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Reference	NR/L3/CIV/140/52N
Issue	2
Publication date	4 th September 2010
Compliance date	4 th December 2010

MODEL CLAUSES FOR CIVIL ENGINEERING WORKS

SECTION 52

EARTHWORKS

Fill materials **52/1** In addition to the laboratory compaction tests, full-scale field tests shall be carried out in which a test section shall be compacted with the Contractor's Equipment proposed to be employed for the work.

Note to specifier

Add detail of field trial requirements.

(52.002)

Placing, compacting and in situ testing of fill material **52/2** Embankments constructed of Class 3 materials shall be left for a period of months either 600 mm below formation level or above formation level where a protective layer has been placed. (52.003)

Note to specifier

Insert required period. Typically a period of 3 months is required to allow the embankment materials to settle so that in-service movements will not have a detrimental effect on the performance of the embankment.

Requirements for finished subgrade and capping **52/3** Plate bearing tests, in accordance with BS 1377-9, shall be carried out on the finished subgrade once every (250) m². The maximum load shall be such that the average pressure applied to the plate is in excess of (150) kN/m². The elastic modulus shall be determined as the secant modulus for a pressure of (75) kN/m² applied during the second loading cycle. The finished subgrade shall be compacted such that the undrained modulus shall be a minimum of (80) MN/m² and a maximum of (130) MN/m². (52.005)

Note to specifier

Add particular requirements to the above Clause. Typical values specified are given in brackets.

Areas of low subgrade strength shall be dealt with as follows:

Where the area is less than 40 metres in length, it may be treated as a local soft spot and the capping thickness shall be increased to 600 mm.

Where the area exceeds 40 metres in length, the construction shall include an increased capping thickness. (52.005)

Reference	NR/L3/CIV/140/52N
Issue	2
Publication date	4 th September 2010
Compliance date	4 th December 2010

Note to specifier

Consideration should also be given to the following:

- (i) *drawing to show locations where capping is required and its thickness,*
- (ii) *allowed surface level tolerance,*
- (iii) *permitted Classes of capping materials,*
- (iv) *the procedure to be adopted for construction of capping, or which alternatives are permitted,*
- (v) *requirements for a demonstration area - including its location and protection. In addition, requirements for the removal and reinstatement of demonstration area where it does not form part of the permanent works,*
- (vi) *drawing to give shaping requirements for sub-formation,*
- (vii) *whether quicklime, hydrated lime or another form of lime or cement stabilisation is required,*
- (viii) *locations where treatment of formation is required,*
- (ix) *details of any additional tests for rate of spread of lime,*
- (x) *intervals for the preparation and availability of chemical analysis reports,*
- (xi) *preparation of the formation on existing sub-bases.*

Filling to mobilise passive resistance to structures

52/4

Backfilling to the front of bases of retaining walls, gravity and strutted abutments etc., shall be completed using dry lean concrete or concrete of minimum grade ST2 to BS 8500-2 in accordance with Section 85 (Concrete for ancillary purposes) to mobilise passive resistance to the structure.

The extent and timing of any subsequent loading arising from ensuing filling which might affect the performance of the dry lean concrete, shall be governed by the curing time of the concrete and shall be subject to the agreement of the Employer's Representative.

Note to specifier

Identify on the Contract Drawings the excavations to be backfilled with dry lean concrete or suitable alternative such as grade ST2 concrete.

(52.007)

Permeable backing to earth retaining structures

52/5

Permeable backing to earth retaining structures shall comply with the following requirements.

Reference	NR/L3/CIV/140/52N
Issue	2
Publication date	4 th September 2010
Compliance date	4 th December 2010

Note to specifier

Insert or delete as appropriate.

Clause 513 in the Specification for Highway Works lists various options. If the specifier wishes to restrict or specify particular options, the appropriate detail should be added in this Clause.
(51.010)

Soil nails **52/6** Corrosion allowances, creep behaviour and other time dependent aspects of the soil nails shall be designed for the design life of years.
(52.011)

Note to specifier

Insert required design life (see recommendations given in NR/L3/CIV/071).

Soil nails **52/7** The soil nail facing shall comprise.....
(52.011)

Note to specifier

Insert details and cross refer to Contract Drawings.

Soil nails **52/8** The locations of soil nails to be tested are shown on the Contract Drawings.
(52.011)

Note to specifier

Add any particular requirements to the above Clause.

Crib walling **52/9** The location and details of crib walling are shown on Drawing No...

The design life of the timber crib elements shall be years.

Note to specifier

The following should be included:

- (1) References to Contract Drawings should show locations and outlines.*
- (2) The value of the active earth pressure coefficient can be derived from Coulomb's theory to allow for wall inclination.*
- (3) Where the design retained height exceeds 1.5 metres, include the requirement for the design to be subject to Technical Approval in accordance with Network Rail standard RT/CE/S/003.*

(52.012)

Gabions and protective mattresses **52/10** Gabions shall be designed and constructed for the design life of years.

Note to specifier

Insert the required design life. A period of 60 years is commonly specified.