BRITISH STANDARD

BS 6579-8: 1987

Safety fences and barriers for highways —

Part 8: Specification for concrete safety barriers

UDC 625.738 + 692.88

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Road Engineering Standards Committee (RDB/-) to Technical Committee RDB/18 upon which the following bodies were represented:

Aluminium Federation
Association of Consulting Engineers
British Railways Board
British Steel Industry
Cement and Concrete Association
Convention of Scottish Local Authorities
County Surveyors' Society
Department of Transport (Highways)
Institution of British Engineers
Institution of Civil Engineers
Institution of Highways and Transportation
Royal Automobile Club
Royal Society for the Prevention of Accidents

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

Department of Transport (Transport and Road Research Laboratory)
Fencing Contractors' Association

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Contents

Foreword

This Part of BS 6579 has been prepared under the direction of the Road Engineering Standards Committee. The other Parts of BS 6579 either published or in preparation are:

— *Part 1: Specification for components for tensioned corrugated beam safety fence on Z posts;*

— *Part 2: Specification for tensioned corrugated beam safety fence on offset brackets;*

— *Part 3: Specification for tensioned rectangular hollow section beam safety fence (100 mm × 100 mm);*

— *Part 4: Specification for tensioned rectangular hollow section beam safety fence (200 mm × 100 mm);*

— *Part 5: Specification for open box beam safety fence (single height);*

— *Part 6: Specification for open box beam safety fence (double height);*

— *Part 7: Specification for untensioned corrugated beam safety fences.*

In this revision of the 1985 edition of BS 6579-8 the principal changes are as follows.

a) Additional figures have been included to cover extra types of transition unit (types 3 and 4).

b) Most of the existing figures have had minor modifications incorporated.

c) The references to CP 110 "The structural use of concrete" Part 1 "Design, materials and workmanship" (now withdrawn) have been replaced by appropriate references to BS 8110-1.

This revision of BS 6579 supersedes the 1985 edition which is withdrawn.

BS 6579 is being produced at the request of users and manufacturers in order to cover the various types of safety fences and barriers available.

Fences detailed in Parts 1 to 7 have been developed already and approved for use in roads in the United Kingdom.

The designs are based on the results of static and dynamic tests carried out in the past on components and complete systems under the direction of the Transport and Road Research Laboratory.

The safety barrier detailed in this Part is for use only on certain roads at the date of publication of this Part of BS 6579.

If further types are developed, BS 6579 will be revised and increased in scope to cover additions and variations.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 26, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

0 Introduction

0.1 The objective of providing safety fences and safety barriers adjacent to a highway is to reduce the consequences of vehicles leaving the carriageway and entering areas where it would be unsafe for them to travel.

Safety fences are intended to absorb some of the energy of impact and to redirect the errant vehicle, so that it follows, within a narrow angle, the line of the fence in the direction of the traffic and does not overturn.

Safety barriers are intended to provide containment without significant deflection or deformation under impact, and to re-direct errant vehicles along the line of the barrier in the direction of traffic.

0.2 The safety fences and barriers for ground mounting which are the subject of BS 6579 are for use in conjunction with parapets on bridges and other structures, which are the subject of BS 6779. Although definitions in both standards have been chosen so as to align as closely as possible, there are some cases where the definition is applicable only to a particular Part of BS 6579 and does not apply generally.

0.3 No direct guidance is given in BS 6579 on the situations where safety fences and barriers should be erected or on the choice of the types described in the various parts, but information pertaining to general characteristics of different types of safety fences and barriers is given in Appendix A.

0.4 There are various situations and various methods by which transition between a safety fence or safety barrier and a vehicle containment parapet can be assured without impairing the overall protection afforded to the users of the highway. Guidance is provided in Figure 12, Figure 15, Figure 17 and Figure 18 on means for connecting the concrete barrier to two types of safety fence.

1 Scope

This Part of BS 6579 specifies the methods and materials to be used for the construction of concrete safety barriers and the manufacture of precast units.

Basic installation details are included on the figures.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this Part of BS 6579 the following definitions apply.

2.1
safety fence

an installation provided for the protection of users of the highway consisting of horizontal members mounted on posts

2.2
safety barrier

an installation provided for the protection of users of the highway which is continuously in contact with its supporting foundation

2.3
concrete safety barrier

a non-yielding concrete barrier the traffic face of which may be so contoured as to assist the redirection of an errant vehicle along the line of the installation

2.4
profile

the cross-sectional outline of the barrier

2.5
traffic face

the face of a safety fence or barrier that is nearer to the vehicular traffic flow

2.6
impacting vehicle

a vehicle striking a safety fence or barrier whether or not it is redirected

2.7
base fixing

the method of fixing the base of the barrier to or into the underlying surface or foundation for stability of the installation

2.8
end fixing

the method of securing adjacent sections one to another for stability of the installation

2.9
transition

the transition from a concrete safety barrier to a safety fence

2.10
termination

the ramped end of a safety barrier installation

3 Construction

3.1 Methods

Concrete safety barriers shall be constructed by one of the following methods:

a) in-situ between fixed forms (see **3.2**);

b) in-situ between sliding forms (see **3.3**);

c) in precast units (see **3.4**).

NOTE The choice of method of construction should be stated when making an enquiry or order (see Appendix B).

3.2 In-situ between fixed forms

3.2.1 Barriers constructed in-situ between fixed forms shall be either type 1, 2 or 3 and shall conform to the required profiles, dimensions, tolerances and reinforcement details as follows:

a) profile type 1 in conformity with Figure 1;

b) profile type 2 in conformity with Figure 2;

c) profile type 3 in conformity with Figure 3.

3.2.2 Reinforcement shall be provided and fixed in accordance with section 7 of BS 8110-1:1985.

3.2.3 Barriers constructed between fixed forms shall have a type C finish as described in **6.10.3** of BS 8110-1:1985, formwork shall be in accordance with **6.9** of BS 8110-1:1985, transporting, placing and compacting shall be in accordance with **6.5** of BS 8110-1:1985 and curing shall be in accordance with **6.6** of BS 8110-1:1985.

3.2.4 The terminations of an in-situ installation or the transition of a concrete safety barrier to a safety fence shall be constructed in precast units as shown in Figure 11, Figure 12, Figure 15, Figure 17 or Figure 18 as applicable.

3.2.5 Dowelled base fixings for type 1 in-situ barriers shall be provided to conform to the details shown in Figure 1.

3.2.6 Connection between an in-situ section of barrier and precast termination or transition units shall be no less efficient than the method of end fixing at vertical joints between precast units as shown in Figure 10.

3.3 In-situ between sliding forms

3.3.1 Barriers constructed in-situ by slip form machines between sliding forms shall be either type 1 or 2 and conform to the profiles, dimensions, tolerances and reinforcement details as follows:

a) profile type 1 in conformity with Figure 1;

b) profile type 2 in conformity with Figure 2.

3.3.2 Slip-form machines shall have the characteristics described in **A.2** of BS 5931:1980. The workability of the concrete and the method of construction shall be in accordance with **8.4** and **8.5** of BS 5931:1980 respectively.

3.3.3 The type of surface finish required shall be in accordance with **6.10.3** of BS 8110-1:1985.

3.3.4 The terminations of a concrete safety barrier constructed with slip form machines, or the transition to a safety fence shall be constructed in precast units as shown in Figure 11, Figure 12, Figure 15, Figure 17 or Figure 18 as applicable.

3.3.5 Connections between a slip-formed section of barrier and precast termination or transition units shall be no less efficient than the method of end fixing at vertical joints between precast units that is shown in Figure 10.

3.3.6 Dowelled base fixings for type 1 barriers shall be provided to conform to the details shown in Figure 1.

3.4 In precast units

3.4.1 Concrete safety barriers which comprise precast units installed on a regulating/bedding layer of low moisture content cement-sand mortar shall be constructed to the profiles, dimensions and tolerances shown in Figure 4, Figure 5 and Figure 7.

3.4.2 Precast units for use in the construction of concrete safety barriers shall be manufactured, handled, transported and stored in accordance with clause **5**.

3.5 Joints

Provision shall be made to accommodate contraction movement in in-situ installations at intervals which are appropriate to the amount of reinforcement that is used in the section.

NOTE 1 No additional measures will normally need to be taken to accommodate contraction movement in precast installations.

In all cases joints shall be provided to coincide with expansion or contraction joints in an underlying pavement or structure.

NOTE 2 No provision will normally be necessary to accommodate expansion movement in either precast or in-situ installations.

4 Materials

4.1 Concrete

4.1.1 *Air entrainment and mix design*. Concrete which is used for the construction of in-situ and precast safety barriers shall be air-entrained, and comply with the requirements of BS 5328 and shall be either:

a) a designed mix, or

b) a special prescribed mix.

4.1.2 *Strength and durability*. The concrete shall be C40 grade in accordance with Table 3 of BS 5328:1981.

4.1.3 *Cement content*. The minimum cement content shall be 330 kg/m^3 of fully compacted concrete.

4.1.4 *Water/cement ratio*. The ratio of free water to cement shall be a maximum of 0.5.

4.1.5 *Air content*. The air content of the concrete shall be 5 ± 1.5 % by volume.

4.1.6 *Lightweight concrete*. Where it is required to reduce dead-loading on structures, lightweight aggregate concrete with a density of at least 1 800 kg/m^3 shall be used.

4.2 Cement

The cement shall be either ordinary Portland or Portland-blastfurnace cement complying with the requirements of BS 12 or BS 146, respectively.

Coloured Portland cement shall comply with the physical requirements of BS 12.

4.3 Aggregates

4.3.1 *Quality*. Fine and coarse aggregates shall consist of either:

a) crushed or uncrushed materials complying with the requirements of BS 882 or BS 1047, or

b) lightweight (see **4.1.6**) coarse aggregate complying with the requirements of BS 877 or BS 3797.

4.3.2 *Maximum size*. The maximum size of the coarse aggregate shall be 20 mm.

4.4 Admixtures and pigments

4.4.1 *Air-entraining admixtures*. Concrete shall be air-entrained with an admixture which complies with the requirements of BS 5075-2.

4.4.2 *Accelerating admixtures*. Accelerating admixtures containing calcium chloride shall not be used.

4.4.3 *Water-reducing admixtures*. If water-reducing admixtures are used they shall comply with the requirements of BS 5075-1.

4.4.4 *Pigments*. Any colour pigments used in the concrete shall comply with the requirements of BS 1014.

4.5 Reinforcement

Reinforcement shall be provided as shown in the appropriate figures of this Part of BS 6579 and shall comply with the requirements of:

a) for bar reinforcement: BS 4449;

b) for fabric reinforcement: BS 4483;

c) for special reinforcement (see Figure 13, Figure 14 and Figure 16): grade 070M20 of BS 970-1:1983.

Immediately prior to placing the concrete the reinforcement shall be clean and free from loose scale, loose rust, oil and grease or other matter likely to impair the bond or mar the surface of the concrete.

4.6 Connectors

Prefabricated, reinforced threaded socket connectors manufactured from low carbon steel complying with the requirements of grade 070M20 of BS 970-1:1983 and to the dimensions shown in the appropriate figures of this Part of BS 6579 shall be firmly fixed in the required positions in the moulds of formwork prior to being cast into transition units.

4.7 Dowel bars

Dowel bars for base fixings shall be of low carbon steel complying with the requirements of grade 070M20 of BS 970-1:1983 and free from oil, paint, dirt, loose rust or scale. They shall be straight and free from burrs or other irregularities and the ends shall be either sawn or cold cropped in a way that does not deform the bars outside the normal diameter.

4.8 Testing of concrete

The sampling, making and curing of test specimens and the testing of fresh or hardened concrete shall be carried out in accordance with BS 1881.

5 Manufacture and handling of precast units

5.1 General

Precast units shall be manufactured to the profiles and dimensions given in the figures described as follows, subject to a tolerance of ± 0.5 % on all dimensions:

a) profile type 4 in conformity with Figure 6;

b) profile type 5 in conformity with Figure 7;

c) precast 3 m standard length unit in conformity with Figure 8;

d) precast 1 m long make-up unit in conformity with Figure 9;

e) details of base and end fixings for precast units in conformity with Figure 10;

f) precast termination unit in conformity with Figure 11;

g) precast transition unit: type 1 (for transition to double sided open box beam safety fence) in conformity with Figure 12;

h) connectors for precast transition unit: type 1 in conformity with Figure 13 or Figure 14, as appropriate;

i) precast transition unit: type 2 (for transition to tensioned rectangular hollow section beam safety fence) in conformity with Figure 15;

j) connectors for precast transition unit: type 2 in conformity with Figure 16.

5.2 Surface finish and colour

5.2.1 *Surface finish*. To provide a smooth finish of uniform appearance and colour, the units shall be cast in moulds which have an impervious surface.

5.2.2 *Colour*. Units shall be supplied:

a) preferably in natural colour, or

b) using coloured cement (see **4.2**), or

c) using coloured pigments (see **4.4.4**).

NOTE The colour requirements should be stated when submitting to a manufacturer an enquiry or an order (see Appendix B).

5.3 Casting and curing

5.3.1 *Casting and compaction*. Concrete for casting shall be transported, placed and compacted in accordance with **6.5** of BS 8110-1:1985. Units shall be cast in moulds of such a design and so constructed as to prevent any loss of fine material. The concrete shall be compacted by internal vibration and when placed into the moulds shall have a minimum temperature of 5 °C.

5.3.2 *Curing and removal from moulds*. The methods of curing and their duration shall be such as to ensure that the precast units remain undistorted and free from cracks and that the strength and durability of the concrete meets the requirement set out in **4.1.2**. Whilst in the moulds, the newly cast units shall be maintained at a temperature above 0 °C and shall not be removed from the moulds until the concrete has matured sufficiently to have attained a minimum compressive strength of 10 N/mm^2.

To prevent undue evaporation of moisture, upon being removed from the moulds all exposed surfaces of the units shall be covered with either impermeable sheeting or curing compound for a further minimum period of 4 days.

In cases where appearance is important the same method of curing shall be applied to each unit.

5.4 Cover to reinforcement

Reinforcement as shown in the appropriate figures of this Part of BS 6579 shall be positioned on the centre line of the units with a minimum depth of cover of 50 mm.

5.5 Handling, storing and transporting

After the initial curing period, units shall be handled, stored and transported in such a way as to prevent damage to them.

When delivered to site, the units shall be free from surface damage, cracks and reinforcement staining.

6 Marking of precast units

All precast units shall be marked on the top surface with the number and date of this Part of this British Standard (i.e. BS 6579-8:1987[1)]) and with the name, trade mark or other means of identification of the manufacturer.

[1)] Marking BS 6579-8:1987 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

Appendix A Vehicle safety fences and barriers for highways: type characteristics

Information on type characteristics is given in Table 1. Illustrations of fence and barrier types are given in Figure 20.

Table 1 — Safety fences and barriers: type characteristics

Type	Reference	Material	Type of support or mounting	Post spacing	Beam position mounting height	Single/ double sided	Tension/ untensioned T/UT	Design deflection	Design vehicle mass	Vehicle speed	Design angle of departure (max.)
				m	mm			mm	t	km/h (miles/h)	degrees
Corrugated beam[a]	TCB1	Steel	Z section steel post	3.2	Side 610	Single	T	1 000	1.5	113 (70)	8
Corrugated beam[a]	TCB2	Steel	Z section steel post	1.6	Side 610	Single	T	800	1.5	113 (70)	10
Corrugated beam	TCB3	Steel	Steel or timber post with offset	3.2	Side (inclined at 15°) 535	Double	T	800	1.5	113 (70)	10
Corrugated beam	TCB4	Steel	Single Z section steel post	3.2	Side 610	Double	T	800	1.5	113 (70)	10
Corrugated beam	UCB	Steel	Steel or timber posts with offsets	3.8 (max.)	Side 525	Single or double	UT		1.5	80 (50)	10
Rectangular hollow section 100 mm × 100 mm[b]	TRHS1	Steel	Single Z section steel post	3.2	Top 610	Both	T	1 000	1.5	113 (70)	10
Rectangular hollow section 200 mm × 100 mm	TRHS2	Steel	Single Z section steel post	3.2	Top or side 610	Both Single	T T	600 600	1.5	113 (70)	8
Open box beam	OB1	Steel	Z section steel post	2.4	Side 610	Single	UT	600	1.5	113 (70)	10
Open box beam	OB2	Steel	Z section steel post	2.4	Side 610	Double	UT	400	1.5	113 (70)	10
Open box beam (double height)[c]	OB3	Steel	Z section steel post	2.4	Side 610 and 1 020	Single	UT	1 000	5	80 (50)	15
Concrete barrier[a]	CSB	Concrete	Profiled barrier on continuous foundation	—	816 to top of concrete	Double	—	Zero	1.5	80 (50)	8

NOTE 1 Mounting heights quoted are to the centre of the beam above the adjacent carriageway level. If the horizontal distance from the beam traffic face to the carriageway exceeds 1 500 mm the height dimension of the beam centre line will relate to the surface immediately below.

NOTE 2 Design angle of approach of vehicle is 20° in each case.

NOTE 3 Beams THRS2 and OB1 may be mounted on steel brackets fixed to structures.

NOTE 4 Generally, double sided beams for dual carriageways on similar levels require only a single line of posts.

[a] May reduce dazzle when mounted in central reserve.

[b] Reduces extent of snow/sand drift. On dual carriageway central reserve has to be hardened.

[c] This type of safety fence will also satisfy the condition of a 1.5 t vehicle impacting at 20° and travelling at 113 km/h (70 miles/h).

Appendix B Information to be supplied by the purchaser

B.1 General enquiries

At least the following information should be provided when making an enquiry or order:

a) the choice of method of construction (see **3.1**);

b) the type of profile required;

c) the length of barrier required;

d) requirements as regards transition and termination units.

B.2 Ordering precast units

The following information should be provided when submitting to a manufacturer an enquiry or an order for precast units to the requirements of this Part of BS 6579:

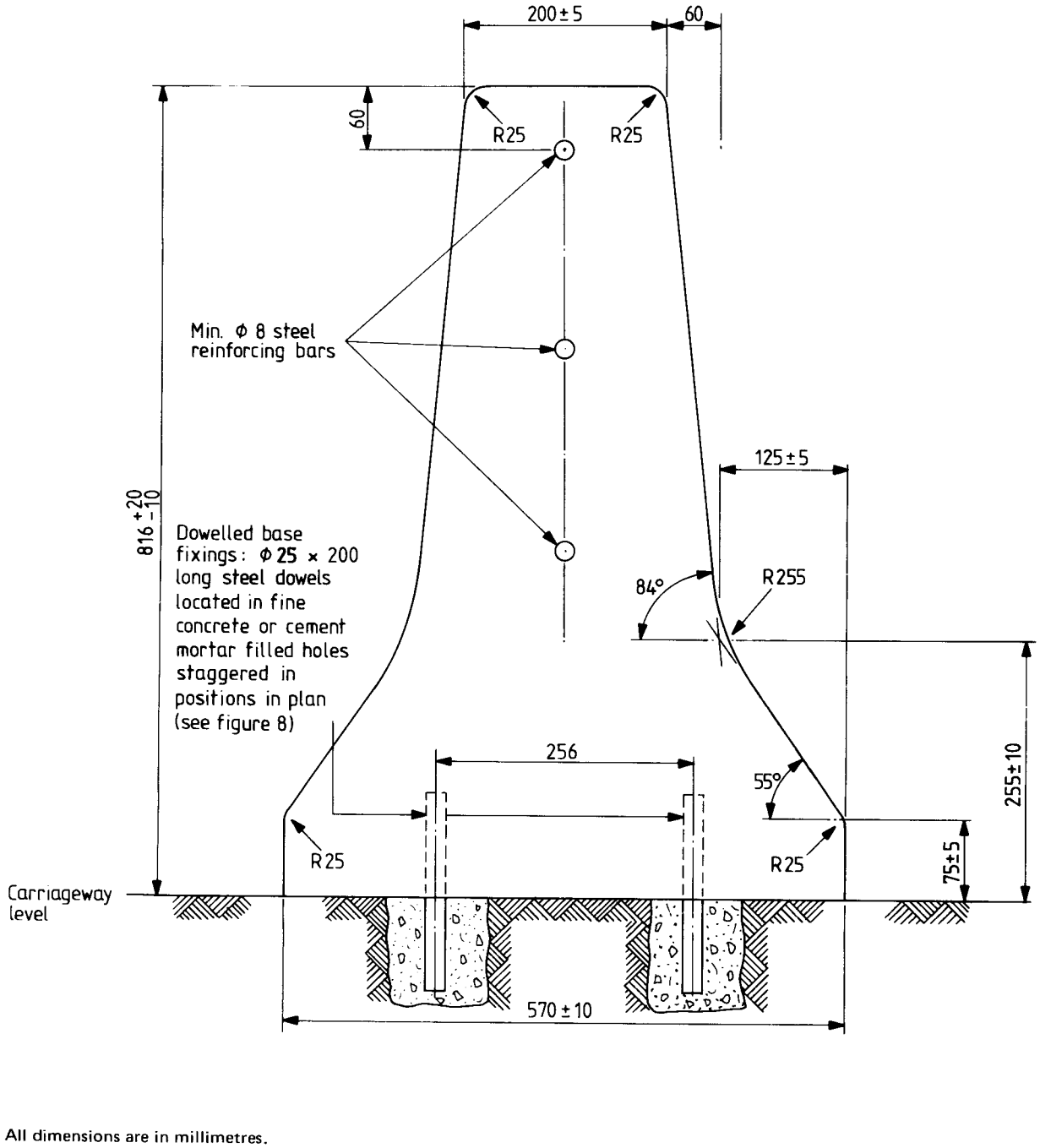
a) the type and profile of safety barrier units required together with the reference number of the figure (or figures) which apply;

b) the number of standard length units (3 m) and the number of make-up units (1 m) required;

c) the number and type of termination units required;

d) the number and type of transition units required;

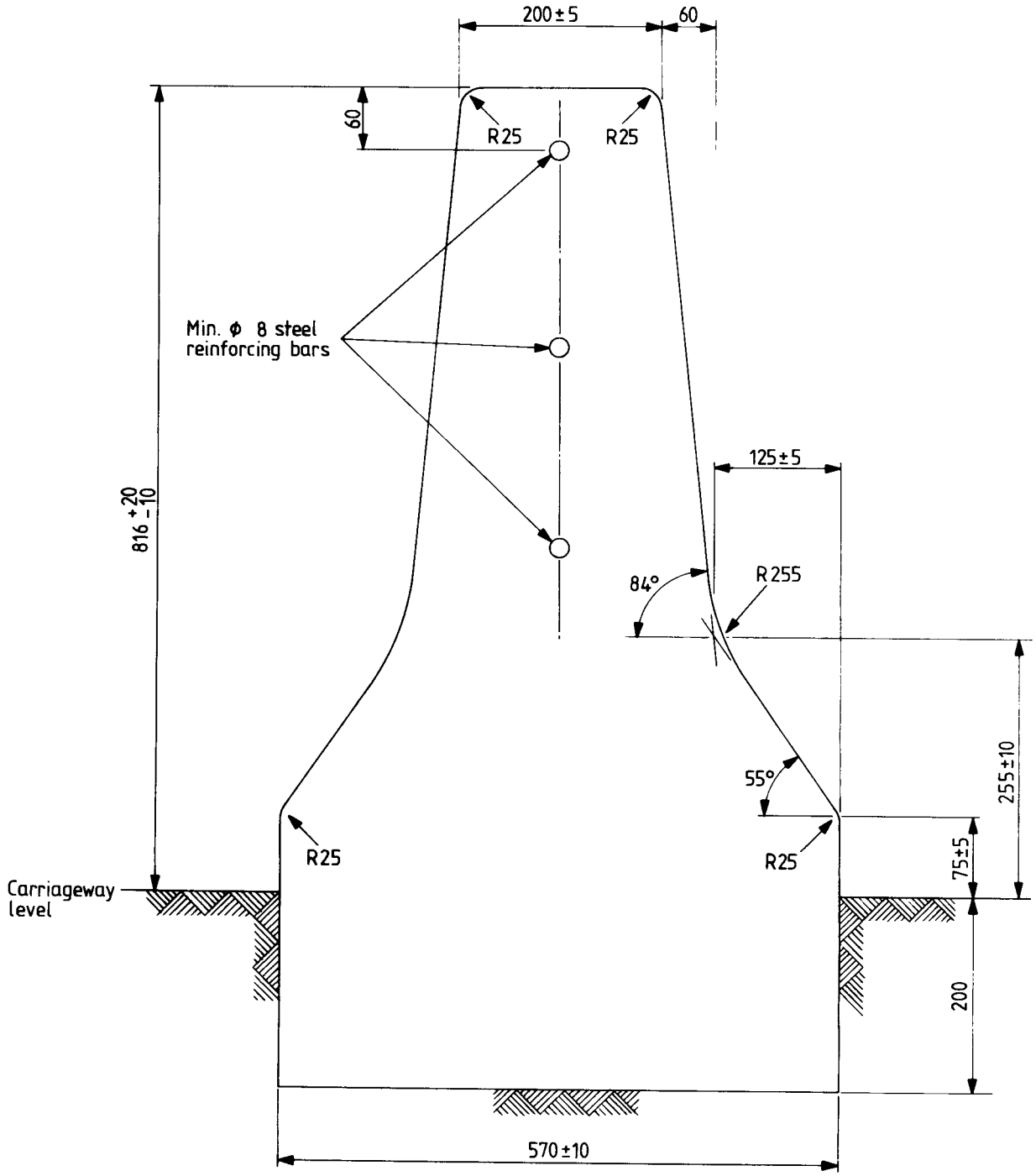
e) the colour requirements (see **5.2.2**).



All dimensions are in millimetres.

NOTE Details of installation are indicative only and are not part of the standard.

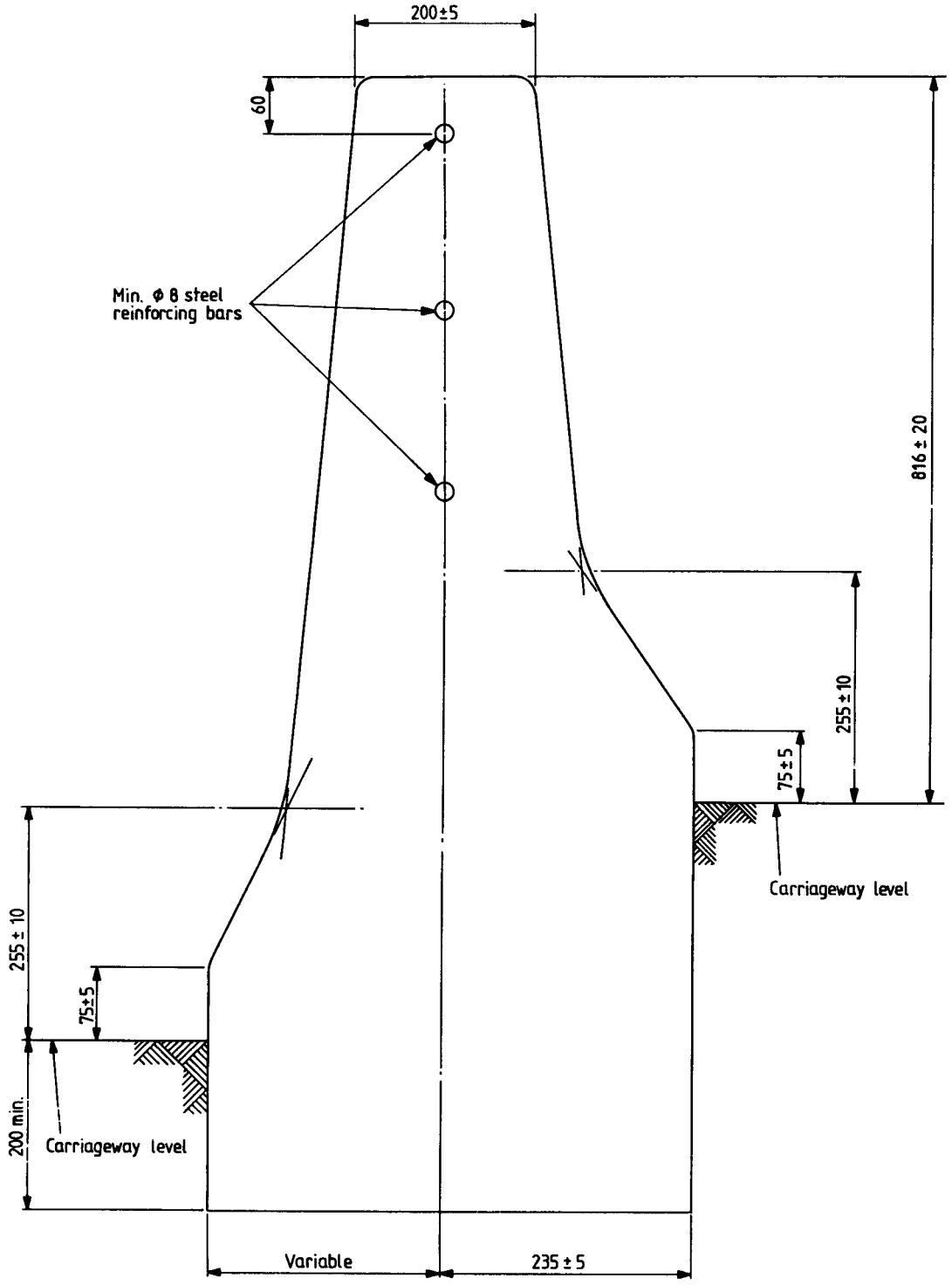
Figure 1 — Profile type 1: in-situ



All dimensions are in millimetres.

NOTE Details of installation are indicative only and are not part of the standard.

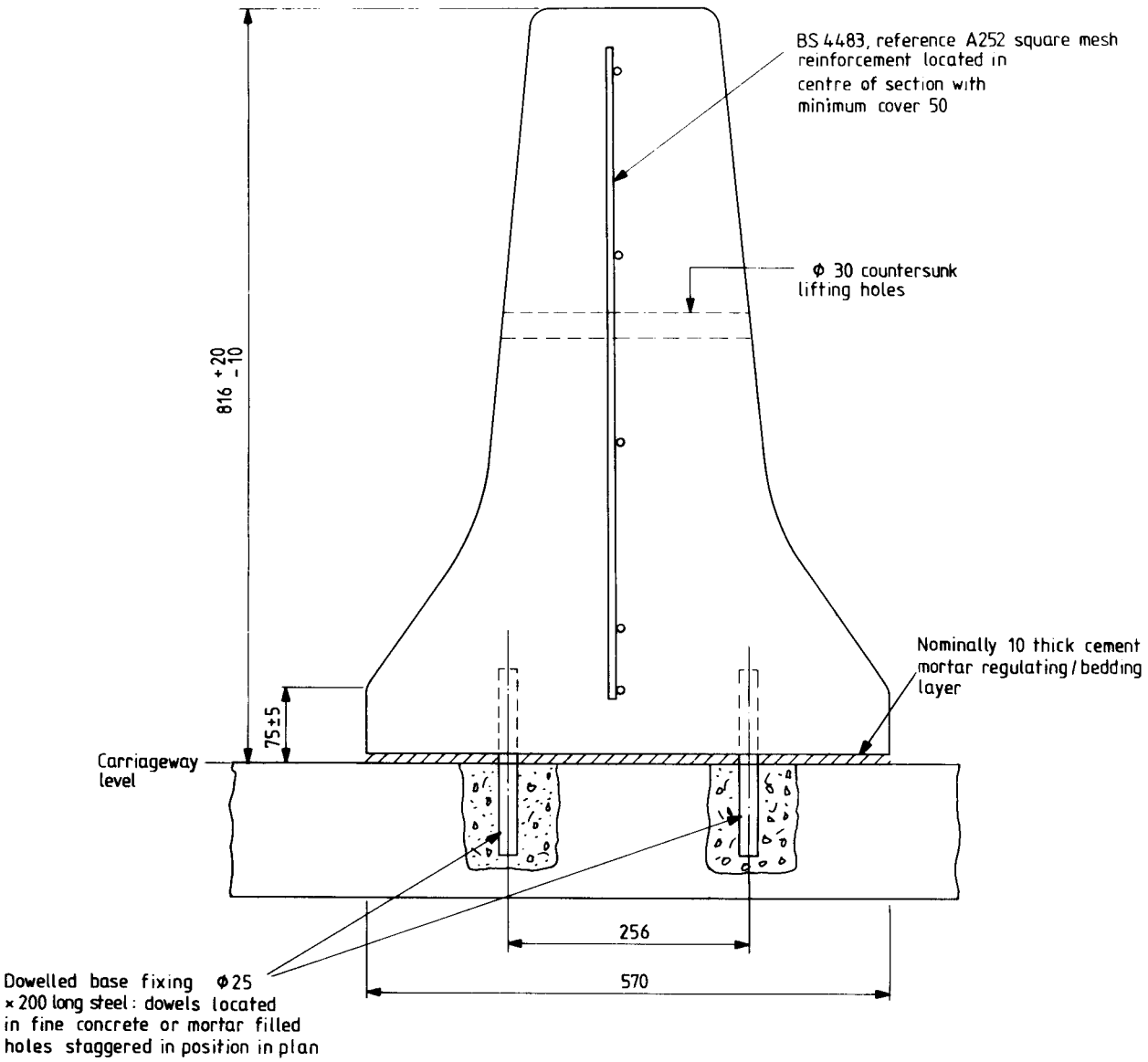
Figure 2 — Profile type 2: in-situ



All dimensions are in millimetres.

NOTE 1 Details of installation are indicative only and are not part of the standard.
NOTE 2 Structural reinforcement to be provided throughout the full height of the section where the difference in level between two carriageways requires it.
NOTE 3 Additional reinforcement to be provided where necessary.

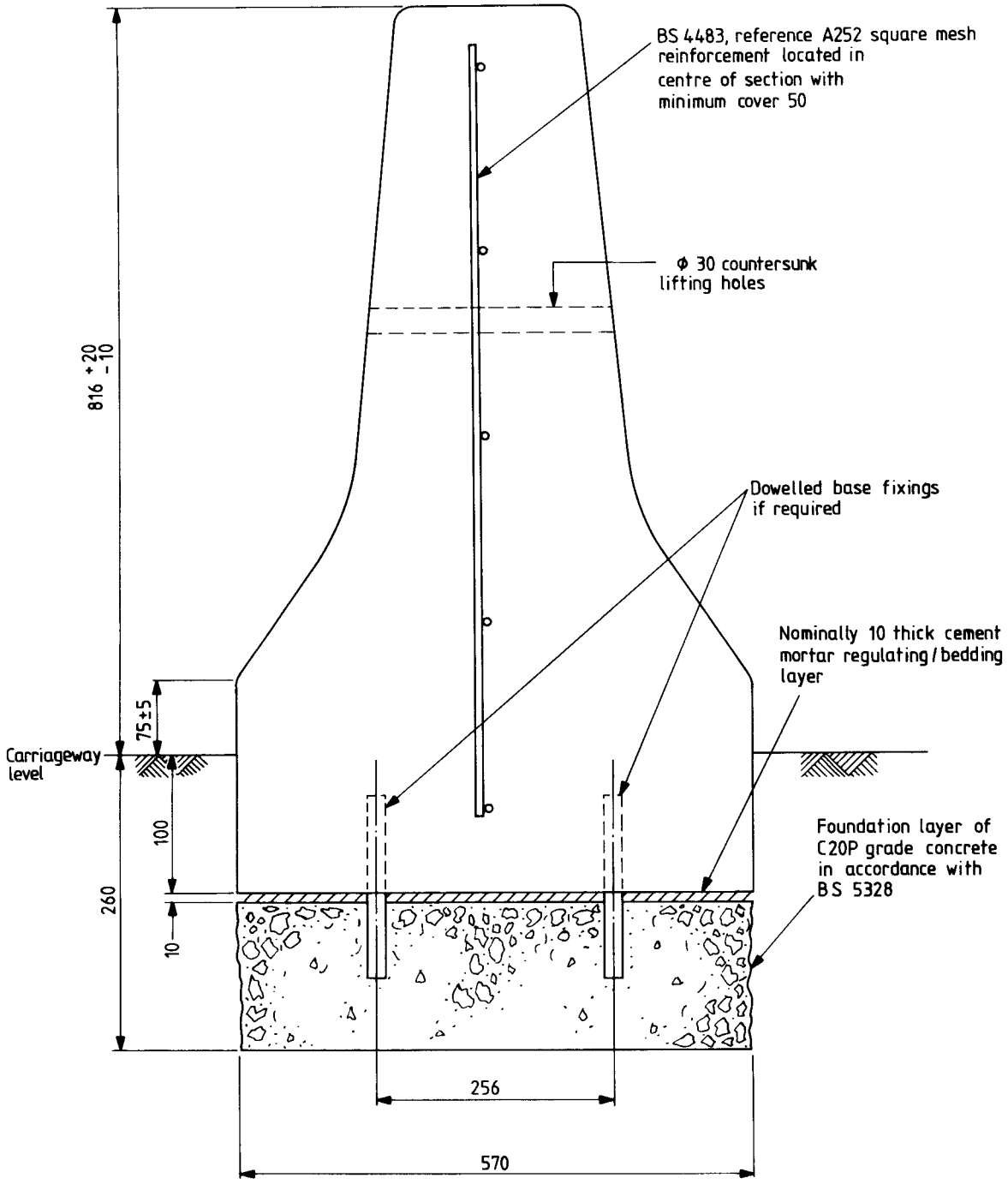
Figure 3 — Profile type 3: in-situ split level



All dimensions are in millimetres.

NOTE Details of installation are indicative only and are not part of the standard.

Figure 4 — Profile type 4: precast units installed



All dimensions are in millimetres.

NOTE Details of installation are indicative only and are not part of the standard.

Figure 5 — Profile type 5: precast units installed

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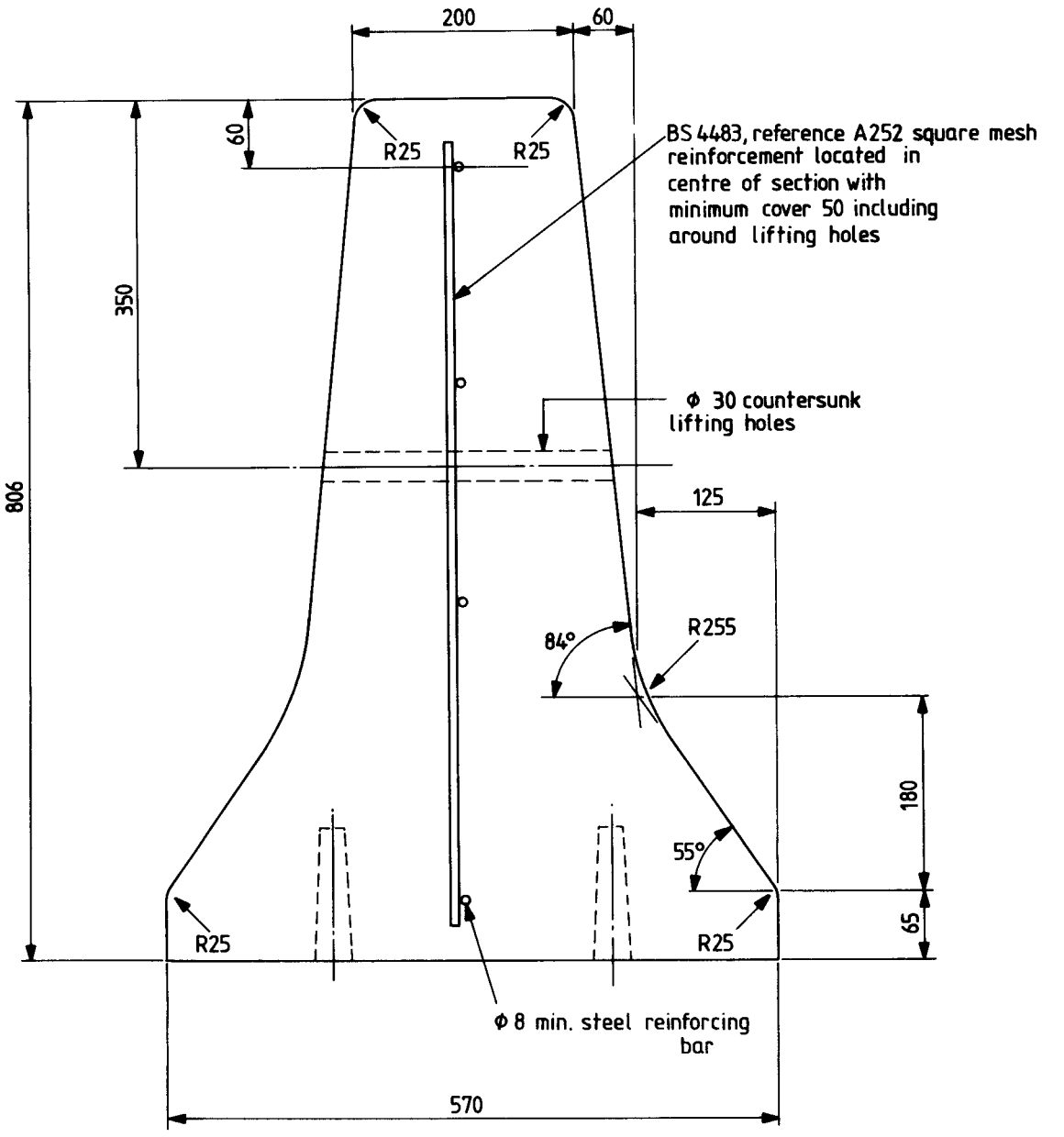
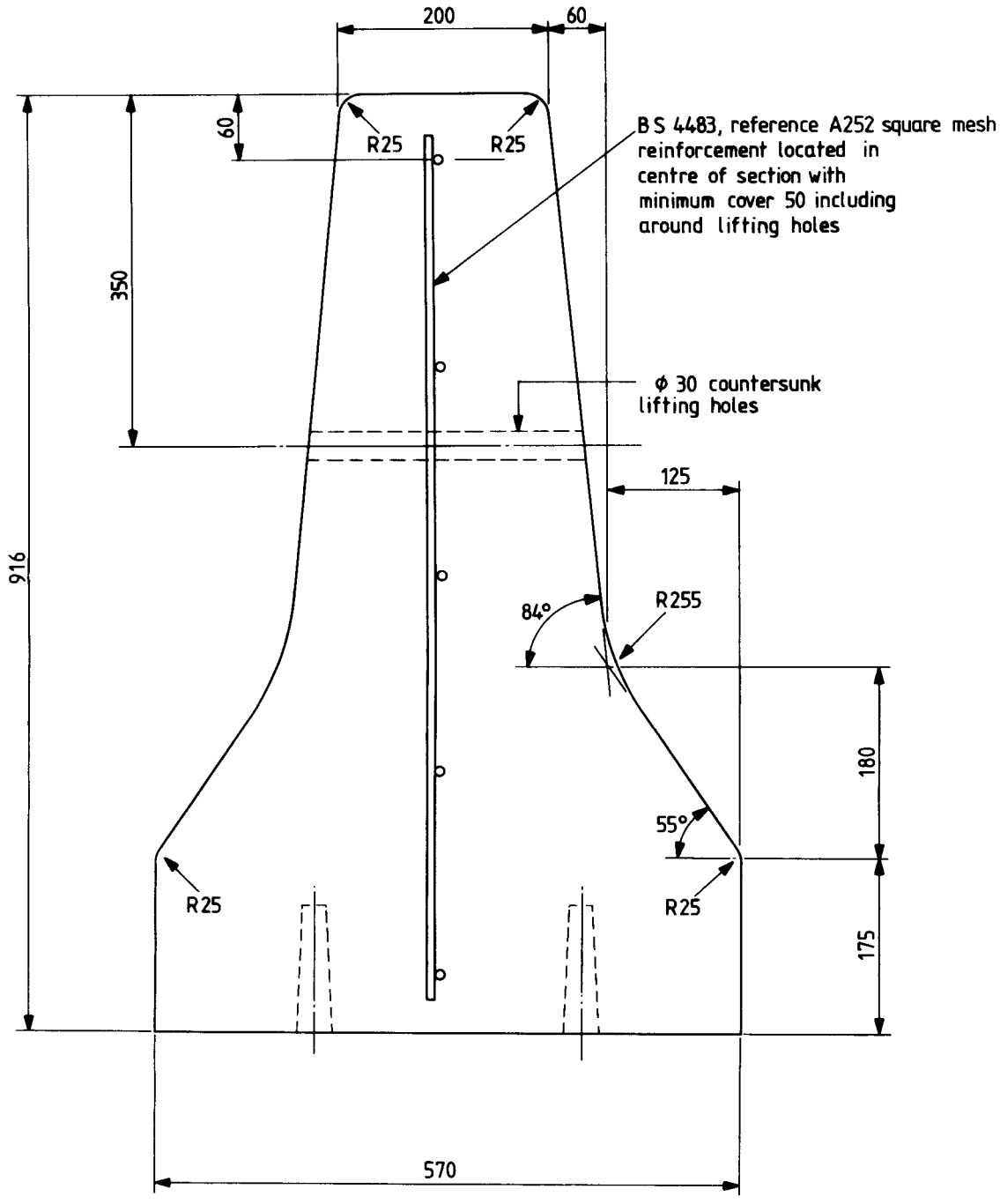


All dimensions are in millimetres.

NOTE For manufacturing tolerance see **5.1**.

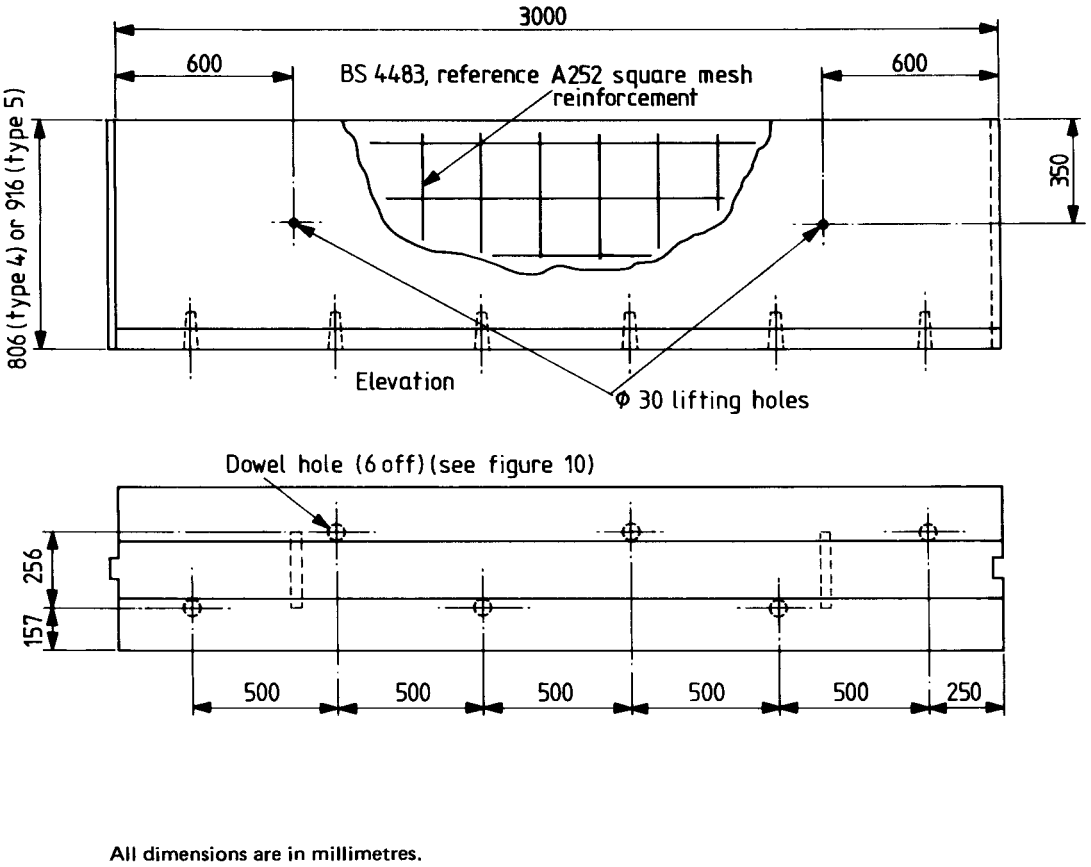
Figure 6 — Profile type 4: precast unit



All dimensions are in millimetres.

NOTE For manufacturing tolerance see **5.1**.

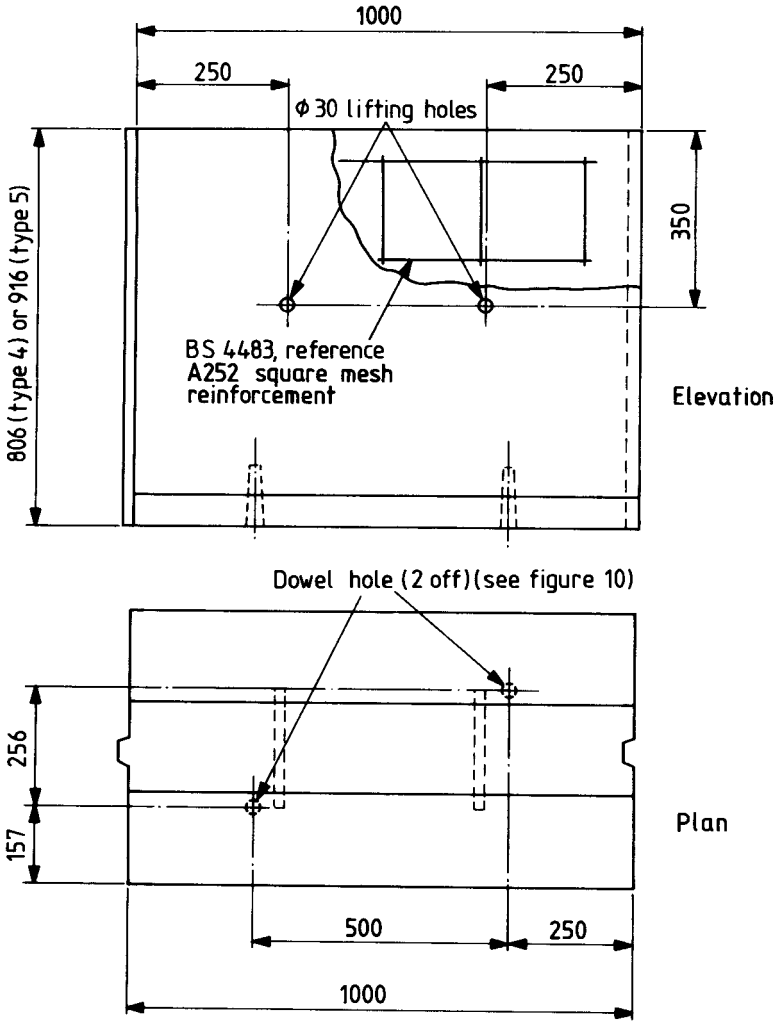
Figure 7 — Profile type 5: precast unit



All dimensions are in millimetres.

NOTE For manufacturing tolerance see **5.1**.

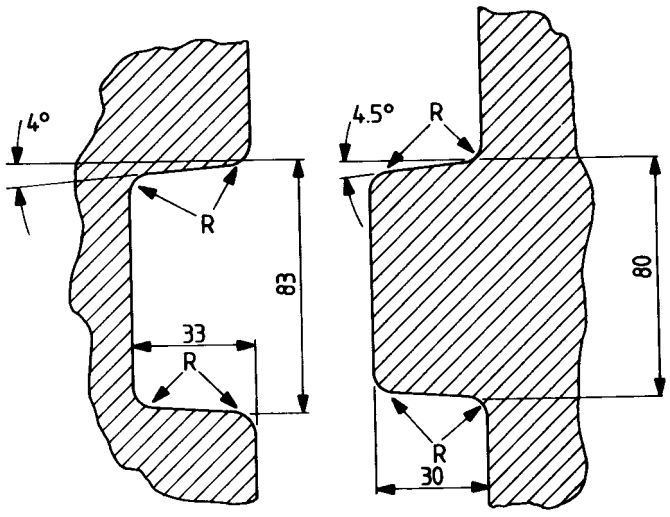
Figure 8 — Precast 3 m standard length unit



All dimensions are in millimetres.

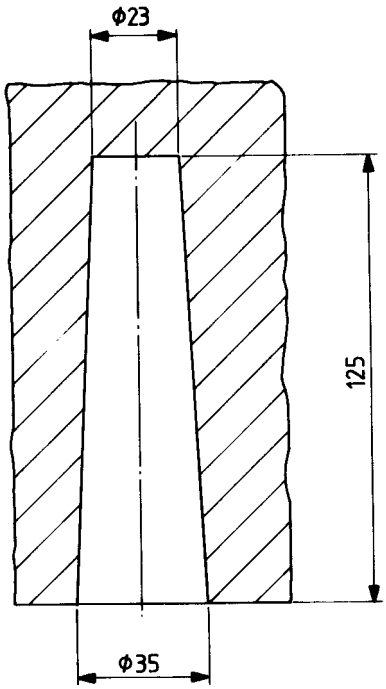
NOTE For manufacturing tolerance see **5.1**.

Figure 9 — Precast 1 m long make-up unit



Vertical joint

Note: All rad. 5

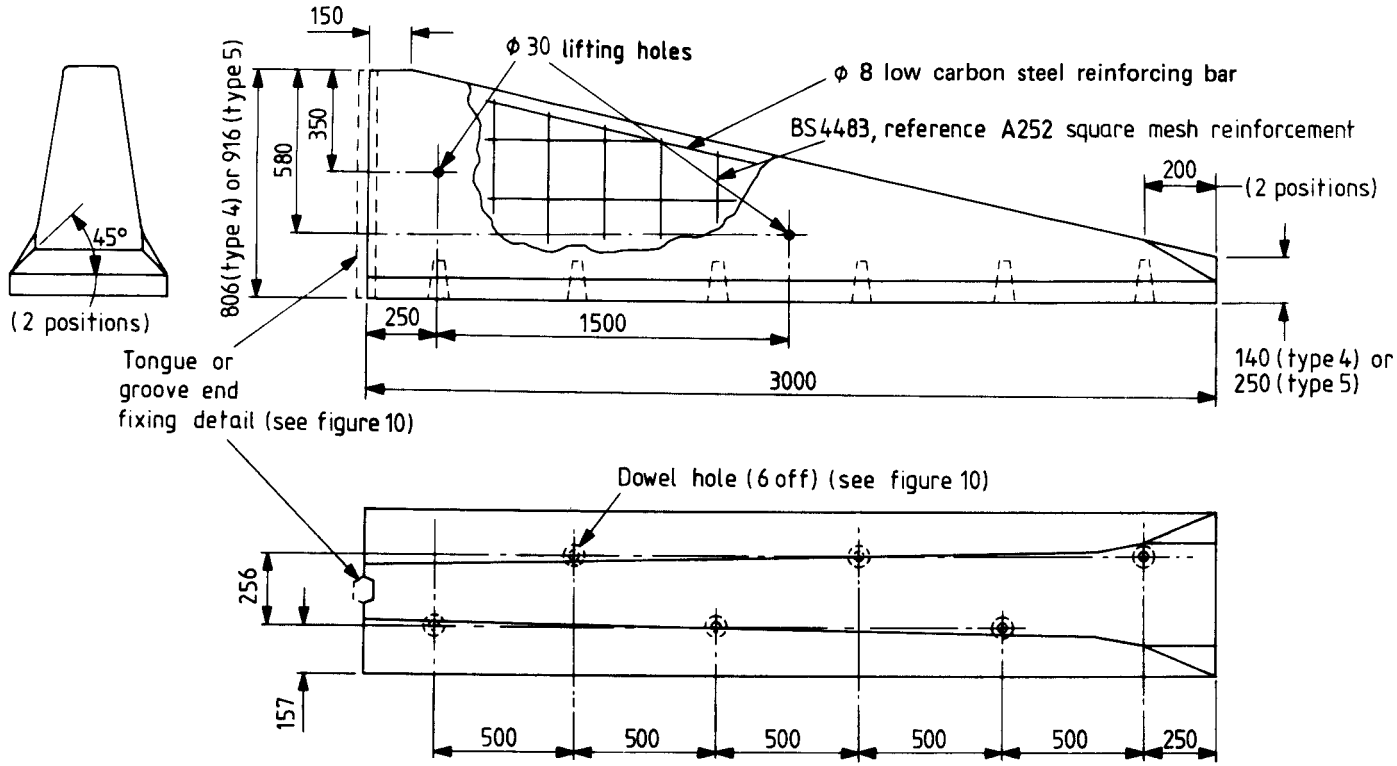


Dowel hole

All dimensions are in millimetres.

NOTE 1 All radii are 5 mm. Taper is the same for both sides.
NOTE 2 For manufacturing tolerance see **5.1**.

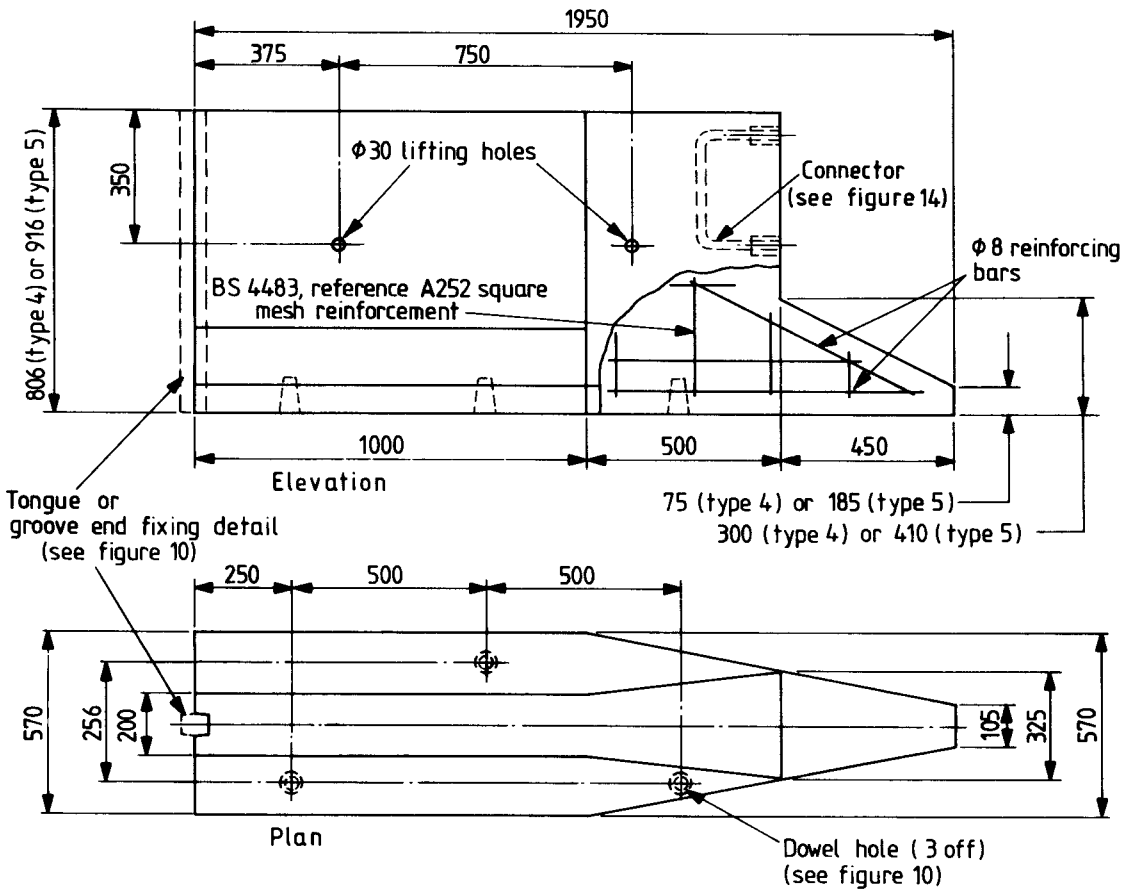
Figure 10 — Details of base and end fixings for precast units



All dimensions are in millimetres.

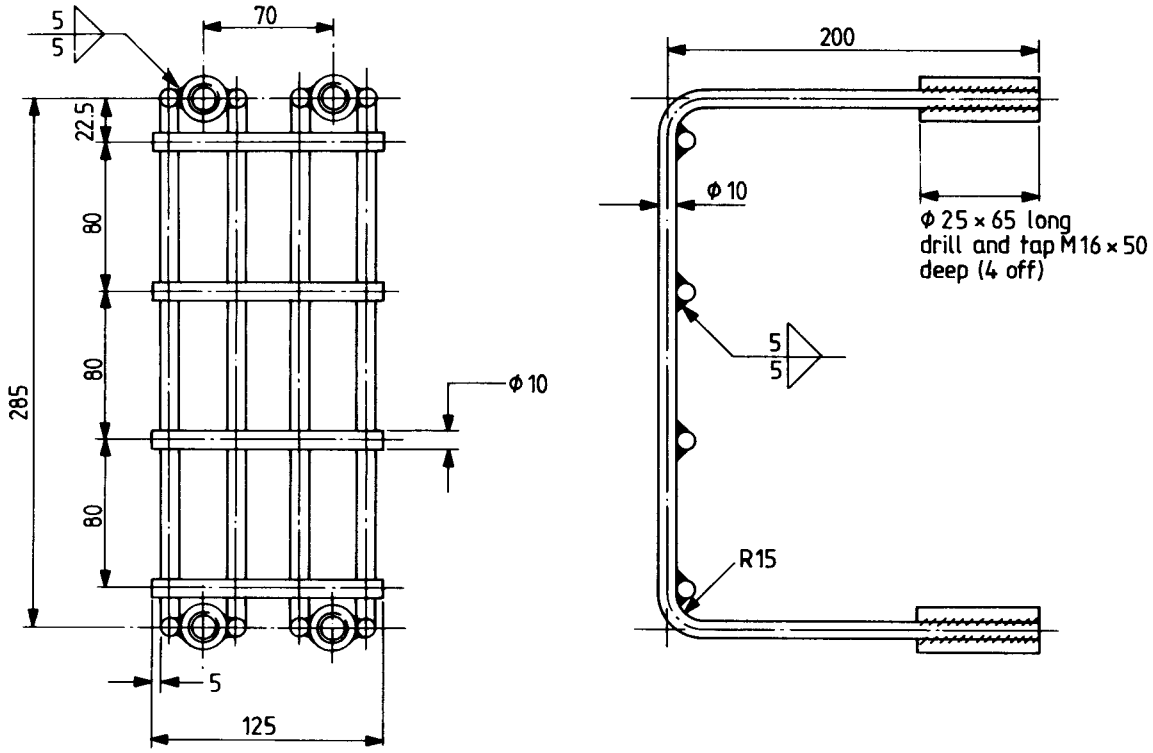
NOTE For manufacturing tolerance see **5.1**.

Figure 11 — Precast termination unit



All dimensions are in millimetres.

Figure 12 — Precast transition unit: type 1 (for transition to double sided open box beam safety fence)



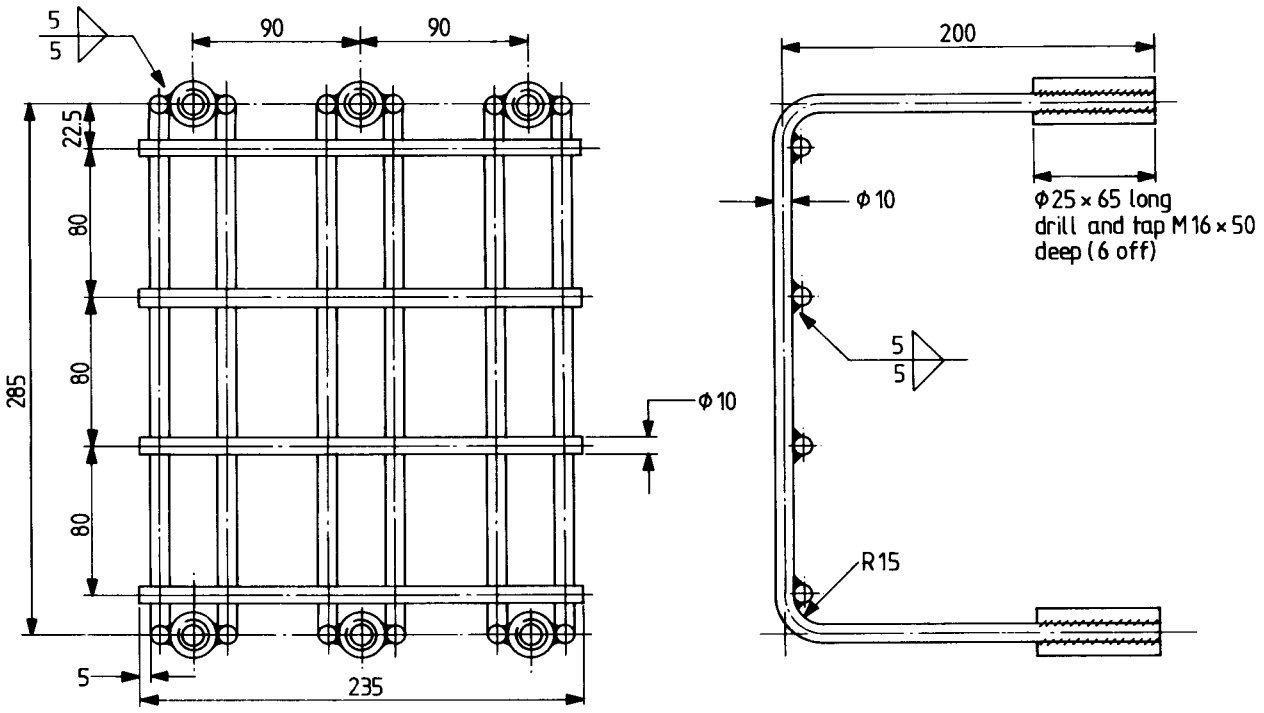
All dimensions are in millimetres.

NOTE 1 Low carbon steel to grade 070M20 of BS 970-1.

NOTE 2 Galvanize to BS 729.

NOTE 3 Weld symbols to BS 499.

Figure 13 — Connector for precast transition unit: type 1 to single sided open box beam safety fence



All dimensions are in millimetres.

NOTE 1 Low carbon steel to grade 070M20 of BS 970-1.

NOTE 2 Galvanize to BS 729.

NOTE 3 Weld symbols to BS 499.

Figure 14 — Connector for precast transition unit: type 1 to double sided open box beam safety fence

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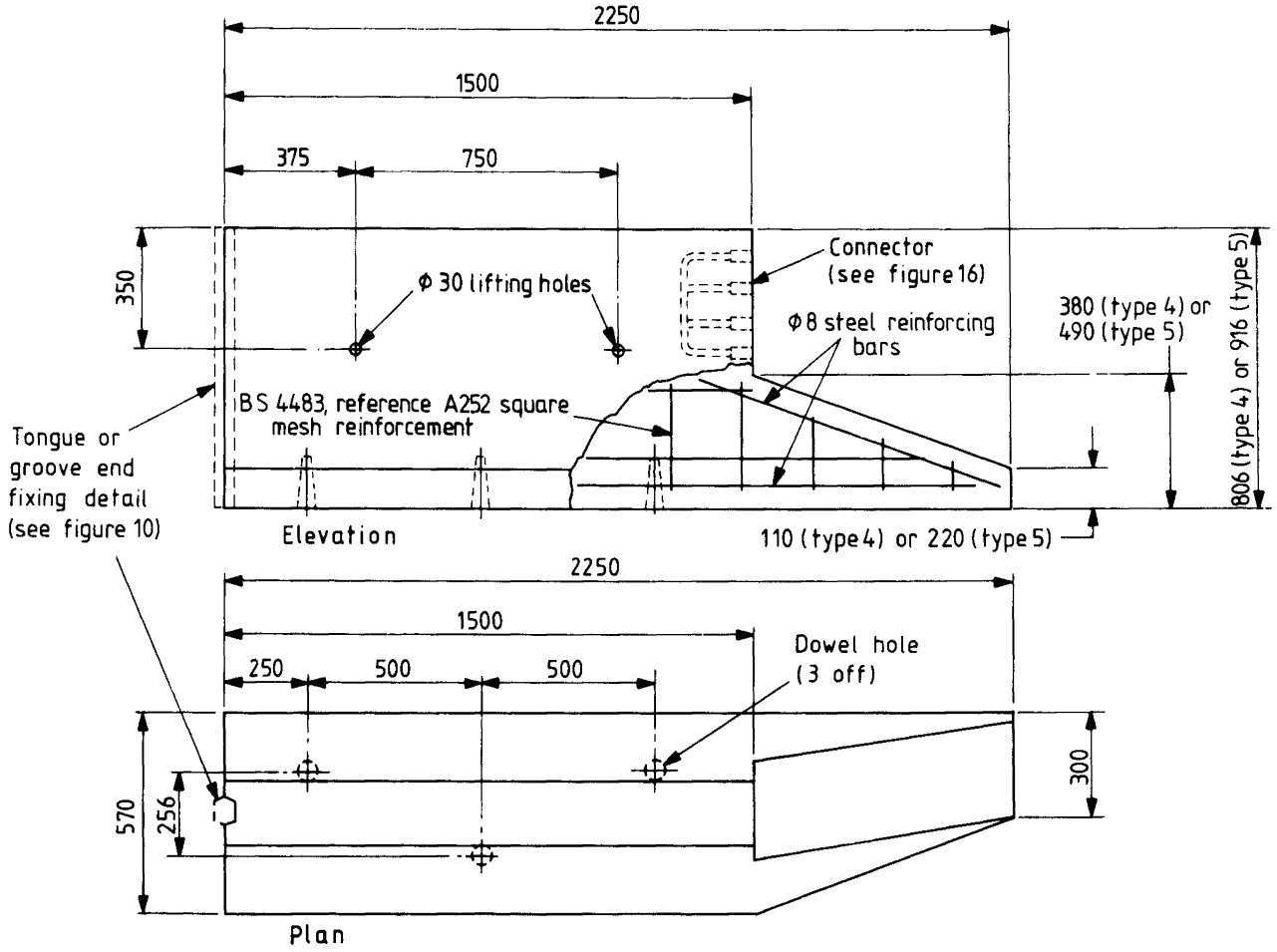
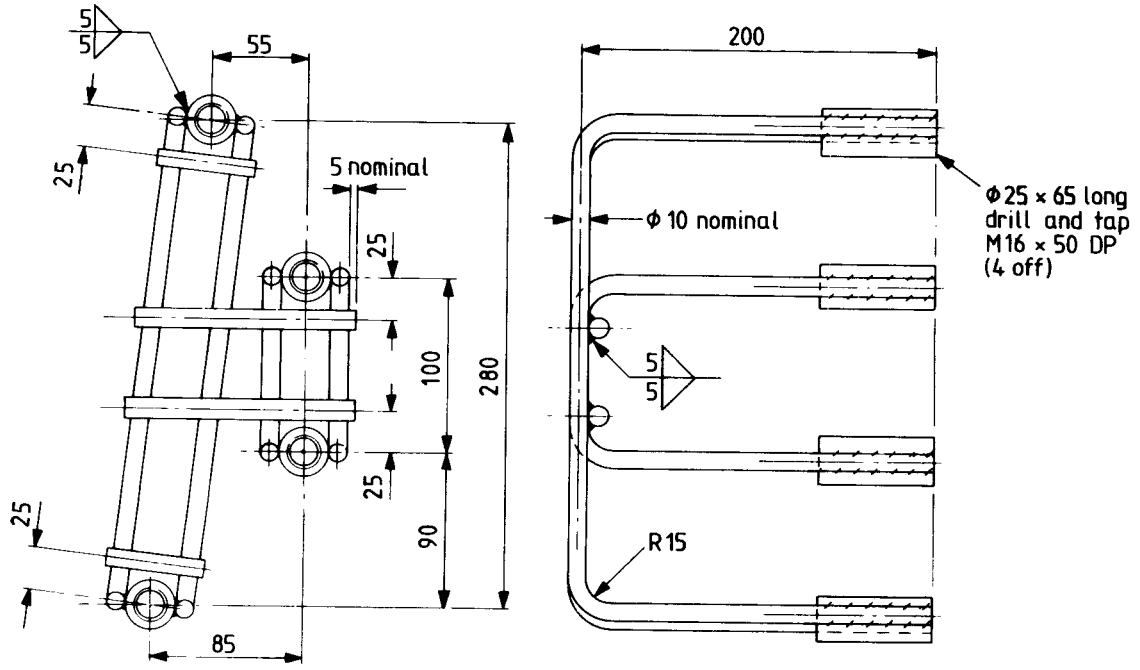


All dimensions are in millimetres.

NOTE For manufacturing tolerance see **5.1**.

Figure 15 — Precast transition unit: type 2 (for transition to 200 mm × 100 mm tensioned rectangular hollow section beam safety fence)



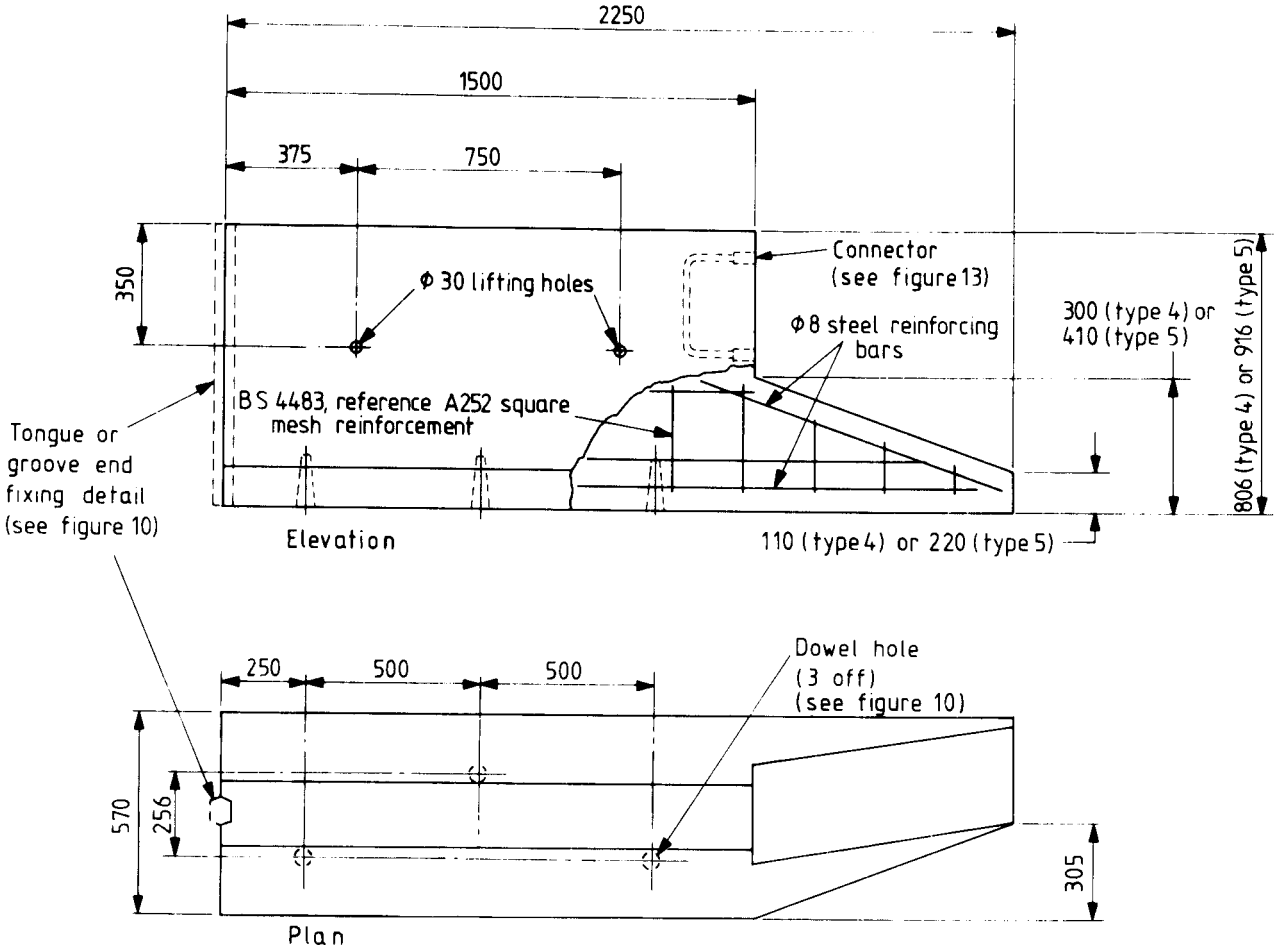
All dimensions are in millimetres.

NOTE 1 Low carbon steel to grade 070M20 of BS 970-1.

NOTE 2 Galvanize to BS 970-1.

NOTE 3 Weld symbols to BS 499.

Figure 16 — Connector for precast transition unit: type 2 (for transition to tensioned rectangular hollow section beam safety fence)



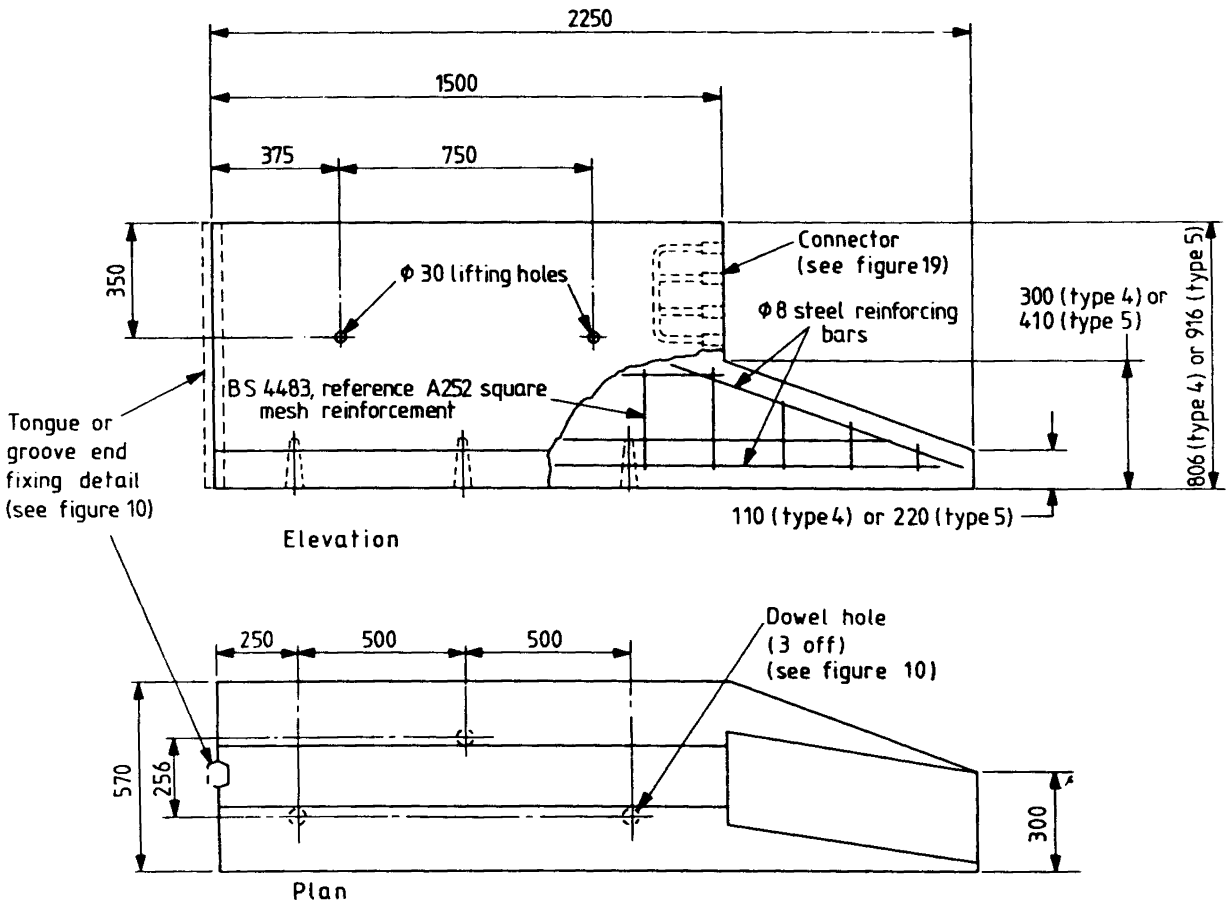
All dimensions are in millimetres.

NOTE 1 For manufacturing tolerances see **5.1.**

NOTE 2 The figure shown is applicable to verge departure situation.

NOTE 3 The verge approach situation requires the opposite hand to that shown.

Figure 17 — Precast transition unit: type 3 (for transition to single sided open box beam safety fence)

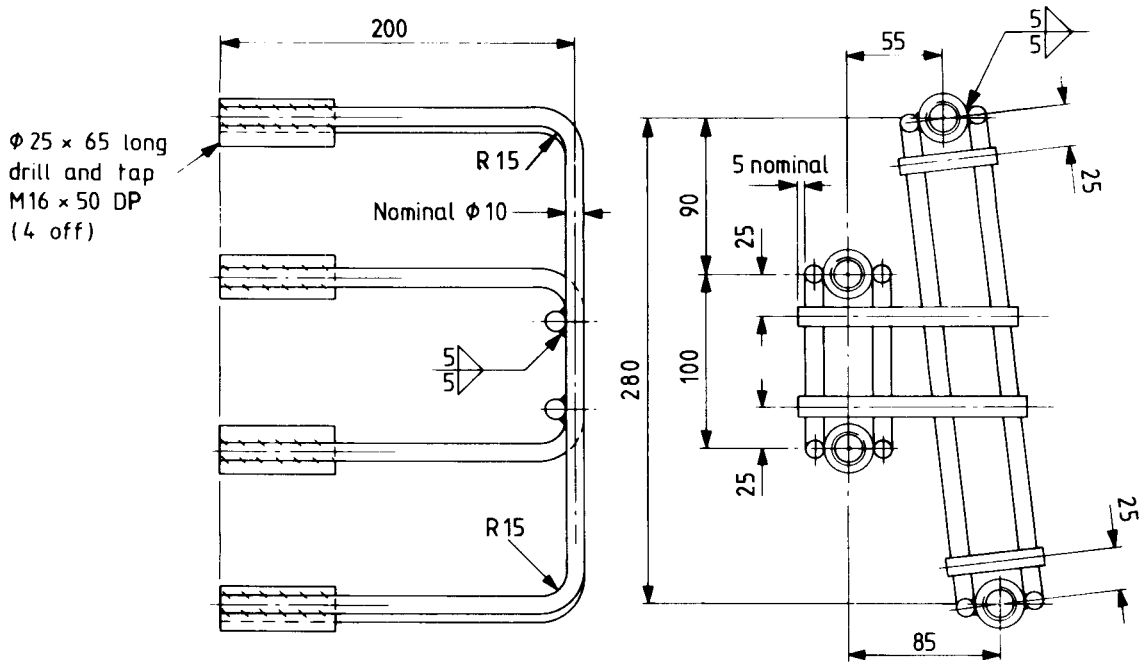


All dimensions are in millimetres.

NOTE 1 For manufacturing tolerances see **5.1**.

NOTE 2 The figure shown is applicable to verge approach situation.

Figure 18 — Precast transition unit: type 4 (for transition to 200 mm × 100 mm tensioned rectangular hollow section beam safety fence)



All dimensions are in millimetres.

NOTE 1 Low carbon steel to grade 070M20 of BS 970-1.

NOTE 2 Galvanized to BS 729.

NOTE 3 Weld symbols to BS 499.

Figure 19 — Connector for precast transition unit: type 4 (for transition to tensioned rectangular hollow section beam safety fence)

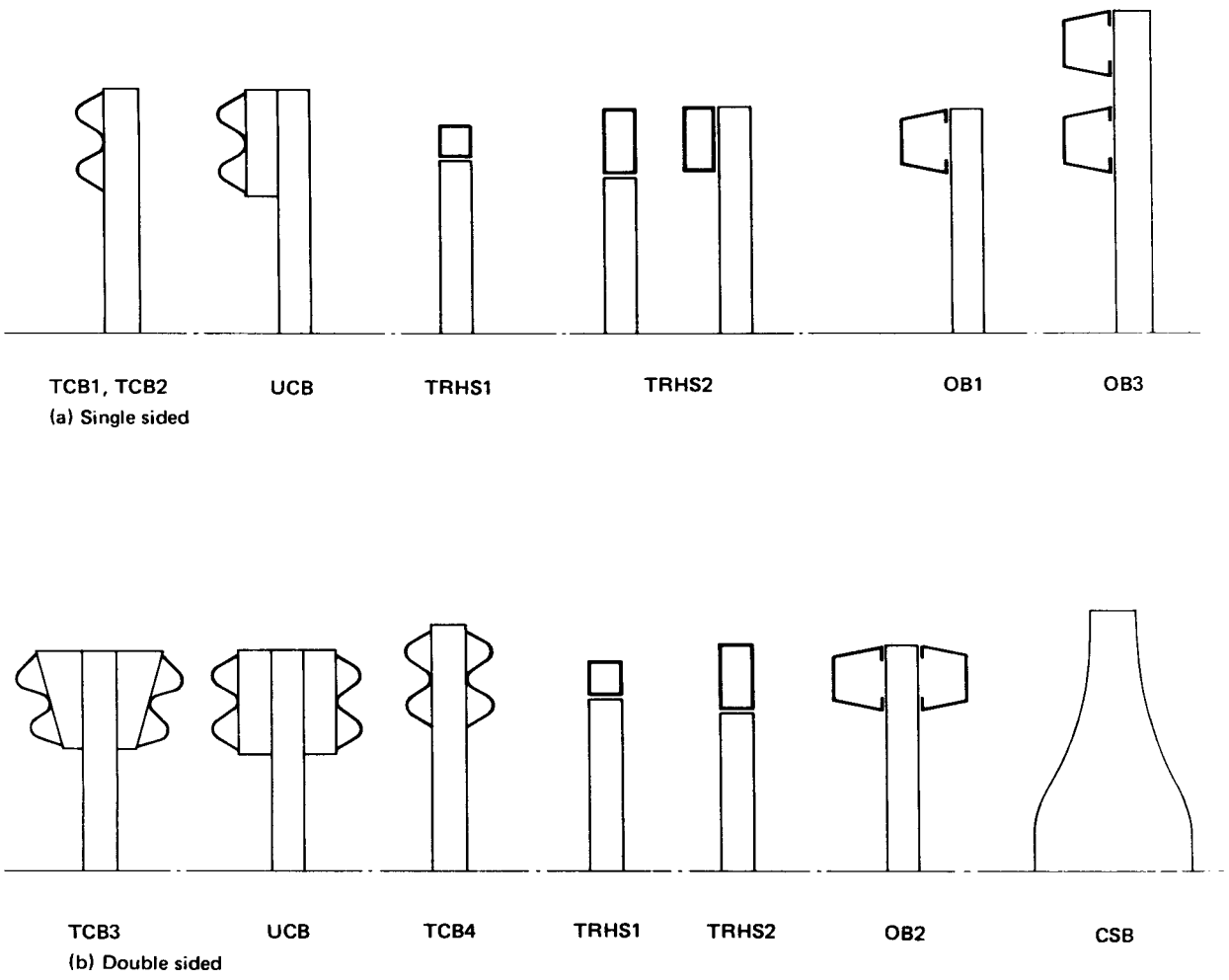


Figure 20 — Diagramatical representation of fences and barriers

Publications referred to

BS 12, *Specification for ordinary and rapid-hardening Portland cement.*

BS 146, *Specification for Portland-blastfurnace cement.*

BS 499, *Welding terms and symbols.*

BS 729, *Specification for hot dip galvanized coatings on iron and steel articles.*

BS 877, *Specification for foamed or expanded blastfurnace slag lightweight aggregate for concrete.*

BS 882, *Specification for aggregates from natural sources for concrete.*

BS 970, *Specification for wrought steels for mechanical and allied engineering purposes.*

BS 970-1, *General inspection and testing procedures and specific requirements for carbon, carbon manganese, alloy and stainless steels.*

BS 1014, *Specification for pigments for Portland cement and Portland cement products.*

BS 1047, *Specification for air-cooled blastfurnace slag aggregate for use in construction.*

BS 1881, *Testing concrete.*

BS 3797, *Specification for lightweight aggregates for concrete.*

BS 4449, *Specification for hot rolled steel bars for the reinforcement of concrete.*

BS 4483, *Specification for steel fabric for the reinforcement of concrete.*

BS 5075, *Concrete admixtures.*

BS 5075-1, *Specification for accelerating admixtures, retarding admixtures and water reducing admixtures.*

BS 5075-2, *Specification for air-entraining admixtures.*

BS 5328, *Methods for specifying concrete, including ready-mixed concrete.*

BS 5931, *Code of practice for machine laid in-situ edge details for paved areas.*

BS 6779, *Parapets for vehicle containment on highways.*

BS 8110, *Structural use of concrete.*

BS 8110-1, *Code of practice for design and construction.*

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