

**General Specification for Civil Engineering Works****2006 Edition****AMENDMENT NO. 1/2015****VOLUME 1****SECTION 1****GENERAL****MATERIALS AND EQUIPMENT**

- (a) Clause 1.35 **Replace Sub-clauses 1.35(4) and (5) with the following:**
- (4) Useless crates and containers for materials or equipment provided by the Employer shall be disposed of by the Contractor as agreed by the Engineer.
- (5) Equipment and materials provided by the Employer which are surplus to the requirements of the Works shall be returned with crates and containers to the locations stated in the Contract.
- (b) Clause 1.37(a) **Replace the sub-clause with the following:**
- Bear the stamp of the registered certification trade mark of the BSI, known as the BSI Kitemark, or
- (c) Clause 1.39(1)(b) **Add “or PWL” after “Employer”.**
- (d) Clause 1.39(2) **Add “or test locations at where the Works” after “to select samples” in the 2<sup>nd</sup> sentence of the sub-clause.**
- (e) Clause 1.39(4) **Replace “the Contractor or material supplier” with “the Contractor, its sub-contractors or material suppliers”.**
- (f) Clause 1.39(5)(a) **Replace “do not change” with “are not affected” in the 1<sup>st</sup> sentence of the sub-clause.**
- (g) Clause 1.40 **Replace Sub-clauses 1.40(1) to (4) with the following:**
- (1) Unless otherwise stated in the Contract, insitu tests and laboratory tests shall be carried out by the Employer’s laboratories if the aforesaid tests can be undertaken by the Employer’s laboratories. Testing shall not be carried out in other laboratories unless permitted by the Engineer. If testing is permitted to be carried out by the laboratories engaged by the Contractor:
- (a) Independent laboratories with no affiliation as a legal entity to the Contractor or its sub-contractors shall be

used,

- (b) Laboratories accredited by HOKLAS for the relevant tests shall be used, if available, in which case results shall be issued on HOKLAS endorsed test reports, and
- (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 out the testing, shall be submitted to the Engineer for approval.

(2) Permitted tests carried out by the Contractor shall be adequately supervised by the Engineer. The result recording of insitu tests shall be countersigned by the Engineer.

(3) The Contractor may carry out quality control tests using their own laboratories or commercial laboratories for their own purposes. However, these tests should not be taken as the compliance tests done through the Employer's laboratories.

(4) The Contractor shall be entitled to attend testing associated with the Works that is carried out in the Employer's laboratories, and to inspect relevant records.

(5) Unless otherwise stated in the Contract, equipment, apparatus and materials for insitu tests and laboratory tests carried out by the Contractor shall be provided by the Contractor. The equipment and apparatus shall be maintained by the Contractor and shall be calibrated before testing starts and at regular intervals agreed by the Engineer. Calibration requirements and source of calibration applicable to all laboratory equipment shall follow those recommended in the HOKLAS Supplementary Criteria No. 2 "All Test Categories - Equipment Calibration and Verification". The equipment, apparatus and materials for insitu tests shall be removed by the Contractor as soon as practicable after testing is complete.

(6) Workability tests of fresh concrete shall be carried out by skilled personnel of the Contractor.

(h) Clause 1.42(1)

**Delete** "and laboratory compliance tests" **after** "insitu tests".

(i) Clause 1.42(2)

**Delete** "compliance" **after** "laboratory".

(j) Clause 1.42(4)

**Replace the sub-clause with the following:**

For tests carried out through the Employer's laboratories, a copy of test reports will be given to the Contractor by the Engineer on request.

**WORKMANSHIP AND TOLERANCES**

- (k) Clause 1.43 **Replace** “British Standard” **with** “standards”.
- (l) Clause 1.44(1) **Add** “or planes” **after** “the specified lines”.

**SITE ESTABLISHMENT**

- (m) Clause 1.52(1) **Add the following sentence after the 2<sup>nd</sup> sentence of the sub-clause:**

The motor vehicle shall achieve emission standard of Euro IV (for 4 or 5 seater car) or Euro III (for others).

**APPENDIX 1.1 - STANDARDS**

- (n) Appendix 1.1 **Add the following standards:**

|                        |   |
|------------------------|---|
| BS EN 1463-1:2009      | Road marking materials. Retroreflecting road studs. Initial performance requirements  |
| BS EN 1463-2:2000      | Road marking materials. Retroreflecting road studs. Road test performance specifications  |
| BS EN 13986:2004       | Wood-based panels for use in construction – Characteristics, evaluation of conformity and marking                                   |
| BS EN ISO 12567-1:2010 | Thermal performance of windows and doors — Determination of thermal transmittance by the hot-box method. Complete windows and doors |

**SECTION 10****CONCRETE CARRIAGEWAYS****GENERAL**

- (o) Clause 10.01 **Replace the clause with the following:**

(1) The works and materials specified in Clauses 10.02 to 10.06 shall comply with the sections stated, unless otherwise stated in this Section.

(2) All adhesives and sealants shall contain not more than 0.01% and 0.5% by wet weight of formaldehyde and total aromatic compounds (including benzene, toluene, xylenes, ethylbenzene, etc.) respectively.

## **SECTION 12 TRAFFIC SIGNS, ROAD MARKINGS AND ROAD STUDS**

### **PART 1: TRAFFIC SIGNS**

#### **GENERAL**

- (p) Clause 12.04(3) **Delete the publication year from the reference number of the standard stipulated in the sub-clause.**

#### **MATERIALS**

- (q) Clauses 12.07(1), 12.07(2), 12.09(1) & 12.09(2) **Delete the publication year from the reference numbers of the standards stipulated in the sub-clauses.**

#### **FABRICATION OF TRAFFIC SIGNS**

- (r) Clauses 12.13(5), 12.13(6), 12.15(4) & 12.15(5) **Delete the publication year from the reference numbers of the standards stipulated in the sub-clauses.**

#### **CONSTRUCTION AND ASSEMBLY OF TRAFFIC SIGNS**

- (s) Clauses 12.18(8) & 12.18(9) **Delete the publication year from the reference numbers of the standards stipulated in the sub-clauses.**

#### **TESTING: TRAFFIC SIGNS**

- (t) Clause 12.21 **Delete the publication year from the reference number of the standard stipulated in the clause**

### **PART 2: ROAD MARKINGS**

#### **MATERIALS**

- (u) Clauses 12.23, 12.25, 12.26, 12.27 & 12.28 **Delete the publication year from the reference numbers of the standards stipulated in the clauses.**

#### **SUBMISSIONS**

- (v) Clause 12.29(1) **Delete the publication year from the reference number of the standard stipulated in the sub-clause.**

#### **DELIVERY AND STORAGE OF MATERIALS**

- (w) Clause 12.30(d) **Delete the publication year from the reference number of the standard stipulated in the sub-clause.**

#### **LAYING ROAD MARKINGS**

- (x) Clauses 12.37 & 12.39 **Delete the publication year from the reference numbers of the standards stipulated in the clauses.**

### **PART 3: ROAD STUDS**

#### **MATERIALS**

(y) Clause 12.42

**Replace Sub-clauses 12.42(2) to (4) with the following:**

(2) Except for thermoplastic road studs, road studs shall be of a proprietary type approved by the Engineer.

(3) Reflecting road studs shall comply with BS EN 1463-1 and BS EN 1463-2.

(4) Permanent reflecting road studs to be used as lane line markers on dual carriageway trunk roads and primary distributor roads shall be of a type to which traffic cylinders of a type approved by the Engineer can be attached. The method of attachment shall be such that the traffic cylinder can be easily detached from the road stud.

(5) Thermoplastic road studs of white colour shall be applied for indicating the limits of a zebra crossing or a light signal crossing, unless otherwise agreed or instructed by the Engineer.

(6) Temporary reflecting road studs to be used as markers for temporary traffic routes shall be fluorescent yellow.

#### **INSTALLATION OF ROAD STUDS**

(z) Clause 12.45

**Add the title of the new clause to read as follows:**

*Laying of thermoplastic road studs*

**Add the new clause with the following:**

(1) Road surfaces shall be prepared in accordance with Clause 12.33 prior to laying of thermoplastic road studs. The hot-applied thermoplastic material for thermoplastic road studs shall be prepared and laid in accordance with Clauses 12.34(1) and (2).

(2) The thermoplastic road studs for indicating the limits of a pedestrian crossing shall be square in plan, the sides of a square stud shall not be less than 95 mm nor more than 110 mm in length.

(3) The thickness of thermoplastic road studs, not including surface applied solid glass beads, shall not be less than 2 mm nor more than 5 mm. The thickness shall be measured in accordance with BS 3262:Part 3, Appendix B.

(aa) Clause 12.46

**Add the title of the new clause to read as follows:***Test certificate***Add the new clause with the following:**

When required by the Engineer, the Contractor shall submit the test certificate prepared and signed by a local or overseas independent laboratory to the Engineer before commencing the Works in order to certify that the reflecting road studs to be used in the Contract comply with BS EN 1463-1 and BS EN 1463-2.

## **VOLUME 2**

### **SECTION 14**

### **FORMWORK AND FINISHES TO CONCRETE**

#### **GENERAL**

(ab) Clause 14.01

**Replace the clause with the following:**

(1) The works and materials specified in Clauses 14.02 and 14.03 shall comply with the sections stated, unless otherwise stated in this Section. **Hardwood is strictly prohibited for use in the falsework.**

(2) **All sealants shall contain not more than 0.01% and 0.5% by wet weight of formaldehyde and total aromatic compounds (including benzene, toluene, xylenes, ethylbenzene, etc.) respectively.**

#### **REMOVAL OF FALSEWORK AND FORMWORK**

(ac) Table 14.6

**Replace the title row of the table with the following:**

| Type of falsework or formwork | Class F1, F2, F3 and F4 finishes |                        | Class F5 finish |
|-------------------------------|----------------------------------|------------------------|-----------------|
|                               | Concrete without PFA/GGBS        | Concrete with PFA/GGBS | All concrete    |

**SECTION 16****CONCRETE AND JOINTS IN CONCRETE****PART 1: CONCRETE WORKS****TESTING: CONCRETE - COMPRESSIVE STRENGTH**

(ad) Clause 16.61(6)

**Replace the sub-clause with the following:**

(6) For designed mix concrete with a grade strength of 20 MPa or greater, the standard deviation or the coefficient of variation of test results shall be calculated after every test result for each designed mix using the last 40 test results judged by the same compliance criteria. The acceptance criteria shall depend on the calculated standard deviation as follows:

- (a) For 100 mm test cubes, if the standard deviation does not exceed 5.5 MPa, compliance criteria C2 shall apply to subsequent test results. If the standard deviation exceeds 5.5 MPa, compliance criteria C1 shall apply to subsequent test results.
- (b) For 150 mm test cubes, if the standard deviation does not exceed 5 MPa, compliance criteria C2 shall apply to subsequent test results. If the standard deviation exceeds 5 MPa, compliance criteria C1 shall apply to subsequent test results.
- (c) When the following situation occurs, no further concreting of permanent works should be allowed until an investigation of the materials, mix design, methods of production, sampling and testing has been carried out and measures, which in the opinion of the Engineer will result in restoring a steady and satisfactory production of the concrete mix, have been taken:
  - (i) For designed mix concrete with grade strength not exceeding 60 MPa, the standard deviation exceeds 8.5 MPa for 100 mm test cubes or 8 MPa for 150 mm test cubes; or
  - (ii) For designed mix concrete with grade strength exceeding 60 MPa, the coefficient of variation exceeds 14%.

**PART 2: JOINTS IN CONCRETE****GENERAL**

(ae) Clause 16.71

**Replace the clause with the following:**

(1) The works and materials specified in Clauses 16.72 and 16.73 shall comply with the sections stated, unless otherwise stated in this Section.

(2) All adhesives and sealants shall contain not more than 0.01% and 0.5% by wet weight of formaldehyde and total aromatic compounds (including benzene, toluene, xylenes, ethylbenzene, etc.) respectively.

## SECTION 24

## BUILDING WORKS

### PART 2: CARPENTRY AND JOINERY

#### MATERIALS

(af) Clause 24.25(8)

**Add the following new sub-clause after Sub-clause 24.25(7) :**

(8) All wood-based panels shall comply with the following requirements with supporting certificates:

- (a) The panels shall be of formaldehyde class E1 in accordance with BS EN 13986.
- (b) The level of hazardous materials or their compounds in the panels shall not exceed the following limits in mg/kg of dry panel:
  - Arsenic - 25
  - Cadmium - 50
  - Chromium - 25
  - Copper - 40
  - Lead - 90
  - Mercury - 25
  - Fluorine - 100
  - Chlorine - 1000
  - Pentachlorophenol (PCP) - 5
  - Benzo(a)pyrene – 0.5
- (c) The panels shall not contain flame retardant of polybrominated biphenyl (PBB), polybrominated diphenyl ether (PBDE) or short-chain chlorinated paraffin added as formulated components.

### PART 3: GLAZING

#### MATERIALS

(ag) Clause 24.42(1)

**Add the following sentences after the 1<sup>st</sup> sentence of the sub-clause:**

Glass used in windows shall not be formulated with Arsenic, Cadmium, Hexavalent chromium, Lead, Mercury, Organic tin, Phthalates or their compounds. Its thermal transmittance (U-value) shall not exceed 1.4 W/m<sup>2</sup>K when determined in accordance with BS EN ISO 12567-1. The Contractor shall submit supporting certificates showing that the glass used complies with the specification.



**PART 5: PLASTERWORK AND OTHER FINISHES****MATERIALS**

(ah) Clause 24.75

**Add the following sentence after the end of the clause:**

For ceramic tiles with antimony, cadmium, lead or their compounds used in the glazes, the content of antimony, cadmium and lead shall not exceed 0.25%, 0.1% and 0.5% respectively by weight of the glazes with supporting certificates.

**PART 8: METAL WINDOWS AND DOORS****MATERIALS**

(ai) Clause 24.181(1)

**Replace the sub-clause with the following:**

Materials for metal windows and doors shall be as stated in Clause 24.181(2) to (10).

(aj) Clause 24.181(10)

**Add the following new sub-clause after Sub-clause 24.181(9):**

(10) All components of windows (including frame, paint, surface treatment, etc.) shall not be formulated with Arsenic, Cadmium, Hexavalent chromium, Lead, Mercury, Organic tin, Phthalates or their compounds.

**Quality Management & Standards Unit  
Civil Engineering and Development Department  
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