

**Geoguide 1 – Guide to Retaining Wall Design****Second Edition****AMENDMENT NO.: GG1/01/2017****BACKGROUND**

This amendment sheet incorporates the recommendations given in the following GEO Technical Guidance Notes:

- (i) GEO Technical Guidance Note No. 10 (TGN 10) – Enhancement of Rock Slope Engineering Practice Based on Findings of Landslide Studies.
- (ii) GEO Technical Guidance Note No. 41 (TGN 41) – Amendments to British Standards References in Technical Guidance Documents for Migration to Eurocodes.

The amendments are given below.

**AMENDMENTS****SECTION 3**                      **CONSTRUCTION CONSIDERATIONS IN DESIGN**

- (a) Section 3.2.2                      **In paragraph 8, line 2, delete ‘Geospec 2 : Model Specification for Reinforced Fill Structures (GCO, 1989a)’ and substitute ‘Geoguide 6 (GEO, 2002)’.**
- (b) Section 3.7                      **In paragraph 2, line 6, delete ‘Geospec 2 : Model Specification for Reinforced Fill Structures (GCO, 1989a)’ and substitute ‘Geoguide 6 (GEO, 2002)’.**

**SECTION 5**                      **GEOTECHNICAL PARAMETERS**

- (a) Section 5.5.3                      **In paragraph 3, line 4, delete ‘BS 1377: Part 8 (BSI, 1990a)’ and substitute ‘Geospec 3 (GEO, 2001)’.**  
  
**In paragraph 3, line 5, delete ‘Geospec 2 : Model Specification for Reinforced Fill Structures (GCO, 1989a)’ and substitute ‘Geoguide 6 (GEO, 2002)’.**
- (b) Section 5.8.2                      **Add the followings after paragraph 3:**

Site-specific laboratory tests may be carried out to characterise the operational joint shear strength where considered necessary, with consideration given to the roughness and persistence of the joint, influence of any weak infill, etc. (Hencher, 1981).

**SECTION 7**                      **EFFECTS OF SURCHARGE AND SEISMIC LOAD**

- (a) Section 7.2.1                      **Delete paragraph 1 and substitute the following new paragraph 1.**

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.

## **SECTION 9**                      **GRAVITY RETAINING WALLS**

- (a) Section 9.1                      **In paragraph 1, line 5, delete** ‘Geospec 2 : Model Specification for Reinforced Fill Structures (GCO, 1989a)’ **and substitute** ‘Geoguide 6 (GEO, 2002)’.
- (b) Section 9.3.3,  
(1) Concrete                      **In paragraph 1, line 2, delete** ‘BS 8110: Part 1 (BSI, 1985)’ **and substitute** ‘BS EN 206-1 (BSI, 2000b), BS8500-1:2006+A1:2012 (BSI, 2012a), and BS8500-2:2006+A1:2012 (BSI, 2012b)’.
- (c) Section 9.3.4                      **In paragraph 2, lines 1 and 2, delete** ‘BS 8007 (BSI, 1987a) provides guidance on details of expansion, contraction and other movement joints, as well as their spacings.’ **and substitute** ‘BS EN 1992-3:2006 (BSI, 2006) provides general guidance on movement joints.’.
- (d) Section 9.5.3,  
(1) Gabion  
Materials                      **In paragraph 5, line 1, delete** ‘BS 1052 (BSI, 1986b)’ **and substitute** ‘BS 1052 (BSI, 1980)’.
- In paragraph 5, line 4, delete** ‘BS 443 (BSI 1990b)’ **and substitute** ‘BS EN 10244-1 (BSI, 2009a) and BS EN 10244-2 (BSI, 2009b)’.
- In paragraph 5, line 5, delete** ‘BS 729 (BSI, 1986c)’ **and substitute** ‘BS EN ISO 1461 (BSI, 2009c)’.
- In paragraph 6, line 3, delete** ‘Geospec 2 : Model Specification for Reinforced Fill Structures (GCO, 1989a)’ **and substitute** ‘Geoguide 6 (GEO, 2002)’.
- In paragraph 6, line 6, delete** ‘BS 4102 (BSI, 1990c)’ **and substitute** ‘BS EN 10245-1 (BSI, 2011a) and BS EN 10245-2 (BSI, 2011b)’.

## **SECTION 11**                      **CANTILEVERED RETAINING WALLS**

- (a) Section 11.3.4, (2)  
Large Diameter  
Machine Bored Piles                      **In paragraph 2, lines 2, and 3, delete** ‘(Hong Kong Government, 1992)’ **and substitute** ‘(HKSARG, 2006)’.

## **SECTION 12**                      **SUPERVISION AND MONITORING**

- (a) Section 12.1                      **In paragraph 3, line 6, delete** ‘British Standards in the BS 5750 series (BSI, 1987b)’ **and substitute** ‘BS EN ISO 9000 family of standards (BSI, 2005, 2009d, 2009e, 2011c)’.

## **TABLES**

- (a) Table 2                      **In Note (5), delete** ‘Geospec 2 (GCO, 1989a)’ **and substitute** ‘Geoguide 6 (GEO, 2002)’.
- (b) Table 3                      **In Note (3), delete** ‘Geospec 2 (GCO, 1989a)’ **and substitute** ‘Geoguide 6 (GEO, 2002)’.

(c) Table 4 **In Note (4), delete ‘Geospec 2 (GCO, 1989a)’ and substitute ‘Geoguide 6 (GEO, 2002)’.**

**Add the following as Note (7).**

‘(7) BS Sieve Sizes are specified in BS 410-1:2000, ISO 3310-1:2000 (BSI, 2000a).’

(d) Table 16 **In row 1, under column ‘Source of Loading’, delete ‘(3)’ after ‘Highway structures’, delete ‘(a) HA Loading’ and ‘(b) HB Loading (45 Units)’.**

**In row 1, under column ‘Equivalent Uniformly-Distributed Load’, delete ‘10 kPa’ and ‘20 kPa’ and add ‘See Note (3)’.**

**In Note (3), add the sentence ‘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) for design of new and modification of existing retaining walls that are subject to traffic loadings, but not for stability assessment of existing retaining walls.’ at the start of this footnote.**

## **REFERENCES**

(a) **Add the following new references:**

BSI (1980). *Specification for Mild Steel Wire for General Engineering Purposes (BS 1052:1980)*. British Standards Institution, London, 10 p.

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 UK, 22 p.

BSI (2000b). *Concrete - Part 1: Specification, Performance, Production and Conformity (BS EN 206-1:2000)*. British Standards Institution, London, 74 p.

BSI (2005). *Quality Management Systems - Fundamentals and Vocabulary (BS EN ISO 9000:2005)*. British Standards Institution, London, 42 p.

BSI (2006). *Eurocode 2. Design of Concrete Structures - Liquid Retaining and Containing Structures (BS EN 1992-3:2006)*. British Standards Institution, London, 28 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.

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.

BSI (2009d). *Quality Management Systems - Requirements (BS EN ISO*

9001:2008). (*Incorporating corrigendum July 2009*). 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 (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.

BSI (2011c). *Guidelines for Auditing Management Systems (ISO 19011:2011) (BS EN ISO 19011:2011)*. British Standard Institution, London, 56 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, 66 p.

BSI (2012b). *Concrete - Complementary British Standard to BS EN 206-1 - Part 2: Specification for Constituent Materials and Concrete (BS 8500-2:2006+A1:2012)*. British Standards Institution, London, 52 p.

Evans, N.C. & Irfan, T.Y. (1991). *Landslide Studies 1991 : Blast-induced Rock Slide at Shau Kei Wan, November 1991*. Special Project Report No. SPR 6/91, Geotechnical Engineering Office, Hong Kong, 115 p.

GEO (2001). *Model Specification for Soil Testing (Geospec 3)*. Geotechnical Engineering Office, Hong Kong, 340 p.

GEO (2002). *Guide to Reinforced Fill Structure and Slope Design (Geoguide 6)*. Geotechnical Engineering Office, Hong Kong, 239 p.

GEO (2007). *Engineering Geological Practice in Hong Kong*. Geotechnical Engineering Office, Hong Kong, 278 p.

Hencher, S.R. (1981). *Report on Slope Failure at Yip Kan Street (11SW-D/C86) Aberdeen on 12th July 1981*. Geotechnical Control Office Report No. GCO 16/81, Geotechnical Control Office, Hong Kong, 26 p.

HKSARG (2006). *General Specification for Civil Engineering Works (2006 Edition) (Incorporating all Amendments)*. The Government of Hong Kong Special Administrative Region, Hong Kong, Volumes 1 and 2.

HyD (2013). *Structures Design Manual for Highways and Railways (2013 Edition)*. Highways Department, Hong Kong, 274 p.

(b)

**Delete the following new references:**

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 (1987a). *Code of Practice for Design of Concrete Structures for Retaining Aqueous Liquids (BS 8007: 1987)*. British Standards Institution, London, 32 p.

BSI (1987b). *Quality System (BS 5750: Parts 0 to 3: 1987)*. British Standards Institution, London, 64 p.

BSI (1986b). *Specification for Mild Steel Wire for General Engineering Purposes (BS 1052: 1986)*. British Standards Institution, London, 4 p.

BSI (1986c). *Specification for Hot Dip Galvanized Coatings on Iron and Steel Articles (BS 729: 1986)*. British Standards Institution, London, 16 p.

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.

BSI (1990b). *Specification for Testing Zinc Coatings on Steel Wire and for Quality Requirements (BS 443 : 1990)*. British Standards Institution, London, 12 p.

BSI (1990c). *Specification for Steel Wire and Wire Products for Fences (BS 4102: 1990)*. British Standards Institution, London, 20 p.

GCO (1989a). *Model Specification for Reinforced Fill Structures (Geospec 2)*. Geotechnical Control Office, Hong Kong, 140 p.

Hong Kong Government (1992). *General Specification for Civil Engineering Works. (1992 edition)*. Hong Kong Government Printer, 3 volumes, 743 p.