

**Regional  
Council**

**Department of Roads**

# **Guidelines For Development Roads**

**W S McAlonan MSc DipTP Ceng FICE FIHT  
Director of Roads  
Strathclyde House  
20 India Street  
Glasgow G2 4PF**

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# Part I

## Policy and Procedures

*Preamble*

Part I of the guidelines is intended to assist private and public developers in obtaining the necessary authority which is required before a new road is constructed and, subsequently, in having the new road adopted by the Regional Council.

## 1. The Need for Consultation

- Initial Consultation*
- 1.1 It is important that developers consult the appropriate Roads Department officials, as listed in Appendix C, at an early stage in their preparations as:
- (a) the location chosen for development may not be suitable for the type of development envisaged in terms of access and/or may be affected by future road schemes;
  - (b) the proposed layout may not be acceptable in relation to development control standards;
  - (c) minor adjustments to the layout may be necessary to meet Construction Consent requirements;
  - (d) some discretionary powers are available and the Divisional/Area Engineer may advise developers in respect of variation to the Specification to suit certain specific local conditions.

If not noted at an early stage, any of the above possibilities could result in considerable abortive work and expense.

*Outline Planning Consent*

- 1.2 Before recommending to the Local Planning Authority that Outline Planning Consent for a development be granted, the Divisional/Area Engineer will have assessed:
- (a) the adjacent road hierarchy based on the volume, type and destinations of vehicular traffic using it;
  - (b) how traffic patterns are likely to change in the foreseeable future;
  - (c) the volume and type of vehicular traffic likely to be generated by the proposed development;
  - (d) the distribution of this generated traffic;
  - (e) the adequacy of the adjacent road network and the need for any traffic management measures (para 24.7);
  - (f) any restrictions on road access to the site including location, sight distances;
  - (g) any requirement for structures;
  - (h) in conjunction with bus operators, possible extensions or alterations to bus services (para 24.4 et seq.).

*Detailed Planning Consent*

- 1.3 Before undertaking layout design an early meeting should be arranged to discuss:
- (a) the types of road which it might be necessary to provide;
  - (b) the location of existing or proposed community facilities, such as shops, schools, relative to the development;
  - (c) the location and treatment of particular problem areas external to the site;
  - (d) desire lines for pedestrian movements;
  - (e) the location of pedestrian routes and crossing facilities
  - (f) the location and amount of parking provision
  - (g) appropriate housing styles for different types of road;
  - (h) the form of any structures required;
  - (i) the provision of road drainage;
  - (j) the provision of road lighting;
  - (k) the location of underground services

*Consultation with Other Bodies*

- 1.4 The information contained in these guidelines refers principally to Local Roads Authority requirements. The requirements of the Local Planning Authority, Public Utilities, Fire Department, Police Department and Department of Sewerage will be extra to these requirements and should be checked out individually at an early stage.

## **2 Authority Required to Construct New Roads**

- |                             |     |  |
|-----------------------------|-----|--|
| <i>Necessary Consents</i>   | 2.1 | Before undertaking any new road construction the developer must obtain both Detailed Planning Consent and Construction Consent. It should be noted that the granting of one does not necessarily imply the granting of the other.  |
| <i>Planning Consent</i>     | 2.2 | Detailed Planning Consent is normally granted by the Local Planning Authority (the District Council) from whom further advice should be sought (Section 4).  |
| <i>Construction Consent</i> | 2.3 | In terms of Section 21 of the Roads (Scotland) Act 1984, any person other than a Roads Authority who wishes to construct a new road or an extension of an existing road must obtain Construction Consent, irrespective of whether or not such roads are to be submitted for adoption as public. Construction Consent is granted by the Local Roads Authority (the Regional Council) and road construction works may only be undertaken while the Construction Consent (Form CC3) remains valid.  |
| <i>Design Requirements</i>  | 2.4 | Construction Consent will be granted only where proposals for the layout and construction of roads, structures, road drainage and lighting meet the Local Roads Authority's standards. Guidance as to how these standards should be achieved is contained in this document: Geometric and Layout Details in Part II; Construction Details in Part III. Since economy of maintenance will be a major consideration in the assessment of applications for Construction Consent, the use of structures to support roads (e.g. retaining walls and bridges) should be avoided wherever possible. |
| <i>Other Consents</i>       | 2.5 | The granting of Construction Consent signifies the Local Roads Authority's approval of the proposed roads, structures, road drainage and lighting. Construction Consent does not exempt the applicant from obtaining any other permissions which may be required such as Planning Consent, Building Warrant or approval for connection to a sewer.   |

### 3 Policy Regarding Adoption and Maintenance

- Adoption of Roads* 3.1 In terms of Section 16 of the Roads (Scotland) Act 1984, Strathclyde Regional Council as Local Roads Authority will, upon request, adopt - i.e. add to its list of public roads - any new road (including any associated footway or verge) constructed in accordance with a Construction Consent.
- Phased Adoption* 3.2 To avoid long delays between construction and adoption of roads, developers are recommended to programme construction to enable the adoption of roads to be phased as sections of work are completed, subject to the following conditions:-
- (a) Carriageways, footways and verges will not be adopted separately.
  - (b) Only lengths of road between junctions or completed culs-de-sac will be adopted.
  - (c) All roads submitted for adoption should form a continuous system with the existing public roads.
- Footpaths* 3.3 In terms of Section 18 of the Roads (Scotland) Act 1984, Strathclyde Regional Council as Local Roads Authority will, upon request, adopt any footpath which is the subject of an Agreement (Form CC4). Furthermore, should a developer fail to complete a footpath to the Authority's satisfaction within the period specified in such an Agreement, the Regional Council may itself carry out the work and recover reasonably incurred expenses from the developer. The suitability of footpaths for adoption under Agreement will be judged against the following criteria:-
- (a) They should be constructed in accordance with a Construction Consent.
  - (b) They should form part of a general pedestrian network interconnecting houses, shops, schools, public transport, etc. and be available to pedestrians on an unrestricted basis.
  - (c) They should serve more than one dwelling.
  - (d) In the case of multi-storey buildings, the footpath may be adopted up to the point where it is deemed to enter the curtilage (i.e. garden, landscaped or forecourt area surrounding building).
  - (e) Surfaced areas surrounding buildings and intended essentially for maintenance purposes will not be considered.
  - (f) Where footpaths lead to both front and rear, only one will be considered.
  - (g) At least one end of a footpath should abut a public road to facilitate access for maintenance purposes.
  - (h) Arrangements of steps which prevent access to isolated lengths of footpath by maintenance vehicles should be avoided.
- Parking Areas* 3.4 In both new development and redevelopment, the developer will normally be required to provide parking spaces off the carriageway in accordance with the parking standards detailed in Part II of this document. The suitability of such areas for adoption or maintenance by Strathclyde Regional Council will be judged against the following criteria:-
- (a) Parking areas contiguous with the carriageway will normally be adopted as public roads provided that their use by the general public is not restricted in any manner.
  - (b) Off-road parking areas, which have been identified as meeting a general public parking need and have been constructed as detailed in Part III, may be taken over for maintenance purposes.
  - (c) Parking areas provided in lieu of garages or private drives for the regular parking of residents' cars will not be taken over for maintenance purposes by the Regional Council and must, therefore, be subject to private maintenance agreements. They will remain the responsibility of the District Council in the case of local authority housing, or of the proprietors in the case of private housing. Where local authority houses are sold for owner occupation, associated parking areas will remain the responsibility of the District Council unless transferred in a manageable form to the purchaser.

<i>Service Areas</i>	3.5	Service areas in industrial or commercial developments, which provide loading facilities for the premises, will not normally be considered for adoption even though these may take the form of paved areas contiguous with the carriageway.
<i>Road Lighting</i>	3.6	<p>Lighting installations on publicly maintainable roads, footpaths and parking areas will be taken over the Regional Council for operation and maintenance from the date of their commissioning, subject to:</p> <ul style="list-style-type: none"> <li>(a) the submission of a separate Installation Inspection and Test Certificate, as detailed in Table L22/1 of Appendix B, for any lighting installation or part thereof that requires to be commissioned during the construction period;</li> <li>(b) acceptance by the developer of responsibility for any necessary repairs or replacements, arising from faulty workmanship or from the failure of materials, during the twelve months following commissioning;</li> <li>(c) written assurance from the developer that all roads concerned will be offered for future adoption.</li> </ul>
<i>Structures</i>	3.7	Where a Construction Consent provides for a road to be supported by a structure (e.g. a retaining wall or a bridge), Strathclyde Regional Council will normally enter into an agreement with the developer, in terms of Section 79 of the Roads (Scotland) Act 1984, whereby the structure will vest in the Local Roads Authority. If, however, the solum has not been so acquired, the Local Roads Authority will be responsible only for maintaining the road surface.
<i>Road Bonds</i>	3.8	In terms of Section 17 of the Roads (Scotland) Act 1984 and the Security for Private Road Works (Scotland) Regulations 1985 (S.I. 2080), developers are required to make financial provision with the Local Roads Authority in order to safeguard the completion of housing development roads which are the subject of a Construction Consent. Such provision, which may take the form of a "Road Bond" or deposit, protects prospective house purchasers from having to bring incomplete roads up to adoptable standards. It should be noted that no <b>building</b> works of houses can commence until such securities have been lodged.



#### **4. Application for Planning Consent**

- Place of Application* 4.1 Application for Planning Consent must be made to the Local Planning Authority. The addresses of District Council Planning Offices in Strathclyde Region are listed in Appendix D.
- Outline Consent* 4.2 The developer may wish to ascertain whether his proposals are likely to be acceptable, in principle, to the Local Planning Authority and for this purpose may apply for Outline Planning Consent. Before submitting such an application to the Local Planning Authority, the developer should seek the advice of the Divisional/Area Engineer (para 1.2) to ensure that the requirements of these guidelines can be met and to ascertain, at this early stage, any other requirements (e.g. mineral reports in certain areas).
- Site Plan* 4.3 An application for Outline Planning Consent should include a 1:2500 scale site plan. This plan should desirably indicate the location of the proposed point(s) of access.
- Detailed Consent* 4.4 Before submitting to the Local Planning Authority an application for Detailed Planning Consent, the developer should consult the Divisional/Area Engineer for consideration of those matters detailed in paragraphs 1.3 and 1.4. The developer should ensure that the road proposals detailed in the finalised planning application meet the Local Roads Authority's requirements for Construction Consent.
- Layout Plans* 4.5 Subsequently, the Divisional/Area Engineer will make observations to the Local Planning Authority on the application submitted for Detailed Planning Consent. This application should therefore include a layout plan (minimum scale 1:500) in sufficient detail to enable the provision and geometric standards of roads and associated areas to be fully appraised.
- Construction Consent* 4.6 It should be noted that the granting of Detailed Planning Consent does not relieve the developer of the requirement, in terms of Section 21 of the Roads (Scotland) Act 1984, to obtain Construction Consent from the Local Roads Authority for permission to construct new roads.

## 5. Application for Construction Consent

### *Place and Date of Application*

- 5.1 An application for Construction Consent should be made on Form CC1, obtainable at the Divisional and Area Offices of the Department of Roads listed in Appendix C. Completed application forms should be submitted **at least three months prior to the commencement of construction** to the Divisional/Area Engineer appropriate to the locality of the development.

### *Submission of Plans*

- 5.2 Applications for Construction Consent should be accompanied by one linen and three paper copies of each of the following:-
- (a) **A location plan**, preferably on the Ordnance Survey base, to a scale of 1:1250 or 1:2500, showing the proposed road network and its relationship to existing development.
  - (b) **A layout plan** of the carriageways, footways, verges, footpaths, retaining walls, bridges and earthworks to a scale of 1:500 (1:200 where pedestrian/vehicle shared surfaces are proposed) showing:
    - (i) the proposed centre, building and kerb lines (and also the heel of the footway where this differs from the building line);
    - (ii) curve radii of the road alignment and junctions;
    - (iii) dimensioned visibility splays at road junctions;
    - (iv) vehicular access points to properties;
    - (v) pedestrian crossing points at junctions and other locations where dropped kerbs will be provided;
    - (vi) the location of all road gullies;
    - (vii) the location of the road drainage system and its discharge points;
    - (viii) the location and type of lighting columns and lanterns, wall-mounted lighting units (if applicable), control pillars, underground cables and road crossing ducts;
    - (ix) the location of all underground services and ancillary apparatus;
    - (x) the full extent of all cut and fill slopes;
    - (xi) the boundaries of any areas which it is intended will subsequently be offered for adoption or maintenance.
  - (c) **A longitudinal section** along the road(s) giving vertical alignment details, surface water drain gradients with manhole positions marked thereon, together with the nature of the substrata to a depth of 1 metre below road formation level or to rockhead where bedrock is at a depth less than 1 metre.
  - (d) **Typical cross sections** through the carriageways, footways and footpaths detailing widths, crossfalls, construction depths and materials used, kerb and edge details, and typical details of gullies and gully connections.

The details submitted for construction and the specification for materials therein must comply with these guidelines. This may be indicated by quoting the relevant clause number of the specification, but it will not be sufficient merely to state that construction is to the agreed specification.

### *Structures*

- 5.3 Where the submission includes structural design (e.g. retaining walls or bridges) the application must include detail drawings, calculations and a design check certificate. This certificate, signed on behalf of an organisation independent of the applicant, should certify that the design complies with the relevant national standards. If the need for an additional or amended structure arises after the granting of Construction Consent, the developer should seek the approval of the Divisional/Area Engineer **before** starting construction of it.

<i>Responsibility for Design</i>	5.4	The granting of Construction Consent does not imply that the Regional Council accepts any responsibility for the accuracy and suitability of the design of any structure within the submission.
<i>Mineral Report</i>	5.5	In areas which are known to have been infilled or have a history of mineral workings, the Divisional/Area Engineer may require the developer seeking Construction Consent to supply a mineral report together with supporting information on ground stability.
<i>Docqueting of Plans</i>	5.6	It is essential that the plans, detailed drawings and specification submitted with the application are docqueted, "This is the plan/drawing/specification referred to in the application", signed and dated by the applicant.
<i>Notification of Owners</i>	5.7	Where any person other than the developer owns land which fronts, abuts or is comprehended in <b>the new road(s) or the extension of the existing road(s)</b> for which Construction Consent is being sought, the developer will be required to declare on Form CC2 (obtainable at Roads Department offices) that all such persons have been notified of the application for Construction Consent. A draft "Notice for Service on Owner" is included as Appendix E for the convenience of potential applicants.
<i>Owner's Objections</i>	5.8	Any person to whom the application has been intimated under the provisions of the preceding paragraph may, within twenty-eight days of the date of intimation, make written representation to Strathclyde Regional Council. Any such representations will be considered before Construction Consent is granted.
<i>Hearing of Applicant</i>	5.9	Should it be considered that the application for Construction Consent should be refused or granted subject to special conditions, the applicant will be afforded an opportunity to be heard prior to such a decision being made.
<i>Construction Period</i>	5.10	It will be a standard condition of any Construction Consent that the construction be completed within the period specified in the Consent. This period will be not less than three years. If, as a result of a change in circumstances during construction, it is demonstrated that the specified period is no longer realistic, the Local Roads Authority may grant an extension. In the absence of such an extension a new application for Construction Consent must be made.
<i>Right of Appeal</i>	5.11	If an application for Construction Consent is (i) refused or (ii) granted subject to special conditions, the applicant may within twenty-eight days of the date of intimation of such a decision appeal to the Secretary of State for Scotland.
<i>Amendments to Consent</i>	5.12	Should the developer, for any reason, wish to depart from the construction or layout details for which Construction Consent has been granted, he must first seek the approval of the Divisional/Area Engineer. Major changes may require the submission of a new application for Construction Consent.
<i>Footpath Agreement</i>	5.13	In addition to obtaining Construction Consent, the developer should (by completing Form CC4 obtainable at Roads Department offices) enter into an Agreement with the Local Roads Authority before constructing any footpath which it is intended should subsequently be adopted (para 3.3).
<i>Road Lighting</i>	5.14	The developer will be responsible for the provision of any road lighting deemed necessary under Construction Consent.
<i>Road Bond</i>	5.15	Where a developer is required to lodge a Road Bond or deposit (para 3.8), Form CC6 (obtainable at Roads Department offices) should be completed as part of the application for Construction Consent.

## 6 Inspection Procedures During Construction

### *Notice of*

*Commencement* 6.1 **Two weeks notice** must be given to the Divisional/Area Engineer of the start of roadworks together with names and telephone numbers of responsible persons who may be contacted in connection with the construction of the works.

### *Inspection and Testing*

6.2 During the construction period, irrespective of whether or not it is intended that the road(s) be subsequently adopted as public, the Divisional Engineer's representative must be afforded access to the site to ensure that the works are being undertaken in conformity with the Construction Consent. The developer and/or his contractor should provide every facility to enable the Divisional Engineer's representative to examine the works being executed and the materials being used, but will remain responsible for ensuring that standards are met.

### *Charges for Inspection*

6.3 Strathclyde Regional Council reserves the right to charge for expenses incurred in inspecting and testing arising from the granting of Construction Consent. Samples of the various materials proposed to be used should be supplied, free of cost to the Regional Council, together with particulars as to the source of supply or manufacture of such materials; or, at the discretion of the Divisional/Area Engineer, test certificates may be submitted indicating the suitability of the materials proposed for use.

### *Notice of Operations*

6.4 The developer or his contractor must give the Divisional Engineer's representative a minimum 48 hours notice (excluding weekends) of:

- (a) completion of formation;
- (b) commencement of each pavement layer to the carriageways, footways and footpaths;
- (c) each concrete pour (including blinding) and commencement of steelfixing where reinforced concrete is used;
- (d) striking of formwork;
- (e) setting out of road lighting plant positions, backfilling of cable trenches and painting of lighting columns.

It should be noted that these are minimum requirements and that, in certain cases, the developer may be required to notify the Divisional Engineer's representative of additional construction stages.

### *Completion Inspection*

6.5 Towards completion of any development incorporating new roads, a request should be made to the Divisional/Area Engineer to have a completion inspection carried out. As a result of this inspection, a list of any remedial work required to bring the road(s) up to the Local Roads Authority's standards will be prepared. Following the satisfactory completion of any such remedial work, an application may be made as detailed in Section 7 for the addition of the road(s) to the Regional Council's list of public roads.

## 7 Application for Adoption of New Roads and Footpaths

<i>Application for Adoption</i>	7.1	Following completion of a private road constructed in accordance with a Construction Consent, an application (on Form CC5 obtainable at Roads Department offices) for its inclusion in the Regional Council's list of public roads may be submitted to the appropriate Divisional/Area Engineer by the person to whom such consent was granted.
<i>Footpaths</i>	7.2	Only those footpaths which are the subject of an Agreement (para 5.13) will be eligible for adoption.
<i>Documents to Accompany Application</i>	7.3	The submission should include two copies of the drawings described in paragraph 5.2 and contain all relevant details <b>as built</b> . The roads offered for adoption should be shown in colour, and the plans should clearly indicate the ownership of all areas so coloured.
<i>Road Lighting</i>	7.4	The submission should include two copies of a signed Completion Certificate (Appendix F) together with <b>as installed</b> drawings. These drawings must show the positions and circuit arrangements of all apparatus and be in ink on a transparent material which will permit the unlimited reproduction of prints.
<i>Adoption Inspection</i>	7.5	Within a period of twelve months from the time of application for adoption of a new road, an inspection will be undertaken by the Divisional/Area Engineer to ensure that the road has not deteriorated to a standard below that required for adoption.
<i>Addition to List of Public Roads</i>	7.6	Following a satisfactory adoption inspection, the road(s) shall be added to the list of public roads, in terms of Sections 16 and 18 of the Roads (Scotland) Act 1984, as appropriate.
<i>Car Parking Areas</i>	7.7	A separate written application must be made in respect of any car parking areas which do not form part of the road and are thus ineligible for adoption but which are to be taken over for maintenance purposes by the Regional Council (para 3.4(b)).

# Part I I

## Geometry and Layout

*Preamble*

**This part of the document is intended to assist developers in the geometric design of road layouts and associated facilities. The following sections describe first how the guidelines should be used to conceive a layout in terms of road hierarchy and then give detailed design guidance for each type of road and for associated facilities.**

## 8 Use of Guidelines for Layout Design

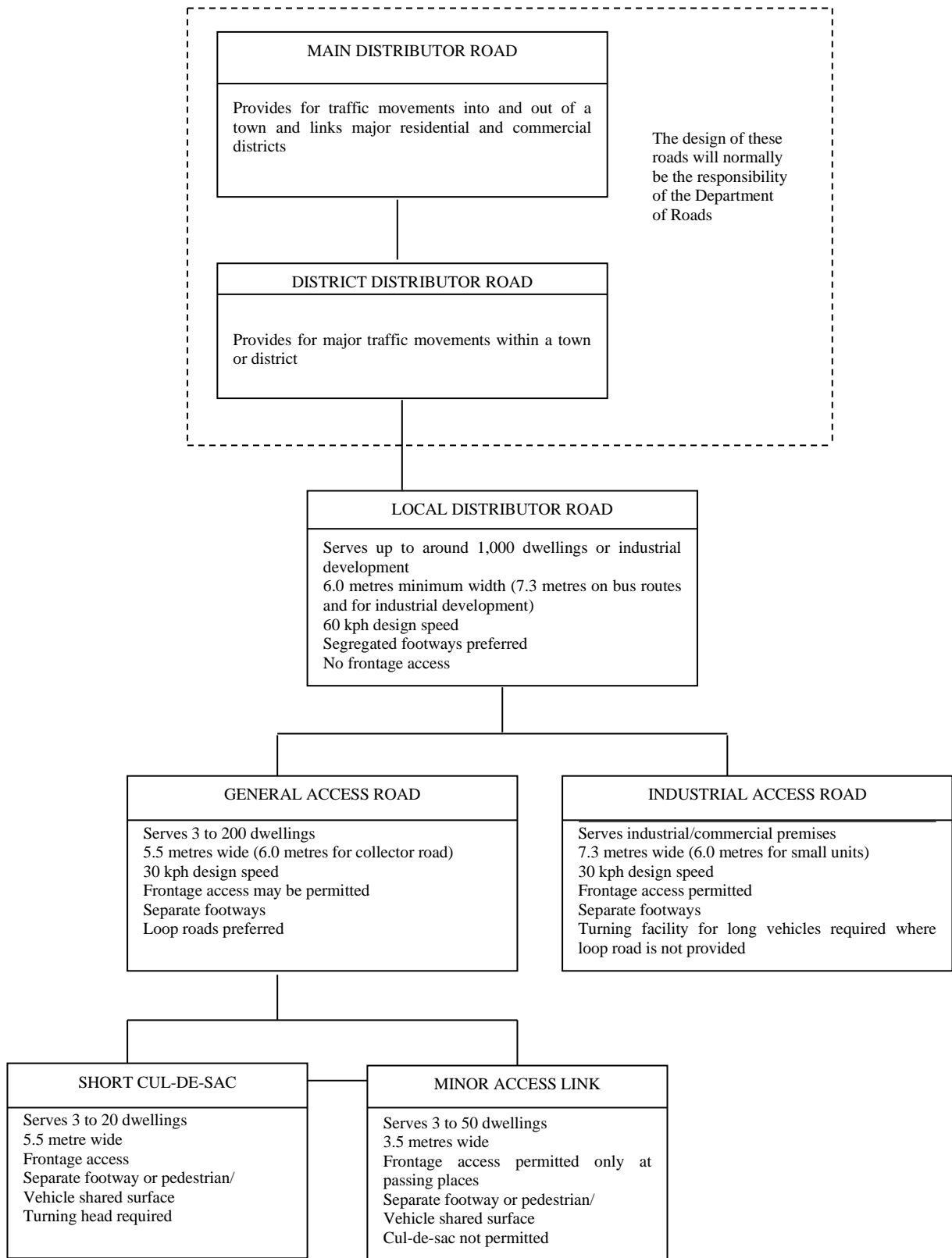
<i>Consultation</i>	8.1	Whenever it is intended to construct new roads or extend existing roads, the desirability of consultation from the earliest stages cannot be over-emphasised.
<i>Guideline Principles</i>	8.2	An understanding of the principles behind these guidelines is essential in their application to the geometric design of road layouts and the following paragraphs are included to brief developers in this respect.
<i>Road Layout</i>	8.3	It is not the intention to dictate road layout to the developer but rather to indicate how an overall design concept can be realised by different combinations of various types of road, always taking account of such factors as road safety and ease of maintenance.
<i>Road Types</i>	8.4	The type of road required for a particular situation is governed by its function and by the type and volume of traffic which will use it. Since, for access roads, traffic volume is directly related to the number and type of premises served, each element of a road system is defined in terms of the development which takes access from it.
<i>Access to Premises</i>	8.5	The guidelines are based on the philosophy that public access to any development should, desirably, be equally available to all sections of the community. Provision for motor vehicles should not therefore militate against access for cyclists, pedestrians and the disabled.
<i>Parking and Service Areas</i>	8.6	Vehicles parked on the carriageway reduce both the safety and traffic capacity of a road and development design should therefore aim to minimise this practice. Guidance on achieving this objective is contained in Sections 21 and 22, but detailed advice regarding appropriate parking and servicing provision for a particular development should be sought from the Divisional or Area Engineer.
<i>Additional Design Considerations</i>	8.7	A road layout should not be conceived in isolation but as an element in the overall design of a development. Developers should ascertain at an early stage the requirements of the Public Utilities, Bus Operators and others concerned with servicing the development and make reference to the design notes contained in Sections 23 and 24.
<i>Future Development</i>	8.8	The developer must anticipate future extensions to the development since the level of access provided may limit the extent to which further development will be permitted. Road types should therefore be related to the final volumes of traffic envisaged which will not necessarily be solely those generated by the initial development.
<i>Infill Development</i>	8.9	There has recently been a significant shift away from greenfield development, where the application of these guidelines is relatively straightforward, towards the redevelopment of existing "built-up" areas and "infill" development. While the basic principles outlined above are equally applicable to these latter sites, the constraints of adjacent developments and the prevailing conditions in the locality may give rise to complications in achieving the desired standards. It is therefore of paramount importance that the Divisional or Area Engineer is consulted at the earliest opportunity where infill development is contemplated, so that any difficulties in complying with these guidelines can be identified and alternative proposals evaluated. Cognisance should also be taken of the likelihood of further redevelopment or subsequent road improvements.
<i>Rural Areas</i>	8.10	It should be noted that these guidelines refer essentially to urban areas. In rural areas, where higher vehicle speeds necessitate more stringent design criteria, reference should be made to "Roads in Rural Areas" and to the Scottish Development Department's memoranda which, in part, supersede it.

## 9 The Road Network

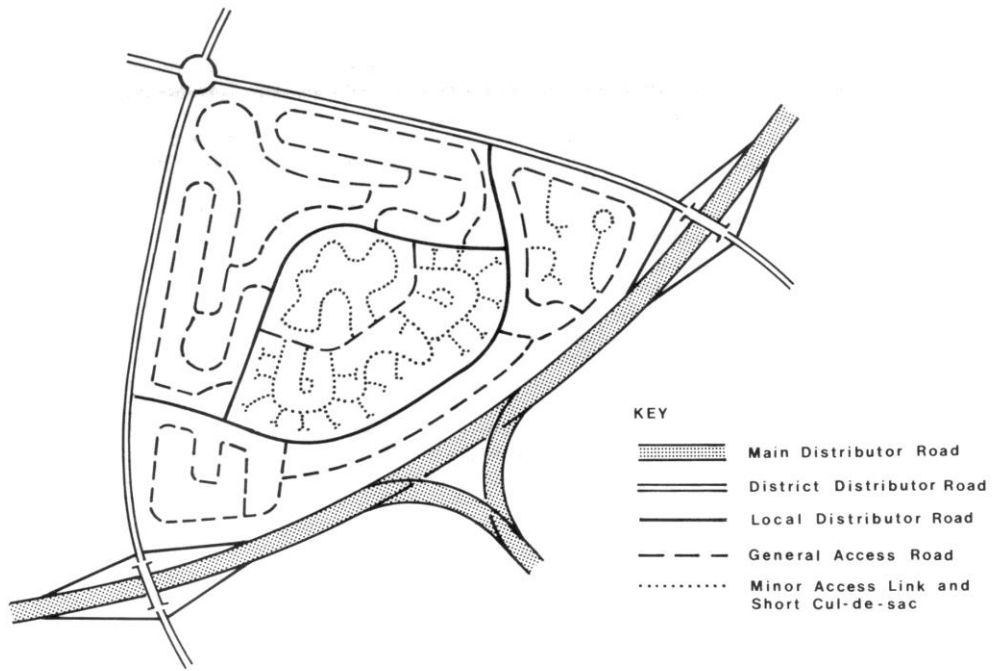
- Function* 9.1 The road network as a whole must both facilitate the movement of traffic from one location to another and provide access to individual premises. Desirably, for reasons of safety and efficiency, no single length of road should fulfil both functions.
- Types of Road* 9.2 In considering road infrastructure for new developments, it is therefore first necessary to define each element of the road network (both existing and proposed) according to its principal function. Four types of road have traditionally been identified:
- (a) MAIN DISTRIBUTOR ROADS - provide for traffic movements into and out of a town and link major residential and commercial districts.
  - (b) DISTRICT DISTRIBUTOR ROADS- provide for major traffic movements within a town or district.
  - (c) LOCAL DISTRIBUTOR ROADS - distribute traffic within a district and link DISTRICT DISTRIBUTOR ROADS to ACCESS ROADS.
  - (d) ACCESS ROADS - link premises and their associated parking areas to LOCAL DISTRIBUTOR ROADS.
- Access Roads* 9.3 In this document, which is intended to cover all development throughout Strathclyde Region, ACCESS ROADS have been further categorised as follows:
- (a) INDUSTRIAL ACCESS ROADS - link industrial/commercial premises and associated parking and service areas to LOCAL DISTRIBUTOR ROADS.
  - (b) GENERAL ACCESS ROADS - link residential premises and associated parking areas to LOCAL DISTRIBUTOR ROADS.
  - (c) MINOR ACCESS LINKS - interconnect SHORT CULS-DE-SAC and GENERAL ACCESS ROADS.
  - (d) SHORT CULS-DE-SAC - link residential premises and associated parking areas to MINOR ACCESS LINKS or GENERAL ACCESS ROADS.
- Shared Surface Roads* 9.4 In line with the recommendations made in the Scottish Housing Handbook Part 3<sup>2</sup> and Design Bulletin 32<sup>3</sup>, MINOR ACCESS LINKS and SHORT CULS-DE-SAC may, in appropriate cases, feature pedestrian/vehicle shared surfaces. It is hoped that this will provide a greater degree of flexibility in design, facilitating better use of sites and helping to create a better environment for living.
- Road Hierarchy* 9.5 A safe and efficient road network combines the various types of road in hierarchical form, thus facilitating the stepped adjustment of driving technique from arterial routes to the domestic environment. Figure 1 details the road hierarchy which should be established by a system of development roads and Figure 2 illustrates its use in creating a variety of residential layouts.
- Residential Road Layouts* 9.6 For residential development the road system must be such that every road serves at least three dwellings and **no length of road constitutes the sole means of vehicular access for more than two hundred dwellings**. The hypothetical layout in Figure 3, for a medium scale development, has been designed to show how dwellings may be served by either conventional or shared surface roads, although it may not, in practice, be appropriate to mix these within a particular development.



In established built-up areas, where redevelopment of a gap site is proposed, it may not always be possible to provide the hierarchy defined in Figure 1, especially where roads, which on account of their traffic volumes should be classed as distributors, already feature frontage access to dwellings. To avoid discontinuity of the footway, it may be appropriate in such circumstances for a development of up to five dwellings to take direct access from the existing road via a single 5.5 metres wide footway crossing (para 25.12). Approval for such a scheme would necessarily depend on the traffic characteristics of the existing road and be at the discretion of the Divisional/Area Engineer in each case.



**FIGURE 1 - Road Hierarchy**



**FIGURE 2 - Residential Layouts Exhibiting Prescribed Road Hierarchy**



**FIGURE 3 - Conventional and Shared Surface Access Roads in Residential Development**

## 10 Local Distributor Roads

<i>Function</i>	10.1	LOCAL DISTRIBUTOR ROADS distribute traffic within environmental areas and form the link between DISTRICT DISTRIBUTORS and ACCESS ROADS. They are also likely to be potential bus routes. LOCAL DISTRIBUTORS are traffic routes and not suitable for frontage development with direct access. Any road serving more than two hundred dwellings or giving access to industrial development should be designed to at least LOCAL DISTRIBUTOR standards.
<i>Layout</i>	10.2	The layout of LOCAL DISTRIBUTOR ROADS should be designed to discourage major through movement of general traffic. There may, however, be advantages in a design which allows buses to make interdistrict movements at this level in the road hierarchy.
<i>Geometry</i>	10.3	The minimum width of carriageway should be 6 metres. On bus routes, this width should be increased to at least 7.3 metres (para 24.4 et seq.) and bus bays may be required at stops. Roads giving access to industrial development should also be at least 7.3 metres wide. A design speed of 60 kph should be adopted for determining road alignment in accordance with Scottish Development Department Technical Memorandum SH3/82 <sup>4</sup> .
<i>Verges</i>	10.4	A verge at least 2 metres wide (paras 28.3 and 28.6) should be provided at all times on each side of the carriageway unless otherwise directed by the Divisional/Area Engineer.
<i>Footways</i>	10.5	The aim both in new development and in redevelopment should be to achieve a system whereby pedestrians are segregated from vehicle movements. Where footways do run alongside LOCAL DISTRIBUTORS they should be at least 2 metres wide (para 18.9) and be separated from the carriageway by a verge.

**TABLE 1 - Design Criteria for Local Distributor Roads**

<i>Feature</i>	<i>Standard</i>	<i>Comment</i>
Design Speed	60 kph	No frontage access permitted.
Carriageway Width	6m	7.3m minimum on bus routes or for industrial development; see Section 15 for widening on curves.
Maximum Gradient	5%	May be increased at discretion of Divisional/Area Engineer
Minimum Gradient	0.8%	Minimum practical for drainage channels
Minimum Vertical Curve Length	K x algebraic difference In % Gradient	Where K = 10 (crests) 13 (sags); absolute minimum length = 30m
Minimum Horizontal Curve Radius	255m	Desirable minimum; may be reduced on difficult sites (see SH3/82 <sup>4</sup> )
Minimum Sight Distance	90m	Desirable minimum; absolute minimum = 70m
Verges	2m grass or deterrent paving	Essential in all cases

## 11 Industrial Access Roads

<i>Function</i>	11.1	An INDUSTRIAL ACCESS ROAD provides frontage or service access to industrial and commercial premises.
<i>Layout</i>	11.2	An INDUSTRIAL ACCESS ROAD may be a cul-de-sac in which case a turning facility should be incorporated (paras 17.3 and 17.7). Elsewhere loop roads should be provided to discourage general through traffic movement.
<i>Geometry</i>	11.3	INDUSTRIAL ACCESS ROADS are transitional in nature between full standard distributor roads and the local industrial/commercial environment and may therefore be constructed to reduced standards of alignment compared with distributor roads. This will largely depend upon the length of the roads and it is still probably desirable to use a formal design speed for assessing curve radii and visibility. 30kph is suggested as an appropriate figure, with a minimum centreline radius of 25 metres. A minimum carriageway width of 7.3 metres will normally be required, but this may be reduced to 6 metres where commercial vehicle activity is likely to be limited (e.g. in small-scale industrial developments comprising nest units) or where one-way working is to be enforced. In all cases carriageways will require widening on small radius curves as detailed in Section 15.
<i>Footways</i>	11.4	A footway at least 2 metres wide (para 18.9) should be provided on each side of the carriageway. However, if development is to one side of the road only, the requirement for a footway on the opposite side of the road may be relaxed. Only in exceptional cases, where it can be demonstrated that pedestrian activity is unlikely, may the requirement for any footway be waived.
<i>Verges</i>	11.5	Wherever a footway is not provided, a 2 metres wide grass verge (para 28.3) or, sightlines and Public Utility services permitting, a 0.6 metre wide hard-landscaped berm (para 28.6) will be required between the edge of the carriageway and any vertical face.

**TABLE 2 - Design Criteria for Industrial Access Roads**

<i>Feature</i>	<i>Standard</i>	<i>Comment</i>
Design Speed	30 kph	
Carriageway Width	7.3m	6m for small units or one-way working; see Section 15 for widening on curves.
Maximum Gradient	5%	May be increased at discretion of Divisional/Area Engineer
Minimum Gradient	0.8%	Minimum practical for drainage channels
Minimum Vertical Curve Length	$K \times \frac{\text{algebraic difference}}{\text{In \% Gradient}}$	Where K = 6; absolute minimum length = 20m
Minimum Horizontal Curve Radius	25m	
Minimum Sight Distance	60m	Desirable minimum; absolute minimum = 40m
Verges	2m grass or 0.6m hard-landscaping	Essential at vertical faces where there are no footways

## 12 General Access Roads

<i>Function</i>	12.1	A GENERAL ACCESS ROAD may function as a collector road linking a LOCAL DISTRIBUTOR ROAD to a number of MINOR ACCESS LINKS and/or SHORT CULS-DE-SAC, or it may act as a housing access road in its own right with frontage access to dwellings. No more than two hundred dwellings in total may be served by a GENERAL ACCESS ROAD.
<i>Layout</i>	12.2	GENERAL ACCESS ROADS should be laid out to discourage through traffic movement and be of loop form where possible. At the same time, layouts should minimise dead mileage for delivery and service vehicles and ensure that all vehicles entering a GENERAL ACCESS ROAD can rejoin the main highway network without reversing at any point en route.
<i>Geometry</i>	12.3	GENERAL ACCESS ROADS are transitional in nature between full standard distributor roads and the local domestic environment and may therefore be constructed to reduced standards of alignment compared with distributor roads. This will largely depend upon the length of the roads, and it is still probably desirable to use a formal design speed for assessing curve radii and visibility. 30kph is suggested as an appropriate figure, with a minimum centreline radius of 25 metres. A minimum carriageway width of 5.5 metres will normally be required, but this is increased to 6 metres where the GENERAL ACCESS ROAD functions as a collector.
<i>Footways</i>	12.4	A footway at least 2 metres wide (para 18.9) should be provided on each side of the carriageway. However, if development is to one side of the road only, the requirement for a footway on the opposite side of the road may be relaxed. Only where there is a segregated footpath system, and it can be demonstrated that pedestrians are unlikely to walk along the access road, may the requirement for any footway be waived.
<i>Verges</i>	12.5	A 2 metres wide verge (para 28.3) will be required wherever a footway is not provided.

**TABLE 3 - Design Criteria for General Access Roads**

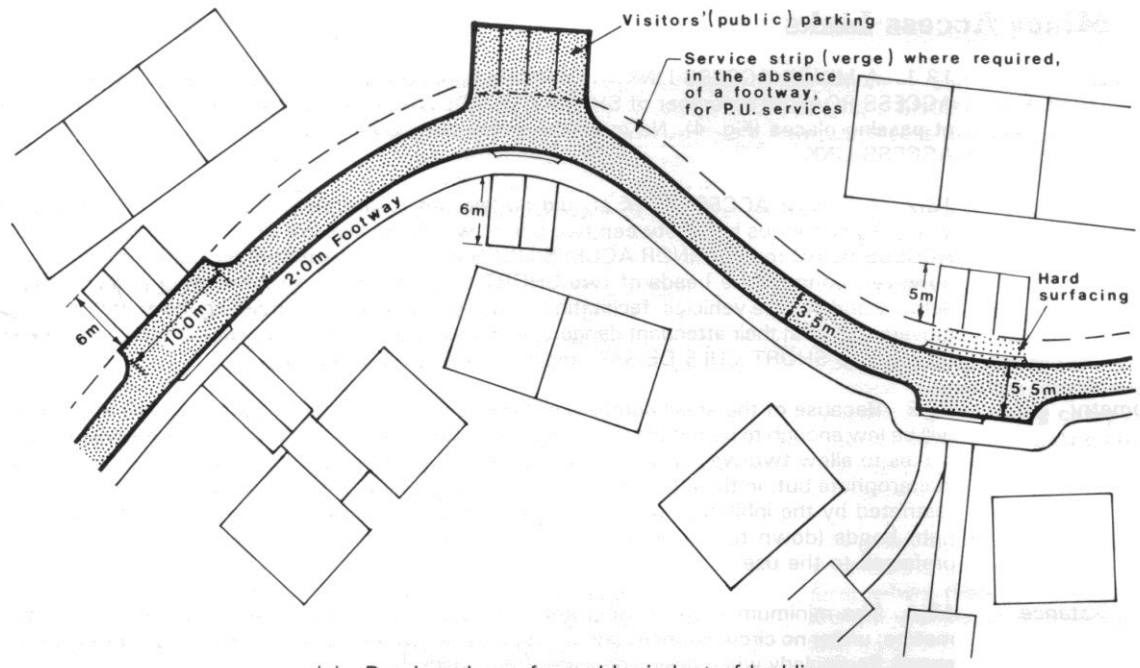
<i>Feature</i>	<i>Standard</i>	<i>Comment</i>
Design Speed	30 kph	
Carriageway Width	5.5m	6m width for collector roads; see Section 15 for widening on curves.
Maximum Gradient	8%	May be increased at discretion of Divisional/Area Engineer
Minimum Gradient	0.8%	Minimum practical for drainage channels
Minimum Vertical Curve Length	$K \times \frac{\text{algebraic difference}}{\text{In } \% \text{ Gradient}}$	Where K = 6; absolute minimum length = 20m
Minimum Horizontal Curve Radius	25m	
Minimum Sight Distance	60m	
Verges	2m grass	Essential where there are no footways

### 13 Minor Access Links

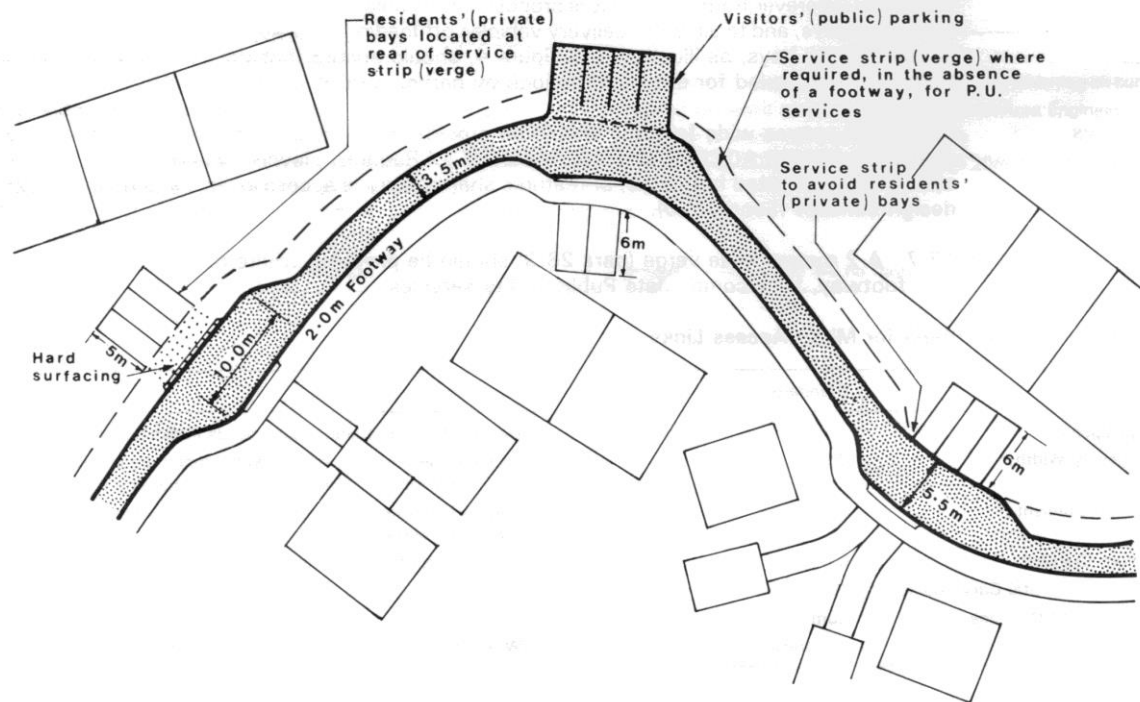
- Function* 13.1 A MINOR ACCESS LINK will normally function as a collector road, linking a GENERAL ACCESS ROAD to a number of SHORT CULS-DE-SAC, but houses may have frontage access **at passing places** (Fig. 4). No more than fifty dwellings in total may be served by a MINOR ACCESS LINK.
- Layout* 13.2 A MINOR ACCESS LINK should be laid out to discourage through traffic movement, forming a circuitous loop between two points which are also linked by a more direct GENERAL ACCESS ROAD route. MINOR ACCESS LINKS will not be permitted as culs-de-sac; they may, however, connect the heads of two SHORT CULS-DE-SAC, so minimising dead mileage for delivery and service vehicles, facilitating emergency access and obviating the need for reversing movements with their attendant dangers. In this case up to forty dwellings in total may be served by the two SHORT CULS-DE-SAC and the MINOR ACCESS LINK.
- Geometry* 13.3 Because of the small numbers of houses involved, vehicle volumes even at peak hours will be low enough to permit the use of 3.5 metres wide single track roads **with intervisible passing places** to allow two-way working. At this level of the road hierarchy formal design speeds are inappropriate but, in the interest of the local residential environment, vehicle speeds should be restricted by the inhibiting effect of the narrow single track carriageway and the adoption of tight bends (down to 10 metres centreline radius). A flowing alignment of gentle curves is preferred to the use of long straight sections, particularly on falling gradients.
- Sight Distance* 13.4 The minimum sight distance for drivers joining a MINOR ACCESS LINK should be 20 metres; **under no circumstances should reduced visibility be used as a means of reducing vehicle speed.** Particularly when designing single track roads, it should be remembered that two vehicles each travelling at 15kph have a closing speed of 30kph.
- Passing Places* 13.5 Passing places should be 10 metres long x 5.5 metres wide. They must be intervisible and may be combined with the entries to SHORT CULS-DE-SAC (para 16.5). They will be obligatory wherever frontage access is proposed: to enable cars to manoeuvre into 90° driveways or parking bays, and to allow for delivery vehicles off-loading. This adjacent location of driveways and/or parking bays, as illustrated in Figure 4, should ensure that the passing places are not themselves occupied for extended periods by parked cars.
- Footways* 13.6 A 2 metres wide footway should be provided on at least one side of the carriageway unless the MINOR ACCESS LINK forms part of a "Radburn" layout, having a comprehensive system of segregated footpaths, or features shared surface access as an element of the overall design concept (Section 20).
- Verges* 13.7 A 2 metres wide verge (para 28.3) should be provided where required, in the absence of a footway, to accommodate Public Utility services.

**TABLE 4 - Design Criteria for Minor Access Links**

<i>Feature</i>	<i>Standard</i>	<i>Comment</i>
Design Speed	-	Design should not encourage speeds in excess of 10-15kph
Carriageway Width	3.5m	To minimise on-road parking, width should be increased only On small radius curves (Section 15) and at passing places
Maximum Gradient	8%	May be increased at discretion of Divisional/Area Engineer except for shared surfaces
Minimum Gradient	0.8%	Minimum practical for drainage channels
Minimum Horizontal Curve Radius	10m	
Minimum Sight Distance	20m	
Verges	2m grass	Where required to accommodate PU services (Section 23)



(a) Passing places formed by indent of kerblines



(b) Passing places formed by offset of kerblines

FIGURE 4—Alternative Layouts of Passing Places on Minor Access Link

FIGURE 4 - Alternative Layouts of Passing Places on Minor Access Link



## 14 Short Culs-de-Sac

<i>Function</i>	14.1	A SHORT CUL-DE-SAC serves a maximum of twenty dwellings with frontage access. It is not intended to function as a traffic route and vehicular access via any part of a SHORT CUL-DE-SAC to development in excess of this will not be permitted.
<i>Layout</i>	14.2	The layout of SHORT CULS-DE-SAC will vary according to the type and density of the development and may range from short lengths of road ending in turning heads to housing squares and more informal courtyard areas.
<i>Geometry</i>	14.3	A formal design speed is inappropriate for a SHORT CUL-DE-SAC but at junctions with roads constructed to higher standards the visibility from the SHORT CUL-DE-SAC approach should be appropriate to the design speed of the major road. Carriageway width should not be less than 5.5 metres to allow for delivery vehicles standing outside dwellings.
<i>Informal Courtyard</i>	14.4	The less formal courtyard should still have a 5.5 metres wide core area and should be large enough and of a shape to accommodate a full turning area as detailed in Figure 9. The remaining area, available for casual parking, should be delineated by a change in type, or colour, of surfacing or by an alternative form of permanent marking and, in conjunction with the arrangement of any private driveways, should be designed to discourage casual parking in the core area.
<i>Footways</i>	14.5	A 2 metres wide footway should be provided around the perimeter of the carriageway unless the SHORT CUL-DE-SAC features a pedestrian/vehicle shared surface (Section 20) or forms part of a "Radburn" layout having a comprehensive segregated footpath system.
<i>Verges</i>	14.6	A 2 metres wide verge (para 28.3) should be provided where required, in the absence of a footway, to accommodate Public Utility services.

**TABLE 5 - Design Criteria for Short Culs-de-Sac**

<i>Feature</i>	<i>Standard</i>	<i>Comment</i>
Carriageway Width	5.5m	Core width to be maintained in courtyards
Maximum Gradient	8.0%	May be increased at discretion of Divisional/Area Engineer except for shared surfaces
Minimum Gradient	0.8%	Minimum practical for drainage channels
Verges	2m grass	Where required to accommodate PU services (Section 23)

## 15 Carriageway Widening on Curves

### *Need for Widening*

- 15.1 The need for widening on curves depends upon the radius and the length of curve, and the types of vehicles using the road. Table 6 shows the increased widths required on 90° bends to allow two vehicles to pass, while maintaining appropriate clearances.

### *Single Track Roads*

- 15.2 Single track MINOR ACCESS LINKS, having a basic width of 3.5 metres, should be widened to 4 metres on curves of radii less than 25 metres to minimise the risk of overriding kerbs or verges. For radii of less than 15 metres, a 4 metres width should still suffice provided the deflection is no more than about 45°.

### *Method of Widening*

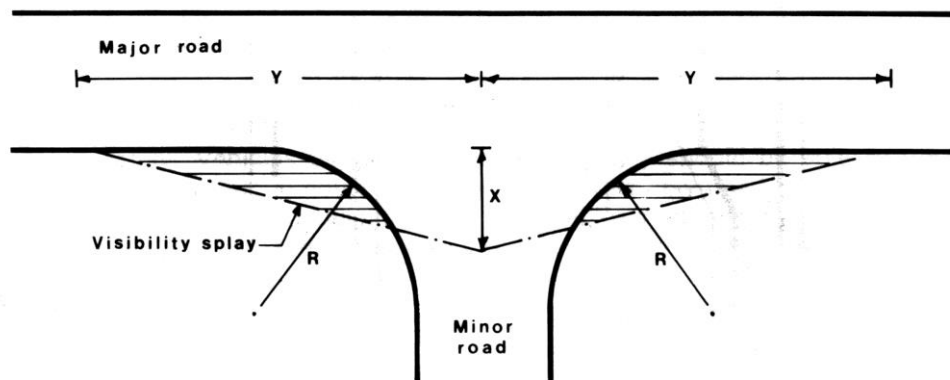
- 15.3 Widening is most simply achieved by maintaining the outer kerb line as a circular arc ( $R_o = \text{centreline radius} + 0.5 \times \text{nominal road width}$ ), and increasing the road width on the inside of the bend. Further details of inside kerb lines for industrial roads are to be found in "Designing for Deliveries" published by the Freight Transport Association<sup>5</sup>.

**TABLE 6- Carriageway Widening on Curves**

Centreline Curve Radius (metres)	Road Width Required at Apex of 90° Bend (Metres)					
	General Access Road		Industrial Access Road		Local Distributor Road	
	(5.5m basic)	(6.0m basic)	(6.0m basic)	(7.3m basic)	(6.0m basic)	(7.3m basic)
25	7.3	7.8	9.9	11.2	-	-
50	6.8	7.3	8.1	9.4	-	-
75	6.3	6.8	7.4	8.7	-	-
150	5.9	6.4	6.7	7.9	6.4	7.9
300	5.5	6.0	6.0	7.3	6.0	7.3

## 16 Road Junctions

*Form of Junction 16.1* Where two roads intersect a right angled T-junction should be formed with the major road, defined as that carrying the greater volume of traffic, continuous through the junction (Fig. 5).



**FIGURE 5 - Generalised Layout of a Priority Junction**

- Priority* 16.2 In general the geometric layout should clearly establish the priority of the major road to approaching drivers. The Divisional/Area Engineer may additionally require that road signs and/or road markings be provided to emphasise this priority.
- Siting* 16.3 It is preferable to site junctions on level ground or in sags rather than at, or near, the crests of hills. Where possible, T-junctions on curves should be sited so that the minor road is on the outside of the curve. Junctions on the inside of sharp curves are most undesirable.
- Staggered Junctions* 16.4 Where two minor roads approach a major road from opposite sides, a staggered junction comprising two T's should normally be used instead of a crossroads. Right/left staggers (where minor road traffic crossing the major road first turns right out of the minor road, proceeds along the major road and then turns left) are preferred to left/right staggers.
- Geometry* 16.5 Road junctions should be designed to meet the criteria listed in Table 7, and laid out as illustrated in Figures 5, 6 and 7. It should be noted that at junctions on MINOR ACCESS LINKS the carriageway must be widened to 5.5 metres to minimise the risk of congestion and allow for larger vehicles negotiating the junctions. The form of such widening should ensure that traffic proceeding from the junction into a MINOR ACCESS LINK encounters an offset to the right in the nearside kerb alignment.

**TABLE 7 - Dimensions for Priority Junctions**

Major Road Type	Minor Road Type	Minimum Spacing on Major Road (metres)	Visibility Splay		Corner Radii R (metres)
			X (metres)	Y (metres)	
District Distributor	Local Distributor	210 (150□)	9	120	10.5*
Local Distributor	Local Distributor	100	9	90	10.5*
Local Distributor	Industrial Access Road	100 (40□)	9	90	Refer to Figure 7
Local Distributor	General Access Road	100 (40□)	9	90	10.5
Industrial Access Road	Industrial Access Road	25	4.5	60	9.0
General Access Road	General Access Road	25	4.5	60	7.5
General Access Road	Minor Access Link or Short Cul-de-Sac	25	4.5	60	6.0
Minor Access Link	Minor Access Link or Short Cul-de-Sac	-	2.5	20	4.5

□ Absolute Minimum \* Refer to Figure 7 where long vehicles are anticipated

*Spacing* 16.6 Junction spacing (Table 7) is related to the likely volumes and speeds of traffic and to the distance required by moving vehicles to take up position between junctions for particular turning movements. The need to maintain road safety and minimise the likelihood of congestion will dictate the spacing and location of major access points.

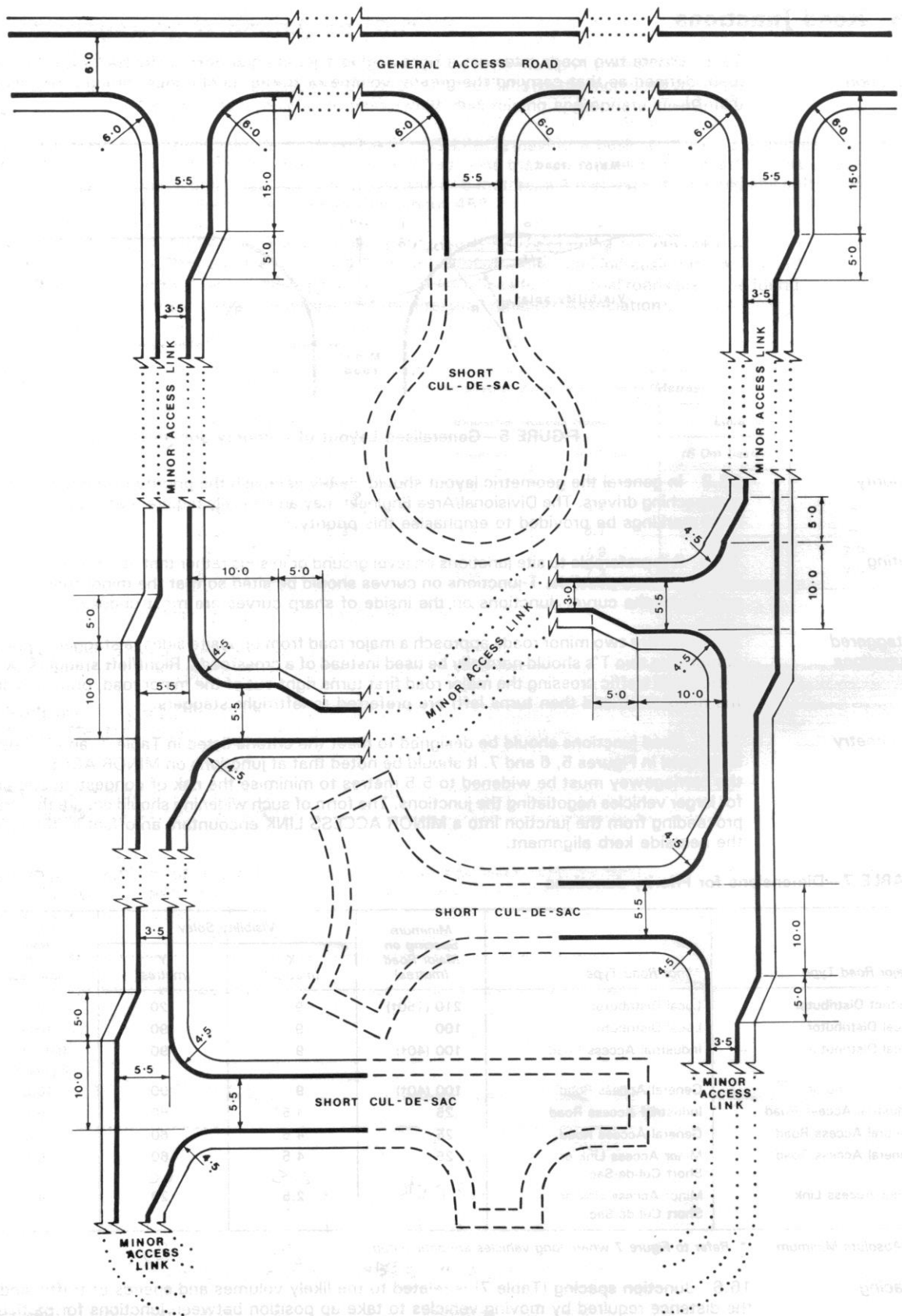


FIGURE 6—Junction Layouts for Minor Access Links and Short Culs-de-sac

Visibility Splay

16.7 At priority junctions there should be full visibility to left and to right between points 1.05 metres above carriageway level over the visibility splay area defined in Figure 5. The X and Y distances (Table 7) are determined solely by the major road type and will be applied on this basis to junctions comprising combinations of road types not specifically listed in the table. Where, of necessity, a minor road forms an uphill approach to the major road, care should be taken to ensure that objects within the visibility triangle, although less than 1.05 metres above carriageway level, do not interfere with visibility. For junctions on curves, reference should be made to Scottish Development Department Technical Memorandum SH8/82<sup>6</sup> for determination of parameters X and Y.

Corner Radii

16.8 The radii for corners (Table 7) are determined by the need for vehicles using the junction to manoeuvre safely. Vehicles using the junction regularly should be able to turn without obstructing oncoming traffic although some larger vehicles may need to use the full width of road. At junctions where it is anticipated that long vehicles will emerge from the minor road (e.g. from an industrial estate) the nearside kerb should incorporate a taper as detailed in Figure 7.

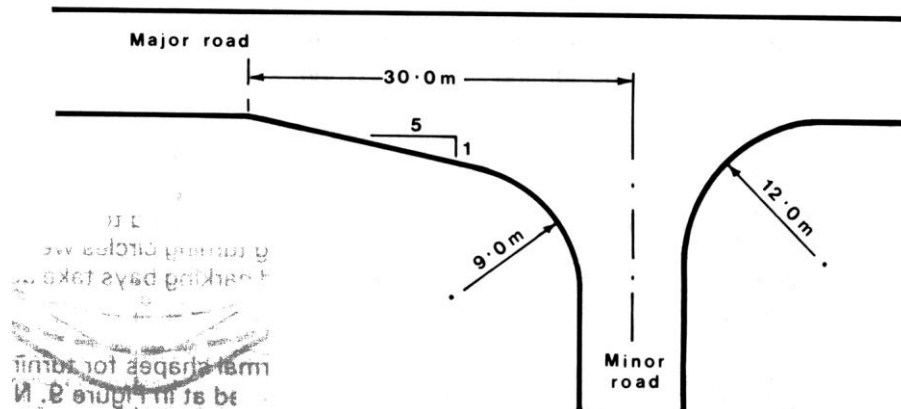


FIGURE 7 - Junction Layout for Long Vehicles

Special Cases

16.9 In special cases (e.g. one-way roads) some reduction in the values of X, Y and R may be permitted by express permission of the Divisional/Area Engineer.

Gradients

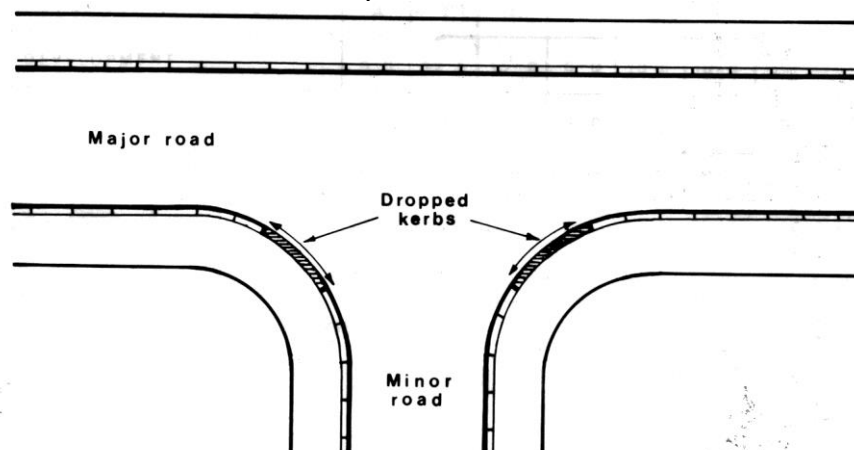
16.10 The maximum gradient of the final approach of the minor road at junctions should be limited over the X distance to 2 per cent where the major road is a DISTRICT or LOCAL DISTRIBUTOR and to 5 per cent in other situations.

Frontage Access/  
Parking

16.11 No frontage access or lay-by parking will normally be permitted in the immediate vicinity of a road junction, or where parked vehicles would interfere with junction sightlines.

Dropped Kerbs

16.12 Provision should be made at all road junctions for pedestrians to continue along the major road with a minimum of inconvenience. Kerbs should therefore be dropped (para 25.14), as indicated in Figure 8, at all junctions other than those at which a footbridge or underpass, suitable for use by pedestrians with prams and wheelchairs, is provided.



## **FIGURE 8 - Dropped Kerbs at Road Junctions**

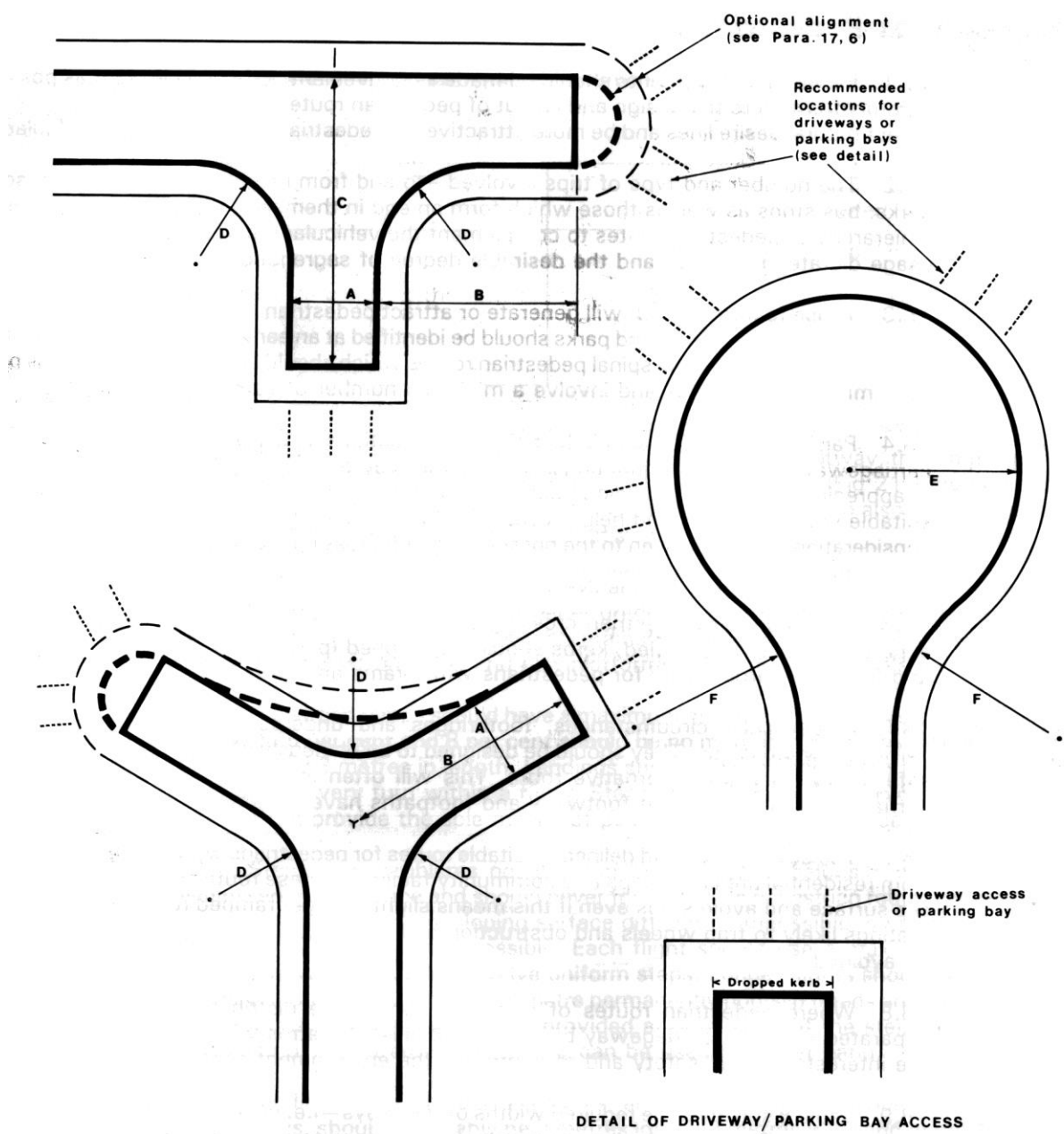
*Rural Areas*

- 16.13 The dimensions given in Table 7 apply only where there is a speed limit of 40 mph or less. Where speeds are higher, and particularly in rural areas, the Divisional/Area Engineer will advise on appropriate standards.

## 17 Turning Areas

<i>Turning Provision</i>	17.1	It is desirable for road layouts to be designed so that service vehicles do not need to reverse on the public highway. Wherever possible this should be achieved by the provision of access roads in the form of loops off LOCAL DISTRIBUTOR ROADS; thus avoiding the need for turning areas and minimising dead mileage for delivery and service vehicles.
<i>Turning Areas</i>	17.2	In general, roads not of loop form (i.e. culs-de-sac) should terminate in turning circles which can be negotiated by all vehicles in forward gear. Where lack of space in a SHORT CUL-DE-SAC precludes the creation of a turning circle, or as a temporary solution as part of phased development, turning heads may be substituted; but the attendant dangers of reversing service vehicles should not be overlooked.
<i>Geometry</i>	17.3	The dimensions of turning areas should suit the characteristics of the largest vehicles to use the facility regularly. In residential roads these will normally be refuse collection vehicles, while in industrial/commercial development it may be necessary to cater for 15.5 metres long articulated vehicles or 18 metres long draw-bar trailers. The turning areas detailed in Figure 9 are based on the turning circles between kerbs of these vehicles.
<i>Body Overhang</i>	17.4	Where there is no adjacent footway, turning areas should be provided with a 2 metres wide verge or margin to allow for any overhang of vehicle bodies when manoeuvring.
<i>Parking</i>	17.5	The layout of a development should be designed to discourage casual parking in turning areas. This may be achieved either by locating turning circles well clear of frontage development or by arranging that premises and designated parking bays take access via the turning area (Fig. 9)
<i>Informal Courtyards</i>	17.6	In residential areas the use of less formal shapes for turning heads in SHORT CULS-DE-SAC will be acceptable and this had been hinted at in Figure 9. Note that the shape should still incorporate the basic turning head dimensions.
<i>Service Areas</i>	17.7	A separate turning area may not always be necessary where an INDUSTRIAL ACCESS ROAD is flanked by services areas which will themselves accommodate the turning manoeuvres of the largest vehicles anticipated.





	A	B	C	D	E	F
<b>RESIDENTIAL DEVELOPMENT</b>	5.0	12.5	15.0	6.0	10.5	10.5
<b>INDUSTRIAL/COMMERCIAL DEVELOPMENT</b>	6.0	25.0	22.0	9.0	13.0	9.0

(all dimensions are in metres)

**FIGURE 9 - TURNING AREAS**

## 18 Provision for Pedestrians

<i>Desire Lines</i>	18.1	Pedestrian movements should be made as convenient, safe and pleasant as possible by careful attention to the design and layout of pedestrian routes. The pedestrian network should reflect natural desire lines and be more attractive for pedestrians to use than the vehicular route.
<i>Hierarchy</i>	18.2	The number and type of trips involved - to and from neighbours, local shops, schools, parks, bus stops as well as those which form an end in themselves - leads to the definition of a hierarchy of pedestrian routes to complement the vehicular network. In a similar manner the usage dictates the width and the desirable degree of segregation.
<i>Main Routes</i>	18.3	Those features which will generate or attract pedestrian traffic such as shopping areas, schools, bus routes, clinics and parks should be identified at an early stage in the planning process. These will dictate the main spinal pedestrian routes which should be segregated as far as possible from major traffic routes and involve a minimum number of carriageway crossings.
<i>Location of Crossings</i>	18.4	Particular attention should be paid to the locations at which pedestrian routes cross the carriageway (e.g. at road junctions) so that footway and footpath users are not exposed to unappreciated dangers. Judicious use of hard and soft landscaping can guide pedestrians to suitable crossing points and help prevent children running directly out on to the road. Special consideration should be given to the possible need for crossing facilities adjacent to shops, clinics, community facilities and other generators of pedestrian traffic.
<i>At-Grade Crossings</i>	18.5	At designated pedestrian crossing points, other than those at which a suitable grade separated facility is provided, kerbs should be dropped (para 25.14) to permit easy access to and from the carriageway for pedestrians with prams and wheelchairs.
<i>Grade-Separated Crossings</i>	18.6	In particular circumstances, footbridges and underpasses may be appropriate for carriageway crossings. They should be designed to be obviously more convenient, pleasant and safe to use than any alternative route. This will often involve elevating or depressing the carriageway to ensure that footways and footpaths have minimal changes in level.
<i>Routes for Prams And Wheelchairs</i>	18.7	The developer should delineate suitable routes for pedestrians with prams and wheelchairs, from residential areas to shops and community facilities. These routes should have a firm, non-slip surface and avoid steps even if this means slightly longer ramped routes. Steep crossfalls, gratings likely to trap wheels and obstruction by lighting columns, sign posts etc. should also be avoided.
<i>Routes on Distributor Roads</i>	18.8	Where pedestrian routes of necessity run beside distributor roads, they should be separated from the carriageway by a verge at least 2 metres wide (paras 28.3 and 28.6) in the interests of road safety and of improving the environment of the road.

*Footway Widths*

18.9 Table 8 specifies the required widths of footways - i.e. pedestrian routes associated with carriageways. These widths may require to be increased to cater for high pedestrian volumes. Conversely, at the discretion of the Divisional/Area Engineer, footways may be reduced in widths over short lengths not exceeding 3 metres to negotiate mature trees and other obstructions, but they should at no point be less than 1.4 metres wide. Where Public Utility services underlie the footway, special arrangements may be necessary at sections of reduced width (para 23.4).

**TABLE 8 - Footway Widths**

<i>Frontage Development</i>	<i>Width* (metres)</i>
None	2.5-3.0□
Industrial	2.0-5.0
Residential	2.0-3.0
Local Shops	4.0
Major Shops	5.0

\* See paragraph 18.9

□ Minimum 3.0 metres for District Distributor Road.

*Footpath Widths* 18.10 Table 9 details appropriate widths for footpaths and pedestrian areas intended for adoption (see para 3.3 regarding eligibility). These widths may require to be increased to facilitate maintenance of the footpath and/or underlying services (para 23.4).

**TABLE 9 - Footpath Widths**

<i>Type of Footpath</i>	<i>Width (metres)</i>
Minor pedestrian routes	2.0*
Major pedestrian routes	3.0
Shopping Precinct	6.0
Footbridge	2.5
Underpass (2.3m headroom)	2.5

\* May be inadequate for maintenance purposes (para 18.10).

*Footway Crossings*

18.11 Where vehicular access to premises is taken across a footway, the ramped portion should be confined to that immediately adjacent to the carriageway (Fig 21), thus emphasising the pedestrians' priority. The short ramp adjacent to the dropped kerb also encourages a reduction in the speed of vehicles crossing the footway.

*Gradients*

18.12 Desirably, gradients on footways and footpaths should not exceed 5 per cent, with a normal maximum of 8 per cent. Steeper gradients may occasionally be permitted, except on routes delineated for pedestrians with prams and wheelchairs, subject to the provision of a handrail on at least one side and rest platforms at 10 metre intervals.

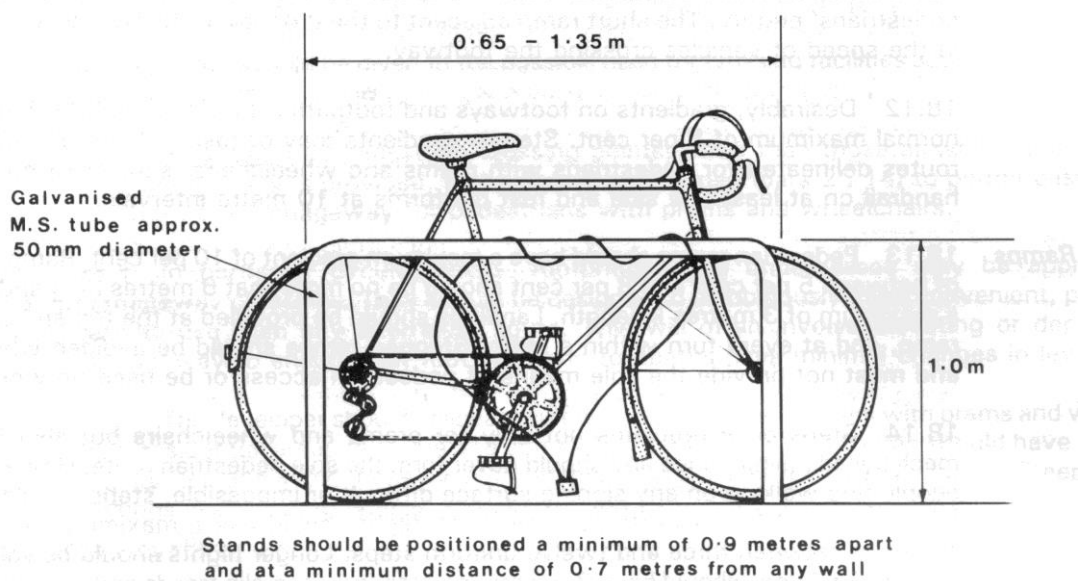
*Pedestrian Ramps*

18.13 Pedestrian ramps should have a maximum permitted gradient of 1 in 12 (8.33 per cent). Ramps with gradients of between 5 per cent (1 in 20) and 8.33 per cent (1 in 12) should be a desirable length of 6 metres and an absolute maximum length of 10 metres. Landings should be provided at the top and bottom of every ramp, and at every turn within a ramp. Stepped ramps should be avoided wherever possible and must not provide the sole means of pedestrian access or be used on wheelchair routes.

<i>Steps</i>	18.14	Steps pose problems not only for prams and wheelchairs but also for subsequent mechanised maintenance and should never form the sole pedestrian route. However, since some people find walking on any sloping surface difficult or impossible, steps should be provided in addition to ramps wherever possible. Each flight should rise a maximum of 1.5 metres and comprise between three and twelve uniform steps. Longer flights should be split into sections by landings. Steps should have 0.3 metre permanently non-slip treads and a minimum clear width of 1.4 metres. Handrails should be provided at both sides of the steps (or centrally on steps a minimum of 3 metres wide) so they can be used by either hand.
<i>Landings/Rest Platforms</i>	18.15	Landings on ramps and stairways, and rest platforms provided adjacent to footpaths and footways, should preferably be 2 metres long x 2 metres wide and of minimum dimensions 1.2 metres x 1.2 metres.
<i>Handrails</i>	18.16	Handrails should comprise 50mm diameter, galvanised, mild steel tube and must be securely fixed. They should be set 1 metre above a ramp and 0.85 metre above the tread of a step. They should extend at least 0.3 metre horizontally beyond the top and bottom of a ramp or flight of steps and should be returned at each end. Free standing handrails should be complemented with a lower rail set not more than 0.3 metre above the walking surface.
<i>Grit Bins</i>	18.17	In developments featuring pedestrian routes with gradients steeper than 8 per cent, and/or an extensive network of footpaths, the Divisional/Area Engineer may require small areas adjacent to these to be provided for the siting of grit bins.
<i>Parapet Height</i>	18.18	All footbridges should have a parapet provided with a minimum height of 1.5 metres.

## 19 Provision for Cyclists

- Network* 19.1 Where there is likely to be sufficient cycling demand in new housing schemes and where an existing network of cycle tracks terminates at or adjacent to a new development consideration should be given to the need to link the scheme to it or extend it.
- Cycle Tracks* 19.2 In addition, it may be appropriate to construct comparatively short lengths of cycle track in the immediate vicinity of shops or schools to allow cyclists to disperse in greater safety than would otherwise be possible.
- Parking* 19.3 Consideration should be given to the installation of secure cycle parking facilities of the "Sheffield" type (Fig 10) at shopping and other communal centres where significant cycle usage is anticipated. For maximum security, stands should be placed away from access by motor vehicles and be visible to passers-by (i.e. not hidden at the side or rear of buildings). In shopping areas, it is preferable for the provision to consist of a number of groups each comprising a few stands rather than extensively long racks.

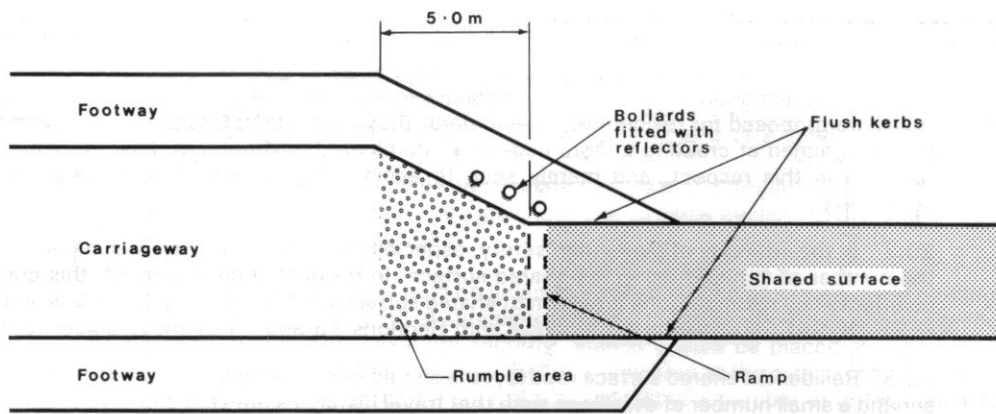


**FIGURE 10 - Sheffield Cycle Parking Stand**

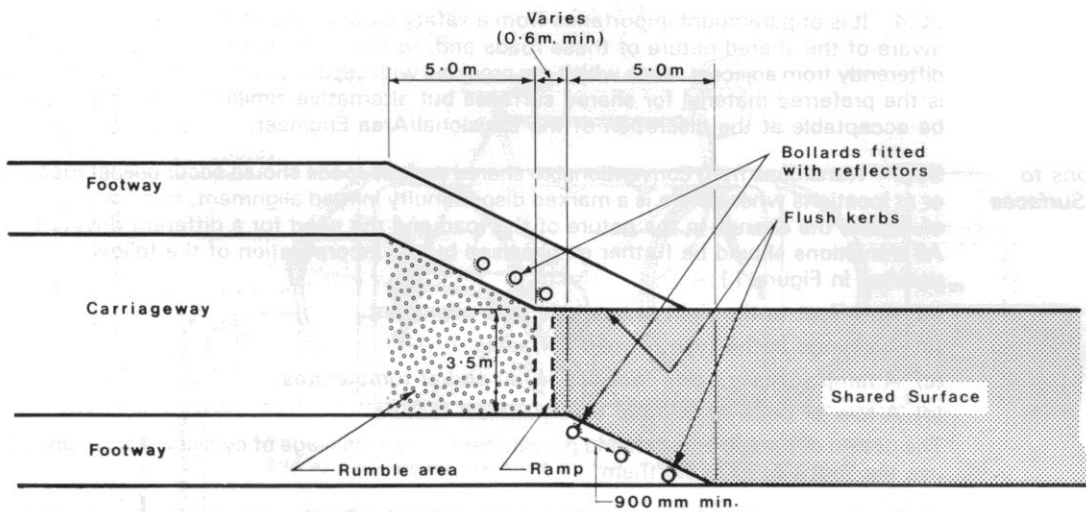
## 20 Pedestrian/Vehicle Shared Surfaces

<i>Function</i>	20.1	A shared surface allows pedestrians and vehicles to gain access to premises via a road which is not demarcated into the conventional carriageway/footway arrangement. Where such roads are proposed for residential development, they must constitute part of an overall design concept, aimed at creating a more pedestrian dominated environment. Layouts which do not conform in this respect, and merely seek to avoid the provision of footways, will not be acceptable.
<i>Road Types</i>	20.2	In the interests of pedestrian safety, especially of children at play, it is important to limit the number of vehicles using the shared surface. In residential development, this control will be effected by restricting the provision of shared surfaces to MINOR ACCESS LINKS and SHORT CULS-DE-SAC designed in accordance with Sections 13 and 14 of these guidelines.
<i>Layout</i>	20.3	Residential shared surface road layouts should comprise short loops and culs-de-sac each serving a small number of dwellings such that travel distances are kept short, thus discouraging drivers from speeding. Special attention should be paid to the provision of adequate visibility to enable drivers to give way to pedestrians under all circumstances. In particular, dwellings, garages and parking bays should be set back sufficiently from the shared surface to ensure that emerging drivers or pedestrians can see and be seen by approaching traffic.
<i>Paving</i>	20.4	It is of paramount importance from a safety viewpoint that all road users are continually aware of the shared nature of these roads and, to this end, shared surfaces should be paved differently from adjacent roads which are provided with separate footways. Concrete block paving is the preferred material for shared surfaces but alternative similar materials (e.g. setts) may be acceptable at the discretion of the Divisional/Area Engineer.
<i>Transitions to Shared Surfaces</i>	20.5	<p>Transitions from conventional to shared surface roads should occur only at road junctions, or at locations where there is a marked discontinuity in road alignment, to draw to the attention of drivers the change in the nature of the road and the need for a different driving technique. All transitions should be further emphasised by the incorporation of the following features as detailed in Figure 11:-</p> <ul style="list-style-type: none"><li>(a) An offset to the right in nearside kerb alignment.</li><li>(b) A change in the type of road surfacing.</li><li>(c) A ramp (usually up to footway level) and/or rumble area.</li><li>(d) A row of bollards or other topographical feature.</li></ul> <p>The design of rumble areas should provide for the safe passage of cyclists, who might otherwise use the footway to avoid them.</p>
<i>Road Junctions</i>	20.6	The principles of road junction design outlined in Section 16 remain appropriate for shared surfaces, and reference should be made to Table 7 for dimensional criteria. The layout of junctions incorporating shared surfaces is, however, specifically illustrated in Figure 12, where it should be noted that all junctions between conventional and shared surface roads incorporate the features detailed in the preceding paragraph.
<i>Parking</i>	20.7	The presence of parked vehicles can be especially dangerous in that children using the shared surface may thereby be concealed from the view of approaching drivers. Layout design should therefore include provision of clearly demarcated parking spaces in convenient and safe locations, and every effort should be made to discourage casual parking elsewhere on the shared surface. <u>Parallel lay-by parking will not be appropriate for shared surface roads</u> (para 22.16).
<i>Play Areas</i>	20.8	Where dwellings are likely to contain children, gardens and/or nearby play areas should be provided to obviate the need for the shared surface to be used as a main location for play.

<i>Footpaths</i>	20.9	The servicing of a development by shared surface roads should not be taken to preclude the provision of a separate footpath system. The desirability of such a system will depend upon the size of the development and the disposition of existing roads and footpaths. At all junctions between shared surfaces and footpaths, there should be intervisibility between pedestrians and approaching vehicles, and bollards or similar obstacles (a minimum of 0.9 metre apart to permit the passage of prams and wheelchairs) should be erected to prevent unauthorised vehicular access on to the footpaths.
<i>Road Lighting</i>	20.10	Road lighting will be required to emphasise the shared nature of these roads during the hours of darkness and enable drivers and pedestrians to see each other and potential obstacles such as changes in level.
<i>Sheltered Accommodation</i>	20.11	Shared surfaces are not recommended for access to sheltered accommodation where the elderly, blind or infirm would be regular users.



(a) Transition from 5.5m wide carriageway to 3.5m wide shared surface



(b) Transition from 5.5m wide carriageway to 5.5m wide shared surface

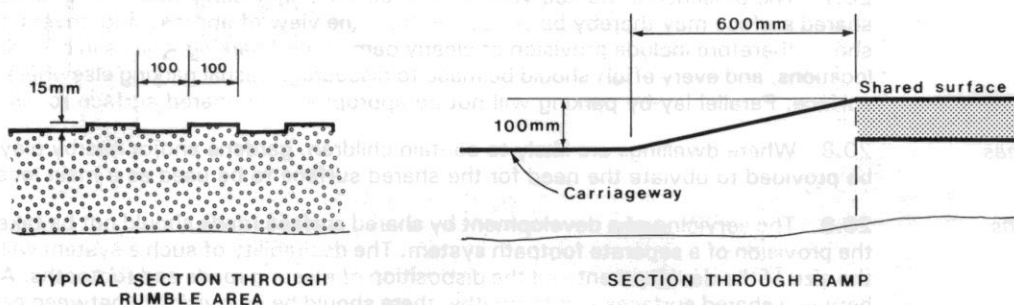


FIGURE 11 – Transitions to Shared Surface Roads





## 21 Vehicular Access to Premises and Servicing Arrangements

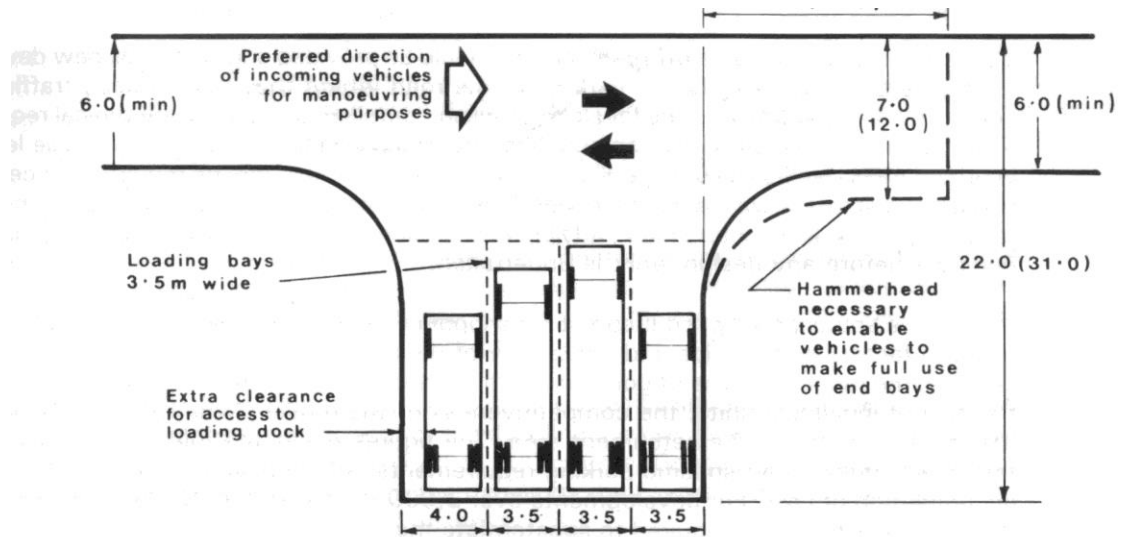
- Access to Premises* 21.1 Vehicular access to residential and commercial premises will normally be taken from the public road via a footway crossing designed to cater for the traffic volume and maximum weight of vehicle anticipated (paras 25.12 and 25.13). For major commercial and industrial development, however, access should be by means of "service roads" connecting to the main road network at a T-junction designed as detailed in Section 16. In the case of larger retail warehouses, supermarkets and superstores, it may be desirable for service access to be segregated from access to customers' parking areas in the interest of operational convenience and of safety.
- Service Roads* 21.2 Service roads should be designed to at least INDUSTRIAL ACCESS ROAD standards (Section 11), with particular attention to widening on small radius bends (Section 15) and turning areas (Section 17).
- Driveways* 21.3 Private driveways should normally meet the road at right angles and, unless giving direct access to a garage, should be at least 10 metres long. A length of 2 metres nearest the road should be paved to prevent deleterious material (e.g. loose chippings) being carried on to the road. Severe gradients, which render driveways unsuitable for car parking, should be avoided wherever possible.
- Driveway Gates* 21.4 On roads which are not subject to a 30mph speed limit, particularly in more rural areas, and where the public highway is restricted in width, gates to private drives should be set back by at least 6 metres so that cars entering or leaving do not require to stand on the carriageway while the gates are opened and closed.
- Garages* 21.5 Individual garages or car ports provided adjacent to buildings should, wherever possible, be set back by at least 6 metres from the heel of the footway (or the kerbline if there is no footway). This provides space for car washing purposes, allows garage doors to be opened when the car is in the driveway and facilitates adequate sightlines. The setback can also allow for second cars or for long-stay visitors' parking.
- Servicing Provision* 21.6 All new development, and redevelopment where possible, should be designed such that premises can be serviced from vehicles parked off the public road. For residential and small commercial properties, servicing can generally be satisfactorily undertaken via access driveways but, for major commercial and industrial premises, a separate service area should be provided.
- Rear Servicing* 21.7 Where buildings directly abut the public road at their frontage, as do many shops, servicing facilities should be provided at the rear of the premises or by means of grade separation wherever possible.
- Service Areas* 21.8 Service areas range from single parking bays for delivery vehicles to sophisticated structures incorporating loading bays and mechanical goods handling equipment. The size and layout of all service areas should be such that all vehicles enter and leave in a forward gear and do not need to reverse on the public road to turn round.
- Gradients* 21.9 Gradients on ramps within service areas should not exceed 10 per cent on straight sections and should be less where there is significant horizontal curvature. At breaks of slope a transitional grade not exceeding 5 per cent should be employed and care should be taken with headroom to allow for the bridging effect of long, high vehicles. A maximum gradient of 2.5 per cent is appropriate for areas where vehicles will be parked for loading/unloading, while the minimum gradient will be governed by drainage considerations (Section 26).

*H.G.V. Sizes*

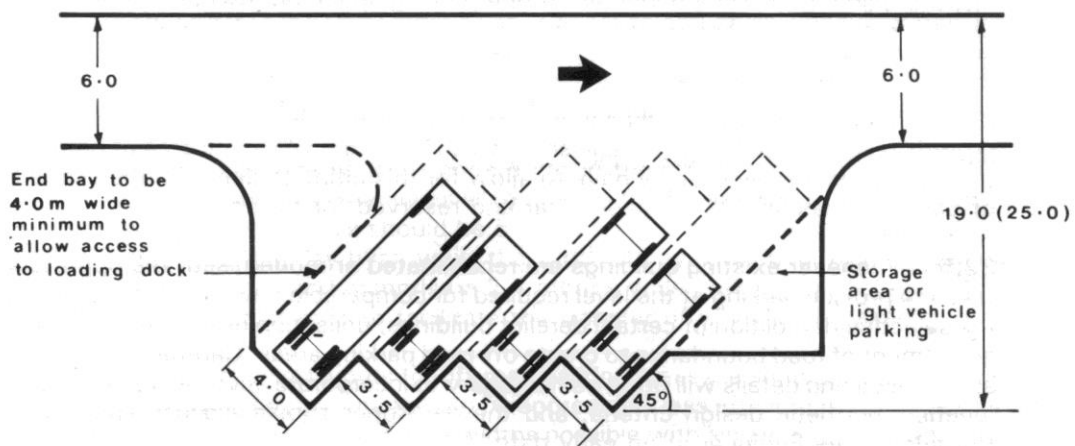
21.10 The maximum dimensions of goods vehicles in this country are currently 11 metres x 2.5 metres for rigid wheelbase vehicles and 15.5 metres x 2.5 metres for articulated vehicles. Drawbar trailer combinations comprising a rigid load-carrying towing vehicle plus a load-carrying trailer are 18 metres long, and the maximum dimensions of passenger coaches are 12 metres x 2.5 metres. All widths are exclusive of door mirrors and it should be noted that loads on platforms may overhang by 0.3 metre on each side. Apart from a limit of 4.2 metres for 38 tonne lorries loaded in excess of 32.5 tonnes, there is no regulation governing maximum height but most vehicles are less than 4.5 metres high.

*Loading Bays*

21.11 Most goods vehicles are loaded and unloaded from the rear end and typical dimensions for end-on loading bays are shown in Figure 13. Allowing room to manoeuvre and shunt, these bays suit rigid vehicles up to 11 metres long or articulated vehicles up to 15.5 metres long (based on the recommendations of the Freight Transport Association<sup>7</sup>). The total depth of the bays can be reduced where vehicles are parked at an angle with a saw-tooth loading deck but this arrangement is appropriate only when used with a one-way circulation system. Bay widths should be increased where side loading of vehicles by fork lift trucks is contemplated to give a clear width of 3 metres between adjacent vehicles.



(a) 90° Loading Bays



(b) 45° Loading Bays  
(one-way operation only)

NOTES:— (1) Dimensions (metres) should suit the majority of rigid vehicles.  
(2) For 15.5 metre long articulated vehicles the figures in brackets represent the absolute minimum dimensions.

**FIGURE 13 - End-Loading Service Bays**

**Kerbside Loading** 21.12 Where vehicles are to be loaded or unloaded while parked parallel to the kerb in service roads, parking bays, 3 metres wide and at least 3 metres longer than the vehicles using them, should be clearly marked out and the width of the service road should be increased as detailed in Table 10.

**TABLE 10 - Service Road Widths for Kerbside Loading**

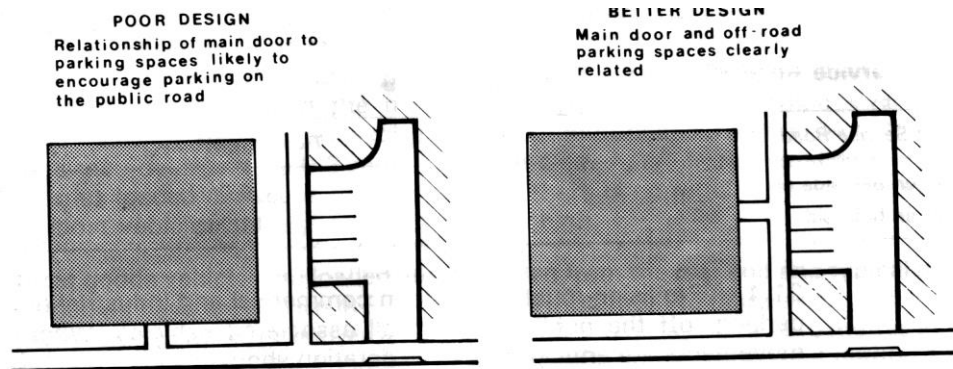
Description of Service Road	Two-Way Working	One-Way Working
Loading Bays on one side only	9.0m	6.5m
Loading Bays on both sides	12.0m	9.5m

*Parking*

- 21.13 Provision must be made in commercial and industrial developments for the overnight parking, off the public road, of all associated vehicles. Where large numbers of servicing movements are anticipated, consideration should be given to the provision of parking bays for vehicles awaiting access to loading bays. The dimensions of the parking bays should be similar to those of the loading bays but reference should be made to "Designing for Deliveries" published by the Freight Transport Association<sup>8</sup> for layout details. Provision must also be made for car parking as detailed in Section 22.

## 22 Car Parking Provision

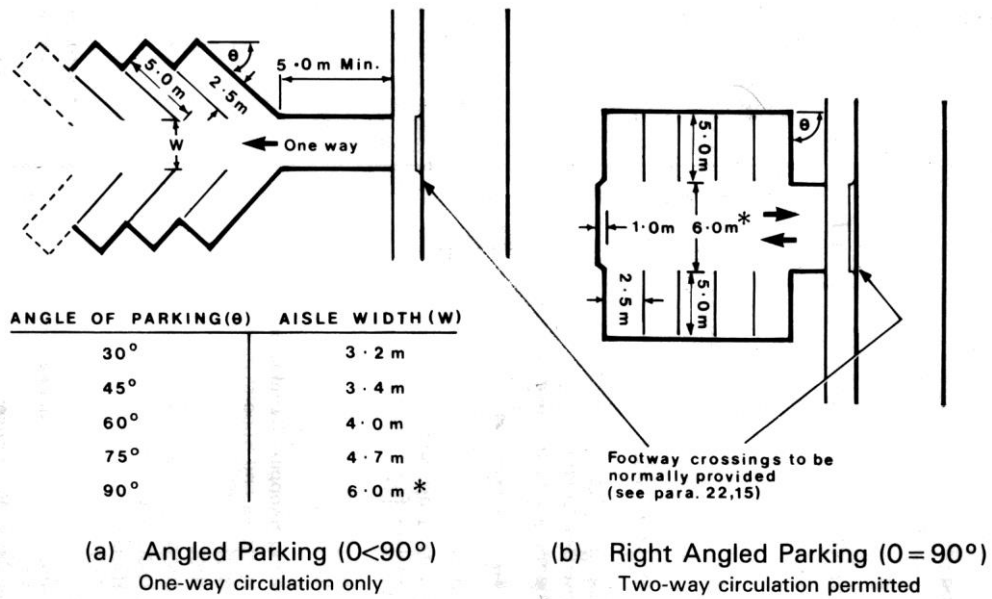
<i>Level of Provision</i>	22.1	In general, adequate off-road parking should be provided adjacent to all new developments to ensure that vehicles are not parked on the road where they may impede traffic flow and constitute a safety hazard. The levels of provision detailed in Table 11 are typical requirements; developments in isolated locations are likely to require parking in excess of these levels while in urban areas, well-served by public transport, fewer spaces may be required. Since the actual parking requirement will ultimately depend upon such local conditions and may also be governed by the Strathclyde Structure Plan <sup>9</sup> , advice on provision should be sought from the Divisional/Area Engineer before any design work is undertaken.
<i>Shopping Development</i>	22.2	The actual parking requirement for shopping development will additionally be influenced by such factors as the price and availability of parking compared to that in adjacent shopping centres, the range and type of goods sold (food shops generate more traffic than carpet shops), the size of individual units, the competitiveness of the retailer, whether petrol is sold on site and car ownership in the catchment area. The figures given in Table 11 should therefore be taken as a guide only; specific parking requirements being derived from the anticipated peak accumulation of cars. For developments over 2,000 square metres Gross Floor Area, a Traffic Impact Analysis will be required to substantiate the level of parking provision and quantify the effects of generated traffic on the existing road network.
<i>Residential Development</i>	22.3	In residential development specific provision should be made for residents' and casual visitors' parking. While a minimum of one parking space per dwelling should be dedicated for use by residents and/or guests, parking for casual visitors (normally three spaces per ten dwellings) should be provided communally.
<i>Future Demand</i>	22.4	Parking provision should not only allow for present demand; an assessment of foreseeable growth in car ownership and usage should also be made. While the area of hardstanding initially provided does not necessarily have to allow for this ultimate demand, the scope for expansion of parking areas should be made clear and reserved for future use.
<i>Rehabilitation</i>	22.5	Whenever existing buildings are rehabilitated or modernised, the opportunity should be taken to provide parking at the level required for comparable new development. This may involve the selective demolition of certain derelict buildings, utilisation of former garden ground or some adjustment of road boundaries to create off-road parking areas. Careful attention to "built form" and landscaping details will often be necessary to incorporate appropriate parking provision while meeting aesthetic design criteria and the developer should discuss such matters with the Divisional/Area Engineer at an early date.
<i>Glasgow Central Area</i>	22.6	Parking associated with hotel and office developments in Glasgow City Centre is limited to that required for operational or servicing needs as prescribed by the Strathclyde Structure Plan <sup>9</sup> . For residential development within the central area, the normal requirement for the provision of visitors' parking is waived and, where existing buildings are being refurbished, the Divisional Engineer may, exceptionally, agree to the provision of less than one parking space per dwelling.
<i>Location</i>	22.7	The location of car parking areas in a development should be considered at an early stage in the design process to achieve a balanced distribution of spaces throughout the site, conveniently related to user destinations. Pedestrian access to premises should be so arranged that it is easier and more convenient to use the designated parking areas than to park casually on the road (Fig 14) with special consideration given to the needs of disabled people (para 24.3).



**FIGURE 14 - Relationship of Main Door to Off-Road Parking Spaces**

<i>Residents' Parking</i>	22.8	Parking spaces reserved for the exclusive use of certain proprietors and/or their guests should be located <b>within the property curtilage</b> wherever possible. This is most readily achieved by the provision of private driveways (para 21.3) and/or individual garages/car ports (para 21.5). Failing this, the location and surface treatment of off-road parking areas provided in lieu of the above should emphasise their private nature. In localities where there is a significant demand for public car parking, private spaces should be screened from public view and take access via a gateway or pend fitted with a lockable barrier. Alternatively spaces should be individually controlled by means of lockable bollards.
<i>Visitors' Parking</i>	22.9	Parking areas provided for communal use by casual visitors should be located so as to be obvious to strangers to the development. It will often be appropriate for such public parking to be located in lay-bys, particularly since their presence can positively discourage indiscriminate kerbside parking elsewhere on the road.
<i>Walking Distances</i>	22.10	Residents' parking spaces should be situated no more than 30 metres walking distance from the main entrance to the dwelling they serve and the maximum distance for visitors' spaces should be similarly limited to 100 metres. Consequently, where lock-up garages are provided at some distance from the dwellings they serve, other off-road areas may be required for the convenient parking of residents' cars.
<i>Conspicuity</i>	22.11	Since parked vehicles can be visually intrusive, particularly in the residential environment, it is desirable for there to be an element of screening of the actual parking bays, either by the judicious use of landscaping or by setting them behind building lines. At the same time, communal parking areas in some localities are subject to anti-social behaviour which militates against their use. Off-road parking should, therefore, be located in such a manner that parking spaces are within sight of associated premises and, where spaces are allocated to individual dwellings, they should be visible from the appropriate house.
<i>Bay Sizes</i>	22.12	The size of the standard car in the UK is approximately 4.75 metres x 1.8 metres. Allowing suitable clearances all round and for the opening of doors, the minimum design module for car parking bays should be 5 metres x 2.5 metres. Longer bays will be required in certain situations (e.g. lay-bys), while the width of bays provided for the disabled should be increased to 3.3 metres and comprise a 2.4 metres wide parking space together with a 0.9 metre wide cross-hatched strip to facilitate the transfer of wheelchair passengers.

Car Park Layouts 22.13 Typical layouts for off-road parking areas are shown in Figure 15. It should be noted that angled parking layouts tend to be appreciably less efficient in land-use than 90° parking layouts even with the narrower aisle widths possible with single-way working. The use of angled parking may, however, be appropriate on narrow sites.



\*8.0 metres aisle width required for lock-ups

FIGURE 15 - Off-Road Parking Areas



**TABLE 11 - Typical\* Car Parking Provision for Different Types of Development □**

Type of Development	Appropriate Provision (spaces per 100m <sup>2</sup> gross floor area (G.F.A.) unless otherwise indicated)	Comment
<b>Factories and Workshops</b>	1.0 + 0.1 visitor parking	Special provision for buses may be required
<b>Warehousing (non-sales)</b>	0.5	Office space to be separately assessed
<b>Office Accommodation</b>		
Glasgow City Centre	0.4	
Elsewhere	2.0	Maximum permissible provision
<b>Banks</b>	1 space per 10m <sup>2</sup> public floor area + 1 space per 3 staff	
<b>Shops in Established Centres</b> (See Strathclyde Structure Plan)		
Tier 1	2.0	
Tier 2	3.0	
Tier 3/Tier 4	5.0	
<b>Free Standing Shopping Developments</b> (incl. Superstores and Supermarkets)		
0-500m <sup>2</sup> G.F.A.		
500-2000m <sup>2</sup> G.F.A.	5.0	
2000-5000m <sup>2</sup> G.F.A.	6.5	Extensions to freestanding shopping developments to be assessed according to their incremental effect on the Gross Floor Area rather than as a separate development.
5000-7500m <sup>2</sup> G.F.A.	8.0	
7500-10000 m <sup>2</sup> G.F.A.	7.0	
	6.0	
<b>Fast Food Franchise within Shop</b>	3 spaces minimum	
<b>Markets</b>	1 space per stall holder	
<b>Cash and Carry Warehouses</b>	1 space per 50m <sup>2</sup> sales area	
Trade	5.0	Includes staff parking
Retail	5.0-10.0 + 1 space per 3 staff	
<b>Motor Trade</b>		
Vehicle Display Area	2.0	Includes showrooms and any external display area
Spares Department	4.0	
Servicing/Bodywork	4 spaces per service bay	Provision stated is for customers only and must be reserved and marked for their use. Developers will be required to demonstrate that space has been allowed for storage of new/used cars and other operational requirements.
Tyre & Exhaust Centres	2 spaces per service bay	
Car Wash	5 spaces queueing space	
Scrapyards	2.0	
Staff	1 space per 2 staff	
Jetwash	3 spaces queueing space	
<b>Hotels</b>		
Glasgow City Centre	space per 2.5 bed spaces	Maximum permissible provision
Elsewhere	space per 2.5 bed spaces + space per 3 staff	
		For bars open to non-residents additional parking provision will be required as for public houses (see below).

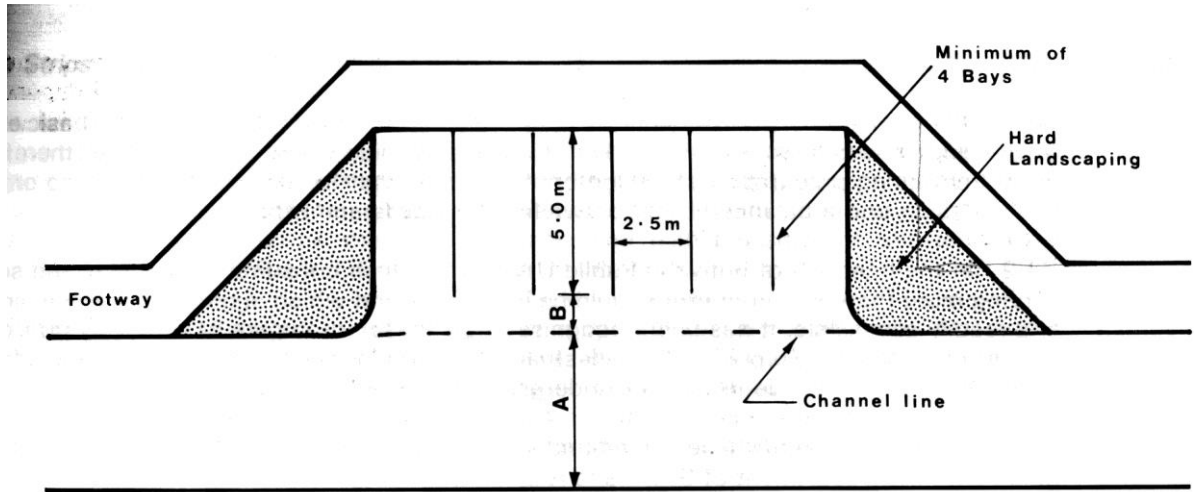
**Housing**

<p><b>Warehousing (non-sales)</b>  * All developments not listed below  Terrace P/car park - 3 bedroom</p> <p>Redevelopment/refurbishment  in town and city centres  Private sheltered housing</p> <p>Local authority sheltered housing  <b>Nursing Home</b>  <b>Old People's/Children's Homes</b></p> <p><b>Hospitals</b></p> <p><b>Health Centres/Clinics/Surgeries</b></p> <p><b>Schools</b>  Nursery, Primary and Secondary</p> <p><b>Universities and Colleges</b></p> <p><b>Libraries</b></p> <p><b>Community Centres</b></p> <p><b>Social Clubs/Function Rooms/Cafes and Restaurants</b></p> <p><b>Take-Aways</b>  <b>Public Houses</b></p> <p><b>Theatres and Concert Halls</b></p> <p><b>Cinemas/Bingo Halls/Churches</b></p> <p><b>Sports Centres</b>  Swimming Baths  Snooker Halls  Other facilities</p> <p>Spectators  Staff</p> <p><b>Marinas</b></p>	<p>Space per dwelling + 0.3  Spaces visitor parking per dwelling  2 + 0.3 visitors</p> <p>1 space per dwelling</p> <p>0.2-0.5 spaces per dwelling +  0.3 spaces visitor parking per dwelling  + 1 space per warden</p> <p>0.25 spaces per dwelling +  1 space per warden  1 space per 4 residents</p> <p>1 space per 3 beds + 1 space per doctor/surgeon + 1  space per 3 other staff</p> <p>4 spaces per consulting room +  1 space per practitioner + 1 space per 3 other staff</p> <p>1 space per staff member + provision for buses where  required</p> <p>1 space per staff member +  1 space per 10 students</p> <p>3.0 + 1 space per 3 staff</p> <p>5.0-20.0</p> <p>20 spaces per 100m<sup>2</sup>  public floor area  5 spaces in total  10 spaces per 100m<sup>2</sup> public floor area</p> <p>1 space per 5 seats</p> <p>1 space per 10 seats</p> <p>10 spaces per 100m<sup>2</sup> pool area  1 space per table  1 space per 2 players at peak time</p> <p>1 space per 10 seats  1 space per 3 staff at peak time</p> <p>1 space per berth +  1 space per 3 staff</p>	<p>Initial provision in local authority housing may be reduced where public  Transport facilities are good. Minimum provision 0.8 with scope for expansion.  Greater provision may be required in areas of high car ownership.</p> <p>Lower provision may be agreed by Divisional Engineer where necessitated by  Physical constraints.  Provision dependent on size of units, degree of communal facilities and  location of development.</p> <p>Includes provision for visitors</p> <p>Includes provision for visitors and outpatients</p> <p>Includes dental and veterinary practices</p> <p>Includes for casual visitors but playgrounds should be used to accommodate  Visitors parking on open days and for evening activities.</p> <p>Lower figure applicable to centres with catchment within walking distance</p> <p>Minimum Desirable</p> <p>Special provision for buses/coaches may be necessary</p>
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\*See para 22.1  Appropriate provision for development of a type not listed will be based on experience of similar development elsewhere. For small developments, it may be inappropriate to provide parking on site and in such cases a financial contribution towards S.R.C. public provision may be required.

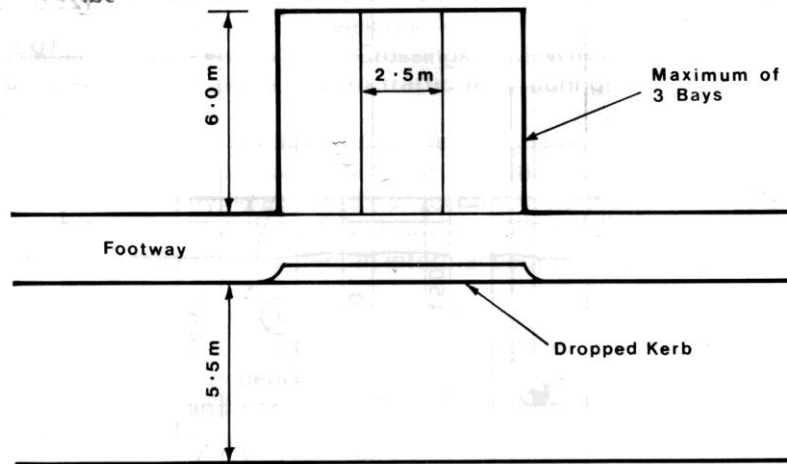
\*Note to Planners - Garages should be of a size which will be practicable to use ie Roads suggest a minimum size of 6 x 3m.

<i>Large Car Parks</i>	22.14	In industrial, commercial and shopping developments, parking provision will normally be in the form of either large surface or multi-storey car parks. The layout will depend upon operational requirements, particularly where it is proposed to control entry and exit by means of barriers, with adequate space provided to ensure that any queues which develop do not extend on to the public road. Large unbroken expanses of parking are visually unattractive and can be confusing to the driver trying to find his car. It is desirable for larger parking areas to be subdivided, with the use of appropriate landscaping, into units of between fifty and one hundred spaces. Detailed design guidance for multi-storey car parks can be obtained from the Divisional Engineer.
<i>Access</i>	22.15	Vehicular access to off-road parking areas will normally be taken from the public road via a footway crossing (Fig 21). However, for large car parks, liable to generate substantial traffic flows, access should be taken via a road junction formed in accordance with Section 16. In such cases the car park access should be constructed to GENERAL ACCESS ROAD standards although a reduced width may be appropriate where one-way operation is to be enforced.
<i>Lay-by Parking</i>	22.16	The layout of lay-by parking areas is dependent on the road type and the traffic flow: on GENERAL ACCESS ROADS lay-by parking should normally comprise bays, 6 metres long x 2.5 metres wide, located parallel to the carriageway, but on lightly-trafficked roads (i.e. serving less than fifty dwellings) deeper lay-bys may be provided to permit parking at right angles to the road. On MINOR ACCESS LINKS right angle layouts (combined with passing places as illustrated in Figure 4) are preferable to parallel parking bays since the latter can easily be confused with passing places; and on shared surface roads, where parallel parking can jeopardise pedestrian safety, right angle parking will be obligatory. In all cases lay-by parking areas should be delineated from the adjoining carriageway.
<i>Right Angled Parking</i>	22.17	Figure 16 illustrates the layout of parking bays located at right angles to the carriageway. Public parking (e.g. for casual visitors) should be provided in groups of not less than four bays, located in lay-bys immediately adjacent to the carriageway (Fig 16a). Long lay-bys should be subdivided, by appropriate landscaping, into groups of between six and ten bays. Private parking (e.g. for residents) should be provided in groups of no more than three bays, located at the heel of the footway (if any) and take access via a dropped kerb (Fig 16b). Such parking areas should be hard-surfaced: loose chippings are unacceptable.
<i>Licensing</i>	22.18	A developer wishing to operate a charging public car park should be aware of any legal requirement to obtain a licence from Strathclyde Regional Council.



ROAD TYPE	A	B
General Access Road	5.5	1.0
Minor Access Link	3.5	3.0
Short Cul-de-Sac	5.5	1.0

(a) Lay-by Parking



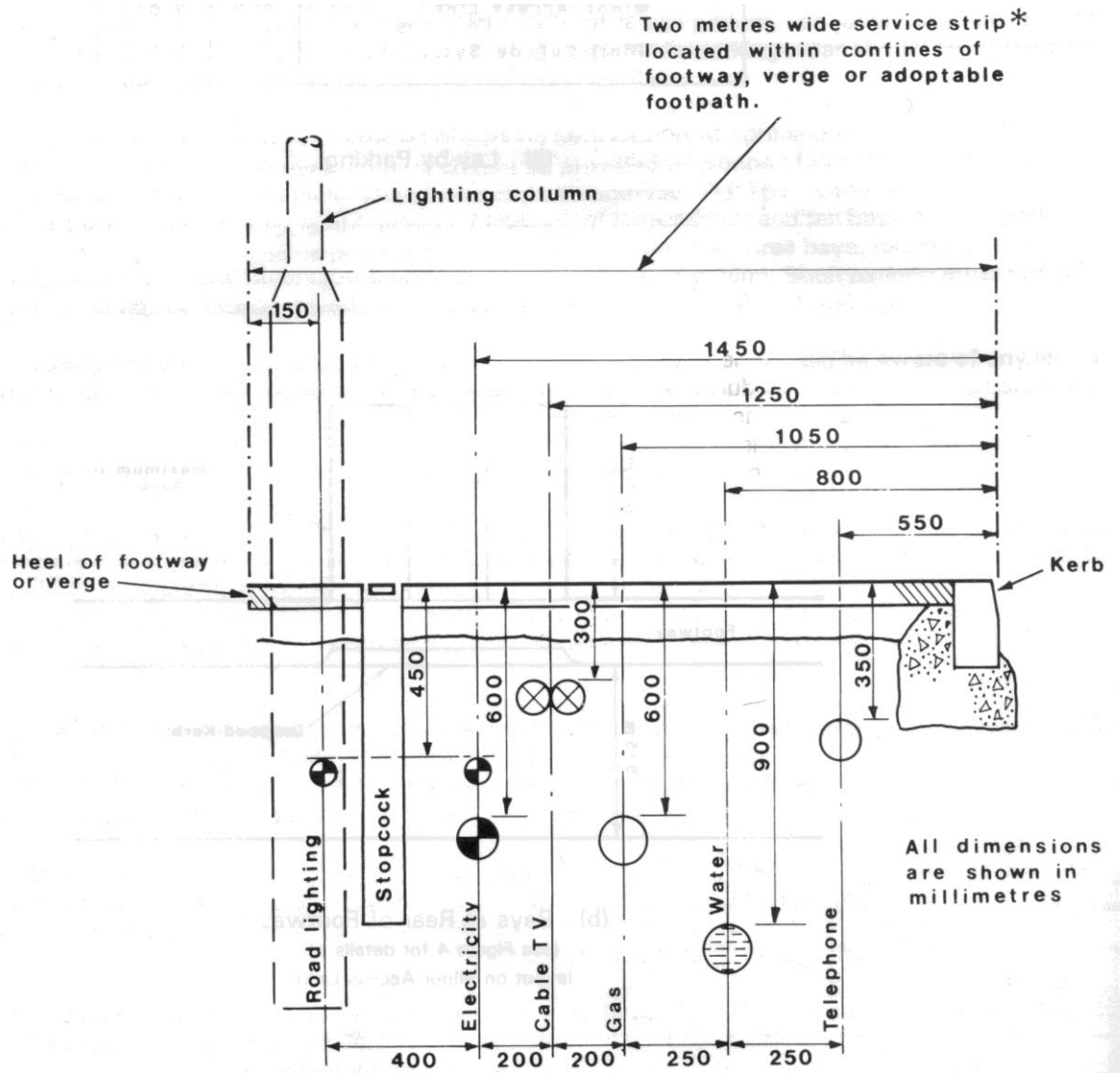
(b) Bays at Rear of Footway  
(see Figure 4 for details of layout on Minor Access Link)

FIGURE 16—Parking Bays at Right Angles to the Carriageway



## 23 Public Utility Services

- Provision* 23.1 The provision of statutory or other services laid underground constitutes a basic element of development design. The Public Utilities, who provide such services, must therefore be consulted during preparation of design briefs, so that their requirements can be co-ordinated in the design and a balance struck between their needs and other objectives.
- Routeing* 23.2 In the interests of both the Public Utilities and their consumers, all mains and services serving more than one proprietor should be located in land which is both publicly maintained and readily accessible. It has been recognised that these criteria are best met by public roads and, as well as making provision for pedestrian and vehicular movement, it is therefore a function of most roads to provide routes for underground services.
- Location* 23.3 Sewers will normally be placed under the carriageway and early consultation should be made with the Department of Sewerage regarding that Department's provision, in accordance with the Sewerage (Scotland) Act 1968<sup>10</sup>, of surface water sewers, for the drainage of roofs and paved areas within the curtilage of premises and the foul water drainage system. All services other than sewers and occasionally water mains, should be grouped in "service strips" located within the limits of the footways, verges and adoptable footpaths (para 3.3) with a minimum of service connections across the carriageway.



\*Refer to Para 23.4 regarding increased widths

**FIGURE 17 - Location of Service Mains**

<i>Service Strips</i>	23.4	The width of a service strip will depend on the number and type of premises served. Normally, all domestic services (gas, electricity, lighting, water and telephones) will be accommodated in a 2 metres wide reservation and Figure 17 shows typical positions, the minimum clearance between each service being to the Public Utilities satisfaction for up to two hundred dwellings. This diagram is, however, only a guide and does not absolve the designer from negotiating with each Public Utility in turn at the earliest possible stage since, in any development, the depth, clearance and relative position of each service will require to be decided by the Public Utilities, and the method of laying cables and pipes left to their discretion. Special arrangements will require to be made where a footway is less than 2 metres wide, and local widening in excess of 2 metres may be necessary to accommodate access chambers or where roads have tight bends. Where service strips are not located adjacent to carriageways their width must allow for access by mechanical plant and/or vehicles for maintenance or repair. In all cases there must be a permanent and continuous demarcation of the boundary between the service strip and any adjacent private property (e.g. by a fence, wall or concrete edge kerbing).
<i>Road Furniture and Lighting</i>	23.5	All road furniture should normally be located at the rear of footpaths/footways or recessed behind them and no furniture or structures should obstruct any road junction sight line. Conversely, no services other than road lighting cables should be located within 0.5 metre of the rear of the footway to allow for lighting columns and joint pillars or other road furniture. Detailed guidance regarding the provision of road lighting is contained in Section 27.
<i>Maintenance Access</i>	23.6	Ready access must be available at all times to all parts of service routes for maintenance and in cases of emergency. Lorry access will be needed to some places such as manholes, electricity substations, post office junction boxes and gas governor house installations; and the Public Utilities requirements for such facilities should be ascertained at an early stage. They should be positioned so as to minimise disruptions to vehicle and pedestrian access when service maintenance is being carried out, whilst ensuring that access to services will not itself be obstructed by parked vehicles. Special consideration in this respect will be necessary where services run beneath or adjacent to single lane carriageways and parking bays.
<i>Fire Hydrants</i>	23.7	The position of all hydrants should be agreed with the Firemaster and Water Authority and be clear of the possibility of vehicles being parked on top of them.
<i>Carriageway Crossings</i>	23.8	Where service strips or branch connections cross the carriageway, cabled services should be individually ducted at increased depths in accordance with the requirements of the Public Utilities as directed by the Divisional/Area Engineer. Ducted crossings for road lighting cables are detailed in paragraph 27.14. Crossings of MINOR ACCESS LINKS should be located at passing places to minimise disruption to traffic flow during maintenance/repair works.
<i>Shared Surface</i>		



- Roads* 23.9 In shared surface layouts, all services should continue to be located in land eligible for adoption by the Local Roads Authority (Section 3). While, in certain cases, this may entail a service strip underlying a shared surface, under no circumstances should any service be located beneath the 3.5 metres wide entrance neck to a SHORT CUL-DE-SAC unless an alternative emergency access is provided. In informal courtyards the discipline of a service strip should be maintained.
- Surface Treatment* 23.10 The surface finish of all service strips must form an integral part of the environment and be acceptable for general maintenance by the Local Roads Authority. Service strips adjacent to carriageways and parking areas should normally be located under paved footways or be otherwise protected when there would be risks of damage from occasional overriding by vehicles.

- Landscaping* 23.11 Any landscaping of service strips must conform with Section 28 and be such that each service runs at a constant depth. It is essential that any trees adjacent to service strips are located so that their roots will not damage services underground or be damaged themselves during the maintenance of such services.
- Location Plans* 23.12 The proposed location of all services within road boundaries, including those required under P.U.S.W.A. 1950<sup>11</sup>, should be indicated on plans submitted to the Divisional/Area Engineer for Construction Consent as detailed in paragraph 5.2(b).
- Existing Services* 23.13 The developer is responsible for contacting the Public Utilities regarding the position of, and connection to, any existing underground plant. In all cases, the necessary Road Opening Permit must be obtained from the Divisional/Area Engineer before any excavation is undertaken in a public road.

## 24 Additional Design Considerations and Statutory Requirements

<i>Headroom</i>	24.1	The minimum headroom for any structure other than a footbridge must be 5.3 metres when spanning a MAIN or DISTRICT DISTRIBUTOR ROAD and 5.1 metres for <b>all other roads</b> , including those through pends. Footbridges should be constructed at a clear height of 5.7 metres above the carriageway, and appendages to buildings (i.e. sunblinds, projecting signs, etc.) should be fixed at least 2.25 metres above adjacent footways, footpaths or verges.
<i>Security</i>	24.2	Little used or non-overlooked public open spaces, footpaths and routes under or between buildings are prone to vandalism. For such reasons, as well as for economy, it is important to ensure that as much space around buildings as possible is within curtilages. Good lighting can help to inhibit vandalism, though the lighting itself is likely to be damaged where the other conditions are not met.
<i>Disabled Persons</i>	24.3	It is a statutory requirement to have regard to the needs of disabled people in designing any building to which the public have access. This will include the provision of suitable access routes for wheelchairs and the marking out of parking bays for use by disabled drivers (para 22.12) close to pedestrian entrances.
<i>Bus Services</i>	24.4	In planning major new developments, the need to provide or augment local bus services will have an effect on road layout, widths, corner radii and pedestrian access arrangements. For phased development, consideration should be given to encouraging access by bus services at an early stage, for the convenience of the first residents (see also paragraph 3.2).
<i>Bus Stops</i>	24.5	Bus routes, in order to be practical, must be reasonably fast and direct and connect the centroids of the residential, business and shopping areas which they serve. Services will generally be based on DISTRICT and LOCAL DISTRIBUTOR ROADS although to achieve the desired penetration it may be necessary to use access roads (suitably widened if required). Ideally bus penetration should be such that no house or workplace is more than 400 metres from the nearest bus stop where these are spaced at two or three per kilometre. Where bus shelters are to be provided, these should be sited so as not to obstruct vehicle sight lines or footways.
<i>Road Widths for Bus Routes</i>	24.6	The minimum carriageway width for two-way operation of buses in new development should be 7.3 metres increasing to 9 metres where the two-way bus frequency is likely to exceed thirty buses per hour. Following on from the assessment (para 1.2) of the desirability of extensions or alterations to local bus services to serve a proposed housing development or redevelopment: where the road width required to accommodate bus services is greater than that required to cater for the traffic generated by the development alone, the cost of providing the increased width will be borne by Strathclyde Regional Council.
<i>Traffic Management</i>	24.7	The layout of a development may be influenced by existing or proposed traffic management measures and the Divisional/Area Engineer should be consulted about these at an early stage. Where the Local Roads Authority decides that traffic

management measures should be introduced to facilitate a particular development, the developer may be required to reimburse the Authority for expenses incurred in the promotion and implementation of these measures.

*Fire Fighting*

- 24.8 The width of roads and reinforced emergency vehicle paths and their proximity to buildings is detailed in part E of the Building Standards (Scotland) Regulations<sup>12</sup>. This document specifies a minimum width of 3.7 metres adjacent to low rise dwellings to facilitate the use of pumping appliances (this width is increased to 4.5 metres to permit the use of heavy rescue and fire fighting equipment where buildings are 9 metres or more in height). It should be noted that the 3.5 metres width of MINOR ACCESS LINKS is appropriate for access but not operation of the fire tender.

*Refuse Collection* 24.9

The Building Standards (Scotland) Regulations permit a maximum carry distance for dustbins of up to 46 metres<sup>13</sup>. However, British Standard Code of Practice, BS5906, suggests a maximum carry distance of 25 metres<sup>14</sup> and it is recommended that this standard be adopted as far as possible. Where communal refuse storage accommodation is provided, the Regulations require that this be located no more than 15 metres from an access road and where such accommodation forms part of a chute system, or is used for the storage of bulk refuse containers, the access road should extend to the door of the accommodation. While the size of vehicles used by local cleansing authorities varies, the length is usually less than 9 metres and the turning circle less than the 21 metres standard turning circle on which Figure 9 is based.

*Traffic Noise*

24.10 The Planning Authority will normally require new housing to be designed in accordance with Design Bulletin 26<sup>15</sup>. Traffic noise from the following sources should be taken into account:-

- (a) Existing roads
- (b) New roads being constructed as part of the proposed development.
- (c) Alterations to the road network to accommodate the proposed development.
- (d) Alterations to the road network listed in the Regional Council's Transport Policies and programmes document<sup>16</sup> for construction within a period of five years and/or included in the Strathclyde Structure Plan<sup>17</sup>.

# **PART III**

# **CONSTRUCTION DETAILS**

*Preamble*

**This part of the document details the construction standards necessary for Construction Consent. Exceptionally, because of local conditions, variations from these standards may, after discussion, be permitted. It is in the applicant's interest that any such requests be made at an early stage in the design process.**

## 25 Pavement Construction

*Specification* 25.1 The specification for the construction of road pavements and associated structures is detailed in Appendix A. Clause numbers in the following text refer to that specification.

*Carriageway Construction* 25.2 Carriageways should be designed as flexible pavements in accordance with the current edition of Road Note 29<sup>18</sup> as modified by subsequent SDD Technical Memoranda (e.g. SH5/82<sup>19</sup>), TRRL Report LR1132<sup>20</sup> and the additional qualifications and exceptions listed here:-

- (a) No frost-susceptible material shall be permitted within 450mm of the final running surface.
- (b) The minimum Wearing Course thickness shall be 40mm (cl 907) for DISTRIBUTOR and INDUSTRIAL ACCESS ROADS and 35mm (cl 907, 908) for residential access roads.

A typical cross section of carriageway construction is shown in Figure 18.

*Table 12* 25.3 It will be permissible for developers constructing short lengths of road to adopt the construction thicknesses detailed in Table 12, unless there is any indication that the CBR is less than 5 per cent. However, where suitable technical facilities exist, it is recommended that the specific circumstances of each site are catered for by designing the road in accordance with the criteria stipulated in the preceding paragraph.

**TABLE 12 - Carriageway Construction**

Road Type	Sub-Base	Roadbase	Basecourse	Wearing Course
Local Distributor or Industrial Access Road (1.5 MSA *)	300mm (cl 803-804)	160mm DBM* <b>Combined</b> Roadbase and Basecourse (cl 811)	-	40mm Hot Rolled Asphalt (cl 907)
Residential Access Road (0.4 MSA*)	300mm (cl 803-804)	120mm DBM* <b>Combined</b> Roadbase and Basecourse (cl 811)	-	35mm Hot Rolled Asphalt (cl 907)
Car Parking Area (0.2 MSA*)	250mm (cl 803-804)	80mm DBM* <b>Combined</b> Roadbase and Basecourse (cl 811)	-	As for Residential Roads
		60mm DBM* (cl 811)	-	65mm Bitumen Macadam (cl 912) <b>Combined</b> Basecourse/Wearing Course
Pedestrian/Vehicle Shared Surface or Minor Commercial Access	300mm (cl 803)	-	50mm Bedding Layer of Sharp Sand	200 x 100 x 80mm thick Rectangular Block Paving (cl 1025)
Bus Stance/Terminus	300mm (cl 803)	750mm DBM* Roadbase (cl 811)		

\* DBM = Dense Bitumen Macadam, MSA = Million Standard Axles

□ Graded roadstone Roadbase does not comply with the Department of Transport Specification<sup>21</sup> and is significantly weaker than the alternatives listed. Consequently its use will be restricted to minor roads and, together with the source of such material, will be subject to the specific approval of the Divisional/Area Engineer.

N.B. (i) **This table is for guidance only:** please refer to paragraph 25.3.  
(ii) Clause numbers in brackets refer to the Specification (Appendix A).

*Combined*



*Roadbase/Basecourse*      25.4      The use of a combined DBM Roadbase and Basecourse (cl 811), laid as a single layer to a maximum thickness of 150mm as permitted by clause 704(S) is particularly recommended; it is, however, emphasised that the requirements of clause 705 relating to laying and compaction must be strictly adhered to.

Two Stage  
Construction

25.5 Where, owing to the continued use of the road by construction traffic, it is necessary (in order to avoid damage to the Wearing Course) to adopt a two stage construction, either a DBM Roadbase (cl 811) or a minimum Basecourse thickness of 60mm should be provided. Consideration should be given to the temporary drainage of the first stage (ie Basecourse), to minimise ponding caused by the projection of gully gratings above the temporary surface, either by adjustment of gully frames or other approved method. This applies particularly in large projects where the construction period may be long and the Wearing Course not laid before a winter work period. Any settlement which may occur in the Basecourse should be taken up with Regulating Course before the laying of the Wearing Course, and early reinstatement of openings or failed areas is essential. Before the Regulating Course or Wearing Course is laid, the top surface of the Basecourse must be well cleaned and tack coat applied at the rate of 0.6 litre per square metre.

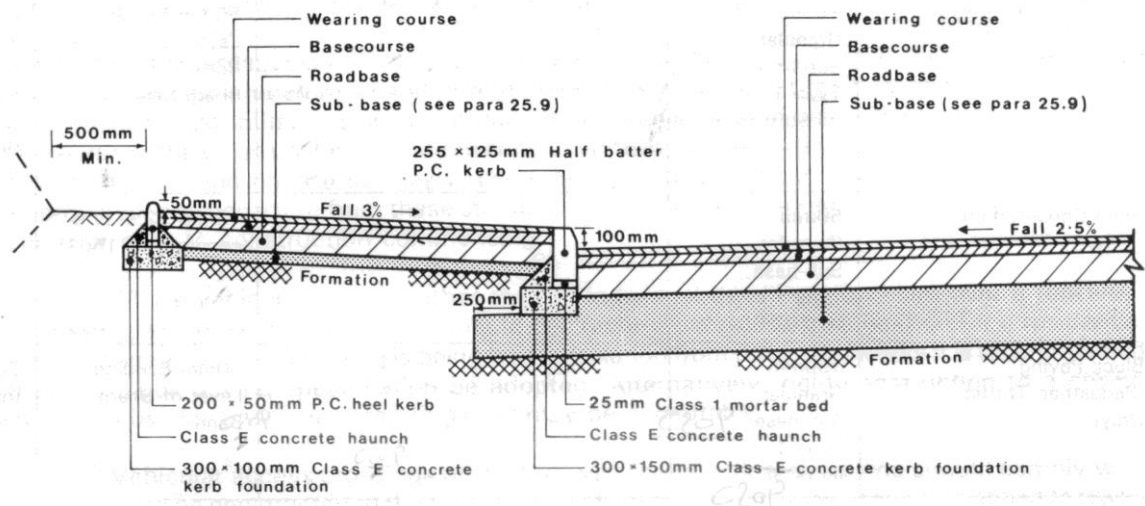


FIGURE 18 - Typical Carriageway and Footway Construction

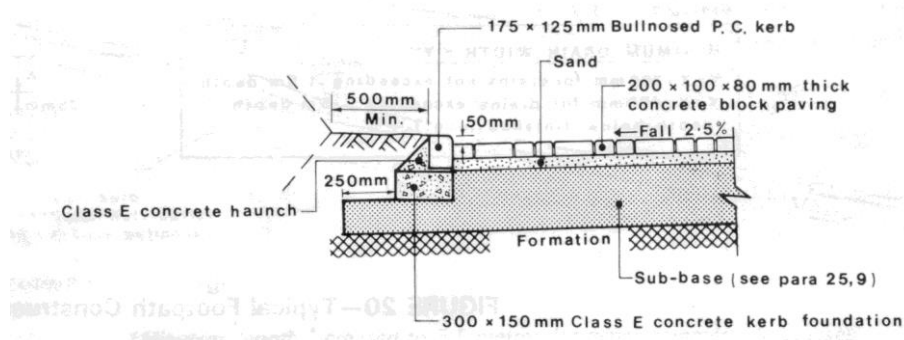
Concrete  
Carriageway

25.6 Rigid pavement construction will not normally be accepted except for individual accesses to industrial or commercial premises.

*Concrete Block Paving*

- 25.7 Concrete block paving (cl 1025) is particularly suitable for:
- (a) pedestrian/vehicle shared surfaces (Fig 19) where a change of material is required to emphasise the different character of the thoroughfare;
  - (b) bus termini or other locations at risk from diesel spillage;
  - (c) commercial or industrial accesses.

Block pavements should be designed in accordance with paragraph 25.2, but with the block paving and bedding layer replacing the Roadbase, Basecourse and Wearing Course. It is particularly important that the design incorporates adequate provision for the drainage of unbound Sub-base and subgrade materials (para 25.9). Exceptionally, where sections of the pavement have a high longitudinal fall or where the block paving is laid on concrete, cement or bituminous bound materials, the Divisional/Area Engineer may specify that the bedding layer be formed with a bitumen bound sand to avoid the risk of washout.



**FIGURE 19 - Typical Shared Surface Construction**

*Footway and Footpath Construction*

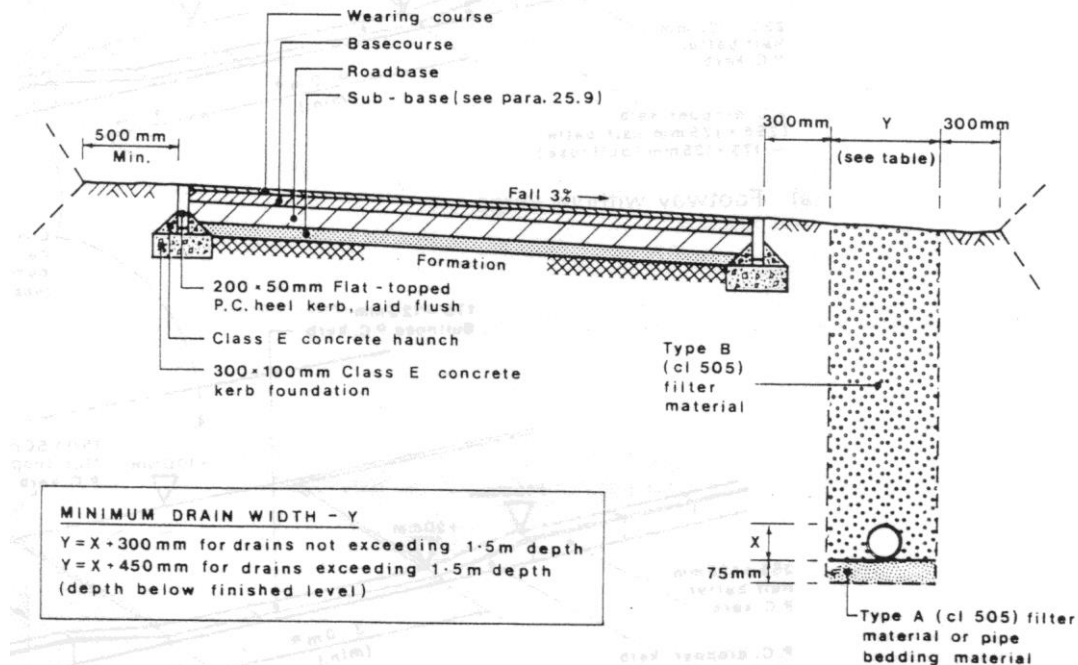
- 25.8 Footways and footpaths should be constructed in accordance with Table 13 as detailed in Figures 18 and 20 respectively unless an alternative design is agreed with the Divisional/Area Engineer.

**TABLE 13 - Footway and Footpath Construction**

Type	Sub-Base	Roadbase	Basecourse	Wearing Course
Flexible Construction	50mm Granular Sub-base Type 1 or 2 (cl 803-804)	100mm Type 1 or 2 (cl 803-804)	40mm Dense Bitumen Macadam (cl 903)	20mm* Hot Rolled Asphalt (cl 907) or Fine Cold Asphalt (cl 910)
Slabbed Construction	150mm Granular Sub-base Type 1 (cl 803)	-	50mm Bedding Layer of Crushed Rock Fines or Sharp Sand	<i>Footways and Footpaths:</i> Slabs 400 x 400 x 65mm (cl 1104(S)) <i>Footpaths only:</i> Slabs 450, 600 or 900 x 600 x 65mm (cl 1104(S))
Rigid Construction	50mm Granular Sub-base Type 1 or 2 (cl 803-804)	-	75mm 22.5/37.5 concrete (cl 1601)	40mm Granolithic (cl 1106)
Block Paving (Pedestrian Traffic Only)	150mm Granular Sub-base Type 1 (cl 803)	-	50mm Bedding Layer of Sharp Sand	200 x 100 x 65mm thick Rectangular Block Paving (cl 1025)

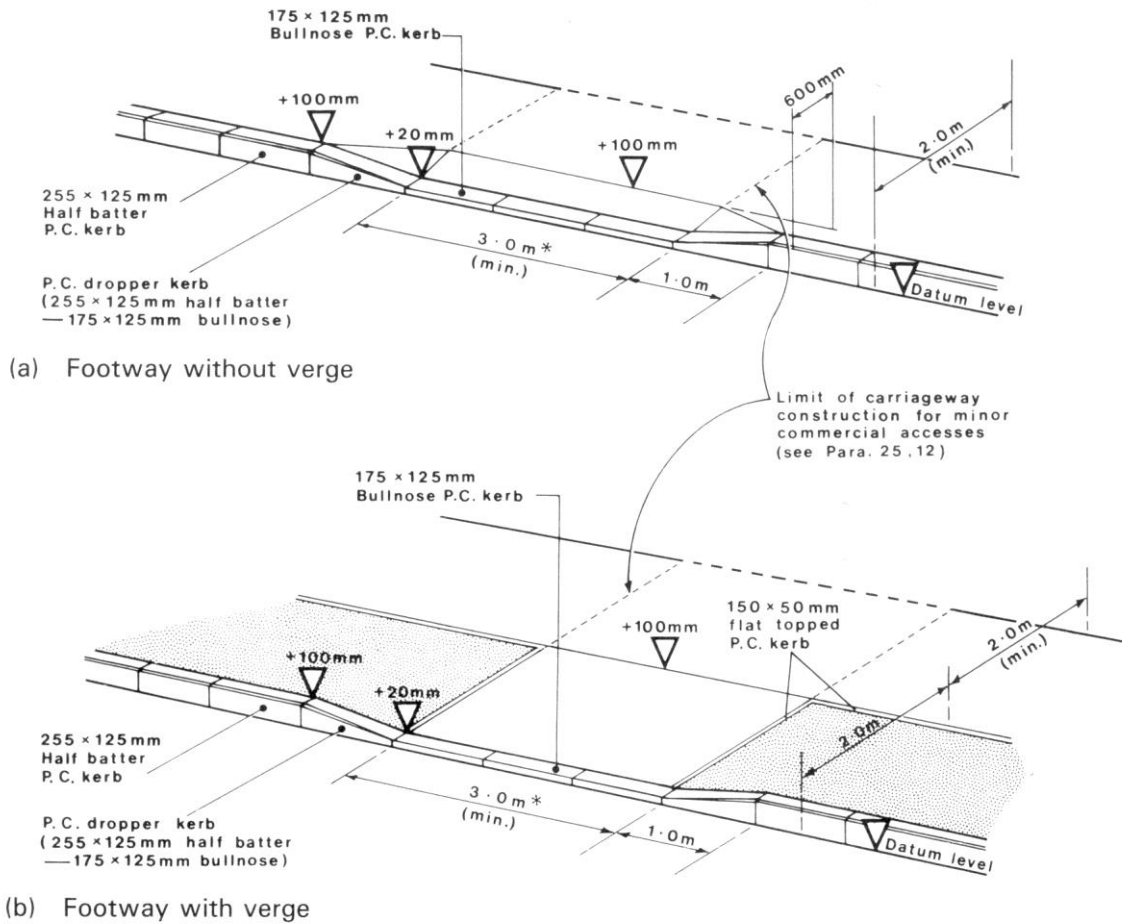
\*Prior to compaction 6mm or 10mm limestone or other approved chippings should be applied to the surface at a nominal rate of 1kg/m<sup>2</sup>.

NB. Clause numbers in brackets refer to the Specification (Appendix A).



**FIGURE 20 - Typical Footpath Construction**

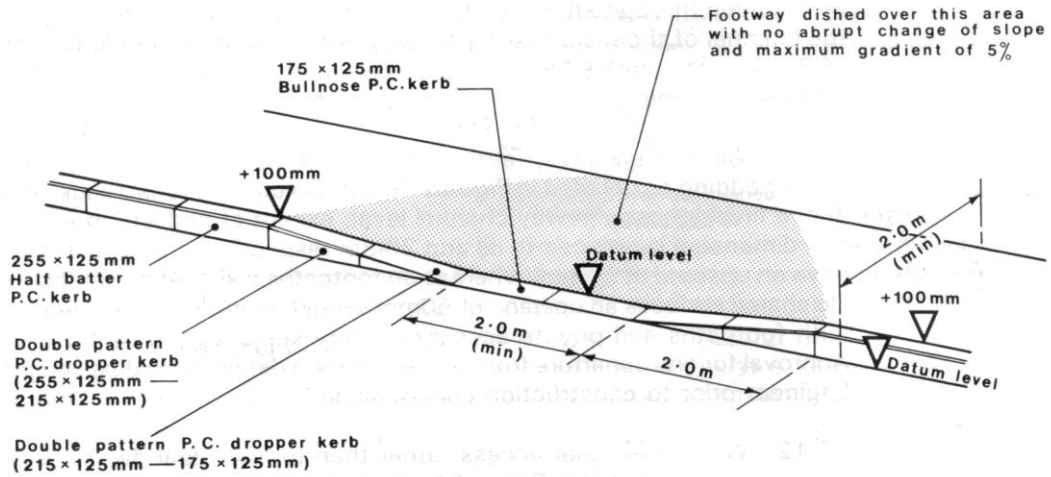
- Subgrade Drainage* 25.9 It is important to provide efficient permanent drainage of the subgrade and any other permeable layer of the road. Ideally the water-table should be prevented from rising to within 0.6 metre of the formation level. This requirement is additional to those for surface water drainage detailed in Section 26.
- Camber, Crossfall and Gradients* 25.10 Carriageways should be cambered with a fall of 2.5 per cent from the centreline to the channel except on curves where, to eliminate adverse camber, a crossfall of 2.5 per cent between channels should be provided. For roads surfaced with block paving a 2.5 per cent crossfall should be provided throughout. At a junction, the carriageway of the minor road should be graded into the channel of the major road. Footways and footpaths should be constructed with a crossfall of 3 per cent, and lay-bys should be provided with a 2.5 per cent crossfall towards the road channel. Channel gradients should not be flatter than 0.8 per cent (1 in 125).
- Kerbs and Edging* 25.11 All carriageways, footways and footpaths should be provided with precast concrete kerb or edging as detailed in Figures 18-22. On conventional roads, kerbs should be set 100mm above finished carriageway channel level, except at pedestrian and vehicular crossings where this dimension is reduced to nil and 20mm respectively. Edging at the heel of footways should have an upstand of 50mm, whereas on footpaths it should be set flush with the walking surface. On shared surfaces an upstand of 50mm should normally be provided (Fig 19), except at junctions with footpaths and private accesses where kerbs should be flush with the walking surface. Approval for any departure from these standard details should be sought from the Divisional/Area Engineer prior to construction commencing.
- Minor Commercial Accesses* 25.12 Where vehicular access, other than to individual dwellings, is taken over a footway, a crossing, as detailed in Figure 21, should be constructed to the specification for a residential road carriageway. If the crossing is being built in isolation from other roadworks it is recommended that the block paving specification be adopted. Alternatively, rigid construction to a design approved by the Divisional/Area Engineer may be acceptable.
- Residential Accesses* 25.13 Vehicular access crossings of the footway for individual dwellings should comply with Figure 21 and be constructed to the footway specification except in the case of a slabbed footway where the crossing should be formed in block paving.



\*Minimum length increased to 5.5 metres for minor commercial accesses

**FIGURE 21 - Footway Crossings**

Figure 22 details the requirement for dropped kerbs where pedestrian routes cross the carriageway from adjacent footways (eg at T-junctions and pelican crossings). Note the use of double pattern dropper kerbs and the large dished area to minimise footway gradients (5 per cent maximum) and avoid abrupt changes of slope. Pedestrian crossings of a carriageway with an adjacent grass verge should comply with Figure 21(b) except that the dropped kerb should be set flush with the carriageway and extend for a minimum length of 2 metres.



**FIGURE 22 - Dropped Kerb Detail at Designated Pedestrian Crossing Point**

## 26 Road Drainage

- Specification* 26.1 The specification for the construction of road drainage is detailed in Appendix A. Where discharging into an existing watercourse or public sewer, road drainage should additionally meet the requirements of the appropriate drainage authority.
- Design* 26.2 Road drainage design should be in accordance with the current edition of Road Note 35<sup>22</sup> subject to the qualification that the minimum pipe diameter permitted will be 150mm. Land drainage or other appropriate measures must be taken to prevent water flowing on to the road from adjacent properties.
- Gully Spacing* 26.3 Table 14 details the acceptable channel distance between gullies for a road comprising carriageway and two 2 metres wide footways, based on criteria adapted from TRRL Report LR277<sup>23</sup>. The spacing may require to be altered according to the road layout (e.g. at junctions) and special measures will be required where the grade is necessarily flatter than 0.8 per cent (sags, crests, etc). Advice on these matters should be sought from the Divisional/Area Engineer, who should be consulted at an early stage by any developer wishing to carry out a full drainage design. Irrespective of design spacings, a gully should be positioned.
- (a) just upstream of the tangent point at road junctions;
  - (b) short of the point where adverse camber is removed when applying super-elevation;
  - (c) at any local low point

**TABLE 14 - Gully Spacing for Carriageways**

Gradient:		Flatter than 1/150 (0.66%)*	1/150* 0.66%	1/100 1.00%	1/80 1.25%	1/60 1.66%	1/40 2.50%	1/30 3.33%	1/20 5.00%
<b>Cross Section</b>	<b>C/Way Width</b>	<b>Gully Spacing (metres)</b>							
1 in 40 (2.5%) Camber	5.5m	20	30	35	40	45	55	60	75
	6.0m	20	25	30	35	40	50	60	70
	7.3m	15	20	25	30	35	40	45	55
1 in 40 (2.5%) Crossfall	5.5m	10	15	17	20	22	27	30	37
	6.0m	10	12	15	17	20	25	30	35
	7.3m	7	10	12	15	17	20	22	27

\* Gradients flatter than 0.8% applicable to sags and crests only.

- Lay-by Drainage* 26.4 Lay-bys should be drained by means of gullies located along the road channel; it should not, therefore, be necessary to provide gullies at the rear of lay-by parking areas.
- Irregular Areas* 26.5 For large, irregularly shaped areas the empirically derived formula of one gully for each 200 square metres of catchment may be used. Additional gullies will be required where gradients are steeper than 1/20 or flatter than 1/150 and where surface water draining from adjacent areas may be anticipated.
- Footpath Drainage* 26.6 To obviate gully-clearing difficulties, remote footpaths should be constructed with flush edging and adjacent land drainage provided as detailed in Figure 20. Only in exceptional circumstances, as agreed with the Divisional/ Area Engineer,



should direct drainage into gullies be considered as an alternative.

- Gullies* 26.7 Road gullies should be constructed in accordance with clause 508 of the Specification as detailed in Figure 23. Gully gratings and frames must be positioned with grating bars running at right angles to the kerb and, where required by the Divisional/Area Engineer, be of the captive variety. On DISTRIBUTOR and INDUSTRIAL ACCESS ROADS they must be Grade A, GA2-450 but on residential access roads the use of Grade B, GB-325 gratings and frames will be permissible.
- Connections* 26.8 Connections should be constructed in accordance with clause 508 of the Specification. They must be formed with junction pipes unless the Divisional/Area Engineer has specifically approved the use of saddles.

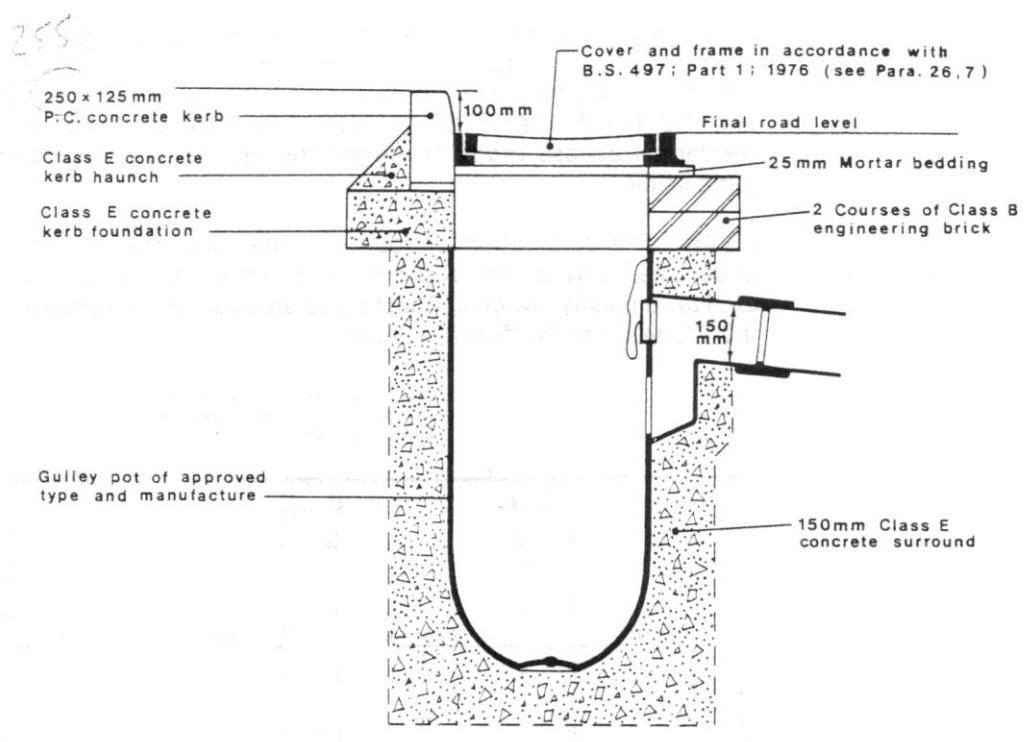


FIGURE 23—Typical Road Gully

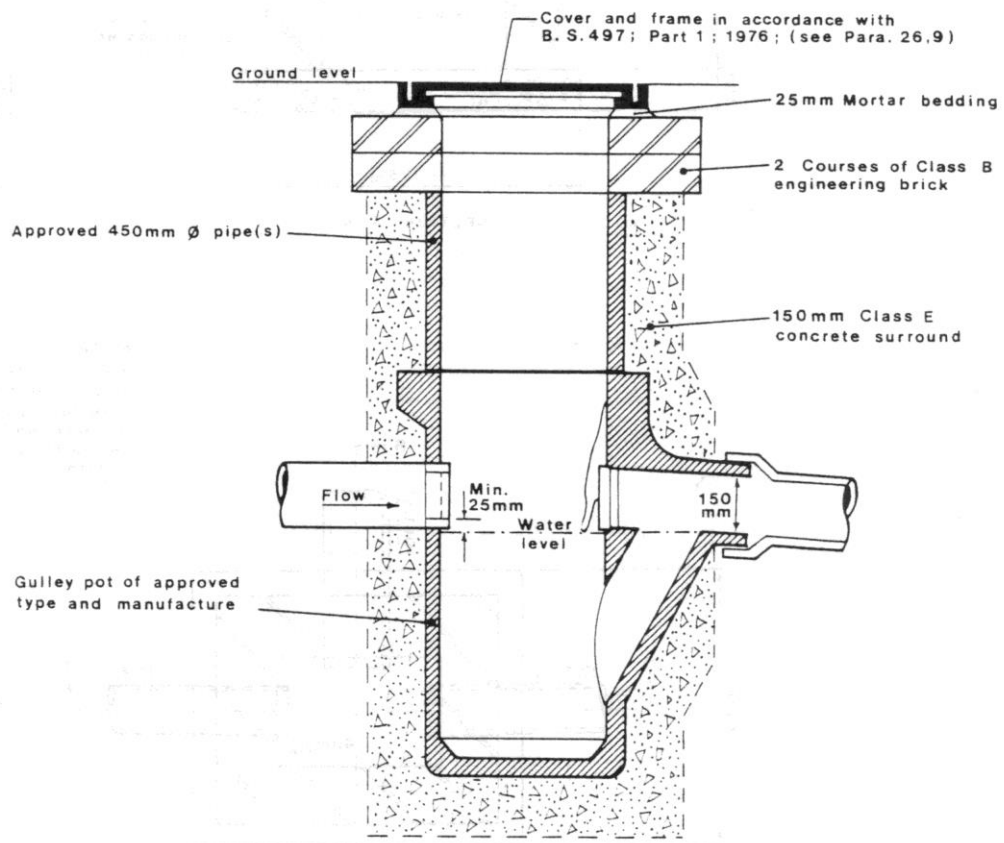
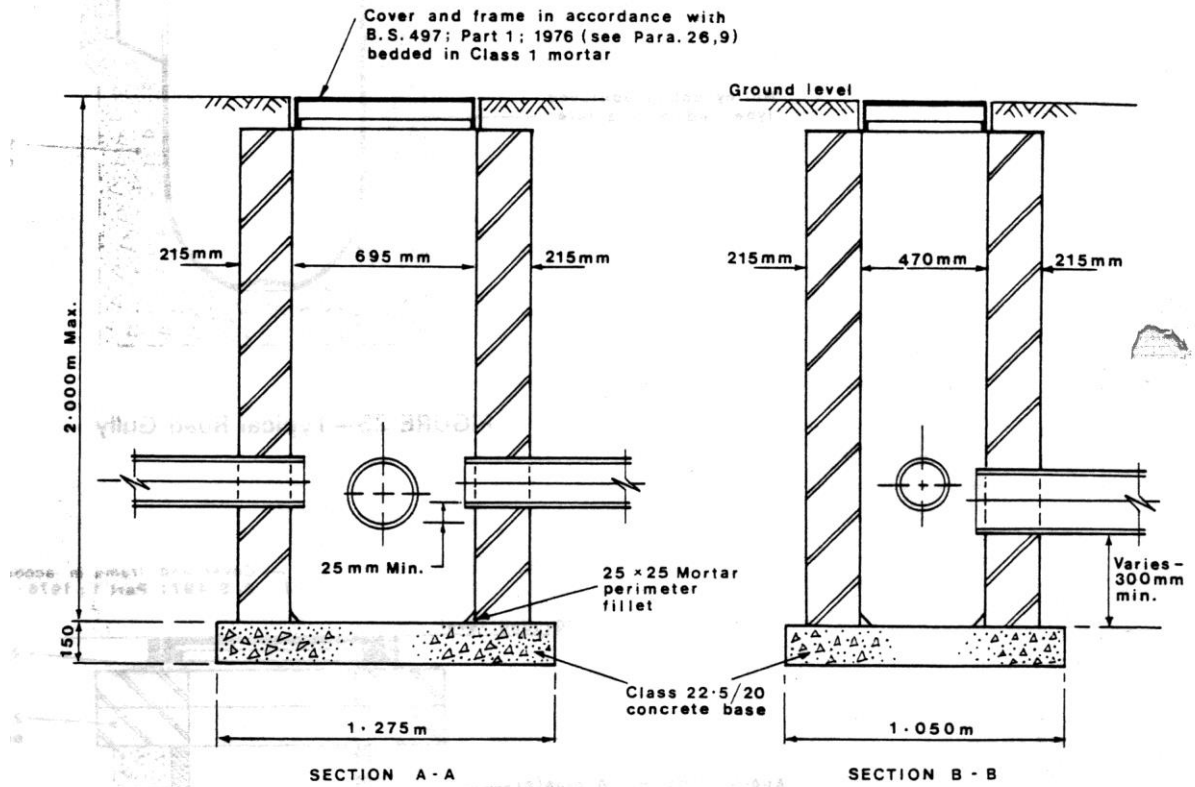
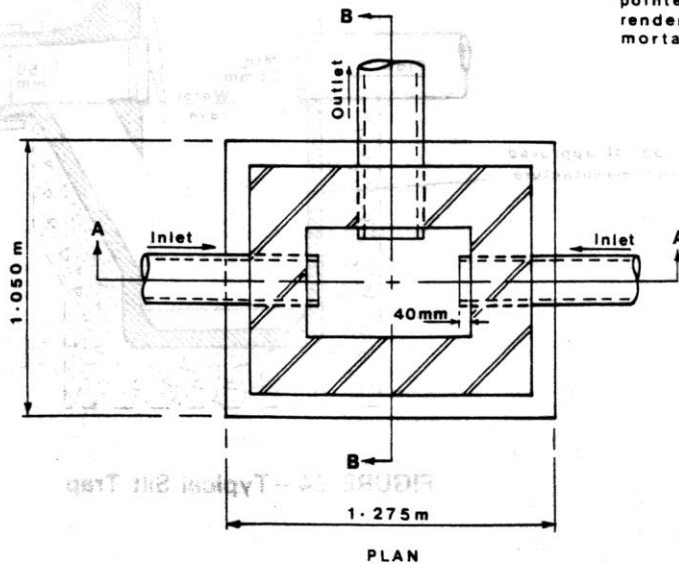


FIGURE 24—Typical Silt Trap

- Chambers* 26.9 With the exception of silt traps, details of which are shown in Figures 24 and 25, chambers should be constructed as detailed in the Standard Specification for Water and Sewerage Schemes<sup>24</sup>. Manhole covers and frames should comply with BS 497 Part 1: on DISTRIBUTOR and INDUSTRIAL ACCESS ROADS they must be Grade A, MA55, MA60 or MA-T but on residential access roads or verges the use of Grade B, Class 1 covers and frames will be permissible.
- Outfall Connection* 26.10 The connection of road drainage systems to the public sewer network should be undertaken only on the authority and to the requirements of the Director of Sewerage (para 23.13). Similarly, when connecting to an existing watercourse, approval should be sought from the Clyde River Purification Board.



**NOTE**  
 All brickwork to be Class 'B' engineering in English Bond, set in Class 1 mortar. Interior faces shall be neatly flush pointed and exterior faces shall be rendered with 20mm thick Class 1 mortar



**FIGURE 25 - Alternative Brick Silt Trap**

## 27 Road Lighting

- Specification* 27.1 The specification for the provision and installation of road lighting is detailed in Appendix B. Clause numbers prefixed "L" in the following text refer to that specification.
- Design* 27.2 Road lighting design should be as determined by the Divisional Engineer and detailed on the drawings returned to the developer (para 1.4). No departure from the requirements detailed on the drawings should be made without the written agreement of the Divisional Engineer.
- Location of Apparatus* 27.3 While the approximate location of all lighting apparatus is indicated on the drawings, the exact positions will require to be determined on site and approved by the Divisional Engineer's representative (para 6.4(e)). Lighting columns should normally be located at the rear (heel) of the footway or, where there is a grassed service strip immediately adjacent to the carriageway, at the heel of this verge. Underground lighting cables should be correspondingly located within 0.3 metre of the rear of the footway or verge (Fig. 17) and the developer must ensure that no other service is allowed to encroach within this area (para 23.5). The routes of any surface cables (cl LO7) must be agreed with the Divisional Engineer's representative prior to their installation.
- Column Clearances* 27.4 In the absence of a footway, the preferred minimum clearance from the front face of the kerb to the lighting column is 1.5 metres but, if this is unattainable, lesser clearances will be permissible subject to the absolute minima detailed in Table 15. All measurements for clearances are horizontal distances, at a height of 3 metres above the carriageway, between the column and the vertical plane containing the carriageway edge.

**TABLE 15 - Minimum Clearances for Lighting Columns**

Carriageway Crossfall (towards the kerb)	Minimum Clearance (kerb face - column face)
Not exceeding 2.5%	0.5m
Not exceeding 4.0%	0.6m
Exceeding 4.0%	0.8m

- Strategic Roads* 27.5 The above design notes do not apply to the siting of columns in MAIN and DISTRICT DISTRIBUTOR ROADS, or to roads with speed limits of 60kph (40 mph) or more. The developer should consult the Divisional Engineer for guidance on these aspects, where applicable.
- Column Erection* 27.6 Lighting columns should be erected such that the door at the base is in a position agreed by the Divisional Engineer's representative and, unless otherwise agreed, should be planted in the ground at the depth specified by the manufacturer (cl L12).
- Wall-mounted Brackets* 27.7 Brackets and lighting units to be erected directly on buildings and structures should be fixed and aligned in accordance with the specific instructions of the Divisional Engineer's representative.
- Painting* 27.8 Where lighting columns, brackets and control pillars are to be painted, the Divisional Engineer will specify the particular

protective system (cl L19: Table L19/1) to be used for the development.

*Identification  
Numbering*

- 27.9 The Divisional Engineer will provide the developer with a schedule of numbers for the individual identification of columns and brackets, and will instruct the developer as to the required form and orientation of the markings.

- Cable Trenches* 27.10 Trench lines should be set out as shown on the drawings or as directed by the Divisional Engineer's representative, with any deviation from the defined line being approved before work is started. For drainage and structural reasons, as far as is practicable trenches should avoid the line of the channel of the carriageway. The depth of excavation should be such that cables laid under a verge, footway or footpath have a minimum cover of 0.45 metre to finished ground level. Where laid under carriageways minimum cover will be specified by the Divisional Engineer's representative in accordance with Table 16.
- Road Opening Permit* 27.11 The developer must obtain the necessary road opening permit from the Divisional/Area Engineer before undertaking any excavation in an existing public road and will be responsible for the subsequent reinstatement of the road surface as specified in the permit.
- Existing Services* 27.12 The developer is responsible for contacting the Public Utilities regarding the position of any existing underground plant. The Divisional/Area Engineer can accept no responsibility for the accuracy of any information given as to the whereabouts of such plant nor, more particularly, for any conflict between new and existing plant which may arise where such information is incorrect.
- Cable Ducts* 27.13 All underground lighting cables should be enclosed in ducts as specified in Table 16. Except for crossings of carriageways or commercial accesses, ducts should have an internal diameter of not less than 75mm.

**TABLE 16 - Laying Details for Cable Ducts**

<i>Location</i>	<i>Duct Material</i>	<i>Depth</i>	<i>Surround</i>
Crossing of Carriageway or Commercial Access	Steel	0.5m	Concrete
	Fireclay, Self-coloured purple PVC	0.75/1.0m (as directed)	Concrete
Residential Access, Footway Footpath or Verge	Self-coloured purple PVC	0.45m	Approved Backfill

*Ducted Crossings* 27.14 At crossings of carriageways and commercial accesses, cable ducts should be not less than 100mm internal diameter, laid to a straight grade and should extend 0.5 metre either side of the crossing. Depths below finished level should be as detailed in Table 16, with 0.3 metre x 0.3 metre Class E concrete surrounds where indicated.

*Bollards and Traffic Signs* 27.15 The lighting of any traffic bollards and signs required within the development should be as detailed on the drawings (para 1.4) and in accordance with clause L15 of the Specification.

*Cable Joints* 27.16 The installation should only include cable joints where specifically instructed by the Divisional Engineer's representative. Any such joints must be of a type approved by the Divisional Engineer.

*Electricity Supply* 27.17 The developer will be responsible for the provision of an electricity supply or supplies by the Electricity Board to the designated

control pillar or pillars shown on the drawings (para 1.4) and for the giving of all notices required by the Board in respect of such works. The developer should indicate the position that the Board services are to occupy in control pillars.



*Connection to  
Existing Apparatus*

27.18 Where the road lighting in a development is to be connected electrically to any existing Roads Authority lighting column or control pillar, the Divisional Engineer's representative will, on receipt of an Installation Inspection and Test Certificate (Table L22/1 of Appendix B) completed in respect of Items 1-19, carry out the necessary connection or connections at the point of supply in accordance with the Health and Safety at Work etc., Act 1974, the cost to be borne by the developer. The Divisional Engineer's representative will require a minimum of 48 hours notice (excluding weekends) from receipt of the Installation Inspection and Test Certificate to provide the connection facility. Alterations to existing services and equipment which the Divisional Engineer deems necessary to accommodate the development will be charged to the developer on a time and material basis.

*Testing*

27.19 Where an installation is connected to existing apparatus as described above, the developer will be required, at the time of connection, to carry out the tests listed under Items 20 and 21 of the Installation Inspection and Test Certificate (Table L22/1 of Appendix B). The Divisional Engineer's representative should be afforded the opportunity to witness these tests, and may disconnect the installation from the Roads Authority's supply network in the event of the test results proving unsatisfactory

## 28 Road Landscaping

<i>Specification</i>	28.1	The specification for road landscaping is detailed in Appendix A. Clause numbers in the following text refer to that specification.
<i>Design</i>	28.2	Any landscaping proposed for areas within the road boundaries should be designed to minimise future maintenance requirements as determined by the Divisional/Area Engineer.
<i>Soft Verges</i>	28.3	Soft verges should be grassed (cl 611) unless an alternative form of surfacing is authorised by the Divisional/Area Engineer, in consultation with the Public Utilities where appropriate. There must be a permanent and continuous demarcation of the boundary between the verge and adjoining private property (e.g. by a fence, wall or concrete edge kerbing).
<i>Topsoil</i>	28.4	Topsoil should be spread to a minimum thickness of 100mm on all areas to be seeded or turfed (cl 611). Prior to soiling, the top 200mm of existing ground should be broken up to facilitate drainage and all stones and rubbish upstanding more than 50mm should be removed.
<i>Grass Seed</i>	28.5	Unless otherwise agreed by the Divisional/Area Engineer, grass seed should comprise the mixture listed in clause 2616 of the Specification. The developer will be responsible for re-sowing, in the following season, any area where the seeding is not successful.
<i>Hard Verges</i>	28.6	The form of any hard landscaping should be agreed with the Divisional/Area Engineer at an early stage in the design process. Where hard verges are provided on distributor roads, they should be surfaced with pedestrian deterrent paving.

# Appendices

## APPENDIX A

### SPECIFICATION FOR ROAD CONSTRUCTION AND MATERIALS

- Specification* A1 The specification for the construction of development roads shall be the current edition of the Department of Transport (DTp) Specification for Road and Bridge Works<sup>21</sup> including any supplements and as further modified in this appendix. Should any supplementary clause herein conflict or be inconsistent with any provision made in the DTp Specification, the supplementary clause shall always prevail.
- SDD Amendments* A2 The attention of developers is drawn to the fact that amendments and additions are made to the DTp Specification by the Scottish Development Department (SDD) and they are advised to consult the Divisional/Area Engineer in respect of these alterations.
- SRC Amendments* A3 The following table lists additions and amendments to the DTp Specification required by the Local Roads Authority (SRC). These are fully detailed in this appendix with clauses and tables numbered to correspond to those in the DTp Specification. Amendments to existing clauses are suffixed "A", whereas an "S" suffix indicates that the clause supersedes an existing clause. Additional clauses have no suffix.

**TABLE 1 - List of SRC Amendments to DTp Specification**

<i>Series</i>	<i>Section</i>	<i>CL No.</i>	<i>Clause Title</i>
500	Drainage	508(S)	Gullies and Connections
600	Earthworks	611(A)	Soiling, Grassing and Turfing
700	Roadworks, Overall Requirements	704(S)	Numbers of Layers for Bituminous Courses
800	Sub-bases and Roadbases	820	Graded Roadstone
1000	Concrete Pavement	1025	Concrete Block Paving
1100	Kerbs & Footways	1101(S) 1104(S) 1105(S) 1106(S)	Kerbs and Edging Footways and Footpaths (Concrete Paved) Footways and Footpaths (Flexible) Granolithic Concrete
2600	Materials	2616(S)	Grass Seed

- New Materials* A4 It is not the intention to preclude the use of new materials or processes, but the specific prior approval of the Local Roads Authority must be sought through the Divisional/Area Engineer.

<p><b>508(S) Gullies and Connections</b></p> <p><b>1</b> Gully Pots shall be trapped and have a minimum storage capacity of 100 litres (20 gallons). They shall where appropriate comply with the relevant British Standard:</p> <p>(i) Concrete pots - BS 5911 Part 2, 1982;</p> <p>(ii) Vitriified clay pots - BS 65, 1981.</p> <p>In the absence of an approved British Standard, polypropylene pots shall be "Hepworth" or equivalent fitted with an integral but <b>external</b> trap, while high density polypropylene pots shall be Davigulli (E.Kilbride) or equivalent. Brickwork or other approved method shall be provided from the top of the pot to the underside of the frame.</p> <p><b>2</b> Backfilling to gullies up to formation level shall be concrete Class E to Clause 1602. The remainder of the backfilling shall be in appropriate road pavement materials except that, where mechanical compaction of granular sub-base is impractical, Class E concrete shall be used.</p> <p><b>3</b> The gully shall be positioned in such a way that the maximum distance between it and the adjacent kerb shall not exceed 10mm.</p> <p><b>4</b> Junction pipes which are laid, but not immediately connected shall be fitted with temporary stoppers or seals and the position of all such junctions shall be clearly defined by means of stakes or tracing wires properly marked or labelled. Junction pipes shall be manufactured of the same type and class of material as the remainder of the pipes in the</p>	<p><b>6</b> All connections to a depth of 1 metre below the level of the finished surface shall be surrounded in 150mm of Class E concrete.</p> <p><b>611(A) Soiling, Grassing and Turfing</b> The rate of application of the seed shall be increased to not less than 11g/m<sup>2</sup> in all areas.</p> <p><b>704(S) Number of Layers for Bituminous Courses</b></p> <p><b>1</b> A bituminous pavement course shall be laid in one or more layers so that the compacted thickness of each layer shall not exceed 150mm.</p> <p><b>820 Graded Roadstone</b></p> <p><b>1</b> Graded roadstone shall consist of stone complying with Clause 2602, supplied from a source approved by the Engineer. The grading shall conform to the undernoted table.</p> <p><b>Table 8/10 Graded Roadstone</b></p> <table border="1"> <thead> <tr> <th><u>B.S. Sieve Size</u></th> <th><u>% by Mass passing</u></th> </tr> </thead> <tbody> <tr> <td>75mm</td> <td>100</td> </tr> <tr> <td>37.5mm</td> <td>30-60</td> </tr> <tr> <td>10mm</td> <td>0-25</td> </tr> </tbody> </table>	<u>B.S. Sieve Size</u>	<u>% by Mass passing</u>	75mm	100	37.5mm	30-60	10mm	0-25
<u>B.S. Sieve Size</u>	<u>% by Mass passing</u>								
75mm	100								
37.5mm	30-60								
10mm	0-25								

run or shall be in accordance with the manufacturer's recommendations.	2mm	0-10
5 Saddles for asbestos cement and plastic pipes shall be installed in accordance with the manufacturer's recommendations such that no internal projections greater than 5mm remain. Saddles with clay pipes shall be jointed with Class 1 mortar to Clause 2693 excluding lime. Saddles and pipes shall be surrounded with Class E concrete.	2	The material shall be laid without segregation of the various stone sizes in layers 100mm to 150mm thick, well rolled with a roller not less than 8,000Kg or the vibratory equivalent. Each layer shall be blinded with suitably graded crusher dust brushed into the interstices of the stones and thoroughly rolled to provide a surface in accordance with Clause 701.

#### APPENDIX A

##### 1025 Concrete Block Paving

- 1 Concrete blocks shall be rectangular in shape, 80mm thick constructed in accordance with the Specification of Precast Concrete Paving Blocks and laid to the Code of Practice for Laying Precast Concrete Paving Blocks; both documents being published jointly by the Cement and Concrete Association, the County Surveyors' Society and Interpave. Copies can be obtained from C&CA, Wexham Springs, Slough SL3 6TL.
- 2 The pavement sub-base shall be designed in accordance with paragraphs 25.2 and 25.9 of the Guidelines.
- 3 Blocks shall be laid 5mm proud of any rigidly constructed edge details to allow for differential settlement.
- 4 Block paving shall be laid in an uphill direction, to a herring-bone pattern, with the blocks laid generally parallel and at right angles to the carriageway edge.
- 5 All items of ironwork shall be surrounded by insitu concrete to avoid sand loss underneath their frames.

##### 1101(S) Kerbs and Edging

- 1 The type of kerb used shall be one of the following: -
  - (i) Whin kerb - 125mm x 250mm nridged whin kerb all in accordance with BS 435, 1975.
  - (ii) Concrete kerb - 125mm x 255/175mm hydraulically pressed concrete kerb all in accordance with BS 340, 1979. The kerbs shall be in lengths of not less than 900mm.
  - (iii) Kerb founds shall be formed with Class E concrete to the dimensions shown in Figures 18 and 19 of the Guidelines. Kerbs shall be laid on a 25mm bed of Class 1 mortar and the haunching shall extend over the full length. All joints shall be flush pointed and grouted.
  - (iv) For radii of 12 metres or less, kerbs of appropriate radius shall be used.
- 2 Precast concrete edgings shall be:-
  - (i) At the heel of footways: 200 x 50mm half round
  - (ii) Elsewhere: 150 x 50mm flat-topped
 In addition they shall be hydraulically pressed and shall comply with the requirements of BS 340, 1979. The edging shall be bedded on a 25mm bed of Class 1 mortar laid on a foundation of Class E concrete to the dimensions stated in Figures 18 and 20 of the Guidelines. The haunching shall extend over the full length and all joints shall be flush pointed and grouted.
- 3 Any unit of kerb or edging deviating more than 3mm in any 3m length from line or level shall be made good by lifting and relaying.
- 4 Where kerbing or edging is being laid adjacent to an existing carriageway or footway to which the public has access, a temporary reinstatement of the surface must be made, or barricades erected, at the end of each working day.
- 5 Where lengths of kerbing are strung out prior to laying, provision must be made for crossing points at junctions and pedestrian crossings.
- 6 Where existing kerbs are being relaid it will be permissible to lay them directly in a concrete bed of the same dimensions as the foundation specified in Figure 18 of the Guidelines.

##### 1104(S) Footways and Footpaths (Concrete Paved)

- 1 Concrete paving slabs shall be hydraulically pressed and be in accordance with BS 368 with the addition that the range of sizes will be increased to permit the use of 400 x 400mm slabs.
- 2 Slabs shall be dimensioned and laid in accordance with Table 13 of the Guidelines, to a crossfall of 3 per cent. 600mm wide slabs shall be laid to a 150mm broken bond, while 400 x 400mm slabs may be laid to straight bond; in both instances with joints at right angles to the kerb.
- 3 On radii of 12m or less, either flags shall be cut radially on two edges to the required line or segments of concrete block paving shall be introduced between the flats, to accommodate the change in direction.

##### 1105(S) Footways and Footpaths (Flexible)

- 1 Construction shall be in accordance with Table 13 of the Guidelines, with 6mm or 10mm limestone (or other approved chippings) applied to the surface prior to compaction at a nominal rate of 1kg/m<sup>2</sup>. Compaction shall conform to Clause 705 with the proviso that the weight of the roller shall be reduced to 3 tonnes deadweight or equivalent.

##### 1106 Granolithic Concrete

- 1 Granolithic footways/footpaths shall be laid in accordance with Table 13 of the Guidelines.
- 2 The concrete shall be manufactured using either ordinary or rapid hardening Portland cement (BS 12) or Portland blast furnace cement (BS 146).
- 3 Concrete aggregates shall conform to the requirements of BS 1201: Aggregates for granolithic concrete floor finishes.
- 4 Where coloured finishes are required, coloured cements shall be used. The use of pigments at the mixer shall not be permitted.
- 5 The water used for mixing concrete shall be obtained from a source approved by the Engineer.
- 6 The concrete topping should preferably be laid monolithically with the base concrete (i.e. within a period of one to three hours). If this is not practicable, the base concrete shall be treated, e.g. by the removal of latence prior to setting, so as to ensure a satisfactory bond between the base and top layers.
- 7 The mix proportions by weight shall be:
  - (i) 1:1:2, cement: fine aggregate: coarse aggregate, or
  - (ii) 1:3, cement: all-in aggregate.
- 8 When batched by "volume" the proportions shall be:
  - (i) 50Kg cement: 0.035m<sup>3</sup> dry fine aggregate: 0.07m<sup>3</sup> coarse aggregate, or
  - (ii) 50Kg cement: 0.1m<sup>3</sup> all-in aggregate.
- 9 Water content must be kept as low as possible consistent with obtaining full compaction (to satisfy this requirement the water/cement ratio shall not exceed 0.42).
- 10 The concrete shall be laid in bays not exceeding 15 square metres.
- 11 All concrete shall be fully compacted with neither segregation nor excessive latence being permitted.
- 12 Once the concrete has been fully compacted and trowelled to a smooth finish, it shall be left for a period of between two and three hours after which further trowelling shall be undertaken. Should water be brought to the surface as a result of this operation, the concrete shall be left for a further period of one hour and the process repeated as often as is necessary until no surface water is produced by the trowelling action. Thereafter, the surface shall be marked out in panels (not exceeding 0.6m x 0.6m) and indented with a granolithic roller.
- 13 As soon as the surface has hardened sufficiently to prevent damage, it shall be cured for a minimum period of 48 hours by:
  - (i) spraying the surface with a curing compound complying with Clause 2603 at a rate of 0.25 litre/m<sup>2</sup>, or
  - (ii) covering the surface with building paper, plastic, or other waterproof sheeting, kept in close contact with the surface. The covering shall overlap the sides of the slab and shall be securely held in position.

For coloured concrete work method (ii) shall be used.

- 14 Concreting shall cease when the atmospheric temperature is below 30°C on a falling thermometer and shall not be resumed until a temperature of at least 1°C on a rising thermometer has been reached.

##### 2616(S) Grass Seed

- 1 Grass seed shall be a tested mixture from an approved source and certificates of purity and germination shall be provided if requested. Unless otherwise directed by the Engineer, the mixture shall consist of the following parts by mass:

Brown Top	5 Kg
Creeping Red Fescue	5 Kg
Crested Dogstail	5 Kg
Rough Stalked Meadow Grass	2 1/2 Kg
Chewing Fescue	12 1/2 Kg
Perennial Rye Grass	20 Kg

50 Kg

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## APPENDIX B

### SPECIFICATION FOR ROAD LIGHTING

*Specification* B1 The specification for the supply, erection and commissioning of a system of road lighting shall comprise the clauses listed in Table B1 and detailed in this appendix.

**TABLE 1 - List of Road Lighting Specification Clauses**

<i>Subject</i>	<i>Cl. No.</i>	<i>Clause Title</i>
General	LO1	Health and Safety at Work Act 1974
	LO2	Compliance with Regulations
	LO3	Work on Existing Roads
Cabling	LO4	Cable Network
	LO5	Earthing
	LO6	Underground Cables
	LO7	Surface Cables
	LO8	Cable Jointing
	LO9	Excavation of Cable Trenches
	L10	Cable Laying
	L11	Backfilling of Cable Trenches
Lighting Equipment	L12	Erection of Road Lighting Equipment
	L13	Identification Numbering
	L14	Internal Wiring
Control Equipment	L15	Bollard and Traffic Sign Lighting
	L16	Control Pillars
	L17	Photo-electric Controls
Protection of Steelwork	L18	Metal Coatings
Materials, Workmanship and Testing	L19	Painting of Steelwork
	L20	Type and Manufacture of Equipment
	L21	Suitability in Service
	L22	Certification of Installation

*Appendix A Clauses* B2 Certain of the clauses listed in Table B1 make reference to other clauses, the numbers of which are not prefixed "L". These latter clauses are detailed in the Specification for Road Construction and Materials (Appendix A of the Guidelines) and are deemed to form an integral part of the Specification for Road Lighting.

*Approved Equipment* B3 Tables L19/1 and L20/1 of the Specification list items which will require to be of a type approved by the Local Roads Authority. As the availability of products is liable to change, details of approved equipment are omitted from the tables in this appendix and will be supplied by the Divisional Engineer as required.

*Alternative Equipment* B4 To facilitate subsequent maintenance by the Local Roads Authority, road lighting equipment will normally be limited to that approved as above. However, in **exceptional** circumstances, the Divisional Engineer may agree to the use of alternative equipment, provided that specific approval is sought prior to application being made for Construction Consent.

<p><b>L01 Health and Safety at Work Act 1974</b></p> <p><b>1</b> The Contractor shall comply with all relevant requirements of the Health and Safety at Work Act 1974, in respect of site operations and personnel.</p> <p><b>L02 Compliance with Regulations</b></p> <p><b>1</b> All apparatus and material supplied and all works carried out shall comply with all parts of the 15<sup>th</sup> Edition of the IEE Wiring Regulations, the current regulations of the Home Office, Department of Transport/SDD and local Electricity Board and shall comply with the requirements of any local authority having jurisdiction.</p> <p><b>L03 Work on Existing Roads</b></p> <p><b>1</b> Work on existing roads shall be carried out in accordance with clauses 103, 104 and 105.</p> <p><b>2</b> Where the works involve the obstruction of a footway, the Contractor</p>	<p><b>3</b> No excavation shall be undertaken until the Contractor has obtained the necessary Road Opening Permit (see paragraph 27.11 of the Guidelines).</p> <p><b>4</b> All services, pipes and culverts or other plant which may be interfered with in the progress of the works are to be carefully supported or relaid where necessary and in such a manner as the Statutory Undertakers may direct, and any damage to services, pipes etc. (whether underground or overhead) must, without delay, be made good by the Contractor to the satisfaction of the Statutory Undertaker; any consequential costs arising from such damage shall be met by the Contractor.</p> <p><b>5</b> Existing public roads must not be used as sites for stock-piling and storing lighting equipment or plant; the Contractor shall be liable for the cost of reinstatement of any road surfaces, fences and other</p>
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shall provide an alternative safe footway, properly signed, guarded and lit.	existing surfaces or structures which may be interfered with by the installation of the lighting equipment.
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## APPENDIX B

<p><b>L404 Cable Network</b></p> <ol style="list-style-type: none"><li>1 Electricity Board supplies to control pillars will be 415/240V 3ph 50Hz or 240V 1ph 50Hz as indicated on the drawings.</li><li>2 Outgoing circuits to lighting columns will be via "looped" single phase, split concentric copper cables terminating in cut-outs in the column bases.</li></ol> <p><b>L05 Earthing</b></p> <ol style="list-style-type: none"><li>1 The earthing of all columns, conduits, cables, boxes, fittings, control pillars and other exposed metal shall comply with the recommendations contained in the 15<sup>th</sup> Edition of the IEE Wiring Regulations.</li><li>2 Supplementary bonding conductors shall be of copper and shall be sized in accordance with Section 547 of the IEE Wiring Regulations.</li><li>3 The Contractor shall make arrangements with the Electricity Board for the connection of the protective conductor to the Electricity Board's earthing terminals in control pillars.</li></ol> <p><b>L06 Underground Cables</b></p> <ol style="list-style-type: none"><li>1 Underground cables shall:<ol style="list-style-type: none"><li>(i) be PVC insulated split concentric cables with stranded copper conductors, 600/1000V grade to BS4533 : 1970;</li><li>(ii) consist of PVC insulated central conductor and concentric layer comprising bare earth continuity cores separated from black PVC covered neutral wires by PVC strings;</li><li>(iii) have live cores of equal cross-sectional area and of such cross-sectional area as indicated on the drawings;</li><li>(iv) have earth continuity protective conductor of such cross-sectional area as to comply with the requirements of Table 54F of the IEE Wiring Regulations.</li></ol></li></ol> <p><b>L07 Surface Cables</b></p> <ol style="list-style-type: none"><li>1 Where so indicated on the drawings, surface cable runs to wall-brackets shall be mineral insulated copper cable, pvc sheathed, 600V grade, secured to the buildings or structures by pvc covered slips spaced at the recommended intervals. The cable sheath colour shall be as detailed on the drawings.</li><li>2 All glands for M.I.C.C. cables shall be fitted with corrosion resistant shrouds.</li><li>3 All surface cable routes shall be agreed on site (see paragraph 27.3 of the Guidelines) before work is started.</li></ol> <p><b>L08 Cable Jointing</b></p> <ol style="list-style-type: none"><li>1 Cable jointing shall be undertaken only where authorised in terms of paragraph 27.16 of the Guidelines.</li><li>2 Cable joints shall be made up in accordance with cable and joint manufacturer's instructions.</li><li>3 During the making of any cable joint, the Contractor shall ensure that correct phasing is maintained with cables joined colour to colour.</li><li>4 Jointing shall only be carried out when all materials used in the jointing are free from moisture.</li></ol> <p><b>L09 Excavation of Cable Trenches</b></p> <ol style="list-style-type: none"><li>1 Trench lines and depths shall be as detailed in paragraph 27.10 of the Guidelines. Such stipulation in no way releases the Contractor from his obligations in regard to Statutory Undertakers services and plant and due care must be taken at all times during excavation work.</li><li>2 Excavation in existing public roads shall be undertaken in accordance with clause LO3.</li><li>3 Where trenches are excavated in grassed verges, turfs which are to be re-laid should be carefully stripped and stacked. All turfs shall be used within one week of cutting during the period 1 April to 31 August or within two weeks during the remainder of the year. Turfs not used within these periods shall be regarded as topsoil. Topsoil shall be set aside for re-use.</li></ol> <p><b>L10 Cable Laying</b></p> <ol style="list-style-type: none"><li>1 Cables shall be mechanically protected by being drawn into ducts in accordance with paragraphs 27.13 and 27.14 of the Guidelines.</li><li>2 PVC ducts shall be Class O, interlocking, to BS 3506. They shall be loose laid on a bed of sifted soil (or sand to BS 882, Zone 1) 75mm deep and covered with 75mm of sifted soil before general reinstatement of the trench. The trench shall be free of water when sifted soil, duct and cable are laid.</li><li>3 The ends of ducts crossing carriageways or commercial accesses shall be plugged and sealed after installation of the cables.</li></ol>	<ol style="list-style-type: none"><li>4 An adequate length of cable shall be left at each column and pillar position to enable connections to be made when apparatus is erected after the cable is laid.</li><li>5 Any cable ends left temporarily exposed shall be appropriately sealed and buried.</li><li>6 Cables shall only be laid when the ambient temperature is above 0°C and has been at or above this temperature for the previous 24 hours, or special precautions approved by the Engineer have been taken to maintain the cables above this temperature, to avoid risk of damage during handling.</li><li>7 Yellow self-coloured pvc or polythene marker tape shall be laid above the line of the cable, 225mm below finished ground level. The tape shall be not less than 0.1mm thick, printed "STREET LIGHTING CABLE" along its full length. The wording shall occur at least at 1m intervals and shall occupy not less than 75% of the available length.</li><li>8 Trenches shall be left open for inspection by the Engineer after the cable is laid and shall not be backfilled without his permission.</li></ol> <p><b>L11 Backfilling and Compaction of Cable Trenches</b></p> <ol style="list-style-type: none"><li>1 Except where there is local agreement for the use of specialised material, excavated material may be used as backfilling provided that it does not comprise any materials listed in clause 601, sub-clause 1(iii).</li><li>2 Unsuitable material shall be removed from the site and be replaced with Type 2 material (cl 804).</li><li>3 Where the nearest edge of any opening in the carriageway is less than 1 metre from the edge of the carriageway, backfilling shall be carried out with Type 2 material (cl 804).</li><li>4 Compaction of material within the first 300mm above the sand cover shall be carried out by hand ramming. The material shall be compacted so that negligible settlement occurs. Where necessary, the moisture content of the material shall be adjusted so as to ensure adequate compaction.</li><li>5 The material to be used as backfill above the first 300mm is to be placed and compacted in layers from an uncompacted thickness not greater than 225mm. Compaction shall be carried out by approved mechanical compacting equipment capable of producing an effect equivalent to a dead-weight roller weighing not less than 6 tonnes. Each layer shall be compacted until no further compaction is observed.</li><li>6 On completion of backfilling a trench in an existing public road, the surface shall be reinstated as specified in the Road Opening Permit (cl LO3).</li></ol> <p><b>L12 Erection of Road Lighting Equipment</b></p> <ol style="list-style-type: none"><li>1 The erection of road lighting equipment shall conform to the latest edition of the "Code of Practice for the Erection of Street Lighting Equipment" issued by the Association of Street Lighting Erection Contractors save insofar as they are varied hereby expressly or by implication.</li><li>2 Column erection shall comply with paragraph 27.6 of the Guidelines.</li><li>3 Columns shall be carefully erected and aligned in the vertical position by the use of slings applied at the correct lifting points as recommended by the manufacturer.</li><li>4 Column bracket arms and lanterns shall be fixed in accordance with the manufacturer's instructions to prevent rotation in service.</li><li>5 Each column shall be located in a hole with steep sides allowing a minimum 100mm clearance all round the base of the column for the full excavation depth.</li><li>6 Each column shall be surrounded with Class E concrete (cl 1602) up to the lower edge of the cable entry slot. The concrete shall be compacted by hand or by mechanical vibration. The cable entry slot shall be temporarily plugged to ensure that it is maintained free from concrete and soil during the backfilling process.</li><li>7 Brackets and lighting units to be erected directly on buildings and structures shall be installed in accordance with paragraph 27.7 of the Guidelines.</li></ol>
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<p><b>L13 Identification Numbering</b></p> <ol style="list-style-type: none"><li>1 After erection and final finish, each column and bracket shall be numbered in accordance with paragraph 27.9 of the Guidelines.</li><li>2 The numbers shall be not less than 50mm high and shall be:<ol style="list-style-type: none"><li>(i) stencilled in black on a white background; or</li><li>(ii) applied in the form of plastic coated, stick-on labels; as directed by the Engineer.</li></ol></li><li>3 On columns, the numbers shall be at a height of 2m above ground level.</li></ol> <p><b>L14 Internal Wiring</b></p> <ol style="list-style-type: none"><li>1 Wiring between the terminal block in the lantern and the components in the base of the column shall be pvc insulated and sheathed flexible cable of 300/500 volt grade having a copper conductor size of 1.5mm<sup>2</sup>. All cables shall be correctly colour coded. Unsupported lengths of wiring shall be kept to a minimum and not be allowed to come into contact with components by their freedom of movement.</li><li>2 The cable termination and bonding arrangements in the column base compartment shall be as shown in Figure L14/1. All cable terminations shall be made using insulated-type crimped connectors formed from solid drawn copper tube.</li><li>3 Each lamp circuit shall be protected by a 4A HRC fuse to BS88 (for lamp ratings up to and including 150W).</li></ol> <p><b>L15 Bollard and Traffic Sign Lighting</b></p> <ol style="list-style-type: none"><li>1 Underground cabling to signs and bollards shall be carried out by looping from adjacent column termination units as indicated on the drawings.</li><li>2 At traffic signs, the cable shall be terminated in the signpost base compartment or root-box provided, using a cut-out unit of the type specified for use in lighting columns with similar cable termination arrangements.</li></ol>	<ol style="list-style-type: none"><li>3 At bollards, the incoming cable shall be glanded and terminated in a bollard termination box (as specified in Table L20/1). A "Klippon" terminal rail, or equivalent, is incorporated in the box for termination of the cable cores.</li><li>4 At traffic signs wiring between the lantern terminal block and the termination unit in the sign post base compartment or root-box shall be pvc insulated and sheathed flexible cable of 300/500 volt grade having a copper conductor size of 1.5mm<sup>2</sup>. All cables shall be correctly colour coded. Unsupported lengths of wiring shall be kept to a minimum and not allowed to come into contact with components by their freedom of movement. Where cables pass through holes drilled in posts or other supporting metalwork, the holes shall be free from burrs and fitted with grommets.</li><li>5 Bollards should be supplied with pre-wired lamp and control gear assemblies complete with weatherproof Reyrolle plug for connection to a Reyrolle socket provided in the top of the termination box. The Contractor is required to wire from the "Klippon" terminal rail or equivalent to the underside of the socket in 2.5mm<sup>2</sup> pvc insulated and sheathed cable, 300/500 volt grade, with copper conductors.</li><li>6 The Contractor shall erect and wire sign lanterns using brackets, clips or posts as appropriate.</li><li>7 The Contractor shall construct the concrete foundation for bollards in accordance with the drawings provided by the Engineer and mount the bollards using shear bolts.</li></ol>
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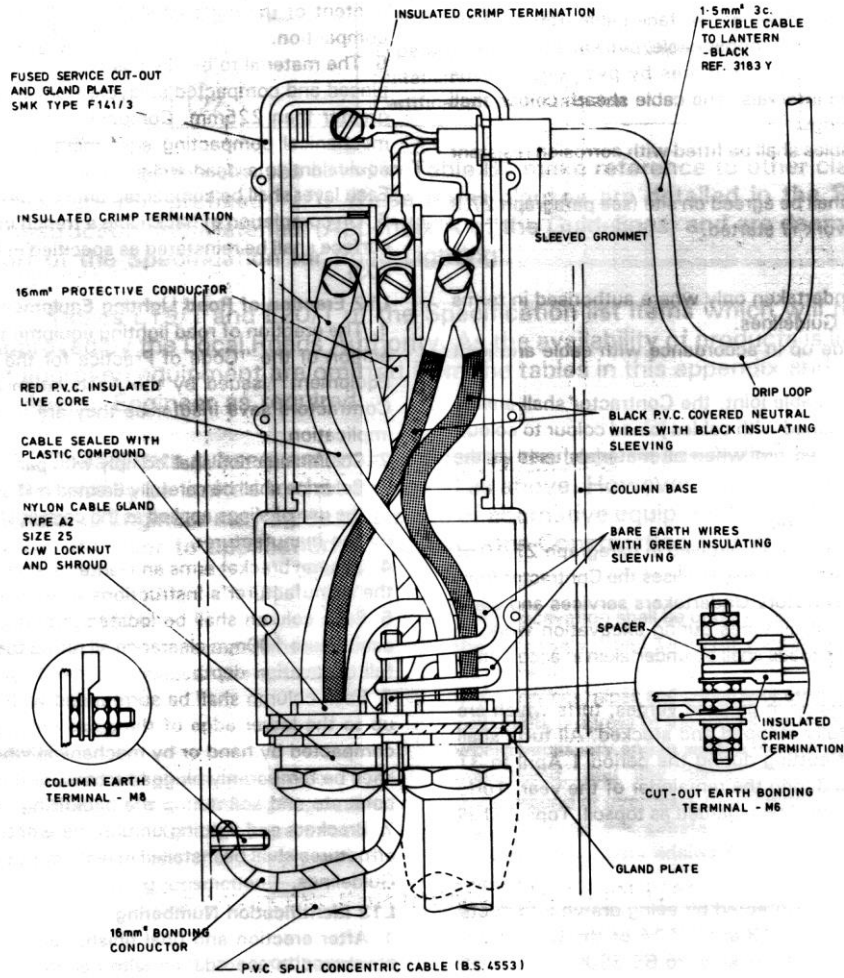


FIGURE L14/1 - Column Base Cable Termination

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### L16 Control Pillars

- 1 Control Pillar enclosures shall be of cast iron and consist of two sections: a cabinet above ground level and a root below ground level; bolted together and erected on a suitable Class E concrete foundation (cl 1602).
- 2 Site painting shall be in accordance with clause L19.
- 3 An adequate number of 100mm dia pvc ducts shall be provided to accommodate outgoing cables and the ducts shall extend beyond the area of the concrete foundation. A separate duct shall be provided for the Electricity Board's incoming supply cable.
- 4 The ducts shall rise into the cabinet enclosure and finish just above the level of the base. After completion of work in the pillar, the base void shall be filled with sand or pea gravel and sealed against the ingress of moisture with an epoxy type sealer at a level just below that of the duct ends.
- 5 Space shall be left in the pillar to accommodate the Electricity Board's incoming supply cable and 100A TP & N cut-out.

- 6 The distribution panel shall be as shown in Figure L16/1. The cores of all outgoing circuit cables shall be terminated using crimped connectors formed from solid drawn copper tube and the cables glanded to the bottom face of the panel enclosure using glands as specified in Table L20/1.
- 7 A "plug-in" photo cell control unit (compatible with a detector head mounted in an adjacent lantern) incorporating a test switch and thermal relay suitable for operation on 200/250V, shall be mounted adjacent to the panel to form the auxiliary control circuit.
- 8 A schematic diagram of the main and auxiliary circuits is shown in Figure L16/2.
- 9 A label of "Traffolyte" or equivalent material, having a white background and 15mm red lettering stating "Danger - 415V", shall be fitted to the outside of the pillar door.

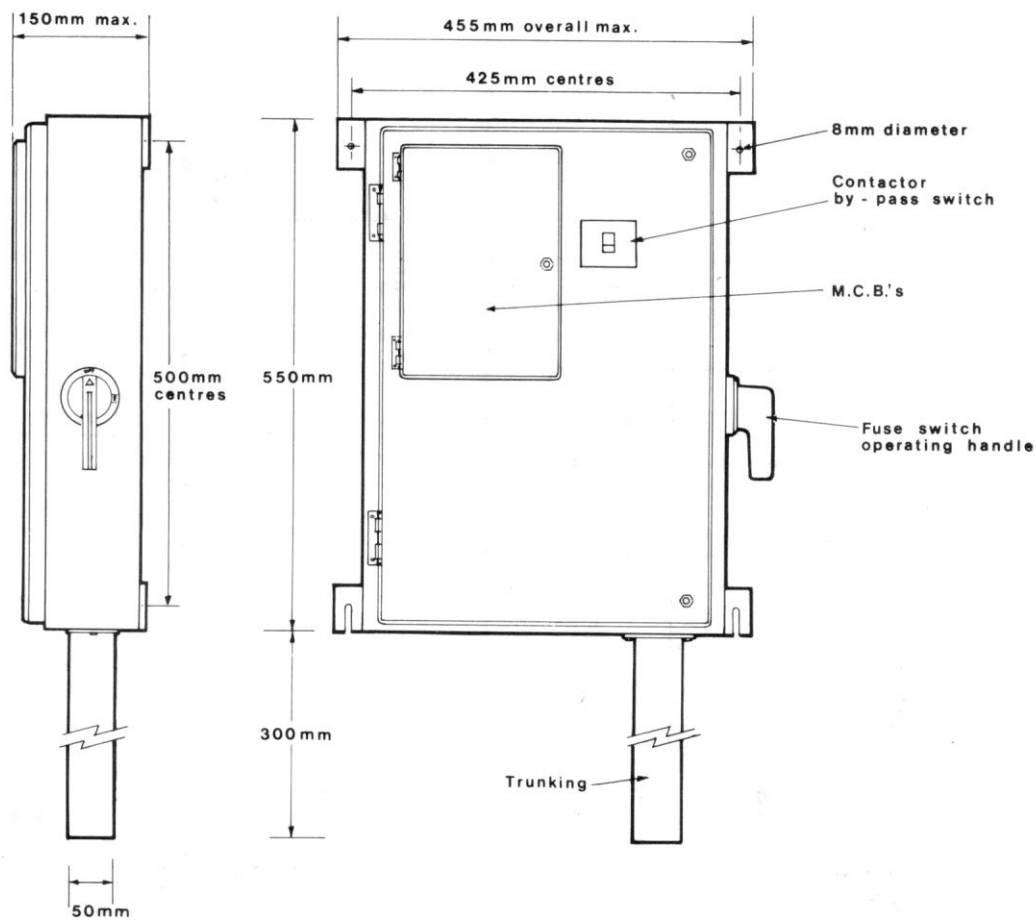


FIGURE L16/1 - Lighting Distribution Panel

APPENDIX B

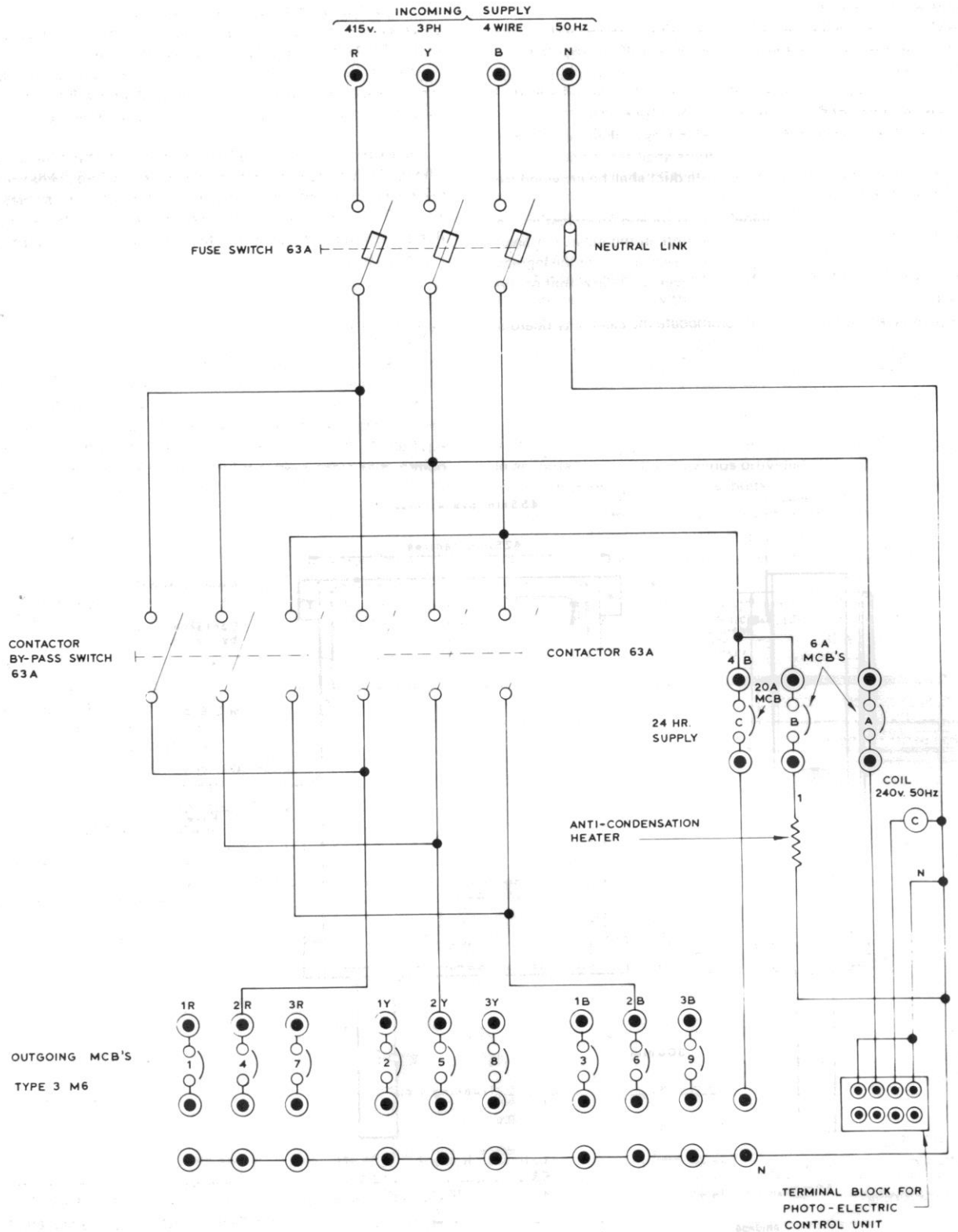


FIGURE L16/2—Schematic Diagram for Control Panel

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<p><b>L17 Photo-electric Controls</b></p> <ol style="list-style-type: none"> <li>1 Photo-electric control units shall be as specified in Table L20/1, with the cell unit (sensor) mounted in the canopy of a lantern adjacent to the control pillar.</li> <li>2 The lantern canopy shall be suitably drilled to receive the cell unit which shall be wired to a terminal block within the lantern.</li> <li>3 Units shall be designed to switch on at 70 lux and off at 35 lux.</li> </ol> <p><b>L18 Metal Coatings</b></p> <ol style="list-style-type: none"> <li>1 Steel columns shall be protected against corrosion by hot-dip galvanising to BS729.</li> <li>2 Any part of the protective coating found damaged after erection shall be treated in accordance with clause 1907, sub-clause (iii).</li> </ol> <p><b>L19 Painting of Steelwork</b></p> <ol style="list-style-type: none"> <li>1 The protective system to be applied to lighting columns, brackets and control pillars shall be as detailed in Table L19/1 in accordance with paragraph 27.8 of the Guidelines.</li> <li>2 Bare metal surfaces shall be prepared for painting as specified in clause 1901, sub-clause 1(iii).</li> <li>3 All surfaces shall be prepared for painting as specified in clause 1901, sub-clause 2.</li> <li>4 Joints shall be treated as specified in clause 1903.</li> <li>5 Paint shall be stored as specified in clause 1904.</li> <li>6 Paint shall be applied in accordance with clause 1905 except that air pressure and airless spraying (sub-clause 14(iii) and (iv)) shall not be permitted.</li> <li>7 Damaged surfaces shall be repaired in accordance with clause 1907.</li> <li>8 Surfaces with concrete cast against them shall be treated as specified in clause 1909.</li> </ol>	<p><b>L20 Type and Manufacture of Equipment</b></p> <ol style="list-style-type: none"> <li>1 All lighting and electrical equipment used shall be in accordance with Table L20/1 as regards type and manufacture.</li> <li>2 The equipment listed complies with the Local Roads Authority's requirements and ensures that the installation will be acceptable for subsequent maintenance by the Authority as regards materials used therein.</li> <li>3 Where a British Standard is in existence for material or equipment detailed in this specification, the equipment offered shall comply with the relevant Standard whether or not it is referred to specifically.</li> <li>4 Samples of materials and manufactured goods to be used by the Contractor may be called for by the Engineer for approval before commencement of the work.</li> </ol> <p><b>L21 Suitability in Service</b></p> <ol style="list-style-type: none"> <li>1 The works shall be installed to ensure the satisfactory operation of all component parts, in which continuity of service is the first consideration, and to secure maximum safety and accessibility of all parts for connecting, inspecting, cleaning, repair and operation.</li> <li>2 Work on the installation shall be carried out to the satisfaction of the Engineer and facilities shall be given to him at all stages of installation for the inspection and checking of the works in progress.</li> </ol> <p><b>L22 Certification of Installation</b></p> <ol style="list-style-type: none"> <li>1 Two copies of an Installation Inspection and Test Certificate (Table L22/1) shall be supplied for the approval of the Engineer in respect of the installation, or any part thereof which requires to be separately commissioned.</li> </ol>
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Table L19/1	Specification Form	Paint System Sheet
1. Environment: Inland/Marine	2. Job Description:	3. Required durability of system: No Maintenance Minor Maintenance Major Maintenance
4. Surface Preparation		5. Tender Date
6. Paint system to be applied to:		7. Paint Manufacturer:
	1 <sup>st</sup> Coat                      2 <sup>nd</sup> Coat	3 <sup>rd</sup> Coat                      4 <sup>th</sup> Coat
Registered Description : Colour and Item No. : Registration Date : Brand Name and Ref. No. : Where applied : How applied : Wet Film Minimum : Average : Dry Film Minimum : Average : Coverage/Litre :		

Additional Information:

**Note 1:** Minimum total dry film thickness shall be 10 to 20% greater than the calculated sum of individual coat minima discounting thickness of Blast or Etch Primer.

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Table L20/1		Approved Equipment			
Item and SRC Spec. No.	Approved Equipment				
1. Lighting, Columns & Brackets (S96 & S97)		4	5	Mounting Height (m)	
	6	8		5	
	Bracket	Post Top Separate Bracket	Post Top	Integral Bracket	Integral
2. Luminaries (Lanterns) Side Entry		Post Top	Post Top	Side Entry Side	Entry
	SOX	70W SON	70W SON	35W SOX 55W SOX 90W	
				70W SON	
		150W SON			
3. Discharge Lamps (S84)		Low Pressure Sodium (SOX)		High Pressure Sodium (SON)	
4. Control Pillars (i) Enclosures Single Door (S83) (ii) Distribution Panel (For pillar interior) (S95)					
5. Photo-electric Control Units (S93)					
6. Split Concentric Cable (S81)					
7. Fused Service Cut-outs (S77)					
8. Cable Glands (S77)					
9. Insulated Crimped Connectors (S77)					
10. Bollard Termination Box (S99-2)					

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Notes:

- (i) All luminaries shall be of the gear enclosed type.
  - (ii) Control gear for high pressure sodium lamp circuits shall include choke, ignitor and capacitor.
  - (iii) High pressure sodium lamps shall **not** be fitted with an internal starter.
  - (iv) Control gear for low pressure, sodium lamp circuits shall be of the "low-loss" type, comprising separate choke, ignitor and capacitor.
  - (v) Luminaire bowls shall be of UV stabilised polycarbonate or high-impact acrylic.
  - (vi) The listing of columns, luminaries and other items in this table does not imply any order of preference or costs.
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Table L22/1 Installation Inspection and Test Certificate			
<p>Inspection and Test Certificate to be given by the Contractor or other person responsible for carrying out an inspection and test of an installation, or part of an installation, or by an authorised person acting on his behalf.</p> <p>I certify that the electrical installation at:</p> <p>has been inspected and tested in accordance with the requirements of Part 6 of the IEE Regulations for Electrical Installations (15<sup>th</sup> Edition) and that the results are as indicated below.</p>			
Items Inspected	Pass	Fail	Not Applicable
1. Connections of conductors			
2. Identification of conductors			
3. Selection of conductors for current carrying capacity			
4. Connection of single pole devices in phase conductors only			
5. Correct connection of lampholders and socket outlets			
6. Protection against thermal effects			
7. Methods of protection against direct contact, i.e. protection by insulation of Live parts; protection by enclosures; protection by placing out of reach			
8. Appropriate isolation and switching devices			
9. Appropriate protective devices			
10. Labelling of circuits, etc.			
11. Selection of equipment for environmental conditions			
12. Presence of warning and danger notices			
13. Presence of diagrams, instructions, etc.			
14. Conditions of flexible cables, switching, plugs and socket outlets			
<p>The following shall be tested, in the sequence indicated, as per standard methods of testing detailed in Appendix 15 of the Regulations. If any test indicates failure to comply, that test and those preceding shall be repeated in the correct sequence, after the fault has been rectified.</p>			
Items Inspected	Pass	Fail	Not Applicable
15. The continuity of final circuit conductors (Regulation 613-2)			
16. The continuity of protective conductors, including main and supplementary equipotential bonding (Regulation 613-3)			
17. Insulation resistance, which should not be less than 1 megohm for fixed installations and not less than 0.5 megohm for separate items of apparatus. (Regulations 613-5 to 613-8)			
18. Protection by enclosures, which shall afford a degree of protection not less than IP2X (Regulation 613-12)			
19. Polarity (Regulation 613-14)			
20. The earth fault loop impedance, which should be satisfactory for ready operation of Protective devices in compliance with Regulations 413-3 to 413-5 (Regulation 613-15)			
<i>Circuit No.</i>	<i>Protective Device</i>	<i>Earth Fault Loop Impedance</i>	
21. The operation of residual current devices tested independently of any facilities incorporated in the device. (Regulation 613-16)			
Comments (if any) and departures from the Wiring Regulations			

Signed ..... Date .....  
For and on behalf of .....  
Address .....  
.....

**APPENDIX E**

**NOTICE FOR SERVICE ON OWNER OF LAND FRONTING, ABUTTING OR  
COMPREHENDED IN NEW ROAD OR EXTENSION OF EXISTING ROAD**

**ROADS (SCOTLAND) ACT 1984**

Notice under Section 21(2) of application for Construction Consent

Proposed Road Construction at (a)  
.....  
.....

TAKE NOTICE that application is being made to North Lanarkshire Council by

(b)  
.....

for construction Consent to (c)  
.....  
.....

If you wish to make representations about the application you should make them in writing not later than

(d).....  
.....

to North Lanarkshire Council at the Divisional/Area Engineer's office

(e)  
.....  
.....

Signed .....

On behalf of .....

Date .....

(a) Insert address or location of proposed road construction.

- (b) Insert name of applicant.
- (c) Insert description of proposed road construction.
- (d) Insert date 28 days later than the date on which the notice is served.
- (e) Insert address of Divisional/Area Engineer's office at which the application is being lodged.



Signed ..... Date  
.....

For and on behalf of  
.....

Address  
.....  
.....  
.....  
.....

\*See copy Inspection and Test Certificates (attached)

## APPENDIX G

### GLOSSARY

<i>Adopt</i>	Add to the Local Roads Authority's list of public roads.
<i>Carriageway</i>	That part of a road constructed for use by vehicular traffic. Auxiliary traffic lanes, passing places, lay-bys and bus bays are included.
<i>Commercial Access</i>	Any access to commercial premises or otherwise where the vehicle weight may exceed 1500kg.
<i>Cycle Track</i> pedestrians only.	A road for use by pedal cycles only or by pedal cycles and pedestrians only.
<i>Dead Mileage</i>	Non-productive mileage incurred by retracing access route.
<i>Dropped Kerb</i>	A reduction in carriageway edge kerb height.
<i>Formation</i>	Subgrade prepared for road construction.
<i>Footpath</i> only.	A road, not associated with a carriageway, for use by pedestrians only.
<i>Footway</i>	That part of a road, associated with a carriageway, reserved exclusively for pedestrians.
<i>Footway Crossing</i>	Crossing of footway, via a dropped kerb, to give vehicular access to premises or parking area.
<i>Frontage Access</i> front.	Vehicular access to premises taken directly from the road which they front.
<i>Frontage Development</i>	Development with buildings fronting the road.
<i>Pavement</i>	That part of the carriageway or footway/footpath structure above the subgrade (formation).
<i>Residential Access</i>	Access to individual dwelling where the vehicle weight is unlikely to exceed 1500kg.
<i>Road</i>	Any way (other than a waterway) over which there is a public right of passage (by whatever means) and including the road's verge and any bridge (whether permanent or temporary) over which, or any tunnel through which, the road passes.
<i>Service Area</i>	Loading/unloading area for delivery vehicles.
<i>Service Road</i>	A road providing or giving access to servicing facilities.
<i>Service Strip</i>	Reservation for Public Utility services (gas, water, etc.) normally located within confines of footway or verge.
<i>Shared Surface</i> vehicles.	Paved area for unsegregated use by both pedestrians and vehicles.
<i>Subgrade</i>	Material on top of which a carriageway, footway, footpath or parking area is constructed.

*Verge*

The landscaped part of a road adjacent to the carriageway and generally at substantially the same level. It may abut footways, cycle tracks or ditches.

# **References and Index**



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