BRITISH STANDARD

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Amendment No. 1

Road lighting

Part 4. Code of practice for lighting for single-level road junctions including roundabouts

Committees responsible for this British Standard

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British Lighting Association for the Preparation of Standards (Britlaps)
British Precast Concrete Federation Ltd.
Chartered Institution of Building Services Engineers
Council for the Protection of Rural England
County Surveyors' Society
Department of Transport
Institution of Civil Engineering Surveyors
Institution of Civil Engineers
Institution of Electrical Engineers
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Foreword

This Part of BS 5489 has been prepared under the direction of the Electrical Illumination Standards Policy Committee and is a new edition of BS 5489 : Part 4 : 1987 which is withdrawn.

This Part gives recommendations for the lighting of single-level road junctions and roundabouts. Lighting for grade-separated junctions is described in BS 5489 : Part 5. Both roundabouts and other junctions require special treatment because of the risks arising from conflicting traffic movements and they call for great care in their design. It is necessary to study the kerb lines and the points of confusion or possible collision and to provide suitable lighting to reveal them. As local conditions vary widely, these recommendations should be adapted to suit the geometry of the junction or roundabout and the surrounding environment.

BS 5489 : Part 4 : 1987 brought the Part more into line with international road lighting philosophy. It provided for major/minor priority junctions which were introduced, with some changes of layout, and also for the introduction of priority to traffic on the immediate right of drivers approaching the give-way line of the entry to a roundabout, except where otherwise indicated. The principles applied to lighting the simple form of junctions are applied in a similar way to modern junction layouts.

This edition incorporates editorial improvements and a revision to **8.6** but it does not reflect a full review or revision of the standard, which will be undertaken in due course.

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

Section 1. General

1 Scope

This Part of BS 5489 gives recommendations for the lighting of junctions at grade (single-level), including major/minor priority junctions where at least one road is lit as a traffic route in accordance with BS 5489 : Part 2, and for junctions where lighting is provided on otherwise unlit traffic routes. It also includes recommendations for the general arrangement of lighting, siting, height of columns and choice of luminaire types.

For junctions, luminance-based recommendations are made in relation to those luminance provisions applying along routes linking to form the junction. Recommendations for roundabouts are expressed in illuminance terms in consideration of the wider range of dimensional road design and the application of alternative types of lighting equipment.

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 5489 the definitions given in BS 5489 : Part 1 apply, together with the following.

2.1 at grade double mini roundabout

Two mini roundabouts at an at grade junction that are either connected by a short link road or are contiguous.

2.2 at grade junction

Road junction at which no road passes over another.

2.3 central reserve

Area that separates the carriageways of a dual-carriageway road.

2.4 diverging lane

Auxiliary traffic lane tapered to allow turning traffic to approach a junction without impeding through traffic.

2.5 fork junction

At grade junction of two roads, at which the major road deviates from a straight path at the junction with the minor road.

2.6 ghost island

Area marked on the carriageway, generally at a road junction, shaped and located so as to direct traffic movement.

2.7 gyratory system

Road system to enable traffic from several roads to pass around a large central area using priority junctions, mini roundabouts or traffic signals at intersections.

2.8 mini roundabout

Road junction that has one way movement of traffic round a ghost island or small traffic island.

2.9 mini roundabout at T junction

T junction with a mini roundabout at the intersection of two roads.

2.10 refuge

Raised platform or a guarded area so sited in the carriageway as to divide the streams of traffic and to provide a safety area for pedestrians.

2.11 right-turn lane

Diverging lane for traffic turning right.

2.12 roundabout

Road junction that has a one-way movement of traffic round a traffic island.

2.13 staggered junction

At grade junction of three roads at which the major road is continuous through the junction and the minor roads connect with the major road so as to form two opposed T junctions.

2.14 T junction

At grade junction of two roads, at which the minor road joins the major road at right angles approximately.

2.15 traffic island

Raised area on the carriageway, generally at a road junction, shaped and located so as to direct traffic movement.

2.16 Y junction

At grade junction of two roads, at which the minor road joins the major road at an oblique angle and terminates at the junction.

Section 2. Lighting of single-level junctions

3 General

Road junctions present difficulties in choice of the best positions for the luminaires to reveal both the layout of the junction and the movement of the traffic, particularly where the widths of the entry roads may necessitate excessive spacing. A high standard of lighting is particularly important at junctions where the traffic is channelled to ensure effective working.

4 Functions of lighting

The lighting should reveal, within prescribed glare limits, the existence of the junction, the positions of the kerbs and road markings, the directions of the roads, the presence of any pedestrians or obstructions, and the movement of any vehicles in the vicinity of the junction.

It is not a primary function of the lighting to indicate the routeing of the traffic. Where possible, however, the lighting should be arranged to assist such routeing and it is important that the installation should not mislead drivers. The choice of the positions for the lighting columns should be made after consideration of the lines of traffic flow, the sight lines for merging flow and the areas of possible collisions.

The lighting at a junction should be related to the need of drivers approaching the junction to see vehicles approaching from other directions. However, it is not generally necessary to provide separate luminaires for each of the sight lines and compromise positions may be chosen to suit the road layout and traffic conditions. Care should be taken not to discard luminaires particularly sited to reveal features at junctions.

NOTE. Layouts shown in figures 4(a), 4(b), 5(a) and 5(b) give examples of spacing and positions chosen to provide lighting which is adequate both in quantity and quality to reveal road obstructions and traffic movements either by positive or negative (reverse silhouette) luminance contrasts.

The luminance, on the carriageway, throughout a junction should be not less than the luminance provided on the main roads leading to the junction.

If the number of points of conflict between the traffic streams is reduced by traffic signals, the precise choice of the positions for the luminaires indicated in clause 5 may not be quite so important. Care should, however, be taken that the standard of lighting at the junction is not thereby reduced.

5 Particular types of junction

5.1 General

The design and quality of the lighting should be not only related to its functions, as indicated in clause 4 but, also, to the traffic importance of the junction.

In principle a luminaire is needed just beyond each junction on the nearside and this may be the only requirement at junctions of minor traffic importance. Where there is a turning movement of traffic from an approach road it is also desirable to place a luminaire opposite the approaching traffic. At junctions where gradual changes of direction occur, such as Y and fork junctions, the arrangement of lighting should be considered together with the recommendations for siting luminaires on bends given in clause 9 of BS 5489 : Part 2 : 1992. Isoluminance templates may give guidance for junctions such as these.

NOTE 1. Wide and complicated junctions such as the example given in figure 8 may call for closer spacing or for an opposite arrangement of lighting columns in the vicinity of the junction. Higher mounting heights with increased output luminaires may also be considered.

Luminaires should be placed so that the kerb is clearly revealed. It should be noted that centrally placed luminaires or luminaires on the nearside of entry roads just before the junction tend to make kerbs less conspicuous.

Where the approach roads are lit by moderate threshold increment (MTI) luminaires the junctions should be lit by MTI or low threshold increment (LTI) luminaires; where the approach roads are unlit or lit by LTI luminaires, the junction should be lit by LTI luminaires. If any road is unlit, the system should extend to at least 60 m into that road using the same luminaire and mounting height.

NOTE 2. The lighting requirements at a junction, whether channelled or not, are not generally affected by the presence of a traffic signal installation.

NOTE 3. It is emphasized that, as individual junction designs, traffic usage and environment vary so widely, the examples give can only illustrate basic principles.

5.2 T junctions

To achieve the required luminance on the T junction, typical lighting positions should be as shown in figure 1. Four luminaires are directly associated with the junction.

(a) Luminaire A on the major road should be sited in line with centre line of the approach lane(s) of the minor road to reveal the end of the minor road to traffic approaching along it and to reveal pedestrians crossing its mouth.

(b) Luminaire B on the major road should be sited at a distance from the kerb of the minor road approximately equal to one-third of the design spacing for the major road and preferably not greater than 12 m along the major road. This luminaire reveals both the junction with the minor road to traffic in the major road (approaching from the right in figure 1) and a vehicle waiting in the mouth of the minor road.

(c) Luminaire C on the major road should be sited at not more than the design spacing for the major road from luminaire A and preferably at a distance from the kerb of the minor road of about one-half of the same design spacing along the major road. This luminaire reveals turning movements to traffic in the major road (approaching from the left in figure 1).

(d) Luminaire D on the minor road should be sited on the nearside for traffic leaving the major road at a distance from the kerb of the major road of about one-half of the design spacing for the major road along the major road. This luminaire reveals the traffic conditions in the mouth of the minor road to traffic entering from the major road.

5.3 Staggered junctions

Two T junctions (1) and (2) on opposite sides of the major road, as shown in figure 2, should be considered independently in the first instance. If they are closer together, i.e. less than about 60 m apart, compromise positions may be chosen for luminaires B or C in figure 2 but care should be taken not to reduce the standard of lighting.

5.4 Cross roads

Typical light positions for a cross roads are shown in figure 3.

On each road, there should be a luminaire A on the nearside for traffic leaving the junction at a distance from the kerb of the cross roads approximately equal to one-third of the design spacing for the major road. These four luminaires should be of the same type and mounted at the same height. This distance may have to be reduced if the cross roads are wide or if there is a pedestrian crossing. Luminaires A serve to reveal crossing and turning traffic (see BS 5489 : Part 2).

The next luminaire B, on each road, on the offside for traffic leaving the junction, should be at not more than two-thirds of the design spacing for the major road, from luminaire A.

5.5 Y and fork junctions

5.5.1 *General*

Y and fork junctions can take a number of configurations and for simplicity typical examples have been illustrated in figures 4(a), 4(b), 5(a), 5(b), 6(a) and 6(b).

The luminaires at shorter spacings than S, the normal major road design spacing, are arranged as far as possible to give effective road luminance and increased direct illuminance on traffic negotiating the junction.

At a Y junction on a wide road it may be difficult to avoid excessive luminaire spacing across the mouth of the minor road. This may require a column on a refuge or traffic island in the mouth of a wide entry road so that the major road design spacing is not exceeded.

5.5.2 *Y junctions*

For a Y junction, the general arrangement of the luminaires in the major road should be continued across the junction, but with the spacing shortened to site the luminaires where they are needed and to increase the amount of light in the vicinity of the junction. Typical positions for a staggered arrangement are shown in figures 4(a) and 4(b) for the minor road on the right and left respectively. These luminaires serve to reveal the junction in much the same way as for T junctions described in **5.2**. The amount of light on the junctions should be not less than that along any of the approach roads; this may be achieved by arranging these four luminaires somewhat closer than the design spacing for the major road. Luminaire A should be conspicuous and should emit adequate light to reveal road layout and traffic movement along the minor road. Luminaires B, C and D should provide no less light than those on any of the approach roads; their positions are more critical than that of luminaire A.

5.5.3 *Fork junctions*

For a fork junction, the junction should be lit as a bend with luminaires in the major road along the outer kerb and at appropriately reduced major road design spacing. In order to span the minor road without exceeding this design spacing, there may be cases where one luminaire should be mounted on a longer bracket arm or on a column situated on a refuge or traffic island in the mouth of the minor road. This may be determined either by the daytime appearance or local conditions. Typical positions for a staggered arrangement are shown in figures 5(a) and 5(b) for the major road turning to the left and right respectively.

5.5.4 *Junctions with triangular islands*

In some junctions traffic from the minor road may be separated from that on the major road by a triangular island. Figure 6(a) indicates the possible arrangements of luminaires where the minor road approaches the major road at an obtuse angle of 135° and figure 6(b) where the minor road joins the major road at an acute angle of 45°.

In figure 6(a) junction (1) may be considered as a T junction (see figure 1), junction (2) as a Y junction (see figure 4(b)) and junction (3) as a fork junction (see figure 5(a)). The configuration of the luminaires then approximates to that given in figure 6(a) but the final number and position should depend on the overall size and shape of the island and junction.

In figure 6(b) all junctions may be considered individually as Y junctions having full regard to various junction priorities in the choice of lighting layouts given in figures 4(a) and 4(b). Junctions (1) and (3) may be considered as figure 4(a) and junction (2) as figure 4(b). As in figure 6(a) the final configuration of luminaires should depend on the overall size and shape of the junction and island.

5.6 Symmetrical fork junctions

If there is some form of traffic control by signals, road-markings or other means, the lighting of a symmetrical fork junction may follow the recommendations given in **5.5**.

5.7 Complex single-level junctions

Complex single-level junctions should first be treated as a number of distinct T, Y or fork junctions or cross roads, in accordance with the recommendations given in **5.1** to **5.6**. Compromise positions should be chosen for the luminaires if necessary to reduce the total number but taking care not to discard any important luminaires. Ample light should be provided because of the complex movements of traffic and because there may be other obstructions or distractions, at a multiple junction. Spacing, therefore, should be closer. The spacing should of course be related to the road width and, when applicable, to the isoluminance templates and to the dangers of traffic movement as defined in **5.1**.

Height and type of luminaire should be uniform over the area of the junction. If inclined luminaires are used, care should be taken to avoid either a confusing pattern or any unsatisfactory daytime appearance. The arrangement of luminaires should be simple and consistent.

NOTE. In some cases it may be practicable to light complex junctions by luminaires mounted at heights considerably greater than 12 m.

5.8 Junctions on bends

The recommendations for a T junction with a curved major road differ from those for the junctions illustrated in figure 1.

If the minor road is on the outside of the bend, the T junction arrangement illustrated in figure 7(a) should be adopted. The distance between luminaires B and C should not exceed the appropriate spacing for a bend. If the curvature is sharp, the distance of luminaire B from the minor road may be reduced to one-quarter of the design spacing for the major road. If the minor road is on the inside of the bend, as in figure 7(b) the junction should be lit in two stages:

(a) as a bend, with one of the luminaires on the outer kerb in a position corresponding to luminaire A in figure 7(a);

(b) as a T junction, with luminaires in positions corresponding to B and D in figure 7(a).

NOTE. Luminaire A may be omitted if deemed to be unnecessary.

5.9 Junctions with ghost or traffic islands

To minimize delays and reduce risk of accidents, the layout of a junction may include traffic islands, or roundabouts or their equivalent in roadway markings. These ghost islands are often associated with diverging traffic lane markings with suitable directional arrows or other instructions. To ensure efficient working, markings, as well as the other features of the junction, should be clearly visible to approaching drivers and, since vehicles in different lanes of traffic may be moving at different speeds, any road lighting should, for safety, provide good visibility over the whole junction area. High values of road surface luminance should be provided with the minimum amount of glare, e.g. by using a well designed lighting installation for a traffic route employing LTI luminaires. The texture of the paint used for road markings should also be taken into consideration.

Where junction layouts include increased highway width to accommodate additional lanes, the mounting height should be greater than that used on the connecting roads, especially if ghost islands are used instead of traffic islands with raised kerbs. If the latter exist they should be used for siting lighting columns, providing there is no abnormal collision risk and vision is not impaired. Where they may be a risk of collision, because of substandard lane width or restricted highway width, columns should not be sited on traffic islands but may be mounted on verges.

Where a right-turn lane is provided for traffic waiting to make a right-turn, while other flows may be fast moving, particular attention should be given to revealing vehicles in this lane to enable the drivers of such vehicles to judge a safe gap in the flow of opposing traffic. Typical lighting positions for a junction with ghost or traffic islands and right-turn lanes are shown in figure 8. These considerations are of special importance where approach speeds are high and where right-turn lanes are defined by road surface markings. If the approach roads are otherwise unlit, the extent of the lighting should be determined mainly by the visibility distances needed.

Section 3. Lighting of roundabouts

6 General

The standard of lighting for a roundabout should not be inferior to that in any of the associated roads and in general should be as for a traffic route in accordance with BS 5489 : Part 2. The lighting provided at a roundabout should enable a driver near an entrance to see clearly any traffic to the right at the preceeding entry or entries and traffic already on the gyratory system of the roundabout. The driver should also have adequate forward vision, when on the roundabout, to enable him to see traffic entering from the left and to decide whether it is safe to proceed.

7 Functions of lighting

A roundabout presents a diversion to the direct flow of traffic and should be revealed as such. Lighting should make drivers aware of the roundabout ahead and enable them to recognize it in ample time. This is particularly important since some drivers may not have noticed any advance warning signs. It is not enough merely to throw light on the central island itself, since this kind of warning tends to be overlooked in haze or rain. The arrangement, character and the level of lighting should be distinctive and should provide a reliable warning of the roundabout.

Drivers approaching a roundabout entrance at night require to see any traffic to the right on the gyratory system and as far as the preceding entry or entries. This makes the visual task more difficult than on straight roads and the illuminance of the road surface should, therefore, be higher than on the approach roads. The lighting should reveal the form, direction and the edges of the carriageway all the way round the roundabout, with special emphasis on the central and other traffic islands. Vehicles should be clearly lit by direct light, because the angles and distances do not generally allow silhouette vision to operate in the same way as on the approach roads.

8 Lighting arrangement

8.1 General

It is recommended that roundabouts should generally be lit from the outer perimeter rather than by lighting columns on the central traffic islands. The arrangement of lights around the perimeter should form a ring. This is more distinctive from a distance and less liable to form a confusing array than with luminaires on the central traffic island.

Where possible this should be a simple ring with no lights out of line, whether on the central traffic island or other traffic islands, or the near parts of the exit roads. There are three exceptions to this general recommendation:

(a) very large central traffic islands;

(b) exeptionally wide carriageways;

(c) small central traffic or ghost islands (including mini roundabouts).

As already indicated (see clause 7) silhouette vision is less important and direct attention should, therefore, be given to illuminating the vehicles so that they can be identified rather than to siting the luminaires so that the road surface luminance is high.

8.2 Siting of columns

8.2.1 *Approach and exit roads*

Columns should not be placed on the central traffic island opposite to any entry road. They may be placed behind the outer kerb at a spacing appropriate to their mounting height, the width of the road and the light distribution of the luminaire.

Columns should be placed along each exit road, so as to provide adequate road surface brightness for vehicles turning out of the roundabout, and to reveal the tail of a traffic island if there is one. The lighting should be extended at least 60 m along each exit road if otherwise unlit.

Roundabouts which have wide approach roads without traffic islands may require higher columns than elsewhere. If either traffic islands or the widened ends of the central reserve in approach roads are used for the siting of columns, care should be taken to ensure that the luminaires form part of the ring of lights around the periphery.

NOTE. It may be convenient to place a column with a double bracket arm and two luminaires on the central traffic island.

8.2.2 *Central traffic islands*

For exceptionally large central islands, e.g. over 100 m diameter, with dividing traffic islands it may be possible to place a column on the central traffic island opposite the exit from the roundabout, where the presence of the dividing traffic island would reduced the hazard to approaching traffic. For abnormally wide gyratory carriageways, over 15 m wide, it may be necessary to supplement the peripheral lighting by columns on the central traffic island, but this should only be done where approach speeds are low.

For small roundabouts with kerbed central traffic islands a centrally placed lighting column may be sufficient if the light distribution is substantially symmetrical. In such cases exit roads should be lit by a luminaire positioned on the offside about 12 m down each road.

8.2.3 ***Mini roundabouts***

Mini roundabouts, particularly those of the ghost island type, or those which have been located relatively remote from approach road give way lines, may be difficult to see. Luminaires should be sited to reveal the island.

NOTE. Dome-type islands do not present great difficulties but illumination of flush painted islands without profiles is more difficult and probably impossible in wet conditions.

A mini roundabout should be lit as a junction (see clause **4** and **5.1** to **5.9**) ensuring that the whole area of the junction, including the central island, has a minimum illuminance not less than the value indicated in **8.6** and preferably not less than that provided on the major approach road.

Figures 9 to 12 give examples of typical lighting positions for roundabouts.

8.3 Set back of columns

The clearance between the columns and the carriageway should be in accordance with BS 5489 : Part 1.

Unlike straight roads, the position of the luminaires around the periphery of the roundabout is not critical in relation to the line of the kerb, so luminaires themselves may be set back provided the required illuminance is obtained. For aesthetic reasons, long bracket projections are undesirable but, if used, should be not greater than one-quarter of the column height.

8.4 Mounting height

Mounting height should generally be uniform throughout the junctions; the mounting height at the roundabout should be not less than that on any approach road but may be increased if the number of columns is thereby reduced. However, if for reasons not directly connected with the lighting the mounting height has to be restricted, the spacing should be reduced accordingly. Columns in excess of 18 m (high masts) may be employed at grade junctions in certain circumstances.

8.5 Luminaires and light distribution

Where approach roads are lit, the luminaires at roundabouts may have a similar type of light distribution to those on the major approach road. Where the approach roads are unlit, LTI luminaires should be used to reduce glare. However, the light distribution should be related to the gradient of the road, e.g. MTI luminaires for a downhill approach or LTI luminaires with a lower angle beam and sharper run-back than usual for an uphill approach.

Luminaires should usually be mounted with the lamp axis at right angles to the adjacent kerb. For reasons of daytime appearance the luminaires should be reasonably compact and well related to the supporting columns.

8.6 Road surface illuminance

The sizes and forms of roundabouts vary so widely that no simple rule can be stated relating mounting height and light output. As the lighting technique is directed towards revealing the kerbs, obstructions, vehicles, etc. by direct light rather than by silhouette, it is appropriate to express the minimum requirements in terms of a horizontal illuminance on the surface of the road. For traffic routes to the road categories defined in table 1 of BS 5489 : Part 2 : 1992, the maintained minimum illuminance measured at the kerb should be not less than 20 lux for category 2/1 roads, 15 lux for category 2/2 roads and 10 lux for category 2/3 roads and for subsidiary roads as defined in BS 5489 : Part 3.

Where approach roads to a roundabout are of different categories and some or all are lit, the roundabout lighting maintained illuminance should relate to the highest road category. In instances where roundabouts have unlit approach roads the value of roundabout lighting should relate to the traffic demands and general environment of the roundabouts.

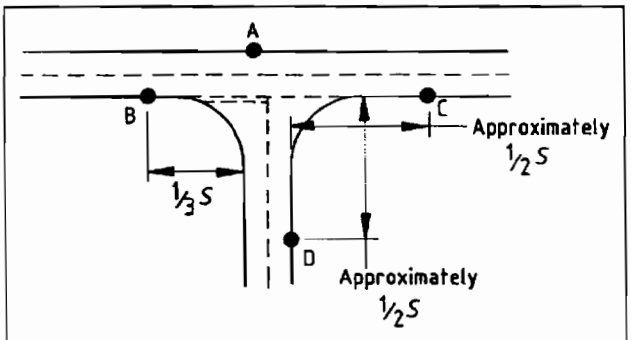
For mini roundabouts without kerbed central traffic islands the maintained minimum illuminance should be not less than 20 lux, on category 2/1 roads, 15 lux, on category 2/2 roads, and 10 lux on category 2/3 roads and for subsidiary roads as defined in BS 5489 : Part 3.

In general, the illuminance should be sufficient to allow drivers near the roundabout entrance to see any traffic to their immediate right, to allow easy identification of the road edges and traffic islands and allow safe manoeuvring around the central island to and out of their exit. Higher illuminances may be required for roundabouts with abnormally dense traffic or where the number of night-time accidents may be reduced by improved lighting standards.

8.7 Pedestrian crossings across approach roads

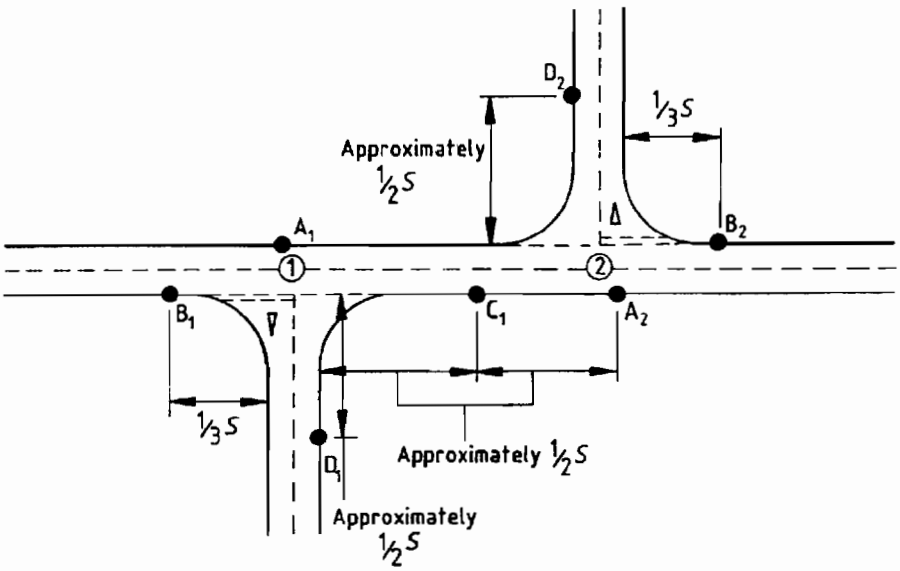
The arrangement of lighting columns recommended for roundabouts is not the best arrangement for revealing the presence of pedestrians on a crossing near the end of an approach road. In accordance with **10.3.5** of BS 5489 : Part 2 : 1992 crossings on a straight road should be about midway between two columns, the one on the nearside being beyond the crossing as seen by a driver. For roundabouts, however, in order to light the entry of traffic the arrangement of the two columns at the end of the approach road should be reversed, i.e. the one on the nearside of the road should be closer than the one on the offside.

NOTE. Where a pedestrian crossing is adjacent to a roundabout there may be difficulty in achieving the best arrangement both for vehicular traffic, as described in clause 8, and for pedestrians, as described in BS 5489 : Part 2. It may be necessary, in such cases, to provide additional lights.



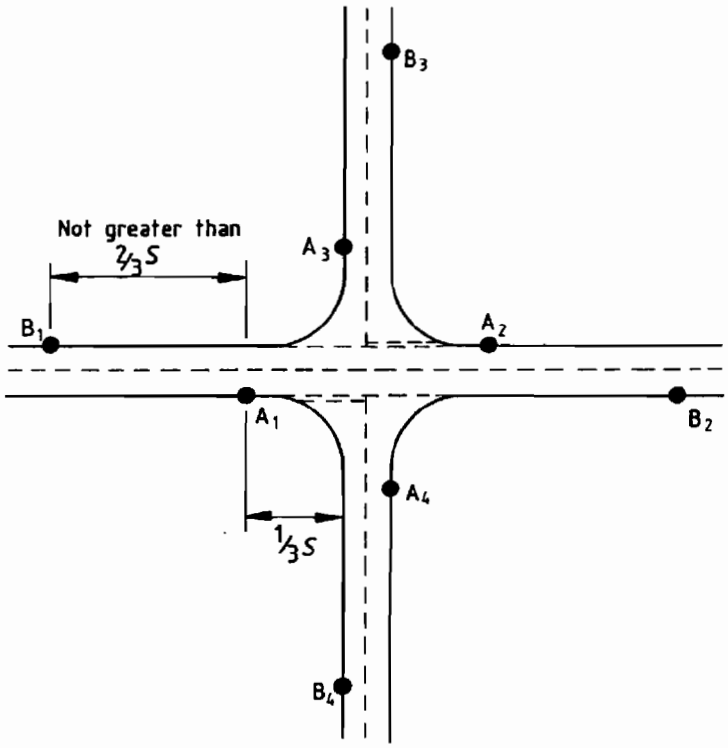
S is the design spacing for the major road.

Figure 1. T junction



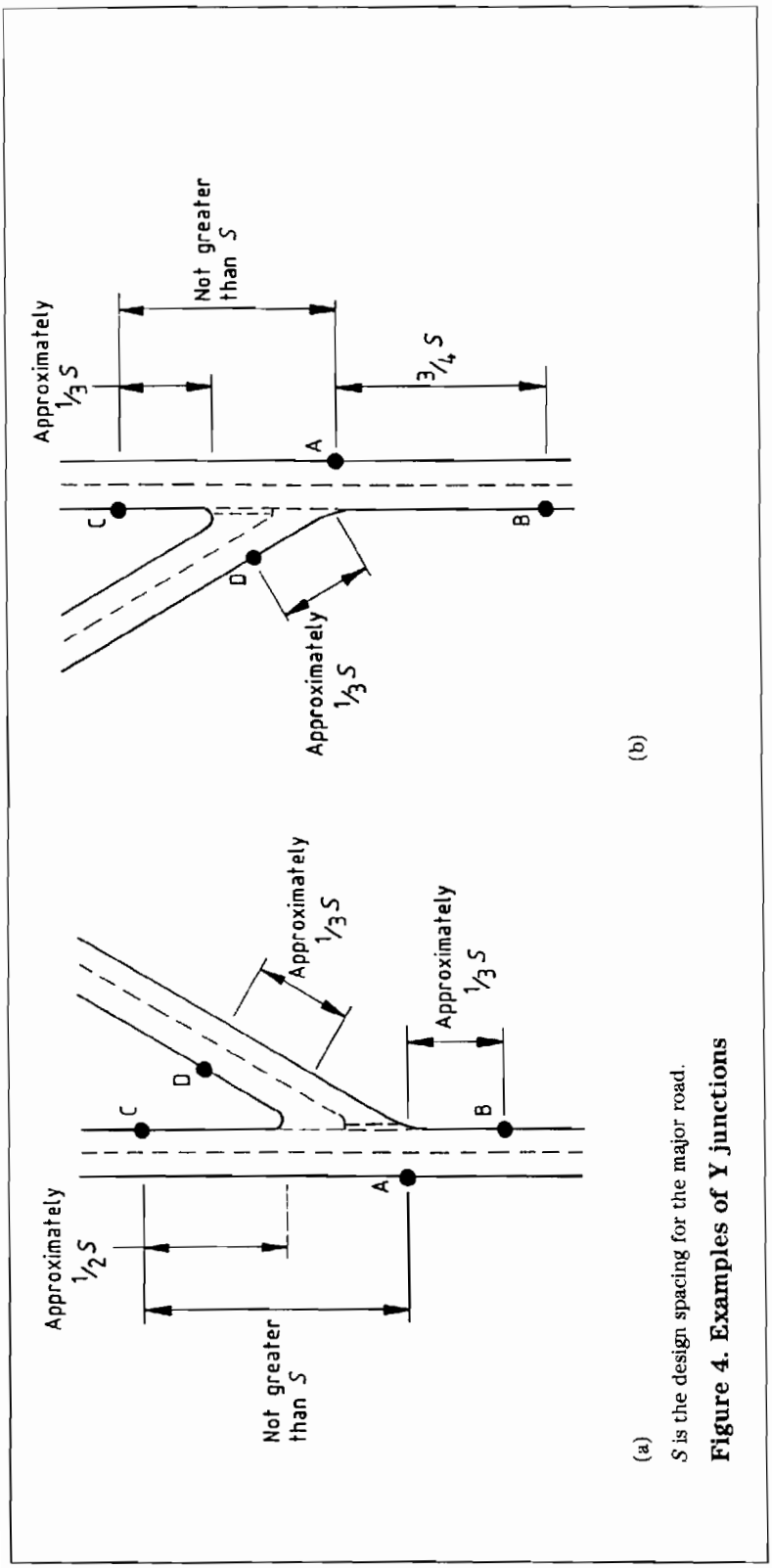
S is the design spacing for the major road.

Figure 2. Staggered junction



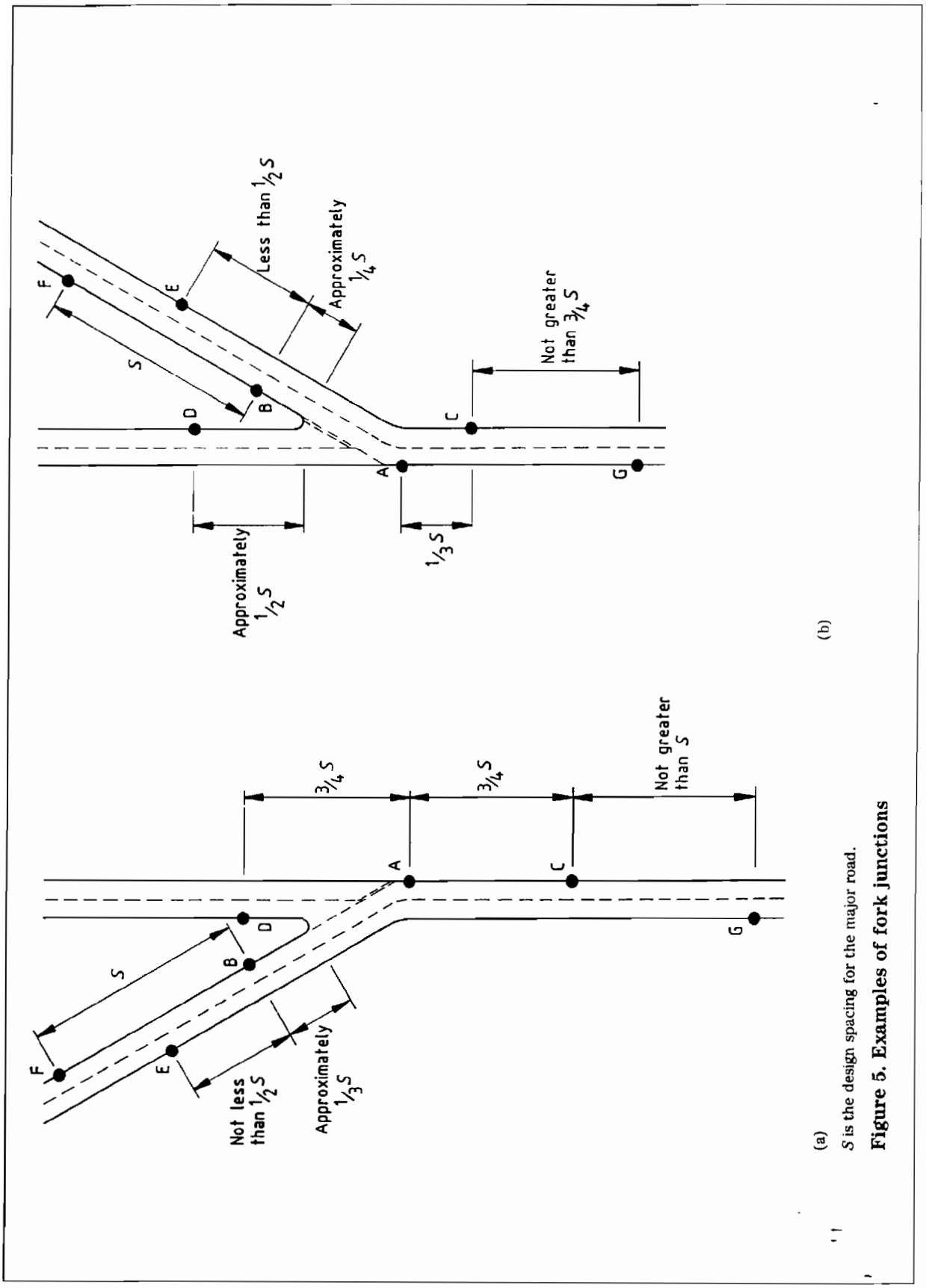
S is the design spacing for the major road.

Figure 3. Cross roads



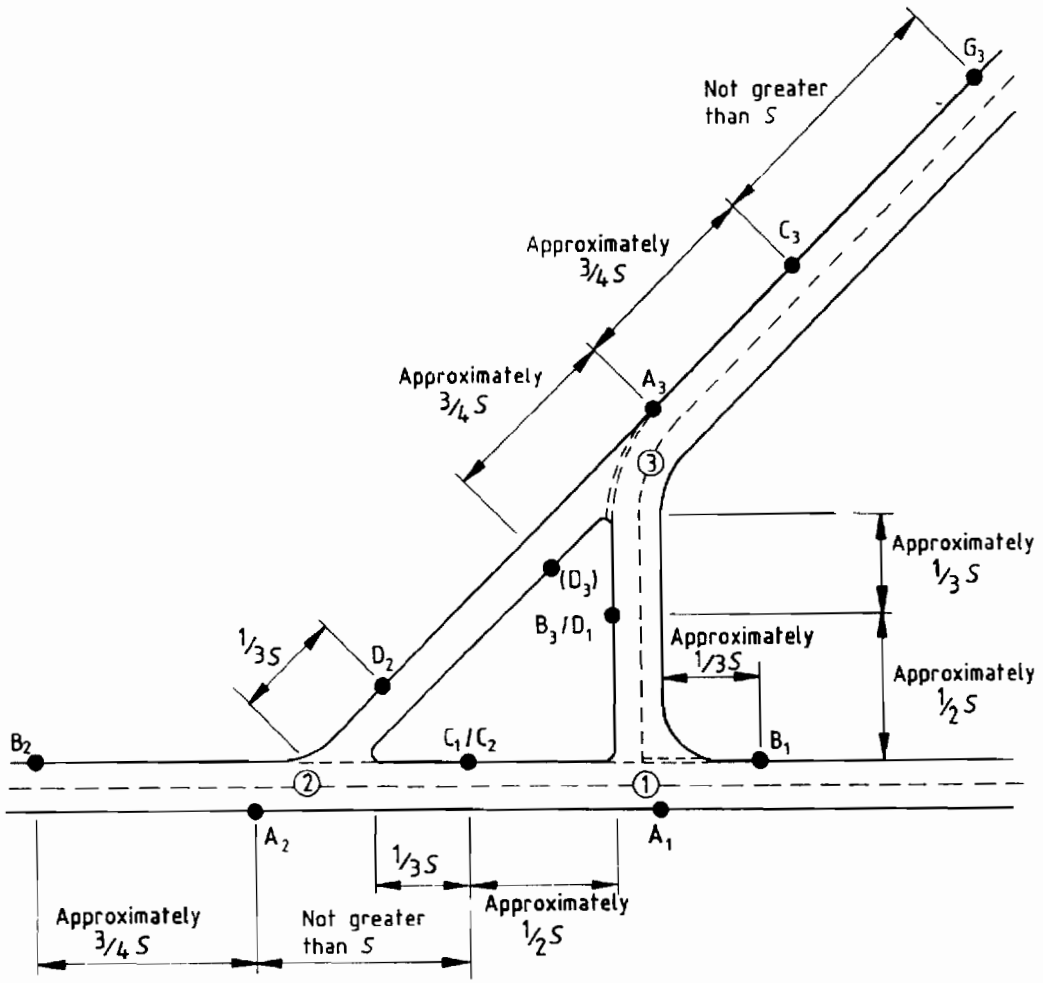
S is the design spacing for the major road.

Figure 4. Examples of Y junctions



S is the design spacing for the major road.

Figure 5. Examples of fork junctions



NOTE. In this particular example:

(a) the link road is one way from junction (2) to junction (3) and for this link road luminaire D_2 is preferred to (D_3);

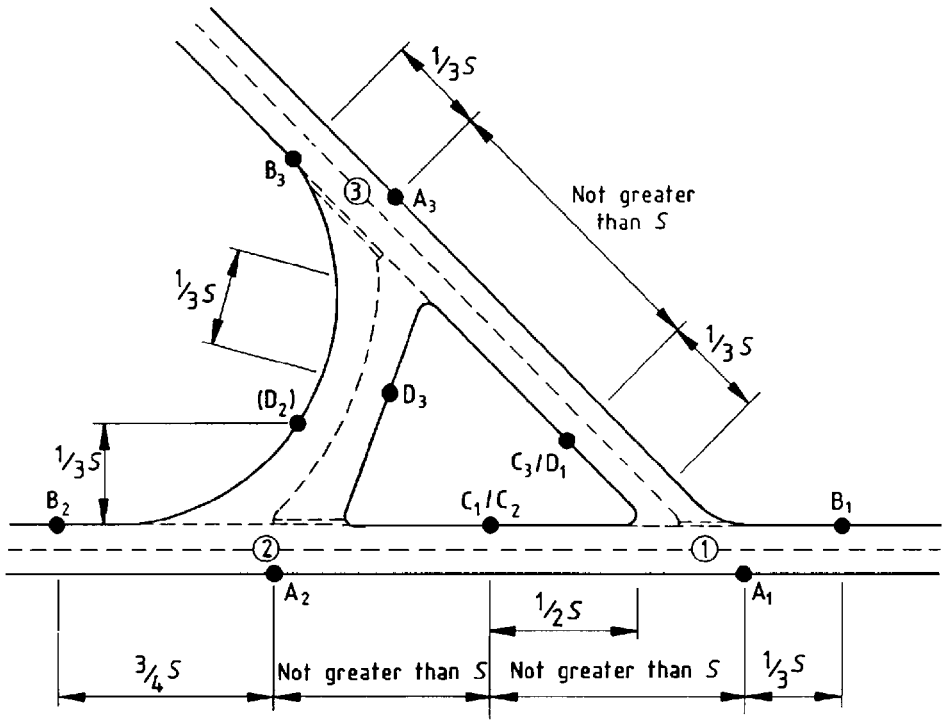
(b) the size of the island gives the luminaire C_1/C_2 a dual role for junctions (1) and (2); similarly B_3/D_1 for junctions (1) and (3).

If the island were bigger separate luminaires would be required for each junction.

S is the design spacing for the major road.

(a)

Figure 6. Examples of junctions with triangular island



NOTE. In this particular example:

(a) on the link road between junctions (2) and (3) the luminaire D_3 is preferred to luminaire (D_2);

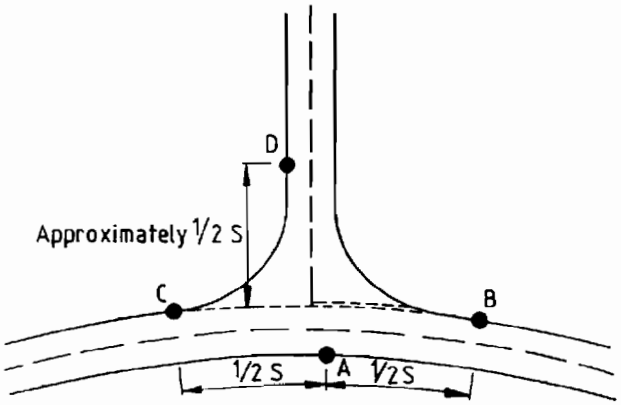
(b) the size of the island gives the luminaire C_1/C_2 a dual role for junctions (1) and (2); similarly C_3/D_1 for junctions (1) and (3).

If the island were bigger separate luminaires would be required for each junction.

S is the design spacing for the major road.

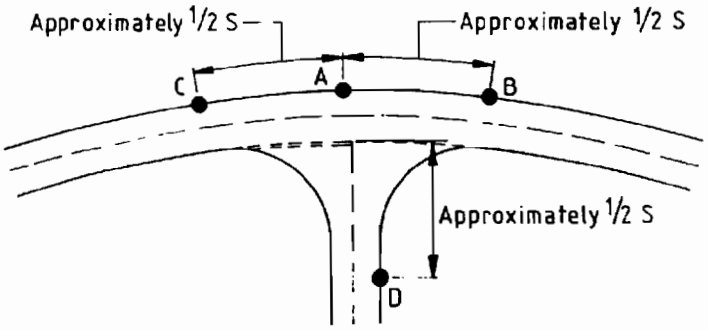
(b)

Figure 6. (*concluded*)



S is the design spacing for the major road.

(a) T junction on outside of bend



S is the design spacing for the major road.

(b) T junction on inside of bend

Figure 7. Examples of T junctions on bends

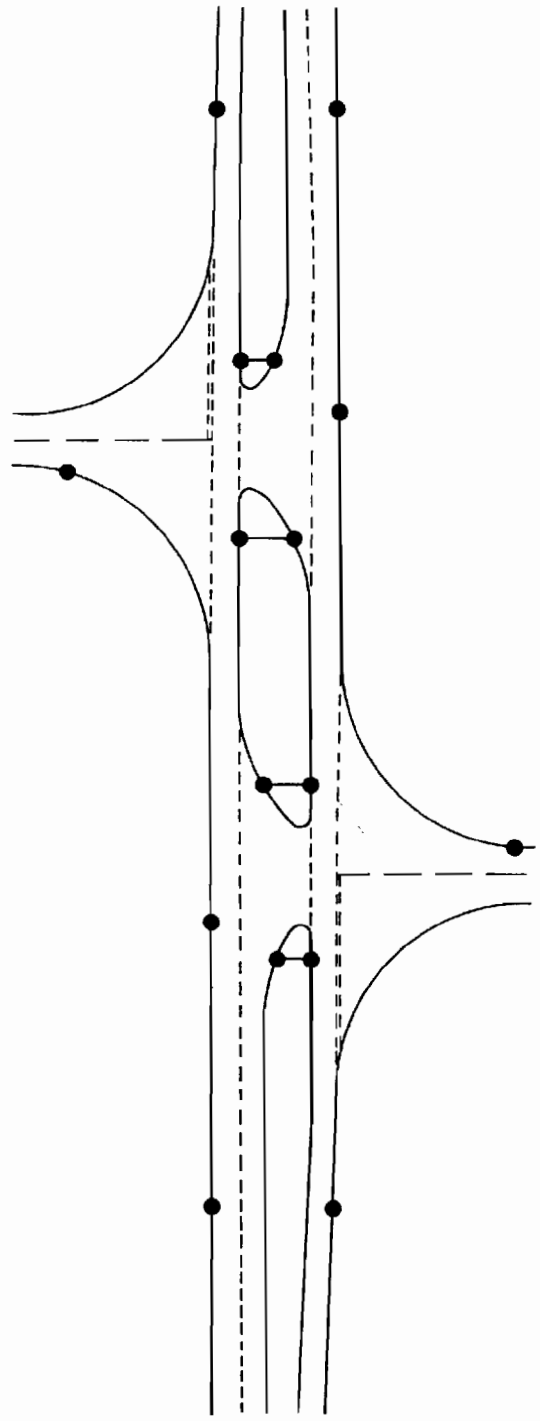


Figure 8. Junctions with ghost or traffic islands and right-turn lanes on the major road

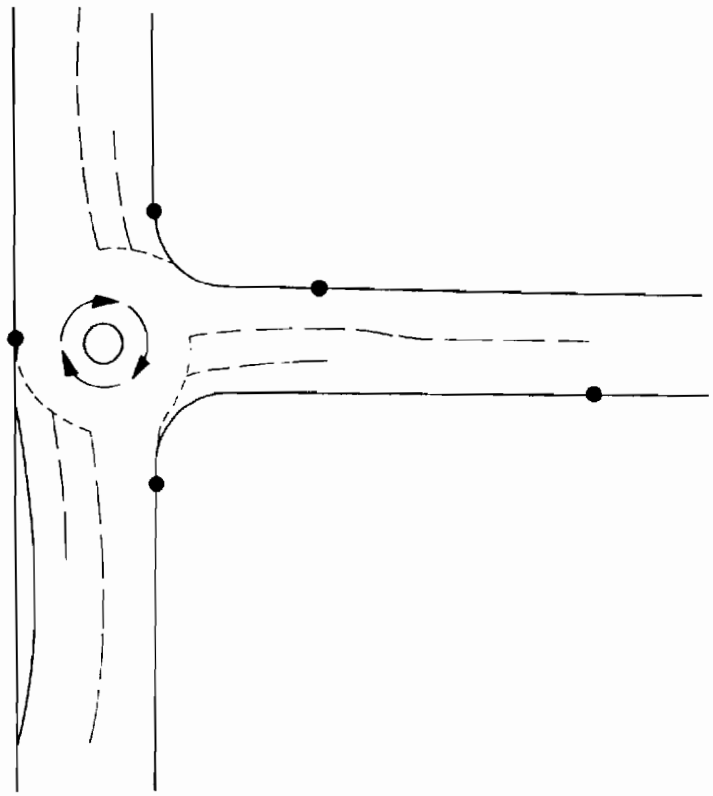


Figure 9. Mini roundabout at T junction

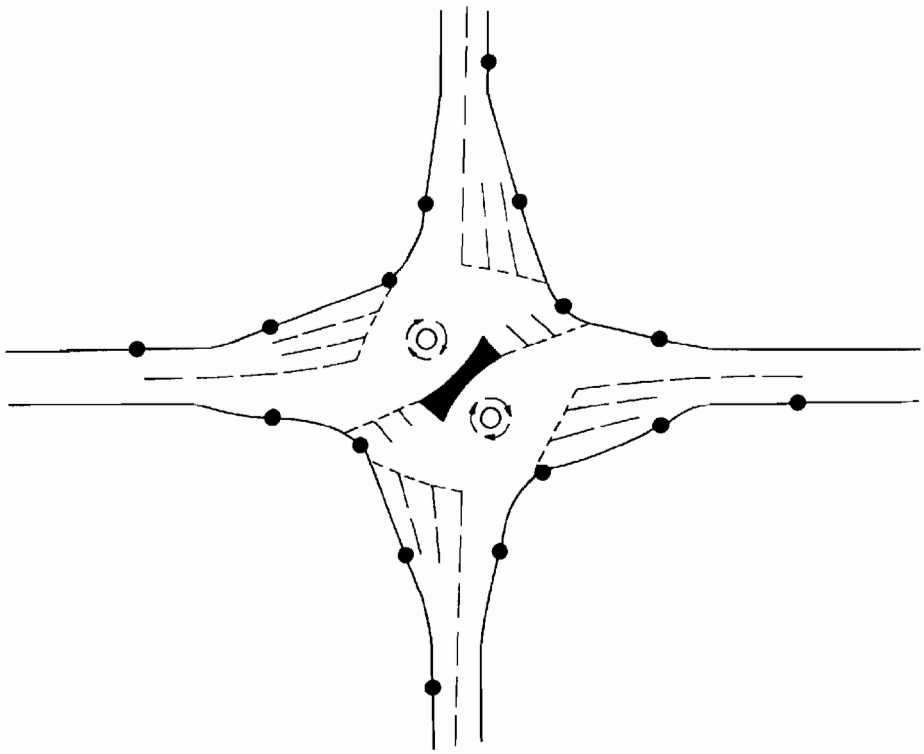
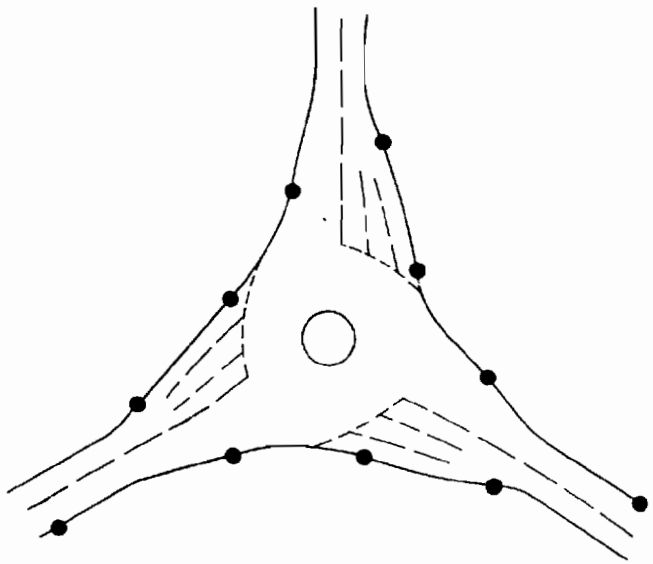
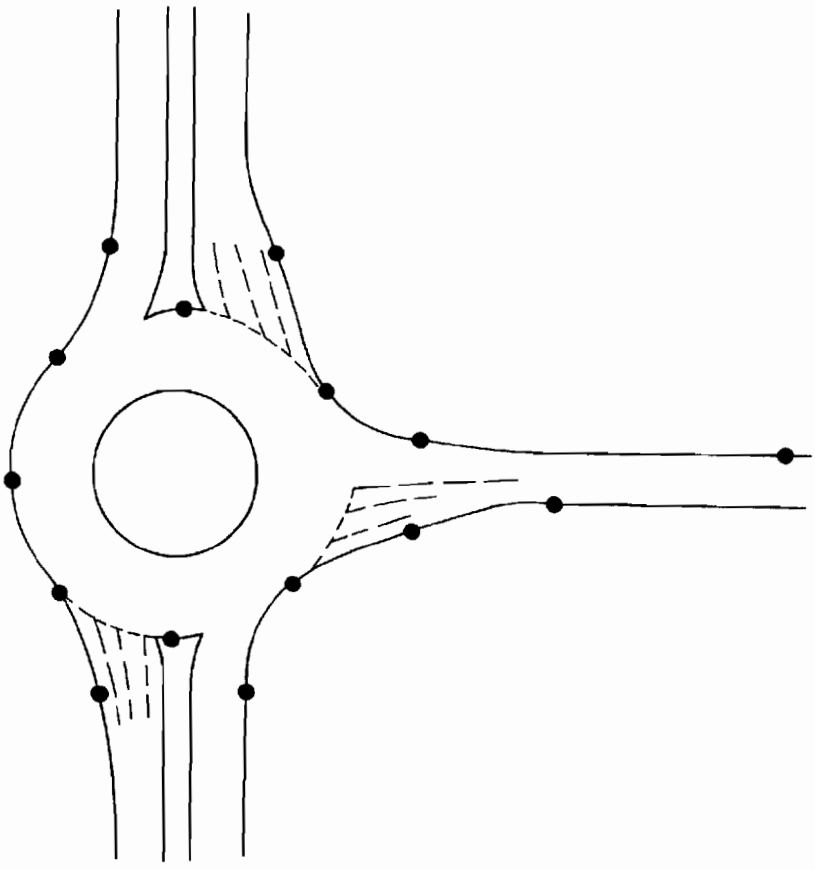


Figure 10. At grade double mini roundabout (with large right-turning flows)

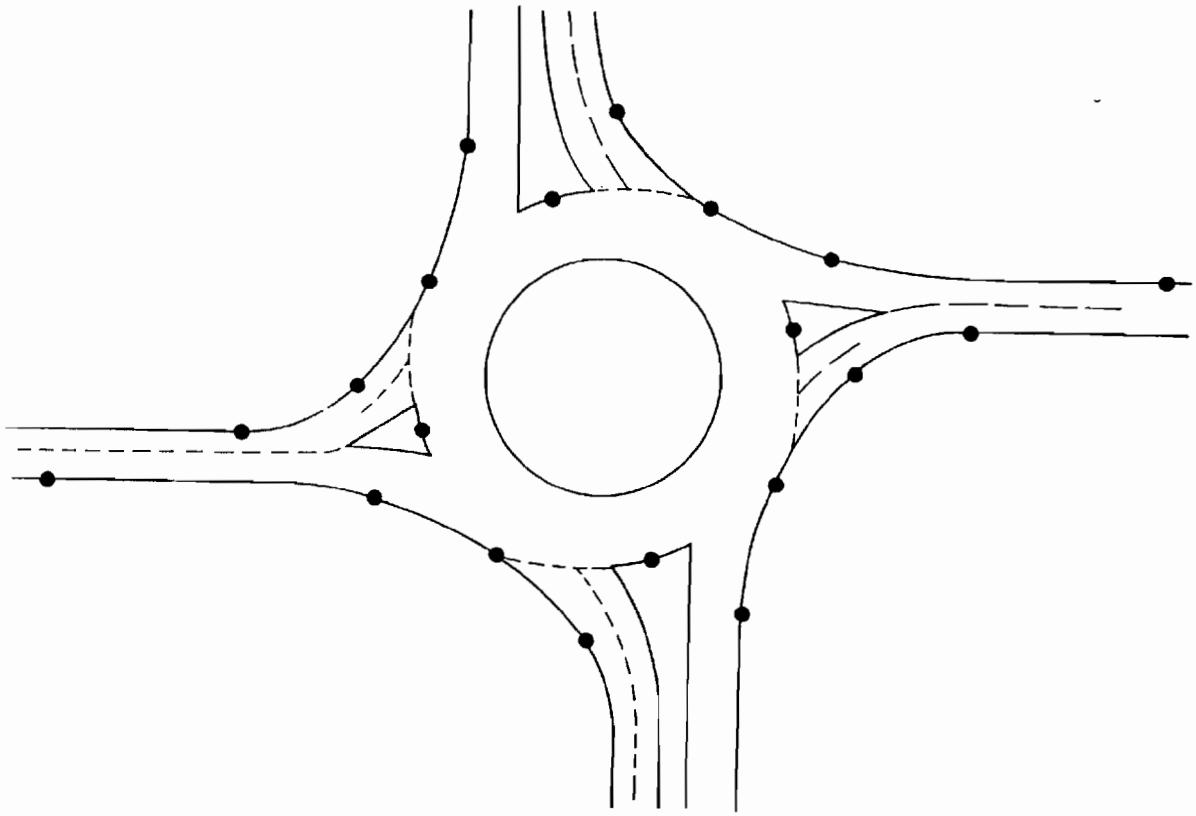


(a) With single approach roads

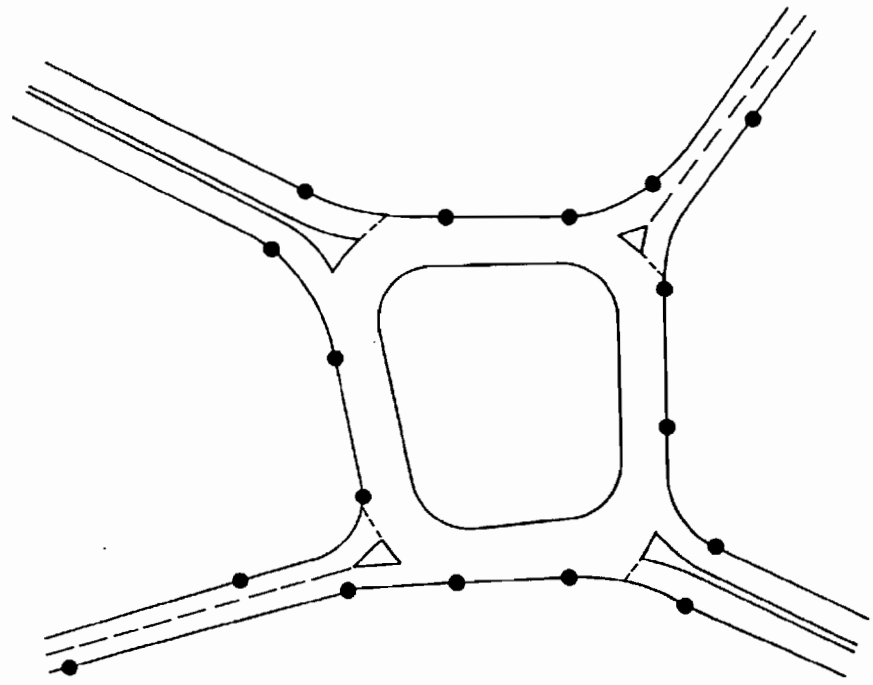


(b) With dual and single approach roads

Figure 11. Examples of roundabouts at three-way junctions



(a)



(b)

Figure 12. Examples of roundabouts at four-way junctions

Publication(s) referred to

BS 5489 Road lighting
Part 1 Guide to the general principles
Part 2 Code of practice for lighting for traffic routes
Part 3 Code of practice for lighting for subsidiary roads and associated pedestrian areas
[1)]Part 5 Code of practice for lighting for grade-separated junctions

[1)] Referred to in the foreword only.

Issue 2, May 1996

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to BS 5489 : Part 4 : 1992

Road lighting

Part 4. Code of practice for lighting for single-level road junctions including roundabouts

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BRITISH STANDARD

BS 5489 :
Part 4 : 1992

Incorporating
Amendment No. 1

Road lighting

Part 4. Code of practice for lighting for single-level road junctions including roundabouts

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Electrical Illumination Standards Policy Committee (LGL/-) to Technical Committee LGL/23, upon which the following bodies were represented:

Automobile Association
British Lighting Association for the Preparation of Standards (Britlaps)
British Precast Concrete Federation Ltd.
Chartered Institution of Building Services Engineers
Council for the Protection of Rural England
County Surveyors' Society
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Institution of Civil Engineering Surveyors
Institution of Civil Engineers
Institution of Electrical Engineers
Institution of Lighting Engineers
Institution of Mechanical Engineers
Lighting Industry Federation Ltd.
Royal Fine Art Commission
Scottish Office (Building Directorate)

This British Standard, having been prepared under the direction of the Electrical Illumination Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 August 1992

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Committee reference LGL/23
Draft announced in *BSI News* March 1992

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Amendments issued since publication

Amd. No.	Date	Text affected
9012	May 1996	Indicated by a sideline in the margin

Summary of pages

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Inside front cover	2	10	original
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b	blank	12	original
1	original	13	original
2	original	14	original
3	original	15	original
4	original	16	original
5	original	17	original
6	original	18	original
7	original	19	original
8	original	20	original
		Inside back cover	original
		Back cover	2

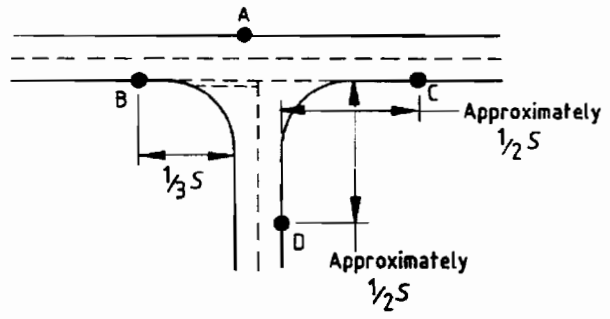
For mini roundabouts without kerbed central traffic islands the maintained minimum illuminance should be not less than 20 lux, on category 2/1 roads, 15 lux, on category 2/2 roads, and 10 lux on category 2/3 roads and for subsidiary roads as defined in BS 5489 : Part 3.

In general, the illuminance should be sufficient to allow drivers near the roundabout entrance to see any traffic to their immediate right, to allow easy identification of the road edges and traffic islands and allow safe manoeuvring around the central island to and out of their exit. Higher illuminances may be required for roundabouts with abnormally dense traffic or where the number of night-time accidents may be reduced by improved lighting standards.

8.7 Pedestrian crossings across approach roads

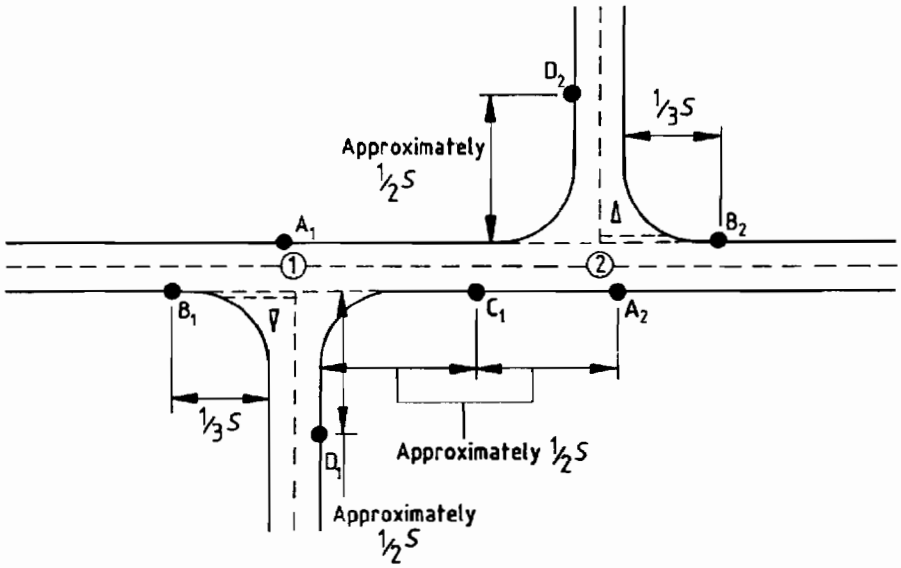
The arrangement of lighting columns recommended for roundabouts is not the best arrangement for revealing the presence of pedestrians on a crossing near the end of an approach road. In accordance with **10.3.5** of BS 5489 : Part 2 : 1992 crossings on a straight road should be about midway between two columns, the one on the nearside being beyond the crossing as seen by a driver. For roundabouts, however, in order to light the entry of traffic the arrangement of the two columns at the end of the approach road should be reversed, i.e. the one on the nearside of the road should be closer than the one on the offside.

NOTE. Where a pedestrian crossing is adjacent to a roundabout there may be difficulty in achieving the best arrangement both for vehicular traffic, as described in clause **8**, and for pedestrians, as described in BS 5489 : Part 2. It may be necessary, in such cases, to provide additional lights.



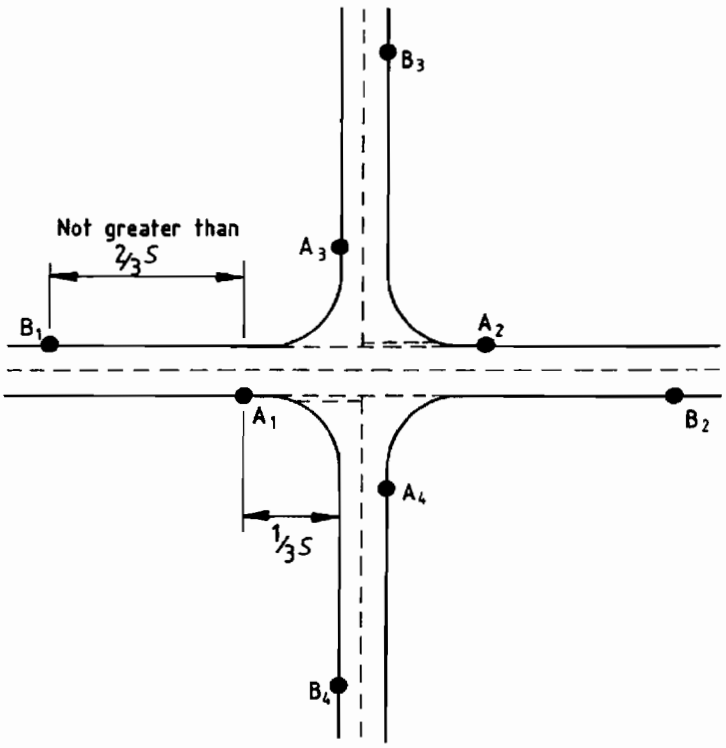
S is the design spacing for the major road.

Figure 1. T junction



S is the design spacing for the major road.

Figure 2. Staggered junction



S is the design spacing for the major road.

Figure 3. Cross roads

Publication(s) referred to

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