concrete. BS EN 206-1:2000, Concrete. Specification, performance, production and conformity. | 4b |
| Superseded, Withdrawn, but contains NCCI | BS EN 1997-1:2004 BS 8004:1986 (NCCI) | GEO1:8004-1 | 126 | BSI (1986a). Code of Practice for Foundations (BS 8004:1986). British Standards Institution, London, 160 p. | 1986a; Reference; GEO1:8004-1; There are four informative and one normative citations of the reference document. All five citations are in the context of NCCI. Consequently the reference and citations should be retained unchanged. | 1 |

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| BS Status | Relevant Updated Code for Citation | ID No. | Page no. | Existing Content of Technical Guidance Document | General Comments to define Scope of Updating / Specific Clauses in EN (s) / UK NA(s) | Scope of Updating |
|---|--|-------------|----------|---|---|-------------------|
| Confirmed, Current | BS 1052:1980 | GEO1:1052-1 | 126 | BSI (1986b). Specification for Mild Steel Wire for General Engineering Purposes (BS 1052:1986). British Standards Institution, London, 4 p. | 1986b; Reference; GEO1:1052-1; There is a single normative citation of the reference document. The reference document is current, having been last confirmed by BSI on 01 January 2011. It should be noted, however, that the date cited is incorrect. The correct date for the reference document is 1980. Consequently a 'scope for updating' category of 3 has been applied. | 3a |
| Superseded, Withdrawn | BS EN ISO 1461:2009 | GEO1:729-1 | 126 | BSI (1986c). Specification for Hot Dip Galvanized Coatings on Iron and Steel Articles (BS 729:1986). British Standards Institution, London, 16 p. | 1986c; Reference; GEO1:729-1; There is a single normative citation of the reference document. The reference document has been superseded. The current standard is BS EN ISO 1461:2009. It may be noted that the citation and reference date appears to be incorrect. The original standard was published in 1971. It is assumed that 1986 has erroneously been cited from a periodic BSI confirmation carried out at that time. | 4a |
| Superseded, Withdrawn | BS EN 1992-1-1:2004 BS EN 1992-3:2006 | GEO1:8007-1 | 126 | BSI (1987a). Code of Practice for Design of Concrete Structures for Retaining Aqueous Liquids (BS 8007:1987). British Standards Institution, London, 32 p. | 1987a; Reference; GEO1:8007-1; There is one informative citation of this reference, however it refers to two distinct elements in the reference document; types of movement joints and spacing of movement joints. BS8007:1997 has been superseded by BS EN 1992-1-1:2004 Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings and its supplementary standard BS EN 1992-3 Eurocode 2: Design of concrete structures - Part 3: Liquid retaining and containment structures. Neither of the replacement standards discusses types of movement joint. Spacing of movement joints is addressed in both standards, however BS EN 1992-3:2006 is more rigorous because it deals with joints in liquid retaining | 5 |
| Superseded, Withdrawn | BS EN ISO 9000:2005 | GEO1:5750-1 | 126 | BSI (1987b). Quality Systems (BS 5750:Parts 0 to 3:1987). British Standards Institution, London, 64 p. | 1987b; Reference; GEO1:5750-1; There is a single informative citation of the reference document. The reference document has been superseded and should be replaced by BS EN ISO 9000:2005. | 4a |
| Confirmed, Current | Geospec 3 | GEO1:1377-1 | 126 | BSI (1990a). Methods of Test for Soils for Civil Engineering Purposes. Part 8 - Shear Strength Tests (Effective Stress) (BS 1377:Part 8:1990). British Standards Institution, London, 32 p. | 1990a; Reference; GEO1:1377-1; Although the reference document is current, it has been superseded in Hong Kong practice by Geospec 3. There is only one citation of the reference, therefore it should be replaced by a reference to Geospec 3 (GEO, 2001). | 4a |
| Superseded, Withdrawn | BS EN 10244-1:2009 BS EN 10244-2:2009 | GEO1:443-1 | 126 | BSI (1990b). Specification for Testing Zinc Coatings on Steel Wire and for Quality Requirements (BS 443:1990). British Standards Institution, London, 12 p. | 1990b; Reference; GEO1:443-1; There is a single normative citation of the reference document. The reference document has been superseded. The replacement standards are BS EN 10244-1:2009 and BS EN 10244-2:2009. | 4a |
| Revised, Withdrawn (Partially replaced) | BS EN 10245-1:2011 BS EN 10245-2:2011 | GEO1:4102-1 | 126 | BSI (1990c). Specification for Steel Wire and Wire Products for Fences (BS 4102:1990). British Standards Institution, London, 20 p. | 1990c; Reference; GEO1:4102-1; The reference document has been revised and subsequently partially replaced. The sections relevant to Geoguide 1, however, are now presented in BS EN 10245-1:2011 and BS EN 10245-2:2011. | 4a |
| Current | BS 410-1:2000, ISO 3310-1:2000 | GEO1:410-1 | | [Reference not included in Geoguide 1] | 2000; Reference; GEO1:410-1; There is an uncited reference to BS Sieve Sizes in Table 4. This requires the addition of a reference to the appropriate standard for sieves used for grading of soils. | 4b |

Table C2 - Extracts of Relevant Sections or Clauses of the British Standards and Eurocodes / National Annexes

| Relevant Updated Code for Citation | ID No. | Page no. | Scope of Updating | Extracts of Relevant Sections or Clauses of the superseded British Standard(s) | Extracts of Relevant Sections or Clauses of the replacement British/European Standards |
|--|-------------|----------|-------------------|---|---|
| Technical Clauses in Report | | | | | |
| BS 5400:Part 2:1978 Steel, Concrete and Composite Bridges. Part 2 - Specification for Loads | | | | | |
| BS EN 1990:2002+A1:2005 BS EN 1991-2:2003 | GEO1:5400-2 | 71 | 5 | BS 5400-1:1978, Clause 6 and Annex A. | BS EN 1991-2:2003 (incorporating corrigenda December 2004 and February 2010), whole document. |
| Structures Design Manual for Highways and Railways (2013 Edition) | GEO1:5400-3 | 151 | 5 | BS 5400:Part2:1978, information regarding nominal loadings to be adopted for highway structures as per above reference. | BS EN 1991-2:2003 (incorporating corrigenda December 2004 and February 2010), whole document. |
| BS 8110:Part 1:1985 Structural Use of Concrete. Part 1 - Code of Practice for Design and Construction | | | | | |
| BS 8500-1:2006+A1:2012 BS 8500-2:2006+A1:2012 BS EN 206-1:2000 | GEO1:8110-2 | 91 | 4a | BS 8110-1:1985, Clause 3.1.5.1, which states: 'A durable concrete element is one that is designed and constructed to protect embedded metal from corrosion and to perform satisfactorily in the working environment for the life-time of the structure. To achieve this it is necessary to consider many interrelated factors at various stages in the design and construction process. Thus the structural form and cover to steel are considered at the design stage and particularly aggressive, it may be necessary to consider the type of cement at the design stage'. | BS EN 206-1:2000 (incorporating corrigenda 1 and 2 and amendments 1, 2 and 3), whole document. BS 8500-1:2006+A1:2012 and BS 8500-2:2006+A1:2012 complement BS EN 206-1. |
| BS 8004:1986 Code of Practice for Foundations | | | | | |
| BS 8004:1986 (NCCI) | GEO1:8004-2 | 20 | 1 | No change. | No change. Additional reference can be made to GEO Publication No. 1/2006. |
| BS 8004:1986 (NCCI) | GEO1:8004-3 | 21 | 1 | No change. | No change. Additional reference can be made to GEO Publication No. 1/2006. |
| BS 8004:1986 (NCCI) | GEO1:8004-4 | 27 | 1 | No change. | No change. |
| BS 8004:1986 (NCCI) | GEO1:8004-5 | 53 | 1 | No change. | No change. |
| BS 8004:1986 (NCCI) | GEO1:8004-6 | 53 | 1 | No change. | No change. |
| BS 1052:1986 Specification for Mild Steel Wire for General Engineering Purposes | | | | | |
| BS 1052:1980 | GEO1:1052-2 | 98 | 3a | Whole document. | Whole document. |
| BS 729:1986 Specification for Hot Dip Galvanized Coatings on Iron and Steel Articles | | | | | |
| BS EN ISO 1461:1999 | GEO1:729-2 | 98 | 4a | Whole document. | Whole document. |
| BS 8007:1987 Code of Practice for Design of Concrete Structures for Retaining Aqueous Liquids | | | | | |
| BS EN 1992-3:2006 | GEO1:8007-2 | 92 | 5 | Advice on types of joints: BS8007:1997 defines five types of movement joint: expansion joints, complete contraction joints, partial contraction joints, hinged joints and sliding joints. Advice on spacing of joints: BS8007:1987 clause 5.3.3 states: 'The provision of movement joints and their spacing are dependent on the design philosophy adopted, i.e. whether to allow for or restrain shrinkage and thermal contraction in walls and slabs. At one extreme, the designer may exercise control by providing a substantial amount of reinforcement in the form of small diameter bars at close spacing with no movement joints. At the other extreme, the designer may provide closely spaced movement joints in conjunction with a moderate proportion of reinforcement'. | Advice on types of joints: There is no definiton of types of movement joints in either BS EN 1992-1-1:2004 or BS EN 1992-3:2006. Advice on spacing of joints: BS EN 1992-1-1:2004 (incorporating corrigenda January 2008 and November 2010), clause 2.3.3 <i>Deformation of concrete</i> states: '(3) In building structures, temperature and shrinkage effects may be omitted in global analysis provided joints are incorporated at every distance d _{joint} to accommodate resulting deformations'. The accompanying note states: 'The value of d _{joint} is subject to a National Annex. The recommended value is 30 m. For precast concrete structures the value may be larger than that for cast in-situ structures, since part of the creep and shrinkage takes place before erection'. In addition, Annex N of BS EN 1992-3:2006 paraphrases BS8007:1987 by stating two extremes for design, that with no movement joints (i.e. total restraint) and that with complete freedom of movement. |
| BS 5750:Parts 0 to 3:1987 Quality Systems | | | | | |
| BS EN ISO 9000 family of stand | GEO1:5750-2 | 117 | 4b | Whole document. | Whole document. |
| BS 1377:Part 8:1990 Methods of Test for Soils for Civil Engineering Purposes. Part 8 - Shear Strength Tests (Effective Stress) | | | | | |
| Geospec 3 | GEO1:1377-2 | 42 | 4a | BS1377-8:1990, whole document. | Geospec 3, Clause 14. |
| BS 443:1990 Specification for Testing Zinc Coatings on Steel Wire and for Quality Requirements | | | | | |
| BS EN 10244-1:2009 BS EN 10244-2:2009 | GEO1:443-2 | 98 | 4a | Whole document. | Whole document. |
| BS 4102:1990 Specfication for Steel Wire and Wire Products for Fences | | | | | |
| BS EN 10245-1:2011 BS EN 10245-2:2011 | GEO1:4102-2 | 98 | 4a | Sections of document specifying PVC coating. | Whole document. |

Table C2 - Extracts of Relevant Sections or Clauses of the British Standards and Eurocodes / National Annexes

| Relevant Updated Code for Citation | ID No. | Page no. | Scope of Updating | Extracts of Relevant Sections or Clauses of the superseded British Standard(s) | Extracts of Relevant Sections or Clauses of the replacement British/European Standards |
|---|------------|----------|-------------------|--|--|
| BS 410-1:2000, ISO 3310-1:2000 Test sieves. Technical requirements and testing. Test sieves of metal wire cloth | | | | | |
| BS 410-1:2000, ISO 3310-1:2000 | GEO1:410-2 | 142 | 4b | [No extract - reference not cited] | Whole document. |

Table C3 - Description of Standards, Differences and Recommended Amendments

| ID No. | Page no. | Scope of Updating | Description of Design, Specification and/or Testing Required | | Effects of differences in Adopting Up-to-date Standard(s) | Recommended Amendments |
|--|----------|-------------------|---|--|--|--|
| | | | Quoted Standard(s) | Up-to-date Standard(s) | | |
| Technical Clauses in Report | | | | | | |
| BS 5400:Part 2:1978 Steel, Concrete and Composite Bridges. Part 2 - Specification for Loads | | | | | | |
| GEO1:5400-2 | 71 | 5 | Definition of highway loads on bridges. | Definition of highway actions on bridges. | Potential change in design philosophy for calculation of loads or actions. | Delete the citation and reference. Replace the reference to the Civil Engineering Manual with a reference to 'Structures Design Manual for Highways and Railways, 2013 Edition'. |
| GEO1:5400-3 | 151 | 5 | Nominal traffic loadings for design of highway structures | There is no such equivalent uniformly-distributed load for traffic loadings, which should be determined on a case by case basis. | The traffic loading on retaining structures should be determined in accordance with the Structures Design Manual for Highways and Railways (2013 Edition). | Delete the nominal loadings and make reference to the 'Structures Design Manual for Highways and Railways'. |
| BS 8110:Part 1:1985 Structural Use of Concrete. Part 1 - Code of Practice for Design and Construction | | | | | | |
| GEO1:8110-2 | 91 | 4a | Specification of measures to protect concrete from aggressive ground. | Specification of measures to protect concrete from aggressive ground. | No change. | Update reference and citation. |
| BS 8004:1986 Code of Practice for Foundations | | | | | | |
| GEO1:8004-2 | 20 | 1 | General advice on durability of different materials for foundations. | No change. | No change. | Retain existing reference although citation will require amendment. Add reference to GEO Publication No. 1/2006. |
| GEO1:8004-3 | 21 | 1 | General statement on risk of aggressive soils. | No change. | No change. | Retain existing reference although citation will require amendment. Add reference to GEO Publication No. 1/2006. |
| GEO1:8004-4 | 27 | 1 | General advice on dewatering. | No change. | No change. | Retain existing reference and although citation will require amendment. |
| GEO1:8004-5 | 53 | 1 | General advice on rock mass modelling. | No change. | No change. | Retain existing reference and although citation will require amendment. |
| GEO1:8004-6 | 53 | 1 | Specific advice on rock mass modelling. | No change. | No change. | Retain existing reference and although citation will require amendment. |
| BS 1052:1986 Specification for Mild Steel Wire for General Engineering Purposes | | | | | | |
| GEO1:1052-2 | 98 | 3a | Material specification. | No change. | No change. | Correction to error in reference and citation. |
| BS 729:1986 Specification for Hot Dip Galvanized Coatings on Iron and Steel Articles | | | | | | |
| GEO1:729-2 | 98 | 4a | Material specification. | Material specification. | No change. | Update reference and citation. |
| BS 8007:1987 Code of Practice for Design of Concrete Structures for Retaining Aqueous Liquids | | | | | | |
| GEO1:8007-2 | 92 | 5 | Information on types of movement joints. Advice on spacing of movement joints. | Advice on spacing of movement joints. | Removal of link to information on types of movement joints. | Update reference and citation with respect to spacing of movement joints. Amend text of Geoguide 1 to include definitions of types of movement joint relevant to soil retaining |
| BS 5750:Parts 0 to 3:1987 Quality Systems | | | | | | |
| GEO1:5750-2 | 117 | 4b | Definition of quality systems. | Definition of quality systems. | No change. | Update reference and citation. |
| BS 1377:Part 8:1990 Methods of Test for Soils for Civil Engineering Purposes. Part 8 - Shear Strength Tests (Effective Stress) | | | | | | |
| GEO1:1377-2 | 42 | 4a | Method of test for soils. | Method of test for soils. | No change. | Update reference and citation. |
| BS 443:1990 Specification for Testing Zinc Coatings on Steel Wire and for Quality Requirements | | | | | | |
| GEO1:443-2 | 98 | 4a | Material specification. | Material specification. | No change. | Update reference and citation. |
| BS 4102:1990 Specfication for Steel Wire and Wire Products for Fences | | | | | | |
| GEO1:4102-2 | 98 | 4a | Material specification. | Material specification. | No change. | Update reference and citation. |

Table C3 - Description of Standards, Differences and Recommended Amendments

| ID No. | Page no. | Scope of Updating | Description of Design, Specification and/or Testing Required | | Effects of differences in Adopting Up-to-date Standard(s) | Recommended Amendments |
|---|----------|-------------------|---|--|--|---|
| | | | Quoted Standard(s) | Up-to-date Standard(s) | | |
| BS 410-1:2000, ISO 3310-1:2000 Test sieves. Technical requirements and testing. Test sieves of metal wire cloth | | | | | | |
| GEO1:410-2 | 142 | 4b | Technical specification. | No change. | No change. | Insert appropriate reference. |
| Reference Section of Report | | | | | | |
| GEO1:5400-1 | 126 | 5 | This reference document is: Superseded, Withdrawn. | The current document(s) is (are): BS EN 1990:2002+A1:2005 | The reference is inappropriate as it supports an out of date local standard. | The reference should be deleted and the reference to the local standard updated. |
| GEO1:8110-1 | 126 | 4b | This reference document is: Superseded, Withdrawn. | The current document(s) is (are): BS 8500-1:2006+A1:2012 BS 8500-2:2006+A1:2012 BS EN 206-1:2000 | The reference has been superseded by several documents. | Update the reference to the document most appropriate for the citation; BS EN 206-1:2000. |
| GEO1:8004-1 | 126 | 1 | This reference document is: Superseded, Withdrawn, but contains NCCI. | The current document(s) is (are): BS EN 1997-1:2004 | All citations of this document are to NCCI. | Retain the existing reference. |
| GEO1:1052-1 | 126 | 3a | This reference document is: Confirmed, Current. | The current document(s) is (are): BS 1052:1980 | No change, however the date of the reference is incorrect. | Correct the date error in the reference. |
| GEO1:729-1 | 126 | 4a | This reference document is: Superseded, Withdrawn. | The current document(s) is (are): BS EN ISO 1461:2009 | The reference has been superseded by an equivalent document. | Update the reference to the document most appropriate for the citation; BS EN ISO 1461:1999. |
| GEO1:8007-1 | 126 | 5 | This reference document is: Superseded, Withdrawn. | The current document(s) is (are): BS EN 1992-1-1:2004 BS EN 1992-3:2006 | Although the reference has been superseded, some information provided previously is no longer contained in the replacement document. | Geoguide 1 text will require revision to accommodate the information no longer referenced. That information which is referenced can be ascribed to BS EN 1992-3:2006. |
| GEO1:5750-1 | 126 | 4a | This reference document is: Superseded, Withdrawn. | The current document(s) is (are): BS EN ISO 9000:2005 | The reference has been superseded by an equivalent document. | Update the reference to the document most appropriate for the citation; BS EN ISO 9000:2005. |
| GEO1:1377-1 | 126 | 4a | This reference document is: Confirmed, Current. | The current document(s) is (are): Geospec 3 | Although the reference remains current, it has been superseded in local practice. | Replace the reference with Geospec 3 (GEO, 2001). |
| GEO1:443-1 | 126 | 4a | This reference document is: Superseded, Withdrawn. | The current document(s) is (are): BS EN 10244-1:2009 BS EN 10244-2:2009 | The reference has been superseded by equivalent documents. | Update the reference to the documents most appropriate for the citation; BS EN 10244-1:2009 and BS EN 10244-2:2009. |
| GEO1:4102-1 | 126 | 4a | This reference document is: Revised, Withdrawn (Partially replaced). | The current document(s) is (are): BS EN 10245-1:2011 BS EN 10245-2:2011 | The reference has been superseded by an equivalent document. | Update the reference to the documents most appropriate for the citation; BS EN 10245-1:2011 and BS EN 10245-2:2011. |
| GEO1:410-1 | 0 | 4b | This reference document is: Current. | The current document(s) is (are): BS 410-1:2000, ISO 3310-1:2000 | Add the appropriate reference. | Add reference to BS 410-1:2000, ISO 3310-1:2000. |

Table C4 - Recommended Revisions to Existing Clauses referring to British Standards

| Page no. | BS Referenced in Technical Guidance Document | Scope of Updating ⁽¹⁾ | ID No. | Existing Content of Technical Guidance Document | Recommended Content for Updated Technical Guidance Document |
|----------|--|----------------------------------|-------------|---|--|
| 20 | BS 8004:1986 | 1 | GEO1:8004-2 | Some guidance on how concrete, steel and timber can be expected to deteriorate in different circumstances is given in BS 8004 (BSI, 1986a), which also indicates some of the steps which may be taken to prolong the life of these materials when used. | Some guidance on how concrete, steel and timber can be expected to deteriorate in different circumstances is given in BS 8004 (BSI, 1986a), which also indicates some of the steps which may be taken to prolong the life of these materials when used. |
| 21 | BS 8004:1986 | 1 | GEO1:8004-3 | Also, the backfill should not be chemically aggressive, e.g. the presence of excessive sulphate in soils can cause accelerated deterioration of concrete and steel (BSI, 1986a). | Also, the backfill should not be chemically aggressive, e.g. the presence of excessive sulphate in soils can cause accelerated deterioration of concrete and steel (BSI, 1986a). |
| 27 | BS 8004:1986 | 1 | GEO1:8004-4 | Groundwater levels may be controlled by dewatering. The dewatering method chosen should ensure the stability of the excavation and the safety of nearby structures. Reference may be made to Terzaghi & Peck (1967), NAVFAC (1982b), BS 8004 (BSI, 1986a) and Somerville (1986) for guidance on techniques of dewatering. | Groundwater levels may be controlled by dewatering. The dewatering method chosen should ensure the stability of the excavation and the safety of nearby structures. Reference may be made to Terzaghi & Peck (1967), NAVFAC (1982b), BS 8004 (BSI, 1986a) and Somerville (1986) for guidance on techniques of dewatering. |
| 42 | BS 1377-8:1990 | 4a | GEO1:1377-2 | Both triaxial compression and direct shear tests can be used to determine the shear strength parameters of a fill material. Guidance on methods for carrying out such tests and on the interpretation of test results can be found in the Geotechnical Manual for Slopes (GCO, 1984), Head (1986) and BS 1377:Part 8 (BSI, 1990a). A detailed description of a direct shear test procedure suitable for a range of fill materials is given in Geospec 2:Model Specification for Reinforced Fill Structures (GCO, 1989a). It should be noted that the test conditions, including specimen size, method and time of soaking or saturation, as well as the stress path, rate of shearing and drainage conditions, can affect the test results. | Both triaxial compression and direct shear tests can be used to determine the shear strength parameters of a fill material. Guidance on methods for carrying out such tests and on the interpretation of test results can be found in the Geotechnical Manual for Slopes (GCO, 1984), Head (1986) and Geospec 3 (GEO, 2001). A detailed description of a direct shear test procedure suitable for a range of fill materials is given in Geospec 2:Model Specification for Reinforced Fill Structures (GCO, 1989a). It should be noted that the test conditions, including specimen size, method and time of soaking or saturation, as well as the stress path, rate of shearing and drainage conditions, can affect the test results. |
| 53 | BS 8004:1986 | 1 | GEO1:8004-5 | For a rock mass containing discontinuities, the insitu modulus is generally much smaller than the laboratory modulus of the intact rock, E_i . BS 8004 (BSI, 1986a) gives the following equation which relates E_m to E_i through a 'mass factor' j : | For a rock mass containing discontinuities, the insitu modulus is generally much smaller than the laboratory modulus of the intact rock, E_i . BS 8004 (BSI, 1986) gives the following equation which relates E_m to E_i through a 'mass factor' j : |
| 53 | BS 8004:1986 | 1 | GEO1:8004-6 | For reasonably tight discontinuities, BS 8004 (BSI, 1986a) suggests that j may be taken as numerically equal to the average discontinuity spacing expressed in metres, with an upper limit of unity. | For reasonably tight discontinuities, BS 8004 (BSI, 1986) suggests that j may be taken as numerically equal to the average discontinuity spacing expressed in metres, with an upper limit of unity. |
| 71 | BS 5400-2:1978 | 5 | GEO1:5400-2 | In Hong Kong, public highway and railway structures are generally designed for the loads given in the Civil Engineering Manual Volume V (EDD, 1983), which makes reference to BS 5400:Part 2 (BSI, 1978) for highway loading. Retaining walls and bridge abutments which form part of a highway, as well as retaining walls for railways, should in general be designed for 45 units of type HB loading. Highway structures spanning less than 15 m and situated along rural roads other than trunk or main roads may be designed for type HA loading only. Where special conditions indicate that a smaller load would be appropriate, the agreement of the relevant authorities should first be obtained. | In Hong Kong, public highway and railway structures, including retaining walls and bridge abutments which form part of a highway or railway, are generally designed for loads given in the Structures Design Manual for Highways and Railways (HyD, 2013). Where special conditions indicate that a smaller load would be appropriate, the agreement of the relevant authorities should first be obtained. |
| 91 | BS 8110-1:1985 | 4a | GEO1:8110-2 | (1) <i>Concrete</i> . Concrete of adequate durability should be specified. Where sulphates are present in soil and groundwater, reference may be made to BS 8110:Part 1 (BSI, 1985) for guidance on the selection of cement type and mix proportions to ensure durability. In situations where the soil or groundwater is found to be particularly aggressive to concrete, adequate protection to the back of the wall should be provided. Examples of such protection include installation of a suitable form of lining (e.g. polyethylene sheeting) and application of a surface coating (e.g. using asphalt, chlorinated rubber, epoxy or polyurethane materials). | (1) <i>Concrete</i> . Concrete of adequate durability should be specified. Where sulphates are present in soil and groundwater, reference may be made to BS EN 206-1 (BSI, 2000b), BS 8500-1:2006+A1:2012 (BSI, 2012a) and BS 8500-2:2006+A1:2012 (BSI, 2012b) for guidance on the specification of cement type and mix proportions to ensure durability. In situations where the soil or groundwater is found to be particularly aggressive to concrete, adequate protection to the back of the wall should be provided. Examples of such protection include installation of a suitable form of lining (e.g. polyethylene sheeting) and application of a surface coating (e.g. using asphalt, chlorinated rubber, epoxy or polyurethane materials). |

Geoguide 1 (2nd Edition): Guide to Retaining Wall Design

Table C4 - Recommended Revisions to Existing Clauses referring to British Standards

| Page no. | BS Referenced in Technical Guidance Document | Scope of Updating ⁽¹⁾ | ID No. | Existing Content of Technical Guidance Document | Recommended Content for Updated Technical Guidance Document |
|----------|---|-------------------------------------|--|--|--|
| 92 | BS 8007:1987 | 5 | GEO1:8007-2 | BS 8007 (BSI, 1987a) provides guidance on details of expansion, contraction and other movement joints, as well as their spacings. As a guide, expansion and contraction joints should be spaced not more than 22.5 m and 7.5 m apart respectively. Joints in decorative facings should coincide with the locations of movement joints. | BS EN 1992-3:2006 (BSI, 2006) provides general guidance on movement joints. As a guide, expansion and contraction joints should be spaced not more than 22.5 m and 7.5 m apart respectively. Joints in decorative facings should coincide with the locations of movement joints. |
| 98 | BS 1052:1986 BS 729:1986 BS 443:1990 | 3a 4a 4a | GEO1:1052-2 GEO1:729-2 GEO1:443-2 | The wires used for the wire-mesh should be mild steel wire to BS 1052 (BSI, 1986b) , with a minimum tensile strength of 350 N/mm ² . For permanent applications, the wires should be at least 2.7 mm in diameter and galvanized. For hexagonal wire-mesh the wires should be galvanized to BS 443 (BSI, 1990b) before weaving. For welded mesh, the mesh panels should be hot dip galvanized to BS 729 (BSI, 1986c) after welding. The making of panels with galvanized wires welded together is not recommended as the welds are left unprotected. | The wires used for the wire-mesh should be mild steel wire to BS 1052 (BSI, 1980) , with a minimum tensile strength of 350 N/mm ² . For permanent applications, the wires should be at least 2.7 mm in diameter and galvanized. For hexagonal wire-mesh the wires should be galvanized to BS EN 10244-1 (BSI, 2009a) and BS EN 10244-2 (BSI, 2009b) before weaving. For welded mesh, the mesh panels should be hot dip galvanized to BS EN ISO 1461 (BSI, 2009c) after welding. The making of panels with galvanized wires welded together is not recommended as the welds are left unprotected. |
| 98 | BS 4102:1990 | 4a | GEO1:4102-2 | The soil and water with which the gabion wall is to be in contact should be assessed. Guidance on soil and water properties that are aggressive to galvanized steel is given in Geospec 2 : Model Specification for Reinforced Fill Structures (GCO, 1989a). If the soil and water conditions are aggressive, PVC (polyvinylchloride) coating should be provided to the wires. The PVC coating should be at least 0.5 mm thick and should meet the requirements of BS 4102 (BSI, 1990c) . For hexagonal woven mesh, the PVC coating may be applied by hot dipping or by extrusion onto the galvanized wire before weaving. For welded mesh, it is usually applied electrostatically onto the panels. The PVC should be bonded sufficiently to the wire core to prevent capillary flow of water between the wire and the PVC, which can produce corrosion. | The soil and water with which the gabion wall is to be in contact should be assessed. Guidance on soil and water properties that are aggressive to galvanized steel is given in Geospec 2 : Model Specification for Reinforced Fill Structures (GCO, 1989a). If the soil and water conditions are aggressive, PVC (polyvinylchloride) coating should be provided to the wires. The PVC coating should be at least 0.5 mm thick and should meet the requirements of BS EN 10245-1 (BSI, 2011a) and BS EN 10245-2 (BSI, 2011b) . For hexagonal woven mesh, the PVC coating may be applied by hot dipping or by extrusion onto the galvanized wire before weaving. For welded mesh, it is usually applied electrostatically onto the panels. The PVC should be bonded sufficiently to the wire core to prevent capillary flow of water between the wire and the PVC, which can produce corrosion. |
| 117 | BS 5750-0 to 3:1987 | 4b | GEO1:5750-2 | Only those aspects of construction control which are directly related to verification of the geotechnical design assumptions are covered in this Chapter. Detailed guidance on the general duties of site staff, project management and quality assurance principles are outside the scope of this Geoguide. For these aspects, reference should be made to specialist literature such as the ASCE Manual of Professional Practice: Quality in the Constructed Project (ASCE, 1988) and British Standards in the BS 5750 series (BSI, 1987b) . | Only those aspects of construction control which are directly related to verification of the geotechnical design assumptions are covered in this Chapter. Detailed guidance on the general duties of site staff, project management and quality assurance principles are outside the scope of this Geoguide. For these aspects, reference should be made to specialist literature such as the ASCE Manual of Professional Practice: Quality in the Constructed Project (ASCE, 1988) and the BS EN ISO 9000 family of standards (BSI, 2005, 2009d, 2009e, 2011c) . |
| 126 | BS5400-2:1978 | 5 | GEO1:5400-1 | BSI (1978). Steel, Concrete and Composite Bridges. Part 2 - Specification for Loads (BS 5400:Part 2:1978). British Standards Institution, London, 46 p. | HyD (2013). Structures Design Manual for Highways and Railways (2013 Edition). Highways Department, Hong Kong, 275p. |
| 126 | BS 8110-1:1985 | 4b | GEO1:8110-1 | BSI (1985). Structural Use of Concrete. Part 1 - Code of Practice for Design and Construction (BS 8110:Part 1:1985). British Standards Institution, London, 124 p. | BSI (2000b) Concrete - Part 1: Specification, Performance, Production and Conformity (BS EN 206-1:2000) . British Standards Institution, London, 74 p. BSI (2012a). Concrete - Complementary British Standard to BS EN 206-1 - Part 1: Method of Specifying and Guidance for the Specifier (BS 8500-1:2006+A1:2012) . British Standards Institution, London, 66p BSI (2012b). Concrete - Complementary British Standard to BS EN 206-1 - Part 1: Specification for Constituent Materials and Concrete (BS 8500-2:2006+A1:2012) . British Standards Institution, London, 52p. |
| 126 | BS 8004:1986 | 1 | GEO1:8004-1 | BSI (1986a). Code of Practice for Foundations (BS 8004:1986). British Standards Institution, London, 160 p. | BSI (1986a) Code of Practice for Foundations (BS 8004:1986). British Standards Institution, London, 406 p. |
| 126 | BS 1052:1986 | 3a | GEO1:1052-1 | BSI (1986b). Specification for Mild Steel Wire for General Engineering Purposes (BS 1052:1986). British Standards Institution, London, 4 p. | BSI (1980) Specification for Mild Steel Wire for General Engineering Purposes (BS 1052:1980). British Standards Institution, London, 10 p. |
| 126 | BS729:1986 | 4a | GEO1:729-1 | BSI (1986c). Specification for Hot Dip Galvanized Coatings on Iron and Steel Articles (BS 729:1986). British Standards Institution, London, 16 p. | BSI (2009c) Hot Dip Galvanized Coatings on Fabricated Iron and Steel Articles - Specifications and Test Methods (BS EN ISO 1461:2009) . British Standards Institution, London, 24 p. |

Table C4 - Recommended Revisions to Existing Clauses referring to British Standards

| Page no. | BS Referenced in Technical Guidance Document | Scope of Updating ⁽¹⁾ | ID No. | Existing Content of Technical Guidance Document | | Recommended Content for Updated Technical Guidance Document | |
|----------|--|----------------------------------|-------------|---|----------------|---|--------------|
| 126 | BS 8007:1987 | 5 | GEO1:8007-1 | BSI (1987a). Code of Practice for Design of Concrete Structures for Retaining Aqueous Liquids (BS 8007:1987). British Standards Institution, London, 32 p. | | BSI (2006) Eurocode 2. Design of Concrete Structures - Liquid Retaining and Containing Structures (BS EN 1992-3:2006). British Standards Institution, London, 23 p. | |
| 126 | BS 5750-0 to 3:1987 | 4a | GEO1:5750-1 | BSI (1987b). Quality Systems (BS 5750:Parts 0 to 3:1987). British Standards Institution, London, 64 p. | | BSI (2005) Quality Management Systems - Fundamentals and Vocabulary (BS EN ISO 9000:2005). British Standards Institution, London, 42 p. BSI (2009d). Quality Management Systems - Requirements (BS EN ISO 9001:2008). British Standards Institution, London, 40 p. BSI (2009e). Managing for the Sustained Success of an Organization – A Quality Management Approach (BS EN ISO 9004:2009). British Standards Institution, London, 56 p. BSI (2011c). Guidelines for Auditing Management Systems (ISO 19011:2011) (BS EN ISO 19011:2011). British Standard Institution, London, 56 p. | |
| 126 | BS 1377-8:1990 | 4a | GEO1:1377-1 | BSI (1990a). Methods of Test for Soils for Civil Engineering Purposes. Part 8 - Shear Strength Tests (Effective Stress) (BS 1377:Part 8:1990). British Standards Institution, London, 32 p. | | GEO (2001) Model Specification for Soil Testing (Geospec 3). Geotechnical Engineering Office, Hong Kong, 340 p. | |
| 126 | BS 443:1990 | 4a | GEO1:443-1 | BSI (1990b). Specification for Testing Zinc Coatings on Steel Wire and for Quality Requirements (BS 443:1990). British Standards Institution, London, 12 p. | | BSI (2009a) Steel Wire and Wire Products - Non-ferrous Metallic Coatings on Steel Wire, Part 1: General principles (BS EN 10244-1:2009). British Standards Institution, London, 12 p. BSI (2009b) Steel Wire and Wire Products - Non-ferrous Metallic Coatings on Steel Wire, Part 2: Zinc or Zinc Alloy Coatings (BS EN 10244-2:2009). British Standards Institution, London, 22 p. | |
| 126 | BS 4102:1990 | 4a | GEO1:4102-1 | BSI (1990c). Specification for Steel Wire and Wire Products for Fences (BS 4102:1990). British Standards Institution, London, 20 p. | | BSI (2011a) Steel Wire and Wire Products - Organic Coatings on Steel Wire, Part 1: General Rules (BS EN 10245-1:2011). British Standards Institution, London, 22 p. BSI (2011b) Steel Wire and Wire Products - Organic coatings on Steel Wire, Part 2: PVC Finished Wire (BS EN 10245-2:2011). British Standards Institution, London, 14 p. | |
| | [No citation] | 4b | GEO1:410-1 | [Additional reference required.] | | BSI (2000a) Test sieves - Technical Requirements and Testing - Part 1: Test Sieves of Metal Wire Cloth (BS 410-1:2000, ISO 3310-1:2000). British Standards Institution, London, 22 p. | |
| 142 | [Not cited] | 4b | GEO1:410-2 | In Table 4: Requirements column: "% Passing 63 microns BS Sieve Size" | | Add footnote to table as follows: (7) BS Sieve Sizes are specified in BS 410-1:2000, ISO 3310-1:2000 (BSI, 2000a). | |
| 151 | [Not cited] | 5 | GEO1:5400-3 | Highway structures ⁽³⁾ (a) HA Loading (b) HB Loading | 10kPa 20kPa | Highway structures | See Note (3) |
| | | | | Under Notes: (3) The designer should use the appropriate combinations of highway loadings for different design situations (see Section 7.2.1). | | Under Notes: (3) Design loads for highway structures should be determined in accordance with the guidance given in the Structures Design Manual for Highways and Railways (HyD, 2013). The designer should use the appropriate combinations of highway loadings for different design situations (see Section 7.2.1). | |