GENERAL SPECIFICATION FOR CIVIL ENGINEERING WORKS

2006 Edition

AMENDMENT NO. 2/2013

VOLUME 1

SECTION 1 GENERAL

APPENDIX 1.1 STANDARDS

(a) Section 1.1.1 **Delete the following standards from Section 1.1.1 and rearrange the items nos.:**

BS 1610
BS 1610:Part 1:1992
BS 3148:1990
BS 3900:Part C5:1992
BS 4027:1996
BS 4551 -1980
BS 5075:Part 1:1982
BS 5075: Part 3:1985

(b) Section 1.1.1 **Rename the following standards:**

"BS 6744:2001" **to** "BS 6744:2001+A2:2009"
"BS 4652:1991(1975)" **to** "BS 4652:1995 Incorporating Amendment No. 1"

(c) Section 1.1.7 **Rename the following standards:**

"APHA 4500-C1-B, 18th Edition (1992)" **to** "APHA 4500-C1-B, 21st Edition (2005)"
"APHA 4500-SO42-C, 18th Edition (1992)" **to** "APHA 4500-SO42-C, 21st Edition (2005)"

(d) Section 1.1.8 **Rename the following standards:**

"BS EN 196-1:1995" **to** "BS EN 196-1:2005

"BS EN 196-3:1995" **to** "BS EN 196-3:2005+A1:2008"
"BS EN 196-6:1992" **to** "BS EN 196-6:2010"
"BS EN 196-7:1992" **to** "BS EN 196-7:2007"
"BS EN 197-1:2000" **to** "BS EN 197-1:2011"
"BS EN 934: Part 2:2009" **to** "BS EN 934-2:2009+A1:2012"

(e) Section 1.1.8 **Rename the title of the standard** BS EN 196-3:2005+A1:2008 **as** "Method of testing of Cement – Part 3: Determination of setting times and soundness"

(f) Section 1.1.8 **Insert new standard** "BS EN 1015-2:1999 Methods of test for mortar for masonry. Bulk sampling of mortars and preparation of test mortars" **after** "BS EN 1011: Part 4:2000" **and rearrange the items nos.**

(g) Section 1.1.9 **Rename the standard** "BS EN ISO 1461:1999 (Replaces former BS 729)" **as** "BS EN ISO 1461:2009"

(h) Section 1.1.9 **Insert new standards as follows and rearrange the items nos.:**

"BS EN ISO 2808:2007 Paints and varnishes. Determination of film thickness" **after** "BS EN ISO 1461:2009"
"BS EN ISO 7500-1:2004 Metallic materials. Verification of static uniaxial testing machines. Tension/compression testing machines. Verification and calibration of the force-measuring system" **after** "BS EN ISO 4624:2003"

APPENDIX 1.3 REQUIREMENTS FOR CURING TANK

(i) Clause 1.3.2 **Amend the 1st para. to read as** "…..such as galvanized sheet steel to BS EN ISO 1461 for hot-dip ….."

SECTION 4 FENCING

(j) Clause 4.16 **Amend Sub-clause 4.16(1) to read as** "….. galvanized in accordance with BS EN ISO 1461."

SECTION 5 DRAINAGE WORKS

(k) Clause 5.16 **Amend Sub-clause 5.16(2) to read as** "….. medium class thickness and shall be galvanized in accordance with BS EN ISO 1461."

(l) Clause 5.17 **Amend Sub-clause 5.17(1) to read as** "….. hot-dip galvanised in

accordance with BS EN ISO 1461 or treated ….."

(m) Clause 5.27 **Amend Clause 5.27 to read as** "….. hot dip galvanized in accordance with BS EN ISO 1461."

SECTION 7 GEOTECHNICAL WORKS

(n) Clause 7.89 **Amend Sub-clause 7.89(5) to read as** "….. shall be galvanized to BS EN ISO 1461." **and Sub-clause 7.89(6) to read as** "….. comply with BS EN ISO 1461."

(o) Clause 7.90 **Amend Sub-clause 7.90(1) to read as** "….. Rock bolts shall be galvanized to BS EN ISO 1461. Rock bolts ….." **and Sub-clause 7.90(3) to read as** "….. bearing plates shall be galvanized to BS EN ISO 1461. Rock bolts ….."

(p) Clause 7.92 **Amend Clause 7.92 to read as** "….. with CS2 and shall be galvanized to BS EN ISO 1461. Rock dowels ….."

(q) Clause 7.94 **Amend Sub-clause 7.94(1) to read as** "….. soil nails shall be galvanized to BS EN ISO 1461."

SECTION 11 MISCELLANEOUS ROADWORKS

(r) Clause 11.40 **Amend Sub-clause 11.40(2) to read as** "Posts shall be hot dip galvanized in accordance with BS EN ISO 1461."

(s) Clause 11.41 **Amend Sub-clause 11.41(2) to read as** "Cleats and struts shall be hot dip galvanized in accordance with BS EN ISO 1461."

(t) Clause 11.42 **Amend Sub-clause 11.42(3) to read as** "Bolts and nuts shall be hot dip galvanized in accordance with BS EN ISO 1461."

(u) Clause 11.43 **Amend Sub-clause 11.43(3) to read as** "Plain washers shall be hot dip galvanized in accordance with BS EN ISO 1461."

SECTION 12 TRAFFIC SIGNS, ROAD MARKING AND ROAD STUDS

(v) Clause 12.10 **Amend Sub-clause 12.10(1) to read as** "….. Code 18B19 or shall be galvanized in accordance with BS EN ISO 1461."

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SECTION 13 WORK FOR ELECTRICAL AND MECHANICAL INSTALLATIONS

(w) Clause 13.04 **Amend Clause 13.04 to read as** "Galvanization in this Section shall be hot dip galvanization to BS EN ISO 1461."

(x) Clause 13.07 **Amend Sub-clause 13.07(3) to read as** "….. saddles for ducts shall be hot dip galvanized in accordance with BS EN ISO 1461."

SECTION 15 STEEL REINFORCEMENT

(y) Clause 15.04 **Amend Clause 15.04 to read as** "….. use in concrete shall be ribbed bar to BS 6744."

(z) Clause 15.06 **Amend Sub-clause 15.06(1) to read as** "….. reinforcement shall comply with BS EN ISO 1461 ….."
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(aa) Clause 15.14 **Amend Sub-clause 15.14(1)(b) to read as** "….. results of tests carried out by methods as recommended in BS EN ISO 1461 ….."

(bb) Clause 15.22 **Amend Sub-clause 15.22(3) to read as** "….. shall refer to Section 6.3 of BS EN ISO 1461 and also Annex C for advice on repair ….."

(cc) Clause 15.32 **Amend Sub-clause 15.32(4) to read as** "….. Hot dip galvanized coating : BS EN ISO 1461"

(dd) Clause 15.32 **Amend Sub-clause 15.32(5) to read as** "….. Thickness test shall be in accordance with Methods 7A, 7B and 7C of BS EN ISO 2808."

(ee) Clause 15.33 **Amend Sub-clause 15.33(1) to read as** "The thickness test shall be in accordance with Methods 7A, 7B and 7C of BS EN ISO 2808. For bars of 12mm diameter or below, only instruments which operate on magnetic flux principle, Methods 7B and 7C can be used. For bars of 16 mm diameter or above, instruments which operate on either magnetic flux principle or magnetic pull-off principle, Method 7A can be used ….."

SECTION 16 CONCRETE AND JOINTS IN CONCRETE

(ff) Clause 16.06 **Replace Clause 16.06 with the following:**

(1) Cement shall comply with the following, unless otherwise approved by the Engineer:

Portland cement (PC)	: BS EN 197-1 (Type CEM I) Strength Class of cement used in structural concrete to be 52.5N
Sulphate resisting Portland Cement (SRPC)	: BS EN 197-1 (Types CEM I-SR 0, CEM I-SR 3, or CEM I-SR 5) Strength Class of cement used in structural concrete to be 52.5N
Portland fly ash (PFAC) cement	: BS EN 197-1 (Types CEM II/A-V and CEM II/B-V) Strength Class of cement used in structural concrete to be 42.5N or higher

(2) The limiting values applicable to acceptance inspection of cement at delivery shall be those given in Table NB.1 of National Annex NB of BS EN 197-1.

(gg) Clause 16.09 **Amend Sub-clause 16.09(2) to read as** "….. according to the procedures given in BS EN 1008, it had no ….."

(hh) Clause 16.10 **Replace Sub-clause 16.10(1) with the following:**

(1) Admixtures shall comply with the following:

Pigments for Portland cement and Portland cement products	: BS 1014

Accelerating admixtures, retarding admixtures and water-reducing admixtures	: BS EN 934-2
Superplasticising admixtures	: BS EN 934-2.

(ii) Clause 16.51 **Amend Sub-clause 16.51(4) to read as** "….. at delivery shall be as stated in National Annex NB of BS EN 197-1. The ….."

(jj) Table 16.6 **Amend the Method of sampling for** "Admixture (powdered)"**,** "Admixture (liquid)" **and** "Curing compound" **as** "BS EN 934-2"

(kk) Table 16.7 **Amend the Method of testing for** "Admixture" **as** "BS EN 934-2"

(ll) Table 16.8 **Amend the Test method for** "Physical test" **as** "BS EN 196-3"

(mm) Table 16.8 **Amend the Test method for** "Chlorine content (as Cl^-)" **as** "APHA 4500-C1-B"

(nn) Table 16.8 **Amend the Test method for** "Sulphate content (as SO_4)" **as** "APHA 4500-SO42-C"

(oo) Table 16.8 **Amend the Test method for** "Alkali-soluble alkali content" **as** "BS EN 1008"

APPENDIX 16.1 DETERMINATION OF THE EFFICENCY INDEX OF CURING COMPOUNDS

(pp) Clause 16.1.2 **Amend Sub-clause 16.1.2(a) to read as** "….. testing admixtures and identified as 'CAA/BS EN 934-2 Reference Portland Cement' ….."

(qq) Clause 16.1.3 **Amend Sub-clause 16.1.3(e) to read as** "….. driven mixer complying with BS EN 1015-2 and having a nominal ….."

(rr) Clause 16.1.5 **Amend Sub-clause 16.1.5(a) to read as** "….. admixtures in accordance with BS EN 934-2, Appendix A."

APPENDIX 16.3 DETERMINATION OF THE RECOVERY VALUE AND REDUCTION IN MASS, AND THE EXTRUSION OF JOINT FILLER

(ss) Clause 16.3.2 **Amend Sub-clause 16.3.2(d) to read as** "…..machine complying with BS EN ISO 7500-1 with auxiliary platens ….."

SECTION 18 STEELWORK

(tt) Clause 18.62 **Amend Sub-clause 18.62(2) to read as** "….. hot-dip galvanizing in accordance with BS EN ISO 1461. The coating thickness shall comply with BS EN ISO 1461."

SECTION 19 HANDRAILING, LADDERS, STAIRS AND FLOORING

(uu) Clause 19.01 **Amend Clause 19.01 to read as** "….. Hot dip galvanization shall comply with BS EN ISO 1461."

(vv) Clause 19.14 **Amend Sub-clause 19.14(1) to read as** "….. hot dip galvanized in accordance with BS EN ISO 1461."

SECTION 21 MARINE WORKS

APPENDIX 21.2 SPECIFICATION FOR REINFORCED CONCRETE IN MARINE ENVIRONMENT (TO BE READ IN CONJUNCTION WITH SECTION 16 AND THE AMENDMENTS)

(ww) Clause 21.2.3 **Replace Sub-clause 21.2.3(1) with the following:**

(1) An admixture is defined as a constituent material of concrete other than cementitious materials, aggregates and water. The admixtures shall comply and be used in accordance with the supplier's recommendation. The admixtures shall comply with the following:-

Pigments for Portland cement and Portland cement products	:	BS 1014
Accelerating admixtures, retarding admixtures and water-reducing admixtures	:	BS EN 934-2
Superplasticising admixtures	:	BS EN 934-2

Where two or more admixtures are used in a concrete mix, the

compatibility shall be verified in writing by the supplier with the following: -

BS EN 934-2 Concrete Admixtures

SECTION 22 WATER SUPPLY PIPEWORKS

(xx) Clause 22.15 **Amend Sub-clause 22.15(1) to read as** "….. sulphate-resisting Portland cement complying with BS EN 197-1."

SECTION 24 BUILDING WORKS

(yy) Clause 24.50 **Amend Sub-clause 24.50(1) to read as** "….. mild steel, which shall comply with BS EN ISO 1461 or otherwise approved ….."

(zz) Clause 24.60 **Amend Sub-clause 24.60(3) to read as** "….. pipe sleeve shall comply with BS EN ISO 1461 or otherwise approved by the Engineer ….."

(aaa) Clause 24.94 **Amend Sub-clause 24.94(1)(viii) to read as** "….. less than 2%, in accordance with class 2 of testing machine range of BS EN ISO 7500-1;"

(bbb) Clause 24.104 **Amend Sub-clause 24.104(1) to read as** "….. corner beads, which shall comply with BS EN ISO 1461 or otherwise approved ….."

(ccc) Clause 24.104 **Amend Sub-clause 24.104(2) to read as** "….. staples and nails shall comply with BS EN ISO 1461 while the tying ….."

(ddd) Clause 24.160 **Amend Clause 24.160 to read as** "….. rods and shall be galvanized in accordance with BS EN ISO 1461 or otherwise approved ….."

(eee) Clause 24.162 **Amend Sub-clause 24.162(4) to read as** "The galvanized mild steel flats shall comply with BS EN ISO 1461 or otherwise approved by the Engineer."

(fff) Clause 24.182 **Amend Sub-clause 24.182(10) to read as** "….. galvanized in accordance with BS EN ISO 1461 or zinc sprayed ….."

(ggg) Clause 24.184 **Amend Sub-clause 24.184(14) to read as** "….. devices above shall comply with BS EN ISO 1461 or otherwise approved by the Engineer."

(hhh) Clause 24.194 **Amend Clause 24.194 to read as** "….. walls and concrete shall be galvanized mild steel flats complying with BS EN ISO 1461 or otherwise approved ….."

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14 June 2013