GENERAL SPECIFICATION FOR CIVIL ENGINEERING WORKS

2006 Edition

AMENDMENT NO. 1/2013

VOLUME 1

SECTION 1 GENERAL

(a) Clause 1.09 **Replace Sub-clause 1.09(2) with the following:**

(2) The Surveyor shall possess a Diploma/ Higher Certificate in Land Surveying or a Higher Diploma in Geomatics from a Hong Kong technical institute/ polytechnic or university; or an Associate Membership of the Hong Kong Institute of Surveyors in the Land Surveying Division; or equivalent qualification appropriate to the nature of the survey work required for the Contract, plus a minimum of 2 years of relevant experience in engineering surveying.

(b) Clause1.11 **Replace Sub-clause 1.11(3) with the following:**

(3) The Construction Engineer shall be a holder of a recognized degree in civil/structural/geotechnical engineering with 5 years of relevant experience. The Construction Supervisor shall either be a holder of a Higher Diploma/ Higher Certificate in civil/structural/geotechnical engineering with 3 years of relevant experience in piling works, or a holder of a Diploma/Certificate in the same subjects with 5 years of relevant experience in piling works, or an Associate Member of the Hong Kong Institution of Engineers in the civil/ structural/geotechnical discipline with 3 years of relevant experience in piling works.

(c) Clause 1.40 **Replace Sub-clause 1.40(1)(c) with the following:**

(c) Particulars of the laboratory proposed by the Contractor, including a declaration made by the laboratory that it is not a holding company, a subsidiary company, an associated company or a related party of the Contractor or any of his sub-contractors under the Contract, and that there is no actual, potential or perceived conflict of interest arising between its personal/ financial interests and its duties in carrying the testing, shall be submitted to the Engineer for approval, and

APPENDIX 1.1 STANDARDS

(d) Section 1.1.1 **Delete standard** "BS 4447:1973(1990)" **from Section 1.1.1 Item 118 and rearrange the item nos.**

(e) Section 1.1.8 **Insert new standard** "BS EN 445:2007 Grout for prestressing tendons. Testing methods" **as Item 5 and rearrange the items nos.**

(f) Section 1.1.8 **Insert new standard** "BS EN 13391:2004 Mechanical tests for post-tensioning systems" **as Item 51 and rearrange the items nos.**

VOLUME 2

SECTION 17 PRESTRESSING

(g) Clause 17.07 **Replace Sub-clause 17.07(2) with the following:**

(2) Prestressing anchorages shall be tested in accordance with BS EN 13391 and shall allow a minimum of 25 mm cover to cropped ends of prestressing tendons.

(h) Clause 17.09 **Replace the last sentence of Clause 17.09 with the following:**

All vents and vent connections shall have an internal diameter no less than 20 mm and shall be clearly identified by labeling.

(i) Clause 17.10 **Replace Sub-clauses 17.10(2), 1710(3) and 17.12(4) with the following:**

(2) Grout shall have a minimum crushing strength of 27 MPa at 7 days.

(3) The amount of bleeding of grout shall not exceed 0.3% of the initial volume of the grout after 3 hours kept at rest when tested in accordance with Clause 17.60 for the average of three results. The water shall be reabsorbed by the grout within 24 hours after mixing.

(4) The volume change of the grout at rest for 24 hours shall be within the range of -1% and +5% when tested in accordance with Clause 17.60.

(j) Clause 17.10 **Replace Sub-clause 17.10(7)(a) with the following:**

(a) the volume change of the grout shall be within the range as stated in Clause 17.10(4).

(k) Clause 17.10 **Replace Sub-clause 17.10(8) with the following:**

(8) The fluidity of the grout immediately after mixing and 30 minutes after mixing shall not be more than 25 seconds when tested in accordance with Clause 17.66. The fluidity of the grout shall not change by more than 20% for immediately after mixing to 30 mintues after mixing.

(l) Clause 17.16 **Replace Sub-clause 17.16(1) with the following**:

(1) One sample of grout shall be provided from the trial mix to determine the amount of bleeding and volume change of the grout. The method of sampling shall be as stated in Clause 17.59(2).

(m) Clause 17.16 **Add new Sub-clause 17.16(3) as follows**:

(3) One sample of grout shall be provided from the trial mix to determine the fluidity of the grout. The sample shall be protected from rain before the tests for fluidity are carried out.

(n) Clause 17.17 **Replace Sub-clause 17.17(1) with the following**:

(1) Each sample of grout taken as stated in Clause 17.16(1) shall be tested to determine the amount of bleeding and volume change. The method of testing shall be as stated in Clause 17.60.

(o) Clause 17.17 **Add new Sub-clause 17.17(3) as follows**:

(3) Each sample of grout taken as stated in Clause 17.16(3) shall be tested to determine the fluidity immediately after mixing and 30 minutes after mixing. The method of testing shall be as stated in Clause 17.66.

(p) Clause 17.18 **Replace Sub-clause 17.18(1) with the following**:

(1) If the result of any test for amount of bleeding, volume change, crushing strength or fluidity of trial mixes for grout does not comply with the specified requirements for the property, particulars of proposed changes to the materials, grout mix or methods of production shall be submitted to the Engineer. Further trial mixes shall be made until the result of every test complies with the specified requirements for the property.

(q) Clause 17.40 **Replace Sub-clause 17.40(6) with the following**:

(6) Measurement of extensions shall not commence until any slack in the prestressing tendon has been taken up. If the design permits, the draw-in of prestressing tendons at the non-jacking end shall also be measured. For each post-tensioning stage, the tensioning shall be applied in increments of load and the extensions shall be measured at each increment. The average measured total extension of the prestressing tendons in each post-tensioning stage shall be within 5% of the average calculated total extension of prestressing tendons of the corresponding post-tensioning stage. The measured total extension of individual prestressing tendons in each post-tensioning stage shall be within 10% of the calculated total extension of individual prestressing tendons of the corresponding post-tensioning stage.

(r) Heading **Amend the heading after Clause 17.58 to read as**

TESTING: GROUT - BLEEDING AND FIRE EXPANSION

(s) Clause 17.59 **Rename the title of Clause 17.59 to read as:**

Samples: bleeding and volume change of grout

(t) Clause 17.59 **Replace Sub-clauses 17.59(1) and 17.59(2) with the following**:

(1) For each grout mix one sample of grout shall be provided from each 25 batches of grout, or from the amount of grout produced in a day, whichever is the lesser, to determine the amount of bleeding and volume change of the grout.

(2) Samples shall be provided and tested immediately after the grout has been mixed. Samples shall be protected from rain before the tests for amount of bleeding and volume change are carried out.

(u) Clause 17.60 **Rename the title of Clause 17.60 to read as:**

Testing: bleeding and volume change of grout

(v) Clause 17.60 **Replace Sub-clause 17.60(1) with the following and rename as Clause 17.60**:

Each sample of grout taken as stated in Clause 17.59 shall be divided into three specimens. Each specimen shall be tested to determine the amount of bleeding and volume change of the grout by the wick-induced method in accordance with BS EN 445.

(w) Clause 17.60 **Delete Sub-clause 17.60(2).**

(x) Clause 17.61 **Rename the title of Clause 17.61 to read as:**

Non-compliance: bleeding and volume change of grout

(y) Clause 17.61 **Replace Sub-clause 17.61 with the following**:

If the result of any test for amount of bleeding or volume change of grout for prestressing systems does not comply with the specified requirements

for the property, particulars of proposed changes to the materials, grout mix or methods of production shall be submitted to the Engineer. Further trial mixes shall be made and further grouting trials shall be carried out unless otherwise permitted by the Engineer.

(z) Heading **Add new heading after Clause 17.64 as follows:**

TESTING: GROUT – FLUIDITY

(aa) Clause 17.65 **Add new Clause 17.65 "*Samples: fluidity of grout*" as follows:**

(1) For each grout mix one sample of grout shall be provided from each 25 batches of grout, or from the amount of grout produced in a day, whichever is the lesser, to determine the fluidity of the grout.

(2) Samples shall be provided and tested immediately after the grout has been mixed. Samples shall be protected from rain before the tests for fluidity are carried out.

(bb) Clause 17.66 **Add new Clause 17.66 "*Testing: fluidity of grout*" as follows:**

Each sample of grout taken as stated in Clause 17.65 shall be tested to determine the fluidity of the grout by the cone method in accordance with BS EN 445.

(cc) Clause 17.67 **Add new Clause 17.67 "*Non-compliance: fluidity of grout*" as follows:**

If the result of any test for fluidity of grout for prestressing systems does not comply with the specified requirements for the property, particulars of proposed changes to the materials, grout mix or methods of production shall be submitted to the Engineer. Further trial mixes shall be made and further grouting trials shall be carried out unless otherwise permitted by the Engineer.

Quality Management & Standards Unit
Civil Engineering and Development Department
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