

**BRITISH STANDARD**

# **Fences –**

## **Part 8: Specification for mild steel (low carbon steel) continuous bar fences and hurdles**

ICS 91.090

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**BSi**  
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## **Summary of pages**

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 17 and a back cover.

# Foreword

This British Standard was published by BSI and came into effect on 30 November 2006. It was prepared by Technical Committee B/201, *Fences*. A list of organizations represented on this committee can be obtained on request to its secretary.

## Supersession

This part of BS 1722 supersedes BS 1722-8:1997, which is withdrawn.

## Relationship with other publications

BS 1722 is published in parts as follows:

- *Part 1: Specification for chain link fences;*
- *Part 2: Specification for strained wire and wire mesh netting fences;*
- *Part 4: Specification for cleft chestnut pale fences;*
- *Part 5: Specification for close-boarded and wooden palisade fences;*
- *Part 7: Specification for wooden post and rail fences;*
- *Part 8: Specification for mild steel (low carbon steel) continuous bar fences and hurdles;*
- *Part 9: Specification for mild steel (low carbon steel) fences with round or square verticals and flat horizontals;*
- *Part 10: Specification for anti-intruder fences in chain link and welded mesh;*
- *Part 11: Specification for prefabricated wood panel fences;*
- *Part 12: Specification for steel palisade fences;*
- *Part 13: Chain link fences for tennis court surrounds<sup>1)</sup>;*
- *Part 14: Specification for open mesh steel panel fences;*
- *Part 16: Specification for organic powder coatings to be used as a plastics finish to components and mesh;*
- *Part 17: Specification for electric security fences – Design, installation and maintenance;*
- *Part 18: Specification for steel mesh site perimeter temporary fencing systems<sup>2)</sup>.*

## Information about this document

It should be noted that no attempt has been made to standardize fences or gates of a purely decorative nature, or those suited to special requirements; nor to specify requirements for “patent” proprietary fencing systems. It is recommended, however, that the structure of such fences or gates should conform to those clauses of this part of BS 1722 that are applicable.

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<sup>1)</sup> Obsolescent.

<sup>2)</sup> Part 18 is in development and will be published as a Draft for Development (DD).

This standard aims to establish minimum requirements for materials and workmanship of the more common types of fence in order to ensure satisfactory service for the purchaser, and to assist manufacturers and installing contractors by eliminating unnecessary minor variations in the demands of purchasers. It specifies requirements for the components that make up a fence and the way in which the fence should be constructed.

Throughout this standard there are requirements for sizes of components, together with the permissible tolerances on size. These are minimum requirements and it will normally be acceptable to use larger sizes, except where this would adversely affect the fitting of components, or where replacement parts are needed to match up with those already present. The choice of fence is affected by factors such as its intended purpose, the desired service life, aesthetic considerations, and the availability of components. By reference to Table 1, the specifier is able to match a suitable choice of fence to its intended purpose and is also able to inform those installing the fence of the basic characteristics that need to be provided.

This standard includes requirements for protective treatments but does not include maintenance requirements. Premature failure of the fence can be avoided by taking care not to damage protective treatments during installation.

The post setting depths specified in this standard are for normal ground conditions, but where special ground conditions exist, e.g. if the ground is softer or firmer than usual, such variations should be agreed with the specifier. This also applies to other similar variations.

It is assumed in this part of BS 1722 that continuous bar fences and welded hurdle fences are installed on horizontal ground. Where gradients are encountered, continuous bar fencing is suitable, but special design measures may be deemed necessary.

This part of BS 1722 amends and augments the former part 8 of BS 1722 in the following respects:

- a) Steel specifications and horizontal lengths are amended to cover current material availability and welding details are included.
- b) Obsolete fence types are deleted, and new additions made; guidance on foundations is improved and post designs and types are amended accordingly.
- c) Design detail improvements are made; particularly for posts, wedges, gates and connectors.
- d) Criteria for design and loading capacity of gates and gate posts are given.

It should be noted that in this part of BS 1722, the fence post spacing is given in terms of centre distances.

To assist the procedure of specifying fences, Annex A provides guidance on the most important details that should be specified at the time of ordering.

Annex B provides some typical gate designs that meet aesthetic requirements and loading criteria.

## Use of this document

It has been assumed in the drafting of this part of BS 1722 that the execution of its provisions is entrusted to appropriately qualified and experienced people. Before installation commences the lead installer should hold a current FISS/CSCS registration card skilled level (blue card) or equivalent and all other operatives should hold the basic fence operative card (green card) or equivalent.

At the time of publication of this British Standard, the registration cards are validated by the Joint Fencing Industry Scheme (FISS) and Construction Scheme Skills Certification Scheme (CSCS). FISS/CSCS maintains a national register of fence installers and operatives. There might be other schemes available.

## Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

*Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.*

Requirements in this standard are drafted in accordance with *The BSI guide to standardization – Section 2: Rules for the structure, drafting and presentation of British Standards*, subclause **11.3.1**, which states, “Requirements should be expressed using wording such as: ‘When tested as described in Annex A, the product shall ...’”. This means that only those products that are capable of passing the specified test will be deemed to conform to this standard.

## Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a British Standard cannot confer immunity from legal obligations.**

# 1 Scope

This part of BS 1722 specifies requirements for mild steel (low carbon steel) continuous bar fences for farm animal containment applications and welded hurdle fences of continuous bar type. A range of five specifications of fence of both types available, in three heights, is listed in Table 1 and Table 3.

Requirements for the construction of suitable gates for these fences is given in Clause 5, which states certain functional requirements for the designs, but does not specify the designs in detail.

A list of information that should be obtained from the purchaser at the time of enquiry and/or order is given in Annex A.

# 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 1722-16, *Fences – Part 16: Specification of organic powder coatings for use as a plastics finish to components and mesh*

BS 4620, *Specification for rivets for general engineering purposes*

BS 7371-3, *Coatings on metal fasteners – Part 3: Specification for electroplated zinc and cadmium coatings*

BS 7371-6, *Coatings on metal fasteners – Part 6: Specification for hot dipped galvanized coatings*

BS 7371-8, *Coatings on metal fasteners – Part 8: Specification for sherardized coatings*

BS EN 287-1, *Qualification test of welders – Fusion welding – Part 1: Steels*

BS EN 1011-1, *Welding – Recommendations for welding of metallic materials – Part 1: General guidance for arc welding*

BS EN 1011-2, *Welding – Recommendations for welding of metallic materials – Part 2: Arc welding of ferritic steels*

BS EN ISO 1461:1999, *Hot dip galvanized coatings in fabricated iron and steel articles – Specifications and test methods*

BS EN ISO 2063, *Thermal spraying – Metallic and other inorganic coatings – Zinc, aluminium and their alloys*

BS EN ISO 4014, *Hexagon head bolts – Product grades A and B*

BS EN ISO 12944 (all parts), *Paints and varnishes – Corrosion protection of settle structures by protective paint systems*

### 3 Dimensions and general characteristics

The general dimensions of continuous bar fences and welded hurdle fences shall be as given in Table 1 and Table 3.

Table 1 Types, categories and dimensions of continuous bar fences

Type reference	Category	Height of fence m	Posts			Horizontals		
			Depth in ground (min.)		Distance apart (max.) M	Number	Diameter of top horizontal mm	Lower flat horizontal mm
			With pronged feet or base plates mm	With thrust plate Mm				
CB/100/4	Light duty	1.00	300	400	1.00	4	16	25 × 6
CB/120/5	Medium duty	1.20	350	500	1.00	5	20	25 × 6
CB/120/6/H	Heavy duty	1.20	350	500	1.00	6	25	30 × 6
CB/150/6	Medium duty	1.50	350	600	1.00	6	20	25 × 6
CB/150/6/H	Heavy duty	1.50	350	600	1.00	6	25	30 × 6

## 4 Materials and construction

### 4.1 Material form

Steel posts, gates and rails shall be produced from the following:

- Rolled steel angle (RSA)<sup>3)</sup>;
- Flat section bar<sup>4)</sup> and round section bar<sup>5)</sup>;
- Rectangular or square hollow sections (RHS)<sup>6)7)</sup>;
- Circular hollow sections (CHS)<sup>5)6)</sup> or round tubes<sup>5)6)</sup>.

### 4.2 Material grades

The steel grade(s) employed shall be specified by the customer (the purchaser, fence designer, supplier, component manufacturer, fabricator or installer, as applicable) on the basis of the mechanical properties, formability and weldability required.

Appropriate mild steel grades shall be selected from national or international standards.

<sup>3)</sup> Fence posts only.

<sup>4)</sup> Intermediate posts, joiner posts and horizontal rails.

<sup>5)</sup> Top rails only.

<sup>6)</sup> End, gate or corner posts only.

<sup>7)</sup> Gates.



Steel grades to be considered shall have a minimum yield strength in excess of 175 N/mm<sup>2</sup>, unless the design permits lower strength materials to be employed.

*NOTE 1 Tubes and hollow sections can be hot or cold formed.*

Where components are to be hot dipped galvanized, the purchaser shall confirm with the supplier that the steel composition is suitable.

*NOTE 2 A non-exhaustive range of recommended material grades is given in Table 2.*

Table 2 **Recommended steel grades**

Material	Dimensional standard	Material standard	Material grade <sup>A)</sup>
Rolled steel angle	BS EN 10056-1	—	—
Flat bar	BS EN 10058	BS EN 10025-2	S185/S235JR
Round bar	BS EN 10060	—	—
Circular, square or rectangular hollow sections	BS EN 10210-2 BS EN 10219-2	BS EN 10210-1 BS EN 10219-1	S235JRH S235JRH
Circular tubes	BS EN 10255 BS EN 10296-1 DIN 1615	BS EN 10255 BS EN 10296-1 DIN 1615	S195T E155 <sup>B)</sup> /E190/E195 ST 33
Plate for baseplates, caps, etc.	—	BS EN 10025-2	S185/S235JR

A) Where applicable, the use of higher strength or more enhanced grades than those shown is permissible, provided that they meet the necessary requirements for formability, weldability or galvanizing.

B) Where the design permits.

### 4.3 Construction

A continuous bar fence shall be constructed of a round top bar, mounted horizontally, and flat steel lower horizontal bars with joiner posts at 6 m or 3 m centres. Intermediate posts shall be spaced at 1 m intervals between joiner posts. Welded bar hurdles shall be similarly constructed, but produced in 2 m standard panels. End and corner posts shall be of hollow section or angle section (see Figure 1).

### 4.4 Components

#### 4.4.1 Horizontal bars

##### 4.4.1.1 Size and cross-section

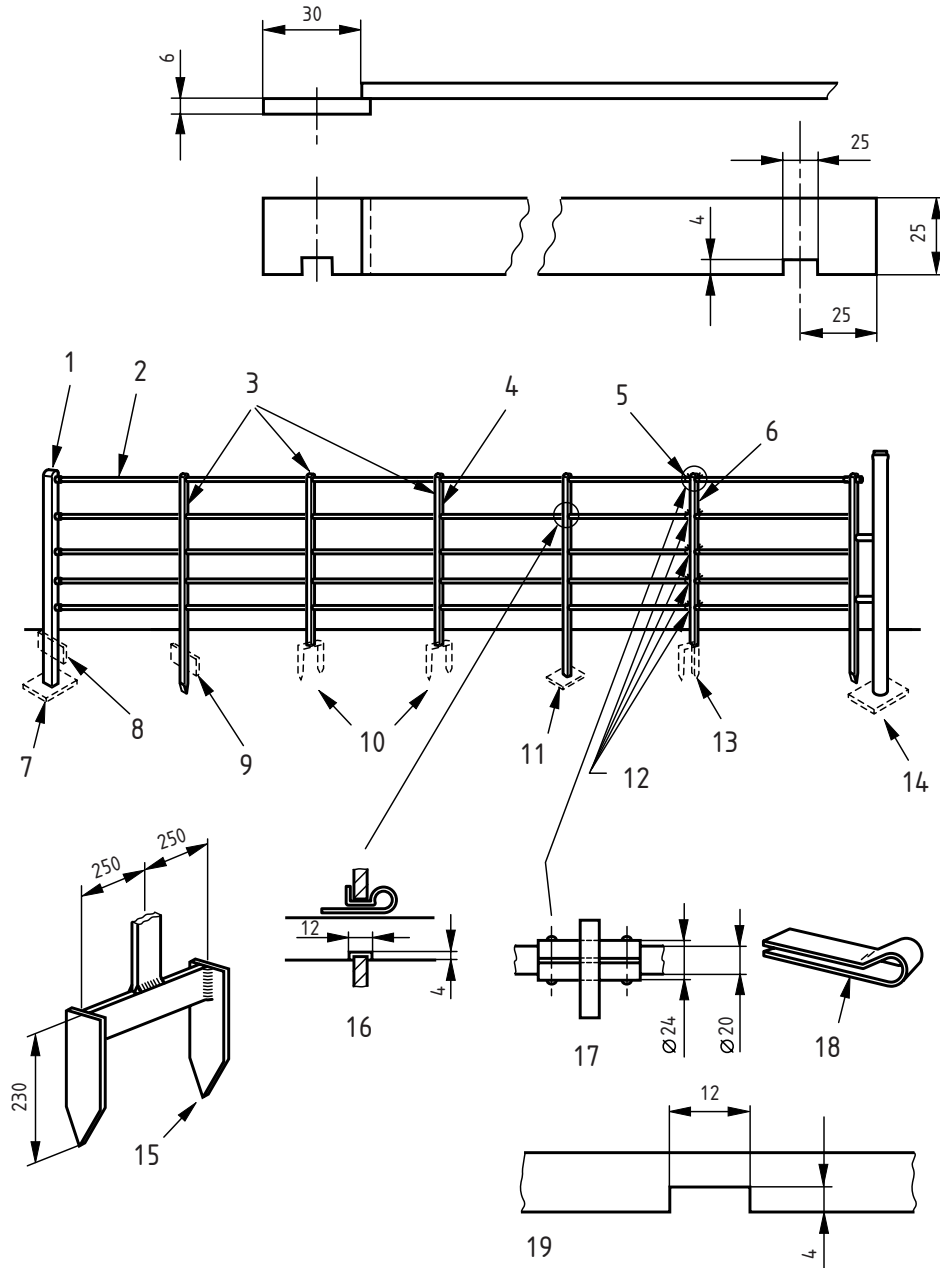
Horizontal bars shall be of the size and cross-section given in Table 1 and Table 3.

One end of each flat bar shall be prepared either by bending or welding (see Figure 1) to facilitate the overlap at joiner posts.

The top flat horizontal bar shall be prepared with a 12 mm × 4 mm slot or keyway on the underside to facilitate seaming to joiner posts (see Figure 1).

Figure 1 Continuous bar fence

Dimensions in millimetres



**Key**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>1 End or corner post with round bosses or lugs</li> <li>2 Round horizontal top</li> <li>3 Flat or angle intermediate posts</li> <li>4 Steel wedge at each junction of intermediate post and flat horizontal top rail</li> <li>5 Joiner ferrule at top rail</li> <li>6 Flat or angle joiner post</li> <li>7 Base plate</li> <li>8 Thrust plate (if specified)</li> <li>9 Thrust plate</li> <li>10 Double pronged feet</li> <li>11 Post suitable for concrete foundation</li> </ul> | <ul style="list-style-type: none"> <li>12 Flat horizontals overlapping at end of rail. Rails secured to joiner posts with steel wedges.</li> <li>13 Alternative for driving against kerbs etc</li> <li>14 Alternative corner or end post design</li> <li>15 Enlarged view of typical pronged foot</li> <li>16 Top flat horizontal locked into position at joiner post by 12 × 4 mm keyway, wedge installed above horizontal</li> <li>17 Detail of ferrule for top round horizontal</li> <li>18 Enlarged view of typical wedge</li> <li>19 Detail of 12 × 4 mm keyway in top flat horizontal at each junction of intermediate and joiner post (see 6.4.2.2 note)</li> </ul> |
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Table 3 Types, categories and dimensions of welded hurdle fences

Type reference	Category	Height of fence m	Posts			Horizontals		
			Depth in ground (min.)		Distance apart (max.) m	Number	Diameter of top horizontal mm	Lower flat horizontal mm
			With pronged feet or base plates mm	With thrust plate mm				
WH/100/4	Light duty	1.00	300	400	1.00	4	16	25 × 6
WH/120/5	Medium duty	1.20	350	500	1.00	5	20	25 × 6
WH/120/6/H	Heavy duty	1.20	350	500	1.00	6	25	30 × 6
WH/150/6	Medium duty	1.50	350	600	1.00	6	20	25 × 6
WH/150/6H	Heavy duty	1.50	350	600	1.00	6	25	30 × 6

#### 4.4.1.2 Spacing

Horizontal bars shall be spaced as in Table 4.

Table 4 Spacing of horizontals

Height of fence m	Number of horizontals	Spacing between centres (starting from centre of top rail) mm				
1.00	4	300	280	250	—	—
1.20	5	300	280	240	210	—
1.20	6	300	220	170	170	170
1.50	6	300	280	270	260	220

NOTE Approximately 150 mm space to ground line should be given by these spacings.

#### 4.4.2 Intermediate and joiner posts

##### 4.4.2.1 Sizes and cross-section for continuous bar fences

Intermediate and joiner posts shall be flats or angles of the sections shown in Table 5, and long enough to provide the depth in ground given in Table 1 and Table 3.

##### 4.4.2.2 Sizes and cross-section for welded hurdle fences

Intermediate and joiner posts shall be flats of the section shown in Table 5, and long enough to provide the depth in ground given in Table 1 and Table 3.

##### 4.4.2.3 Base plates for concrete-in posts

A 150 mm × 150 mm × 3 mm base plate shall be welded to the base of the post when concreting is specified (see Figure 1).

#### 4.4.2.4 Feet and thrust plates

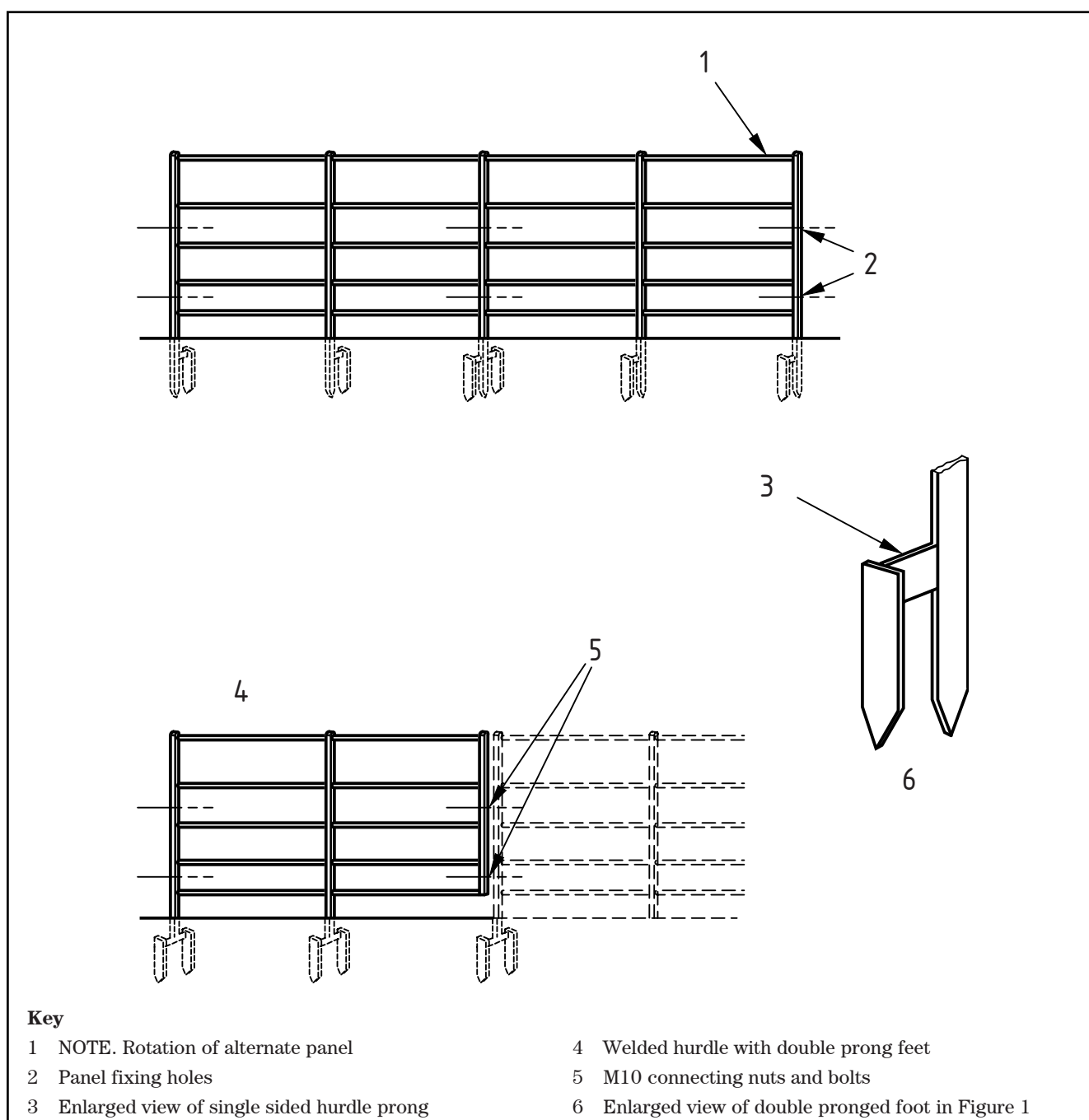
Posts shall have either:

- pronged feet of the same section as the post, with transverse bars not less than 350 mm in length, and prongs not less than 230 mm (see Figure 1 and Figure 2); or;
- for intermediate posts, a welded thrust plate 250 mm × 150 mm × 3 mm (with the 250 mm dimension at right angles to the vertical post).

The minimum depth from ground level to the top of the thrust plate shall be 100 mm.

*NOTE* The 150 mm dimension of the thrust plate may be increased to suit poor soil conditions, if specified.

Figure 2 Welded bar hurdle fence



### 4.4.3 Ferrules and sockets

At joiner posts, a split or solid 75 mm ferrule shall pass through the post in order to receive the round horizontals. The ferrule shall be provided with 6 mm grub screws, fasteners or rivets for fixing.

*NOTE* The ferrule may be welded into the joiner post, provided that 50% of the circumference is welded, on the uppermost face.

At end or corner posts a 40 mm socket shall be welded to receive the round horizontals.

### 4.4.4 Wedges

In continuous bar fences, split wedges of mild steel shall be provided for fixing flat horizontals (see Figure 1). The wedges shall be driven into the gap above the horizontal flats to achieve an interference fit with respect to the post slot; the upper leaf of the wedge being bent flush with the post surface.

Table 5 Dimensions of intermediate and joiner posts

Type reference	Application	Height of fence m	Flats		Angles	
			Intermediate posts mm	Joiner posts mm	Intermediate posts mm	Joiner posts mm
CB/100/4	Light duty	1.00	30 × 10	40 × 10	40 × 40 × 5	50 × 50 × 6
CB/120/5	Medium duty	1.20	40 × 10	50 × 10	40 × 40 × 5	50 × 50 × 6
CB/120/6/H	Heavy duty	1.20	50 × 10	50 × 10	40 × 40 × 5	50 × 50 × 6
CB/150/6	Medium duty	1.50	40 × 10	50 × 10	40 × 40 × 5	50 × 50 × 6
CB/150/6/H	Heavy duty	1.50	50 × 10	50 × 10	40 × 40 × 5	50 × 50 × 6
WH/100/4	Light duty	1.00	30 × 10	30 × 10	N/A	N/A
WH/120/5	Medium duty	1.20	40 × 10	40 × 10	N/A	N/A
WH/120/6/H	Heavy duty	1.20	50 × 10	50 × 10	N/A	N/A
WH/150/6	Medium duty	1.50	40 × 10	40 × 10	N/A	N/A
WH/150/6/H	Heavy duty	1.50	50 × 10	50 × 10	N/A	N/A

Table 6 Dimensions of end and corner posts

Height of fence m	Embedded depth of post m	Circular hollow section mm	Square hollow section mm	Rolled steel angle mm
1.00	0.45	60.3 × 3	50 × 50 × 3	50 × 50 × 6
1.20	0.55	60.3 × 3	50 × 50 × 3	50 × 50 × 6
1.50	0.60	60.3 × 3	50 × 50 × 3	50 × 50 × 6

### 4.4.5 End and corner posts

#### 4.4.5.1 Cross section

End and corner posts shall be of the dimensions given in Table 6.

#### 4.4.5.2 Positioning

End posts shall be provided at the ends of the fence. Corner posts shall be provided at all significant changes in direction.

**4.4.5.3 Base plates**

Each end and corner post shall be provided with a base plate 200 mm × 200 mm × 3 mm.

**4.4.5.4 Thrust plates**

Where specified, thrust plates shall be 250 mm × 150 mm × 3 mm and shall have a minimum depth (from ground level to top plate) of 100 mm.

*NOTE* Thrust plates provide additional resistance to overturning in soft or loose ground. If required, they should be specified at the time of enquiry and/or order [see A.3 a)].

**4.4.5.5 Caps**

The tops of tubular posts shall be capped off or sealed to prevent moisture entering.

**4.4.5.6 Connections**

End and corner posts shall be connected to horizontals by means of:

- a) welded sockets for round horizontals; or
- b) welded flat lugs, drilled for fastening.

*NOTE* Connection of joiner posts to end or corner posts may alternatively be facilitated by means of two threaded round bosses, 20 mm in diameter and 20 mm long, welded to the end or corner post (see Figure 1), or by use of two tubular spacers bolted through the end joiner post into the tubular or square end or corner post.

**4.5 Welding**

All welding operations shall be carried out in accordance with BS EN 1011-1 and BS EN 1011-2, by suitable personnel qualified in accordance with BS EN 287-1.

**5 Construction of gates****5.1 General**

Gates shall be fabricated from steel tubes or hollow sections and joints shall be continuously welded, with all corners mitred or saddled square. The section sizes and grades of steel selected shall be of sufficient strength to satisfy the gate type, size and load specified by the purchaser (see Annex A).

*NOTE 1* Recommended steel grades are given in Table 2.

Gates shall be of a single or double leaf type and shall be suitably braced to prevent any natural frame distortion when the gate is under a load that would render it unserviceable.

*NOTE 2* Some examples of gate designs are given in Annex B.

## 5.2 Gate posts

Gate posts shall be of a sufficient strength to properly support the gate, even when subject to all loading criteria (see Annex A). Posts shall be constructed from steel hollow or open sections, with all joints continuously welded. The tops of hollow section gate posts shall be closed by either a welded cap or a push fit plastic cap. A steel baseplate shall be fitted to the bottom of all steel posts to support and retain them after installation.

*NOTE 1 Recommended steel grades for posts, baseplates and caps are given in Clause 4 and Table 2.*

Gate posts shall be equipped with fittings to suit the gate and fence panel requirements (see A.3).

*NOTE 2 Gate posts may be freestanding or combined gate pillar and end posts.*

## 5.3 Dimensions

### 5.3.1 Height

The overall height of the gate, when fixed, shall match the height of the adjacent fencing, and the lower gate frame member shall not be more than 150 mm above the ground line below the gate.

### 5.3.2 Width

The widths between posts shall be as follows for standard gates.

a) Single gates

1.0 m; 1.2 m; 1.5 m; 2.0 m; 3.0 m; or 4.5 m.

b) Double gates

2.0 m; 3.0 m; or 4.0 m.

If non standard widths are required, they shall be agreed between the manufacturer and specifier. Double gate leaves shall be of equal width unless specified otherwise.

## 5.4 Welding

All welding operations shall be carried out, in accordance with BS EN 1011-1 and BS EN 1011-2, by suitable personnel qualified according to BS EN 287-1.

## 6 Installation

### 6.1 Assembly

Continuous bar fences shall be supplied unassembled for assembly at site by the installing contractor. Welded hurdles shall be supplied complete for fixing by the installing contractor.

### 6.2 Line and level

The fence shall be installed accurately on the line set out by the purchaser. The top of the fence shall either follow the approximate profile of the ground, or any levels indicated by the purchaser.

*NOTE Unless specified (see Annex A), the installation of the fence does not include cutting or filling of the ground to vary the levels.*

The presence of any electricity, gas, water or other underground services shall be established prior to commencement of excavation, drilling or installation in the working area.

### 6.3 End and corner posts

End and corner posts shall be set in the ground to the depth indicated in Table 6. Unless concrete fixing is specified, the post hole shall be as small as practicable to allow for refilling with earth, which shall be well rammed as the filling proceeds.

### 6.4 Procedure for continuous bar fences

#### 6.4.1 Intermediate and joiner posts

Posts shall be installed at 1 m centres with a joiner post every 6 m.

*NOTE 1 Where necessary, a joiner post every 3 m may be specified, to suit individual site layouts.*

Posts shall be driven vertically into the ground, to the depths specified in Table 1.

*NOTE 2 Where ground conditions do not permit the foregoing procedure, intermediate and joiner posts should be installed as described in 6.3, ensuring that no part of any transverse bar or plate projects above ground level.*

#### 6.4.2 Horizontals

##### 6.4.2.1 Joining rounds

Round horizontals shall be fitted into 24 mm diameter ferrules that pass through joiner posts.

The ferrules shall have a minimum length of 75 mm. The horizontals shall be secured on either side of the posts by 6 mm grub screws or rivets or fasteners, or a fillet weld conforming to 4.4. Ferrule fillet welds shall face upwards on the completed fence. Holes shall be oriented vertically to avoid water entrapment and to improve appearance.



#### 6.4.2.2 Joining flats

Flat horizontals shall overlap each other by a minimum of 50 mm at all joiner posts and shall be secured by a steel wedge. At least one of the flat horizontals shall also be secured to each intermediate post with a steel wedge, placed above the horizontal (see Figure 1).

*NOTE* Optionally, a 12 mm × 4 mm keyway in the top flat horizontal at intermediate and joiner post positions may be specified to assist in maintaining vertical location of posts (see Figure 1).

#### 6.4.3 End connections

All round horizontals – at a circular or square hollow section, or angle section end, or corner posts – shall be fitted into a socket welded to the end or corner posts, and secured by a 6mm fastener, grub screw, or rivet. Flat horizontals shall be secured to a lug, of the same section as the flat horizontal, welded to the end or corner post. The lug and flat horizontal shall be drilled, and secured with a minimum M8 nut and bolt.

#### 6.4.4 Rivets

Rivets shall conform to BS 4620, and shall be finished in accordance with Clause 7.

### 6.5 Procedure for welded hurdle fences

#### 6.5.1 Welded hurdles

Welded hurdles (see Figure 2) shall be supplied in 2 m lengths, and shall conform to Table 3, Table 4 and Table 5. The posts on each hurdle shall be upright and driven into the ground to the depth specified. Adjoining hurdles shall be connected with M10 nuts and bolts.

*NOTE* Welded hurdle fences cannot accommodate large changes in gradient. Small changes in gradient may be accommodated by adjustment in the hole positions for M10 connecting bolts, thus forming steps in the fence line to suit the ground contours.

#### 6.5.2 End connections

End and corner posts shall be secured to the welded hurdles using two M10 nuts and bolts.

#### 6.6 Fasteners

Fasteners shall conform to BS EN ISO 4014.

## 7 Corrosion protection

### 7.1 Works treatment

After fabrication of the fencing, including posts and gates, and following the punching or drilling of holes and completion of all welding operations, the fencing shall be suitably protected against corrosion by one or more of the following treatments as specified by the purchaser [see **A.3 b**]):

- a) hot dip galvanizing in accordance with BS EN ISO 1461;
- b) thermal spray coating of zinc or aluminium in accordance with BS EN ISO 2063;
- c) organic powder coating in accordance with BS 1722-16;
- d) painting in accordance with BS EN ISO 12944 (parts 1 to 8), as applicable, to meet the durability requirement specified.

All loose scale, oil and dirt shall be removed from the surfaces before treatment. If specified by the customer [see **A.3 b**)], grit blasting shall be carried out as a preliminary operation. Closed hollow sections to be hot dipped galvanized shall be provided with the necessary drain holes.

### 7.2 Renovation and repair of hot dipped galvanized coating

The fence shall be inspected after installation and any damaged areas found in the hot dipped galvanized coating shall be repaired in accordance with one of the procedures set out in BS EN ISO 1461:1999, **6.3**.

*COMMENTARY ON [7.2] These include thermal spraying with zinc (per BS EN ISO 2063) or use of a suitable zinc rich paint. The zinc content of such a paint should conform to BS 4652 (i.e., at least 80% in the dry film).*

The coating thickness in the repaired area shall exceed that of the local galvanized coating layer.

*NOTE For guidance on suitable proprietary coating repair products, reference should be made to the Galvanizer's Association<sup>8)</sup>.*

### 7.3 Fasteners and rivets

The corrosion protection to be applied to mild steel fasteners and rivets shall be at the discretion of the fence supplier and selected from the following options:

- a) galvanizing in accordance with BS 7371-6;
- b) sheradizing in accordance with BS 7371-8;
- c) zinc electroplating in accordance with BS 7371-3;
- d) other suitable proprietary treatments.

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<sup>8)</sup> [www.hdg.org.uk](http://www.hdg.org.uk)

## 8 Statement of conformity

### 8.1 Fence manufacturer

On delivery, the manufacturer/supplier of the fence shall provide the installer with a certificate, conforming to **8.3**, confirming that the fence and/or gates are manufactured in accordance with the client's instructions.

*NOTE This certificate can be in the form of an invoice provided this conforms to 8.3.*

### 8.2 Fence installer

On completion, the fence installer shall provide the end user with a certificate conforming to **8.3** confirming that the installation, and materials used, are in accordance with the client's instructions.

*NOTE This certificate can be in the form of an invoice provided this conforms to 8.3.*

### 8.3 Certificate

In addition to the requirements of **8.1** and **8.2**, the certificate shall also include the following information:

- a) the supplier's name and address;
- b) the contract or order number;
- c) the date of delivery or installation, as appropriate;
- d) the purchaser's name and address.

### 8.4 Statement

The manufacturer and/or installer shall make a statement to the effect that it is their policy to conform to a previously client agreed and documented specification and to offer goods and/or services accordingly.

*NOTE This could be done by inclusion in trade advertising and "terms of trading" statements supplied with quotations.*

## Annex A (informative) Specifying a continuous bar fence

### A.1 General

This Part of BS 1722 specifies requirements for materials and how they are combined and installed to provide serviceable fences. Because a fence is made up of a number of separate components of which the particular features may vary, there will be a number of permissible combinations available to the user. When preparing a specification for a fence it is therefore important to give precise details of the requirements of the fence and of the installation site. This annex lists those items that should at least be specified. As conditions vary from site to site, the annex should not be assumed to be exhaustive in its listings.

### A.2 Site conditions

The following items shall at least be agreed between the supplier and purchaser at the time of enquiry and/or order:

- a) the line and length of the fence (see Foreword and **6.2**);
- b) the height and type of fence (see Table 1, Table 3 and Table 4);
- c) the site preparation (see **6.2**):
  - 1) site clearance;
  - 2) cutting or filling of ground level;
- d) any specific requirements for non-standard post lengths or thrust plates due to ground conditions (see Foreword);
- e) the type of panel presentation:
  - 1) components supplied loose (“continuous bar fences”);
  - 2) components welded into panels (“welded hurdle fences”);
- f) any special measures required due to site gradients;
- g) the number, specification and position of any gates.

*NOTE* The requirements for the lengths of posts in this part of BS 1722 (see Table 1) have been related to “normal” ground conditions. This part of BS 1722 does not cover situations where the ground is particularly firm or soft, where it may be necessary to modify the specified lengths or provide base plates.

### A.3 Construction of fence

As a minimum, the following items shall be agreed between the supplier and purchaser at the time of enquiry and/or order:

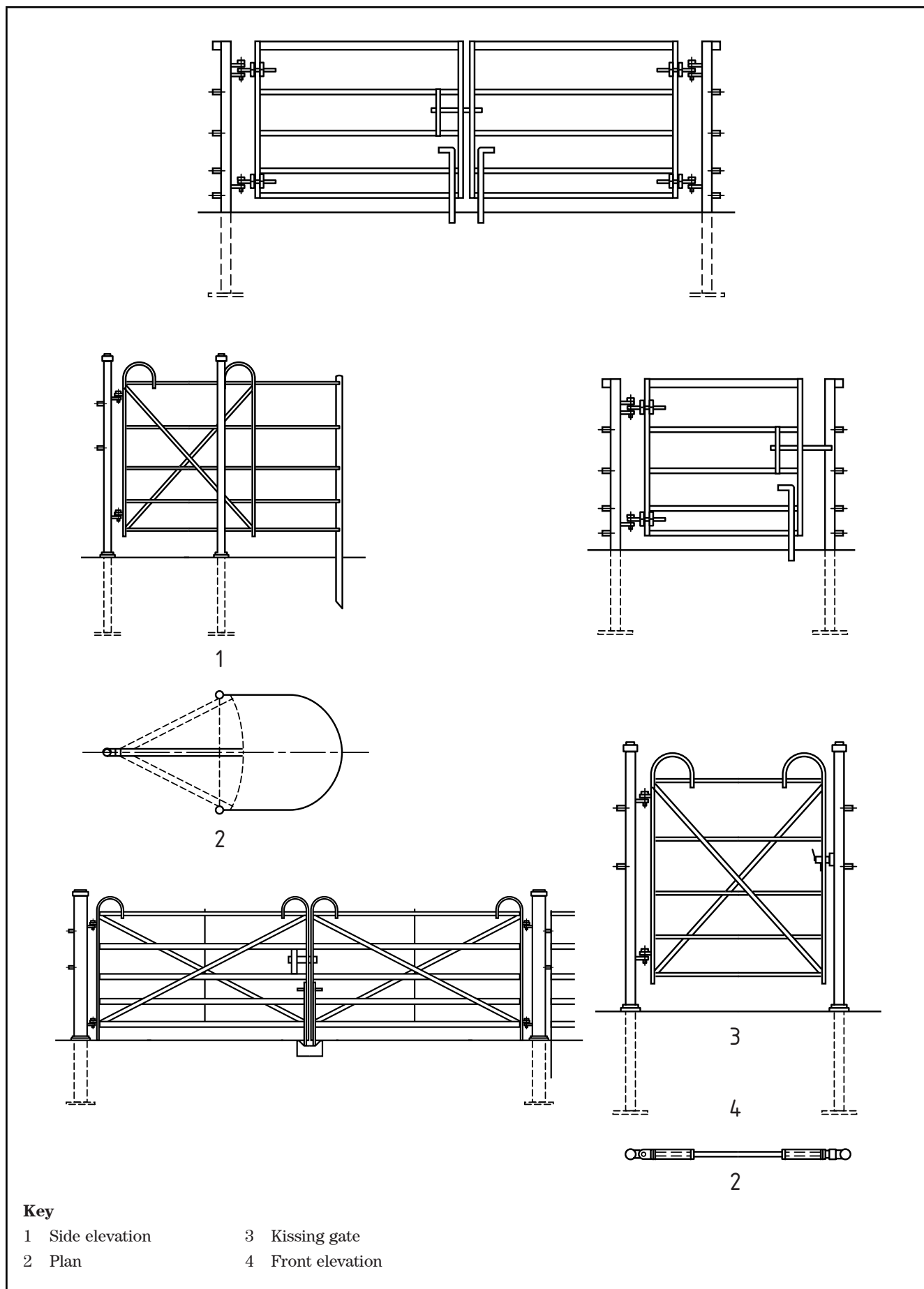
- a) Posts:
  - 1) whether flats or angles are required for intermediate and joiner posts (see 4.4);
  - 2) any requirements for thrust plates on end and corner posts (see 4.4);
  - 3) special requirements for the capping design of end and corner posts (see 4.4);
  - 4) any requirements for post bases (pronged feet, thrust plates, base plates) (see 4.4.2.4);
  - 5) any particular requirements for post spacing;
  - 6) the length of thrust plates if the standard length is not suitable;
  - 7) whether ferrules are to be provided loose or fixed to joiner posts;
  - 8) whether a keyway is required in the top flat horizontal bar (see note to 6.4.2.2);
- b) Protective treatment:
  - 1) requirements for the protective treatment to be applied to the fence and whether grit blasting shall be carried out before application.

*NOTE* Guidance on the appropriate protective coatings to use in specific environments and recommended coating thickness can be found in BS EN ISO 14713.

## Annex B (informative) Examples of designs for gates

Figure B.1 gives some examples of designs for gates.

Figure B.1 Examples of designs for gates



# Bibliography

## Standards publications

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 4652, *Specification for zinc-rich priming paint (organic media)*

BS EN 10025-1, *Hot rolled products of non-alloy structural steels – Part 1: General delivery conditions*

BS EN 10025-2, *Hot rolled products of non-alloy structural steels – Part 2: Technical delivery conditions for flat products*

BS EN 10056-1, *Specification for structural steel equal and unequal angles – Part 1: Dimensions*

BS EN 10058, *Hot rolled flat steel bars for general purposes – Dimensions and tolerances on shape and dimensions*

BS EN 10060, *Hot rolled round steel bars for general purposes – Dimensions and tolerances on shape and dimensions*

BS EN 10210-1, *Hot finished structural hollow sections of non-alloy and fine grain structural steels – Part 1: Technical delivery requirements*

BS EN 10210-2, *Hot finished structural hollow sections of non-alloy and fine grain structural steels – Part 2: Technical delivery requirements*

BS EN 10219-1, *Cold formed welded structural sections of non-alloy and fine grain steels – Part 1: Technical delivery requirements*

BS EN 10219-2, *Cold formed welded structural hollow sections of non-alloy and fine grain steels – Part 2: Tolerances, dimensions and sectional properties*

BS EN 10255, *Non-alloy steel tubes suitable for welding or threading – Technical delivery conditions*

BS EN 10296-1, *Welded circular steel tubes for mechanical and general engineering purposes – Technical delivery conditions – Part 1: Non-alloy and alloy steel tubes*

BS EN ISO 14713, *Protection against corrosion of iron and steel in structures – Zinc and aluminium coatings – Guidelines*

DIN 1615, *Welded circular unalloyed steel tubes not subject to special requirements – Technical delivery conditions*

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