Appendix E

Summaries for Geoguide 3: Guide to Rock and Soil Descriptions

Table E1 - 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						
BS5930:1981 Code of Practice for Site Investigations						
Revised, Withdrawn	N/A	GEO3:5930-2	3	This Geoguide presents a recommended standard of good practice for the description of Hong Kong rocks and soils for engineering purposes. This need was recognized in July 1983, when a Subcommittee of the Building Authority Working Party on Geotechnical Regulations reviewed the application in Hong Kong of the British Standard BS 5930 : 1981, Code of Practice for Site Investigations. With regard to Section 8 of BS 5930 (Descriptions of Soils and Rocks), the Subcommittee concluded that it should not be recommended for general use in Hong Kong, because parts of the section were not relevant to local conditions or conflicted with current Hong Kong practice.	1981; Historical; GEO3:5930-2; BS5930:1981 is mentioned in a historical context. The mention is not cited to a reference. The referral to BS5930:1981 provides essential background information to the development of Geoguide 3 and should be retained in the foreword.	1
Revised, Withdrawn	N/A	GEO3:5930-3	3	This Geoguide should be used in conjunction with the companion document, Guide to Site Investigation (Geoguide 2). which covers the topics dealt with in Sections 1 to 7 of BS 5930. Together, these two Geoguides expand upon, and largely replace, Chapter 2 of the Geotechnical Manual for Slopes (1984).	1981; Historical; GEO3:5930-3; BS5930:1981 is mentioned in a historical context. The mention is not cited to a reference and it should be retained as above comment.	1
Revised, Withdrawn	N/A	GEO3:5930-4	9	The overall structure and many individual text sections of this Geoguide are based on Section 8 of BS 5930 :1981, Code of Practice for Site Investigations (BSI, 1981). This British Standard (BS) has been selected as the basic reference document for both this Geoguide and Geoguide 2, in the belief that many of its sections are applicable to Hong Kong conditions without the need for major modification. However. the layout of this document differs considerably from that of Section 8 of the BS, and a number of new text sections have been added. together with many more tables, figures and plates. These changes reflect not only differences of emphasis with regard to local geological conditions, but also the need for more illustration and explanation of geological terms for the non-specialist user.	1981; Historical; GEO3:5930-4; BS5930:1981 is mentioned in a historical context. This provides the reader with an understanding of the origins of Geoguide 3. Consequently the reference can be retained.	1
Revised, Withdrawn	N/A	GEO3:5930-5	9	Appendix A, which contains a geological summary of the nature and occurrence of Hong Kong rocks and soils, is intended to fulfil a similar role to that of Appendix G in the BS. This is followed by a glossary of terms. Also included separately is a checklist for field or laboratory use.	1981; Historical; GEO3:5930-5; BS5930:1981 is mentioned in a historical context. This provides the reader with an understanding of the origins of Geoguide 3. Consequently the reference can be retained.	1
Revised, Withdrawn	N/A	GEO3:5930-6	14	In the following sections, each of the characteristics in this list is discussed in detail for both rock material and rock mass, as appropriate. The scope of this scheme is similar to the schemes recommended by BSI (1981), Geological Society (1972, 1977) and IAEG (1981). The differences in the present scheme are ones of detail, mainly with respect to the description of the weathered state of the rock material and rock mass, and an expansion of the description of discontinuities and other aspects of rock mass structure.	1981; Historical; GEO3:5930-6; The paragraph contains a historical reference to the origins of the following normative guidance. It would be inappropriate to change the reference.	1
Revised, Withdrawn	N/A	GEO3:5930-7	14	A recommended scale of strength, based on uniaxial compressive strength testing (UCS), is given in Table 2. This scale is similar to that used in BSI (1981). but has been extended at the weaker end in order to cover the extremely weak decomposed rock materials that are commonly encountered in Hong Kong. Simple field identification tests have also been added so that the strength terms may be estimated prior to any laboratory testing; these are based on the classifications given by the Geological Society (1977) and Miller et a1 (1986).	1981; Historical; GEO3:5930-7; The paragraph contains a historical reference to the origins of the following normative guidance. It would be inappropriate to change the reference.	1
Revised, Withdrawn	N/A	GEO3:5930-8	30	Rock mass weathering classifications are usually established on the basis of differing proportions of rock and soil, the presence or absence of mass structure. and the degree of discolouration of discontinuity surfaces. A simple general scheme based on these characteristics is given in Table 10. It should be noted that this zonal classification differs substantially from that recommended in BS 5930 (BSI, 1981). In order to avoid confusion between the two. new self-explanatory zone descriptions and symbols are used.	1981; Historical; GEO3:5930-8; The paragraph contains a historical reference to a significant difference between BS5930:1981 and the following normative guidance. It would be inappropriate to change the reference.	1
Revised, Withdrawn	N/A	GEO3:5930-9	36	In the following sections, the material characteristics in this sequence are considered in Section 3.3 and the mass characteristics in Section 3.4. The scope of this scheme is similar to the schemes recommended by BSI (1981) and IAEG (1981), but the layout of these two sections, and the order in which individual characteristics are considered, have been modified to conform as closely as possible to the scheme used for rock description in Chapter 2.	1981; Historical; GEO3:5930-9; The paragraph contains a historical reference to a difference between BS5930:1981 and the following normative guidance. It would be inappropriate to change the reference.	1
Revised, Withdrawn	N/A	GEO3:5930-10	38	Table 11 is a slightly modified and rearranged form of the version given by BSI (1981) . This method of naming and identifying basic soil types has been criticised in some detail by Child (1984) and Norbury et a1 (1984). They proposed an alternative method which is based more on the probable mass engineering behaviour of the soil (following the scheme used in CP 2001 (BSI, 1957)), rather than on strict grading limits as in the present scheme. However, the use of this alternative method depends more on the judgement of the individual who makes the description. The scheme outlined in Table 11 is considered to be easier for the non-specialist to apply and is therefore recommended.	1981; Historical; GEO3:5930-10; The citation is factually correct. A similar table appears in BS5930:1999+A1:2007. Given the context of the paragraph, there is no effective difference in whether the historically correct reference is retained or the current standard is cited. On balance, it is recommended that the current is retained.	1

Table E1 - 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
Revised, Withdrawn	N/A	GEO3:5930-11	53, 54	Other well-known classification schemes are the fracture spacing/point load strength classification charts used to assess rippability or ease of excavation (Franklin et al, 1971). and the empirical strength criteria developed by Hoek & Brown (1980) for a rock mass classification based on rock type, joint spacing and degree of joint weathering. Rock mass weathering zones (see Section 2.4.4.). when used in conjunction with other mass and material properties (e.g. discontinuities and strength), can also form the basis of a rock mass engineering classification. For example, Dearman et a1 (1978) used the BSI (1981) mass weathering scheme to make a six-fold classification of weathered granites and gneisses from the point of view of ease of excavation, tunnel support, foundation suitability, drilling rates and other factors. A useful summary of seven different rock mass classifications developed for various engineering works in Japan has been compiled by the Japan Society of Engineering Geology (1987).	1981; Historical; GEO3:5930-11; The citation of BS5930:1981 appears in support of practices described in another reference as part of a general discussion. It would seem inappropriate to change the reference.	1
Revised, Withdrawn	N/A	GEO3:5930-12	54	A well-known example of a soil classification system is the British Soil Classification System (BSCS), which is described by BSI (1981). This system, slightly modified in accordance with Table 15, is summarised in Tables 19 and 20, and in Figure 8. The principal soil groups are the same as those shown in Table 11, but the subgroups are divided further on the basis of laboratory tests.	1981; Historical; GEO3:5930-12; The citation is factually correct. The BSCS is not described in later revisions of BS5930 or BS EN ISO 14688-2:2004, therefore the current reference should be retained.	1
Revised, Withdrawn	BS5930:1999+A2:2010	GEO3:5930-13	88	See footnote of "Table 17 -Plasticity Terms Based on Liquid Limit"	1981; Informative; GEO3:5930-13; The values stated match those in the latest revision of BS5930. Equivalent divisions are not described in BS EN 1997-2:2007, which is silent on classification by plasticity. BS EN ISO 14688-1:2002 only deals with field descriptions and therefore does not address plasticity in the degree of detail set out in Table 17. BS5930:1999+A2:2010 can be cited as an up to date reference.	3a
BS1377:1975 Methods of Test for Soils for Civil Engineering Purposes						
Revised, Withdrawn	Geospec3	GEO3:1377-2	19	Assessment of decomposition grade using Table 4 is adequate for general descriptions, but subdivision of the grades may be justified if a more detailed description is required; for example when making detailed correlations between laboratory test results for engineering design and degree of decomposition. For this type of description, more detailed observations of the rock texture/fabric should be made and individual index test results on specific samples should be quoted. Other, more precise, laboratory and field index tests should also be considered (e.g. quick absorption, density, slake durability and point load strength tests in grades 1-111 materials; SPT, dry density and particle size distribution tests in grades IV -VI). Further guidance on rock and soil index tests is given by Brown (1981) and BSI (1975) respectively. A review of the use of index tests for engineering assessment of weathered rocks has been made by	1975; Informative; GEO3:1377-2; The conduct of soil index tests as set out in BS1377:1975 has been superseded in Hong Kong by the introduction of Geospec3.	4a
Revised, Withdrawn	N/A	GEO3:1377-3	37	The compactness terms for sands and gravels in Table 12 are based on N values measured in boreholes by the Standard Penetration Test (BSI, 1975). This scale is recommended for use only in transported soils. There is no generally accepted classification of N values and density terms for soils derived from insitu rock weathering in Hong Kong; for descriptive purposes, any measured N values in these soils should be recorded directly. When used for design purposes, a correction factor is often applied to N values to account for overburden pressure, energy dissipation in the drill rods, and the effect of low permeability in fine sands and silty sands (Rodin et al, 1974; Skempton, 1986). If the descriptive terms are based on corrected N values. this should be noted.	1975; Historical; GEO3:1377-3; The citation is part of a description of how certain values in the Geoguide were determined. It is important that the reference is retained as it states the standard of the test at the time.	1
Revised, Withdrawn	Geospec3	GEO3:1377-4	38	General Aspects. The basic soil types and their sub-divisions are shown in Table 11. The soil name is based on particle size distribution and plasticity properties. These characteristics are used because they can be estimated with sufficient accuracy for descriptive purposes, and can be measured with reasonable precision if required. They give a general indication of the probable engineering characteristics of the soil at any particular moisture content. Table 11 provides guidance essentially for the rapid identification of the soil type by hand and eye in the field or in the laboratory. If necessary, the soil type can be confirmed by determining the particle size distribution and plasticity properties from laboratory tests (BSI, 1975).	1975; Normative; GEO3:1377-4; Current Hong Kong practice for particle size distribution and plasticity tests are contained in Geospec3. The citation and reference should be changed to Geospec3.	4a
Revised, Withdrawn	Geospec3	GEO3:1377-5	40	(3) Plasticity. As shown in Table 11, clay and silt, both alone and in mixtures with coarser material, may be classified for descriptive purposes into three groups, viz non-plastic or low plasticity (generally silts), intermediate plasticity (lean clays), and high plasticity (fat clays). For rapid description in the field or in the laboratory, these classes may be estimated on the basis of visual identification and hand tests, which are summarised in Table 11 and are discussed in more detail below. A more accurate description of plasticity can also be made on the basis of laboratory determination of the liquid limit (BSI. 1975) and the extended classification scale given in Table 17.	1975; Informative; GEO3:1377-5; Current Hong Kong practice for plasticity tests are contained in Geospec3. The citation and reference should be changed to Geospec3.	4a
Revised, Withdrawn	Geospec3	GEO3:1377-6	40, 41	Notes on dry strength of silts and clays are included in Table 11. 'Toughness' of a fine soil refers to the character of a thread of moist soil rolled on the palm of the hand, moulded together, and rolled again until it has dried sufficiently to break at a diameter of about 3 mm, as in the plastic limit test (BSI. 1975). In this condition, inorganic clays of high plasticity are fairly stiff and tough. those of low plasticity are softer and more crumbly. Inorganic silts give a weak and often soft thread that breaks up, crumbles readily, and may be difficult to form.	1975; Informative; GEO3:1377-6; Current Hong Kong practice for plasticity tests are contained in Geospec3. The citation and reference should be changed to Geospec3.	4a

Table E1 - 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
Revised, Withdrawn	Geospec3	GEO3:1377-7	55	The grading and plasticity characteristics of saprolites and residual soils may be affected by pretreatment methods or variations in moisture content (e.g. whether tested in an air-dried or natural condition). BS 1377 (BSI, 1975) draws attention to the difficulty of testing "certain tropical soils" and "highly aggregated soils", with regard to the use of dispersing agents and pretreatment methods in grading tests. and air-dried or natural moisture condition samples in Atterberg limit tests. However, no explicit recommendations are given in BS 1377 for dealing with these problematical soils. Very little work has been done on this topic in Hong Kong. Useful background information and data for saprolites and residual soils in other parts of the world are given by Mitchell & Sitar (1982) and the Committee on Tropical Soils of the ISSMFE (1985). In addition to normal grading and plasticity tests, dispersion tests (ASTM, 1985b; Decker & Dunnigan, 1977; Flanagan & Holmgren, 1977; Sherard et al, 1976; Standards Association of Australia, 1980, 1984) may prove useful in the interpretation of the likely engineering behaviour of these soils. It is recommended that the use of any pretreatment methods or dispersants for grading and plasticity tests should always be recorded in full on laboratory test results sheets and in reports.	1975; Informative; GEO3:1377-7; Much of the text of this paragraph is rendered obsolete by the introduction of Geospec3, which explicitly deals with tests for aggregated soils. The citations of BS5930:1981 can be removed and the text redrafted to identify Geospec3 as the primary reference.	4b
Revised, Withdrawn	N/A	GEO3:1377-8	175	Grading. Particle size distribution, defined as the percentages of the various grain sizes present in a soil as determined by sieving and sedimentation (BSI. 1975).	1975; Informative; GEO3:1377-8; Current Hong Kong practice for particle size distribution is contained in Geospec 3. The citation and should be changed to Geospec 3.	4a
Revised, Withdrawn	BS1377-2:1990	GEO3:1377-9	178	Liquid limit (LL). Moisture content at which a soil passes from the plastic to the liquid state, as determined by the liquid limit test (BSI. 1975).	1975; Informative; GEO3:1377-9; Current Hong Kong practice for liquid limit test is contained in Geospec 3. The citation and should be changed to Geospec	4a
Revised, Withdrawn	BS1377-2:1990	GEO3:1377-10	180	Plastic limit (PL). Moisture content at which a soil becomes too dry to be in a plastic condition, as determined by the plastic limit test (BSI, 1975).	1975; Informative; GEO3:1377-10; Current Hong Kong practice for plastic limit test is contained in Geospec 3. The citation and should be changed to Geospec	4a
CP 2001:1957 Code of Practice for Site Investigations						
Superseded, Withdrawn	N/A	GEO3:2001-2	38, 39	Table 11 is a slightly modified and rearranged form of the version given by BSI (1981) . This method of naming and identifying basic soil types has been criticised in some detail by Child (1984) and Norbury et a1 (1984). They proposed an alternative method which is based more on the probable mass engineering behaviour of the soil (following the scheme used in CP 2001 (BSI, 1957)), rather than on strict grading limits as in the present scheme. However, the use of this alternative method depends more on the judgement of the individual who makes the description. The scheme outlined in Table 11 is considered to be easier for the non-specialist to apply and is therefore recommended.	1957; Historical; GEO3:2001-2; The citation and reference remain factually correct and do not require amendment.	1
Reference Section of Report						
Superseded, Withdrawn	BS5930:1981	GEO3:2001-1	60	BSI (1957). Site Investigations (CP 2001 : 1957). British Standards Institution, London, 123 p.	1957; Reference; GEO3:2001-1; There is a single historical citation of this reference. It should therefore be retained.	1
Revised, Withdrawn	Geospec3, BS1377:1990, BS EN ISO 22476-3:2005, BS1924-2:1990	GEO3:1377-1	60	BSI (1975). Methods of Test for Soil for civil Engineering Purposes (BS1377:1975), British Standards Institution, London, 144 p.	1975; Reference; GEO3:1377-1; This reference has 9 citations (1 normative, 7 informative and 1 historical). The historical citation requires retention of this reference. The normative and most of the informative citations require referencing to Geospec3. One informative citation would require reallocating to BS1377-2:1990, but it is recommended that this citation is deleted.	1
Revised, Withdrawn	BS5930:1999+A2:2010, BS EN 1997-2:2007, BS EN ISO 22475-1:2006, BS EN ISO 22476-1:2012, BS EN ISO 22476-2:2011, BS EN ISO 22476-3:2011, BS EN ISO 22476-12:2009, BS EN ISO 22282-1:2012, BS EN ISO 88828-2:2012, BS EN ISO 88828-4:2012	GEO3:5930-1	60	BSI (1981). Code of Practice for Site Investigations (BS5930:1981). British Standards Institution, London, 148 p.	1981; Reference; GEO3:5930-1; This reference has 12 citations (1 informative and 11 historical). The historical citations requires retention of this reference. The informative citation is should by reassigned to BS5930:1999+A2:2010, which is more up-to-date.	1

Table E2 - 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					
BS5930:1981 Code of Practice for Site Investigations					
N/A	GEO3:5930-2	3	1	General reference to Section 8 of BS5930:1981	No change proposed.
N/A	GEO3:5930-3	3	1	General reference to Sections 1 to 7 of BS5930:1981	No change proposed.
N/A	GEO3:5930-4	9	1	General reference to Section 8 of BS5930:1981	No change proposed.
N/A	GEO3:5930-5	9	1	General reference to Appendix G of BS5930:1981	No change proposed.
N/A	GEO3:5930-6	14	1	General reference to weathering schemes discussed in BS5930:1981	No change proposed.
N/A	GEO3:5930-7	14	1	Cl 44.2.6 of BS5930:1981	No change proposed.
N/A	GEO3:5930-8	30	1	General reference to weathering schemes discussed in BS5930:1981	No change proposed.
N/A	GEO3:5930-9	36	1	Cl 41 of BS5930:1981	No change proposed.
N/A	GEO3:5930-10	38	1	Table 6 of BS5930:1981	No change proposed.
N/A	GEO3:5930-11	53, 54	1	Cl 44 of BS5930:1981	No change proposed.
N/A	GEO3:5930-12	54	1	Cl 42.3 of BS5930:1981. British Soil Classification System	No change proposed.
BS5930:1999+A2:2010	GEO3:5930-13	88	3a	Cl 41.3.2.3 of BS5930:1981	Figure 18 of BS5930:1999+A2:2010
BS1377:1975 Methods of Test for Soils for Civil Engineering Purposes					
Geospec3	GEO3:1377-2	19	4a	BS1377:1975 Tests 1, 2, 3, 5, 6 and 7	Geospec3 cl 5, cl 6, cl 7 and cl 8
N/A	GEO3:1377-3	37	1	BS1377:1975 Test 19 (standard penetration test)	No change proposed.
Geospec3	GEO3:1377-4	38	4a	BS1377:1975 Tests 2, 3 and 7	Geospec3 cl 6 and cl 8
Geospec3	GEO3:1377-5	40	4a	BS1377:1975 Test 2	Geospec3 cl 6
Geospec3	GEO3:1377-6	40, 41	4a	BS1377:1975 Test 3	Geospec3 cl 6
Geospec3	GEO3:1377-7	55	4b	Non-specific text on difficulty of testing certain tropical soils.	Geospec3
N/A	GEO3:1377-8	175	4a	No text found to support the citation.	Deletion proposed
BS1377-2:1990	GEO3:1377-9	178	4a	No text found to support the citation.	Deletion proposed
BS1377-2:1990	GEO3:1377-10	180	4a	No text found to support the citation.	Deletion proposed
CP 2001:1957 Code of Practice for Site Investigations					
N/A	GEO3:2001-2	38, 39	1	Not found	No change proposed.

Table E3 - 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						
BS5930:1981 Code of Practice for Site Investigations						
GEO3:5930-2	3	1	Historical reference	Not applicable	Not applicable	None. Retain citation and reference.
GEO3:5930-3	3	1	Historical reference	Not applicable	Not applicable	None. Retain citation and reference.
GEO3:5930-4	9	1	Historical reference	Not applicable	Not applicable	None. Retain citation and reference.
GEO3:5930-5	9	1	Historical reference	Not applicable	Not applicable	None. Retain citation and reference.
GEO3:5930-6	14	1	Historical reference	Not applicable	Not applicable	None. Retain citation and reference.
GEO3:5930-7	14	1	Historical reference	Not applicable	Not applicable	None. Retain citation and reference.
GEO3:5930-8	30	1	Historical reference	Not applicable	Not applicable	None. Retain citation and reference.
GEO3:5930-9	36	1	Historical reference	Not applicable	Not applicable	None. Retain citation and reference.
GEO3:5930-10	38	1	Historical reference	Not applicable	Not applicable	None. Retain citation and reference.
GEO3:5930-11	53, 54	1	Historical reference	Not applicable	Not applicable	None. Retain citation and reference.
GEO3:5930-12	54	1	Historical reference	Not applicable	Not applicable	None. Retain citation and reference.
GEO3:5930-13	88	3a	Definition of plasticity ranges.	No change	No effect.	None. Retain citation and reference.
BS1377:1975 Methods of Test for Soils for Civil Engineering Purposes						
GEO3:1377-2	19	4a	Method of testing for various soil classification tests.	Tests are the same but there are slight changes in the method.	None. Up-to-date reference is in common use in Hong Kong.	Amend citation and add new reference.
GEO3:1377-3	37	1	Historical reference	Not applicable	Not applicable	None. Retain citation and reference.
GEO3:1377-4	38	4a	Method of testing for various soil classification tests.	Tests are the same but there are slight changes in the method.	None. Up-to-date reference is in common use in Hong Kong.	Amend citation and add new reference.
GEO3:1377-5	40	4a	Method of testing for liquid limit tests.	Tests are the same but there are slight changes in the method.	None. Up-to-date reference is in common use in Hong Kong.	Amend citation and add new reference.
GEO3:1377-6	40, 41	4a	Method of testing for plasticity tests.	Tests are the same but there are slight changes in the method.	None. Up-to-date reference is in common use in Hong Kong.	Amend citation and add new reference.
GEO3:1377-7	55	4b	Not specific. Text alludes to difficultyy in applying some basic classification tests to Hong Kong residual soils.	Test difficulties have been addressed by modifying the BS test methods.	None. Up-to-date reference is in common use in Hong Kong.	Redraft the paragraph and remove citations of BS1377:1975. Reference to Geospec3 may be included.
GEO3:1377-8	175	4a	Standard not applicable in context of citation.	Not applicable	Not applicable	Delete citation.
GEO3:1377-9	178	4a	Standard not applicable in context of citation.	Not applicable	Not applicable	Delete citation.
GEO3:1377-10	180	4a	Standard not applicable in context of citation.	Not applicable	Not applicable	Delete citation.
CP 2001:1957 Code of Practice for Site Investigations						
GEO3:2001-2	38, 39	1	Historical reference	Not applicable	Not applicable	None. Retain citation and reference.
Reference Section of Report						
GEO3:2001-1	60	1	This reference document is: Superseded, Withdrawn.	The current document(s) is (are): BS5930:1981	The replacement document is not relevant as the original reference is cited historically.	Retain existing reference.
GEO3:1377-1	60	1	This reference document is: Revised, Withdrawn.	The current document(s) is (are): Geospec3, BS1377:1990, BS EN ISO 22476-3:2005, BS1924-2:1990	The replacement document should be applied to the normative references. The existing reference should be retained for historical citations.	Retain existing reference and add new reference to Geospec 3.
GEO3:5930-1	60	1	This reference document is: Revised, Withdrawn.	The current document(s) is (are): BS5930:1999+A2:2010, BS EN 1997-2:2007, BS EN ISO 22475-1:2006, BS EN ISO 22476-1:2012, BS EN ISO 22476-2:2011, BS EN ISO 22476-3:2011, BS EN ISO 22476-12:2009, BS EN ISO 22282-1:2012, BS EN ISO 88828-2:2012, BS EN ISO 88828-4:2012	The existing reference should be retained for historical citations but the current version of BS5930 needs referencing to support normative citations.	Retain existing reference and add new reference to BS 5930:1999+A2:2010.

Geoguide 3 - Guide to Rock and Soil Descriptions

Table E4 - 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
3	BS5930:1981	1	GEO3:5930-2	This Geoguide presents a recommended standard of good practice for the description of Hong Kong rocks and soils for engineering purposes. This need was recognized in July 1983, when a Subcommittee of the Building Authority Working Party on Geotechnical Regulations reviewed the application in Hong Kong of the British Standard BS 5930 : 1981, Code of Practice for Site Investigations. With regard to Section 8 of BS 5930 (Descriptions of Soils and Rocks), the Subcommittee concluded that it should not be recommended for general use in Hong Kong, because parts of the section were not relevant to local conditions or conflicted with current Hong Kong practice.	No change.
3	BS5930:1981	1	GEO3:5930-3	This Geoguide should be used in conjunction with the companion document, Guide to Site Investigation (Geoguide 2), which covers the topics dealt with in Sections 1 to 7 of BS 5930. Together, these two Geoguides expand upon, and largely replace, Chapter 2 of the Geotechnical Manual for Slopes (1984).	No change.
9	BS5930:1981	1	GEO3:5930-4	The overall structure and many individual text sections of this Geoguide are based on Section 8 of BS 5930 :1981, Code of Practice for Site Investigations (BSI, 1981). This British Standard (BS) has been selected as the basic reference document for both this Geoguide and Geoguide 2, in the belief that many of its sections are applicable to Hong Kong conditions without the need for major modification. However, the layout of this document differs considerably from that of Section 8 of the BS, and a number of new text sections have been added together with many more tables, figures and plates. These changes reflect not only differences of emphasis with regard to local geological conditions, but also the need for more illustration and explanation of geological terms for the non-specialist user.	No change.
9	BS5930:1981	1	GEO3:5930-5	Appendix A, which contains a geological summary of the nature and occurrence of Hong Kong rocks and soils, is intended to fulfil a similar role to that of Appendix G in the BS. This is followed by a glossary of terms. Also included separately is a checklist for field or laboratory use.	No change.
14	BS5930:1981	1	GEO3:5930-6	In the following sections, each of the characteristics in this list is discussed in detail for both rock material and rock mass, as appropriate. The scope of this scheme is similar to the schemes recommended by BSI (1981), Geological Society (1972, 1977) and IAEG (1981). The differences in the present scheme are ones of detail, mainly with respect to the description of the weathered state of the rock material and rock mass, and an expansion of the description of discontinuities and other aspects of rock mass structure.	No change.
14	BS5930:1981	1	GEO3:5930-7	A recommended scale of strength, based on uniaxial compressive strength testing (UCS), is given in Table 2. This scale is similar to that used in BSI (1981), but has been extended at the weaker end in order to cover the extremely weak decomposed rock materials that are commonly encountered in Hong Kong. Simple field identification tests have also been added so that the strength terms may be estimated prior to any laboratory testing; these are based on the classifications given by the Geological Society (1977) and Miller et a1 (1986).	No change.

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19	BS1377:1975	4a	GEO3:1377-2	Assessment of decomposition grade using Table 4 is adequate for general descriptions, but subdivision of the grades may be justified if a more detailed description is required; for example when making detailed correlations between laboratory test results for engineering design and degree of decomposition. For this type of description, more detailed observations of the rock texture/fabric should be made and individual index test results on specific samples should be quoted. Other, more precise, laboratory and field index tests should also be considered (e.g. quick absorption, density, slake durability and point load strength tests in grades 1-111 materials; SPT, dry density and particle size distribution tests in grades IV -VI). Further guidance on rock and soil index tests is given by Brown (1981) and BSI (1975) respectively. A review of the use of index tests for engineering assessment of weathered rocks has been made by Martin (1986).	Assessment of decomposition grade using Table 4 is adequate for general descriptions, but subdivision of the grades may be justified if a more detailed description is required; for example when making detailed correlations between laboratory test results for engineering design and degree of decomposition. For this type of description, more detailed observations of the rock texture/fabric should be made and individual index test results on specific samples should be quoted. Other, more precise, laboratory and field index tests should also be considered (e.g. quick absorption, density, slake durability and point load strength tests in grades 1-111 materials; SPT, dry density and particle size distribution tests in grades IV -VI). Further guidance on rock and soil index tests is given by Brown (1981) and GEO (2001) respectively. A review of the use of index tests for engineering assessment of weathered rocks has been made by Martin (1986).
30	BS5930:1981	1	GEO3:5930-8	Rock mass weathering classifications are usually established on the basis of differing proportions of rock and soil, the presence or absence of mass structure, and the degree of discolouration of discontinuity surfaces. A simple general scheme based on these characteristics is given in Table 10. It should be noted that this zonal classification differs substantially from that recommended in BS 5930 (BSI, 1981). In order to avoid confusion between the two, new self-explanatory zone descriptions and symbols are used.	No change.
36	BS5930:1981	1	GEO3:5930-9	In the following sections, the material characteristics in this sequence are considered in Section 3.3 and the mass characteristics in Section 3.4. The scope of this scheme is similar to the schemes recommended by BSI (1981) and IAEG (1981), but the layout of these two sections, and the order in which individual characteristics are considered, have been modified to conform as closely as possible to the scheme used for rock description in Chapter 2.	No change.
37	BS1377:1975	1	GEO3:1377-3	The compactness terms for sands and gravels in Table 12 are based on N values measured in boreholes by the Standard Penetration Test (BSI, 1975). This scale is recommended for use only in transported soils. There is no generally accepted classification of N values and density terms for soils derived from insitu rock weathering in Hong Kong; for descriptive purposes, any measured N values in these soils should be recorded directly. When used for design purposes, a correction factor is often applied to N values to account for overburden pressure, energy dissipation in the drill rods, and the effect of low permeability in fine sands and silty sands (Rodin et al, 1974; Skempton, 1986). If the descriptive terms are based on corrected N values, this should be noted.	No change
38	BS1377:1975	4a	GEO3:1377-4	General Aspects. The basic soil types and their sub-divisions are shown in Table 11. The soil name is based on particle size distribution and plasticity properties. These characteristics are used because they can be estimated with sufficient accuracy for descriptive purposes, and can be measured with reasonable precision if required. They give a general indication of the probable engineering characteristics of the soil at any particular moisture content. Table 11 provides guidance essentially for the rapid identification of the soil type by hand and eye in the field or in the laboratory. If necessary, the soil type can be confirmed by determining the particle size distribution and plasticity properties from laboratory tests (BSI, 1975).	General Aspects. The basic soil types and their sub-divisions are shown in Table 11. The soil name is based on particle size distribution and plasticity properties. These characteristics are used because they can be estimated with sufficient accuracy for descriptive purposes, and can be measured with reasonable precision if required. They give a general indication of the probable engineering characteristics of the soil at any particular moisture content. Table 11 provides guidance essentially for the rapid identification of the soil type by hand and eye in the field or in the laboratory. If necessary, the soil type can be confirmed by determining the particle size distribution and plasticity properties from laboratory tests (GEO, 2001).

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38	BS5930:1981	1 1	GEO3:5930-10 GEO3:2001-2	Table 11 is a slightly modified and rearranged form of the version given by BSI (1981). This method of naming and identifying basic soil types has been criticised in some detail by Child (1984) and Norbury et a1 (1984). They proposed an alternative method which is based more on the probable mass engineering behaviour of the soil (following the scheme used in CP 2001 (BSI, 1957)), rather than on strict grading limits as in the present scheme. However, the use of this alternative method depends more on the judgement of the individual who makes the description. The scheme outlined in Table 11 is considered to be easier for the non-specialist to apply and is therefore recommended.	No change.
40	BS1377:1975	4a	GEO3:1377-5	(3) Plasticity. As shown in Table 11, clay and silt, both alone and in mixtures with coarser material, may be classified for descriptive purposes into three groups, viz non-plastic or low plasticity (generally silts), intermediate plasticity (lean clays), and high plasticity (fat clays). For rapid description in the field or in the laboratory, these classes may be estimated on the basis of visual identification and hand tests, which are summarised in Table 11 and are discussed in more detail below. A more accurate description of plasticity can also be made on the basis of laboratory determination of the liquid limit (BSI, 1975) and the extended classification scale given in Table 17.	3) Plasticity. As shown in Table 11, clay and silt, both alone and in mixtures with coarser material, may be classified for descriptive purposes into three groups, viz non-plastic or low plasticity (generally silts), intermediate plasticity (lean clays), and high plasticity (fat clays). For rapid description in the field or in the laboratory, these classes may be estimated on the basis of visual identification and hand tests, which are summarised in Table 11 and are discussed in more detail below. A more accurate description of plasticity can also be made on the basis of laboratory determination of the liquid limit (GEO, 2001) and the extended classification scale given in Table 17.
40	BS1377:1975	4a	GEO3:1377-6	Notes on dry strength of silts and clays are included in Table 11. 'Toughness' of a fine soil refers to the character of a thread of moist soil rolled on the palm of the hand, moulded together, and rolled again until it has dried sufficiently to break at a diameter of about 3 mm, as in the plastic limit test (BSI, 1975). In this condition, inorganic clays of high plasticity are fairly stiff and tough. those of low plasticity are softer and more crumbly. Inorganic silts give a weak and often soft thread that breaks up, crumbles readily, and may be difficult to form.	Notes on dry strength of silts and clays are included in Table 11. 'Toughness' of a fine soil refers to the character of a thread of moist soil rolled on the palm of the hand, moulded together, and rolled again until it has dried sufficiently to break at a diameter of about 3 mm, as in the plastic limit test (GEO, 2001). In this condition, inorganic clays of high plasticity are fairly stiff and tough. those of low plasticity are softer and more crumbly. Inorganic silts give a weak and often soft thread that breaks up, crumbles readily, and may be difficult to form.
53	BS5930:1981	1	GEO3:5930-11	Other well-known classification schemes are the fracture spacing/point load strength classification charts used to assess rippability or ease of excavation (Franklin et al, 1971), and the empirical strength criteria developed by Hoek & Brown (1980) for a rock mass classification based on rock type, joint spacing and degree of joint weathering. Rock mass weathering zones (see Section 2.4.4.), when used in conjunction with other mass and material properties (e.g. discontinuities and strength), can also form the basis of a rock mass engineering classification. For example, Dearman et a1 (1978) used the BSI (1981) mass weathering scheme to make a six-fold classification of weathered granites and gneisses from the point of view of ease of excavation, tunnel support, foundation suitability, drilling rates and other factors. A useful summary of seven different rock mass classifications developed for various engineering works in Japan has been compiled by the Japan Society of Engineering Geology (1987).	No change.
54	BS5930:1981	1	GEO3:5930-12	A well-known example of a soil classification system is the British Soil Classification System (BSCS), which is described by BSI (1981). This system, slightly modified in accordance with Table 15, is summarised in Tables 19 and 20, and in Figure 8. The principal soil groups are the same as those shown in Table 11, but the subgroups are divided further on the basis of laboratory tests.	No change.

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55	BS1377:1975	4b	GEO3:1377-7	The grading and plasticity characteristics of saprolites and residual soils may be affected by pretreatment methods or variations in moisture content (e.g. whether tested in an air-dried or natural condition). BS 1377 (BSI, 1975) draws attention to the difficulty of testing "certain tropical soils" and "highly aggregated soils", with regard to the use of dispersing agents and pretreatment methods in grading tests, and air-dried or natural moisture condition samples in Atterberg limit tests. However, no explicit recommendations are given in BS 1377 for dealing with these problematical soils. Very little work has been done on this topic in Hong Kong. Useful background information and data for saprolites and residual soils in other parts of the world are given by Mitchell & Sitar (1982) and the Committee on Tropical Soils of the ISSMFE (1985). In addition to normal grading and plasticity tests, dispersion tests (ASTM, 1985b; Decker & Dunnigan, 1977; Flanagan & Holmgren, 1977; Sherard et al, 1976; Standards Association of Australia, 1980, 1984) may prove useful in the interpretation of the likely engineering behaviour of these soils. It is recommended that the use of any pretreatment methods or dispersants for grading and plasticity tests should always be recorded in full on laboratory test results sheets and in reports.	The grading and plasticity characteristics of saprolites and residual soils may be affected by pretreatment methods or variations in moisture content (e.g. whether tested in an air-dried or natural condition). Useful background information and data for saprolites and residual soils in other parts of the world are given by Mitchell & Sitar (1982) and the Committee on Tropical Soils of the ISSMFE (1985). In addition to normal grading and plasticity tests, dispersion tests (ASTM, 1985b; Decker & Dunnigan, 1977; Flanagan & Holmgren, 1977; Sherard et al, 1976; Standards Association of Australia, 1980, 1984) may prove useful in the interpretation of the likely engineering behaviour of these soils. It is recommended that the use of any pretreatment methods or dispersants for grading and plasticity tests should always be recorded in full on laboratory test results sheets and in reports (GEO, 2001).
60	CP2001:1957	1	GEO3:2001-1	BSI (1974b) Code of Practice for Foundations for Machinery (CP 2012:1974). Part I - Foundations for Reciprocating Machines. British Standards Institution, London, 36 p.	No change.
60	BS1377:1975	1	GEO3:1377-1	BSI (1975). Methods of Test for Soil for civil Engineering Purposes (BS1377:1975), British Standards Institution, London, 144 p.	No change.
60	BS5930:1981	1	GEO3:5930-1	BSI (1981). Code of Practice for Site Investigations (BS5930:1981). British Standards Institution, London, 148 p.	No change.
	Additional reference required.				BSI (2010) Code of practice for site investigations (BS 5930:1999+A2:2010). British Standards Institution, London, 206 p.
	Additional reference required.				GEO (2001) Model Specification for Soil Testing (Geospec 3). Geotechnical Engineering Office, Hong Kong, 340 p.
88	BS5930:1981	3a	GEO3:5930-13	Note : Classification in terms of plasticity is based on liquid limit, in accordance with BS 5930 (1981).	Note : Classification in terms of plasticity is based on liquid limit, in accordance with BS 5930 (2010).
175	BS1377:1975	4a	GEO3:1377-8	Grading. Particle size distribution, defined as the percentages of the various grain sizes present in a soil as determined by sieving and sedimentation (BSI. 1975).	Grading. Particle size distribution, defined as the percentages of the various grain sizes present in a soil as determined by sieving and sedimentation (GEO, 2001).
178	BS1377:1975	4a	GEO3:1377-9	Liquid limit (LL). Moisture content at which a soil passes from the plastic to the liquid state, as determined by the liquid limit test (BSI. 1975).	Liquid limit (LL). Moisture content at which a soil passes from the plastic to the liquid state, as determined by the liquid limit test (GEO, 2001).
180	BS1377:1975	4a	GEO3:1377-10	Plastic limit (PL). Moisture content at which a soil becomes too dry to be in a plastic condition, as determined by the plastic limit test (BSI, 1975).	Plastic limit (PL). Moisture content at which a soil becomes too dry to be in a plastic condition, as determined by the plastic limit test (GEO, 2001).