

**MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS  
VOLUME 1 SPECIFICATION FOR HIGHWAY WORKS**

---

---

**SERIES 300  
FENCING**

---

**Contents**

Clause	Title	Page
301	(05/01) General	2
302	Requirements for Temporary and Permanent Fences	2
303	Temporary Fencing	2
304	(05/01) Timber Quality	2
305	(05/01) Fittings	3
306	(05/01) Permanent Fencing	3
307	Permanent Fencing for Accommodation Works	4
308	Gates and Stiles	4
309	Removing and Re-erecting Existing Fences and Gates	5
310	Not used	5
311	(05/01) Preservation of Timber	5
312	Painting of Timber Fences, Gates, Stiles and Posts	6

# FENCING

## 301 (05/01) General

1 Temporary and permanent fences shall comply with this Series and the quality management schemes detailed in Appendix A.

2 (05/08) Organisations involved in fencing works for highway schemes shall comply with this Series and the associated quality management schemes detailed in Appendix A.

## 302 Requirements for Temporary and Permanent Fences

1 (05/01) As soon as the Contractor is placed in possession of any part of the Site he shall immediately erect fencing on the boundaries of the land as shown on the Drawings. In places where permanent fencing cannot be erected immediately or where none is required, the Contractor shall erect, and when and where necessary, re-erect and maintain, temporary fencing and subsequently take down and remove as necessary. The type of temporary fencing shall be chosen by the Contractor, unless otherwise described in Appendix 3/1, and may be selected from the four standard types for highway works described in Clause 303, taking into account the usage of the adjoining land. Unless otherwise described in Appendix 3/1, the Contractor shall not use barbed wire in areas accessible to the general public. Access shall be made in temporary fencing as necessary for the use of the occupiers of adjacent lands.

2 Temporary fencing shall remain in position either until it is replaced by permanent fencing or until its removal on completion of the Works, unless otherwise described in Appendix 3/1.

3 When concrete for post footings is required, it shall comply with Clause 2602.

## 303 Temporary Fencing

1 (05/01) Temporary fencing shall be appropriate to the usage of the adjoining land and, unless otherwise described in Appendix 3/1, may be selected from the following types:

- (i) Post and wire fencing type SW 120 complying with BS 1722 : Part 2 in accordance with HCD Drawing Number H1 with at least two of the wires being barbed.

- (ii) Post and wire fencing as sub-Clause (i) above but with no barbed wires.
- (iii) Cleft chestnut pale fencing type CW 120 complying with BS 1722 : Part 4 in accordance with HCD Drawing Number H2.
- (iv) Wooden post and wire fence type C8/80/30 complying with BS 1722 : Part 2 in accordance with HCD Drawing Number H2.

2 If temporary fencing is removed temporarily for the execution of any part of the Works it shall be reinstated as soon as possible and in the meantime the gap in the fencing shall be patrolled so that no unauthorised entry on to adjoining land takes place and no stock escapes from the adjoining land.

3 Unless otherwise described in Appendix 3/1, timber for temporary fencing need not have preservation treatment.

## 304 (05/01) Timber Quality

1 (11/02) Timber for use in permanent works shall be either of appropriate natural durability or be treated with wood preservatives in compliance with Clause 311. Where natural durability is used as the criterion, the timber shall be of class 1 if used in ground contact (e.g. fence posts) and of class 2 or better if used out of ground contact (e.g. fence rails) according to the classification given in BS EN 350-1.

2 (05/08) If any sapwood is present in the timber, irrespective of the natural durability of the heartwood, the timber shall be treated with preservative

3 (05/08) Unless otherwise described in this specification and in Appendix 3/1, timber for permanent fencing shall comply with BS 1722-7, timber for field gates and posts shall comply with BS 3470; and timber for stiles, bridle gates and kissing gates shall comply with BS 5709.

4 (05/08) All timber for permanent fencing, field gates and posts, stiles, bridle gates and kissing gates shall be of sawn timber conforming to BS 1722-7 Annex A. Non structural timber in environmental barriers shall comply with the requirements of sub-Clause 2504.6. Structural timber in environmental barriers shall be stress graded and marked to comply with BS EN 14081-1 and where appropriate BS 4978, BS 5756 or BS EN 519 or other grading rules accepted in BS 5268-2 and BS EN 1912.

**5** (05/08) For checking compliance with strength requirements, samples shall be taken by the manufacturer or supplier in accordance with the suggested sampling plan in Annex B of BS 1722-7.

**6** (05/08) All timber and wood contained in products supplied or used for fences, including field gates and posts, stiles, bridle gates, kissing gates, and environmental barriers shall comply with sustainability criteria described in Clause 126.

### 305 (05/01) Fittings

**1** (05/06) Bolts, screws and nuts shall comply with BS EN ISO 4016, BS EN ISO 4018 and BS EN ISO 4034, for BS EN ISO 898-1 property class 4.6 or 4.8 unless otherwise described in Appendix 3/1. Washers shall comply with BS 4320. Nails shall comply with BS 1202. Bolts washers and nails shall be galvanised to comply with BS EN ISO 1461 unless they are stainless steel.

### 306 (05/01) Permanent Fencing

**1** (11/06) Permanent fencing shall comply with this Clause and the additional requirements described in Appendix 3/1. All permanent fencing, unless otherwise described in Appendix 3/1, shall be erected to present a flowing alignment both in plan and elevation following approximately the level of the ground and the Contractor shall trim the ground along the line of the fence when required in Appendix 3/1. Where the ground is uneven or undulating the Contractor shall provide extra posts, stakes and ground anchors as necessary to ensure that the bottom line wire in planting works fencing does not rise more than 50 mm above ground level. The fencing shall be neatly and effectively joined to existing hedges, fences and to other structures, to comply with HCD Drawing Number H36 and Chapter 8 of TD 19 (DMRB 2.2.8), unless otherwise described in Appendix 3/1. Planting works fencing shall be joined to existing boundaries providing a secure joint capable of withstanding entry by rabbits or larger animals.

**2** Timber fencing for motorways shall be wooden post and rail fence with four rails type SPR 13/4 complying with BS 1722 : Part 7, to dimensions shown on HCD Drawing Number H3. Both ends of posts and rails shall be cross cut at right angles to the length of the piece. The timber species and preservation treatment shall comply with Clause 311 and any additional stockproofing required shall be as described in Appendix 3/1. Painting, if required in Appendix 3/1, shall comply with Clause 312 and concrete surround to posts, if required in Appendix 3/1, shall comply with sub-Clause 302.3.

**3** Wire dropper fences for motorways shall be as shown on HCD Drawing Numbers H4, H5, H6 and H7. They shall comply with BS 1722 : Part 2 Sections 6 and 7, with the following Clauses amended as below and with any additional requirements described in Appendix 3/1.

On completion of the tensioning of the line wires all fittings, droppers and connections shall be painted with plastic paint of the same colour as the fence posts and wire, within 24 hours of erection when required in Appendix 3/1.

Clause 6.1.1 Delete text and insert:

“High tensile wire, zinc and plastic coated, complying with Clause 2605, shall be used unless otherwise stated in Appendix 3/1.”

Appendix B, Clause B.2 Delete text and insert:

“Steel posts and struts shall be galvanized and plastic coated to comply with Clause 2604.”

Clause 4.4.4 Add:

“Only dowelled ends to straining and intermediate posts, and struts shall be used. Turning posts shall be provided and fitted with 225 mm x 150 mm x 3 mm thrust plates complying with Clause 2.4.2.2.

As an alternative to being holed, a steel fillet may be welded to the straining post to allow for bolting the strut and post together.”

Clause 4.6.6 Add:

“Fence post rivets and wire vices shall be as described in Appendix 3/1.”

Clause 4.7 Delete text and insert:

“Concrete for surrounding the base of posts and struts shall comply with Clause 2602.”

Table 3. Add:

Turning Posts	
Length m	Section CHS mm x mm
2.27	76.1 x 4.0
2.72	88.9 x 4.0
3.02	88.9 x 4.0

Clause 5.2.1 Delete paragraphs 2 to 5 and insert:

“All posts and struts shall be set in concrete and the concrete surround shall be filled to within 75 mm of the ground level.”

Clause 7.2.2 Add:

“Turning posts and fittings shall be provided as described in Appendix 3/1.”

Clause 7.3.4 Amend 2nd sentence to read

“The interval between a dropper and a post or between adjacent droppers, shall be as shown on HCD Drawing Numbers H4, H5 and H6”.

### Planting Works Fencing

**4** Fencing for the protection of planted areas shall be one of the following types, required as described in Appendix 3/1:

- (i) Hexagonal wire netting fencing complying with BS 1722 : Part 2 Section 8 and in accordance with HCD Drawing Number H39.
- (ii) Rectangular wire mesh and hexagonal wire netting fencing complying with BS 1722 : Part 2 Section 8 and in accordance with HCD Drawing Number H40.
- (iii) Wooden post and four rail fencing type SPR 13/4 complying with BS 1722 : Part 7 and in accordance with HCD Drawing Number H3.
- (iv) Wooden driven post fencing in accordance with HCD Drawing Number H44.

**5** The ‘turned out’ portion of the hexagonal wire netting of rabbit-proof fencing shall be treated in accordance with one of the methods given below, as described in Appendix 3/1:

- (i) 100 mm of netting buried vertically into the ground beneath the fence, with a further 150 mm turned out towards the rabbit harbourage. The excavation shall be backfilled and rammed.
- (ii) 250 mm of netting turned out towards the rabbit harbourage, laid flat to the ground contours and pegged at 400 mm centres with 300 mm long x 4 mm diameter galvanised wire pins bent hairpin pattern.
- (iii) 50 mm of netting buried vertically into the ground beneath the fence, with a further 200 mm of netting turned out towards the rabbit harbourage and covered with turves. The Contractor shall cut and lift sections of turf at least 30 mm thick from the inside of

the planting area and transfer them to cover the whole of the ‘turned out’ portion of the netting.

- (iv) The netting shall be buried vertically, to a depth of 250 mm below existing ground level. The excavation shall be backfilled and rammed.

### Wire Mesh to Permanent or Existing Fencing

**6** Where required in Appendix 3/1, wire mesh shall be attached to permanent or existing fencing in accordance with HCD Drawing Numbers H46, H47 and H48.

**7** The Contractor shall check the condition of the lengths of existing fencing to which mesh is to be attached before commencing work. Where there is damage to the existing fencing, the Contractor shall report this to the Overseeing Organisation before commencing attachment of the mesh.

### Fenced Tree Guards

**8** Where required in Appendix 3/1, fenced tree guards shall be provided in accordance with HCD Drawing Number H43.

### 307 Permanent Fencing for Accommodation Works

**1** Permanent fencing shall be provided for accommodation works and shall comply with this Series and the particular requirements described in Appendix 1/15.

### 308 Gates and Stiles

**1** Field gates and posts shall comply with BS 3470 and Clauses 304 and 311. They shall be provided to the dimensions shown on HCD Drawing Numbers H17 to H22. Painting, if required in Appendix 3/1, shall comply with Clause 312.

Fittings for field gates shall be as shown on HCD Drawing Numbers H26-H33.

**2** (05/01) Stiles, bridle gates, kissing gates and gates in planting works fencing shall comply with BS 5709 and Clauses 304 and 311. They shall be provided to the dimensions shown on HCD Drawing Numbers H23, H24, H25, H34, H35, H41 and H42.

**3** Concrete for post foundations shall comply with Clause 2602.

**4** Any additional stockproofing required to gates and stiles shall be as described in Appendix 3/1.

**5** (05/01) Where access gates are to be provided in a length of fencing that incorporates wildlife mesh, the underside of the gate shall include the measures described in Appendix 3/1.

### **Badger Gates**

**6** (05/04) Where required in Appendix 3/1, badger gates shall be provided in accordance with HCD Drawing Number H45. Marine ply timber shall comply with BS 1088-1 and BS 1088-2.

## **309 Removing and Re-erecting Existing Fences and Gates**

**1** Where required in Appendix 2/3, existing fences, gates and stiles, with posts shall be carefully taken down, laid aside, removed or later re-erected in compliance with Clauses 306, 307 and 308 as specified in sub-Clause 201.6.

**2** (05/01) Fences, gates, stiles and posts which are to be re-erected shall have any existing paint removed and shall be prepared and treated to comply with Clause 312.

**3** (05/01) If any posts, rails or lengths of fencing are removed to facilitate repairs or renewal of existing fences, the gap in the fencing shall be patrolled or closed with appropriate temporary fencing in accordance with Clause 303 together with any existing wildlife mesh attachments.

## **310 Not Used**

### **311 (05/01) Preservation of Timber**

**1** Prior to preservation treatment and when the moisture content is 28% or below, determined in accordance with BS EN 13183-1 or BS EN 13183-2, the timber quality shall comply with Clause 304. Defects unaffected by moisture content shall not be accepted at any time.

**2** (05/08) The preservation of timber shall be specified in accordance with the system described in BS EN 351-1 and shall comply with National Highways Sector Schemes for Quality Management in Highway Works: Sector Scheme 4 – preservative treatment of timber.

- (i) (05/08) Unless otherwise specified in Appendix 3/1, the preservative used shall be one which can be used in accordance with BS 8417 for use classes 3 and 4 for a desired service life of 30 years as described in (ii), (iii) and (iv) below.

(ii) (05/08) For timber used out of ground contact the retention and penetration requirements of the preservative shall be in accordance with the relevant provisions of BS 8417 (30 year specification). Assessment for compliance with these requirements shall be carried out using the scheme described in (v) and (vi) below.

(iii) (05/08) For timber used in ground contact where the preservative is a creosote preservative complying with BS EN 13991, the penetration and retention requirements shall be in accordance with the relevant provisions in BS 8417 (30 year specification) with the exception of Douglas fir. Douglas fir treated with creosote shall comply with penetration class P8 of BS EN 351-1, i.e. complete sapwood penetration, and the preservative retention in the analytical zone shall be not less than 130 kg/m<sup>3</sup>. Assessment for compliance with these requirements shall be carried out using the scheme described in (v) and (vi) below.

(iv) (05/08) For timber used in ground contact where the preservative is any other acceptable type of formulation, the penetration requirements for all timber species shall be in accordance with the relevant provisions in BS 8417 (30 year specification). The preservative retention shall be derived from BS8417 (30 years specification) and 10 years ground contact field test data (for example BS 7282), interpreted according to the principles in BS EN 599-1. Assessment for compliance with these requirements shall be carried out using the scheme described in (v) and (vi) below.

(v) (05/08) To demonstrate that the required penetration has been achieved, the sampling scheme recommended in BS EN 351-1 for direct testing shall be followed. The number of units to be sampled at random from the treated batch shall be determined using general inspection level II as defined in ISO 2859-1. Penetration shall be determined for each selected unit from sub samples (e.g. core borings) taken as recommended in BS EN 351-2. To determine whether the treated batch has achieved the required penetration, an acceptable quality level (AQL) of 10% for permeable timbers (e.g. Scots pine) and an AQL of 25% for resistant timbers (e.g. Douglas fir) shall be used to establish pass/fail criteria from ISO 2859-1.

A Certificate of Treatment showing the basis of compliance with the specification shall accompany each batch or part batch delivered to site.

- (vi) (05/08) Compliance with the retention requirement within a batch of treated timber shall be calculated from the chemical analysis of the combined analytical zones of the sub samples taken to determine penetration. The retention shall be equal to or greater than the appropriate value derived as described in (ii), (iii) and (iv) above.

## **312 Painting of Timber Fences, Gates, Stiles and Posts**

### **General**

**1** Painting shall be carried out in accordance with the recommendations in the Code of Practice BS 6150.

**2** All timber fabricated into units before delivery to the Site and which is required to be painted shall be primed at the works.

### **Priming**

**3** (05/01) Surfaces of wood shall be clean and dry before being primed. Priming paint shall comply with either Type C primer to BS 7956 or ready mixed aluminium priming paint complying with BS 4756.

### **Undercoats and Finishing Coats**

**4** After erection, all exposed primed surfaces shall be painted with one coat of undercoat as described in Appendix 3/1.

**5** Two finishing coats of the colour and type described in Appendix 3/1 shall be applied.

### **Coloured Wood-Stain**

**6** (05/01) Coloured wood-stains shall be applied as described in Appendix 3/1.