DUNDEE - STREETS AHEAD

Dundee City Council

DUNDEE CITY COUNCIL ROAD STANDARDS
AUGUST 2005

DUNDEE - STREETS AHEAD
Dundee City Council
SECTION ONE; OVERVIEW AND GUIDANCE

1 AUGUST 2005

STREETS AHEAD

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1 INTRODUCTION

1.1 Working Together

1.1.1 This document is concerned with implementing transport infrastructure in Dundee. It is aimed at developers and their advisors and sets out the standards and benchmarks that the Council will use to issue its formal approvals.

1.1.2 The Council's development objectives are clearly set out in the Dundee Local Plan. Other relevant publications are referred to throughout this document. For example, Dundee City Council's Urban Design Guide will provide advice on the Council's intentions with respect to urban built form and the desire to ensure that overall integration of all aspects is achieved. A detailed schedule of appropriate reference material is contained at the back of this document.

1.1.3 Every effort has been made to make this guidance as comprehensive as possible. If you think anything has been omitted and you need help then please contact the Council for assistance. Contact details are provided at the end of this Section.

1.1.4 The Council encourages consultation and liaison at any stage in your development plans. Council officers will do their best to provide advice. After all, ***Working Together*** will achieve the desired objective….a better Dundee.

1.2 The Developer's Guide

1.2.1 "Dundee – Streets Ahead" is divided in to three separate sections that form a single integrated publication. The three sections are:

- Section One; Overview and Guidance
- Section Two; Technical Details
- Section Three; Technical Appendix.

1.2.2 Sections One and Three have been drafted for a wide-ranging audience in order that they can learn about the Council's aims and aspirations. They refer to other publications produced by the Council which explain how the City of Dundee is being improved.

1.2.3 Section Two is the practitioners reference section where professionals can obtain technical details on a range of matters crucial to implementing transport infrastructure in Dundee. In addition to drawing on previous similar publications, this section reflects the ongoing and recent experience of the Council's in-house professional staff who are directly involved on a daily basis with the issues addressed in the document.

1.3 Working in Partnership

1.3.1 The Council's officers are fully aware of the need for close liaison in the delivery of transport infrastructure. Consistent with its objectives outlined in the Council Plan 2003-2007, the ***City Council can help you*** by:

- keeping you informed about its aims and objectives

- providing advice on what documents you will need to obtain formal approvals
- being available to answer your questions and clarifying any points arising from these documents.

1.3.2 Successful outcomes to working in partnership requires co operation to achieve common objectives. In bringing forward your proposals for discussion with the Council, we ask that:

- you try to understand the wider objectives of the Council and develop your plans to assist with their delivery.
- information is supplied in the requested formats in order that we can process your enquiry with maximum speed and efficiency.

2 DELIVERING SUSTAINABLE TRANSPORT

2.1 Ensuring a Sustainable Approach

2.1.1 Whilst sustainable transport objectives in a Dundee context are more fully expressed within the Local Plan and Local Transport Strategy it is of course the guidance set out in this document which will control the delivery of these objectives.

2.1.2 The Council is also committed to the principles of sustainable development and working towards a sustainable future in accordance with Local Agenda 21.

2.1.3 The Council will therefore be actively seeking to ensure that practical delivery is consistent with adopted and approved policies. This approach will require the Council to be open to innovative thinking. The detail of how the Council will achieve this is addressed elsewhere in the document.

2.1.4 This will relate not only to matters dealing with design principles and approach, but also to aspects such as construction materials, drainage regimes and ongoing maintenance.

2.2 Streets, not Roads

2.2.1 Consistent with the above theme of sustainability is the Council's approach to new transport infrastructure. Previous developer guidance in the Council's "Road Standards" dates back a number of years to an era dominated by the car and the car user. In that context, it focuses on the road and although infrastructure for other road users is considered it is done so in a diluted form in comparison with the car.

2.2.2 Things have changed considerably since and, particularly over the last 5-10 years, as public understanding and feelings about their environment have featured more prominently in influencing the services the Council provides and the way in which they are delivered.

2.2.3 The new document Dundee - Streets Ahead reflects the Council's wish to consider all physical infrastructure associated with moving people and goods in all modes. There is now a better understanding of how different modes interact with one another and how the infrastructure that they require should be integrated.

2.3 Access and Mobility

2.3.1 The Council is committed to the principles of inclusive mobility. An integrated approach to the provision of accessible streets and public transport is fundamentally important to this.

2.3.2 Best Practice in urban design to provide inclusive mobility shall be promoted. Developers will be expected to implement suitable measures consistent with the Council's approach.

2.4 Pedestrians and Cyclists

2.4.1 Walking is the most significant of all modes of transport yet it is an experience which many people now do far too little of. The City operates in the midst of a generation that has been brought up

with the motor car and where some people use their car for all journeys, both long and short.

2.4.2 Whilst it is appreciated that there are people who genuinely have no option other than to use their car, there is a need to provide suitably designed infrastructure where pedestrians and cyclists do not feel threatened by motor vehicles. Motor vehicles should not always have the highest level of priority in the design process and in the delivery of transport infrastructure.

2.4.3 There are areas where pedestrians and/or cyclists need to be given a greater priority. Examples of these locations would be residential streets, at schools, and alongside shopping and leisure areas.

2.4.4 Various design initiatives such as Home Zones and Safer Routes to Schools specifically address the concerns of the pedestrians and cyclists in an environment where the presence of the car may prejudice safety.

2.5 Public Transport

2.5.1 Ongoing investment in public transport, especially buses, is important to the citizens of Dundee many of whom have no access to a car.

2.5.2 There are a number of public transport improvement schemes that are setting new standards in Dundee and developers will be expected to implement measures consistent with the Council's initiatives. These initiatives are delivering improved journey times, reliability, passenger facilities and travel information.

2.6 Road Traffic and Car Parking

2.6.1 The Council will actively continue to address the issues raised by continued growth in car traffic and associated parking infrastructure requirements. These will be treated in policy terms within a wider context, with the policy setting the context for what is permissible in design terms.

2.6.2 It may be inappropriate for example for a City Centre residential development to have the generous levels of car-parking afforded in past years. Residents with good access to walking and cycling routes and, bus and train facilities will not be so dependent on the motor car. Putting these principles into practice will influence transport trends over time and will provide advantageous environmental, social and operational benefits.

2.7 Servicing

2.7.1 Deliveries are essential to the life and well-being of communities bringing fresh goods to shops and homes on a regular basis.

2.7.2 Innovation and new opportunities which help to reduce the impact of service vehicles continue to evolve but design implications can be severe in some cases. Servicing is an issue which is often left until last when it should be considered from the outset as an integral part of the design process.

3 AN OVERVIEW OF THE DEVELOPMENT PROCESS

3.1 The Development Process

3.1.1 The development process is the mechanism for delivering sustainable transportation initiatives and consists of a number of stages. The evolution of an idea through to implementation can be influenced by design requirements and consultation with the Council is recommended as early as possible in the design process.

3.1.2 Early consultation is important for large schemes or developments, examples of which might include:

- Residential
- Leisure
- Major Retail
- Business/Commercial

3.1.3 In addition to this document, developments will also be guided by the policies and principles set out in other Council documents, primarily the Dundee Local Plan Review 2005 and Dundee & Angus Structure Plan 2001-2016. If any matter requires clarification then please contact the Planning & Transportation Department.

3.2 Pre-application Stage

3.2.1 The Application Stage embraces anything and everything prior to the preparation of a planning application. This could include preliminary design matters.

3.2.2 The information within "Section Two, Technical Details" should allow you to address all of the requirements but it may be useful for you to consult with the Planning & Transportation Department when your ideas are ready but prior to planning submission.

3.2.3 Planning and design briefs are now frequently available to assist in the evolution of concepts. These allow the developer to derive some specific guidance on which development proposals can be assessed prior to planning submission whilst at the same time allowing the Council to provide important early input to this process.

It is important to ascertain from the Council at an early stage in the process whether a brief has been prepared for any particular site.

3.2.4 Consultations with the Council at an early stage will allow for:

- Discussion on the design elements that will be required for any particular site which in turn will affect transport infrastructure.
- Identification of any off-site influences such as future pedestrian, cycle, public transport, road schemes or infrastructure work
- Consideration of variations to the design standards to meet local conditions
- Identification of additional needs to allow the Planning Application to be considered, including Transport Assessments, Road Safety Audits and Travel Plans
- Consideration of drainage and flooding issues

3.2.5 Advice given in this document should be read in conjunction with current advice offered by the Scottish Executive. In particular reference is made to Planning Advice Notes 67-Housing Quality, 68-Design Statements, 61-Planning and Sustainable Urban Drainage Issues and SPP7-Planning and Flooding.

3.3 The Planning Process

3.3.1 Applications for planning permission are made on the appropriate forms which should be completed and returned to the Director of Planning & Transportation along with all the required plans and supporting documentation.

3.3.2 The procedures for the submission of appropriate details are described further in "Section Two-Technical Details"

3.3.3 Planning permission can either be granted in outline (i.e. agreement to develop in principle) or at detailed stage (i.e. construct exactly as approved). Planning permission can include conditions that are an integral part of the consent - such conditions could include matters relating to the transportation network.

3.3.4 Support for a planning application will be offered only if the required information has been submitted and is acceptable to the Council.

3.4 Construction Consent

3.4.1 Prior to undertaking any new road and infrastructure construction the developer may be required to obtain both detailed planning consent and road construction consent. It should be noted, however, that the granting of one does not necessarily imply the granting of the other. Again early consultation with the Council can resolve issues that may occur in this process.

3.4.2 Drainage of the proposed new road should be agreed in principle at the detailed planning application stage. Dundee City Council is part of a Sustainable Urban Drainage Group, along with SEPA and Scottish Water, which meets regularly to discuss development drainage issues. It is recommended that the developer contacts this group at an early stage to agree drainage requirements.

3.4.3 The developer shall provide and install a street lighting system to the satisfaction of the Council. It should be noted that where the street lighting design is carried out by a party other than the Council, the lighting design must be approved in writing prior to road construction consent being issued.

3.4.4 The Planning & Transportation Department has set procedures for road construction consent applications and due to Committee cycles it is recommended that pre-application discussions are carried out as early in the process as possible.

3.4.5 Details of the requirements for submitting a road construction consent application, including the standard forms, are contained in Section Two-Technical Details of this document.

3.5 Implementation

3.5.1 Prior to the commencement of works on site, the developer must apply for 'Consent to Execute Work in the Road' under the

terms of Section 56 of the Roads (Scotland) Act 1984 and 'Permission to Place and Maintain Apparatus in/under the Road' under the terms of Section 61 of the Roads (Scotland) Act 1984 when necessary.

3.5.2 The developer must give the appropriate statutory undertakers likely to be affected 28 days notice of its intention and the developer shall take this into account when programming the works.

3.5.3 Details of traffic management, access for delivery of materials, number of delivery vehicles and programming shall be submitted to the Planning & Transportation Department at an early stage.

3.5.4 The developer shall consult with all statutory undertakers at an early stage to co-ordinate the timing and siting of all plant. The layout of plant shall be in accordance with NJUG7 guidelines 'Recommended Positioning of Utilities and Plant for New Works' unless otherwise agreed with the Planning & Transportation Department.

3.5.5 Further details are contained in Section 2-Technical Details.

3.6 Maintenance

3.6.1 On completion of the works and subject to both a satisfactory inspection by the Planning & Transportation Department and the end of a one year maintenance period, the developer may request the infrastructure be adopted for maintenance purposes.

3.6.2 Further details of this are contained in Section Two-Technical Details.

4 MANAGING OUR STREETS

4.1 Road Hierarchy

4.1.1 The Council has an ongoing responsibility to manage the transport operational network and its supporting infrastructure. The standards set out in this publication are directed towards ensuring that the Council can be confident about appropriate techniques, materials and safety thereby providing a high quality environment that all users can be proud of.

4.1.2 In order to develop these standards it is necessary to appreciate that different parts of the infrastructure network perform different functions. Traditionally this has been addressed using a road hierarchy and this approach is being continued under this new guidance. Some changes have been made from previous definitions which are addressed in summary now and in detail in Section Two-Technical Details.

4.1.3 The Dundee Road Hierarchy table, Chapter 4 Section Two-Technical Details shows five distinct hierarchical classifications, I to 5. Those at the "lower" end (i.e. Class 5) are subject to greatest change in design approach since the previous guidance was issued. This class reflects the various recent standards which have been developed in relation to speed restraint, traffic calming, home zones, etc.

4.1.4 The "upper" end of the hierarchy includes the high speed, high capacity routes where safety and segregation issues predetermine design decisions.

4.1.5 The interface between "lower" and "upper" standards occurs in Dundee for Class 4 roads and the Council is willing to discuss design innovations within this classification with an open mind, although current thinking suggests that safety considerations would dominate the decision-making process.

4.2 Design Issues

4.2.1 In terms of design issues the greatest flexibility lies in the determination of design layout. For example, many new residential developments are emerging with innovations in terms of layout not only in alignment and road width but also in the shared use of spaces by more than one type of user (pedestrian, cyclist, public transport service provider and vehicle drivers).

4.3 Building for the Future

4.3.1 It is Council policy to encourage conservation and facilitate the use of reclaimed and marginal materials wherever possible, in order to obtain environmental benefits and reduce the pressure on natural reserves of primary aggregates.

4.3.2 Section Two - Technical Details sets out the Council's guidance on the adoption and construction to ensure that design and construction are to an acceptable standard, and also to ensure that due regard is given to the use of processes and products that lessen the impact on the environment.

4.3.3 Some aspects of the specification allow for the use of alternative 'sustainable' products, for example, the use of recycled materials, and should be actively promoted. Other such materials may be considered by the Director of Planning and Transportation on a site specific basis.

4.3.4 It is expected that the quantities of materials that can be used will increase as the range of recycled and secondary materials permitted in the Specification is extended.

5 WORKING TOGETHER

5.1 Consultation and Co-operation

5.1.1 In recent years, design innovations have been well-received in Dundee and it is intended to adopt a similar approach in delivering future aspirations.

5.1.2 An open and co-operative approach is welcomed to the many issues that arise and there exists a willingness to work with developers and their advisors to achieve ever-improving outcomes to the delivery of transport infrastructure.

5.2 Sharing Experience

5.2.1 The Planning & Transportation Department are happy to share experience with others as new infrastructure is developed in Dundee. Equally, the opportunity to learn from the experience of others elsewhere in delivering transportation infrastructure initiatives can be a useful tool.

5.3 Involving the Public

5.3.1 The public have a large part to play in the overall process and there will be occasions where they need to be formally consulted with respect to proposed changes.

5.3.2 Since it is the general public who will subsequently make use of infrastructure delivered through the development process, all parties need to ensure that their concerns are taken on board as part of the evolution of the design and delivery processes.

5.4 Winning Hearts and Minds

5.4.1 It is the Planning & Transportation Department's belief that through these extended consultation processes most needs can be met. It is rarely possible to satisfy everyone's concerns but the aim must be to try to win the hearts and minds of the majority.

5.5 A Better Dundee for Everyone

5.5.1 The over-riding objective is to make Dundee a better place for everyone; for those who work here, shop here, play here and live here.

5.5.2 It is essential that all those involved in the development process in Dundee are encouraged to adopt this ethos and endeavour to ensure that this approach is adopted in all cases.

6 ACCESSING THE DETAILS

6.1 Source of Detailed Information

6.1.1 In order to obtain further details relating to the specific aspects of infrastructure design, construction and maintenance, the reader should refer to the Section Two- Technical Details document.

6.1.2 Detailed information on various topics is set out in Section Two as follows:

- Principles and Overall Approach
- Sustainable Development
- Procedures
- Hierarchy
- Design Issues
- Traffic Calming
- Construction

6.1.3 Council contact details are also provided together with some specific examples.

6.1.4 Technical approvals information, a bibliography and other technical details are provided in the Section Two annexes.

7 CONTACT DETAILS

7.1 Principal Contact

7.1.1 The principal contact in relation to this document is:

The Director of Planning & Transportation
Dundee City Council
Floor 15
Tayside House
Crichton Street
Dundee
DD1 3RB

7.1.2 In some circumstances your questions may require a complex answer or you may have substantial issues to discuss. In this context, you should make contact with the Council to arrange a meeting. See paragraph 8.3 for further contact information.

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Dundee City Council

SECTION TWO; TECHNICAL DETAILS

1 AUGUST 2005

DUNDEE - STREETS AHEAD
CONTENTS :

PREFACE

Dundee City Council through its Council Plan and Local Agenda 21 (Dundee 21), as well as other plans and strategies, wants to improve the quality of life for all its citizens and visitors, particularly those vulnerable sectors of the community. However, these improvements to our quality of life should not affect the ability of future generations to enjoy a healthy, safe and secure environment.

Dundee City Council is committed to sustaining, protecting conserving and enhancing the environment through its policies and activities. Through its partnerships with others, the Council will seek to ensure the city is clean, healthy, prosperous and safe for the benefit of all who live, visit and work in Dundee.

This document has been compiled to set the requirements with regard to the design and construction of all development related transportation infrastructure in Dundee. It also embraces standards required for the provision of accesses, servicing arrangements and parking facilities. It reflects the wider initiatives of the Council in promoting sustainable development, and aims to strengthen other policies through the delivery of infrastructure by sustainable means. The theme of sustainability is promoted and encouraged by the Council from principles of design through to the materials used in construction.

Within Dundee City the roads authority is the Department of Planning & Transportation of Dundee City Council. In the interests of pedestrian and traffic safety, the design standards outlined in this document should apply to all new transport infrastructure constructed in Dundee. Where a developer wishes a new item of infrastructure, he must follow the procedures described in this document. In particular, before commencing construction work, he must notify the Planning & Transportation Department of the Council of this intention. FAILURE TO GIVE NOTICE WILL BE TAKEN TO INDICATE THAT THE NEW INFRASTRUCTURE IS TO REMAIN UNADOPTED.

Dundee is diverse in structure and character. Changes in the attitudes to the design of roads and street areas in recent years require a considered approach to deliver the quality and environment now demanded by all users. This requires flexibility in dealing with developers and the public. Dundee - Streets Ahead provides the opportunity for this flexibility to be incorporated within the planning and development process. This new approach has direct relevance to roads at the lower end of the hierarchy where evolving techniques and the evolution of design principles have seen significant changes to historic practices.

Whilst it is recognised that flexibility is required the Council has a statutory obligation to ensure that all implemented designs are safe and maintainable. In some cases, it may be necessary to be prescriptive. The strict application of the standards contained in this document may not always be entirely appropriate and the Council reserves the right to vary requirements to cater for differing circumstances. For design aspects not fully covered by this document, reference should be made to the appropriate Central Government publications listed in Appendix B.

This document contains the Council's guidance and

recommendations and does not relieve the developer/designer of any duty of care. It will remain the responsibility of the designer to ensure appropriate regulations and standard professional and legislative practices are followed. The Council will not accept such responsibility on the developer's behalf.

It is important that in the interests of clarity the term "road" has generally been used throughout this document to describe a way over which traffic may lawfully pass. Such traffic may be limited to prescribed classes, however, the term "road" should be taken in appropriate circumstances to include streets. Streets is taken to mean all areas adjoining and between buildings and could include the building frontages, road, footways and footpaths and cycle paths.

It is also worthwhile to differentiate between the words "footway" and "footpath". A "footway" is that portion of a road reserved exclusively for pedestrians and associated with a carriageway while a "footpath" is a way or means of passage for pedestrians only, generally across open spaces, and not associated with a carriageway.

In a rural areas, reference should be made to national standards contained in the "Design Manual for Roads and Bridges" obtainable from Department for Transport and The Scottish Executive. DMRB is equally relevant in a wider context and is therefore used for many urban design and junction design situations within Dundee.

Section One; Overview and Guidance of the Guidelines sets out the overall principles and Dundee City Council's aims.

Section Two; Technical Details provides the information required by developers in order that their proposals can be designed to meet the Planning & Transportation Department's requirements and therefore obtain the appropriate Council approvals.

If there are any questions or doubts regarding the information provided in Section Two the developer is requested to contact the Planning & Transportation Department at the earliest possible date to clarify any matters.

Footway

Footpath

1 PRINCIPLES AND OVERALL APPROACH

1.1 A NEW ERA FOR TRANSPORT INFRASTRUCTURE

1.1.1 Investment and spending on transport infrastructure, like many other aspects of society, undergoes extensive public scrutiny. Public involvement in the evolution of design issues is a key aspect of many transport projects and public consultation is now an accepted element of the process.

1.1.2 The increased level of public involvement and interest has generated greater media coverage and, with the parallel advances in world-wide communications, people are generally more aware of what is happening outwith their immediate area. Transport and urban design are two key areas where examples of international activity and experience are now finding their way into UK practice.

1.1.3 This wider knowledge has led to greater demands being placed on developers to be innovative in their approaches and, in particular, to take account of all users when promoting their designs. In some areas, they are specifically directed to promote designs that favour pedestrian and cyclists over the private car.

1.1.4 The developer response to this push for innovation results in designs that challenge traditional practice where specifications were relatively inflexible. This has therefore required a new approach from local authorities in dealing with the many new issues that arise from these innovative designs.

1.2 ADOPTING A NEW APPROACH

1.2.1 This document reflects the practical approach that the Planning & Transportation Department of the Council is promoting by way of its contribution to this ever-evolving process.

1.2.2 The new approach advocates a more flexible attitude to design layout whilst retaining more specific guidance in relation to construction specification.

1.2.3 The new approach is reflected in the text that follows in later chapters of this document. It includes references to a number of issues which, considered collectively, are aimed at promoting sustainable development. This includes traffic calming, home zones and sustainable urban drainage systems.

1.2.4 The approach is intended to encourage consultation and dialogue. In this respect, all developers are asked to consult the Planning & Transportation Department about their proposals in order to ensure that they receive the most up-to-date response on technical issues. An inevitability of current design practices is that they are experiencing ongoing evolution and are therefore difficult to keep up to date in published documents. Consultation and dialogue helps to overcome the difficulties that this creates.

1.3 THE DEVELOPMENT PROCESS

1.3.1 Although the various elements of the development process have their own complexities, the overall process can be explained in simple terms. The process might be summarised as follows:

- Concept Stage; may involve discussions with the Planning & Transportation Department prior to formal submissions

- Planning Consent (may involve both outline and detailed stages)
- Construction Consent
- Implementation
- Maintenance and Adoption

1.3.2 The above elements are explained in more detail in Section One of Dundee - Streets Ahead.

2 SUSTAINABLE TRANSPORT; STREETS AND SPACES

2.1 IMPLEMENTING SUSTAINABLE DEVELOPMENT

2.1.1 Planning and infrastructure directives from central and local government are continually evolving to embrace the requirements of a sustainable development approach. In keeping with most other government initiatives, this approach has been translated from a strategic policy commitment to more detailed guidance on transportation issues.

2.1.2 In addition to providing more focussed issues for measuring improvement, these indicators also provide an awareness of the inter-relationship between a number of engineering, environmental and social issues. Good design that is well implemented and maintained will encourage community pride and involvement, and thereby provide a greater sense of security and social inclusion. Developers must embrace these principles and focus on the creation of community through the design process. Whilst ultimately it will be those who live, work and play in the spaces created that will determine the strength of any community, it is now better understood that design can play an important part in this process.

2.1.3 In addition to design approach, methods of implementation also have their part to play in achieving sustainable development. These issues relate to, for example, building design and energy efficiency, and also, in the case of road construction, to the management of surface water run-off. The science of Sustainable Urban Drainage Systems continues to evolve and is of direct relevance to all developments in Dundee.

2.1.4 The remaining sections of this chapter explain in more detail the current relevant key areas in respect of sustainable development initiatives in Dundee insofar as they relate to design matters.

2.2 DESIGNING SPACES FOR ALL USERS

2.2.1 With passing years the public have become more aware of the presence of the motor car and the influence which it has had on road design. As people continue to voice their opinions on transport and road safety, the design process has evolved in response to the concerns expressed. As a consequence, whilst earlier guidance was developed in an age dominated by the motor vehicle with designs favouring the motorised traffic, current thinking embraces a more inclusive consideration of the needs of all members of the public.

2.2.2 This wider consideration may make little difference to detailed design decisions at the upper end of the road hierarchy where high traffic flows and speeds alongside requirements for segregation of users remains. At the lower end, the inclusive approach is embedded and reflected in the emerging designs particularly in the case of residential development and town centre streetscape.

2.2.3 At this lower end, and in Category 5 in particular, (described in Chapter 4) the UK has now implemented an array of initiatives some of which have been based on experience practised in countries in Europe for many years. These approaches attach much more significance to the movement of pedestrians and cyclists and public transport users in the design process and attempt to reduce the impact of the car in particular by reducing traffic speed.

2.2.4 These design approaches are reflected in three particular types of initiative, which are covered in the following sections:

- Home Zones
- Shared Surfaces
- Traffic Calming

2.2.5 In designing spaces for all users, the Council is committed to the principles of inclusive mobility and adopting an integrated approach to the provision of accessible streets and public transport for disabled people. Part III of the Disability Discrimination Act 1995 (DDA) gives disabled people a "right of access" to goods, facilities, services and premises. Best practice in urban design to provide inclusive mobility to integrate and promote access to pedestrian and transport infrastructure shall therefore be promoted. Developers will be expected to implement suitable measures consistent with the Council's approach.

2.3 HOME ZONES

2.3.1 A home zone is a street or group of streets designed primarily to meet the interests of residents, pedestrians and cyclists rather than motorists, thereby creating an environment that is more suited to social use. A main consideration in the home zone ethos is to aim to provide a sense of community in an area and to give a greater perception of safety within the home zone. Legally, neither pedestrians nor vehicles have priority, but the road may be reconfigured to make it more favourable to pedestrians. For example, traffic calming features and benches or play areas may be introduced.

2.3.2 Home zones can be designed into existing streets through a redesign process or they can be constructed as part of new housing developments. Home zones are common and popular in many European countries.

2.3.3 A prerequisite of any proposal for a home zone in an existing residential area is to get input from the residents and the local community. There should be meetings with the residents/local community at the earliest possible time in the process to ensure that issues raised by all parties are addressed at the appropriate time and to keep the residents/local community aware of progress.

2.3.4 The inclusion of home zones in any new housing development are actively encouraged and discussions regarding the specific design requirements to achieve a home zone should be discussed with officers of the Planning and Transportation Department early in the consideration of the proposed development.

2.3.5 Home zones were introduced in to the UK through pilot projects; nine home zones in England and Wales, four in Scotland and one in Northern Ireland. One of the Scottish pilot projects is at Constitution Road in Dundee. Although there is no ring-fenced funding for home zones in Scotland, local authorities are encouraged to promote them in their Local Transport Strategy.

2.3.6 As well as 'official' pilots, a growing number of home zones are being set up independently by local authorities, developers, and housing associations across the UK.

2.3.7 As cars dominate the streets where many of us live, the key to creating a home zone is to develop street design that makes drivers feel it is normal to drive slowly and carefully. In a home zone:

- The aim is to change the way that streets are used and to improve the quality of life in residential streets by making them places for people, not just for vehicular traffic
- Traffic calming, parking areas, trees and bushes, seating and small play areas slow traffic right down
- Traffic speeds are very low
- Clear signs and where appropriate alternative surfacing reinforce the message to drivers that they are entering a different kind of street

2.3.8 Home zones create attractive urban environments, which could help reduce the demand for new housing in the countryside. They have the potential to benefit the environment as they are likely to encourage more local trips on foot or by bicycle, in turn cutting levels of traffic noise and air pollution.

2.3.9 Home zone design features might typically include elements such as shared surfaces, measures to achieve very low traffic speeds (<10mph), road space designed for community use, play equipment, and high quality landscaping. These elements and other features are subject to the requirements of the residents/local community at the specific location of a proposed home zone.

2.4 SHARED SURFACES

2.4.1 The term shared surface is used to indicate a street type whereby the 'road' is shared by both vehicles and pedestrians i.e. there are no separate footways for pedestrians to use.

2.4.2 Shared surface roads have been designed into areas of new housing developments for several years in the UK and should only be considered in areas where there are low levels of vehicle traffic.

2.4.3 These types of areas must be designed in an appropriate manner that allows the safe passage of both vehicles and pedestrians.

2.4.4 This is usually achieved by limiting the number of houses accessed from the shared surface to under 20 and ensuring that the road is designed to limit the speed of vehicles by incorporating reduced radii, appropriate forward visibility and traffic calming where required (see Chapter 6).

2.4.5 The placing of utilities (Gas, BT etc.) must be considered at a very early stage to ensure that service strips are within the lengths of road to be considered for adoption and provide a width in accordance with current guidelines (see figure 66).

2.5 TRAFFIC CALMING

2.5.1 The main purpose of traffic calming is to deter speeding and improve road safety. It is also effective in deterring unnecessary through traffic from using inappropriate routes. It is therefore important to consider displacement of traffic to other parallel routes and the resulting effect on these routes. In some cases this can result in traffic calming measures being installed in a wider area than initially proposed. Traffic calming measures must relate to the classification of road within the roads hierarchy by encouraging traffic to use appropriate routes, as indicated in the table in Chapter 4.

2.5.2 If the wider area is affected and traffic calming is required on existing roads it is necessary to involve the traffic team of the Planning and Transportation Department as formal consultation is a

requirement of the regulations [Roads (Traffic Calming) (Scotland) Regulations 1994 and the Road Humps (Scotland) Regulations 1998].

2.6 SUSTAINABLE DESIGN

2.6.1 The above design issues may often be addressed in isolation. However it is important for developers to understand that this is only a part of a wider approach to sustainable development being pursued by the Planning & Transportation Department and in a much wider context by the Council.

2.6.2 These include a number of policy and investment issues aimed at ensuring that the ongoing development of Dundee is implemented in a sustainable way, with high quality development that is socially inclusive.

2.6.3 For example, the Council encourages the use of re-cycled materials in construction and welcomes approaches from developers in this regard. The Council already has some experience in the use of these materials that can be shared during early consultations. Where a developer is proposing use of re-cycled materials which are unfamiliar to the Council, a proposer-led certification process can be followed.

2.7 SURFACE WATER CATCHMENT MANAGEMENT INCORPORATING SUSTAINABLE URBAN DRAINAGE SYSTEMS (SUDS)

2.7.1 Developers know that plans for each new development must make provision for the surface water runoff to be drained from the site and that flooding is a material consideration in any planning application. The challenge is to drain the surface water runoff without causing flooding or pollution and without reducing the amenity value or the local biodiversity of the site. This is the challenge for any designer considering the drainage proposals at any development. Sustainable Urban Drainage Systems, SUDS, reduces the impact of surface water run-off from urbanisation into watercourses whilst protecting the environment from pollution.

2.7.2 SUDS rely on gravity to drain the surface water runoff from hard standing areas into the drainage system. SUDS can be designed to attenuate the flow, thereby reducing the risk of flooding. SUDS also provide time for the natural processes of sedimentation, filtration and biodegradation to occur, which reduces the pollutant load in the surface water runoff. In addition, SUDS can be designed to fit into their environmental setting, adding considerably to local amenity and / or local biodiversity. All these benefits help to ensure that the final discharge from a sustainable urban drainage system will not pollute Scotland's rivers, nor create flooding downstream.

2.7.3 Although SUDS are drainage devices that rely on natural processes, SUDS must be designed, built and maintained in the context of the development control system in Scotland. The Sustainable Urban Drainage Scottish Working Party, SUDSWP, has formed in order to facilitate the implementation of SUDS in Scotland.

2.7.4 Making the change from conventional drainage systems to SUDS means that developers and designers need guidance on (detailed and technical) design criteria. SUDSWP members commissioned CIRIA to produce "Sustainable Urban Drainage

Systems Design Manual for Scotland and Northern Ireland". The manual was published in March 2000. PAN 61 also provides further direction and guidance on the issue of drainage and NPPG7 provides guidance on flooding issues.

2.7.5 Sustainable urban drainage not only reduces the amount of diffuse pollution but also improves the environmental quality of development to the benefit of the local community. The SUDS Design Manual requires SUDS to be considered for development at an early stage in project design in order to determine its applicability.

2.7.6 SUDS aims to deal in an integrated way with the issues of water quantity, water quality and amenity. It works on the following principles:

- managing surface water run-off on-site as near to source as possible;
- slowing down run-off;
- treating it naturally; and
- releasing good quality surface water to watercourses or groundwater.

2.7.7 The overall objective is to return excess surface water to the natural water cycle with minimal adverse impact on people and the environment. The means by which this can be achieved can be designed as an attractive integral amenity feature within the development and can achieve significant ecological enhancement compared to conventional drainage options.

2.7.8 The impact of SUDS on development layout and land requirements can be significant and developers are encouraged to contact the Planning & Transportation Department at the outset.

2.7.9 Further details of the specific implementation of SUDS in Dundee is contained in Chapter 7.8

3 PROCEDURES

3.1 NOTES ON PROCEDURES

3.1.1 The following notes on procedures for obtaining approval to the layout of new roads, the adoption of new roads, and alterations to existing roads are included for the guidance of prospective developers. They also give some indication of the relationship between these procedures and the planning procedures.

3.1.2 Prospective developers should note that THE GRANTING OF PLANNING PERMISSION DOES NOT PLACE AN OBLIGATION ON THE LOCAL ROADS AUTHORITY TO EITHER PERMIT THE FORMATION OF A NEW ROAD OR ADOPT A NEW ROAD.

3.2 PLANNING PROCEDURES

3.2.1 Applications for planning permission are made to Dundee City Council as the local planning authority. In the case of developments affecting Trunk Roads, the Council is also required to consult Scottish Ministers who, through the Scottish Executive, are empowered to recommend a course of action for the Council to follow for planning applications for developments located within 67m of the centre line of a trunk road and/or connecting thereto or having a traffic impact on the Trunk Road network. If the recommendation is not followed the application is submitted to the Scottish Ministers for a decision as to whether to "call in" the application.

3.2.2 Developers are advised to supply four copies of drawings during the planning processes for the use and retention of the Planning & Transportation Department.

Road Safety Audit

3.2.3 While planning permission requires the examination of planning issues such as the Development Plan and other material considerations a part of the planning process and associated procedures relates to safety issues. This is delivered by undertaking a Road Safety Audit at various points in the process. Further information on Road Safety Audit procedures is provided later in the document. Reference Should also be made to the separate publication, *Dundee City Council -Road Safety Audit Procedures* available from the Planning & Transportation Department.

Outline Planning Permission

3.2.4 Developers may obtain Outline Planning Permission, sometimes referred to as "Permission in Principle", from the Council. Outline permission is sought when the developer wishes to obtain consent for the outlines or principle of the development before drawing up a detailed scheme. Following the granting of outline permission, a further application must be made to the Council for approval of the detailed scheme within specific time periods.

3.2.5 Much time can be saved if a developer consults the Planning & Transportation Department from the earliest stages in the planning process. In determining an outline planning application where it is known that roads are to be maintained by the Council, the Planning & Transportation Department will need to consider:

- The characteristics of the adjacent road hierarchy based on

the volume, type and destinations of vehicular traffic using it
- How traffic patterns are likely to change in the foreseeable future
- The volume and type of all traffic likely to be generated by the proposed development
- The likely distribution of this generated traffic
  proposed access and parking arrangements
- The safety of all road users
- The adequacy of the adjacent road network and identified any problem areas, including the capacity of the existing road storm water drainage system
- Any proposed new street lighting and/or alterations to existing street lighting
- Any proposed new road structures and/or alterations required to existing road structures
- Any restrictions on road access to the site including location, sight distances, gradients etc
- Possible extensions or alterations to bus services
  The possible implication under the Noise Insulation (Scotland) Regulations 1975

Transport Assessments and Travel Plans

3.2.6 In some circumstances a Transport Assessment (TA) will be required to support a planning application for development - These studies are the responsibility of the planning applicant. Typical threshold values for which a TA may be required are given below :-

- > 1000 m2 retail floor space (gross)
- > 100 trips in/out combined in peak hour
- > 100 parking spaces provided
- where access is from a route carrying > 5000 vehicles Annual Average Daily Flow
- other special circumstances

3.2.7 It should be emphasised that in order to avoid any wasted effort, consultation should be sought with the Planning and Transportation Department at an early stage, and this consultation may be continued throughout the process.

3.2.8 The format of TAs should follow the guidelines in the relevant documents produced by The Scottish Executive and also that contained in the Institution of Highways and Transportation (IHT) TIA Guidelines. The preparation of Travel Plans should also follow current Government guidance.

Approval of Reserved Matters

3.2.9 Every outline planning permission is granted subject to a condition preventing the start of the development until approval of specified 'reserved matters' is obtained from the Council.

3.2.10 Reserved matters can be any matters relating to the siting, design or external appearance of a building, its means of access or landscaping of the site in respect of which details were not given in the application for outline planning permission.

Detailed Planning Permission

3.2.11 An application for full or detailed planning permission is appropriate where the developer has decided on all or most of the

details of the proposed development and these details can be submitted to the Council for approval. If approved the development can proceed and be completed without further planning applications being submitted to the Council.

3.2.12 The developer may subsequently wish to change some details and, depending on the nature of these changes, a further planning application(s) may be required. It is therefore recommended that in the submission of a detailed planning application, early meetings should be arranged with the Planning and Transportation Department to discuss:

(a) the classes of road which it might be necessary to provide
(b) the location of existing or proposed community facilities, such as shops and 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, crossing facilities, Cycle facilities and any public transport requirements
(f) the location and amount of parking provision (see SPP17 for maximum parking standards)
(g) appropriate housing types for different types of road
(h) specific provision regarding traffic noise
(i) satisfactory arrangements for the disposal of road surface storm water, which in certain instances may require early consultation with Scottish Water and SEPA
(j) specific provision regarding road structures

Statutory Undertakers

3.2.13 As well as making provision for pedestrian, cycle and vehicular movements, a major function of residential roads is to provide routes for underground services. These services are an essential part of the layout as a whole and their efficiency and safety considerations must be matters of prime concern. Those who provide such services must be consulted at the earliest stage of developing the brief, their requirements co-ordinated in the layout, and agreement reached on the balance to be struck between their needs and other housing objectives.

3.2.14 The Statutory Undertakers will wish to deal with one road manager so that they are assured of the protection of the New Roads and Street Works Act 1991. It should be noted that the Local Roads Authority will only become the road manager once the section of road is added to the List of Public Roads. Until that time the Developer will act as road manager.

3.3 "CONSTRUCTION CONSENT" TO CONSTRUCT A NEW ROAD

3.3.1 Under Section 21 of the Roads (Scotland) Act 1984 any person who wishes to construct a new road or extension of an existing road in Dundee, before commencing, must obtain the "Construction Consent" of the Local Roads Authority.

3.3.2 Appropriate application Form CC1 is available from the Planning & Transportation Department. Forms must be returned to:

The Director of Planning and Transportation
Dundee City Council
Tayside House
Crichton Street
DUNDEE
DD1 3RB

Drawings to be Submitted

3.3.3 Applications for road construction consent (RCC) to form a new road, amend or extend an existing road, should be accompanied by 5 paper copies of the layout plan detailed below and 4 copies each of drawings (b) to (g) below:

(a) LAYOUT PLAN – Scale 1:500 showing (i) curve radii of the road alignment and junctions, (ii) carriageway, footway and footpath of verge widths, (iii) vehicular access crossings to properties, (iv) the positions of gullies, manholes and sewers and drains relative to the connection or discharge points, (v) the position of services, (vi) road markings and signing, (vii) garage/hardstanding levels and access gradients.

(b) LONGITUDINAL SECTION along roads giving the vertical alignment, details of gradient, and rate of changes of the vertical alignment with changes related to the layout plan.

(c) TYPICAL CROSS SECTION through each type of road, showing widths of carriageway, footways and/or verges, crossfalls, construction depths and materials used, kerb and edge details and details of gullies and their connections. In addition, details of footpaths remote from the carriageway and of vehicular access crossings should be given.

(d) LONGITUDINAL SECTION along drains and sewers showing levels, diameters and gradients of pipes. Additional information will be necessary where the carriageway construction thickness, in most cases the sub-base, is varied according to ground conditions. Generally, the thickness of sub-base can be finally decided during excavations for the surface water sewers, but trial pits can be dug to a depth not less than one metre below formation before construction commences. The location of trial pits, logs of the strata, and the results of tests taken should be submitted.

(e) ROAD LIGHTING – details relating to design, specification, supply, siting and installation are required (see Section 7.0)

(f) SIGNING OF ROADWORKS (see Section 7.2.11)

(g) HIGHWAY STRUCTURES – details relating to design, specification and construction. Technical approval is required for new structures or works to existing structures (see Appendix A).

Consultation

3.3.4 To facilitate the above process, the developer is strongly advised to seek early informal agreement with the Planning & Transportation Department with regard to his proposals. This should be done prior to the formal submission for Construction Consent. The Council will accept drawings submitted electronically for pre-application discussions only.

Notice to Affected Parties

3.3.5 Developers should note that in conjunction with applications for construction consent, notice must be intimated by the applicant to the following:

(a) the owners of all land which would front, abut, or be comprehended in the new road or extension of the existing road
(b) such other persons, if any, as the Local Roads Authority may, for the purpose of the application, specify

Procedures for Construction Consent

3.3.6 The Local Roads Authority shall consider any written representations, made to them within 28 days of the date of intimation, by any person to whom an application has been intimated under Section 2.3.3 above, and may thereafter

(a) subject to Section 2.3.3 grant Construction Consent either without conditions or subject to such conditions as they think fit
(b) refuse Construction Consent.

3.3.7 Before granting the consent subject to conditions other than that in Section 2.3.5, or refusing consent, the Local Roads Authority will allow the person applying for the consent an opportunity to be heard by them.

Duration of Construction Consent

3.3.8 A condition of Construction Consent will be that the construction will be completed within a period of 3 years from the date on which the consent is granted. The Local Roads Authority may subsequently by notice extend the period.

Appeal Regarding Construction Consent

3.3.9 An applicant for Construction Consent may appeal to the Secretary of State within 28 days of the date of the intimation to him of a decision of the Local Roads Authority:

(a) refusing his application
(b) granting it subject to conditions other than a condition that the construction be completed within 3 years of the date on which the consent was granted

Offences in Relation to Construction of New Roads

3.3.10 Under Section 22 of the Roads (Scotland) Act 1984 a person (other then a Roads Authority) commits an offence, which is triable either summarily or on indictment

(a) If they construct a new road or an extension of an existing road without Construction Consent
(b) If they contravene, or fail to comply with a condition imposed by a Construction Consent

3.3.11 Where a condition imposed by a Construction Consent has been contravened or not complied with, the Local Roads Authority may, by notice served on the person holding the consent, require him to bring the new road into conformity with the Construction Consent within such reasonable period as they shall specify in the notice.

Powers of the Local Roads Authority

3.3.12 Under Section 23 of the Roads (Scotland) Act 1984 the Local

Roads Authority may stop up or temporarily close any new road which another person has constructed

(a) without Construction Consent
(b) in contravention of, or non-compliance with, a condition imposed by a Construction Consent

3.3.13 Stopping up or temporary closure may take place whether or not proceedings are pending under Section 22 of the Roads Scotland Act 1984 but shall be ended if in any such proceedings it is found

(a) in a case where the stopping up or closure took place on the basis that there was no Construction Consent, that there was such consent
(b) in any other case, that there was no contravention of, or failure to comply with, the Construction Consent condition to which the proceedings relate

Inspection Costs

3.3.14 Section 21 of the Roads (Scotland) Act 1984 requires any person other than a Roads Authority who wishes to construct a new road or an extension of an existing road to obtain Construction Consent from the local Roads Authority.

3.3.15 In order to ensure that such roadworks have been carried out and completed in a manner and to the standards required by the Council it is necessary for inspection of the works to be carried out at regular intervals by qualified staff of the Planning and Transportation Department.

3.3.16 Section 140(6) of the Act entitles a Roads Authority to recover expenses reasonably incurred in carrying out such inspections from the person to whom the Construction Consent has been granted and any person to whom a Construction Consent has been issued will be charged with the inspections costs incurred by the Inspectors operating in Dundee.

3.4 ADOPTION PROCEDURE

3.4.1 Following the issue of a consent, developers may wish to propose that their new roads be adopted upon completion for future maintenance by the Local Roads Authority. Before considering adoption, it is essential that the Planning & Transportation Department is satisfied that their construction will be in accordance with the consent and the standards described in this document. Accordingly, the following procedure must be observed.

Use of Re-Cycled Materials

3.4.2 Where the developer intends to use re-cycled materials there will be a requirement to provide the Council with a certification notice confirming suitability of the material for the intended purpose. It is recommended that the developer should make early contact with the Council if this approach is to be used.

Commencement of Works

3.4.3 Following receipt by the developer or his contractor of Construction Consent from the Local Roads Authority, he should give at least seven days prior notice in writing to the Director of Planning & Transportation of the commencement date for roadworks or recommencement date following a suspension of works, together

with the name of his agent or person responsible for the works.

3.4.4 The Director of Planning & Transportation or his representative will regularly inspect various stages of the works and will require at least forty-eight hours notice of the commencement of certain operations. The Director of Planning & Transportation requires the above arrangements to ensure that he may finally make a recommendation to Council, in appropriate circumstances, to take the new roads onto the List of Public Roads.

3.4.5 FAILURE TO COMPLY WITH THE ABOVE MAY DELAY THE ADOPTION PROCEDURES.

Programme of Works

3.4.6 The programme for construction should be intimated in writing to the Planning & Transportation Department and should take account of the following broad categories of work which have to be co-ordinated.

(a) All work within the area of carriageway construction such as drainage and sewerage works, and any service cross-connection ducts.
(b) Carriageway construction including preparation of formation, laying sub-base, kerbing, gullies and roadbase. Pavement course shall be suitable for use by constructional plant.
(c) House construction and installation of statutory undertakers plant.
(d) Installation of street lighting.
(e) The surfacing of carriageways, construction of footways, road signing and marking.
(f) Construction of highway structures.

Completion of Works

3.4.7 A substantial completion certificate will be issued when roadworks, or a reasonable part thereof, have been completed in accordance with Council standards. The developer will be responsible for all costs of maintenance during the following year. If the roadworks have performed satisfactorily under usage during the one year maintenance period, they will normally be recommended for adoption by the Local Roads Authority.

Formal Adoption of Public Roads

3.4.8 The developer should make a formal application for the adoption of new roads one year after receiving a substantial completion certificate. The application should be accompanied by four paper copies of all "as built" drawings. A final inspection will be made and any defects agreed and made good by the developer, whereupon the Planning & Transportation Department will then add the said roads to the Council's List of Public Roads.

3.5 BONDS FOR NEW ROADS ASSOCIATED WITH PRIVATE HOUSING DEVELOPMENTS

3.5.1 In accordance with The Security for Private Road Works (Scotland) Regulations 1985 (as amended), prior to the construction of private housing associated with new roads a Developer must lodge a security, in form of a bond or deposit, with the Local Roads Authority to cover the cost of providing the roads to the standard laid down in the Construction Consent. The sum will be based on the estimated cost of the outstanding roadworks at the commencement of building

works. The Local Roads Authority is empowered to release part of the security as the work on the new road progresses subject to retention of at least 10% of the total amount of the original security. This must be released when no longer required, if house building proposals are abandoned, or when the road has been added to the Council's List of Public Roads.

3.6 ALTERATIONS TO EXISTING PUBLIC ROADS

Permanent Closures and Alterations (For temporary closures see Section 5.2.12)

3.6.1 A formal application must be made to the Council when a developer wishes to stop up, divert, raise, lower or otherwise alter a length of public road including the conversion of an existing public road to a footpath using Sections 12 and 68 to 74 of the Roads (Scotland) Act 1984. This should be done as soon as detailed planning permission has been granted.

3.6.2 Prior to this, the Developer should consult the Planning & Transportation Department, Emergency Services, Statutory Undertakers and any other persons or bodies with an interest therein, as to the problems, if any, of the proposed public road alterations in order to check their feasibility.

3.6.3 Developers should note that the period required for processing each Order can be twelve months or more depending upon variable factors such as whether or not objections to the proposals are lodged, the nature of the objections, alterations to original proposals to satisfy objectors and others, and the number and complexity of proposed Orders already awaiting process. A developer should, accordingly, bear this important factor in mind when preparing his building programme and when considering his contractual obligations.

3.6.4 In the case of a development which has received planning permission, an alternative procedure for the stopping up or diversion of a public road may be carried out by the Council under Sections 202, 207 and 208 of the Town and Country Planning (Scotland) Act 1997.

Site Works Affecting Public Roads

3.6.5 The Local Roads Authority should be consulted before any work is carried out on or adjacent to an existing public road. Application should be made to the Planning & Transportation Department. Special attention is drawn to Section 7.2 of this document which covers:

(a) Water, Mud, Debris and Dust on Public Roads (7.2.4 and 7.2.5)
(b) Protection of Pedestrians (7.2.6)
(c) Hoardings Adjacent to or within Public Roads(7.2.7 and 7.2.8)
(d) Prohibition of Use of the Public Road (7.2.9)
(e) Siting of Skips and Scaffolding on the Public Road (7.2.10)
(f) Signing of Work on Public Roads (7.2.11 and 7.2.12)
(g) Road Opening Permits (7.2.13)
(h) Control of Noise (7.2.14)
(i) Demolitions (7.2.15 and 7.2.16)

(j) Maintenance of Access (7.2.17 and 7.2.18)
(k) Temporary Road Closures (7.2.19 to 7.2.23)
(l) Protection of Road Furniture (7.2.24)
(m) Site Signing (7.2.25 and 7.2.26)

3.7 TRAFFIC SIGNS AND ADVERTISEMENTS

Traffic Signs

3.7.1 'Traffic Sign' means any object or device (permanent or temporary) for conveying to road users, or any specified class of traffic on roads, warnings, information, requirements or prohibitions of any description, as specified in the Road Traffic Regulation Acts

3.7.2 Unless otherwise stated the 'mounting height' refers to the distance between the bottom of the sign face and ground level below the sign.

3.7.3 The size, colour, type and means of illumination of all traffic signs should be in accordance with the Traffic Signs Regulations and General Directions and any additions and amendments thereof.

3.7.4 The design, construction, siting, and mounting of signs must comply with the Traffic Signs Manual.

3.7.5 Sign faces shall be rivetless and made using the following materials :-

Regulatory and Warning signs - Prismatic Material

Directional and Advisory signs - Class 1 Material

Waiting Restriction signs - Non Reflective Material

3.7.6 Supporting poles shall tubular in cross section and made of galvanised steel.

3.7.7 Where there is a likelihood of pedestrians passing beneath the sign a minimum mounting height of 2.25m shall be provided. Where there is no likelihood of pedestrians passing beneath the sign the mounting height may be reduced to 1.5m, (subject to sight line requirements).

(3.7.8 On the central islands of roundabouts the mounting height (measured from the bottom of the sign face to the adjacent carriageway level) of the combined signs to diagrams 515 and 606 may be reduced to 1m.

3.7.9 Traffic signs greater than 0.3 sq.m in area shall not be fixed to street lamp standards.

3.7.10 The minimum lateral clearance of any part of a sign to the carriageway shall be 0.5m. On a high speed (speed limit greater than 40mph) dual carriageway roads the minimum lateral clearance of any part of a sign to the carriageway shall be 1.2m.

3.7.11 Supporting poles should be located to avoid obstructing the footway and a minimum effective footway width of 1.2m must be maintained past the sign poles.

3.7.12 Where illuminated traffic bollards are required they shall be base lit and vandal resistant.

3.7.13 Only the Scottish Ministers or the Local Roads Authority may cause or permit traffic signs to be placed on or near any public road. Accordingly proposals for the erection of a traffic sign or signs must

be submitted to the Director of Planning and Transportation for approval by the Council. The Planning & Transportation Department may at the same time give advice as to the extent, colour, type, size, siting details, and materials to be used and of the costs to be borne by the requesting body.

3.7.14 With respect to direction signs :-

- Illuminated traffic signs and bollards require to be designed in conjunction with street lighting.
- Proposed details of the electrical layout, design, and materials used require to be agreed with Street Lighting Section of the Planning and Transportation Department through a meeting with their representative and a design brief drawn up.
- Permission for signs would normally only be granted from the nearest main A or B class route.
- Permission would be dependent on the number of visitors, the degree of difficulty in finding the attraction from that route, the proportion of non- local visitors and the extent of existing signs at the junctions.

3.7.15 With respect to tourist type signing :-

- Dundee City Council policy will apply.

3.7.16 In the case of Temporary Signs :-

- Proposals for the erection of temporary direction signs must be submitted to the Planning and Transportation Department for approval / refusal on behalf of the Director of Planning and Transportation. The traffic section may at the same give advice as to the extent, colour, type, and siting details.
- Signs for special events of short duration (not more than 7 days) should not be erected more than 48 hours before an event, and taken down immediately thereafter, unless the Traffic Section agrees beforehand that there are exceptional circumstances.

3.7.17 Advertising signs containing information for the guidance or direction of persons using a public road should be treated as traffic signs and controlled as indicated above. However, permission to erect advertising signs within the road boundary would normally be refused.

3.7.18 All other advertising signs may require consent and should be the subject of consultation with the Local Planning Officer in order that their location and design may be controlled in the best interests of pedestrians and other road users.

3.8 ROAD MARKINGS

3.8.1 The size, colour and type of road markings should be in accordance with the Traffic Signs Regulations and General Directions and any additions and amendments thereof

3.8.2 The use and layout of road markings must also comply with the Traffic Signs Manual. In addition :-

- The use of Edge of Carriageway lines, Give way lines, Give way triangles and Give way signs should be applied according to table 1.
- All permanent road markings should be laid in thermo-plastic screed.

3.8.3 Only the Scottish Ministers or the Local Roads Authority may

cause or permit road markings to be placed on any public road. Accordingly proposals for provision of road markings must be submitted to the Traffic Section of the Planning and Transportation Department for approval on behalf of the Director of Planning and Transportation. The Traffic Section may at the same time give advice of the use and layout of road markings.

Table 1 Give Way Markings at Junctions

		Minor Road Categories				
		1	2	3	4	5
MAJOR ROAD CATEGORIES	1	Line Triangle Sign	Line Triangle Sign	Line Triangle Sign	Line Triangle (sign in rural areas)	Line Triangle (sign in rural areas)
	2	Line -	Line Triangle Sign	Line Triangle Sign	Line Triangle -	Triangle -
	3	-	-	Line Triangle -	Line Triangle -	Line only*
	4	-	-	-	Line only* #+	Line only* #+
	5	-	-	-	-	Line only* #+

* crossroads or other hazardous locations may require special treatment. Provide sign and triangle if necessary.
\# may be replaced with edge of c/w marking in urban areas.
\+ for rural roads consult traffic team in the Planning and Transportation Department

3.9 ROAD SAFETY AUDITS

Definition and Purpose

3.9.1 Road Safety Audit can be defined as the evaluation of road schemes during design and construction to identify potential safety hazards that may affect any type of road user before the scheme is opened to traffic and where possible to suggest measures to eliminate or mitigate those problems.

3.9.2 The Council is fully committed to preventing road accident casualties occurring and the Road Safety Audit procedures aim to ensure that safety is "designed in" to any road scheme. A Road Safety Audit is undertaken at various stages on all designs for new roads and any alterations to existing roads.

3.9.3 Road Safety Audit is a formal procedure from concept to completion of the design, resulting in signed Road Safety audit Reports at each stage of the design.

3.9.4 The basis of the procedure is that safety practitioners involved in accident investigation and prevention (AIP) use their accumulated knowledge of common safety issues to try to ensure that accident causation factors are not repeated in new and altered road layouts.

Road Safety Audit Stages

3.9.5 The following gives details of the Road Safety Audit stages and provides a guideline to when they are required as part of the Planning Procedures.

- Stage F, Feasibility safety audit, may be required on appropriate development schemes prior to outline planning consent.
- Stage 1 safety audit shall be undertaken at the completion of preliminary design and before deemed planning consent.
- Stage 2 safety audit shall be undertaken on completion of the detailed design and prior to road construction consent being granted.
- Stage 3 safety audit shall be undertaken when the scheme construction is substantially complete, preferably before the works are opened to traffic and prior to a certificate of substantial completion being issued.

3.9.6 Stage 1 and Stage 2 Road Safety Audits may be combined where appropriate, with the agreement of the Director of Planning and Transportation or appropriate nominee.

3.9.7 Full details of the road safety audit procedures to be followed are given in a separate publication, Dundee City Council - Road Safety Audit Procedures, available from the Planning and Transportation Department. These are based on the procedures for road safety audits detailed in the industry standard, DMRB HD 19/03.

3.10 STREET LIGHTING

3.10.1 Annex C details the conditions for the construction of road lighting installations provided by private developers. These conditions require to be met in order to satisfy the Director of Planning and Transportation as per the relevant condition of the construction consent and as such form part of the general conditions for adoption by Dundee City Council for future maintenance.

3.10.2 All the costs involved in providing and installing the complete lighting system shall be borne by the developer who must make all the necessary arrangements for the supply of materials, carrying out of the works and provision of electricity supplies necessary to complete the installation to the satisfaction of the Council. The Developer must also arrange for adequate insurances and performance bond to be provided.

3.10.3 In instances where a new development or the lighting associated with a new development involves work on contiguous Dundee City Council lighting installation this shall only be carried out by the Council at the developer's expense.

3.10.4 The developer must advise all potential purchasers of the position of street furniture to avoid disputes in the future. All costs of any agreed changes will be borne by the developer.

3.10.5 The lighting category which will apply for the various road and location types in Dundee will be as follows:

Traffic Routes	**Category (BS 5489 - Part 2)**
High speed roads and dual carriageways	2/1
Important rural and urban traffic routes Radial roads District distributor roads	2/2
Connecting, less important roads Local distributor roads Residential area major access roads	2/3
Subsidiary Roads	**Category (BS 5489 - Part 3)**
Roads where night-time public use is likely to be high, high crime risk, high traffic use	3/1
Roads where night-time public use is moderate, average - low crime risk, traffic use equivalent to that of a housing estate access road	3/2
Roads where night-time use is minor, crime risk is very low, traffic use is equivalent to that of a residential road	3/3

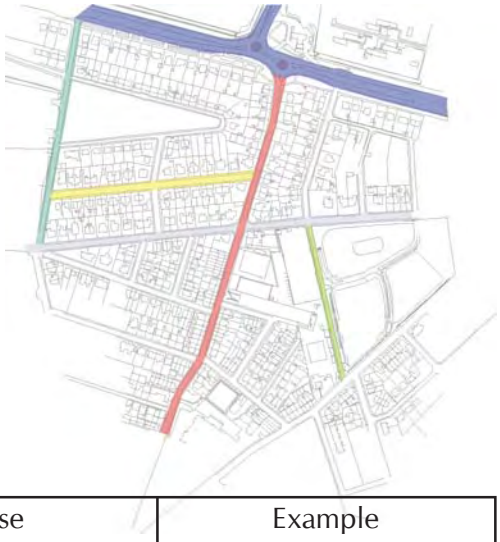
3.10.6 There are other standards for the lighting of public areas, car parks, ramp, etc.

3.10.7 All of the above has been extracted from the BS 5489 code of practice for the design of street lighting. The current standards are being reviewed but the categories of BS 5489 Parts 2 and 3 are to be retained by Dundee City Council at present.

3.11 ROAD STRUCTURES

Appendix A Technical Approval Procedures for Road Structures sets out the procedures to be followed for the design and construction of highway structures.

4 ROAD HIERARCHY



4.1 DEFINING A HIERARCHY FOR DUNDEE

4.1.1 In order to manage the consequences of implementation and ongoing maintenance within the overall development process The Planning & Transportation Department requires a structured management and maintenance regime. This regime is delivered within a hierarchical road structure, the categories and descriptions for which are set out in the table below. The Planning & Transportation Department should be consulted on issues affecting all levels within the hierarchy. A more detailed explanation of the categories within the hierarchy is given in the remaining sections of this chapter.

Category	Description	Principal purpose	Example
5	Access Roads / General Road	Local traffic serving small numbers of well defined areas of residential development	Pentland Crescent, Blackwood Court
4	Local Distributor Type 2	Local traffic, serving residential or industrial / commercial properties with minimal through traffic	Tannadice Street, Forest Park Road
4	Local Distributor Type 1	Local traffic, serving residential or industrial / commercial traffic but considerable through traffic .	Old Craigie Road
3	District Distributor	Roads and bus routes. Important traffic movements within the city carrying through traffic.	B961 Drumgeith RoadB978 Claypotts Road, Perth Road, Macalpine Road
2	Principal Roads	Major traffic movements into, around or out of the city	A923 Dundee – Coupar Angus A911 Marketgait
1	Trunk Roads	Principal Roads within the city that are the responsibility of the Scottish Executive	A90 Dundee - Aberdeen A90 Kingsway

4.2 DRIVEWAYS AND ACCESSES

4.2.1 In certain circumstances, where a development comprises five houses or less and is not capable of further development, and if the Director of Planning & Transportation considers that no public right of passage is necessary for general servicing of the development, the way providing access to the development will be considered to form a Driveway or Access, and no application for Construction Consent will require to be made.

4.2.2 Such an Access, outwith the limits of the public road, will not qualify for inclusion in the List of Public Roads, and the frontagers of the Access will be responsible in all aspects for its upkeep and maintenance. Such a requirement must be written into the Title Deeds for each property.

4.2.3 Developers should note, however, that there is a requirement in their part to apply for planning permission to construct the Driveway or Access.

4.2.4 A recommended layout and construction specification for Accesses is given below. The design must be such that at all times there is no possibility of surface water from the Access reaching the public road and drainage may be in the form of a SUDS drainage system draining to a natural water course or in the form of a soakaway. In no circumstances will permission be granted to the developer to connect the Driveway or Access drainage system to the public road drainage system.

(a) The Access beyond the throat should have an overall width of 5m comprising a 3m carriageway, 1.5m footway/service strip and 0.5m overhang strip (hard landscaped where appropriate) Carriageways should be widened locally to 5.5m at house entrances.

(b) A length of 50m should be the maximum permitted length without suitable passing places. This dimension should be reduced on winding alignments to suit the intervisibility of the passing places.

(c) A standard turning facility as per Figures 2, 3, 4 and 5 should be provided at the extremity of the Access. However, in certain circumstances the alternative described in Section 4.3 may be applied.

(d) Where access is to be taken to a Class II Principal Road or higher classification road the junction radii should be increased to 9m.

4.3 SHORT CULS-DE-SAC

(a) The term Short Culs-de-sac covers a number of possible situations ranging from a short length of road ending in a turning head to housing squares and more informal courtyard areas – depending upon the type and density of development. However, all may feature joint use between pedestrians and vehicles and serve up to 20 dwelling units with direct access.

(b) A formal design speed is inappropriate in this situation. The width should not be less than 5.5m to allow for visitors parking and delivery vehicles standing outside dwellings. However, where Short Culs-de-sac lead off roads which do not feature shared use between pedestrians and vehicles, in the interests of pedestrian safety it is essential to construct a short length of surface 3m wide between the junction with the major road and the entrance to the first dwelling on the Short Culs-de-sac to emphasise the changed nature.

(c) Where Short Culs-de-sac feature shared use between pedestrians and vehicles the kerb treatment should be as shown in Figures ??.

(d) The less formal courtyard areas should still have a 5.5m wide core area and should be large enough and of a shape to accommodate the full specification turning area as shown in Figures 13, 14, 15 and 16. However, in certain circumstances the alternative described in Figure 1 may be applied. The remaining area available for casual parking and for standing delivery vehicles should be delineated.

4.4 ACCESS ROADS

(a) An Access Road can be of conventional or partly shared use nature and may serve up to 50 dwelling units. Houses may have direct access or they may be grouped round Short Culs-de-sac leading off the Access Road. Access Roads should preferably take the form of loop roads provided this is unlikely to encourage through movements. The limit of 50 dwellings applies still in the case of these loop roads. An Access Road which is also a Cul-De-Sac may be permissible but only as an exception.

(b) 3-metre wide single track roads with intervisible 5.5m wide passing places may be allowed for two-way working under very low flow conditions. Where it is proposed to take direct vehicular access to dwellings, local widening to 5.5m will also be required to allow for delivery vehicles and visitor parking. For single track roads the loop form will be preferred.

(c) At this level of the road hierarchy formal design speeds are inappropriate, however the absolute maximum design speed used should be 30kph. When dealing with the home end of vehicle trips and in the interest of the local residential environment vehicle speeds should be kept down by the inhibiting effect of the narrow roadway, the single track working and the adoption of smaller radius bends.

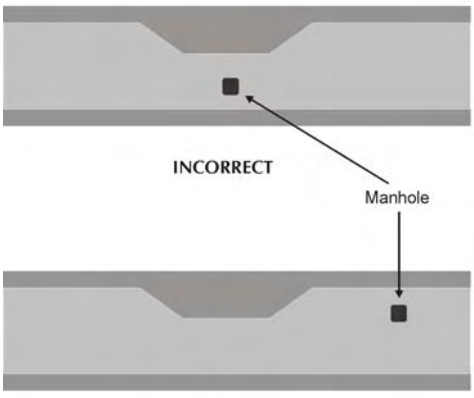
(d) Because speeds and traffic volumes are low, joint use of shared areas by vehicles and pedestrians is to be encouraged in developments of up to 20 dwellings. However, the minimum visibility distance for drivers on and joining the minor road should not be less than 20m in the interest of pedestrian safety – particularly of children at play.

(e) Although joint use of Access Roads by pedestrians and vehicles may be permissible, this should not be taken to preclude the adoption of a separate pedestrian system which may still be desirable depending upon the size of the development and the disposition of existing roads and footpaths. The over-riding objective of the design is to achieve maximum permeability since this will provide the best solution for all users.

(f) At the transition from conventional two-way roads to those single track roads, particularly where use is shared with pedestrians, the latter should be offset to the right to emphasise the change in nature of the roadway to entering traffic, and a ramp introduced.

(g) Statutory undertaker services, apart from main sewers , should not normally underlie the carriageway but instead should be accommodated in the verges, or in the case of shared use carriageways, service strips which will be designated as part of the road. The width of these will be dictated by the need to accommodate the services but should generally not be less than 1.8m wide. Where it is necessary for services to cross roads it should be at widened sections to minimise disruption to traffic flow during maintenance or alteration works. Manholes or inspection covers should be sited clear of 3m wide sections.

LOCATION OF MANHOLE AT ROAD NARROWING



4.5 ROADS IN INDUSTRIAL AREAS

4.5.1 These areas will attract large vehicles and the number of vehicles now meeting the maximum legal size is increasing annually. The increase in size leads to greater swept paths being required to accommodate turning movements. Accordingly, these roads should be a minimum of 7.3m wide.

4.5.2 The road network should preferably be laid out in a system of loops to avoid the formation of the very large turning heads required. A loop road configuration will also minimise the reversing movements of large lorries that are difficult for the drivers concerned and a source of danger to other road users.

4.5.3 There should be footway provision of 1.8 to 2.0 metres in width to each side of the carriageway with a 2m wide verge separating the footway from the carriageway. Details of turning heads required are given in Figures 9, 10, 11 and 12

4.6 GENERAL ROADS

(a) A General Road should take the form of a loop. It may however take the form of a cul-de-sac in some situations. It should serve no more than about 200 dwellings in total. It may fulfil the function of a collector road linking a Distributor Road to a number of Minor Roads or it may act as a housing access road in its own right with direct frontage accesses to dwellings.

(b) 30kph is suggested as an appropriate design speed. However, at junctions with roads constructed to higher standards the visibility from the minor road approach should be appropriate to the higher design speed of the major road.

(c) A minimum carriageway width of 5.5m will normally be required. On each side of the carriageway a footway should be provided. 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. The footway should have a desirable width of 2m but should be no less than 1.8m.

(d) Junctions must be located where the visibility requirements can be met. The number of junctions should be minimised in the interests of the safety of all road users.

(e) In exceptional circumstances where a General Road is in the form of a cul-de-sac and exceeds 60m in length, provision should be made to allow small commercial vehicles to turn every 100m approximately. Turning facilities should be provided at the end of such roads for large industrial vehicles to ensure that any vehicle that enters may leave in a forward gear.

4.7 LOCAL DISTRIBUTOR ROADS – TYPE 2

(a) Type 2 Local Distributor Roads distribute traffic within housing, industrial or business areas however they will have a minimal level of through traffic and will carry between 10 and 100 commercial vehicles per day in each direction.

(b) The layout should be designed to discourage major through movement of general traffic.

(c) Where footways exist near a housing area every effort should be made to achieve effective separation by the introduction of a 2m wide verge.

(d) The minimum width of carriageway should be not less than 5.5m. A design speed of 50kph should be adopted, with a minimum centre line radius of 80m. Where there are no footways, verges 2m wide should be provided.

4.8 LOCAL DISTRIBUTOR ROADS – TYPE 1

(a) Type 1 Local Distributor Roads distribute traffic within housing, industrial or business areas. They will probably carry up to 250 commercial vehicles per day in each direction or generally serve up to 1,000 dwellings. They are also potential bus routes.

(b) Direct frontage access is only suitable where vehicles can enter and leave a driveway in a forward gear. Where footways exist near a housing area every effort should be made to achieve effective separation by the introduction of a 2m wide verge.

(c) The carriageway should be 7.3m wide with an absolute minimum width of 6.1m. A design speed of 50kph should be adopted, with a minimum centre line radius of 80m. Where there are no footways, verges 2m wide should be provided.

4.9 DISTRICT DISTRIBUTOR ROADS

4.9.1 These roads will generally carry between 250 and 1,000 commercial vehicles per day and are likely to link different environmental areas or district centres.

4.9.2 Design of these roads will normally be the responsibility of the Director of Planning and Transportation.

4.10 TRUNK ROADS AND PRINCIPAL ROADS

4.10.1 These roads will generally carry in excess of 1,000 commercial vehicles per day in each direction and form the primary network into and around the city.

4.10.2 Design of Principal roads will normally be the responsibility of the Director of Planning and Transportation.

4.10.3 Design of Trunk Roads is the responsibility of the Scottish Executive.

5 DESIGN ISSUES

5.1 GENERAL DESIGN

5.1.1 The layout of roads in residential areas is complex due to the number of considerations that should be taken into account. The following list of road design considerations is neither exhaustive nor in any particular order, and does not specifically include matters of aesthetics, conservation or preservation.

(a) Identify the main attractors and generators of traffic, both pedestrian and vehicular, for example, schools, shops, town centre, industrial areas, post and telephone boxes, bus stops, etc.

(b) Examine the topography of the site, including any physical restraints, to find out where roads cannot be located due to adverse gradients or for example to avoid existing trees, buildings, streams or unsuitable ground conditions

(c) As a result of (a), draw the main pedestrian desire lines and taking into account (b), plan a draft footway or footpath system. In large residential areas or areas where additional pedestrian traffic is generated, the aim should be to design the main routes as footpaths divorced from the carriageways. In all other areas, this provision is not recommended because of practical maintenance difficulties

(d) Consult the Planning & Transportation Department on bus routes, both present and future. An alteration to the present bus routeing system might be required to serve the proposed development. In larger areas of residential development, the possibility of routeing a bus service into, or through, the development will be considered. Where buses pass, or are likely in the future, through a residential area, the width of the carriageway should be 6.1m minimum and may require local widening at curves.

(e) Locate minor road connections to the existing road system where the visibility requirements can be met. For reasons of traffic safety, the number of connections should be minimised. To facilitate turning movements from main roads of Categories 1, 2 and 3 and so as not to impede traffic flow, the first 25m, at least, of a minor connection road carriageway should be widened to 7.3m, where it serves between 50 and 150 dwellings. Similarly, where there is a short connection to a loop, the carriageway should be widened to 7.3m.

(f) Consider the provision for an alternative means of access for emergency vehicles where there is to be only a single road into a development. This can be done by widening a footpath, or by providing some semi-hard or hard landscaping at another location.

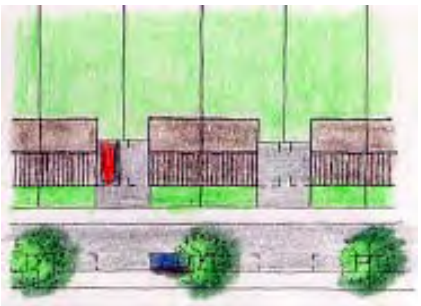
(g) Anticipate future extensions to the development. Whereas a particular residential road may initially only serve 50 dwellings and hence apparently qualify as an Access Road, if there is a possibility that the road may subsequently be extended to serve say 100 dwellings at a later date, the road in question should be designed to Local Distributor Road standards throughout its length. Further housing development off minor roads may not be acceptable unless

Thoughtful Car Parking Layouts[1]

On street parking between pavement buildouts

Wider frontage housing can accept frontage parking whilst still allowing a reasonable area for soft landscaping

Frontage parking with shared drives - useful where it is desirable to limit pavement crossovers e.g. fronting main roads or to avoid existing trees.



Parking to the side can allow the housing to be set forward containing the street.

A shared drive to garaging at the rear allows the housing to be set forward and closely spaced maintaining street enclosure.

specific provision has been made in the design of the road.

(h) While the standards have been specifically aimed at new housing developments on greenfield sites, the principles will also apply to redevelopment of existing sites and for infill development. Except in the case of comprehensive redevelopment, however, it would be unrealistic always to expect these sites to be able to meet all the standards for new development with respect to sightlines etc. although every effort should be made to achieve the required standards. Cognisance should be taken of the prevailing conditions in the locality, the likelihood of further redevelopment or subsequent road improvements and the need to provide adequate off-street parking.

5.2 SAFETY IN DESIGN

5.2.1 The guidance given in this document and the materials specified do not diminish the responsibility of the developer and designers to ensure that due regard is given to health and safety issues through the whole life of the development.

5.2.2 The Developer shall ensure that issues of 'buildability' and 'maintainability' are adequately addressed. This shall include responsibilities under the Health and Safety at Work Act and subsequent regulations such as the CDM (Construction (Design and Management)) Regulations. For example, the use of materials that may be hazardous to health or the requirements for laying kerbs may require the use of mechanical lifting devices.

5.3 VISIBILITY REQUIREMENTS

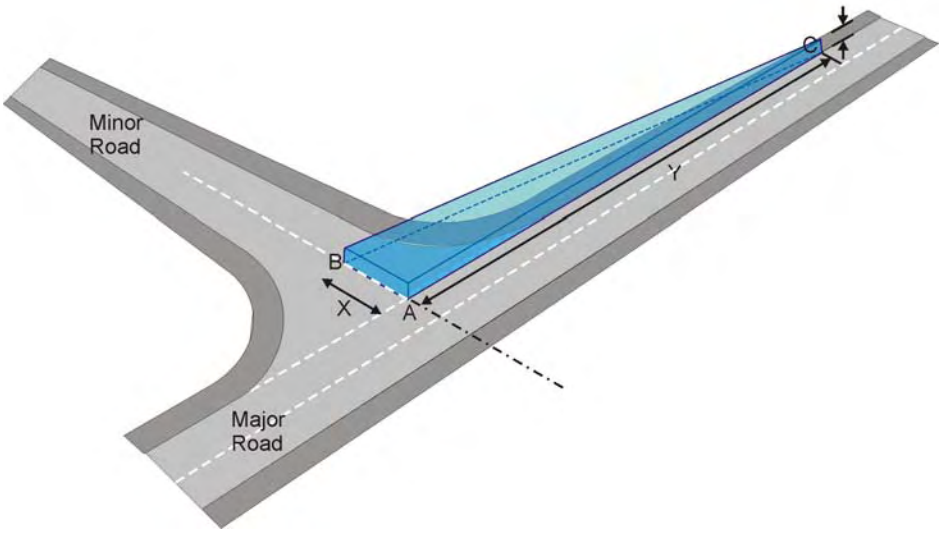
5.3.1 At all junctions a full visibility envelope should be provided to the left and right above two parallel planes 1.05 metres apart vertically defined by

(a) A straight line x metres long measured along the centre line of the side road from the intersection of the nearer edge of the major road carriageway;

(b) A straight line y metres long measured along the nearer edge of the major road carriageway from its intersection with the centre line of the side road;

(c) A straight line joining the ends of the above lines.

SIGHT LINES AT JUNCTIONS



See Paragraph 6.7.6 for x and y values

NOTES

1 In residential areas, a height of 0.85m shall be taken instead of 1.05m to cater for situations where small children are likely to be particularly at risk. This may be further reduced

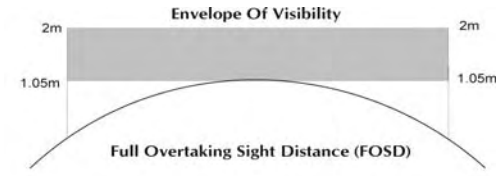
to 0.6m in exceptional circumstances subject to agreement with the Council.

2 Full forward visibility must be provided for following vehicles, at locations which involve right turn manoeuvres across the on-coming traffic lane. This is particularly important at junctions on or near the outside of curves.

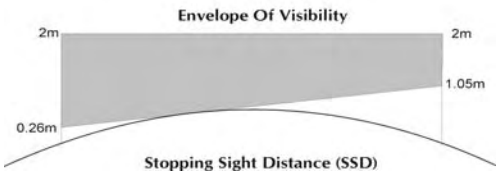
On Curves

5.3.2 Sight distances on curves, both vertical and horizontal, should be maintained and allowed for in the location of new development relative to the road.

5.3.3 Stopping Sight Distance should be measured from a minimum driver's eye height of between 1.05m and 2m to an object height of between 0.26m, and 2m both above the road surface, as shown right. It shall be checked in both the horizontal and vertical plane, between any two points in the centre of the lane on the inside of the curve (for each carriageway in the case of dual carriageways).



5.3.4 Full Overtaking Sight Distance shall be available between points 1.05m and 2m above the centre of the carriageway as shown right and shall be checked in both the horizontal and vertical planes.



Road Category	Stopping Sight Distance SSD (m)	Full Overtaking Sight Distance FOSD (m)
5	20	N/A
4	35 - residential 70 - industrial	N/A
4	35 - residential 70 - industrial	N/A
3	90	345
2	120	410
1	See Trunk Road Authority	See Trunk Road Authority

At Footways

5.3.5 Where vehicles emerge on to a road with high walls, hedges or buildings (over 0.8m high) set at the back of the footway and these obstructions are not to be reduced in height, 45° visibility splays of 2.4m x 2.4m are required for intervisibility between vehicles and pedestrians.

5.3.6 It is essential in locations where pedestrians emerge onto the road that the view between the pedestrian and motorist is similarly unimpeded. In certain situations pedestrian barriers may be appropriate.

Planting Adjacent to Public Roads

5.3.7 Notwithstanding the sight line requirements, it should be noted that there is legislation governing the proximity of tree planting to the carriageway, Roads (Scotland) Act 1984 Clause 89. Any planting within 5m of the edge of a carriageway of a public road or

a prospectively maintainable road requires the permission of the Council.

5.4 GRADIENTS AND CROSSFALLS

5.4.1 The desirable range of longitudinal gradient for public roads lies between 6% and 1% but these limits may be exceeded over short distances where site conditions make this necessary. Gradients outwith the above range will always require specific approval and where footways are adjacent to the carriageway the particular requirements of pedestrians should be borne to mind.

5.4.2 At side road junctions, the gradient over the first 10m of the side road should not exceed 1 in 30.

5.4.3 Carriageway crossfalls and superelevations should normally be 1 in 40 and a maximum of 1 in 20 where the desirable curve radii can be achieved. Footway crossfalls should normally be 1 in 36 and verges and service strips 1 in 20.

5.5 JUNCTION SPACING

5.5.1 All junctions between roads should be formed at right angles except in special circumstances where other design considerations cannot be met. The junction spacings should be as in the following table.

Main Road	Side Road	Normal Spacing	Staggered Spacing
Cat 1,2,3	Cat 1,2,3,4	90m	60m
Cat 4	Cat 4,5	60m	40m
Cat 5	Cat 5	20m	20m

CARRIAGEWAY WIDENING ON SINGLE TRACK MINOR ROADS (URBAN)

5.5.2 The need for widening on curves depends upon the radius and the length of curve. The table below shows the increased widths required on 90° bends, on single track roads having a basic 3m width. The widening shown is that required to minimise the risk of overriding kerbs or verges. For radii of less than 15m on single track roads a 4m width should still suffice provided the deflection is no more than about 45°. If the deflection is 90° a width of 5.5m is required on the bend with a minimum radius of 10m.

Curve Radius (metres)	Road Width Required (metres)
15	4.0
30	3.5
45	3.3
60	3.2
75	3.1
150	3.0
300	3.0

JUNCTION BETWEEN GENERAL ROAD AND ACCESS ROAD

5.5.3 At junctions between General Roads and Access Roads, the Access Roads should be widened to conventional standards over a short length at the junction to minimise the risk of congestion.

5.5.4 Note the off-set to the right as the road narrows to emphasise the changed nature of the paved areas to traffic entering from the General Road.

5.5.5 A similar detail applies to the junctions of General Roads and Short Culs-de-sac where the latter features joint use of paved areas by pedestrians and vehicles. The short Cul-de-Sac would of course be widened out again after the constriction.

JUNCTION BETWEEN ACCESS ROAD AND SHORT CUL-DE-SAC

5.5.6 Where both roads feature shared use of paved areas there is, of course, no need for a constriction and Figure 17 shows a typical detail for a junction between a Access Road and a Short Cul-de-Sac. The widened area on the Access Road doubles as a passing place and manoeuvring area for larger vehicles turning into or out of the side road.

5.6 FACILITIES FOR PEDESTRIANS

GENERAL

5.6.1 Pedestrian movements should be as convenient, safe and as 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.

5.6.2 The number and type of trips involved – to and from neighbours, local shops, schools, parks and bus stops lead 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.

5.6.3 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 spine pedestrian routes that should be segregated as far as possible from major traffic routes and involve a minimum number of road crossings.

MINIMUM WIDTHS OF PEDESTRIAN FACILITIES ASSOCIATED WITH FRONTAGE DEVELOPMENT

5.6.4 The table below details appropriate widths for footpaths, footways and pedestrian areas. These widths may require to be increased to cater for high pedestrian volumes, provision of seats, flower beds, etc. The dimensions are not absolute and may be varied slightly to reflect the size characteristics of the surfacing material to be employed. Thus the width may be adjusted to suit standard sizes of concrete paving slabs. Footpaths and footways may also be reduced in width over very short lengths not exceeding 2-3m to negotiate mature trees and other obstructions.

MINIMUM FOOTWAY AND FOOTPATH WIDTHS

Footways on District distributors	3m minimum
Footways on Local Distributors	2 – 3m
Footways on Other Roads	1.8 – 3m
Footpaths on major segregated pedestrian Routes	3m
Footpaths on Minor Segregated pedestrian routes	1.8 – 3m
Footbridges	1.8m minimum
Underpasses	2.5m min. (2.3m headroom)

FOOTWAYS

5.6.5 It is desirable that pedestrians be separated, where possible, from the carriageways of main roads, of Categories 1, 2 and 3 in the interests of safety. Normally, one 1.8m wide footway should be provided behind a soft landscaped margin of at least 2m in width. If sufficient space is not available for this, the width of the margin may be reduced to between 2m and 1m provided the margin is hard landscaped for economy of maintenance. Where space is even more restricted a 2.5m wide footway may be considered.

SEPARATE PEDESTRIAN SYSTEMS

5.6.6 The full pedestrian network should be provided at the same time as the roads and other services and should connect housing, shops, schools, offices, public transport (bus and rail), and parking areas. In so doing, it should be as direct as possible with a minimum of road crossings. The design of the pedestrian and vehicle networks should be such that it is easier and more convenient for pedestrians to use the footpaths than to walk along the carriageways where there is no footway adjacent to the road. However, a verge or margin should always be provided to the carriageway for emergency use by pedestrians to allow for possible oversweep by manoeuvring commercial vehicles, and to facilitate effective maintenance.

ADOPTION OF SEPARATE PEDESTRIAN SYSTEMS

5.6.7 The Council is prepared to consider adopting remote footpaths (not adjacent to carriageways) where there is a substantial community use. These footpaths shall be at least 1.8m wide. Steps are undesirable but where they are unavoidable, special provision must be made for maintenance vehicles and wheelchairs.

PEDESTRIAN CROSSING POINTS

5.6.8 Segregated footpaths and footways should be designed to converge on points suitable for crossing the carriageway and which meet, as far as possible, the natural desire lines for pedestrians making their way to and from points of attraction such as shops, schools and bus stops. Underpasses or footbridges may be provided depending upon the degree of pedestrian vehicle segregation, the likely relative volumes of pedestrians and traffic and the topography. The latter is particularly important as the design and layout of both underpasses

and footbridges should be such that pedestrians use them as a matter of course with minimal changes in level even if this means elevating or depressing the carriageway. Underpasses should be straight, well drained and well lit. Where segregated footpaths or footways lead to surface crossings or where they are parallel to carriageways, the judicious use of guard rails or high relief landscaping features is approved by the Council and can guide pedestrians to the most suitable crossing places. At such points, and at tangent points of bellmouths, "dropped kerbs" must be provided for the convenience of wheelchairs and prams unless otherwise approved. A minimum of two lengths of dropped kerb is considered sufficient.

MAXIMUM FOOTPATH AND FOOTWAY GRADIENTS INCLUDING BRIDGES AND SUBWAYS

5.6.9 The gradients of footpaths and footways should not normally exceed 8% but may be increased subject to the specific approval of the Council. Where steeper gradients are employed, handrails should be provided on at least one side of the facility. Steps should be avoided for the use of prams and wheelchairs.

CROSSFALLS TO FOOTPATHS AND FOOTWAYS

5.6.10 Crossfalls on footpaths and footways should be 1 in 36. See also needs of elderly and disabled (see Section 5.12).

5.7 FACILITIES FOR CYCLISTS

5.7.1 The need for the provision of a separate cycle network rather than the use of the residential road network is a matter for the local authorities to decide in the light of their overall transport planning policy and consideration of cyclists' needs and safety. In some areas there exists an established use of cycles as a transport mode whilst in other areas the existing physical environment may discourage their use.

5.7.2 Where there is likely to be sufficient cycling demand (such as in new housing schemes) and/or where an existing cycle network terminates at, or adjacent to, a new housing development, consideration should be given to the need to link the scheme to it or to extend it.

5.7.3 In addition, the provision of comparatively short lengths of segregated cycle routes may be sensible in the immediate vicinity of schools or shops to allow cyclists to disperse in greater safety than would otherwise be possible. However, this should connect to a suitably safe route.

5.7.4 The safety of cyclists on narrow minor roads is a matter that should be given consideration in deciding the extent to which the carriageway may be narrowed and the distance over which it occurs.

5.7.5 Any future developments are to be assessed and checked by the Cycling Officer, Dundee City Council. Guidance will be offered to help the developer provide a suitable scheme for cycling facilities.

5.7.6 Further Guidance on ways of helping cyclists in built up areas is given in 'Cycling By Design' by The Scottish Executive and 'Guidelines and Practical Details' by Sustrans.

5.7.7 For recommendations on Cycle Parking provision at

developments see Section 6.8.25) – Covered lockable bike lockers are a preferred option.

5.8 TURNING HEADS

5.8.1 It is desirable for road layouts to be designed so that service vehicles do not need to reverse on the public road to turn round. This can be achieved where roads take the form of loop roads off a Local Distributor or by providing a turning circle or turning head of adequate dimensions at the ends of all Culs-de-sac.

5.8.2 Where lack of space precludes the provision of a turning circle or as a temporary solution as part of a phased development, turning heads must be substituted. In all cases the dimensions of any turning facility should suit the characteristics of the largest vehicle likely to use the facility regularly. This means milk delivery vehicles, refuse collection trucks, possibly pantechnicons in residential areas, and up to 15m long articulated vehicles in industrial, commercial and shopping service areas.

5.8.3 For details see Figures 2 to 16.

TURNING HEAD TYPES

5.8.4 There are three main types of turning heads categorised in accordance with their use.

TURNING HEADS FOR CARS FOR PRIVATE ACCESSES

5.8.5 See Figures 6 to 8

STANDARD TURNING HEAD

5.8.6 The standard turning head for a residential area is designed for the turning of most service type vehicles found in residential areas (see Figures 2 to 5).

INDUSTRIAL TURNING HEAD

5.8.7 The industrial type turning head is for use in industrial and commercial areas. It should be noted, however, due to the large size of turning head required and the associated difficulty in turning large vehicles that service of access roads in commercial and industrial areas are better looped where possible (see Figures 9 to 12).

CLEARANCES

5.8.8 A 1.8m clearance strip in the form of a verge or footway is required all round turning heads (Figures 1 to 5 and 9 to 12) except where shown as 2m for industrial turning heads (Figures 9 to 12), and will be constructed as forming part of the road. In certain circumstances at the discretion of the Planning & Transportation Department part of the clearance strip may be reduced to an absolute minimum of 1m, but the clearance strip of 1.8m or 2m at the ends of the arms of 'T' shaped turning heads should never be reduced. On circular turning heads no reduction of the 1.8m clearance strip will be accepted.

BUS TURNING HEADS

5.8.9 The turning requirements for buses should be based on industrial turning heads.

ALTERNATIVE TURNING HEADS IN SHORT CULS-DE-SAC AND MINOR ROADS

5.8.10 The use of less formal shapes for turning heads on Short Culs-de-sac and Minor Roads may be acceptable to the Council. This has been indicated in the Figures 13, 14, 15 and 16. Note that the shape should still maintain the basic turning head dimensions. A 1.8m wide margin for overhang and possible overriding must also be provided.

PROVISION OF TURNING FACILITIES IN SHORT CULS-DE-SAC AND COURTYARDS

5.8.11 In certain circumstances where Culs-de-sac do not exceed 45m and connect to Minor Roads, lightly trafficked General Roads or extended legs of major turning heads, the need for a full turning facility may be waived.

5.8.12 An alternative turning head shape for the above situation to cater primarily for private cars is shown below (see Figure 1).

MINIMUM TURNING HEADS FOR CARS

5.8.13 The smallest turning head is designed to take the theoretical turning envelope of a standard car 4.8 m long. This design is a practical minimum and consequently where feasible the turning head should be enlarged to make the manoeuvre more acceptable. It is necessary for a 0.5 m clearance strip to be provided around the turning heads for cars.

5.8.14 These turning heads are specifically required where access is to be directly onto a road of Categories 1 to 4. They are generally desirable for reasons of traffic safety to enable a car to enter or leave a road in a forward direction and to prevent manoeuvres that would impede the free flow of traffic.

5.9 LAY-BYS AND BUS BAYS

5.9.1 Lay-bys are introduced to maintain the free flow of traffic by eliminating standing vehicles on carriageways. In general, they are required on roads of Category 1, 2 or 3. Where lay-bys are paired on single carriageways they should be staggered or displaced in the direction of traffic flow.

5.9.2 The crossfall of the carriageway should normally be carried through the lay-by so as not to form a drainage channel between the carriageway and lay-by.

5.9.3 Footpath provision around a bus bay should be sufficient to allow for the erection of a bus shelter. Guidance will be given on appropriate dimensions.

5.10 PASSING PLACES

5.10.1 The dimensions given in Figure 18 for passing places may not always be obtainable due to physical restrictions. At critical

locations where intervisibility is the prime requirement, such as on bends, Planning and Transportation should be consulted.

5.11 ROAD MARKINGS AND TRAFFIC SIGNS

5.11.1 Road Markings and Traffic Signs are to be provided by the Developer and should be in accordance with Chapter 5 of Scottish Development Department, Traffic Signs Manual 1985.

5.11.2 The final details of markings and signs are to be agreed with the Planning & Transportation Department.

5.12 SERVICING ARRANGEMENTS TO COMMERCIAL DEVELOPMENTS

GENERAL

5.12.1 This section relates to typical requirements for the servicing of all types of development including business, shopping, commercial and industrial development. Service areas in new developments should be off-street and to the rear. While it is appreciated that adequate rear access may be difficult to achieve in the redevelopment of some gap sites using existing roads, generally the long term aim should be to segregate servicing from pedestrian areas and the public road.

5.12.2 Service areas should be large enough and so arranged that all vehicles enter and leave in a forward direction, and turning and reversing movements are confined to areas off the public road and away from pedestrian activity. Steps should also be taken to avoid the problems of indiscriminate car parking in servicing areas.

LOADING BAYS: GENERAL

5.12.3 The maximum dimensions of goods vehicles built in this country are currently 11m x 2.5m for rigid wheelbase and 15m x 2.5m for articulated vehicles. Loads on platforms may overhang by 0.3m on each side and, allowing for doors opening, the basic design module for loading bays is 3.3m wide and of variable length depending on the type of vehicle. While there is no regulation governing maximum height, most vehicles do not have a greater overall height than 4.5m. 5.1m headroom is recommended and is necessary for prospectively maintainable roads.

SIDE LOADING BAYS

5.12.4 Service road carriageways should have a nominal width of 7.3m for two way operation and this should be widened to 12m where there are service bays on both sides of the carriageway. Where the circulation within the services area is one-way, these dimensions can be reduced to 6m and 9m respectively (see Figure 33).

END LOADING BAYS

5.12.5 Typical minimum dimensions for end-on loading bays suitable for most service vehicles in the range up to 8-10m long (based on the recommendations of the Freight Transport Association and allowing room to manoeuvre and shunt) are shown in Figures 34 and 35.

5.12.6 The total depth required can be reduced where vehicles are parked at an angle with a saw-tooth loading deck but this arrangement

is only appropriate when used with one-way circulatory service roads.

5.12.7 The depth of the bays will have to be increased to the dimensions shown in brackets to accommodate articulated vehicles up to 15m long.

5.12.8 Where bays are interrupted by columns supporting overhead structures, the spacing should be a multiple of the 3.3m module plus the thickness of the column.

SERVICE ROADS AND RAMPS

5.12.9 The gradient of straight ramps should not exceed 1 in 10 with a transitional grade of 1 in 20 at the break of slope. Care should be taken with headroom, where ramps are involved, to allow for the bridging effect of long high vehicles. The clearance at breaks of slopes may require to be considerably greater than the nominal 5.1m.

5.12.10 Curved service roads/ramps particularly where two way operation is involved, should be widened to allow for the swing of the inner rear wheel and the gradient of such ramps should be eased to 1 in 14.5 on the inner kerbline. See Figure 36.

5.12.11Reference should be made to the Department of Transport guidance document, 'Inclusive Mobility - A Guide to Best Practice on Access to Pedestrians and Transport Infrastructure' and 'BS 8300: Design of buildings and their approaches to meet the needs of disabled people - Code of practice.'

5.13 BUS OPERATIONS

5.13.1 In planning major new housing developments, the need to provide or augment local bus services will have an effect on road layout, widths and corner radii and on the disposition of footways. Bus routes, in order to be attractive must be reasonably fast and direct and connect the centres 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 other roads, suitably widened if required. The relationship of development to any road used as a bus route should be such that development extends to no more than 200-300m on each side. This should mean in practice that no house is more than 400m from the nearest bus stop where these are spaced at 2-3 to the kilometre. The minimum width of carriageway for two-way operation of buses in new developments should be 7.3m.

5.13.2 If extensive measures to aid buses are already in existence in the town centre and elsewhere, or are planned, it is important to ensure that the benefits from these measures are not eroded by poor facilities in new residential areas.

5.13.3 Suitable bus routes should be ready in time to encourage, and help establish, the use of public transport as much as possible.

5.13.4 Mutual benefit can be obtained from regular informal contact between the developer, the Planning & Transportation Department and the bus operators. Thus timely warning will be given of significant proposals for large residential developments requiring bus services. The bus operators can also discuss with the Planning

& Transportation Department any changes in their existing services which they may be contemplating and which may be relevant to a particular housing development under consideration.

5.13.5 The location of local centres, clinics, old people's homes, schools, shops and other areas of concentrated use should be planned to follow a reasonably direct route easily accessible by bus services.

5.13.6 Any roundabouts or turning circles likely to be used by buses making a 360° turn should have a 24m diameter outside swept circle and a minimum inside diameter of 8m to allow for tracking of rear wheels.

5.13.7 It is important to provide turning facilities when a large housing estate is growing even although the route may only be partially established. A service can then be provided and extended in pace with the development. Such turning facilities can take the form of a temporary adaptation of the developing road system.

FIRE FIGHTING

5.13.8 The widths of carriageways and reinforced emergency vehicle paths and their proximity to buildings is detailed on Part E of the Building Standards (Scotland) Regulations. These regulations specify a minimum clear width of 3.7m adjacent to low rise dwellings to facilitate the use of pumping appliances. The design of Minor Roads must be determined with these requirements in mind. Where buildings are 11m or more in height the special requirements for road layout and widths detailed in the above Regulations must be adhered to.

REFUSE COLLECTION

5.13.9 The Building Standards (Scotland) Regulations permit a maximum carry distance for dustbins of 46m. However, British Standard Code of Practice, CP306, suggests a maximum carry distance of 25m and it is recommended that this standard be adopted as far as possible. The size of vehicle used by local cleansing authorities varies but the widths are usually in the range 2.1 to 2.3m and the turning circle less than the 24m size of the standard turning circle in these guidelines.

GULLY EMPTYING

5.13.10 The location of gullies on narrow Minor Roads should have regard to the effect gully emptying vehicles have in blocking the carriageway when clearing the gullies.

WINTER ROAD MAINTENANCE

5.13.11 The operation of winter maintenance vehicles should be kept in mind in planning the layouts and gradients of Minor Roads and Loop Roads.

5.13.12 Where footways or footpaths have gradients greater than 8%, the developer shall provide a grit bin sited on a suitable hardstanding at a location to be agreed with the Planning & Transportation Department.

5.13.13 The developer must arrange for the grit bin to be serviced (either by himself or on a rechargeable basis by the Planning & Transportation Department) until the end of the maintenance period.

VERGES, VISIBILITY SPLAYS AND SERVICE STRIPS – RIGHTS OF THE LOCAL ROADS AUTHORITY AND STATUTORY UNDERTAKERS

5.13.14 Where verges, visibility splays and service strips within the road are contiguous with private gardens special attention will be required to ensure that the rights of the Council and Statutory Undertakers are fully understood by householders and tenants. At the same time it has to be borne in mind that one of the objectives behind the introduction of such roads as Minor Roads and Short Culs-de-Sac is the closer integration of public and private landscaped areas by encouraging householders and tenants to look after service strips right up to the edge of the paved areas.

5.13.15 Much can also be achieved by careful attention to landscaping details to assist Statutory Undertakers, such as setted or cobbled areas to highlight the location of stop cocks, hydrants, manhole covers, etc. Householders and tenants must be made fully aware that the building of walls and fences or the planting of deep rooted trees, shrubs and hedges within the demarked service strip area is prohibited and also that Statutory Undertakers may excavate these underground services at any time. This can be achieved by means of a condition on the missives of the affected property, or the Statutory Undertakers may wish to attach warning notices to meter boards at such properties.

5.13.16 Demarcation of service strips should be in the form of 152 x 51mm precast concrete heel kerbs laid with 51mm face flush with the ground surface level at spacings to be agreed with the Planning and Transportation Department.

TRAFFIC NOISE

5.13.17 New houses should be designed in accordance with Design Bulletin 26 New Housing and Road Traffic Noise (HMSO). 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 system to accommodate the proposed development
(d) Any alterations or additions to the road system likely to be undertaken by the Roads Authority within a five year period or included in an approved Structure Plan or Local Plan

5.13.18 The developer should also check with the Trunk Road Authority through the Scottish Executive Trunk Road Network Management Division, Victoria Quay, Edinburgh, whether or not there are any trunk road proposals which should be taken into account in designing for traffic noise.

5.13.19 Where existing roads are incorporated into a new housing development care should be taken to ensure that traffic noise levels do not exceed the specified level contained in the Noise Insulation (Scotland) Regulations 1975.

NEEDS OF THE ELDERLY AND DISABLED

5.13.20 While it will not always be practicable to plan any residential area so that it is entirely convenient for disabled and elderly people

– to ensure for example that there are no difficult gradients for wheelchair users – many practical arrangements can be made which will be of positive benefit. Reference should be made to the Department of Transport guidance document, "Inclusive Mobility - A Guide to Best Practice on Access to Pedestrians and Transport Infrastructure" and BS 8300 : Design of buildings and their approaches to meet the needs of disabled people - code of practice.

5.13.21 At road junctions and locations where pedestrians will be crossing residential roads pavement kerbs must be dropped and the pavement ramped to assist wheelchair users.

5.13.22 Observance of the recommendations relating to forward visibility along carriageways will generally be advantageous to people who are deaf or hard of hearing so that they are aware of vehicle hazards and so that drivers of vehicles can see them well in advance.

5.14 STATUTORY UNDERTAKERS

5.14.1 The New Road and Street Works Act 1991 gives Statutory Undertakers the right to lay apparatus in public roads and other land. If the adopted road or public open spaces are insufficient for Statutory Undertakers needs the secure easements must be provided for other routes.

5.14.2 While it is preferable to minimise installation and maintenance costs and the disruption which can be caused by repairs by laying services outside carriageways, there will be some situations where the use of carriageways for this purpose cannot be economically avoided. In this instance, even though services usually follow the side of the carriageway from which most dwellings are served, branch crossings may be required and these must be ducted if required by the utility service. Similarly there may be situations where no verges or footways are provided alongside carriageways and where services must unavoidably be situated under the carriageway, or within private curtilages, with safeguards which are acceptable to the Statutory Undertakers.

5.14.3 The vertical and horizontal configuration of carriageways, footways, verges and footpaths may be constrained by requirements such as those for the length and diameter of sewers, water pipes, and gas pipe bends, the need to avoid dead ends for electricity and water services, and the need to lay gas services so that leakages will not cause a hazard.

5.14.4 Water and gas are less flexible than other services as individual pipes tend to be several metres in length and, if bends are sharp, special radius pipes are required, resulting in reduced pressure, and extra cost is incurred. Water and Drainage Authorities are particularly concerned about the proximity of plants to their mains as roots are attracted to them. Certain species of tree can be particularly harmful to water mains. An additional problem is the difficulty of detecting leaks if mains lie under ground covered with plants and shrubs.

5.14.5 Certain Statutory Undertakers sometimes have local agreements to share the same trench with an agreed horizontal clearance between the services.

5.14.6 Ready access must, of course, 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 electricity sub-stations, telecommunication junction boxes, and gas governor house installations. Fire hydrants must also be situated to suit fire requirements and the possibility of vehicles being parked on top of them must be avoided.

5.14.7 Where possible, sewers under carriageways should be confined to a corridor 1.5m from kerbline to allow working space and safety zones required under the "Safety at Street Works and Road Works Code of Practice".

5.15 STREET LIGHTING

5.15.1 The installation provided will, in all respects, be acceptable to the Council and must be designed and constructed to comply with the current Regulations for Electrical Installations (16th Edition), BS7671 published by the Institution of Electrical Engineers, London and the British Standards Institution and (BS 5489), Code of Practice for the Design of Road Lighting.

5.15.2 The level of the road hierarchy shall determine the lighting and type requirements subject to any amending requirements which shall reasonably be required by the Council's Street Lighting Section.

5.15.3 The developer may design the installation or alternatively, at the request of the developer, the Director of Planning and Transportation will at nominal cost provide a road lighting design and associated electrical design. Street lighting layout drawings will be at a scale of 1:500 and be submitted in CAD format compatible with Ordnance Survey mapping. Any other drawings will be at a scale appropriate to the information shown, also in CAD format. A listing of approved materials and equipment to be used will be supplied separately or as part of these drawings. Two paper copies plus a compact disc are required to be submitted by developers if they are submitting their own design.

5.15.4 Where a design is undertaken by the Developer, the road lighting design must be a corporate member of the Institution of Lighting Engineer. The electrical designer must be Incorporate or chartered Engineer with a qualification in design to BS 7671. Details of appropriate registrations must be included in the design certificate. Developer's designs must be agreed prior to formal issue of Construction Consent.

5.15.5 If the developer chooses to utilise the Council's own non-profit making internal design service, the developer shall supply the most up to date agreed road layout showing constraints, such as driveways and trees and elevations showing windows and other features which may interact with street lighting.

5.15.6 Any subsequent requests for changes are likely to incur additional design charges. Drawings are to be supplied in AUTOCad © format (Scale 1:500).

5.15.7 Whether the design is undertaken by the Developer or the Council, the Developer or his agent must arrange a meeting with the Council's Street Lighting Section to agree conditions and have the design brief approved. It is the Developer's responsibility to consult the Council's Traffic Section to determine any requirements for illuminated signage which must be included as part of the design and discussions.

5.15.8 All street lighting designs must be approved by Dundee City Council before construction consent is granted.

5.15.9 The Developer must advise all potential house purchasers of the position of street furniture to avoid future disputes. Once a design has been agreed, any changes at the request of the Developer or a purchaser must be approved by the Council's Street Lighting section. All costs associated with agreed design amendments and changes in position will be borne by the developer.

5.15.10 In instances where the lighting associated with a modification or new development involves work on existing contiguous Council equipment, this work will be carried out by the Council at the Developer's expense. This includes equipment which is to be removed as a result of the development.

It is the Developer's responsibility to inform the Council that work is about to begin and to arrange for the Council to make safe and remove any redundant equipment ***before*** any site work is started.

Developers are encouraged to use Dundee City Council's non-profit design and installation service, especially where this will result in a street lighting system which integrates more effectively with existing lighting.

5.15.11 It will be the Developer's responsibility to ensure that all site operatives are aware of any Council street lighting equipment and cables on or adjacent to the site. The Developer will ensure that appropriate action is taken to avoid damage to such equipment and that no danger to the public or site workers arises from activities in proximity to street lighting equipment. The Developer will immediately inform the Council's Street Lighting section of any damage to street lighting equipment or hazard relating to it caused by site activities.

5.15 ROAD STRUCTURES

5.15.1 The design of highway structures shall be carried out in accordance with the guidelines set out in Appendix A - Technical Approval for Highway Structures.

6 TRAFFIC CALMING

6.1 GENERAL

6.1.1 There are many texts in the UK and overseas which explain the various aspects and design issues in relation to traffic calming schemes. In order to provide some guidance to developers discussing traffic calming designs in Dundee, this section provides guidance on the approach taken by the Planning & Transportation Department to some of the key aspects.

Horizontal Deflections

6.1.2 The Planning & Transportation Department uses the following definitions [refer to the Roads (Traffic Calming) (Scotland) Regulations 1994]:

(i) 'build-out' – an extension of, or a work adjacent to, the verge, footway or cycle track as a means to narrow the carriageway on one side.

(ii) 'chicane' - a series of two or more build-outs constructed on alternate sides of a carriageway and not opposite one another.

(iii) pinch-point' - build-outs constructed on both sides of the carriageway opposite one another

(iv) 'island' –(for the purpose of traffic calming only and not as a pedestrian refuge) .- a work without facilities for pedestrians constructed in a carriageway to reduce carriageway width or to deflect the flow of vehicular traffic.

(v) 'overrun area' – an area of carriageway so constructed of textured or coloured material as to appear to narrow that carriageway.

(vi) 'rumble device' – a part of the carriageway constructed of materials intended to generate noise or vibration in a vehicle passing over it. Rumble devices can be up to 20mm in height but no vertical face should be greater than 6mm. See 6.3 (c)

(vii)'gateway' – aspect of traffic calming scheme intended to convey to drivers that they are about to enter a section of road which is different in character where they should reduce their speed.

6.1.3 The above features can be used in combination to form traffic calming measures. Such measures must comply with the Roads (Traffic Calming)(Scotland) Regulations 1994 and amendments (1999), created under the Traffic Calming Act 1992. Works that do not conform to requirements imposed by the Roads(Traffic Calming)(Scotland)Regulations 1994 will be treated as illegal obstructions in the road.


No treatment


Buildout


Chicane


Pinch Point


Overrun Area


Rumble Strips


Home Zone

Examples	Type	Typical Hierarchy Category
Road humps	Round top Flat top	4,5 [excludes bus routes] 4,5[excludes bus routes]
Speed cushions		bus routes (3)* [4 or 5 if buses or coaches]
Speed tables		bus routes (3)*,4,5 as part of speed reducing measures [check length for buses]
Narrowings	Pinch points Build-outs Traffic Calming Refuges (non- pedestrian)	4,5 3*,4,5 3*,4,5
Chicanes		4,5
Mini-roundabouts		3 (bus routes)*,4,5
Visual effects	Road markings	
	Surface treatments	3*,4,5
Road closures		4,5
Gateways		4
20mph limit	zones	4 (type 2)
	mandatory limit	school frontages*

Notes:

1. Consult with Planning and Transportation Department, DCC for all traffic calming proposals on Categories 2, 3, 4 (type 1) and items above shown *.
2. Typical Categories are shown. Planning and Transportation Department reserve the right to re-assess appropriate measures if necessary.

6.2 VERTICAL DEFLECTIONS

6.2.1 Vertical deflections are a means of controlling speeds after they have been reduced to a desired level. A speed reducing measure is essential prior to the approach of the first road hump e.g a bend of sufficient degree or a junction. The speed reducing feature must ensure the 85th percentile speed of a light vehicle on the immediate approach to the road hump will not exceed 30 mph.

6.2.2 Road humps must comply with the Road Humps (Scotland) Regulations 1998 created under the Roads(Scotland) Act 1984. Works that do not conform to the regulations will be treated as illegal obstructions in the road.

6.2.3 In recent years there has been some local experience of both the implementation and performance of traffic calming measures in Dundee. In the light of this experience The Planning & Transportation

Department has considered the appropriateness of the various traffic calming features within its own road hierarchy. The table overleaf illustrates the present thinking in this regard.

6.3 SCHEME DETAILS – KEY POINTS

6.3.1 There are a number of key points which the Planning & Transportation Department would draw to the attention of all developers intending to implement traffic calming schemes in Dundee. These points (in no particular order of significance) are as follows:

(a) Dundee City Council, Planning and Transportation Department, Traffic Section should be consulted on all traffic calming proposals.

(b) Consideration should be made of the spacing of traffic calming features and resulting speeds between features especially where 20mph may be envisaged in the future.

(c) Rumble devices are effective to alert drivers of a change in the road layout but should not be used in urban areas due to the generated noise. In some locations they are not recommended within 200m of residential property.

(d) Build-outs and pinch points can be used to narrow the road to single carriageway operation and require a priority traffic management system. Such measures can be effective under moderate, balanced traffic flow conditions.

(e) Low flows without opposing traffic may result in aggressive driver behaviour.

(f) Chicanes are less effective on routes where access is required by large vehicles.

(g) Bus operators are opposed to the use of road humps on bus routes. Objections may also be received if humps are placed on diversion routes. Similarly, humps should not be used on routes commonly used by emergency services. Consideration should be given for the use of road cushions in such circumstances, subject to approval.

(h) Road cushions should be avoided within 20 metres of a bus stop, unless bus boarders are provided.
If designing short lengths of narrow road consideration should be given for future maintenance of the carriageway including drainage, utilities and lighting.

(i) No vertical face of any traffic calming feature should exceed 6mm.

(j) Road humps should not exceed 100mm which is the maximum permitted height stated in the regulations

(k) A road hump must be at right angles to the centre of the carriageway

(l) A road hump should not be sited within the limits of a controlled area, or within 30metres from the centre line, of a pelican, puffin or zebra crossing.

(m) Overrun areas should be designed to comply with the tolerances shown in the traffic calming regulations and sited away from pedestrian crossing points.

6.4 FORMAL CONSULTATION

6.4.1 There is a statutory requirement to consult on traffic calming schemes (with or without road humps). Regulations state the

following must be consulted:

(a) the chief officer of police for the area in which the road concerned is situated
(b) the local authority in whose area the road is situated
(c) the fire authority in whose area the road concerned is situated
(d) the Scottish Ambulance Service NHS Trust
(e) such persons or organisations representing persons who use the road concerned or who are otherwise likely to be affected by the traffic calming works/road hump - 'as the Planning & Transportation Department think fit'.

6.4.2 The Council has a standing list of consultees for such works including bus operators, taxi associations, access groups, community councils, road haulage associations, statutory undertakers, etc.. Frontagers should always be consulted. Public notices should be placed in the press and site notices erected giving information of the intention to install traffic calming measures (Section 37, Roads(Scotland)Act 1984). The notices should contain information where scheme proposals can be viewed and the closing date for receipt of objections. The period of consultation should not be less than 28 days. Committee approval is required prior to proceeding with the works

6.5 LIGHTING FOR ROAD HUMPS

6.5.1 There must be an adequate system of carriageway lighting in the vicinity of a road hump. Minimum standards are specified in chapter 4 of the Road Hump (Scotland) Regulations 1998.

6.6 SIGNING

6.6.1 Warning signs as prescribed in the Traffic Signs Regulations must be placed at appropriate locations as the Planning & Transportation Department considers requisite for the purpose of proving adequate warning of the presence of a road hump (unless constructed on a road which is 20 miles per hour zone).

6.6.2 Where a traffic calming feature is constructed in a road, traffic signs must be placed to provide adequate warning, unless the works are so constructed to give adequate visual warning or constructed in a road which is in a 20 mph zone (refer to Road Humps and Traffic Calming (Scotland) Amendment Regulations 1999).

6.7 JUNCTIONS
GENERAL

6.7.1 Junctions between accesses and public roads will in general be of a private nature and will not be adopted for maintenance purposes beyond the boundary of the public road with which the access forms a junction.

6.7.2 The type of junction to be used varies according to the nature of the development and road classification. Basic types of junction are detailed in Figures 22 to 29.

The junction layouts A-E in figures 22 to 29 represent acceptable types of junctions.

DEVELOPMENT TYPE	ROAD CATEGORY				
	5	4	3	2	1
Single dwelling	A	B	B	B	B
2-5 Dwellings	B	B	C	C	C
School	D	D	D	E	E
Office (up to 5 parking spaces)	B	B/C	C/D	C/D	C/D
Office (over 5 parking spaces)	C/D	D	D	D/E	D/E
Shopping Centre	N/A	E	E	E	E
Industrial	N/A	E	E	E	E
Hotel, Pub, Etc	E	E	E	E	E

6.7.3 Gates, pillars, fences, etc must not impair visibility within the appropriate sight line areas.

6.7.4 Gates shall be set back to allow all vehicles to sit completely off the road and footway when the gates are closed. Gates should open inwards so as to cause no obstruction to the public road or footway.

SIGHT LINES

6.7.5 The principles for sight lines applied to junctions are the same as those given in Section 5.2.

6.7.6 The 'y' distances for different categories of road are those given in the tables below.

VISIBILITY DISTANCE

Type Of Major Road	Design Speed kph	Desired Visibility Distance X metres	Y metres
Primary Distributor	100 85 70(min)	9 9 9	215 160 120
District Distributor	60 50	9 9	90 70
Local Distributor	50	9	70
Minor Road	50	9	60

'x' distances are modified according to the type of junction as given below

Type of Junction	x distance (metres) Desirable	Minimum
A & B	2.4	2.4
C & D	6.0	2.4
E	9.0	4.5

GRADIENTS

6.7.7 The gradient along the first 10 metres of an access should

desirably be 1 in 30 particularly where the higher categories of road or types of junction are concerned. This may be relaxed to 1 in 15 over the first 10 metres for junction types C, D and E on road categories 1, 2 and 3. This shall be regarded as the absolute maximum gradient.

6.7.8 For junction types A and B on road categories 4 and 5, a gradient of 1 in 10 should be regarded as the absolute maximum however, care should be taken to avoid sharp changes in gradients where vehicles may bottom.

EMERGENCY ACCESS

6.7.9 Design must take account of emergency services requiring free access on a 24 hour basis. Occasional use vehicle paths should be a minimum of 3 m wide. For specific comments on individual development applications, reference should be made to the Police, Fire and Ambulance Services.

6.7.10 Type of junction generally required in accordance with type of development and road classification (see Table 6 with regard to frontage access).

6.8 PARKING

GENERAL

6.8.1 In general off street parking must be provided for all new developments and the location of the parking must be both convenient and effective. The amount and nature of the parking element will depend upon the type and location of the development. Tables in sections 6.8.15 to 6.8.20 should be taken as a maximum allowance to the parking requirements of Dundee City Council although the actual provision will depend upon local conditions and further advice should be sought from the Planning & Transportation Department. It should be noted that the figures in this table conform with the Scottish Executive standards set in the draft SPP17 document where applicable.

PARKING DESIGN MODULES

6.8.2 The minimum parking bay measures 2.5m x 5m.

6.8.3 Where a proposed parking bay has a fence, wall or other obstruction along its longitudinal boundary the width shall be increased to 3m.

6.8.4 Where parking is parallel to the direction of flow, the length of the bay should be increased to a minimum of 6m ie parking bay size of 2.5m x 6m.

6.8.5 Where parking bays are provided for disabled or parent & child spaces, the minimum bay width should be increased to 3.3m.

6.8.6 Parking angled to the carriageway will not be permitted where the Planning & Transportation Department considers that the extra manoeuvring required will endanger passing traffic or impede free traffic flow. Where such parking bays are permitted they shall be located to the rear of the heel line of the footway outwith the road boundary.

INDUSTRIAL/COMMERCIAL/SHOPPING DEVELOPMENTS

6.8.7 Car parking provided for these development types are generally in the form of surface or multi-storey car parks. A minimum aisle width of 6 metres shall be provided to allow cars to manoeuvre comfortably in and out of the bays. The number of spaces provided shall be based on Tables in section 6.18.16 to 6.18.19 but the layout will depend upon the operational requirements, particularly where it is proposed to charge for parking by means of ticket barriers. Although in general parking areas will not be adopted by Dundee City Council, it is strongly recommended that early discussions are held with Planning & Transportation regarding the layout of any proposed parking area.

PARKING IN DUNDEE CITY CENTRE AND OTHER URBAN AREAS

6.8.8 The level of commuter car parking provided in the Controlled Parking Zone (CPZ) around the city centre has to be restricted in accordance with the capacity of the existing or proposed road network. Any proposed increase on this must be formally agreed with the Planning & Transportation Department.

6.8.9 New parking areas may be acceptable in urban centres where they are found to be consistent with the overall relationship between road capacity and parking needs. All newly provided parking areas would have to operate in accordance with the terms and conditions prevailing for other public car parking in the vicinity, or general area, of the proposal and, where applicable, pricing and operating times must be formally agreed with the Planning & Transportation Department.

PARKING IN RESIDENTIAL DEVELOPMENTS
GENERAL

6.8.10 Residential parking provision shall not only allow for present demand but also an assessment of future changes in car ownership and usage shall be made. While the area of hardstanding initially provided does not necessarily have to allow for this predicted demand the scope for expansion of parking areas should be made clear and reserved for future use.

6.8.11 In general, adequate visitor off street parking should be provided adjacent to all new housing developments. The relationship between pedestrian access to dwellings and the road network should desirably be such that it is easier and more convenient to use the designated parking areas than to park casually on the street. This applies mainly to communal parking areas although consideration should also be given to this matter where individual dwellings have parking spaces within the curtilage.

6.8.12 Parked vehicles can be particularly intrusive in the residential environment and it is desirable for there to be an element of screening of the actual parking spaces either by the judicious use of landscaping or by setting them behind the building line. Communal parking places in some areas are subject to antisocial behaviour which is detrimental to their use by residents who prefer to keep their cars in view. Parking provision within the curtilage obviates many of the problems and can be cheaper to construct.

6.8.13 Where individual garages, or car-ports, are provided adjacent to buildings they shall be set back a minimum of 6 metres from the heel line of the footway, verge or service strip. This provides space for car washing purposes, allows garage doors to be opened while the car is in the drive and allows adequate sightlines.

6.8.14 Where parking bays are proposed on road categories 4 and 5, they should be set not less than 20 metres from any junction. The bays should be at right angles to the road and should be set to the rear of the footway, verge or service strip and have a change in surface treatment from the road (eg. Different colour of embedded chippings).

6.8.15 Private Housing

Development	Appropriate Provision	Comments
City Centre	1 space per dwelling.	Exceptions may be made for conversions, car free schemes or where provision is impractical.
Inner City and Central Broughty Ferry	Houses : all tenures, at least 1 space within the curtilage of each house. In addition 40% of private houses should have a garage or space for one. Where on-street parking is a problem, 30% visitor parking space should be provided.	
	Flats : private flats should have 130%; social rented 100%.	Provision at flats may be increased or decreased in light of on-street parking provision nearby. Innovative design solutions incorporating secure parking will be encouraged.
Suburban - fewer than 3 bedrooms	At least 1 space per dwelling. 50% of houses should have a garage or space for one.	Visitor parking needs will be assessed on the basis of existing local provision.
Suburban - 3 bedrooms or more	At least 2 spaces per dwelling. 50% of houses should have a garage or space for one.	Visitor parking needs will be assessed on the basis of existing local provision.
Suburban - Flats	A minimum of 150% car parking should be provided with at least one space dedicated to each flat.	Provision may be increased or decreased in light of on-street parking provision nearby. Innovative design solutions incorporating secure parking will be encouraged.
Villages	2 spaces plus a garage per dwelling. 50% of garages should be double garages.	
Sheltered Housing	1 space per 2 dwellings.	This may be increased to 1 space per dwelling in parking sensitive areas.
Nursing Homes	1 space per 6 residents plus 1 space per 2 staff members.	

6.8.16 Retail

Development	Appropriate Provision	Comments
Retail - Food (less than 1,000m^2)	3 spaces per 100m^2. Disabled : 3 spaces or 6% of above whichever is greater.	Exceptions may be made if development is in or adjacent to City Centre.
Retail - Non Food (less than 1,000m^2)	3-7 spaces per 100m^2. Disabled : 3 spaces or 6% of above whichever is greater.	Number within range dependant on site specific details.
Retail - Non Food (more than 1,000m^2)	1 space per 20m^2. Disabled : 3 spaces or 6% of above whichever is greater.	
Cash and Carry Warehouse	5 spaces per 100m^2 GFA. Disabled : 3 spaces.	

6.8.17 Business

Development	Appropriate Provision	Comments
Offices - City Centre	No private parking provision to be provided.	Parking for disabled or service/delivery vehicles to be assessed on local conditions.
Offices - less than 2,500m^2 GFA	2-5 spaces per 100m^2. Disabled : 1 space per disabled employee plus 2 spaces or 5% of above whichever is greater.	Number within range dependant on site specific details.
Offices - more than 2,500m^2 GFA	1 space per 30m^2. Disabled : 1 space per disabled employee plus 2 spaces or 5% of above whichever is greater.	

6.8.18 Industrial

Development	Appropriate Provision	Comments
All City Centre	No private parking provision to be provided.	Parking for disabled or service/delivery vehicles to be assessed on local conditions.
Factories and Warehouses	1 space per 100m^2 GFA. Disabled : 1 space per disabled employee plus 2 spaces or 5% of above whichever is greater.	
Business / Science Park	2 spaces per 100m^2 GFA. Disabled : 1 space per disabled employee plus 2 spaces or 5% of above whichever is greater.	

6.8.19 Leisure / Services

Development	Appropriate Provision	Comments
Cafe / Restaurant	20 spaces per 100m^2 GFA. Disabled : 3 spaces or 6% of above whichever is greater.	
Fast Food Restaurant	1 space per 10m^2 GFA. Disabled : 3 spaces or 6% of above whichever is greater.	
Public House	1 space per 100m^2 GFA. Disabled : 3 spaces or 6% of above whichever is greater.	
Cinema / Bingo Hall / Theatre / Concert Hall / Conference Facilities	1 space per 5 seats. Disabled : 3 spaces or 6% of above whichever is greater.	Exceptions may be made if development is in or adjacent to City Centre.
Hotels	1 space per room. Disabled : 3 spaces.	Exceptions may be made if development is in or adjacent to City Centre.
Stadia	1 space per 15 seats. Disabled : 3 spaces or 6% of above whichever is greater.	Specail provision required for provision of separate coach perking.
Health Centres	2 spaces per consulting room plus 1 space per staff member. Disabled : 3 spaces or 6% of above whichever is greater.	

6.8.20 Education

Development	Appropriate Provision	Comments
Nursery School - City Centre	No spaces required.	
Nursery School - Residential / Employment Area	1 space per 3 staff members.	
Primary School / Secondary School	1 space per 2 staff members	Provision within the site or directly adjacent should be made for buses.
College / Universtiy	1 space per 2 staff members plus 1 space per 15 students	Provision within the site should be made for buses.

6.8.21 Cycle Parking Requirements

Dundee City Council recommends that cycle lockers or fully enclosed/secure compounds be provided for users safety, security and protection from weather. Cycle stands should only be considered where it is demonstrated that lockers are inappropriate. Where cycle parking is proposed, CCTV should also be considered for security purposes.

Cycle Stands

Cycle stands should be 750mm high and a minimum of 700mm long. A desirable distance of 1 metre should be provided between the stands to accommodate 2 cycles per stand. Generally a space of 500mm shall be provided to each end of the stand to enable cycles to be easily removed.

Cycle Lockers

Cycle lockers should be of adequate size to accommodate bike and accessories and should provide weather protection. The lockers shall have minimum dimensions of: 750mm wide, 1900mm length and 1200mm height. There shall be a minimum space of 1.5 metres to the front of the locker for ease of access.

Adequate signing to indicate the location of the cycle parking must be provided.

6.8.22 Cycle Parking

Development	Appropriate Provision	Comments
General Housing	1 space per dwelling	
Student Residencies	1 space per 8 staff & residents	
Nursing Home/Sheltered Housing	1 space per 10 dwellings	
Office Developments	1 space per 400m² GFA	
Industrial Developments: Light Industrial General Industrial Warehouses	 1 space per 1000m² GFA 1 space per 2000m² GFA 1 space per 2000m² GFA	
Retail: Food - Out of Town Food - Town Centre Non Food - Out of Town Food - Town Centre Garden Centre	 1 space per 1000m² GFA 1 space per 500m² GFA 1 space per 2000m² GFA 1 space per 1000m² GFA 1 space per 1000m² GFA	
Hotel	1 space per 20 rooms	
Café/Public House/ Restaurant	1 space per 150m² Public Floor Area	
Function Rooms	1 space per 200m² Public Floor Area	
Cinema/Theatre	1 space per 100 seats	
Schools Universities/Colleges	1 space per 25 staff and pupils 1 space per 25 staff and pupils	Pupils assessed for secondary schools & primary 7 only
Hospitals/Health Centres/ Churches//Community Centres/Libraries	1 space per 8 parking spaces	

Note GFA - Gross Floor Area

7 CONSTRUCTION

7.1 GENERAL

GENERAL SPECIFICATION FOR PROSPECTIVELY MAINTAINABLE PUBLIC ROADS

7.1.1The Specification for roadworks in Dundee is the current edition of the Specification for Highway Works issued by HMSO as Volume 1 of the Manual of Contract Documents for Highway Works (MCDHW). Should any supplementary clause herein conflict, or be inconsistent with any provision of the current specification the supplementary clause shall always prevail. The Director of Planning and Transportation may, at his discretion, add or delete supplementary clauses from time to time.

RECYCLED AND INNOVATIVE PRODUCTS AND TECHNIQUES

7.1.2 The above Specification for Highway Works permits a wide range of reclaimed materials and encourages their widest application. Suitable materials may be those reclaimed from roads during reconstruction, from residues of industrial processes and from the demolition of other construction projects.

7.1.3 HD 35/04 Conservation and the Use of Secondary and Recycled Materials gives guidance on conservation techniques and the use of secondary and recycled materials that are currently permitted in the Specification (MCHW 1) and in the earthworks, drainage and pavement construction parts of the Design Manual for Roads and Bridges (DMRB 4.1, 4.2 and 7).

7.1.4 As stated elsewhere in this document, it is Council policy to encourage conservation and facilitate the use of reclaimed and marginal materials wherever possible. Where it is the intention of the developer to adopt the use of recycled, innovative or alternative materials and techniques not covered by the above Specification, this should be confirmed in his application on particular schemes with the Director of Planning and Transportation. A proposer-led certification process can then be followed, which may be subject to appropriate testing and certification, or the use of an alternative agreed specification.

INSPECTION AND TESTING

7.1.5 The developer or his nominated agent will be entirely responsible for meeting the required specification and the costs of testing the materials used in accordance with the appropriate British Standard, and submitting to the Director of Planning & Transportation copies of the test certificates or, if appropriate, reports. In addition, every facility shall be given to the Planning & Transportation Department to examine and test materials, samples being provided free of cost.

7.1.6 All street lighting systems, or any part of a system, must be tested and proved satisfactory in accordance with the requirements of BS 7671 before initial energisation. Further tests as required by same standard must be completed with the system energised before it is put into service. Testing must be done by an inspector registered with the National Inspection Council for Electrical Installation Contracting (NICEIC) who holds an appropriate current electrical

qualification. Testing must be witnessed by a representative of Dundee City Council's Street Lighting Section. A fully completed certificate of testing must be submitted to Dundee City Council.

7.2 TRAFFIC SAFETY AND CONTROL OF WORKS ON OR ADJACENT TO PUBLIC ROADS

GENERAL

7.2.1 All works of a temporary or permanent nature affecting public roads should be carried out in a manner not detrimental to the safety of users. The Developer must undertake a Risk Assessment in accordance with the CDM Regulations. Advice on the statutory requirements with regard to signing, guarding, lighting, depositing of skips or building materials and erection of scaffolding on the public road will be given by the Planning and Transportation Department.

TEMPORARY TRAFFIC MANAGEMENT

7.2.2 All temporary traffic management arrangements with works on or adjacent to the public road network must be agreed in advance with the Network Management Team.

7.2.3 Developers are advised to submit draft proposals which must be in accordance with the Code of Practice "Safety at Street Works and Road Works" at least 1 week in advance, after which advice and guidance will be given by the Planning and Transportation Department.

WATER, MUD, DEBRIS AND DUST ON PUBLIC ROADS

7.2.4 Public roads in the vicinity of the works must be kept free of water, oil, mud, debris and dust falling from vehicles or the wheels of vehicles connected with the works, or spreading from the works.

7.2.5 Where the deposit of water, mud, debris or dust is unavoidable, warning signs must be exhibited whilst work is in progress. The carriageways and footways affected must be kept clean to the satisfaction of the Planning & Transportation Department.

PROTECTION OF PEDESTRIANS

7.2.6 Footway or footpath obstructions can be a serious hazard to pedestrians, particularly to the aged, young or infirm, unless strict precautions are taken. Accordingly

(a) All obstructions and excavations on or near the footway must be barriered off at all times;

(b) Where the footway or verge is substantially obstructed, pedestrians must be provided with a safe passage fully protected from passing vehicles by barriers or devices which clearly indicate the obstruction to approaching drivers;

(c) All temporary pedestrian footways should be kept at least 1.5m wide, and have a well maintained level bituminous surface (surfacing material to be agreed with the Director of Planning & Transportation), kept clear of mud and debris at all times;

(d) All signing and guarding associated with the protection of pedestrians must be in accordance with the Code of Practice "Safety at Street Works and Road Works".

(e) Developers are reminded that should their temporary traffic management requirements involve or require temporary

traffic lights then an application for their use on the public road network must be made to the Planning and Transportation Department.

HOARDINGS ADJACENT TO OR WITHIN PUBLIC ROADS

7.2.7 Hoardings should be designed to protect road users from the activities of the works. Particular attention should be given to pedestrians by roofing over walkways where buildings are being constructed adjacent to the footway.

7.2.8 Where working room is limited on a site and developers intend to use part of the public road, prior approval must be obtained from the Planning and Transportation Department.

PROHIBITION OF USE OF THE PUBLIC ROAD

7.2.9 Existing public roads must not be used as sites for stock-piling and storing plant, vehicles, materials or equipment. In extreme circumstances the Council may agree to the use of the road for the depositing of certain materials, however the appropriate permit must be obtained from the Planning and Transportation Department.

SITING OF SKIPS AND SCAFFOLDING ON THE PUBLIC ROAD

7.2.10 Permission is required from the Network Management Team for the siting of skips and scaffolding on the public road. Appropriate permits may be obtained from the Customer Services desk on Floor 2, Tayside House, Crichton Street, Dundee

SIGNING OF WORKS ON PUBLIC ROADS

7.2.11 Where work has to be carried out on, or adjacent to, an existing public road or a road to which the public have access, the work will be carried out in accordance with The Code of Practice "Safety at Street Works and Road Works".

7.2.12 The developer must prepare and agree at least one week in advance of the works all their temporary traffic management requirements with the Planning and Transportation Department.

ROAD OPENING PERMITS

7.2.13 Where a developer or contractor has to open a public road or street, including verges, footways and footpaths for any purpose, he must before doing so obtain permission from the Network Management Team. Appropriate permits may be obtained from the Customer Services desk on Floor 2, Tayside House, Crichton Street, Dundee

CONTROL OF NOISE

7.2.14 The best practical means to prevent or reduce noise during the execution of work should be taken, including the use of effective silencers on power operated plant and equipment, and the use of a purpose-made muffler on any pneumatic breaker or drill. Where noisy equipment is proposed, its use must be agreed in advance with the Planning & Transportation Department and the Director of Environmental and Consumer Protection.

DEMOLITIONS

7.2.15 Where buildings are demolished adjacent or near to public roads steps must be taken to avoid or minimise damage to footways, carriageways and services. The developer or contractor will be liable for the cost of reinstatement if damage has been caused.

7.2.16 The positions of existing services should be checked with the relevant authority or Statutory Undertakers. When new roads are being constructed it is essential that all voids and drains etc, are located. When such are found they should be brought to the attention of the Planning & Transportation Department and Scottish Water representatives who will advise on the appropriate measures to be taken.

MAINTENANCE OF ACCESS

7.2.17 During construction of the works both vehicular and pedestrian access should be maintained at all times unless, in unavoidable circumstances, access is to be severed temporarily and only then with the permission of those affected.

7.2.18 Also the Planning & Transportation Department must be informed in writing, where an alternative means of access is involved, even on a temporary basis.

TEMPORARY ROAD CLOSURES

7.2.19 When contractors' works necessitate the temporary prohibition or restriction of traffic on roads, the contractor must notify the Network Management Team, who must be satisfied that there is no alternative to closing the road and that every effort has been made by the contractor in considering all other options.

7.2.20 The notification must be in writing at least six weeks before the date when it is desired to implement this requirement, except in cases of emergency, when the Network Management Team must be contacted immediately stating the reasons for and the estimated period of the proposed closure or traffic restriction. This is to enable the Council to promote a temporary Order in accordance with the provisions of Section 14 of the Roads Traffic Regulation Act, 1984, as amended.

7.2.21 It should be noted that a temporary Order made by the Local Roads Authority cannot exceed a period of 18 months duration unless an application is made to the Scottish Executive for the necessary authority to extend the closure period.

7.2.22 Developers should consult the Police and the Planning & Transportation Department where major roads or bus routes are involved in advance of the normal six weeks notice required for closures.

7.2.23 The emergency procedure referred to is where the Council is empowered under the 1984 Act to introduce traffic restrictions on a road or part of a road, by notice, for a period of up to 21 days duration. This action is only taken where there is a likelihood of danger to the public or of serious damage to the public road.

PROTECTION OF ROAD FURNITURE

7.2.24 Where items of existing road furniture, signs, lampstandards,

bus shelters etc are affected by new roadworks, they should be carefully removed, stored, and re-erected unless otherwise instructed by the Council, with adequate notice having been given to the Director of Planning & Transportation prior to such removal.

SITE SIGNING

7.2.25 No site or advertisements shall be attached to road furniture or erected on the public road (including verges, footways and footpaths).

7.2.26 Planning permission may be required for fixed signs or advertisements outwith the road boundary. The developer or contractor should consult the planning authority.

7.3 SITE PREPARATION

FORMATION LEVEL

7.3.1 The formation level of the carriageway and footway will be the appropriate depth below the finished level to accommodate the total thickness of surfacing, base and sub-base.

EXCAVATION AND FILLING

7.3.2 All turf and topsoil should be stripped from the whole area of the construction and the excavation carried down to the correct formation level. Any deposits of unsuitable material should be excavated and replaced with approved materials either taken from the excavations or imported from other sources. Any excess depth unnecessarily excavated below formation level should be backfilled with approved material. The filling should be deposited and firmly compacted in layers in accordance with the current MCDHW Specification compaction requirements.

7.3.3 Clays and silts outwith acceptable moisture contents must not be used as filling for embankments. No frost susceptible material will be permitted within 450mm of the road surface. If any depressions appear in the sub-grade during construction they should be filled with approved material, levelled and compacted. Provision must be made for keeping the formation free of water, sub-soil drains being laid where necessary. Where the nature of the soils at formation level is inadequate for providing a dry firm foundation, further excavation below formation level will be required and the material so removed should be replaced by approved material.

PROTECTION DURING CONSTRUCTION

7.3.4 In order to limit deterioration of the sub-grade, sub-base and roadbase, construction of each of these elements should follow one another with the minimum of delay. If this is not done the developer or contractor will risk having to carry out remedial work at his expense if deterioration occurs. For example, with some soils the ingress of water into the sub-grade results in an increased moisture content with a corresponding reduction in C.B.R. value leading to failure.

7.3.5 Where delays in carrying out elements of construction cause the growth of weeds, particularly associated with footpath construction, suitable weed eradication to the satisfaction of the Planning & Transportation Department should be carried out prior to work continuing.

TESTING OF MATERIALS

7.3.6 The Developer is responsible for carrying out adequate testing of all materials to be used on site. Examples of the tests required are given below but the Planning & Transportation Department reserves the right to request other tests where required at his discretion.

- CBR Test: In accordance with BS 1377:Part 4:1990

7.4 DESIGN DETAILS

GENERAL

7.4.1 While two main types of road construction design have been used in Dundee, incorporating either a dense bitumen macadam road (base) or a dry-bound macadam road (base), all other types of base construction contained in the current MCDHW Specification will be considered suitable. However, prior to their selection for intended use, the approval of the Council must be obtained at the design stage in order to establish the appropriate comparable standard.

CARRIAGEWAY CONSTRUCTION

7.4.2 The following construction standards have been compiled into two broad categories. It is clear, however, that the design must match the actual or projected traffic usage and, accordingly, provision should be made to meet the particular requirements such as for industrial access roads and routes carrying a substantial number of buses.

PRIMARY AND DISTRICT DISTRIBUTORS AND INDUSTRIAL ACCESS ROADS

40mm – Hot Rolled Asphalt Wearing Course(Surface Course) (cl 910)
60mm – Dense Macadam Basecourse(Binder Course) (cl 906)
150mm – Dense Macadam Roadbase(Base) (cl 903)
200mm – Granular Type 1 Sub-base (cl 803)

LOCAL DISTRIBUTORS, UNCLASSIFIED ROADS AND GENERAL ROADS

40mm – Hot Rolled Asphalt Wearing Course(Surface Course) (cl 910)
50mm – Dense Macadam Basecourse(Binder Course) (cl 906)
120mm – Dense Macadam Roadbase(Base) (cl 903)
240mm – Granular Type 1 Sub-base (cl 803)

7.4.3 The use of Stone Mastic Asphalt (SMA) as an alternative wearing (surface) course is permissible in some locations. Discussions with the Planning & Transportation Department should be held at an early stage if this alternative is proposed.

7.4.4 The construction standard below may be used as Alternative Construction for Minor Roads and Short Culs-de-sac with Shared Pedestrian/Vehicle Use

80mm - Concrete paving Blocks (approved design)
50mm - 0.5mm Sharp Sand Zone 2 or 3 grading
375mm - Sub-base (Type 2 Sub-base specifically excluded)

450mm Total

ALTERNATIVE CONSTRUCTION SPECIFICATION FOR GENERAL ROADS, MINOR ROADS AND SHORT CULS-DE-SAC

7.4.6 The alternative construction specification for General Roads, Minor Roads and Short Culs-de-sac should allow for the following:

(a) Two stage construction should be adopted to avoid construction damage to the surface course and the developer should bear this in mind when programming the works. Two stage construction allows the construction traffic to run on the basecourse, which must be sealed to the Council's requirements.

(b) Special consideration should be given to the temporary drainage of the first stage, i.e. binder, to minimise ponding caused by the projection of gully gratings above the temporary surface, either by adjustments of gully frames or other approved method. Consideration should also be given to the management of surface water run-off to swales where the road surface is not at its finished level. This applies particularly in large projects where the construction period may be long and the wearing course not laid before a winter work period.

(c) Any settlement which occurs in the binder should be taken up with regulating course before the laying of the wearing course. Early reinstatement of openings or failed areas is essential. Before the regulating course or wearing course is laid, the top surface of the basecourse shall be well cleaned to the satisfaction of the Council and tack coat applied at the rate of 0.6litre/m2.

FROST SUSCEPTIBILITY

7.4.7 Where soils are proved to be non frost-susceptible by adequate testing, the sub-base may be decreased only with the agreement of the Planning & Transportation Department.

SUB-BASE

7.4.8 The sub-base thickness may also be varied in accordance with the type of sub-grade. The use of the minimum sub-base of 150mm is dependent on obtaining a sub-grade with a California Bearing Ratio (CBR) of 7% or more. Where the sub-grade has a CBR value less than 7%, the sub-base should be increased according to the following figure. A sub-grade with a CBR value less than 2% requires special treatment and, in these circumstances, the contractor should carry out CBR tests to the satisfaction of the Council to determine the appropriate action required.

7.4.9 It should be noted that CBR testing is only relevant in natural soils and cannot be used for pavement design in fill materials. By their nature fills are random and highly variable in density and CBR testing in them only assesses the quality of the material at the locus of the test. Therefore for pavement construction on fill materials, unless the fill material is equivalent or better than the specified capping material, a full capping layer is required.

7.5 FOOTPATHS AND FOOTWAYS CONSTRUCTION

7.5.1 Footpath and footway construction Type A should be used

generally on main pedestrian routes or thoroughfares, while Type D is reserved for local areas where the usage is expected to be low.

7.5.2 Types B and C construction shall only be considered for amenity and conservation areas although Type D may also be considered. The use of special footpath or footway surfacing materials such as Caithness stone or Courtstone may be acceptable in certain areas. The Planning & Transportation Department should be consulted where developers wish to use these forms of construction and may ask that the construction thickness be increased where there is the likelihood of vehicles crossing such areas.

(a) Type A
20mm Hot Rolled Asphalt
40mm Dense Bitumen Macadam
140mm Sub-base Type 1

(b) Type B
63mm Concrete Slab (hydraulically pressed)
25mm Coarse Sand Bedding
150mm Sub-base Type 1

(c) Type C
25mm Granolithic
75mm Concrete Class 30/20
100mm Sub-base Type 1

(d) Type D
60mm Concrete Paving Blocks
50mm Coarse Sand Bedding
150mm Sub-base Type 1

FOOTPATHS AND FOOTWAY DETAILS

(a) A typical footpath and footway construction is indicated in Figures 50 and 51.

(b) Sub-base and base for footpaths and footways etc. should be laid in accordance with the MCDHW Specification to a compacted thickness as shown.

(c) Basecourse and wearing course for footpaths and footways should be laid on accordance with the MCDHW Specification to a compacted thickness as shown.

(d) Concrete base should be used below slabbed areas where these form access routes for emergency and service vehicles, and below granolithic concrete.

(e) Granolithic concrete should be laid in bays not exceeding 15sq.m. in area, finished with a wooden float and when sufficiently firm, indented with a granolithic roller and lined off in panels. Where granolithic concrete is laid more than 24 hours after the base concrete, an approved bonding agent must be used in the granolithic.

(f) Concrete paving slabs for emergency and services vehicles access routes should be laid in accordance with local bonding practice, on a bed of dry lime/cement mortar or whin dust, 25mm thick, overlaying the concrete base, and should be neatly cut to fit back edges, curves, surface boxes and road furniture.

(g) Concrete paving slabs in pedestrian areas. Footpaths and footways, should be laid to local bonding practice and in accordance with the MCDHW Specification. Joints should be up to 6mm wide and should be brushed and course sanded.

(h) Concrete pavior blocks in pedestrian areas, footpaths and footways should be laid in accordance with Section 5.13.

7.6 VEHICULAR CROSSINGS OF FOOTWAYS OR SERVICE STRIPS

FLEXIBLE CONSTRUCTION

7.6.1 Where a vehicle crossing is to be formed, the appropriate adjacent carriageway construction should be carried through the crossing to the throat of the bellmouth which should be edged with hydraulically pressed concrete kerbing of the correct radius. However, where a crossing is to be formed over a footway or verge in accordance with Figures 52 and 53, the appropriate footway construction should be used over the crossing.

7.6.2 When a crossing is to be formed onto a existing road, the construction for the appropriate category of road should be used. In a residential area, the standard footway construction specification may be used at the discretion of the Director of Planning & Transportation to whom applications in respect of such matters should be referred.

RIGID CONSTRUCTION

7.6.3 The following specifications should be used in appropriate circumstances approved by the Planning & Transportation Department.

(i) Light Traffic
25mm Granolithic
75mm Concrete Class 30/20
100mm Sub-base

(b) Heavy Traffic
25mm Granolithic
200mm Concrete Class 30/20
225mm Sub-base

7.7 KERBING

FOOTPATH AND FOOTWAY EDGING

7.7.1 The edges of footpaths and footways must be laterally supported by adequate kerbing or by other satisfactory means such as walls or concrete ground slabs. The kerbs preferably should be 51mm x 152mm in cross section with a flat top set flush with the level of the pavement and in accordance with Figure 41 except where a drainage channel is to be formed, when a 25mm upstand is required.

CARRIAGEWAY KERBING

(a) Carriageways should be kerbed with hydraulically pressed concrete kerbs or approved stone kerbs, as shown in Figures 37 and 38. Alternative kerb details are shown in Figures 39 - 49

(b) Concrete "kerb sett" or equivalent should comply with appropriate Interpave specification for concrete paving blocks.

(c) Kerbing for curves of small radius should be specially formed or radii so chosen as to conform with those radius kerbs commercially available.

(d) Where footway crossings are to formed, special transition kerbs and dropped kerbs (127mm x 152mm) shall be used. The details of construction should be in accordance with Figures 52 and 53.
(e) Where for reasons of conformity with existing development, kerbs outwith this specification are required, the approval of the Council should be sought.
(f) Kerb founds shall be to the dimensions shown in Figures 37 and 38.
(g) Kerb joints may be grouted and flush pointed, or butt jointed dry.
(h) Mortar for kerb joints shall be Class 1 (See MCDHW Specification).
(i) Kerb height above channel shall be 125mm, unless otherwise approved by the Council.
(j) Alteration to existing kerbs should comply with the above requirements, except where punched whinstone or concrete kerb is relaid. These may be laid on a 40mm bed of whin sand/concrete mixture to the satisfaction of the Director of Planning & Transportation.
(k) Where the development road joins an existing road, early discussion must take place with the The Planning & Transportation Department to determine the type of transition kerb to be used and the extent of the existing kerb which is to be replaced.

7.8 SURFACE WATER CATCHMENT MANAGEMENT

7.8.1 The European Water Framework Directive (WFD) has introduced the concept of Water Basin Catchment Management. SEPA are the responsible authority for Basin Catchment Management. The Dundee City Council Area may be viewed as a Sub-catchment and will be required to work with SEPA in managing Surface Water Discharges.

7.8.2 Dundee City Council has adopted the principles of Sustainable Urban Drainage Systems (SUDS) to manage the Surface Water run-off from urbanisation and re-development.

7.8.3 Flooding is a material consideration in Planning Applications.

7.8.4 The Water Services and Environment (Scotland) Act 2003 ensures that Scottish Water is required to adopt Public SUDS complying with a 'SUDS for Scotland' manual currently in preparation.

7.8.5 The Council as roads authority will maintain any SUDS solely for the purposes of road drainage and complying with the requirements of an RCC.

7.8.6 Any SUDS falling outwith these categories will require to be maintained by the developer.

7.8.7 Pre-application discussions should be undertaken with the Dundee SUDS Group who will give guidance on the management of Surface Water discharges and the application of Sustainable Drainage Systems.

7.8.8 The Group may call for a Flood Impact Assessment and/or a Drainage Impact Assessment to be submitted with a Planning Application.

7.8.9 SUDS proposals should follow the methodology given in 'SUDS a Design Manual for Scotland & N. Ireland 2000' Ciria Report 521. It should be noted however that the Authority may be selective in its acceptance of any proposed SUDS solutions.

7.8.10 SUDS may be constructed solely for the disposal of 'Statutory' water and in these circumstances, Scottish Water will dictate requirements.

7.8.11 SUDS may be constructed solely for the purposes of 'Roads' water and in these circumstances, the Authority will dictate requirements.

7.8.12 SUDS may be constructed for the combined treatment of Statutory and Roads water and Scottish Water will have responsibility for the combined elements.

7.8.13 Where the development impacts on a Flood Sensitive Area or watercourse, the SUDS will be required to demonstrate that Post Development run-off does not exceed the Pre Development run-off. The design criteria will be dictated by the Authority in keeping with Scottish Planning Policy Guidance or such criteria dictated by the Authority based on its local knowledge.

7.8.14 SEPA will ensure that SUDS for any purpose will comply with their requirements with regard to Water Quality.

7.8.15 Scottish Water must give a separate Construction Consent before the construction of any drainage to be adopted by them can commence.

7.8.16 To facilitate discussion within the Dundee SUDS Group, the minimum information required from a developer is;

- Volumetric Analysis of S.W. Run-off
- Soil Porosity tests to BRE 365
- Identification of any watercourses and/or culverts in the vicinity.

7.8.18 The design of any open bodies of water shall comply with the R.O.S.P.A guidance.

7.8.19 Certain categories of S.W. run-off may be categorised as 'High Risk' in terms of water quality and these areas will discharge to the 'Foul Water' sewers with the agreement of Scottish Water.

SURFACE WATER DRAINAGE

(a) Surface water drainage may, in certain circumstances, be designed to accept roof water and surface water draining from within the curtilage of the adjacent property, together with the surface water from the road, and should in these particular circumstances comply in all respects with the requirements of the Planning & Transportation Department.

(b) Where, in exceptional circumstances, a positive connection to a suitable surface water outfall cannot be provided for carriageway drainage the Planning & Transportation Department may permit the use of a suitably designed soakaway system (as per Section 5.8.8). Soakaways must be positioned outwith the carriageway or footway areas and be easily accessible for cleaning.

(c) The size and gradient of surface water pipe lines should be calculated using a recognised method. The minimum pipe size is 150mm diameter.

FOUL DRAINAGE

7.8.19 Separate discussions should take place with Scottish Water on all matters relating to Foul Drainage.

CHANNELS

(a) Channel gradients should not be flatter than 1 in 200. Where the grade is necessarily flatter than 1 in 200 (sags, crests, etc.) special measures will be necessary and advice should be sought from the Planning & Transportation Department.

(b) Footway drainage should be provided by offlets through or over the edge kerb or, where suitable, by gully.

(c) Unconventional layouts may lead to the choice of channels with cobbles inverts and other variations from the specification and sizes, and these should be discussed with the Planning & Transportation Department. Alternative channel details are shown in Figure 62.

(d) Bedding for cobbles and concrete blocks should be Class 30/10 concrete.

GULLIES

(a) The tables below detail the acceptable channel distance between gullies for a road comprising of carriageway and two 1.8m wide footways. The spacing may require to be reduced according to the road layout e.g. junctions, sags, crests, etc. and advice should be sought from the Planning & Transportation Department. It should be noted that the gully spacing given in table 14 for cambered roads is for each channel. For details of gullies see Figures 60 and 61.

GULLY SPACING-ROADS IN CAMBER

Width Of Road	Gradient									
	1/300 0.33%	1/200 0.50%	1/150 0.66%	1/100 1%	1/80 1.25%	1/60 1.66%	1/40 2.5%	1/30 3.33%	1/20 5%	1/15 6.66%
5.5m	12	15	17	20	25	30	35	40	Practical Limits	60
7.3m	10	12	15	18	20	25	30	35	40	45

GULLY-SPACING – ROADS IN CROSSFALL

Width Of Road	Gradient									
	1/300 0.33%	1/200 0.50%	1/150 0.66%	1/100 1%	1/80 1.25%	1/60 1.66%	1/40 2.5%	1/30 3.33%	1/20 5%	1/15 6.66%
5.5m	6	8	10	12	14	16	18	20	25	30
7.3m	5	6	7	8	10	12	14	16	20	25

(b) The spacing of gullies has been determined in accordance with R.R.L. Report L.R.277 "The Hydraulic Efficiency and Spacing of B.S. Road Gullies".

(c) The Design Criteria is based on Table 3(c) and is as follows:-
Rainfall of 50mm/hour
Crossfall of 1 in 40 (2.5%)
Manning's Roughness Coefficient (n) of 0.010
Width of Channel flow of 0.5m
For large, irregularly shaped areas, the empirically derived formula of one gully for each 200sq.m. of catchment may be used. Additional gullies or storm gratings will be required where gradients are steeper than 1 in 20 or flatter than 1 in 200.

(d) A gully should be positioned, irrespective of design spacings, as follows:
(i) Just upstream of the tangent point at road junctions.
(ii) Short of the point where adverse camber is removed when applying super-elevation.
(iii) At any local low point.

(e) Gully Pots should be externally trapped where connected to a foul sewer. They should be set on a 150mm bed of 22.5/20.0 concrete and surrounded by 150mm of the same concrete as detailed in Figure 60. Any under-building or raising pieces should be to the approval of the Planning & Transportation Department. Where, for local geographical reasons, untrapped gullies could be used, the prior approval of the Planning & Transportation Department and other interested bodies must be obtained, e.g. River Authority.

(f) Where requested by the Planning & Transportation Department, gully gratings should be captive.

(g) Gully connections should be brought to within 1m of the surface at the gully joint, and all pipes within 1m of the surface should be surrounded with 150mm of 22.5/20.0 concrete.

MANHOLES, INSPECTION CHAMBERS, OVERFLOW SOAKAWAYS AND SILT TRAPS

7.8.20 Manholes and inspection chambers should be constructed in accordance with the requirements of the Planning & Transportation Department.

7.8.21 Details of typical manholes and catchpits are shown in Figures 54 and 55.

FRENCH DRAINS

7.8.22 French drains should be laid at cuttings and slopes and where it is necessary to interrupt the passage of water. Construction should comply with S.O.I.D. Specification (Series 500) and connection to the surface water drain should be to the requirements of the Planning & Transportation Department and Scottish Water.

FOOTWAY DRAINAGE

7.8.23 Footway drainage should be provided by gullies or, as approved by the Planning & Transportation Department, by run-off over the edge kerb to the adjacent French drain. Where French

drains are provided either for cut-off drainage only or as dual purpose cut-off and footpath drainage, they will be adopted for maintenance purposes as will a sealed pipe system if this is installed. Figures 56 and 57 illustrate methods of draining remote footpaths.

SOAKAWAYS

7.8.24 Soakaways should be constructed as Figure 58 in precast concrete or brickwork. Soakaway dimension (D) to be determined from Figure 59 after carrying out permeability test (see below) to determine time (t).

NOTE

Diameter = horizontal limits of hardcore

Effective depth = height from invert of inlet to lower limit of hardcore.

(c) Permeability Test
  (i) Bore a 150mm diameter hole with a hand or power auger, in the position of the proposed soakaway, to a depth of 1m.
  (ii) Pour water into hole to a depth of 300mm.
  (iii) Record time between water entering hole and base of hole becoming visible.
  (iv) Refill hole with 300mm of water and repeat test twice to obtain average result (t minutes).
  (v) On completion of the above test the hole should be bored a further 1m and the above procedure repeated.

7.8.25 For sustainable drainage purposes, the design rainfall return period should be obtained from the Council before attempting to size the soakaway.

SWALES

7.8.26 Swales should be constructed as Figure 63 finished in turf or sown grass having a seed mix.

7.8.27 Drainage offlets from road to swale shall be constructed as Figure 64 or 65.

7.8.28 The use of swales is confined to a constant run of carriageway uninterrupted by driveway crossings. The minimum length of swale shall be 20m.

7.8.29 The maximum gradient for the efficient application of Swales is 1 in 20, at gradients in excess of 1 in 40 the use of dams should be incorporated to retain water in the swale.

7.8.30 At gradients in excess of 1 in 20 Swales function only as carrier devices and treatment is not effective. In this case basins and ponds should be sized to provide the required treatment.

7.8.31 Where topography or layout precludes the use of swales then conventional positive drainage to a site control facility such as a detention basin or pond will be required. Consideration should be given to this factor when preparing site layout plans as land take in the order of 10 – 15 % of the site area may be required.

7.8.32 Swales are generally designed to deal with First Flush water only and consequently will overtop during storms in excess of 1 in 10 year return periods. Accordingly terminal soakaways are incorporated in each swale and connected to the Surface Water

carrier sewer by means of a High Level overflow set at a level to only transmit water at an agreed storm return period. These terminal structures should not permit the entry of external sub-soil waters into the public sewer.

PONDS & BASINS

7.8.33 The design of ponds and basins is a complex process involving several disciplines with significant matters with regard to maintenance and safety. It is not proposed to attempt to deal with the design of these SUDS Site and regional control facilities within the body of this document, other than to say that these are acceptable means of Surface Water Management to the Authority. Members of the Dundee SUDS Group will deal with the specifics of these facilities at the planning application stage.

7.9 LAYOUT OF UNDERGROUND SERVICES

7.9.1 All services necessary for the development, with the exception of the main sewer, surface water drain and, on occasion, water mains, should be located within the limits of the footways or verges, with a minimum of service connections across the carriageways. All pipe, duct and cable connections shall be marked.

7.9.2 The proposed location of services within public road boundaries, including those required under the New Roads and Street Works Act 1991 (NRSWA) should be submitted to the Council for prior approval.

7.9.3 The developer must supply the Council with "as built" drawings showing the final location of all services within the road boundaries.

7.10 LOCATION OF ROAD FURNITURE

7.10.1 All road furniture, unless specifically excluded hereafter, should be located at the rear of footpaths/footways or recessed behind the footpaths/footways and no furniture or structures should encroach within the sight line of a road junction. Wherever possible, services will not be located within 500mm of the rear of the footway to allow for lighting standards and joint pillars or other road furniture.

7.11 STREET LIGHTING

7.11.1 When details of the street lighting have been agreed, the Developer's contractor must arrange a prestart meeting with the Council's lighting representative to ensure that the contractor fully understands all installation requirements.

All associated electrical works shall be carried out by a competent NICEIC registered electrical contractor and all painting shall be carried out by a time served qualified painter.

A programme of works shall be provided before the start of any works. In addition, to allow for inspection, the contractor shall inform the Council's Lighting Section as follows:

(a) 48 hours notice before the Developer intends to commence setting out column positions.
(b) 24 hours notice before any track excavation is back-filled.
(c) 48 hours before erecting columns and pulling cables through ducts.

(d) 48 hours before test and inspection prior putting the system into operation.

7.11.2 Developers or /individuals who fail to give adequate notice of intention of works may be required to carry out excavation of finished works at their expense to prove that the installation has been installed to the Planning & Transportation Department's specification.

7.11.3 Prior to commencement of work affecting the existing road a "Consent to Execute Work in the Road" under Section 56 of the Roads (Scotland) Act 1984 must be obtained from the Network Manager. "Permission to Place and Maintain Apparatus in/under the Road" must also be obtained when necessary under Section 61 of the same act. The Roads Authority must give 28 days notice of their intention to grant permission to those statutory undertakers likely to be affected and the developers must take this into account when programming the works. Any deviations from the scheduled programme of road lighting works must be notified to the Planning and Transportation Department immediately.

7.11.4 All work shall be carried out in a good workmanlike manner using proper tools, equipment and methods of working and in compliance with all legislation and codes of practice following from the Health and Safety at Work Act 1974.

Traffic Management requirements in accordance with the Code of Practice under the New Roads and Street Works Act 1991 must be adhered to at all times.

Failure to comply with statutory safety requirements will result in immediate suspension of the works.

It is recommended that the developer employs only lighting contractors on the Council's current approved list of contractors for that category of work. A list will be made available on request.

MATERIAL SPECIFICATION

7.11.4 The developer will provide all equipment and materials in accordance with the Council's road lighting material/equipment specification. Lanterns, lamps, photosensors and columns should be permanently marked with the date of installation.

WORK SPECIFICATION

7.11.5 The developer will carry out all works in accordance with Dundee City Council road lighting works specification and standard detail drawings. (See appendix).

DEVELOPER'S RESPONSIBILITY

7.11.6 The developer is to ensure that the street lighting is installed, inspected, inspected, tested and commissioned as houses/ development progresses. Notification of any street lighting commissioned should be passed to the Planning and Transportation Department along with any partial test certificates. This will allow the street lighting to be added to the normal street lighting inspection regime.

The Developer will be required to sign an undertaking to comply

with all terms and conditions of the Construction Consent relating to street lighting. Two copies of this undertaking will be issued with a letter approving the design, one of which must be signed and returned the Street Lighting Section. The Construction Consent will not be valid until this signed undertaking is received by the Street Lighting Section.

RECORD INFORMATION

7.11.7 A developer who does not use Dundee City Council's design service, must submit a completed Design Certificate (signed by the designer) along with a detailed plan, specification and bill of quantities for the approval of the Director of Planning & Transportation. (See appendix).

7.11. 11 A detailed "As Built" drawing complying with the requirements of the Street Lighting Section must be passed to the Planning and Transportation Department by the developer. This drawing must show the accurate location of underground cables, cable access chambers, ducts and columns together with details of the make and type of the equipment provided as soon as all or part of the site is completed and at least 5 working days prior to inspection and testing. If requested, the Street Lighting Section will prepare the "As Built" drawing on behalf of the Developer at a nominal cost.

INSPECTION OF WORKS

7.11.12 The planning and Transportation Department will inspect the work during various stages of construction. It is the Developer's responsibility to inform the Street Lighting Section when these stages are reached and to give notice of the need for inspection as set out in 7.11.1 above. In accordance with Section 140(6) of the Roads (Scotland) Act 1984, Dundee City Council - Planning and Transportation Department will recover the costs of these inspections from the developer. Any deviation from the specified work or materials found during the inspections must be rectified. The contractor shall provide the lighting representative with platform viewing facilities free of charge to inspect lanterns etc. both at the start of maintenance and adoption inspections.

Any inspection equipment provided must have a current safety certificate and be operated by a suitably qualified operator in accordance with recognised safety standards and the instructions of the equipment manufacturer.

Where Dundee City Council's Street Lighting Section is awarded the contract for street lighting installation, all inspection will be included as part of the contract and at no additional cost.

COMMISSIONING OF INSTALLATION

7.11.13 Prior to bringing the system, or any part of it, into operation it must be tested as set out in Section 7.1.2.

The Developer will however ensure that street lighting for the development, or any part of it, is brought into operation as soon as properties are ready for occupation, as far as is reasonably practical.

After first commissioning of the complete system, the system will enter a "maintenance period" of one year during which time

maintenance, energy costs and damage liability will remain the responsibility of the Developer. At the end of the maintenance period, the Developer will arrange for a final inspection and test under the same conditions as the initial test. If a period of more than 18 months elapses between the commissioning of any part of the system and the final test, all parts of the system must be fitted with new lamps of the approved type prior to the final test.

ROUTINE INSPECTION

7.11.12 It is Dundee City Council's policy to inspect all street lighting for correct operation, at night, on a weekly cycle. Routine safety checks are also made. The Developer will inform the Planning and Transportation Department as soon as any new street lighting is brought into operation so that it can be added to the inspection list.

7.11.13 Notwithstanding this, the developer will be responsible for the maintenance of the installation until adoption by the Council.

7.11.14 Notice of incorrect operation of any part of the installation found during the course of regular inspection will be passed to the Developer by the Director of Planning and Transportation and all necessary repair works must be carried out by the Developer at his cots within five working days of receipt of notice. (Emergencies are excluded and these will be dealt with immediately by the Council with the costs being recharged to the Developer).

ELECTRICITY SUPPLY SERVICES

7.11.17 Provision of electricity supply for private developments shall be arranged by the Developer who should liaise directly with Scottish and Southern Energy PLC.

All costs of electricity before and during the maintenance period will be met by the Developer.

Where Dundee City Council is contracted to install the lighting system, it will remain the responsibility of the Developer to arrange for the electrical supply but the Developer will not be responsible for energy costs following testing and commissioning. Systems installed by Dundee City Council will be adopted immediately after testing and commissioning without the need for a maintenance period.

SECURITY

7.11.18 The developer will ensure that adequate insurance is available to cover all claims resulting from faulty workmanship, installation, plant and equipment associated with the installation during the period for which he has responsibility. (See general condition for new roads for amount required).

DAMAGE

7.11.19 The developer will also be responsible for making good damage to the lighting installation by unknown persons during the one year maintenance period.

ADOPTION

7.11.20 One year after receipt of acceptable record information and

satisfactory completion of design, construction, installation and test certificates, the developer may apply to the Council for adoption of the lighting installation.

The Developer should then submit a final completed certificate for an inspection and test which has been witnessed by a representative of Dundee City Council's Street Lighting Section.

After approval, the Director of Planning and Transportation will recommend to Dundee City Council that future maintenance of the lighting installation covered by the Construction Consent will be the responsibility of the Planning and Transportation Department.

7.11.21 It should be noted that any phasing of the works which results in the use of a common control pillar or tying into an existing street lights maintained by the Developer, then adoption of the whole installation will not take place until the last street light is installed and has successfully completed its maintenance period.

7.12 LANDSCAPING

7.12.1 All landscaping must be completed before submitting the roads and footpaths etc, for adoption by the Council.

SOILING AND SEEDING

(a) Preparation
All areas where topsoil is to be spread should have the top 200mm of existing ground broken up to facilitate free drainage, and all stones and rubbish removed prior to soiling.

(b) Soiling
All topsoil areas shall have a thickness of at least 100mm of good topsoil evenly spread, and broken down to a fine tilth, free from rubbish and stones larger than 50mm.

(c) Seeding
The tilth should be lightly rolled before the grass seed is applied at the rate of 80-90sq.m./kg. After seeding, the tilth should be raked and rolled in.
Any area where the seeding is not successful should be re-sown in the following season.

(d) Landscaping
Early contact should be made with the Planning & Transportation Department to discuss any landscaping which the Developer proposes within the highway boundaries and to determine verge widths and shrub and tree planting limitations.

7.13 MATERIALS SPECIFICATION

GENERAL

7.13.1 In general, the materials used shall conform to the MCDHW Specification. If a developer wishes to use a material outwith this specification he must first seek the advice of the Planning & Transportation Department.

7.13.2 The Council is active in promoting the use of alternative and innovative newly developed materials, but specific approval of the council must be sought prior to their inclusion in the proposals submitted.

CARRIAGEWAYS

(a) Unbound materials for sub-bases and roadbases (bases) shall comply with the MCDHW Specification.

(b) Dense bituminous macadam roadbase (base) shall be made in accordance with the requirements of and laid in accordance with the MCDHW Specification.

(c) Crusher run for roadbase (base) shall consist of crushed rock supplied from a source approved by the Council. The grading should conform to the following table:

B.S. Sieve Size	%age by weight passing
75mm	100
37.5mm	30-60
10mm	0-25
2mm	0-10

The material should 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 should be blinded with suitably graded crusher dust brushed into the interstices of the stones and thoroughly rolled to provide a surface in accordance with the MCDHW Specification.

(e) Basecourse (Binder Course) shall comply with the following clauses:

(i) Hot rolled asphalt for basecourse (Binder Course) shall be made in accordance with BS 594-1, 2003, and the laying and compaction should be to BS 594 : part 2 : 2003 and the MCDHW Specification.

(ii) Dense bituminous macadam basecourse (Binder Course) shall be made and laid in accordance with the requirement of BS 4987-1, 2003, and the MCDHW Specification.

(f) Wearing course (Surface Course) shall comply with the following clauses:

(i) Hot rolled asphalt wearing course (surface course) shall be made in accordance with BS 594-1:2003 and laid in accordance with BS 594-2:2003 and the MCDHW Specification.

(ii) Coated chippings for carriageways shall be 10, 14 or 20mm nominal size depending on wearing course (surface course) depth, with a minimum PSV of 55 (60 high risk sites) with a maximum AAV of 12, and should comply with the MCDHW Specification. They should be laid to Table 16 of BS 594-2, 2003.

FOOTPATHS AND FOOTWAYS

(a) Hot rolled asphalt for footpaths and footways shall comply with BS 594-1:2003 (70 Pen.)

(b) Fine cold asphalt for footpaths and footways shall comply with BS 4987-1;2003 Category B.

(c) The concrete base used for paved areas Sections 6.5.1 (e) and 6.6.2 (a) and (b) shall be 22.5M/mm^2 concrete, using 20mm aggregate vibrated and cured in accordance with the MCDHW Specification.

(d) Concrete mortar for bedding concrete slabs shall comply with the MCDHW Specification.
(e) Granolithic concrete shall consist of 50kg of Portland Cement to 0.085cn.m. of crushed granite used with the minimum of water consistent with workability.
(f) Chippings for footpaths/footways shall be 6mm-10mm spread at a nominal rate of 10kg/m^2 and of a colour approved by the Council.
(g) Precast concrete slabs shall be hydraulically pressed and manufactured. The specified sizes should be 63mm thick, 600mm wide, in lengths of 450mm, 600mm and 900mm. The use of 400mm by 400mm slabs will be considered in certain situations.
(h) Natural stone surfacing shall comply with appropriate SCOTS - Natural Stone Surfacing, Good Practice Guide.

CONCRETE

(a) Where specified Class E concrete shall be as described in the MCDHW Specification.
(b) The concrete used for structural purposes shall comply with the MCDHW Specification.

KERBS, EDGINGS AND QUADRANTS

(a) Precast concrete kerbs, edgings and quadrants shall comply with BS7263-1, 2001. Kerbs shall be hydraulically presses, 127mm x 254mm, half battered, except where otherwise described, in lengths not less than 900mm. Kerbs cut to suit shall not be less than 300mm in length. Edging should be 51mm x 152mm flat topped at heel of footways and between footway/footpath and grassed areas. Where, for reasons of conformity with existing development, kerbs outwith this specification are required, the approval of the Council should be sought.
(b) Whinstone kerbs shall be 127mm x 254mm and shall comply with BS 435 : 1975.
(c) Concrete "Kerb Setts" or equivalent shall comply with appropriate Interpave Specification, or equivalent and approved

CARRIAGEWAY MARKINGS AND PERMANENT SIGNING

7.13.3 Carriageway markings and permanent signing where required should comply with the MCDHW Specification.

SURFACE WATER DRAINAGE

7.13.4 Drainage materials for surface water drains shall comply with the requirements of the Scottish Water and the Director of Planning & Transportation.

GULLIES

(a) Concrete pots shall conform to BS 5911-6, 2004.
(b) Plastic pots shall be Hepworth or equivalent and approved. Brickwork or other approved method shall be provided from the top of the gully pot to the underside of the frame.
(c) Vitrified clay pots shall be Hepworth or equivalent and approved and shall conform to BS 65 : 1981.

(d) Gully gratings and frames shall comply with BS EN 124:1994 D400. Captive gratings shall be used when required by the Planning & Transportation Department.
(e) Half top, half side entry gullies may be used in appropriate situations.

SERVICE DUCTS

7.13.5 Pipes in service ducts below carriageways and commercial vehicle crossings, shall comply with Series 500 of the S.O.I.D. Specification and shall be surrounded in concrete where the depth of cover to surface is less than 1 metre.

SERVICE PLANT COVERS

7.13.6 Covers and frames for valve chambers, rodding eyes etc shall be cast iron unless otherwise agreed by the Council.

FRENCH DRAINS

7.13.7 Types of pipe shall conform to DMRB Specification, Series 500.

TRENCHES

7.13.8 Backfilling of trenches should be in accordance with DMRB Specification.

LANDSCAPE MATERIALS

7.13.9 Seeding mixture for grassed areas shall be approved by the Planning & Transportation Department.

7.13.10 Fertiliser to be used on all grassed areas shall be a pre-seeding type containing not less than:

10% Nitrogen
15% Phosphoric Acid
10% Potash

or other suitable mix approved by the Planning & Transportation Department dependent on local conditions.

7.14 CONCRETE BLOCK PAVING

7.14.1 The following requirements are to be met by developers wishing to construct roads with concrete block paving. The types of road covered by this section are unclassified, Minor Roads and Culs-de-sac having shared pedestrian/vehicular use. (Also see Section 5.13.11.). In certain circumstances, at the discretion of the Planning & Transportation Department, concrete blocks may be used on lightly trafficked General Roads.

DRAINAGE

(a) The spacing of gullies will be as required for other surfacings.
(b) Where an unbound sub-base is used, adequate drainage of the sub-base and sub-grade will be provided.

GRADIENTS AND CROSSFALLS

7.14.2 The requirements for gradients and crossfalls will be as for other road construction materials. Cambered cross-sections will be permitted where appropriate.

GEOMETRIC DESIGN

7.14.3 Designs which would be approved for use with other materials will be permitted in concrete block paving. Consideration will also be given to alternative layouts that exploit the particular properties of block paving.

NOTICES

7.14.4 The developer should notify the Planning & Transportation Department of his intention to

(a) backfill drainage connections;
(b) lay sub-base;
(c) lay concrete block paving;

at least 48 hours before doing so.

GENERAL

7.14.5 All the requirements of the MCDHW and the Council's standard specifications will apply except where the requirements of this series of special clauses supersedes them.

GEOTECHNICAL CONSIDERATIONS

Site Investigation

The extent and type of ground investigation required, with detailed reporting, will be dictated by the nature of the proposed development, former land use and local ground conditions.

Previous Demolition Site

Where new roads are being constructed, the nature, depth and extent of the fill material should be defined. It is essential that all voids and drains are located.

Excavation and Filling

All turf and topsoil should be stripped from the whole area of the construction and the excavation carried down or deposited material raised to the correct formation level. Any deposits of unsuitable material should be excavated and replaced with approved materials either taken from the excavations or imported from other sources. The fill should be deposited and compacted in layers in accordance with the DMRB. Clays and silts outwith acceptable moisture content must not be used as fill for embankments. No frost susceptible material will be permitted within 450mm of the road surface. If any depressions appear in the sub-grade during construction they should be filled with approved material, levelled and compacted. Provision must be made for keeping the formation free of water. Where the nature of the soil at formation level is inadequate for providing a dry firm foundation, further excavation below formation level will be required which should be replaced with approved material.

Sub-grade / Capping / Formation / Testing

Sub-base thickness and capping requirements will be dependent on sub-grade strength, generally indicated from CBR% values. A sub-grade with a CBR value less than 2% requires special treatment.

Guidance on all of the above should follow that given in the DMRB and any appropriate British Standards.

SURFACE LEVELS OF PAVEMENT COURSES

(a) The formation and sub-base shall not deviate from the true level by more than:
+ 20mm
Formation – 30mm Sub-base ± 10mm

(b) The road base surface level shall not deviate vertically at any point from the true level by more than ± 15mm.

(c) The finished surface and binder course levels shall each not deviate vertically at any point from the true pavement surface by more than ±6mm. Immediately adjacent to gullies and manholes the tolerance shall be 3mm - 0mm.

(d) The maximum deformation within the completed surface, measured by a 3m straight-edge placed parallel to the centre-line of the road, must not exceed 10mm except in parts of the carriageway where vertical curves necessitate a greater deviation.

(e) The levels of any two adjacent blocks shall not differ by more than 2mm.

SUB-BASE

(a) The thickness of the sub-base shall not be less than that shown in the following table. The Director of Planning & Transportation will be entitled to require this thickness to be increased if he considers it necessary.

Road Construction	Subgrade CBR value (percent)					
	2	3	4	5	6	7+
Type A	520	400	310	260	200	170*
Type B	500	380	300	250	190*	160*
Type C	450	340	270*	220*	170*	150*
Type D	440	330	260*	210*	160*	150*

* subject to subgrade being non frost susceptible

(b) Unless otherwise described in the contract, sub-bases shall be constructed by using material complying with the MCHW Specification, Granular sub-base material Type 1.

(c) Type 2 material has been specifically omitted because this material is susceptible to damage if trafficked when wet.

(d) At the time of laying the sand and blocks, the sub-base should be structurally sound, free from contamination, and close knit to prevent ingress of laying course material. Any damage should be made good and the level should not deviate by more than 20mm from the true level.

(e) When wet-weather working is anticipated, particularly over cohesive subgrades, it is recommended that consideration be given to the use of cement-bound sub-base materials. A similar requirement may also apply during normal construction over subgrades which are particularly sensitive to moisture softening.

EDGE RESTRAINT

(a) Unless otherwise agreed in writing by the Planning &

Transportation Department the edge restraints shall be provided in advance of the laying of paving blocks

(b) Edge restraint is deemed to include kerbs in accordance with the MCDHW Specification (The term kerb includes flush kerbs). Where an alternative form of edge restraint is proposed, the Council's written approval should be obtained.

(c) Edge restraint is necessary to restrain the blocks from moving outwards. It therefore needs to be sufficiently rigid at the time when the blocks are laid to resist the horizontal component of the force exerted by (1) the plate vibrator when the blocks are vibrated into position and (2) displacement subsequently by traffic.

LAYING COURSE

(a) The laying course shall consist of graded sharp sand obtained from a single source containing not more than 3% of silt and clay by weight and with not more than 10% retained on a 5mm sieve.

(b) The sand shall be screeded to level so that its mean thickness after compaction is 50mm, and the upper face of the blocks will be true to the finished levels as required by Sections 5.13.6(b), (c) and (d). The laying course material may be spread in one layer and screeded to the appropriate level, making due allowance for the reduction in thickness achieved during compaction. Alternatively, the sand may be spread in two layers, the lower two-thirds being precompacted, and the blocks placed on the upper uncompacted one-third. In each case, only sufficient sand for one day's work should be prepared.

SURCHARGE

(a) Vibration of the blocks should be completed immediately after laying to ensure that the sand surcharge is correct and, if not, alterations made.

(b) Generally the surcharge needed to achieve a 50mm compacted thickness will be about 15mm, and this must be checked as soon as a sufficiently large area is available. If levels are outside the permitted tolerance, the blocks must be taken up and prepared for re-use, the sand must be thoroughly raked and rescreeded to a revised depth. The process must be repeated until the surcharge is found that produces a finished level within tolerance.

(c) The levels of a newly vibrated surface course must be checked as construction proceeds to determine whether variation needs to be made to the surcharge. Carefully controlled screeding is vital id good surface tolerances are to be obtained on the finished block paving. However, careful screeding will never adequately compensate for poor sub-base tolerances.

CONCRETE PAVING BLOCKS

(a) Precast Concrete Paving Blocks shall comply with and be tested in accordance with the requirements of BS 6717 : 2001.

(b) Unless otherwise agreed with the Planning & Transportation Department rectangular blocks should be laid in a

herringbone pattern. On parking areas, footways, or where the shape permits, blocks may be paid in a stretcher bond. Herringbone pattern provides the necessary horizontal interlock when rectangular blocks are used and it is also more adaptable to varying site layouts. Where stretcher bond is being used, it is essential that attention is paid to the geometric layout of the road network and the long axis of the blocks should be laid at approximately 90° to the centre line of the road. It is more difficult to accommodate curves, transitions, varying widths and junctions in stretcher bond than with herring-bone pattern.

(c) Blocks with a nominal thickness of 80mm should be used for residential roads subject to normal vehicular traffic and in areas subjected to regular use by heavy commercial vehicles.
For car parks, drive entrances and other areas where only occasional light traffic will use the road, blocks not less than 60mm nominal thickness may be used.

(d) Blocks should be placed firmly together without disturbance to the laying course and the order of placing the blocks must ensure this.

(e) Obstructions such as gully gratings and manholes should be surrounded with concrete Class 40/10 in advance of paving. Alternatively, blocks can be laid right up to the obstruction or the obstruction may be framed with a course or whole blocks, and gaps infilled with blocks cut to fit. Cut pieces smaller than one quarter of a block should be avoided. In each case, blocks shall be laid 5mm proud of any rigidly constructed details to allow for differential settlement.


Herringbone


Stretcher Bond

VIBRATION

(a) The surface course shall be subject to passes of a vibrating plate compactor which should have a centrifugal force of approx. 16-20kN, a frequency of approx. 75-100Hz and a plate area of between 0.35 and 0.5m^2. Sufficient passes should be made to compact the laying course and produce an even surface.

(b) Vibration should not be carried out within one metre of an unrestrained edge.

(c) After initial vibration, sand should be brushed into joints and further passes of the vibrating plate compactor made to fill the joints, more sand being spread over the surface as required.

(d) Normally two or three passes of the plate vibrator are sufficient to bed the blocks, compact the sand and produce an even surface.

(e) In some situations, wet sand will not enter the joints. Occasions may arise where it is necessary to use artificially dried sand but, in general, the stockpile of sand should be protected by covering with a polythene sheet or tarpaulin and allowed to drain.

(f) Where blocks of thickness less than 80mm (but not less than 65mm) are used a vibrating plate compactor having a centrifugal force of 7-16kN, a plate area of 0.2 - 0.4m^2 and a frequency of 75 – 100HZ should be used.

EDGE

7.14.6 Small gaps left at the edges of the block paving, including against obstructions within a paved area, should be raked out and cleaned and filled to the full depth of the paving block with a sand:cement mortar not leaner than 4:1, or Class 40/10 concrete coloured to match the blocks.

COLD-WEATHER WORKING

7.14.7 The requirements of the MCDHW Specification shall apply except that the paving blocks themselves should not, for the purpose of this Specification, be regarded as "roadworks materials containing cement".

8 CONSULTATION AND CONTACT DETAILS

8.1 APPROVALS

8.1.1 All approvals will be made, subject to the various criteria being satisfied, by Dundee City Council. Communications in respect of approvals should be addressed to:

The Director
Planning & Transportation Department
Dundee City Council
Tayside House
Crichton Street
Dundee DD1 3RB

A TECHNICAL APPROVALS INFORMATION

DUNDEE CITY COUNCIL - PLANNING AND TRANSPORTATION DEPARTMENT

APPLICATIONS FOR TECHNICAL APPROVAL OF HIGHWAY STRUCTURES

NOTES FOR GUIDANCE FOR SUBMISSION TO DCC AS TAA

1 Dundee City Council (DCC) is responsible as Technical Approval Authority (TAA) for the technical approval of structures in schemes on its own roads, whether the Design Firm be the Council's own design organisation, or a firm of consulting engineers. DCC is responsible also as TAA, where a developer is to hand over a structure on completion to the Council.

2 Technical approval procedures for structures described in 1 above shall follow those contained in The Design Manual for Roads and Bridges Vol 1: Highway structures: Approval Procedures and General Design (DMRB Vol 1), together with all current amendments, except that DCC rather that the Scottish Executive Development Department (SEDD) Bridges Section is the responsible TAA.

3 Forms and certificates to be submitted to DCC as TAA during the technical approval procedure should not be those contained in DMRB Vol 1 Section 1: BD2/02. Similar forms and certificates provided by DCC are to be used.

4 The role of DCC as TAA is similar to that outlined in clauses 2.14 – 2.15 of DMRB Vol. 1: Section 1: BD2/02.

5 SEDD Bridges Section may give advice of a general nature on the interpretation of SEDD standards, but will not deal with queries on specific schemes. Departures from standards and aspects not covered by standards require approval by DCC as TAA.

6 The design aspects of structures on local authority roads which may affect the movement of high or abnormal loads shall be agreed by the TAA with SEDD Bridges Section. Similarly, the geometry and design loading for proposed local authority structures over trunk roads shall be agreed by the TAA with SEDD Bridges Section.

7 Where a submission to the Royal Fine Arts Commission for Scotland is proposed for a major structure, or for a structure in an environmentally sensitive area, SEDD Bridges Section will give advice on procedures if requested.

8 The Design Firm should liaise as early as possible with the TAA prior to making a formal submission.

9 Applications by the Design Firm to the TAA for Approval in Principle (AIP) should be accompanied by a location plan, two copies of a preliminary general arrangement drawing, relevant parts of the site investigation report and interpretation (if available), and two completed copies of the AIP Form with original signatures.

10 If a check certificate is required in accordance with DMRB Vol 1: Section 1: BD2/02, the name of the proposed Checking Firm should be included in the AIP submission. Checking procedures

shall comply with clauses 2.20-2.24 of DMRB Vol. 1: Section 1: BD2/02.

11 Although a structure may not, in accordance with DMRB Vol 1 Section 1: BD2/02 require approval in principle, the Design Firm will be required to submit to the TAA two copies of a certificate of compliance with relevant standards Certificate A with original signatures, accompanied by a general arrangement drawing.

12 Detailed design should not normally be undertaken until Approval In Principle has been granted by the TAA. The design must comply with the approval in principle and, should any variations from the approval prove necessary during the design or check, the TAA must agree to them before they are implemented. Such variations must be recorded on a certificate for specification variation, also signed on behalf of both the Design Firm and the TAA.

13 When the design has been completed, two copies of Design Certificate B or C (depending on the category of structure as agreed on AIP Form), with original signatures, shall be submitted by the Design Firm to the TAA.

14 If a check certificate is required (in accordance with DMRB Vol 1: Section 1: BD2/02), two copies of the Check Certificate D, with original signatures, shall be submitted by the Checking Firm to the TAA on completion of the check.

15 Certification in accordance with clauses 2.27-2.32 of DMRB Vol. 1: Section 1: BD2/02 is required to declare the satisfactory completion of the work involved and that the organisations concerned have exercised due professional skill and care. A Construction Compliance Certificate with the original signatures of the contractor's representative, principal contractor and principal works examiner shall be submitted for approval to the TAA.

16 Other requirements of the Director of Planning and Transportation in relation to a Developer's proposals which include new or existing structures are contained in Appendix A.

17 Tenders shall not be invited for a scheme until the technical approval procedures for all structures on that scheme have been completed to the satisfaction of the TAA.

18 All communications with DCC as TAA shall be addressed to The Director of Planning and Transportation (TAA), Tayside House, 28 Crichton Street, Dundee, DD1 3RB.

APPENDIX A

The Requirements of the Director of Planning and Transportation in Relation to a Developer's Proposals which include new or existing Structures necessary for the Support of an Existing or Proposed Road or of Land or Property adjacent to an Existing or Proposed Road.

1 All new structures and any strengthening of existing ones shall be designed and detailed in accordance with the Design Manual for Road and Bridges Volumes 1 to 10 together with relevant additional DCC requirements which can be supplied on request.

2 For structures affecting watercourses, the Developer shall enter into negotiations with the Dundee City Council for the purpose of obtaining consent under the Land Drainage 1958 Act to carry out the works. A completed copy of the authorisation certificate is to be submitted to the Director of Planning and Transportation for record purposes.

3 Regarding the Developer's consultations with other Statutory Undertakers, the Director of Planning and Transportation's consent shall be obtained in respect of the proposals for the accommodation of Statutory Undertakers services, plant and equipment in, on, or adjacent to the structure(s).

4 Wayleaves which may be required for the maintenance of the structure(s) shall be discussed and agreed with the Director of Planning and Transportation.

5 All design work and checking shall be carried out by suitably experienced Chartered Civil or Structural Engineers employed by a firm of Consulting Engineers who are members of the Association of Consulting Engineers or, alternatively, other suitably experienced firms to be approved by the Director of Planning and Transportation prior to appointment.

6 The Developer shall arrange for his Consulting Engineer to submit to the Director of Planning and Transportation an Approval in Principal Form (AIP Form) setting down the design proposals and Design Standards selected from a Technical Approval Schedule (TAS), to be adopted for the design/strengthening of the structure(s). The submission shall also comprise a location plan, general arrangement drawings, the site investigation report including interpretation, documents relating to consultation and any other relevant information. Blank copies of the form and schedule can be obtained from the Director of Planning and Transportation.

7 In accordance with clause 2.10 of DMRB Vol. 1: Section 1: BD2/02, all applications for departure from standards are to be approved by the Director of Planning and Transportation prior to inclusion in the AIP or addendum to the AIP. Details, reasons and justification for the proposed departure including the benefits to Dundee City Council are required for submission for consideration. Adequate time should be allowed for the consideration of the application for departure.

8 AIP is valid for three years after the date of agreement. AIP shall be re-submitted to the Director of Planning and Transportation if construction is commenced outwith the period. Changes to an agreed AIP shall render the original AIP subject to re-approval.

9 If the construction of the structure is to proceed, the proposed list of tenderers must have the approval of the Director of Planning and Transportation and the following documents must be submitted to the Director of Planning and Transportation before tenders are invited:-

i completed Design and Check certificates as appropriate;
ii a complete set of design calculations, and independent check calculations as appropriate;
iii a complete set of construction drawings and the associated specification; and
iv the Developer's programme for the construction of the Works.

10 Checking procedures for assessments, designs and drawings, together with bar bending schedules shall be carried out in accordance to clauses 2.20-2.24 of DMRB Vol. 1: Section 1: BD2/02.

11 For any proposed variations to the Specification for Highway Works, a Certificate for Specification Variation shall be submitted for the approval of the Director of Planning and Transportation in accordance to clause 2.31 of DMRB Vol. 1: Section 1: BD2/02. Blank copies of the certificate can be obtained from the Director of Planning and Transportation.

12 The Director of Planning and Transportation will make arrangements for monitoring inspections of the construction works in addition to the day-to-day supervision of the works which supervision shall be the responsibility of the Developer who shall arrange for the supervision of the works by the Consulting Engineers who were responsible for the design/strengthening of the structure(s). To facilitate the Director of Planning and Transportation's inspections, the Developer and Contractor shall allow the Director of Planning and Transportation, or his representative(s), free access to the construction site. In addition, during construction, the developer shall, unless other alternative arrangements are agreed with the Director of Planning and Transportation:

a arrange for the submission of the Contractor's programme of Works, Method Statements, temporary works drawings, schedules and lists of materials, etc to the Director of Planning and Transportation for consent or comments.
b arrange for the taking of samples and carrying out tests on materials and workmanship, as specified and as deemed necessary by the Director of Planning and Transportation. Also he shall submit to the Director of Planning and Transportation copies of all test results and test certificates relating to the quality of materials and workmanship.

13 On completion of construction, the Developer shall arrange to furnish the Director of Planning and Transportation with a complete set of the following, for bridge record purposes:

a 'As built' drawings in electronic and paper form;
b 'As built' bar bending schedules in electronic and transparency form;
c completed 'Structure Information' sheets of a standard form to be specified by the Director of Planning and Transportation; and
d Completed Health and Safety File as required by the Construction (Design and Management) Regulations 1994.

14 Certification in accordance with clauses 2.27-2.32 of DMRB Vol. 1: Section 1: BD2/02 is required to declare the satisfactory completion of the work involved and that the organisations concerned have exercised due professional skill and care. A Construction Compliance Certificate shall be submitted for the approval of the Director of Planning and Transportation. Blank copies of the certificate can be obtained from the Director of Planning and Transportation.

15 The structure(s) will be adopted at the same time as the road, which it (they) supports, is adopted and shall be maintained by the developer to the end of the Maintenance Period specified in the Section 38 Agreement (ie 12 months after the issue of the Part 2 Certificate). The Part 1 Certificate under the Section 38 Agreement will not be issued until the Director of Planning and Transportation has issued a written acceptance of the satisfactory completion of the structure(s) for adoption purposes. This written acceptance will not be given until all the costs, changes etc referred to in paragraph 16 below have been paid to the City Council.

16 All costs, charges, etc incurred by the Director of Planning and Transportation in servicing the structural aspects of the developer's scheme are to be borne by the Developer.

17 The Developer is required to give his written agreement to the above terms and conditions before arrangements are made to proceed with the works.

B APPENDIX - ROAD CONSTRUCTION CONSENT APPLICATION FORM

Application for Consent to Construct a New Road or to Extend an Existing Road

Date

TO THE DIRECTOR OF PLANNING AND TRANSPORTATION

In terms of Section 21 of the Roads (Scotland) Act 1984

See Note (1) I/We . . . . . .

. . . . . .

See Note (2) hereby apply for consent to construct . . . . . metres

See Note (3) of new road at . . . . . .

adjoining . . . . . .

See Note (4) and I/We herewith deliver and deposit a Plan and Sections

I/We confirm that under Section 21 Paragraph 2(b) of the Roads (Scotland) Act 1984, I/We shall by notice intimate my/our intentions to the owners od all land which would front, abut or be comprehended in the new road or the extension of the existing road; and a list of the names and addresses of such persons upon whom such notice has been served is attached herewith.

I/We also confirm that I/We shall by notice intimate my/our intentions to such other persons, if any, as the Authority may, for the purposes of this application specify.

See Note (5) Signature of applicant . . . . . .

Address of Applicant . . . . . .

. . . . . .

Return to :

The Director of Planning and Transportation

Dundee City Council

Tayside House

28 Crichton Street

Dundee

DD1 3RB

NOTES

1 Here insert Name of Applicant, viz, the Developer.

2 Here specify approximate length of new road in metres.

3 Here specify name of new road or development, together with name of existing public road to which a connection is to be made.

4 It will facilitate consideration of the application if it is accompanied by FIVE copies of the LAYOUT PLAN and FOUR paper copies of each of the remaining drawings.

a LAYOUT PLAN - Scale 1:500 showing (i) curve radii of the road alignment, and junctions, (ii) carriageway, footway and footpath width, (iii) vehicular access crossings to properties, (iv) the position of gullies, manholes and sewers relative to the connection or discharge points, (v) the position of services, (vi) road markings and signing, (vii) garage/hard-standing levels and access gradients.

b LONGITUDINAL SECTION along roads giving the vertical alignment details of gradient, and rate of changes of the vertical alignment with chainages related to the layout plan.

c TYPICAL CROSS SECTION through each type of road, showing widths of carriageway, footways and/or verges, crossfalls, construction depths and materials used, kerb and edge details and details of gullies and their connections. In addition, details of footpaths remote from the carriageway and of vehicular access crossings should be given.

d LONGITUDINAL SECTION along drains and sewers showing levels, diameters and gradients of pipes.

Additional information will be necessary where the carriageway construction thickness, in most cases the sub-base, is varied according to ground conditions. Generally the thickness of sub-base can be finally decided during excavations for the surface water sewers, but trial pits can be dug to a depth not less than one metre below formation before construction commences. The location of trial pits, logs of the strata and the results of tests taken should be submitted.

Details relating to design, specification, supply, siting and installation of street lighting are required.

5 The form MUST be signed by the APPLICANT not the agent.

ROADS (SCOTLAND) ACT 1984

Intimation of Application for Construction Consent

To: . . . . . (Insert here name and address of person to whom intimation is to be made.)

1 Notice is hereby given that application is about to be made by . . . . . (Insert here name of applicant.)

to Dundee City Council as local roads authority for Construction Consent for a new road at . . . . . (Insert here brief description of proposed road construction works.)

2 Plans and other particulars relating to the application may be inspected at the office of the Director of Planning and Transportation, Tayside House, Crichton Street, Dundee

3 If you wish to make any representations in regard to the application, you should do so in writing within 28 days of the date hereof. Representations must be addressed to Director of Support Services, City Square, Dundee

4 Dundee City Council is obliged to consider any written representations made within the said 28 days before deciding whether to grant or refuse Construction Consent.

Signature of Applicant . . . . . .

Address of Applicant . . . . . .

. . . . . .

. . . . . .

. . . . . Date . . . . . .

Application for Consent to construct a New Road at : . . . . . .

. . . . . .

I/We hereby declare that on the . . . . . 20 . . . . . the foregoing application for Construction Consent was, by notice duly intimated to the following persons all being the owners of all land which would front, abut or be comprehended in the proposed construction works :

Name	Address
. . . . .	. . . . .
. . . . .	. . . . .
. . . . .	. . . . .
. . . . .	. . . . .
. . . . .	. . . . .
. . . . .	. . . . .

TECHNICAL APPENDIX

TURNING HEAD IN SHORT CULS-DE-SAC AND COURTYARDS

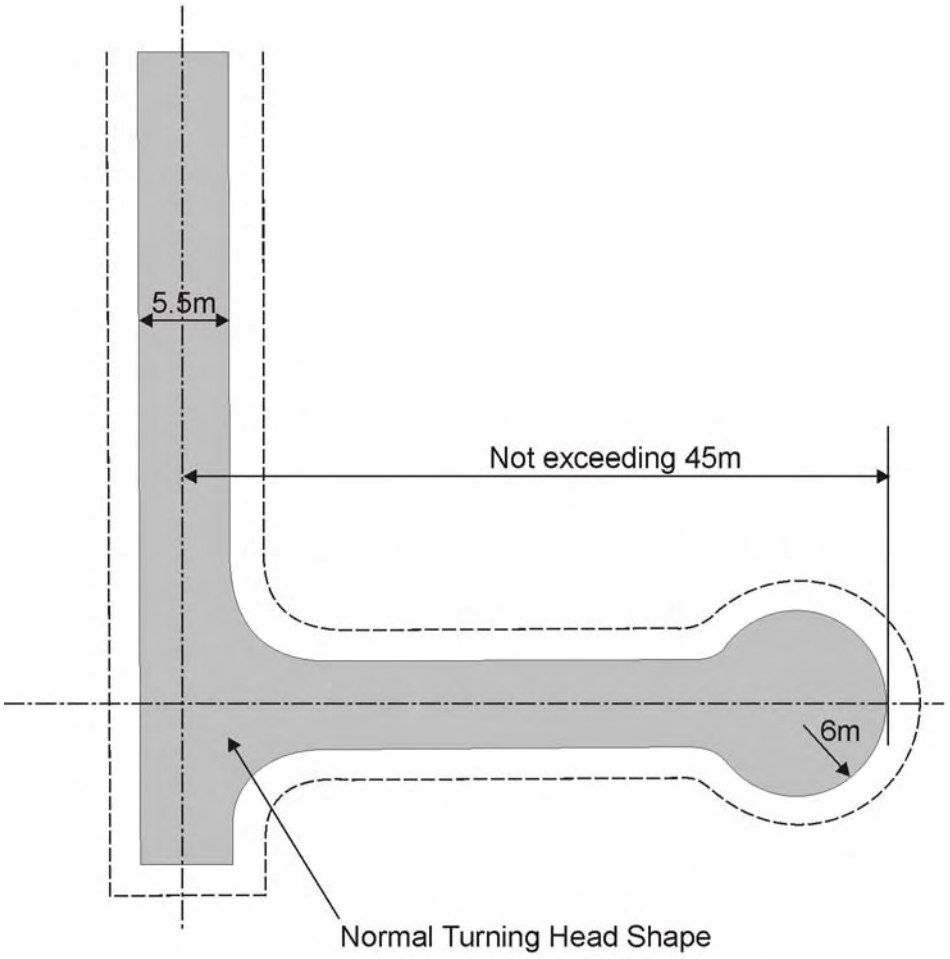


FIGURE 1

STANDARD TURNING HEADS

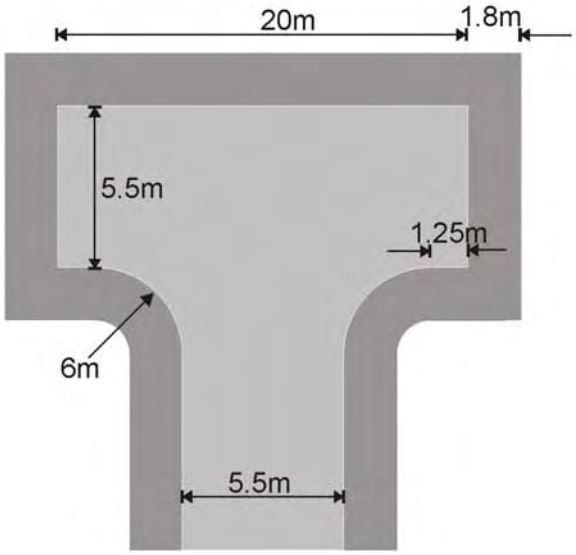


FIGURE 2

SIMPLE T HAMMERHEAD

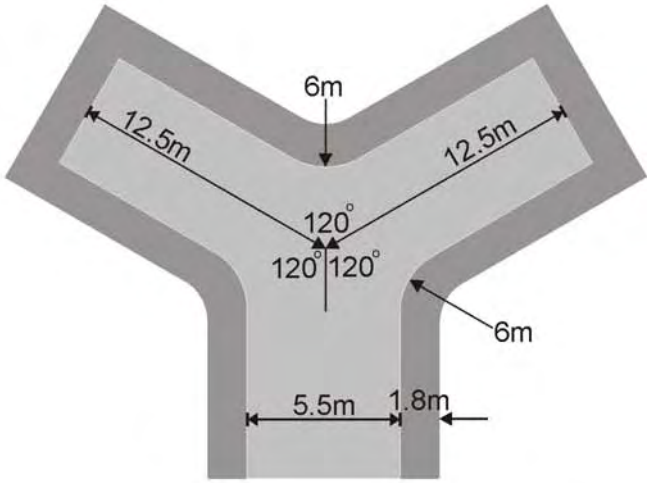


FIGURE 3

SIMPLE Y HAMMERHEAD

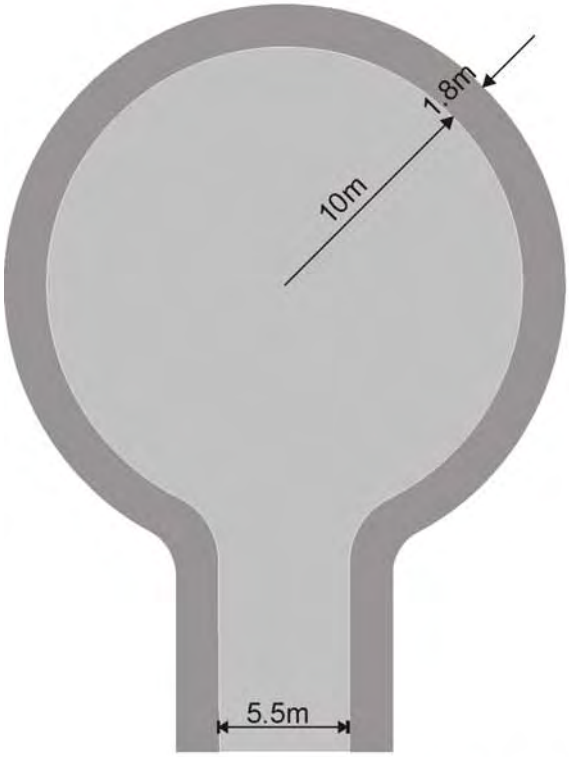


FIGURE 4

TURNING CIRCLE

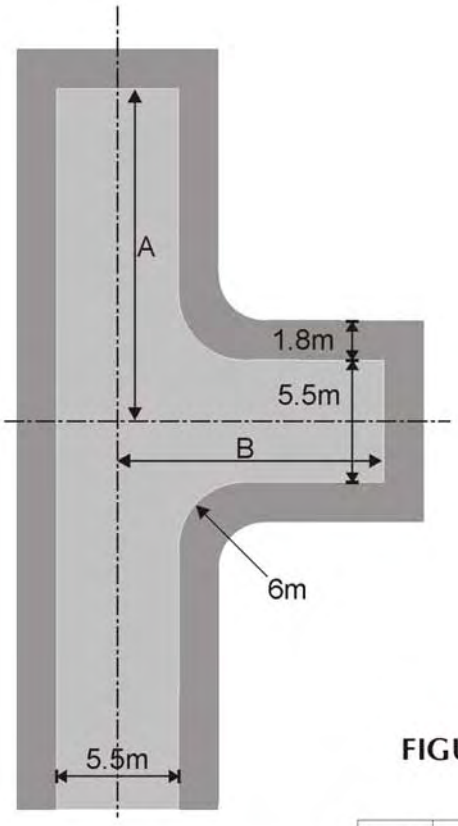


FIGURE 5

	A	B
Forward Side Turn	10m	15m
Reverse Side Turn	15m	12m

OFFSET HAMMERHEAD

MINIMUM TURNING HEADS FOR CARS FOR PRIVATE ACCESSES

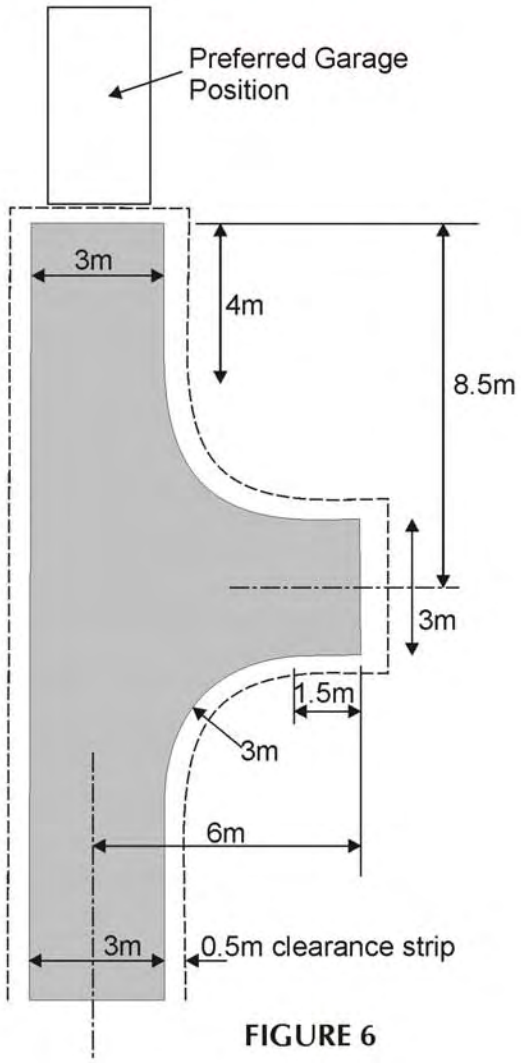


FIGURE 6

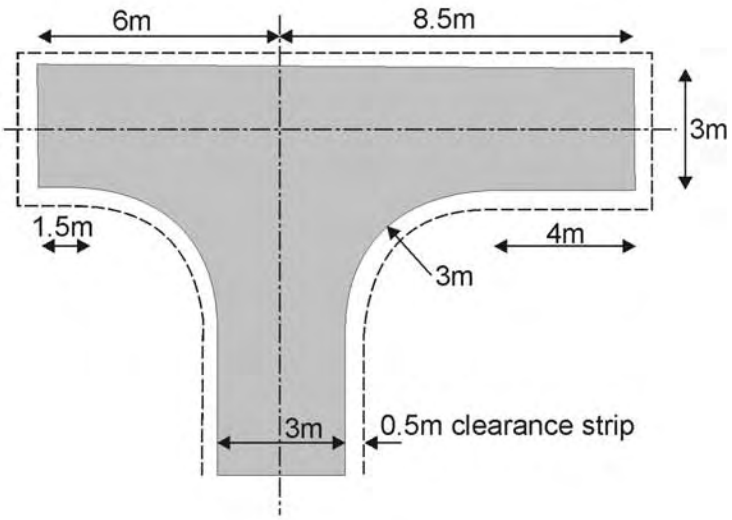


FIGURE 7

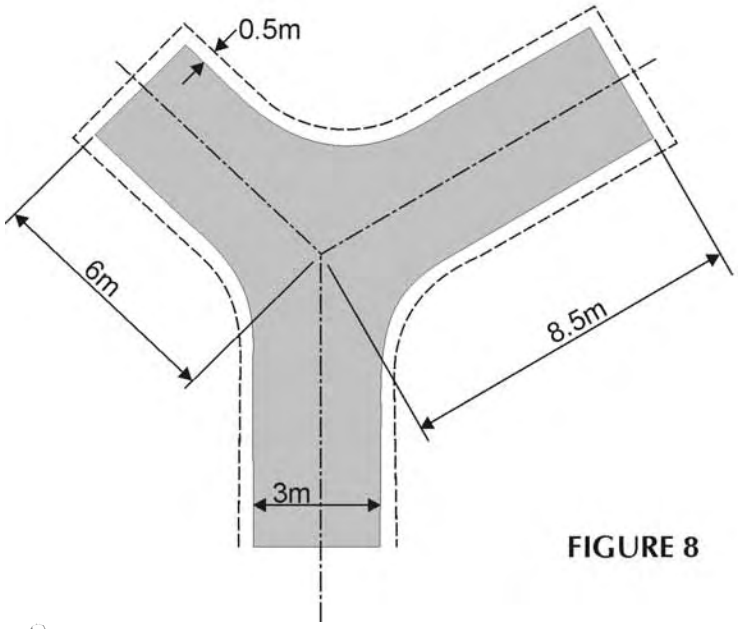


FIGURE 8

Alternative configurations may be used provided the arms of the T are dimensioned 6m & 8.5m and no angle between the arms is less than 90

Where possible the preferred location for a garage would be on the longer leg

TURNING HEADS FOR COMMERCIAL AND INDUSTRIAL AREAS

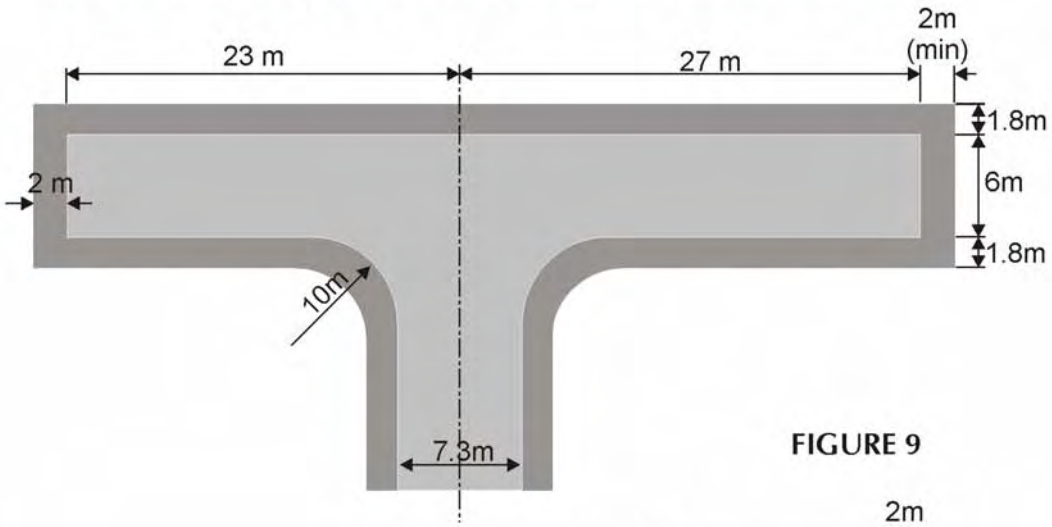


FIGURE 9

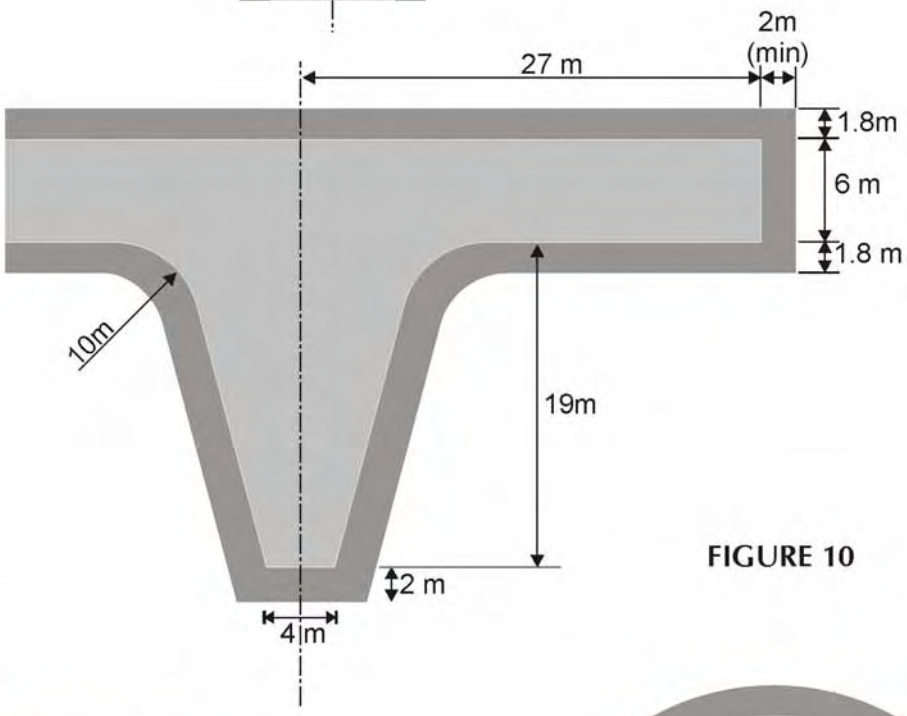


FIGURE 10

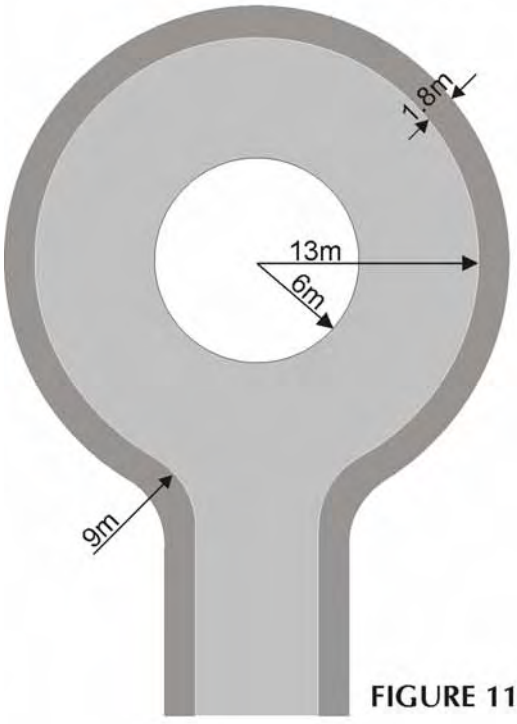


FIGURE 11

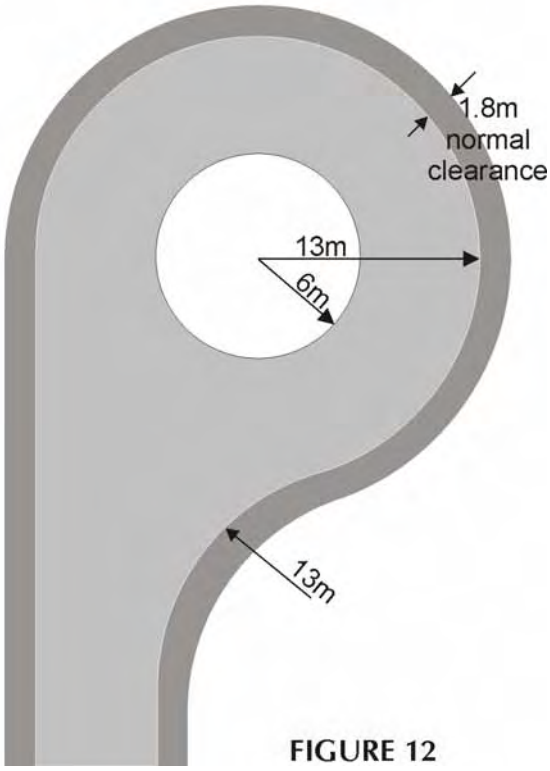


FIGURE 12

ALTERNATIVE TURNING HEADS IN SHORT CULS-DE-SAC AND MINOR ROADS

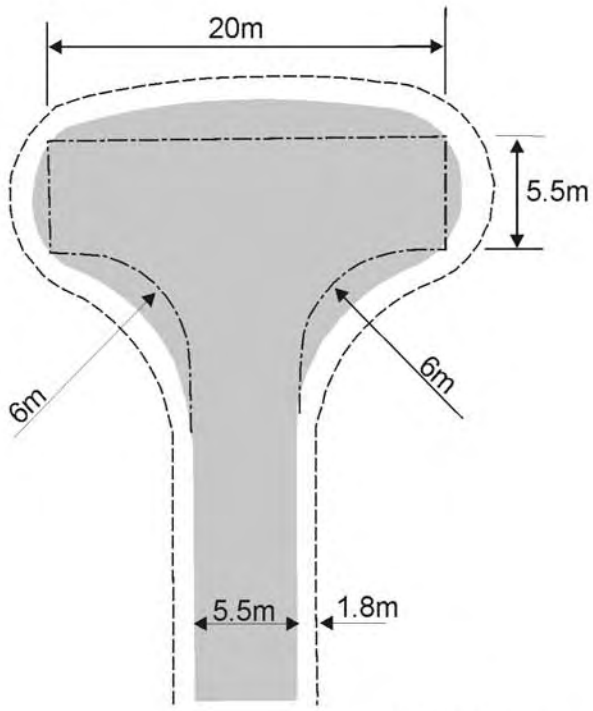


FIGURE 13

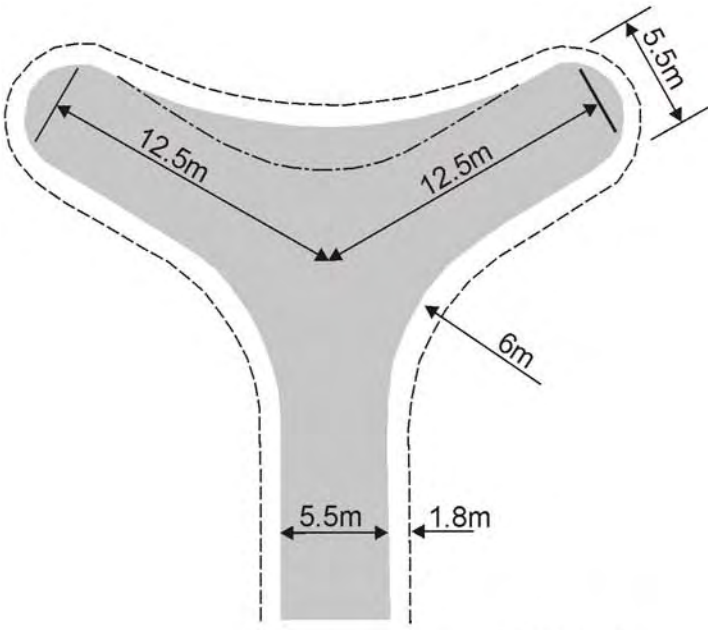


FIGURE 14

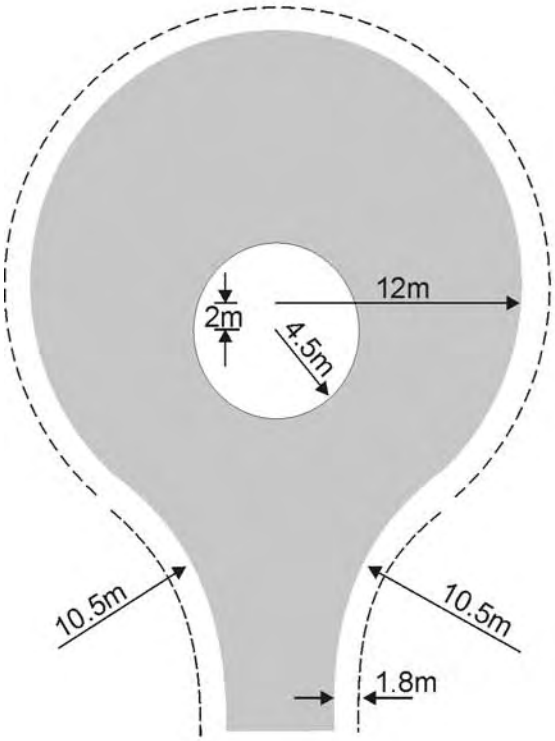


FIGURE 15

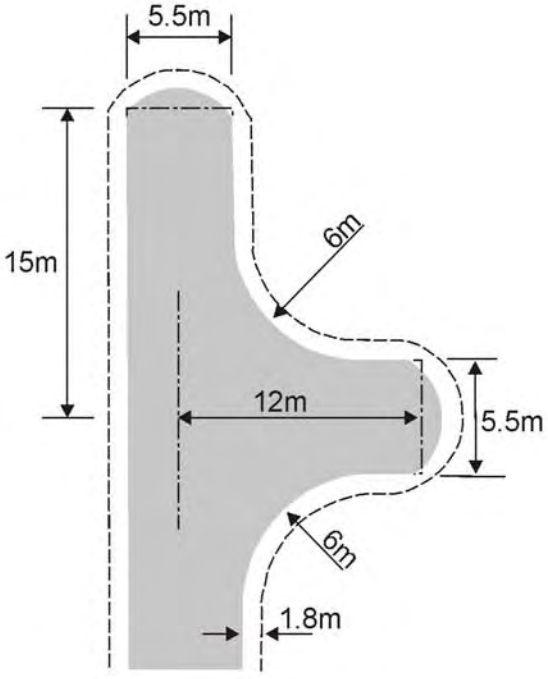


FIGURE 16

JUNCTION BETWEEN MINOR ROAD AND SHORT CULS-DE-SAC OR ACCESS

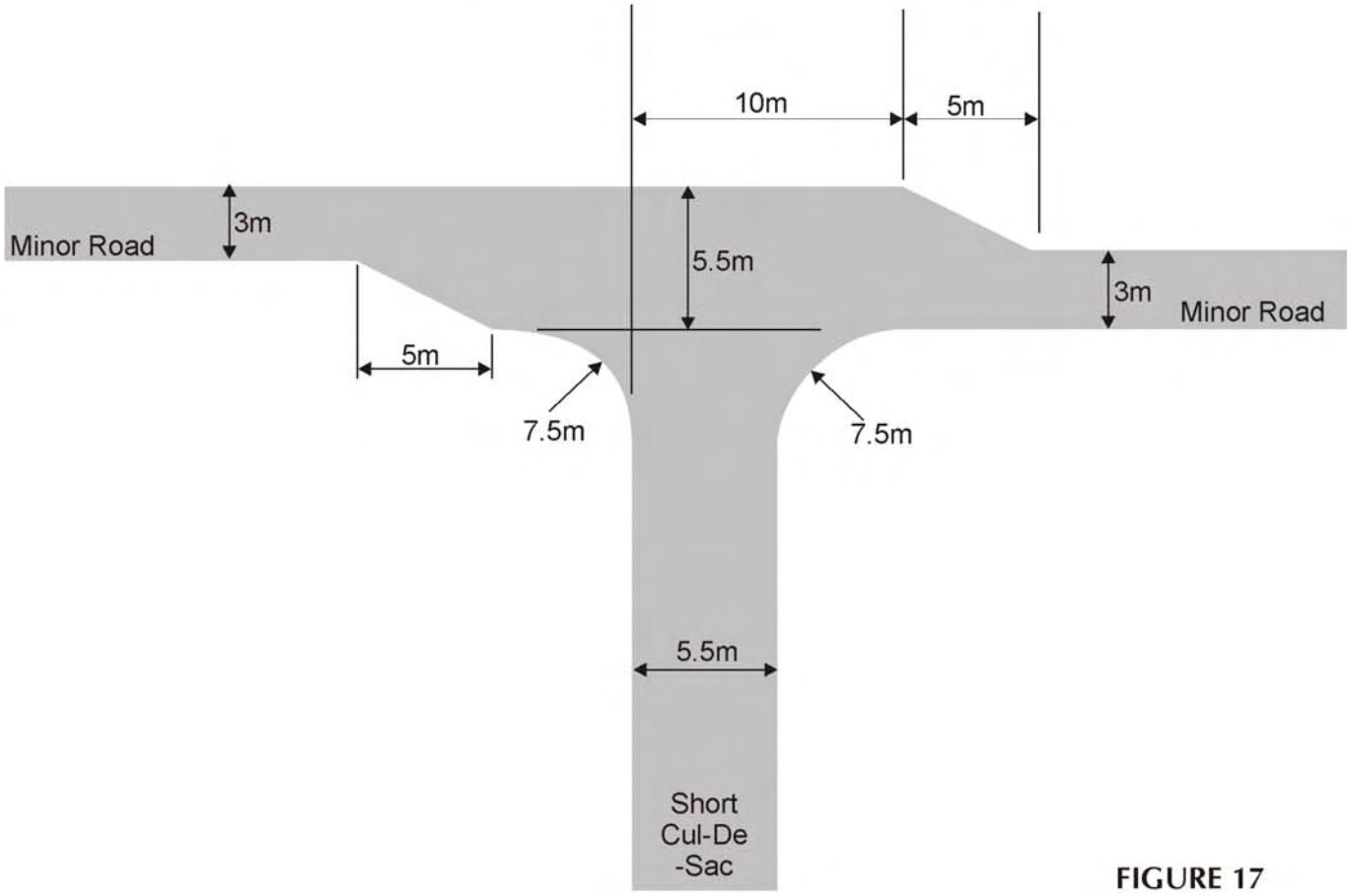


FIGURE 17

PASSING PLACE

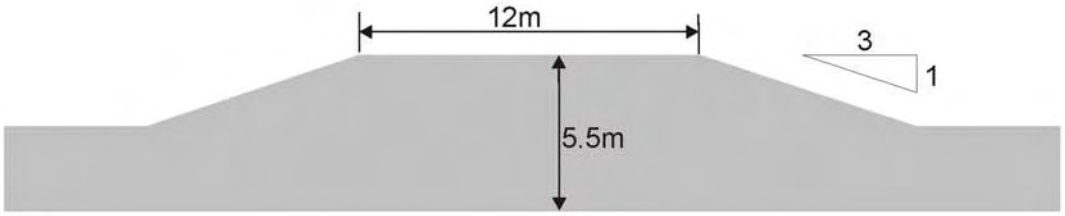
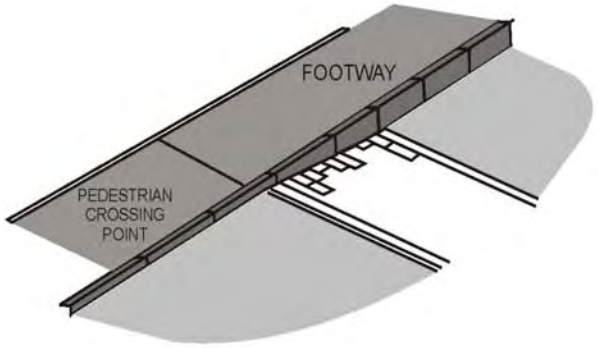


FIGURE 18

RAMP DETAILS AT ENTRANCE TO MINOR ROADS AND SHORT CULS-DE-SAC



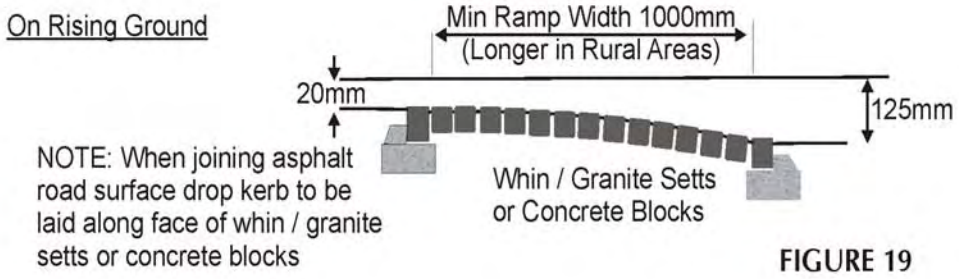


FIGURE 19

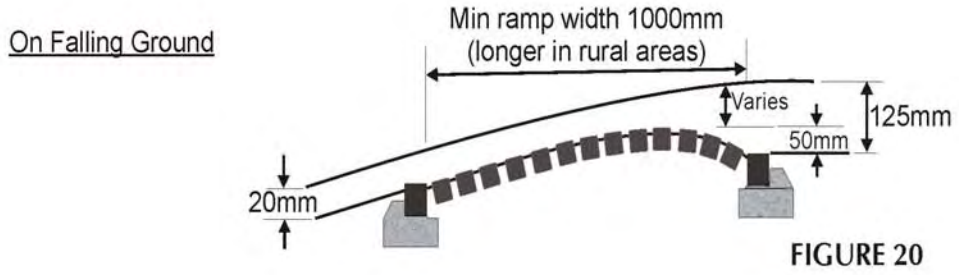


FIGURE 20

RAMP POSITION AT JUNCTION BETWEEN GENERAL ROADS AND MINOR ROADS OR SHORT CULS-DE-SAC

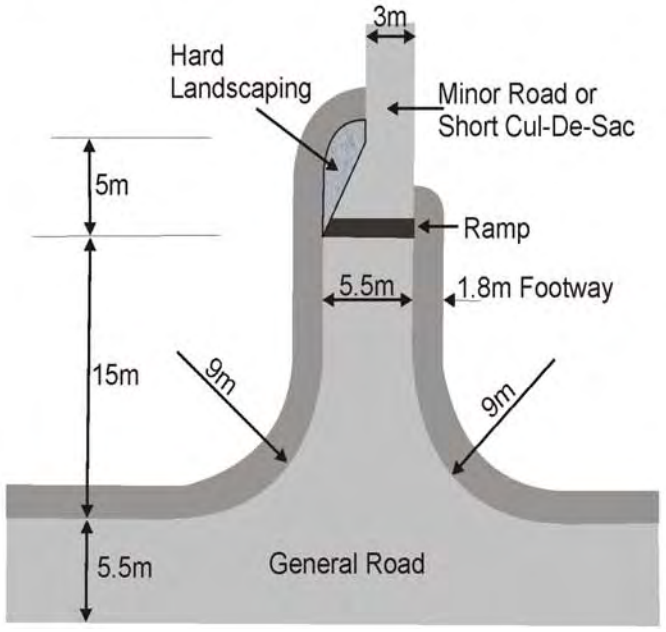


FIGURE 21

JUNCTION TYPES

TYPE A JUNCTION

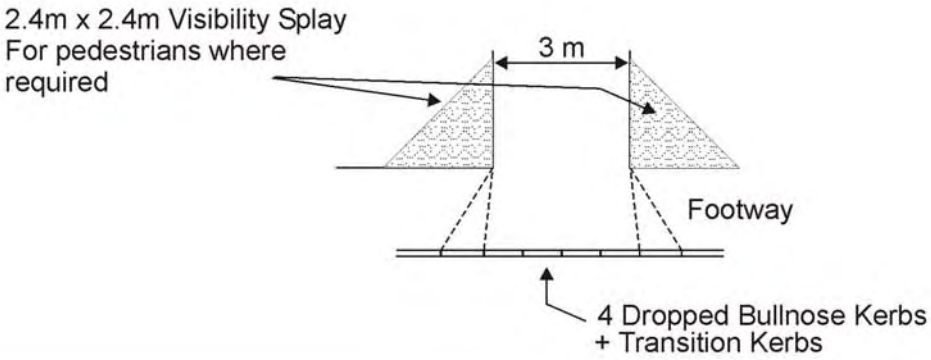


FIGURE 22

TYPE B JUNCTION

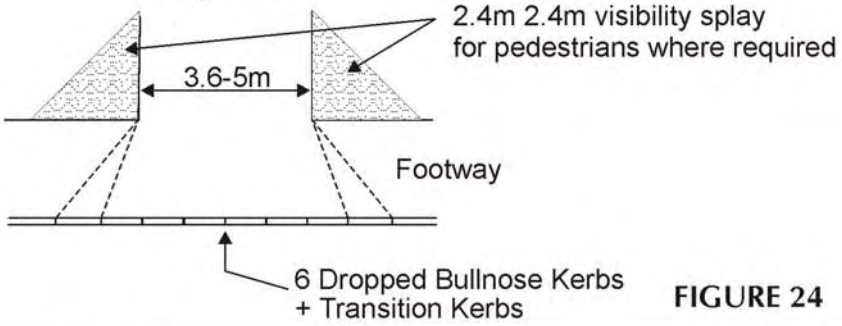


FIGURE 24

TYPE C JUNCTION

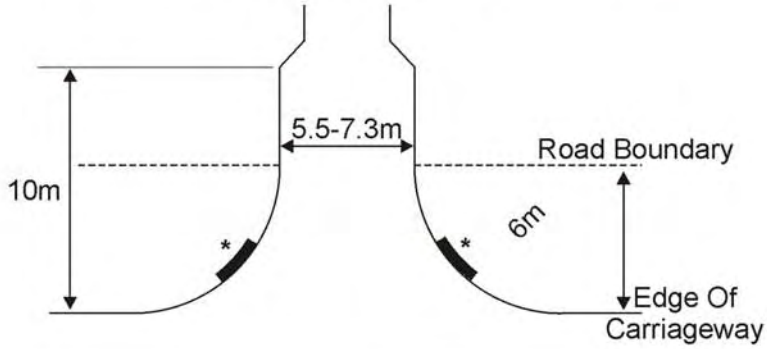


FIGURE 26

TYPE D JUNCTION

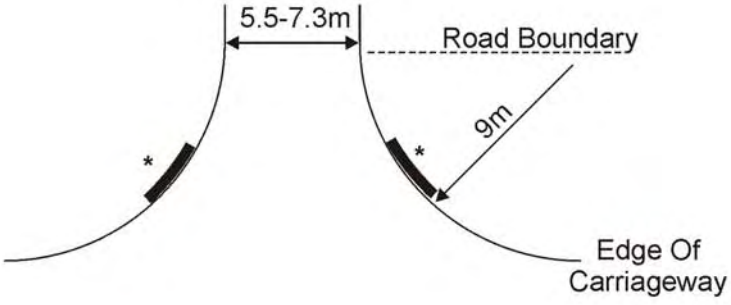


FIGURE 27

*** Dropped Kerb Crossings for wheelchairs, prams etc should be provided where a junction interrupts a footway**

TYPE E JUNCTIONS

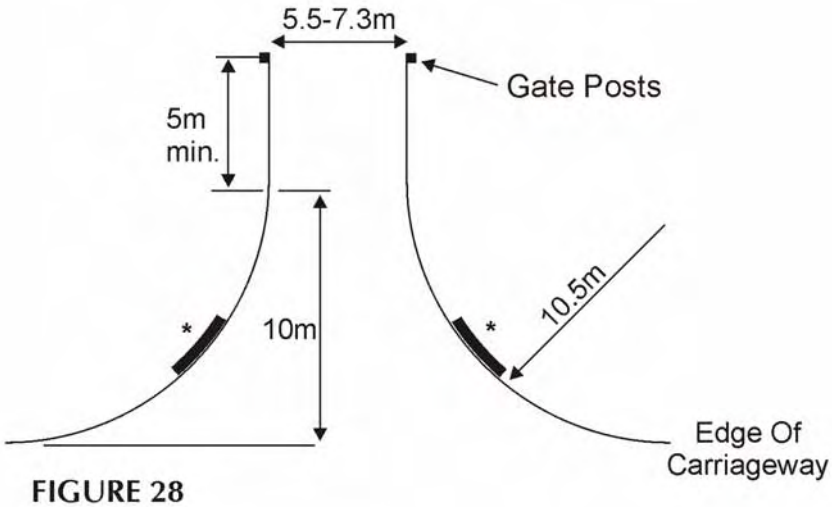


FIGURE 28

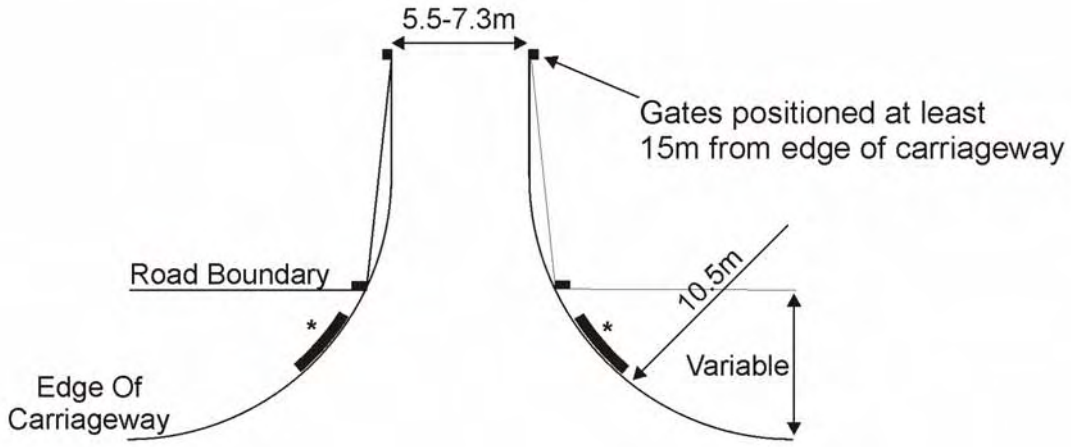


FIGURE 29

*** Dropped Kerb Crossings for wheelchairs, prams etc should be provided where a junction interrupts a footway**

PASSING PLACE ON MINOR ROADS COMBINED WITH GARAGE ACCESS & VISITOR PARKING

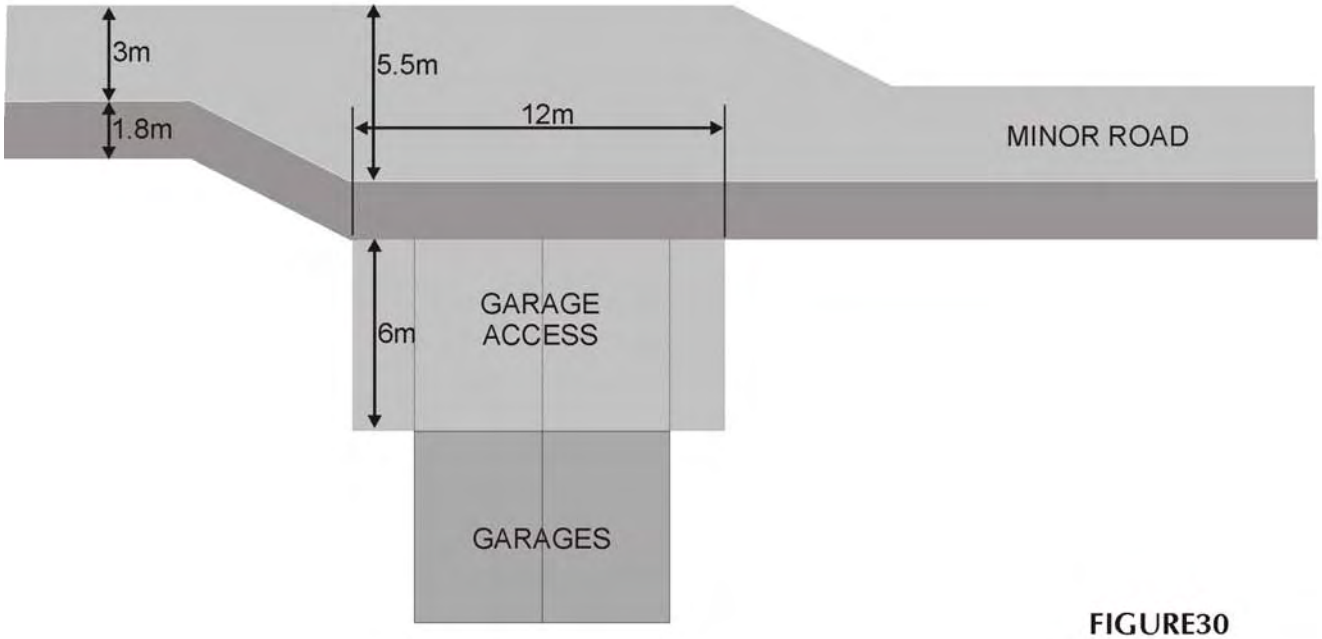
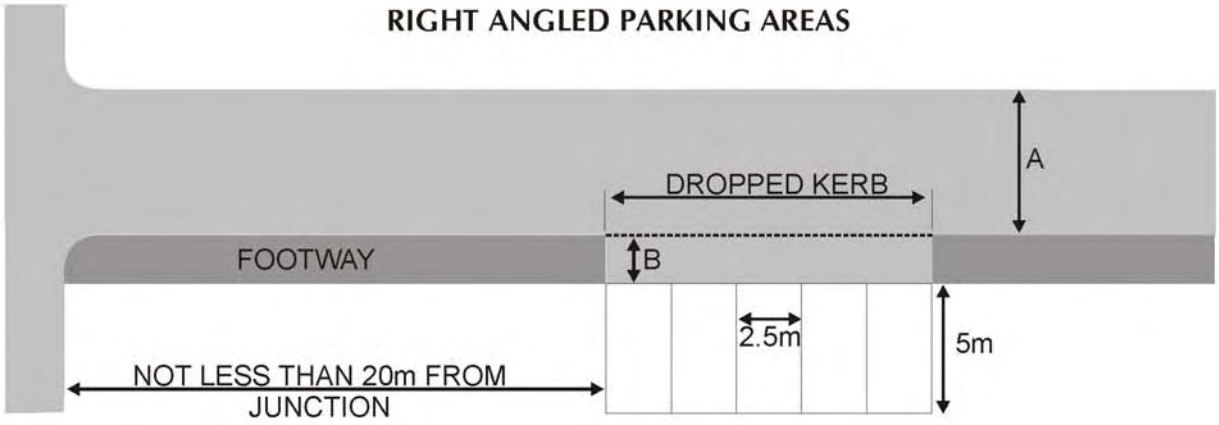


FIGURE30

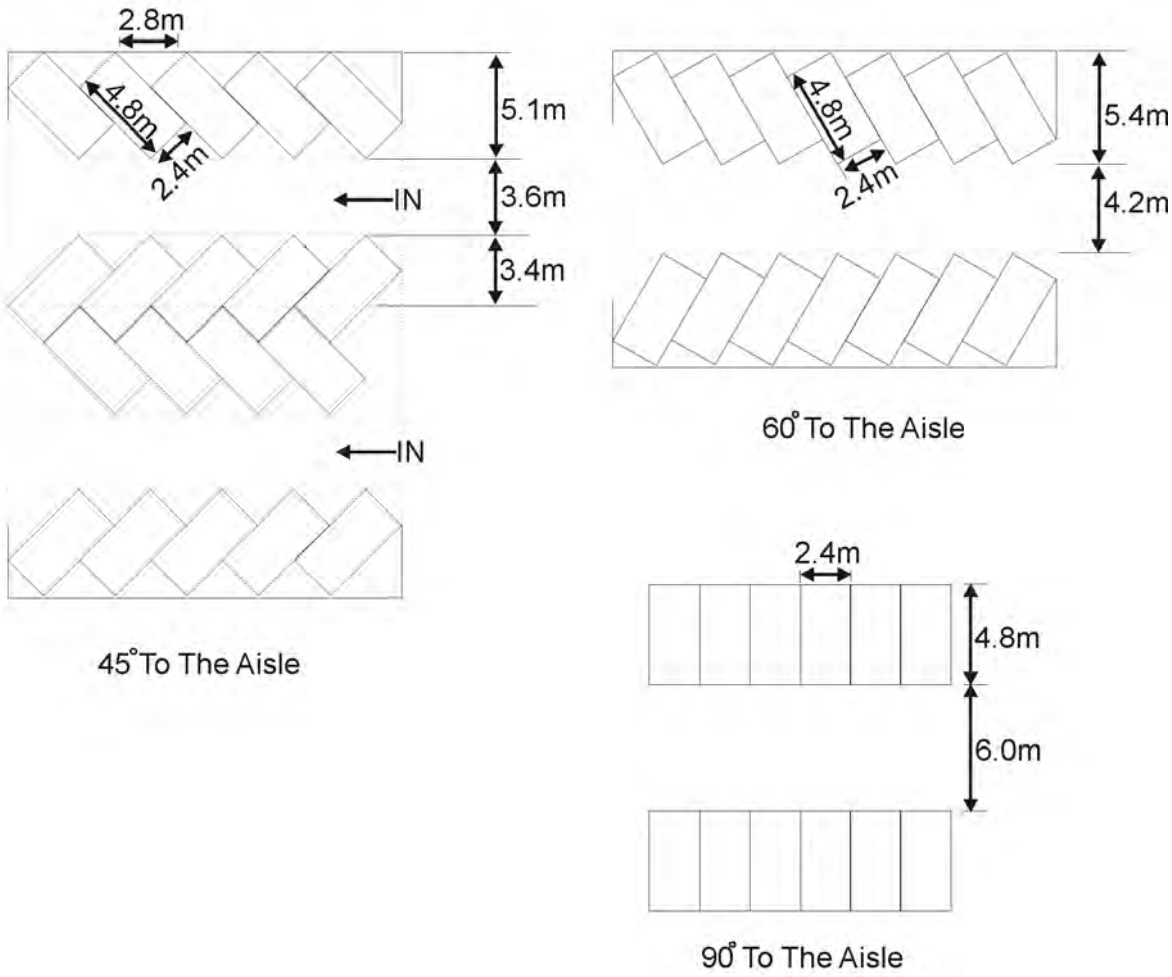
RIGHT ANGLED PARKING AREAS

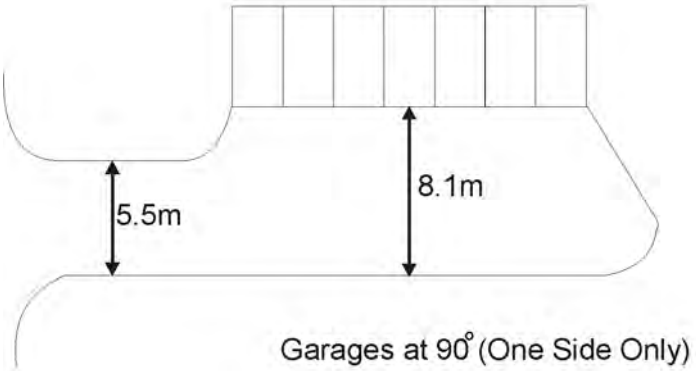


ROAD TYPE	A	B
General Road	5.5m	1.8m
Short Cul De Sac	5.5m	1.8m
Minor Road	3.0m	3.5m

FIGURE 31

PARKING LAYOUTS





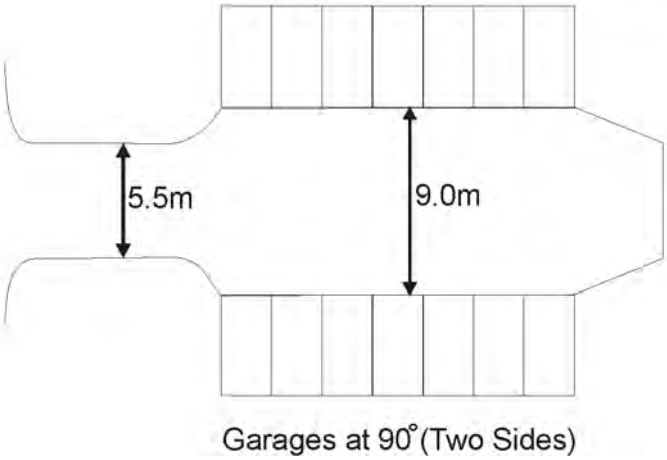


FIGURE 32

LOADING BAYS

FIGURE 33

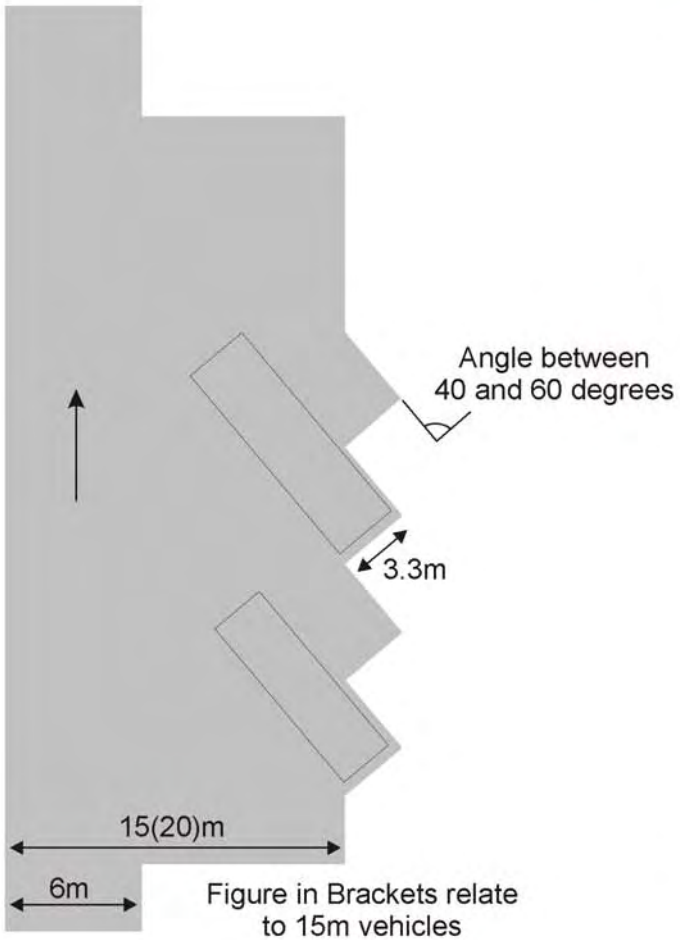


FIGURE 34

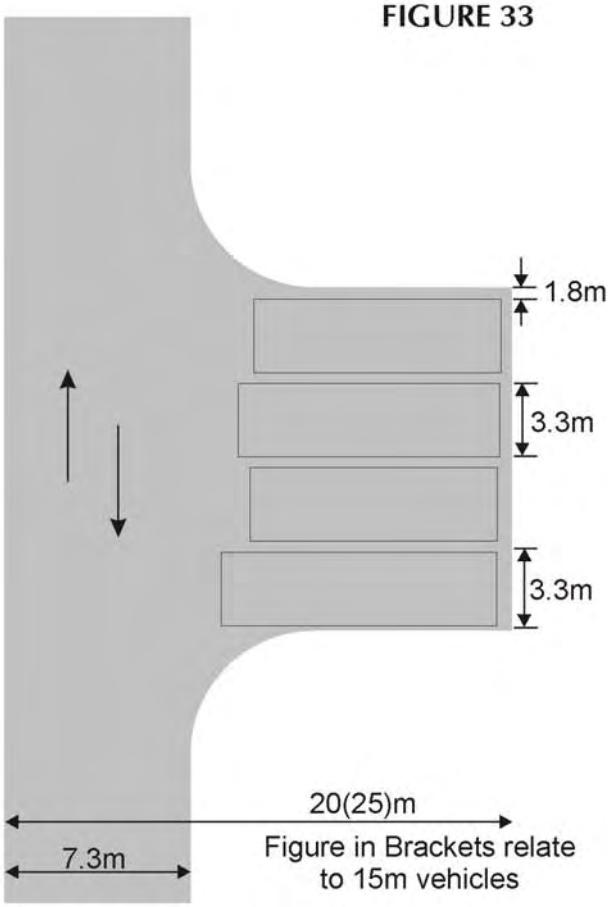


FIGURE 35

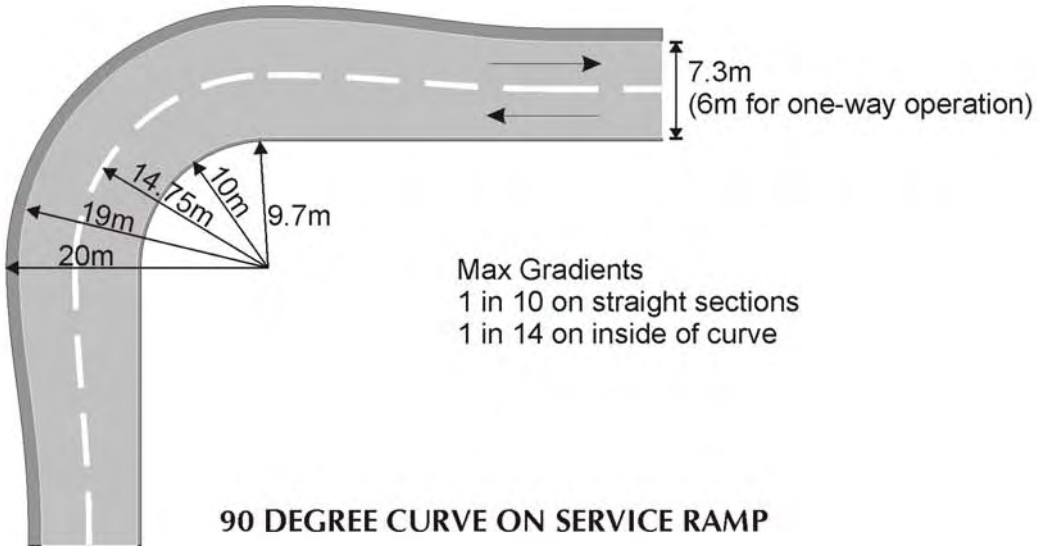


FIGURE 36 90 DEGREE CURVE ON SERVICE RAMP

STANDARD KERB DETAIL

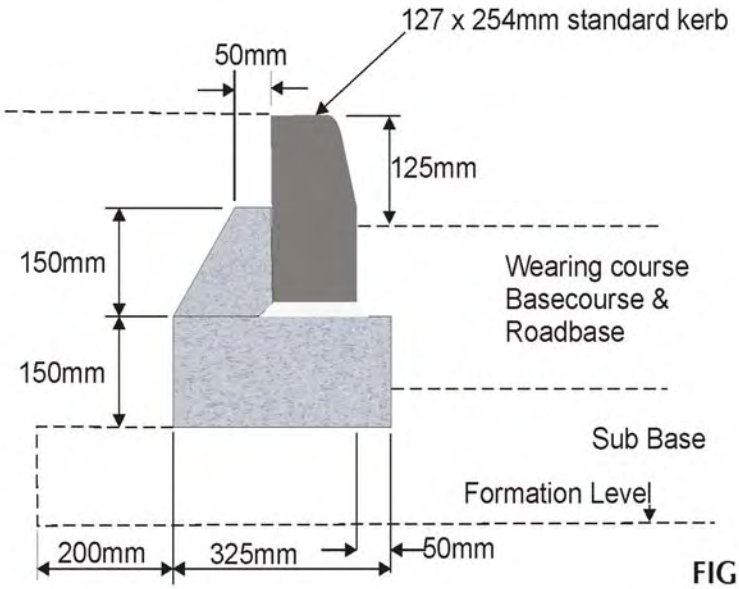


FIGURE 37

DROPPED KERB DETAIL

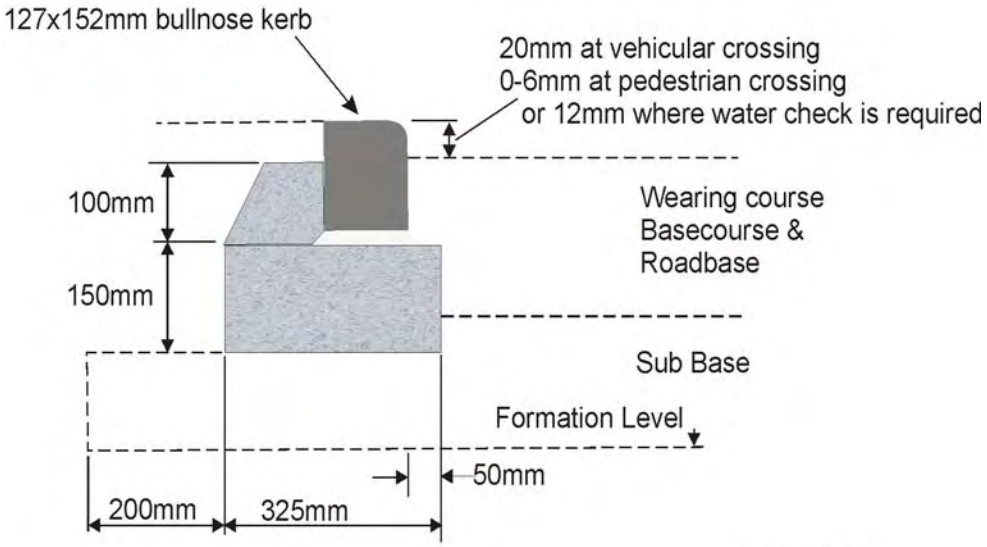


FIGURE 38

ALTERNATIVE STANDARD KERB DETAIL

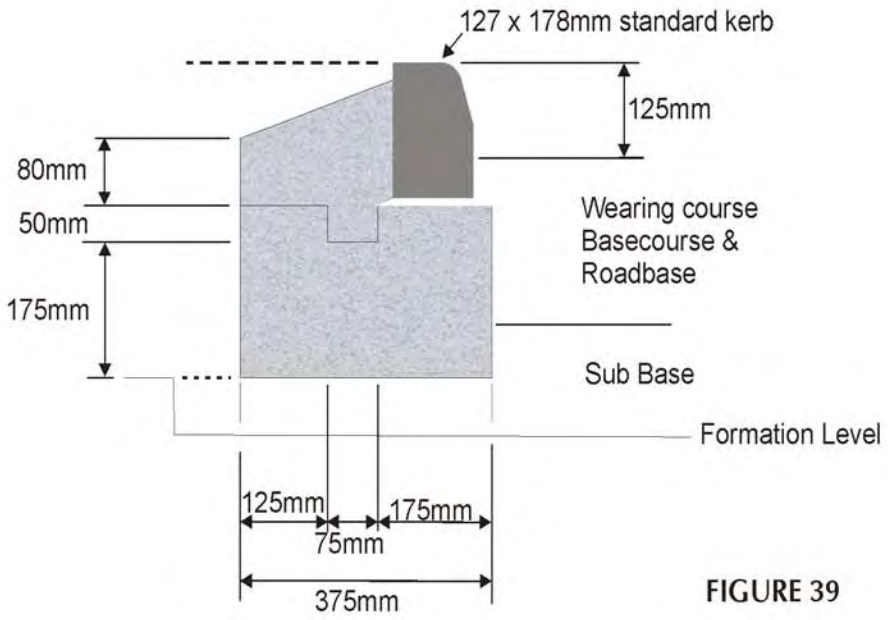


FIGURE 39

ALTERNATIVE DROPPED KERB DETAIL

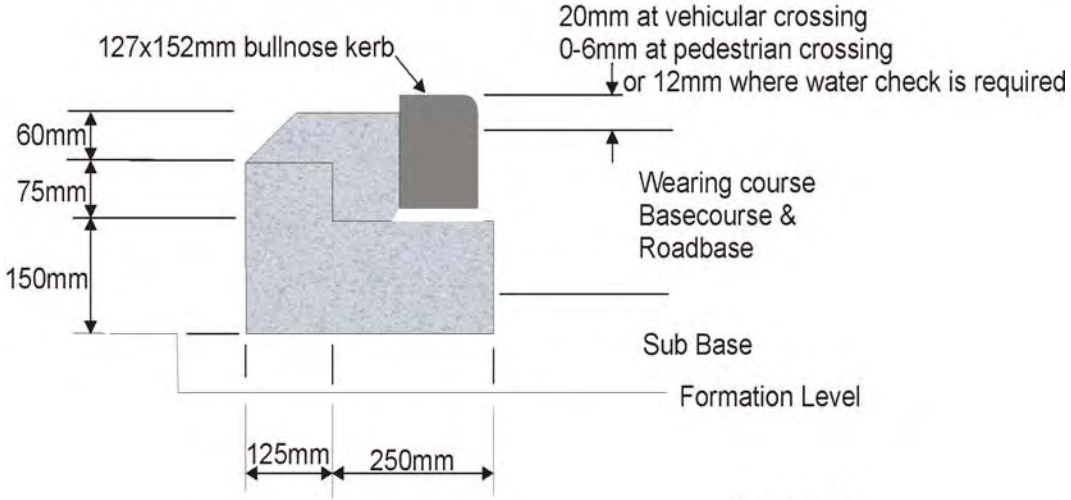


FIGURE 40

FOOTPATH KERB DETAIL

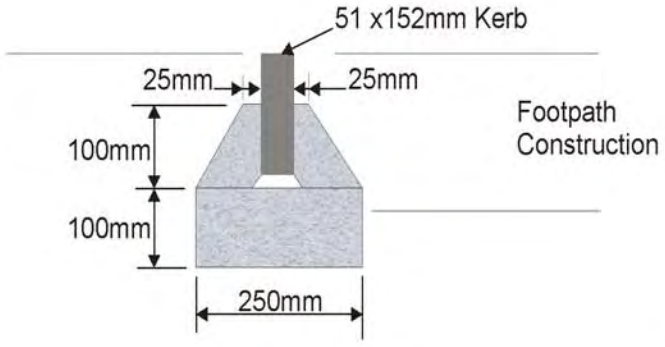


FIGURE 41

L SHAPED LOG DETAIL

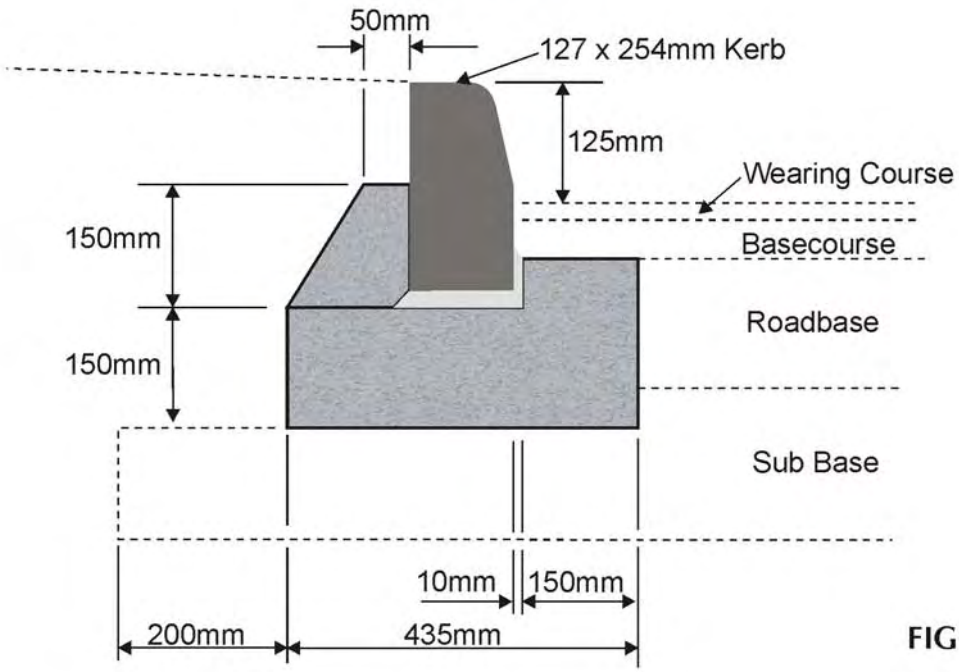


FIGURE 42

WHIN / GRANITE SETT KERB

Alternative Kerb Detail At Minor Roads
particularly useful where over-riding may occur

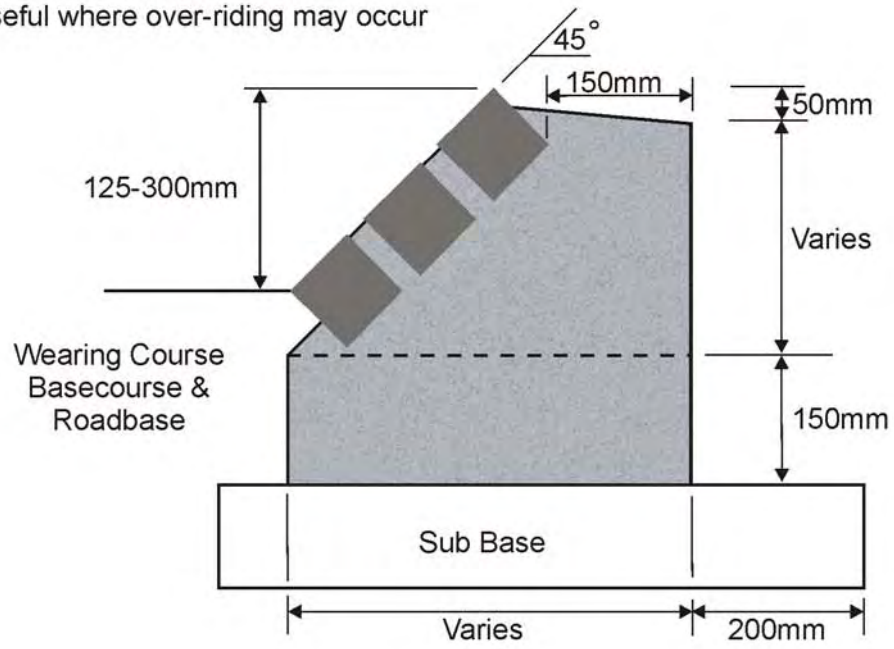


FIGURE 43

SUGGESTED KERB TREATMENT ON SHORT CULS-DE-SAC, MEWS COURTS AND HOUSING SQUARES

BULLNOSE PRECAST PRESSED CONCRETE KERB

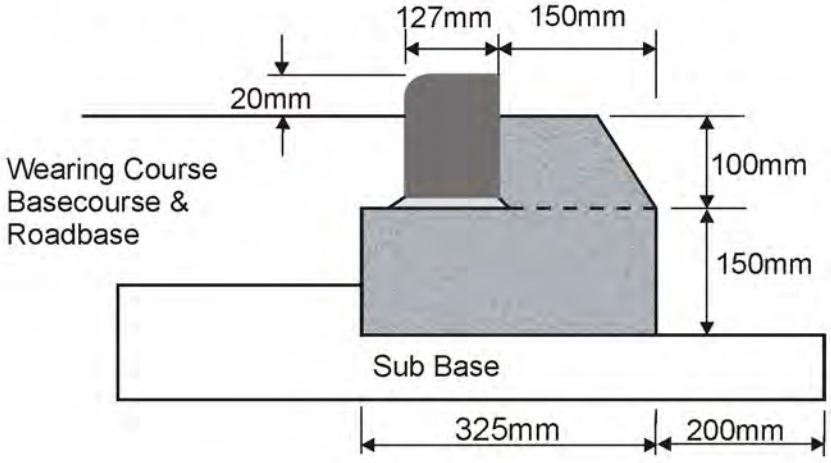


FIGURE 44

WHIN/GRANITE SETT KERB

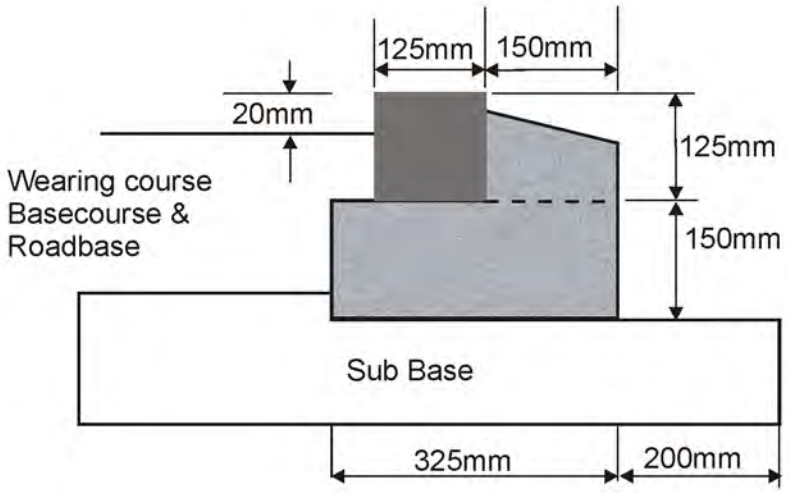


FIGURE 45

DISHED SETTS

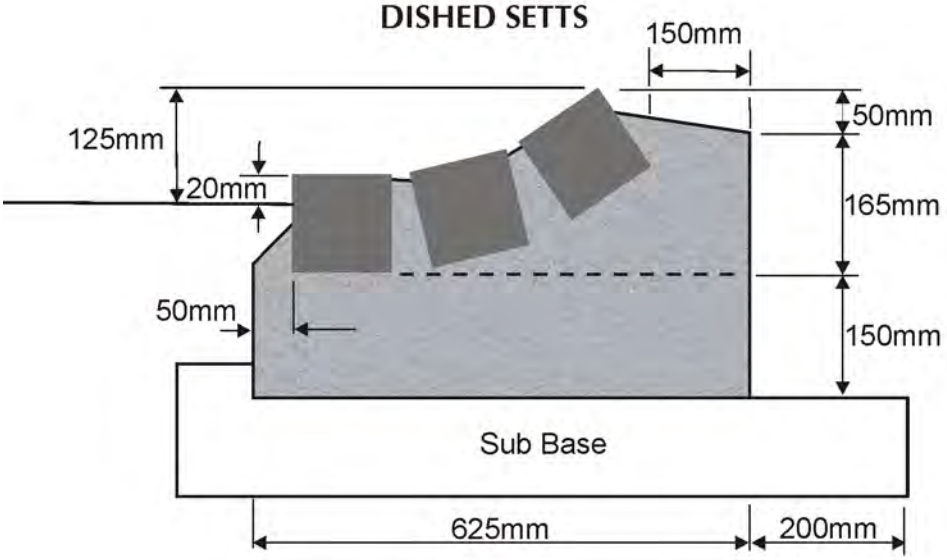


FIGURE 46

TYPICAL DETAIL OF ROAD SURFACED WITH CONCRETE PAVING BLOCKS ABUTTING A KERB WHICH PROVIDES THE EDGE RESTRAINT

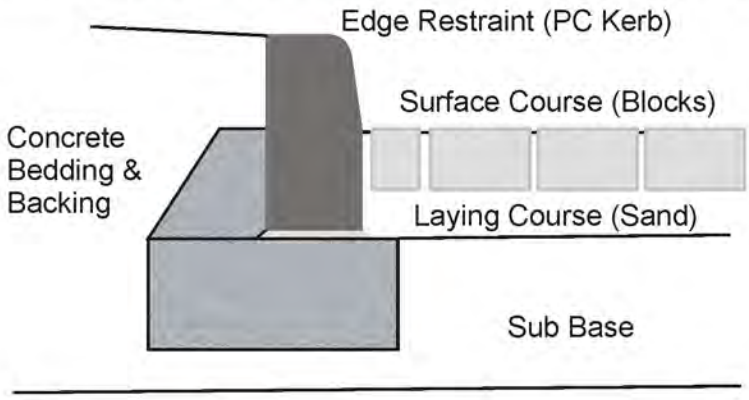


FIGURE 47

KERB DETAIL AT COURTYARD PARKING AREAS

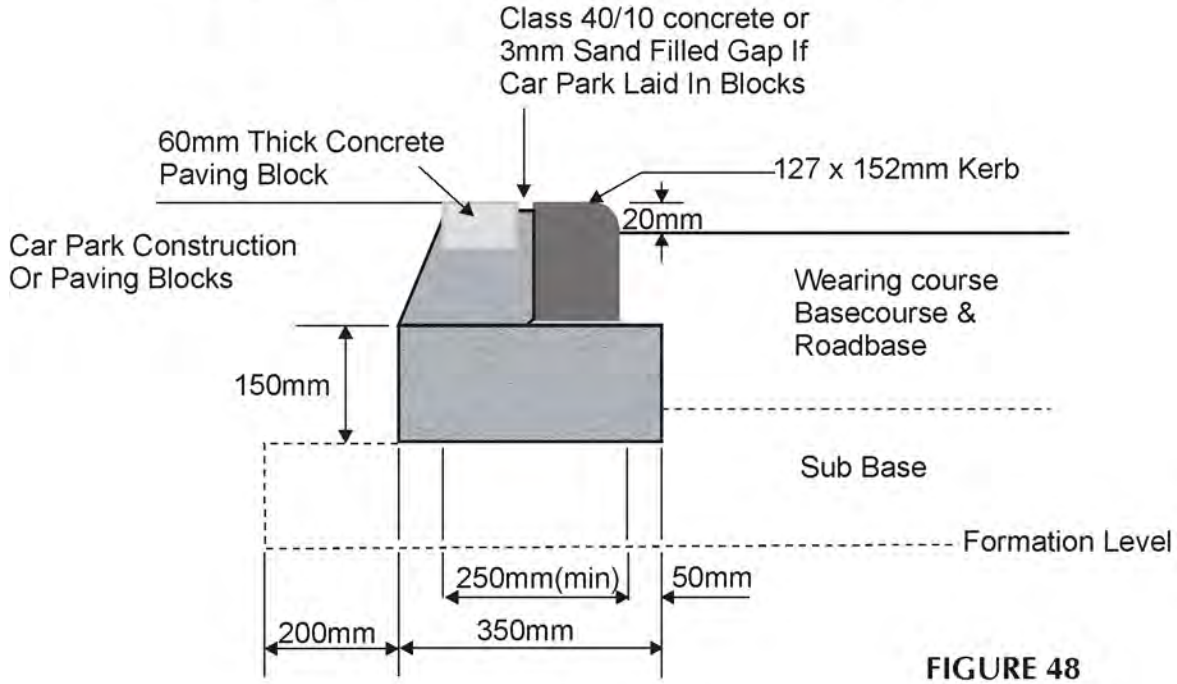


FIGURE 48

KERB SETT DETAIL

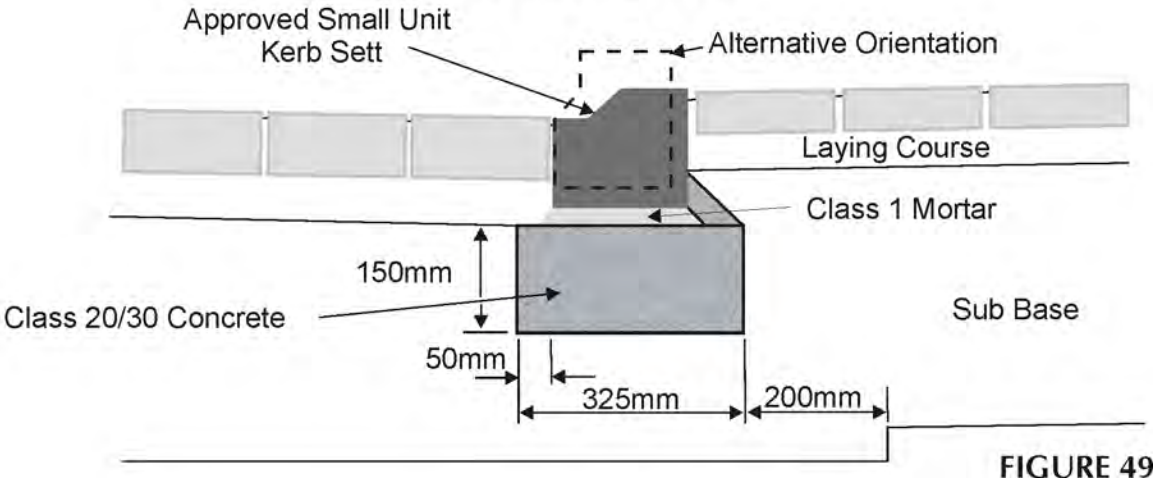


FIGURE 49

DETAIL OF TYPICAL FOOTWAY

FIGURE 50

DETAIL OF REMOTE FOOTPATH

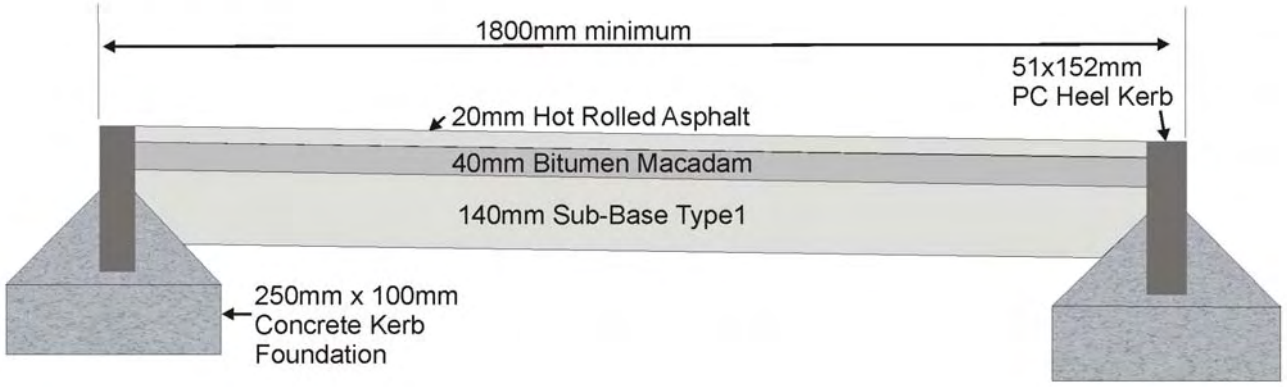


FIGURE 51

TYPICAL DETAIL FOR FOOTWAY

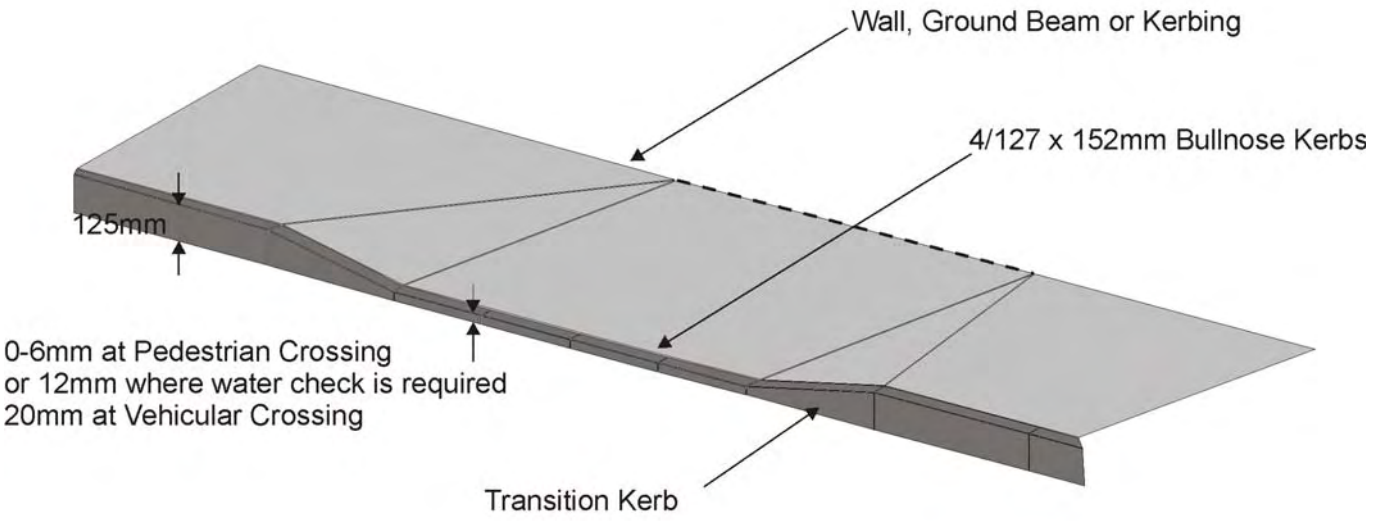


FIGURE 52

TYPICAL DETAIL FOR FOOTWAY WITH VERGE

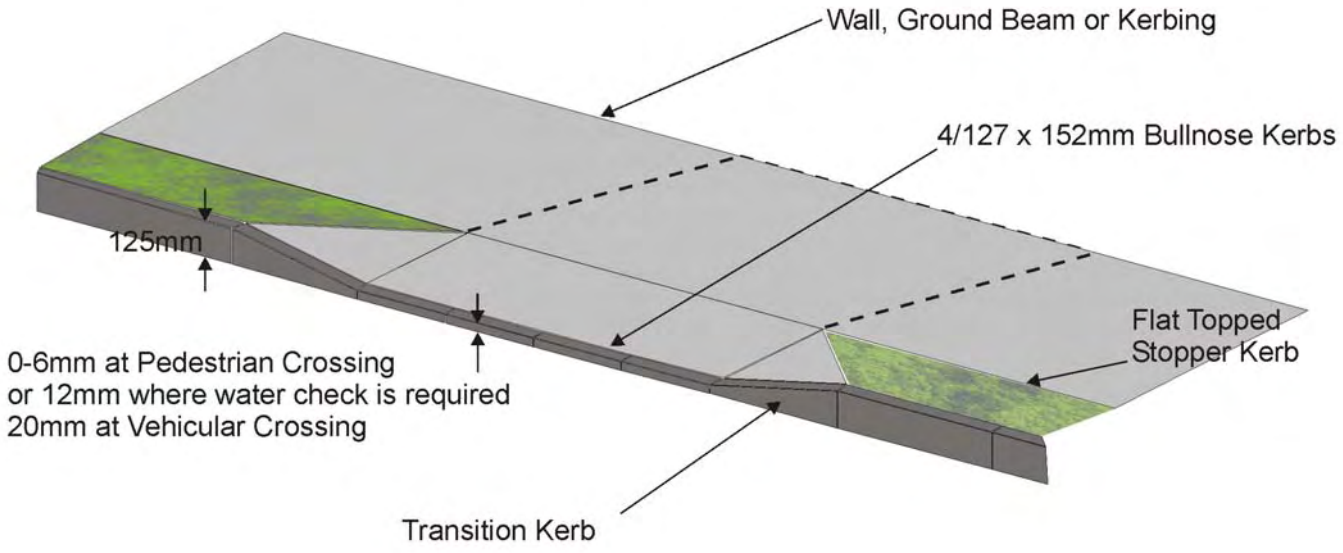


FIGURE 53

TYPICAL DETAIL FOR FOOTWAY

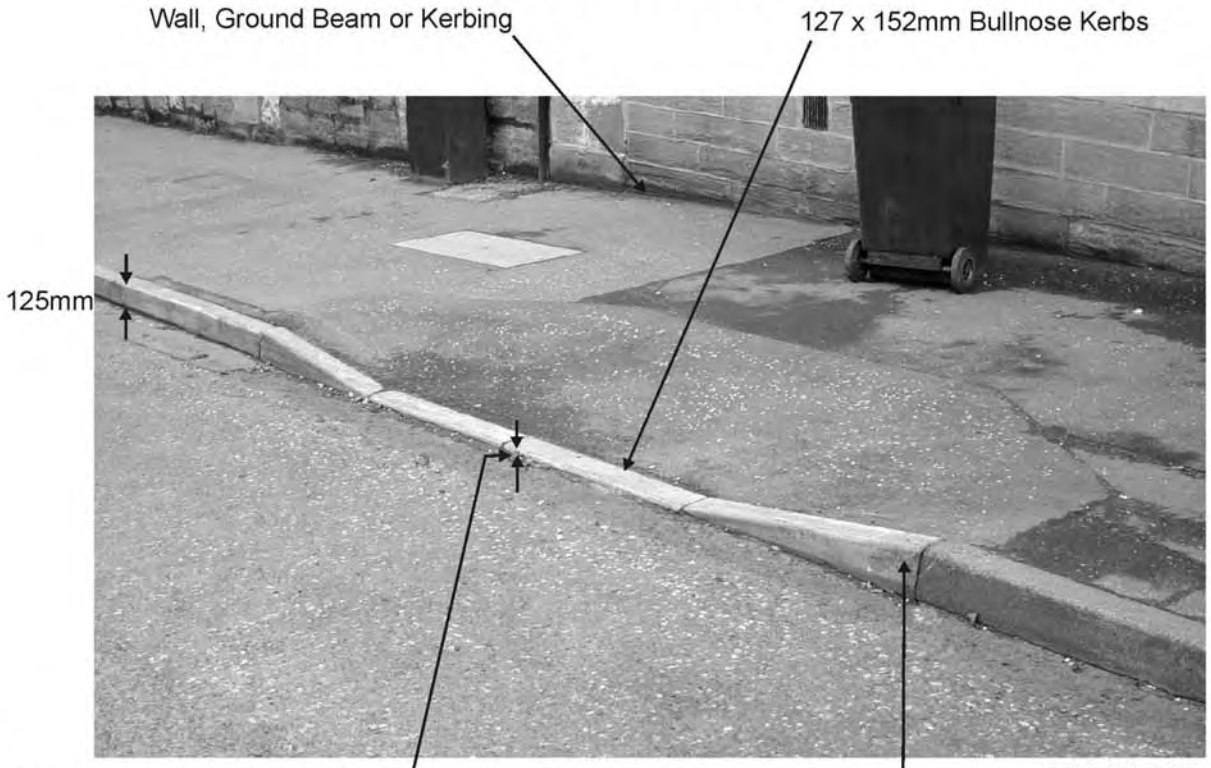


FIGURE 52A

TYPICAL DETAIL FOR FOOTWAY WITH VERGE

FIGURE 53A

SUGGESTED DRAINAGE CHANNEL DETAIL ON SHORT CUL-DE-SAC, MEWS COURTS AND HOUSING SQUARES

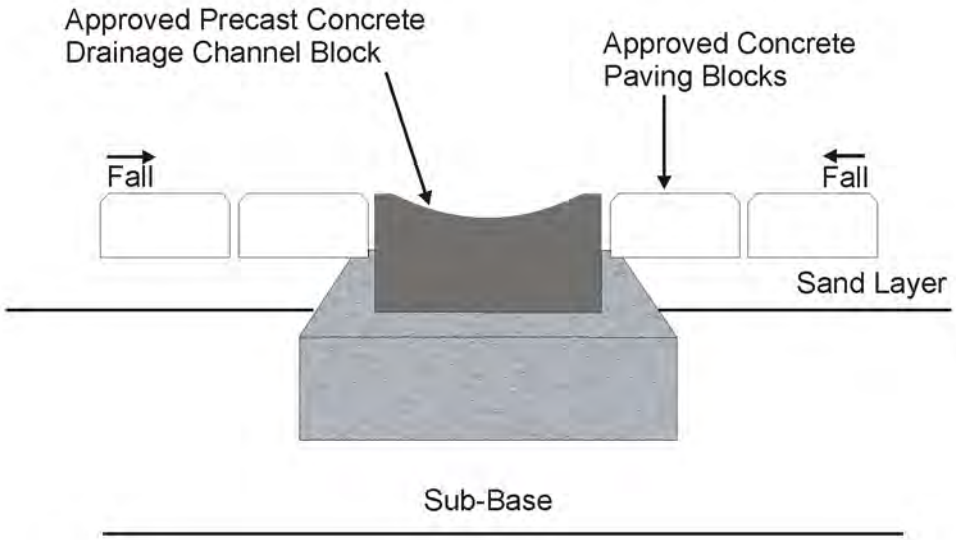


FIGURE 62

PRECAST CONCRETE CATCHPIT

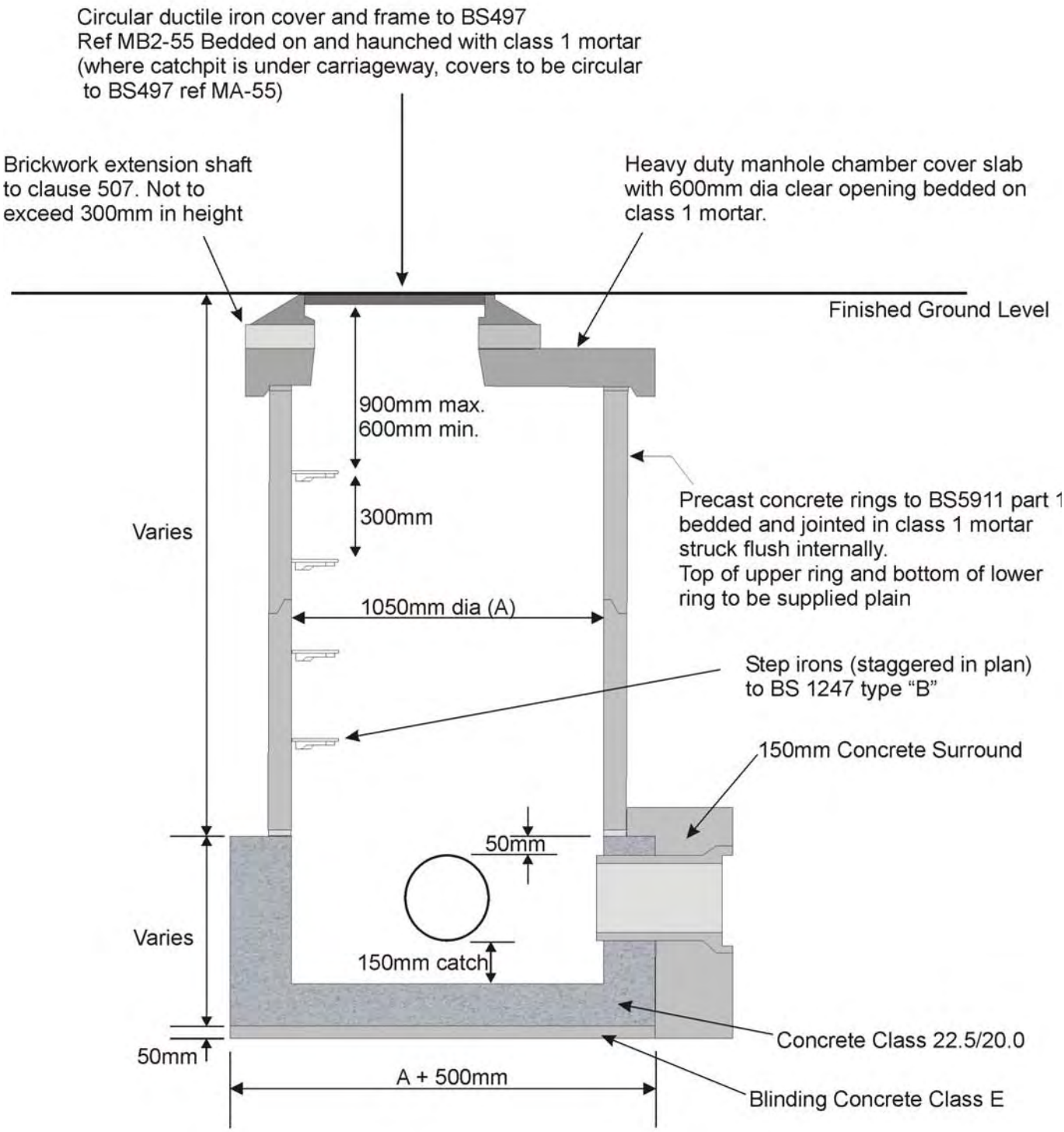


FIGURE 54

SHALLOW BRICK CATCHPIT

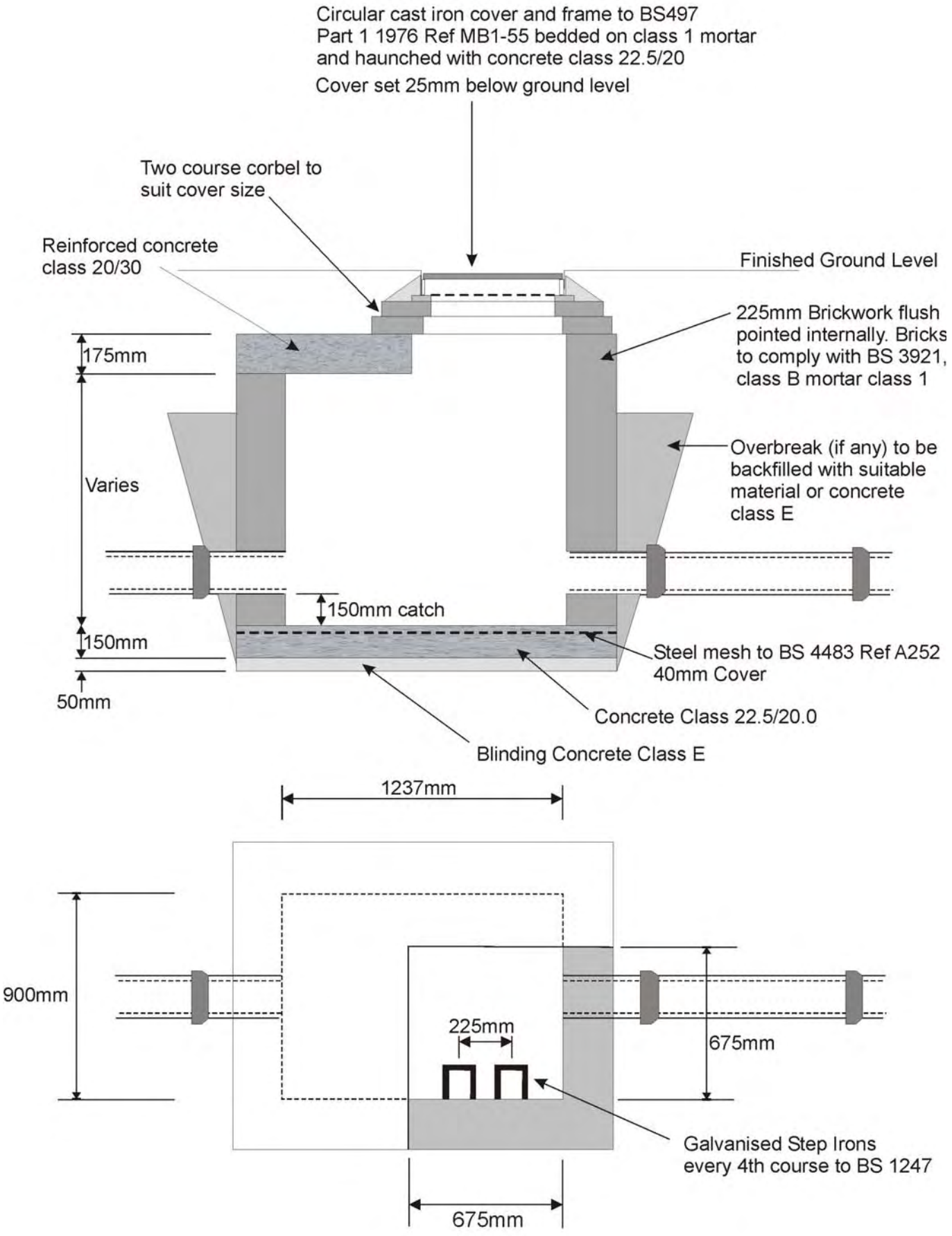


FIGURE 55

REMOTE FOOTPATH WITH DIRECT DRAINAGE

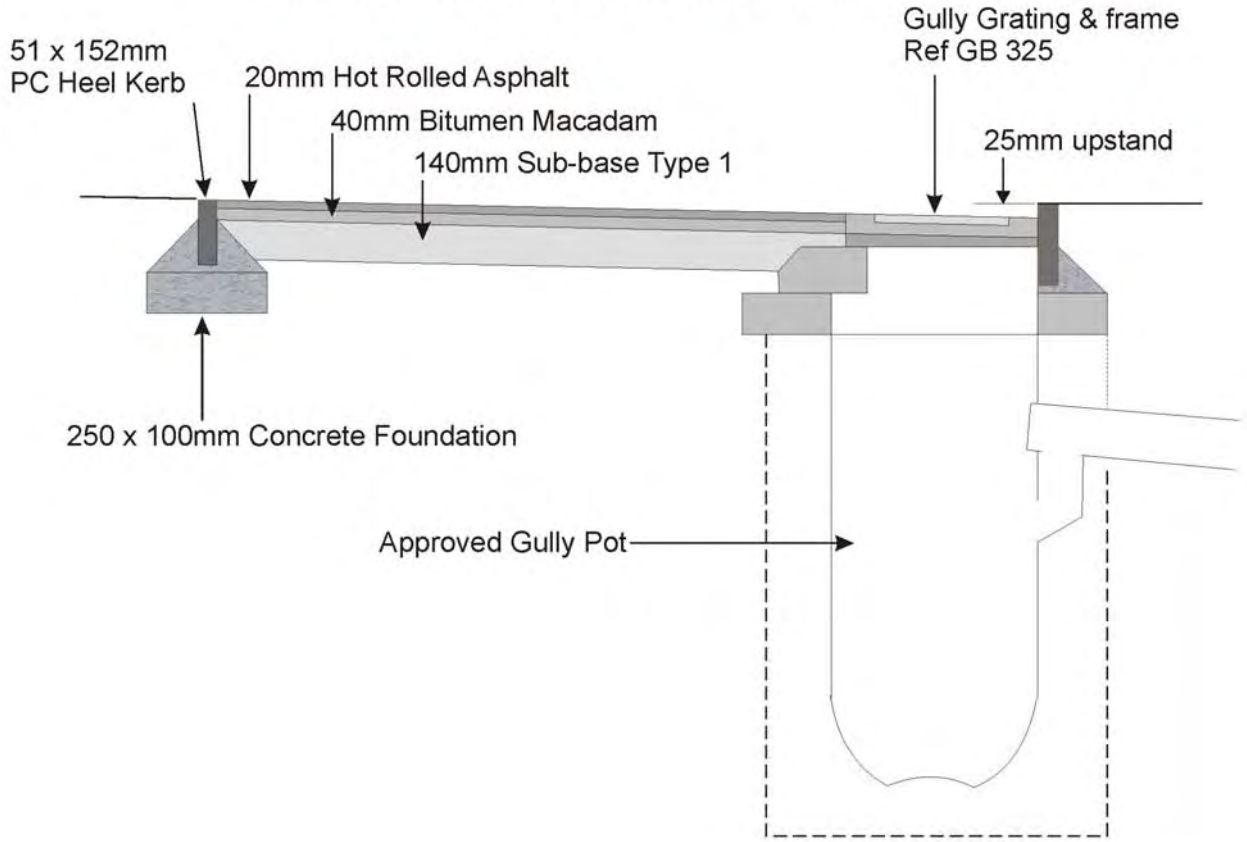
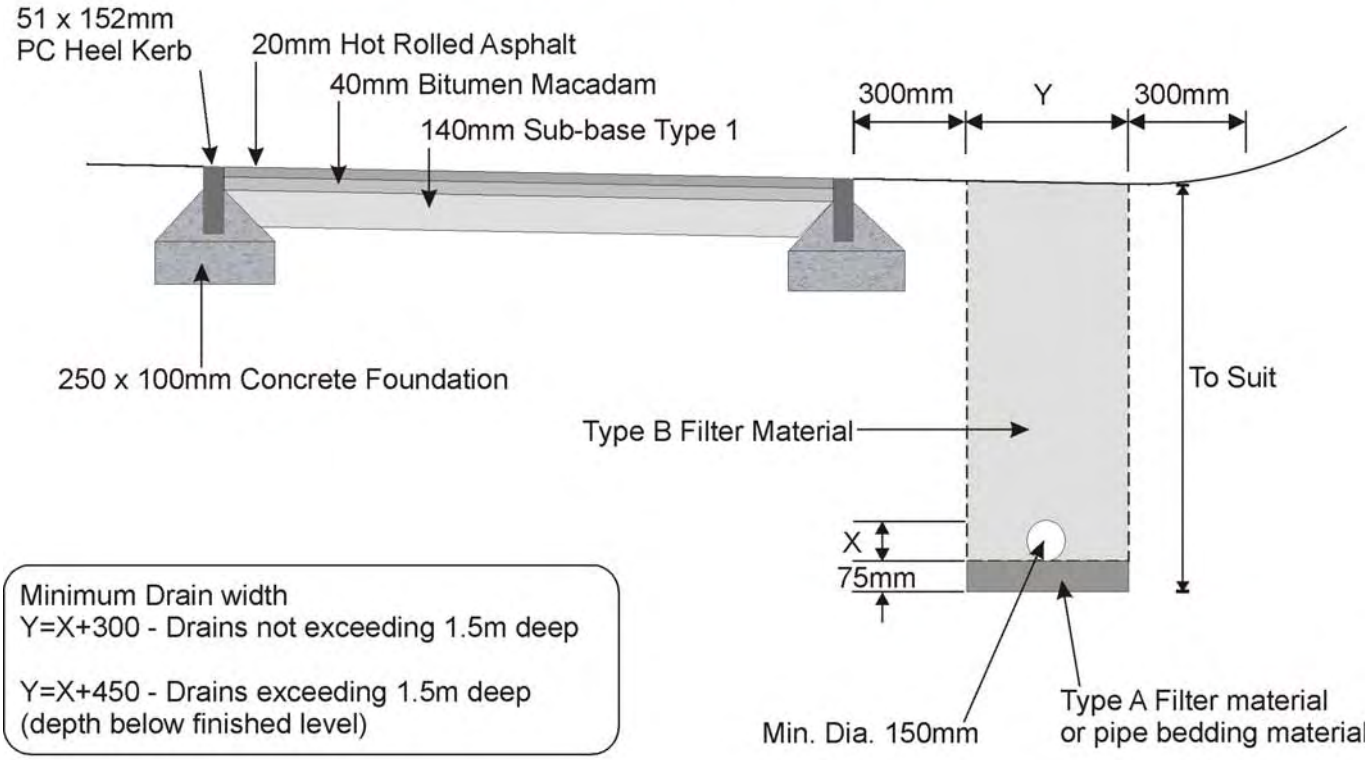


FIGURE 56

REMOTE FOOTPATH WITH INDIRECT DRAINAGE



Minimum Drain width
Y=X+300 - Drains not exceeding 1.5m deep

Y=X+450 - Drains exceeding 1.5m deep
(depth below finished level)

FIGURE 57

PRECAST CONCRETE SOAKAWAY

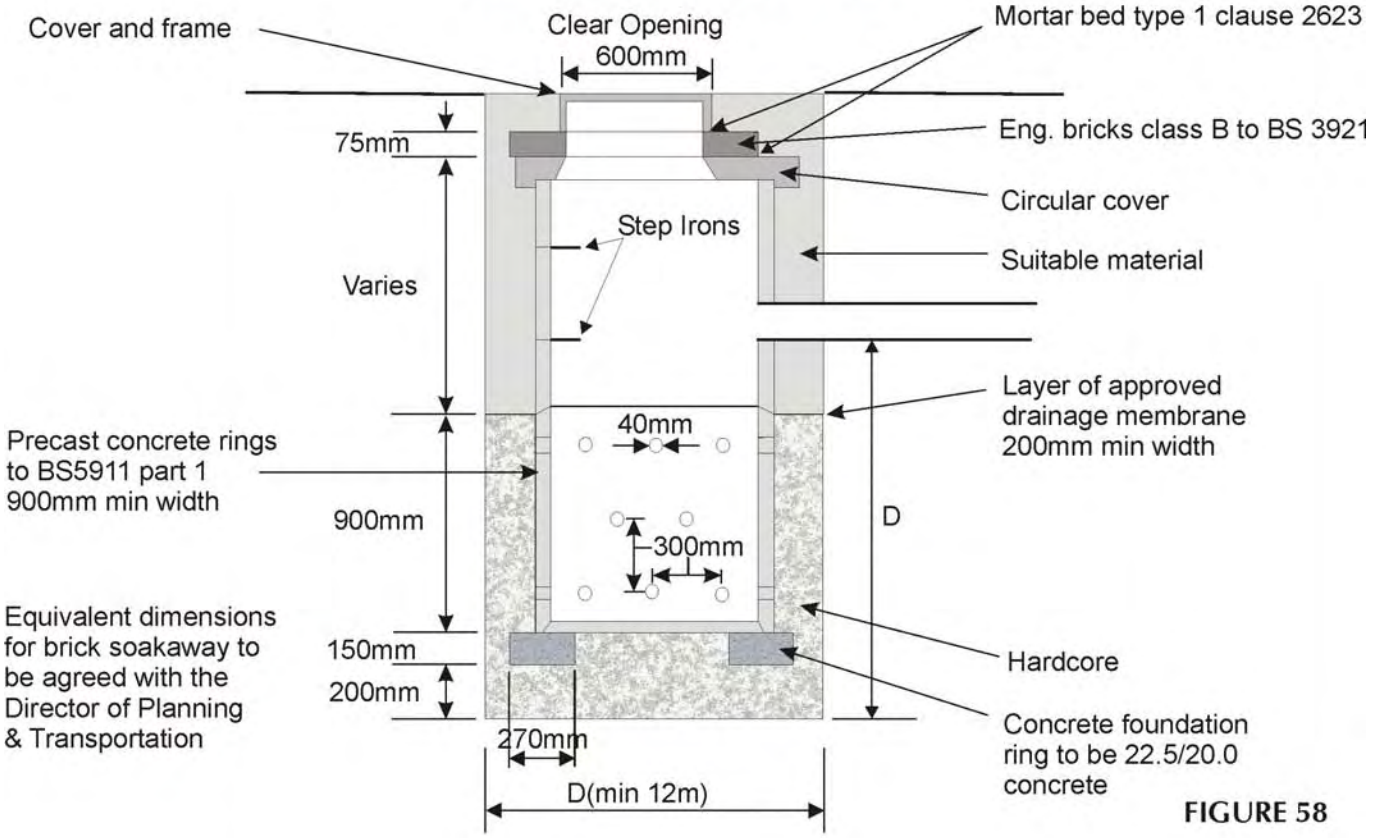


FIGURE 58

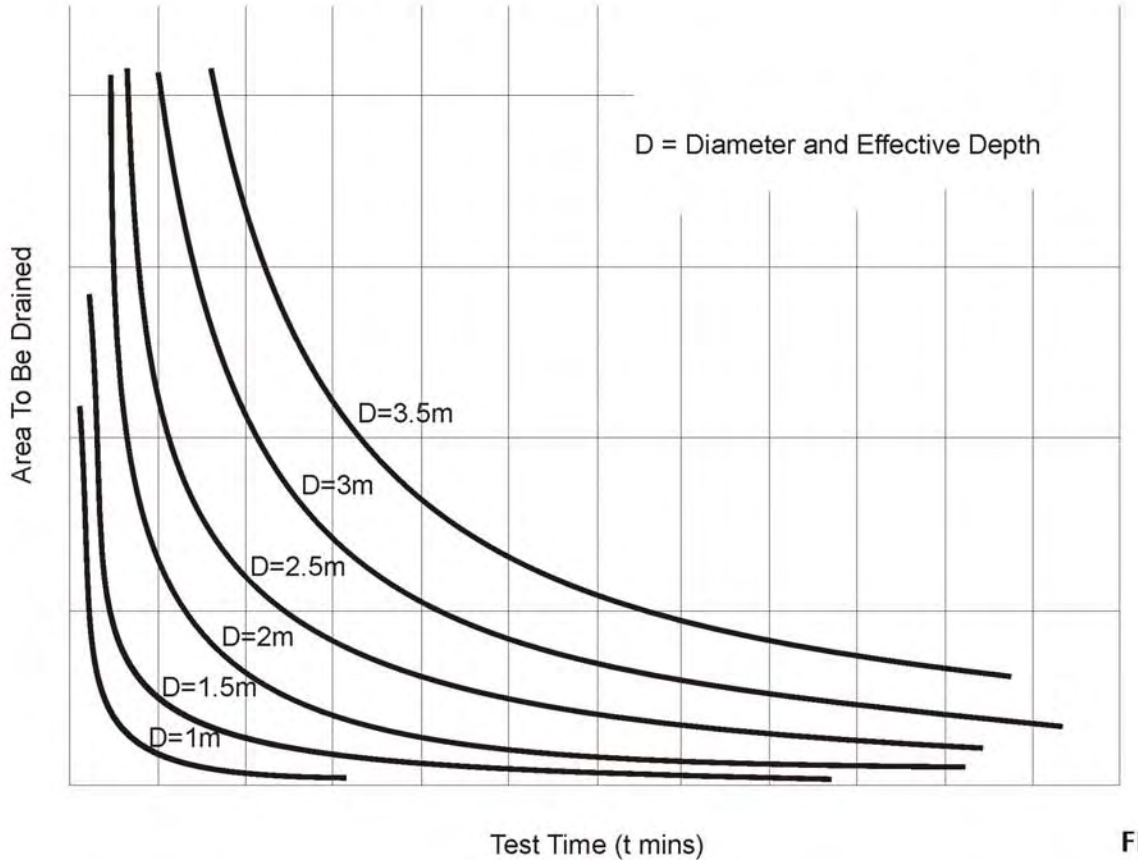


FIGURE 59

CONCRETE ROAD GULLY

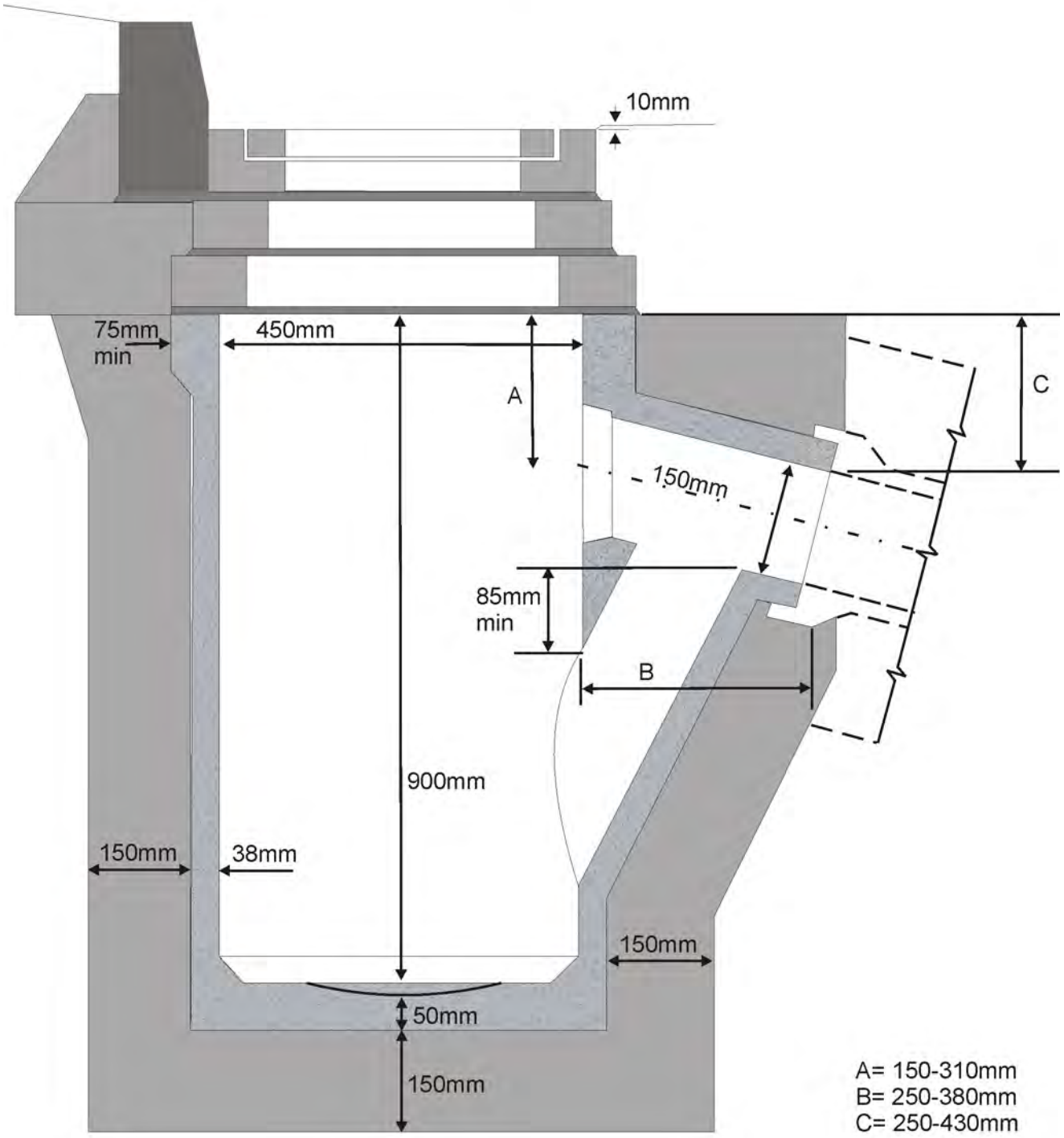


FIGURE 60

TRAPPED PLASTIC ROAD GULLY

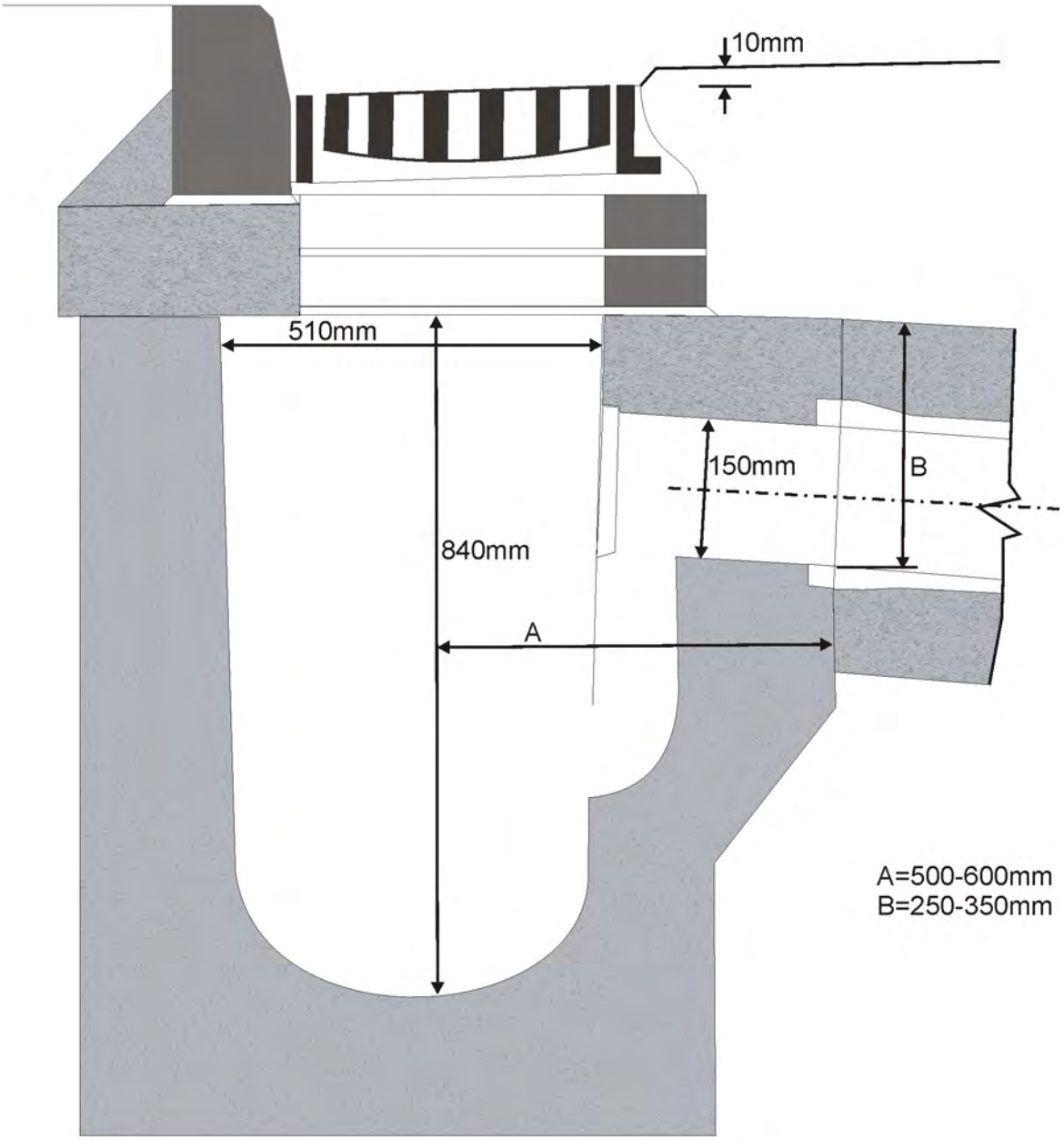


FIGURE 61

ROADSIDE COLLECTION SWALE

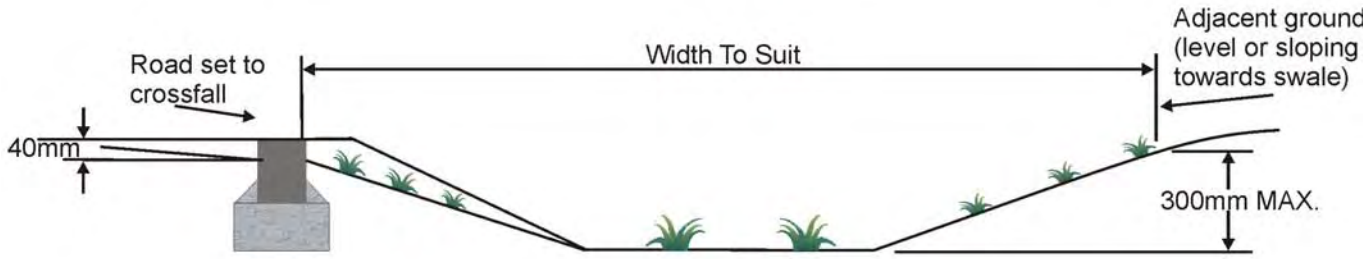


FIGURE 63

ROADSIDE DISCHARGE SWALE

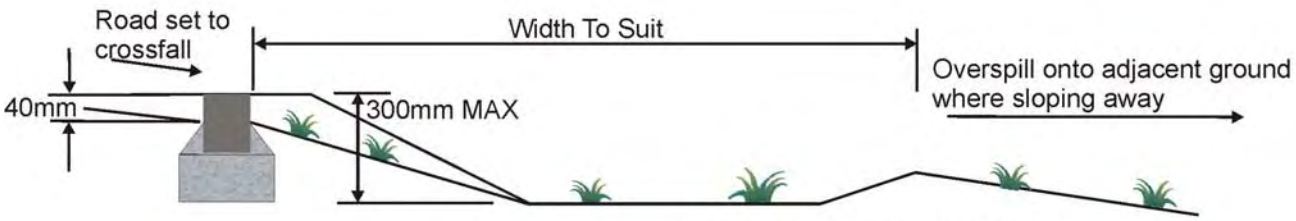


FIGURE 64

ALTERNATIVE SWALE INLET DETAIL USING GULLY GRATING

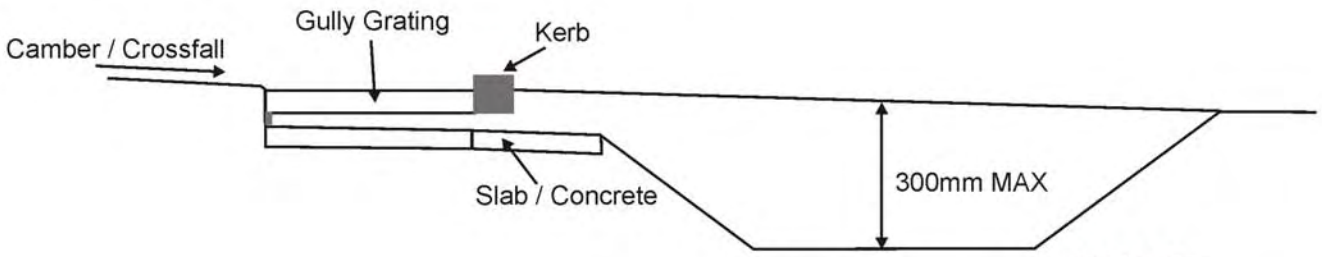


FIGURE 65

PREFERRED LAYOUT FOR SERVICES IN A 1.8M FOOTWAY

Notes:
1. Cables should never be laid at less than minimum cover and without identity

2. Marker tape should always be installed at 225mm below the surface (street lighting)

3. All dimensions in mm

4. For reference see NJUG 7.

5. Double cut in footway for all tracking

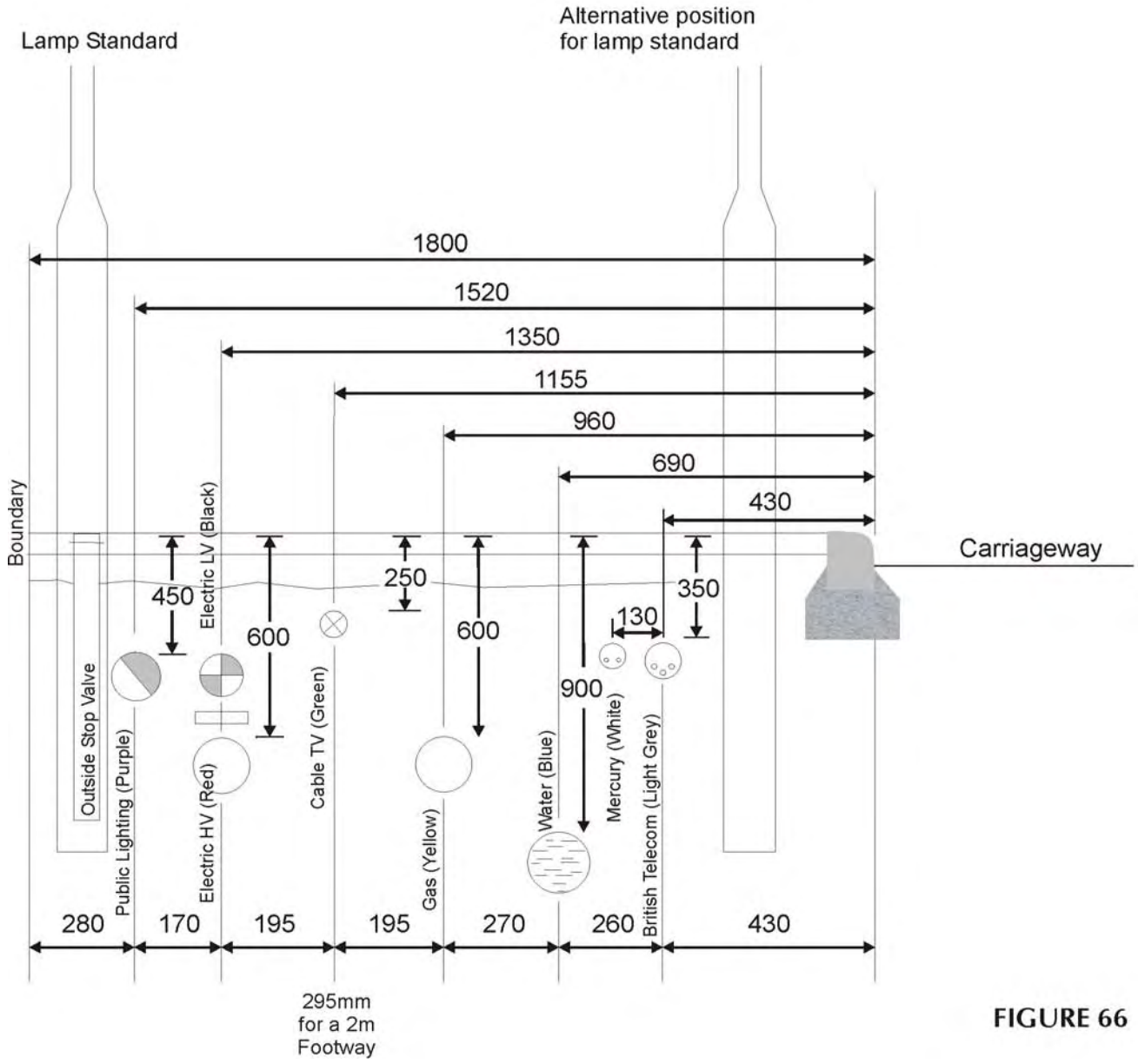


FIGURE 66