

GENERAL SPECIFICATION FOR CIVIL ENGINEERING WORKS

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CORRIGENDUM No. 3/2001 (November)

VOLUME 1

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(a) Page 6

Replace the title of Clause 1.42 by the following:

Raw records of tests and test reports

(b) Page 7

Add the following after APPENDIX 1.1:

APPENDIX 1.2

REQUIREMENTS FOR STEEL CONTAINER ROOM

- 1.2.1 General
- 1.2.2 Equipment

APPENDIX 1.3

REQUIREMENTS FOR CURING TANK

- 1.3.1 General
- 1.3.2 Equipment
- 1.3.3 Maintenance

SECTION 1

GENERAL

(c) Clause 1.02(1)

Insert the following abbreviation:

BS EN : European Standard adopted as British Standard

(d) Clause 1.39

Replace sub-clauses (1), (2), (3) and (4) by the following and re-number the original sub-clauses (5) and (6) as sub-clauses (11) and (12) respectively:

(1) For the purpose of this Clause and Clauses 1.40, 1.42 and 1.49, "the Employer's laboratories" shall mean :

- (a) the laboratories of the Employer such as Public Works Laboratories (PWL), and
- (b) the laboratories currently appointed by the Employer.

(2) Samples for laboratory tests or test locations for insitu tests shall be randomly selected by the Engineer. In addition, the Engineer shall be free to select samples he suspects to be defective. The test locations for insitu tests so selected and, if applicable, the area/extent of Works covered by the tests, shall be traceable by means of either a referenced co-ordinates system or a location plan with defined test positions and levels.

(3) Samples shall be representative and of sufficient size to enable all specified tests to be made.

(4) Samples shall be taken on Site under close supervision of the Engineer or by the Employer's laboratories having no direct commercial relationship with the Contractor or material supplier, and shall be clearly, indelibly and individually marked for identification.

(5) Once selected and taken, samples stored on Site prior to delivery to the place of testing shall remain in the charge of the Engineer or the Employer's laboratories, who/which shall be given adequate facilities (including sample store room) to keep samples securely under lock and key inaccessible to unauthorised persons at all times.

(a) Samples shall be protected, handled and stored in such a manner that they are not damaged nor contaminated such that the properties of the sample do not change. The method of storage shall comply with the requirements of the relevant test methods.

(b) Where insitu concreting works are to be carried out, the Contractor shall, at the discretion of the Engineer, provide sufficient number of steel container rooms (or the like) and curing tanks for storage and curing test cubes to the satisfaction of the Engineer. The steel container room and curing tank being provided shall be in accordance with Clause 1.49(4).

(6) Samples shall be collected and delivered by the Contractor under close supervision of the Engineer or by the Employer's laboratories to the specified place of testing. During transportation from Site to the specified place of testing, all samples shall be securely locked in containers or suitably modified vehicle compartments unless otherwise approved by the Engineer, with keys kept by the Engineer or the Employer's laboratories.

(7) The transfer of samples from one place/person to another shall be clearly documented and checked. The person receiving the samples shall acknowledge the receipt and confirm the identification of the samples. A record, showing :

(a) when, where and by whom the samples are taken, and

(b) persons who have handled the samples prior to and during delivery to the place of testing,

shall be prepared and maintained by the Engineer (with assistance of the Employer's laboratories when necessary) so that the samples delivered from Site to the specified place of testing are traceable.

(8) For those tests where supervisory attendance is essential in providing guidance on Site or in obtaining test data, details of such supervisory site staff present shall be recorded in relevant data sheets and/or sample submission forms to enhance data integrity.

(9) For the purpose of stock control to preclude the swapping of materials under test and where applicable the unauthorised use of materials prior to receipt of test results, the Contractor shall:

- (a) clearly identify all batches of materials arrived on Site (the identification marks so designed shall contain information which can reveal the identity of the batch for each type of materials such as the Contract number, type of materials, batch number and other information as required by the Engineer);
- (b) keep stockpiles and stock items from which samples have been taken pending test results separated from other materials by means of labels denoting "Stock under Test" or similarly agreed by the Engineer;
- (c) establish and maintain a record system showing identification marks, testing status on all materials (under test or approved for use or rejected or re-test or omitted for testing, etc.), key dates (e.g. date of testing) and locations of storage; and
- (d) in connection with the above, submit a proposal of stock management system on Site peculiar to the Contract to prevent unauthorised or uncontrolled use of materials for approval by the Engineer at the commencement of the Contract and subsequent supervision by the Engineer.

(10) Samples on which non-destructive tests have been carried out shall be collected from the place of testing after testing and delivered to the Site or other location instructed by the Engineer.

(e) Clause 1.40

Replace sub-clauses (1), (2), and (3) by the following and delete sub-clause (4):

(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 Contractor :

- (a) independent laboratories with no affiliation as a legal entity to the Contractor and 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,
- (c) particulars of the laboratory proposed by the Contractor shall be submitted to the Engineer for approval, and
- (d) tests shall be adequately supervised by the Engineer.

(2) 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.

(3) 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". The equipment, apparatus and materials for insitu tests shall be removed by the Contractor as soon as practicable after testing is complete.

(f) Clause 1.42,
Marginal heading

Replace the marginal heading by the following:

Raw records of tests and test reports

(g) Clause 1.42

Replace sub-clauses (1), (2) and (3) by the following and add new sub-clause (4):

(1) Raw records of insitu tests and laboratory compliance tests carried out by the Contractor (excluding the laboratories engaged by the Contractor) shall be submitted to the Engineer immediately, or such other time stated in the Contract, after the tests with a copy of the whole set of records kept by the Contractor on the Site.

(2) For all insitu tests and laboratory compliance tests, a test report shall be submitted to the Engineer in sealed envelope within 7 days, or such other time stated in the Contract, after completion of each test. The report shall contain the following details:

- (a) material or part of the work tested,
- (b) location and area/extent of the batch from which the samples were taken or location and area/extent of the part of the work,
- (c) place of testing,
- (d) date and time of tests,
- (e) weather conditions in the case of insitu tests,
- (f) technical personnel supervising or carrying out the tests,
- (g) size and description of samples and specimens,
- (h) method of sampling,
- (i) properties tested,
- (j) method of testing,
- (k) readings and measurements taken during the tests,
- (l) test results, including any calculations and graphs, and
- (m) other details stated in the Contract.

(3) All test reports compiled by the laboratories (which refer to the Employer's laboratories and those engaged by the Contractor) shall be delivered directly to the Engineer in sealed envelope without routing through the Contractor.

(4) Copies of test records carried out through the Employer's laboratories will be given to the Contractor on request.

(h) Clause 1.49(3)

Replace the sub-clause by the following:

(3) Equipment provided for the use of the Engineer/persons authorised by the Engineer shall be maintained in a clean and serviceable condition and all consumables shall be replenished when required. Measuring and testing equipment shall be calibrated before it is used and at regular intervals agreed by the Engineer. Calibration requirements as well as source of calibration applicable to all laboratory equipment shall follow those recommended in the HOKLAS Supplementary Criteria No. 2 "All Test Categories - Equipment Calibration". Survey equipment shall be maintained by the service agent and shall be calibrated by an approved laboratory at regular intervals agreed by the Engineer. Equivalent replacements shall be provided for equipment which is out of service.

(i) Clause 1.49(4)

Replace the sub-clause by the following and re-number the original sub-clause (4) as sub-clause (5):

(4) Where insitu concreting works are to be carried out, steel container rooms and curing tanks shall be provided on the Site, at the discretion of the Engineer, according to the requirements stated in Appendix 1.2 and Appendix 1.3 respectively. In this connection, concreting works shall not commence until curing tanks and container rooms (or the like) are completed and accepted by the Engineer or unless otherwise approved by the Engineer. Where directed by the Engineer, Employer's laboratories shall be given sole access and use of the steel container rooms and curing tanks together with all the equipment provided under the Contract.

(j) Appendix 1.1,
Clause 1.1.1

Replace:

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| BS 4871 : Part 1 : 1982 | Specification for approval testing of welders working to approved welding procedures - Fusion welding of steel |
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by:-

| | |
|---------------------------|--|
| BS EN 287 : Part 1 : 1992 | Approval testing of welders for fusion welding Steels |
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(k) New Appendix 1.2

Add the following new appendix after Appendix 1.1:

APPENDIX 1.2

REQUIREMENTS FOR STEEL CONTAINER ROOM

| | | |
|----------------|-------|---|
| General | 1.2.1 | As a reference, a standard steel container room of nominal size 6000 mm x 2500 mm x 2350 mm may accommodate up to a maximum of five standard curing tanks (see Appendix 1.3 – Clause 1.3.1(2)). |
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| | | |
|------------------|-------|--|
| Equipment | 1.2.2 | Each steel container room shall be equipped with the following: <ul style="list-style-type: none">(a) A security door-lock.(b) Windows with security metal grilles.(c) Fluorescent lighting.(d) Air-conditioner with heating and cooling facilities that is capable to keep the room temperature at $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$.(e) Adequate number of power plugs for operating the curing tanks.(f) Water supply.(g) Drainage outlets connecting to the drainage valves and overflow system of the curing tanks. |
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(l) New Appendix 1.3

Add the following new appendix after new Appendix 1.2:

APPENDIX 1.3

REQUIREMENTS FOR CURING TANK

| | | |
|----------------|-------|--|
| General | 1.3.1 | <ul style="list-style-type: none">(1) The requirements for a curing tank shall be as stated in Appendix A of CS1.(2) As a reference, a standard curing tank of nominal size 1650 mm x 860 mm x 510 mm has a capacity to accommodate about sixty-four number of 150 mm concrete cubes.(3) For curing tanks of different non-standard sizes, the number of curing tanks required may be estimated on the basis of the capacity for a standard curing tank of equivalent volume at the discretion of the Engineer, who may require appropriate adjustments in the pump and heater capacities.(4) Each curing tank shall be accessible for operation and maintenance.(5) At least one stand-by curing tank shall be provided at all times. |
|----------------|-------|--|

- Equipment** 1.3.2 Each curing tank shall be constructed of corrosion-resistant material of adequate strength such as galvanized sheet steel to BS 729 for hot-dip galvanized coating or BS 2569 for flame sprayed metal coating, fully welded on all seams and equipped with the following accessories:
- (a) A lockable insulated lid (or cover) properly numbered.
 - (b) A recirculating water pump and a stand-by pump, both of a waterproof type and with capacity not less than 1000 litres per hour, earthed and fitted internally at one end of the tank drawing water through a pipe from the bottom to the diagonally opposite top of the tank at least 25 mm above the water level to stimulate efficient mixing of the water by free falling.
 - (c) A thermostatically controlled electric immersion heater and a stand-by heater, both with power of not less than 3 kW and connected with a temperature sensor for continual controlling of the water temperature at $27^{\circ}\text{C} \pm 3^{\circ}\text{C}$.
 - (d) A set of three removable lower racks.
 - (e) A drainage valve and an overflow system.
 - (f) A steel stand supporting the water tank.
 - (g) Minimum/maximum thermometers for measuring water temperature.
 - (h) A switch panel.
- Maintenance** 1.3.3 Each curing tank shall be cleaned at regular intervals and the water in each tank be changed at least once a month in accordance with CS1 or as directed by the Engineer. In order to ensure adequate circulation of water and to facilitate the removal of test cubes from the curing tank, a gap of at least 15 mm shall be provided between the test cubes and the sides of the tank.

(m) Clause 6.07

Re-number the sub-clauses (9) and (10) promulgated under Corrigendum No. 2/2001 (September) as sub-clauses (10) and (11) respectively.

VOLUME 3

SECTION 18

- (n) Clause 18.21(1)
- (o) Clause 18.44(1),
2nd sentence

STEELWORK

Replace BS 4871: Part 1 **by** BS EN 287: Part 1

Replace the 2nd sentence by the following:

A welder shall cease to carry out welding if any of the circumstances stated in BS 4570, Clause 21.1 or BS 4872: Part 1, Clause 6 as appropriate occurs, or the requirements stated in BS EN 287: Part 1, Clause 10.1 are not satisfied.

**Standards Unit
Civil Engineering Department
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