SERIES NG 2600
MISCELLANEOUS

Contents

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NG 2601 Bedding Mortar

General

1 Great importance is attached to the material having flow characteristics sufficient for it to occupy all the spaces between base plates and the surrounding sub-strata completely including around all holding down bolts. The Specification for Highway Works does not cover non-flowing mortars or dry pack mortars.

Where a higher strength is required, this should be specified in Appendix 26/2. Materials with higher strengths may be more temperature sensitive and variable.

Mortar test cubes required in connection with early loading should be cured under conditions which simulate as far as possible those of the mortar in the Works.

Materials

2 (i) The minimum thickness of bedding mortar should be 10 mm and the maximum thickness without reinforcement should be 30 mm. This will allow sufficient space to enable filling yet reduce creep and shrinkage effects. The nominal thickness, with tolerances, should be shown on the Drawings.

(ii) A purpose-made portable insulated store, equipped with thermostatically controlled heaters would be suitable for complying with sub-Clause 2601.2(ii)(a). It may be convenient to include provision for storage of the mixing water at 20°C.

Site Mixing, Placing and Curing

3 (i) It is common practice to add the dry material to the water in the mixer. If the material does not flow correctly the addition of extra water or dry mortar to the sample is not permissible. In order to control the amount of water accurately it is good practice to use a proprietary graduated container. A bucket with a mark is not suitable.

(ii) Where permanent shims are used underneath base plates to align or support parapet posts etc. they should take the form of either central packers or slotted washers placed around the shanks of the holding down bolts. Packers and washers should be made of materials which will not corrode. Adequate bedding cover should also be provided to the packers and washers to ensure that they are fully protected from the weather and any road and traffic contaminants. Packers and washers should be compatible with the materials used in the base plates or bolts.

(iii) Addition of mortar may be required to form a finished plinth. Voids may occur under the base plate if this operation is carried out incorrectly.

(iv) The quantity of mortar in the plinth extending beyond the base plate should be kept to a minimum to reduce cracking. Forming of large plinths to support two or more base plates is not recommended.

Approval Tests

4 (i) It is important that the various temperatures required in the flow tests are accurately maintained within the tolerances specified. The testing laboratory appointed should be able to demonstrate that it has the facilities for accurate cold testing.

(ii) Where different methods of placing the mortar are proposed, eg. pumping, or where the geometry of the base plate is significantly different from that shown on HCD Drawing No. K2, then the glass plate test, specified in sub-Clause 2601.4(iii), should be modified to take account of the differences.

Batch Acceptance Tests

5 The tests on Site should be conducted by a competent person. Proof of ability to carry out the flow cone test method consistently may be checked by trials using water.

NG 2602 Concrete for Ancillary Purposes

1 (11/04) Concrete complying with Clause 2602 will normally be suitable for the purposes described in Table 26/1 and need not be shown on the Drawings for these purposes. Standardised prescribed concretes from

BS 8500 may also be suitable for other purposes and should be called up on Drawings where necessary. Sub-Clause 1 of Clause 2602 makes it unnecessary to do more than show "ST4 concrete" (for example) on the Drawings.

2 (11/04) Where additional requirements are necessary, for example the use of sulfate-resisting cement in ground containing sulfates (see sub-Clause 1704.5), or resistance to alkali-silica reaction, these requirements should be specified in Appendix 26/1. Air entrainment will not normally be necessary but if it is required, this should also be specified in Appendix 26/1. Alkali-silica reaction will not normally be a risk because cement contents are comparatively low but in some areas where aggregates are known to be highly reactive, it may be necessary to state in Appendix 26/1 that ancillary concrete is to comply with sub-Clause 1704.5 and 1704.6 for ST4 and ST5 concretes.

3 (05/04) Foundations for traffic sign supports, lighting columns, CCTV masts, cantilever masts and safety barriers, terminal, transition post, crash cushions and anchors including foundations requiring technical approval, should where necessary be structural concrete complying with the Series 1700 and should be shown on the applicable Drawings accordingly.

NG 2606 Cored Thermoplastic Node Markers

Node Markers

1 (11/03) Node markers should be installed at all CHART nodes, link and section ends. The position of the CHART nodes should be in accordance with Trunk Road Maintenance Manual Volume 1 in England and the Welsh Assembly Government (NAW) Trunk Road Management and Maintenance Notice 2/86 in Wales. For works in Scotland reference should be made to the Scottish Executive (SE) and in Northern Ireland reference should be made to the documents designated by the Overseeing Organisation. Where node markers have previously been installed the re-established markers shall be installed in accordance with the existing site record and this should be provided in Appendix 26/3. On new roads or altered roads where the CHART referencing is to change the CHART network and the location of new CHART nodes, link and section ends must be agreed between the designer, the Overseeing Organisation and its Network Maintainers and the Overseeing Organisation's Maintenance Agent. The location of the node markers should then be indicated in Appendix 26/3. The location must be given both longitudinally and transversely.

Site Records

2 (11/03) On completion of the installation of a node marker a record form should be prepared in accordance with Trunk Road Maintenance Manual Volume 1. This form must contain sufficient information to enable the node markers to be restored after resurfacing to the tolerances in sub-Clause 2606.2 (i).

3 The site records for the completed node markers should only use references to permanent features. Where features to which existing node markers are referenced are to be removed during the Contract other suitable references for the re-establishment of the node markers must be provided in Appendix 26/3.

NG 2608 (03/20) Foamed Concrete for Structures

1 (03/20) Contract specific Appendix 26/8 should be used to detail the purpose of the proposed use of foamed concrete. Foamed concrete specified in this Clause may be used for the following structures applications:

(i) void/bulk filling for redundant unmarked sewers/pipes, subways;

(ii) backfill to structures (e.g retaining walls and bridge abutments) for lateral and vertical load reduction;

(iii) arch backing/fill to masonry arch bridges for load reduction;

(iv) foundation and blinding for construction in poor ground;

(v) slope stability in embankment construction; and,

(vi) grouting for tunneling works.

2 (03/20) Where additional requirements are necessary these should be specified in contract specific Appendix 26/8. Additional requirements may for example include:

(i) the use of sulfate-resisting cement in ground containing sulfates (see sub-Clause 1704.5);

(ii) resistance to alkali-silica reaction;

(iii) ventilation in restricted or confined spaces to prevent build-up of explosive gases.

3 (03/20) Foamed concrete should be prepared in accordance with a mix formulation proven, by prior development testing, to yield a compressive strength within the required range. The wet density corresponding to the specified strength should be determined in the development testing.

4 (03/20) Where they are critical to the application, the following should be given in contract specific Appendix 26/8, cement content, water/cement ratio, foamed concrete strength and density giving the minimum and maximum values as necessary.

5 (03/20) The requirements for testing of fresh or hardened foamed concrete should be described in contract specific Appendix 26/8 and scheduled in Appendix 1/5 and/or 1/6.

6 (03/20) Foaming agents to ASTM C869/ C869M-11(2016) and ASTM C796/C796M have been found to be suitable for use and performed well.

7 (03/20) On any site presenting special drainage or groundwater problems, the foamed concrete should be formulated to have a permeability not less than that of the surrounding ground.

8 (03/20) Where standing water is present in the ground the density of the foamed concrete should be specified to be a minimum of 1050 kg/m^3 to avoid the risk of floating and enable displacement of ground water.

9 (03/20) Foamed concrete flows very easily and may infiltrate, and block any damaged drainage or ducting existing within, or immediately adjacent to, excavation. Unguarded exposed pour can represent a risk of drowning whilst foamed concrete remains fluid.

NG SAMPLE APPENDIX 26/1: ANCILLARY CONCRETE

(05/04) [*Note to compiler: Special requirements for Ancillary Concrete, eg. sulfate-resisting cement, etc. should be listed here. Also to distinguish different concrete designs, references should be listed here but differentiated from those for structural concrete in Appendix 17/1]*

NG SAMPLE APPENDIX 26/2: BEDDING MORTAR

[Note to compiler: Include here:]

1. Compressive strength requirements. *[Where different from 2601.1(i)]*
2. Locations at which permanent metal shims are acceptable *[2601.3(v)]*.
3. Early loading requirements *[For bridge bearings, cross-reference should be made to Appendix 21/1]*.

NG SAMPLE APPENDIX 26/3: CORED THERMOPLASTIC NODE MARKERS

[Note to compiler: Include here:]

1. Locations of node markers *[2606.1]*
2. Copies of existing site records
3. References for the re-establishment of existing node markers

(03/20) NG SAMPLE CONTRACT SPECIFIC APPENDICES 26/4 TO 26/7 NOT USED

(03/20) NG SAMPLE CONTRACT SPECIFIC APPENDIX 26/8: FOAMED CONCRETE FOR STRUCTURES

[Note to compiler: Include here where relevant:]

1 (03/20) The details of the proposed use of the foamed concrete *[2608.1 and NG 2608.1]*.

2 (03/20) Reference to relevant drawings and other technical data prepared by the designer *[2608.1 and NG 2608.2]*.

3 (03/20) Any restrictions in the constituent materials for foamed concrete e.g. sulfate resisting cement should be listed here *[NG 2608.2]*.

4 (03/20) The characteristic properties of the foamed concrete such as water/cement ratio, cement content, density, strength giving minimum and maximum values as required by the designer *[NG 2608.4]*.

5 (03/20) The frequency of tests for fresh and hardened foamed concrete for structures as required by the designer *[2608.3 and NG 2608.5]*.