NORTH AYRSHIRE COUNCIL

22 January 2025

Planning Committee

Title:	Supplementary Street Development Guide
Purpose	To seek approval of the proposed Supplementary Street Development Guide
Recommendation:	That the Planning Committee: a) Approves the proposed Supplementary Street Development Guide (SSDG), provided at Appendix One, to be used alongside the National Roads Development Guide; b) delegates authority to the Executive Director (Place) for any future technical changes to the SSDG as required.

1. Executive Summary

1.1 Well-designed streets can be a vital resource in social, economic and cultural terms. They can be the main component of our public realm and a core element of local identity. Given the unique character of North Ayrshire with its coastal towns, rural areas and islands, the need to develop a specific street development guide for North Ayrshire, supplementary to national guidance was identified.

1.2 The proposed Supplementary Street Development Guide (SSDG), for which this report seeks approval from the Planning Committee, has been informed by extensive stakeholder engagement and engagement with the Council's Policy Advisory Panel. This will, alongside the National Roads Development Guide (NRDG), replace the previous Strathclyde Regional Council Roads Development Guide (1996) to provide developers with clear guidance on creating new streets in North Ayrshire.

2. Background

2.1 The Roads (Scotland) Act 1984 requires that, where a road is not constructed by a Roads Authority, the developer obtains the appropriate consent from the local Roads Authority to undertake this work. This is referred to as a Road Construction Consent (RCC).

2.2 The developer is required to design the road in accordance with the guidelines prescribed by the Roads Authority. The guidelines currently used by North Ayrshire Council for development roads are those introduced by Strathclyde Regional Council in 1996. These guidelines are now outdated, as the road layouts are predominantly designed to accommodate vehicles rather than pedestrians, and no longer reflect national policy.

2.3 Designing Streets was launched by the Scottish Government in 2010 as part of the Scottish Government's planning and related policy. This policy statement for street design in Scotland marked a change in the emphasis of guidance towards place-making and away from a system focused on the dominance of vehicles. It raises the importance of street design issues from that of guidance and advice, to policy. It considers that roads within certain environments cater for more important functions than just the movement of people and traffic.

2.4 Following the introduction of "Designing Streets", SCOTS recognised the implications of such a change and the NRDG was produced in 2015 following consultation with the 32 local authorities. The NRDG reflects and expands on principals in Designing Streets whilst supporting a holistic integrated approach to the planning and approval process. Additionally, SCOTS recognised that due to their geography, some local authorities may require local variations to the information provided in the guide.

2.5 Well-designed streets can be a vital resource in social, economic and cultural terms; they can be the main component of our public realm and a core element of local identity. Active Travel and Transport Officers, along with other internal Services, have developed a draft SSDG to be used in conjunction with the NRDG. This approach aims to reflect the unique character of North Ayrshire with its coastal towns, rural areas and islands. It also puts place and people before the movement of vehicles, as attractive and well-connected street networks encourage people to walk and cycle to local destinations, improving their health while reducing traffic, energy use and pollution.

2.6 A dedicated website was launched in January 2024 to enable stakeholder consultation on the draft strategy. Council services, consultants, developers and construction companies that work within North Ayrshire were all invited to comment on the draft guide. The consultation process involved an online questionnaire and feedback form which was publicised via e-mail to all previous consultees and stakeholders. A total of 16 responses were received and all, except for one, agreed that the new guide, in conjunction with the NRDG, provides them with sufficient detail to enable streets to be developed in North Ayrshire. Comments provided by stakeholders through the consultation process have been incorporated into the final draft of the SSDG.

2.7 The SSDG is primarily a technical guidance document that will replace the existing North Ayrshire Roads Development Guide and should be read in conjunction with the NRDG and Designing Streets. It is aimed at assisting developers to meet the requirements of Designing Streets while considering the local characteristics and geography of North Ayrshire. It is proposed that the SSDG and NRDG will be used for the design of all development streets within North Ayrshire. The NRDG

provides certainty and national consistency for developers when planning new developments.

2.8 The draft SSDG was presented to the Policy Advisory Panel on 10 September 2024. It was subsequently reviewed and updated where required, informed by the feedback received. Key points of note include:

- Planning Policy and SSDG relationship: The SSDG predominately focuses on street design and will inform the planning application determination as a material consideration. Section 2.1 recommends early engagement with the Planning Service prior to the submission of an application for planning consent. Section 2.5 lists supporting documentation required for planning applications. Furthermore, in accordance with the Development Plan (National Planning Framework 4 and the adopted North Ayrshire Local Development Plan), the SSDG recommends that new developments should prioritise walking, wheeling, cycling and public transport for everyday travel and reduce the need to travel unsustainably.
- Designing Streets policy: Designing Streets is a national policy document which puts place and people before the movement of motor vehicles. The Scottish Government is committed to sustainable development that focuses on the creation of quality places and believe that good street design is of critical importance in this effort. The SSDG aims to help developers meet the requirements of Designing Streets.
- Parking provision: The SSDG parking provision levels are comparable with similar sized local authorities. The requirements for social housing are now equivalent to private housing requirements where previously the requirement was lower. Smaller garages are also no longer included in parking provision for dwellings. Furthermore, to clarify the parking levels for North Ayrshire the headings within the parking requirements table has been changed from “Vehicle Maximum” to “Appropriate Provision”. The parking provision for shops has also been clarified.
- Street widths: The SSDG recommends a minimum street width of 4.1m and includes a section to assist developers in identifying and addressing potential over-run areas. Developers are also required to provide a swept path analysis at the planning stage to ensure that any potential issues are identified at an early stage in the process.
- Active travel links: The SSDG puts the movement of people first. It aims to ensure that wherever practical, local connections and active travel links from new developments are provided to the surrounding areas, noting the constraints to such provision including land ownership.

2.9 The introduction of the SSDG and NRDG will ensure that the Council is embracing current Scottish Government policy documents. In summary, together they:

- provide guidance on Road Construction Consents;
- provide a source of guidance on complex infrastructure requirements;
- allow for variances in North Ayrshire; and
- support the Scottish Government Policy Designing Streets which:
  - advocates a re-designation of road hierarchy to user hierarchy;
  - supports a multi-disciplinary approach and early engagement;

- encourages environments that focus on people; and
- supports more integration in the planning process.

2.10 The SSDG will be kept under review, informed by updates in national good practice guidance and local circumstances. The report seeks delegated authority for the Executive Director (Place) to make any future technical changes to the SSDG as required.

3. Proposals

3.1 That the Planning Committee:

a) Approves the proposed Supplementary Street Development Guide, provided at Appendix One, to be used alongside the National Roads Development Guide; and
b) Delegates authority to the Executive Director (Place) for any future technical

4. Implications/Socio-economic Duty

Financial

4.1 None.

Human Resources

4.2 None.

Legal

4.3 The NRDG and SSDG primarily support the statutory process for Road Construction Consent that is covered under the Roads (Scotland) Act 1984. The NRDG and SSDG are considered to be the technical enabler to the Scottish Planning Policy 'Designing Streets'.

Equality/Socio-economic

4.4 Well-designed streets can be a vital resource in social, economic and cultural terms; they can be the main component of our public realm and a core element of local identity. The NRDG and SSDG aim to provide greater equality of access based on a user hierarchy rather than the standard road types based on traffic flows and/or the number of buildings served. The SSDG applies a user hierarchy to the design process with pedestrians at the top of this process.

Climate Change and Carbon

4.5 The SSDG aligns with the Sustainable North Ayrshire Strategy. Making appropriate provision for road-based public transport, cycling and walking can encourage and support modal shift from the private car, and contribute to the sustainability and health agendas. Enhancing street environments through high

quality public realm incorporating local materials and historic street features, removal of clutter and pedestrian barriers, use of shared space where appropriate and enhanced street lighting can help to stimulate using travel modes other than the car thereby assisting climate change and carbon reduction policies.

Key Priorities

4.6 The SSDG has been informed by and contributes to the priorities and key priorities of the Council Plan. In particular it contributes to the key activities to ensure our places and spaces where we live, work and visit are well maintained and accessible. It also contributes to the development of infrastructure to support business growth.

Community Wealth Building

4.7 New developments can provide a range of Community Wealth Building benefits. The SSDG seeks to put place and people before the movement of motor vehicles, as attractive and well-connected street networks encourage more people to walk and cycle to local destinations, improving their health while reducing motor traffic, energy use and pollution.

5. Consultation

5.1 The development of the SSDG included extensive internal and external consultation at the initial development and draft guide stages, including the Council's Policy Advisory Panel. The stakeholder consultation exercises included online surveys, and a dedicated website as detailed at Section 2.6.

RUSSELL McCUTCHEON
Executive Director (Place)

For further information please contact **Claire Fitzsimmons, Interim Senior Manager – Regeneration** on **01294 315305**.

Background Papers
Scottish Government, Designing Streets (2010)
Society for Chief Officers of Transport in Scotland (SCOTS), National Roads Development Guide (2015)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

North Ayrshire Supplementary Street Design Guide

Version 1: 2024

Version Control

Issue	Date	Nature of Change/Pages Affected
Version 1	xxxxxxx	Issue of Supplementary Street Development Guide

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1. Introduction

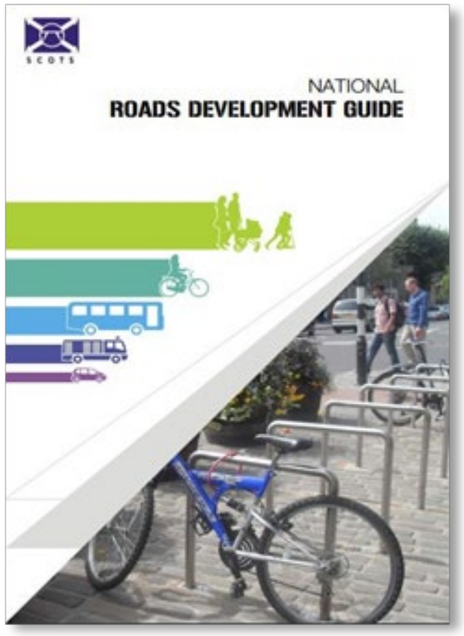
1.1 Background

In 2010 the Scottish Government introduced the Designing Streets policy that puts place and people before the movement of motor vehicles. Subsequently the National Roads Development Guide (NRDG) was created to assist developers with the technical aspect of street design. However, given the unique character of North Ayrshire with its coastal towns, rural areas and islands this document is intended to develop a unique street development guide for North Ayrshire that will be supplementary to the National Roads Development Guide.

1.2 Purpose of the Guide

The replacement of the existing development guide is driven by government policy and opportunity to deliver safe high quality street design. Well-designed streets can be a vital resource in social, economic and cultural terms; they can be the main component of our public realm and a core element of local identity. The new guide will put place and people before the movement of motor vehicles, as attractive and well-connected street networks encourage more people to walk and cycle to local destinations, improving their health while reducing motor traffic, energy use and pollution.

National Roads Development Guide



The key aims of the guide are to:

- Provide a developer with the relevant technical information to enable streets and connections to be created.
- Help developers meet the requirements of North Ayrshire Council and the Scottish Government's Designing Streets policy.
- Set out 'how to develop a street' methodology that provides guidance on street design.
- Establish the dos and don'ts of street design through detailed technical guidance on speed reduction measures, street lighting, materials, construction standards, utilities, drainage and parking standards etc.
- Ensure that no excessive speeds occur and infrastructure to suit the level of use is provided.

1.3 Using the Guide

The guide is designed to be used by developers as a reference document when producing designs and embarking on the planning process. It is essential that liaison between the designers, waste, roads, planning and building control authorities, and access officers, takes place at an early stage.

This street design guide will replace the existing North Ayrshire Roads Development Guide and should be read in conjunction with the NRDG and the government's Designing Streets. It is aimed at assisting developers to meet the requirements of designing streets within North Ayrshire.

Where the documents vary this guidance should be followed for developments in North Ayrshire.

It is intended to be used to supplement other guidance by North Ayrshire Council, Scottish Government, and other design guidance:

- Designing Streets.
- National Roads Development Guide (NRDG).
- Cycling by Design.
- Local Development Plan (LDP).
- Supplementary Planning Policies.
- National Planning Framework 4 (NPF4).

2. Policy and Procedure

2.1 Introduction

It is important that developers consult the appropriate Council officials at an early stage in their preparations. The information contained in these guidelines and the NRDG refers principally to Local Roads Authority requirements. The requirements of the Council's Planning, Building Standards, Waste Operations, Statutory Undertakers, Strathclyde Partnership for Transport, Fire Brigade and Police and Scottish Ambulance Services will be extra to these requirements and should be checked out individually at an early stage. It is important that the policy and procedures are read in conjunction with the NRDG.

Main procedures/ policies required to construct new road and streets include:

- Pre-Planning Consultation.
- Planning Consent.
- Road Construction Consent (RCC).
- Adoption of Footpaths and Cycleways.
- Inspection Procedures during Construction.
- Adoption and Maintenance.

Before undertaking any new road construction, the developer must obtain both detailed Planning Consent and Construction Consent. It should be noted that the granting of one does not necessarily imply the granting of the other. Early engagement with the Planning Service is recommended prior to the submission of an application for planning consent. In accordance with the Development Plan (National Planning Framework 4 and the adopted North Ayrshire Local Development Plan), a new development should prioritise walking, wheeling, cycling and public transport for everyday travel and reduce the need to travel unsustainably. The SSDG will inform the planning application determination as a material consideration.

In accordance with Section 21 of the Roads (Scotland) Act 1984, anyone proposing to construct a new road or extend an existing road must obtain Road Construction Consent (RCC) from the local roads authority. Construction works on existing roads do not require RCC but will normally require other consents, including a permit. Appendix B details the procedure for applying for a Road Construction Consent and further information is available in the NRDG.

Where the development is for residential use, security in accordance with the current Security for Private Road Works (Scotland) Regulations must be lodged with the council prior to house building operations commencing. No security is required for industrial/ office/ retail development or for residential developments carried out by a recognised Housing Association. The Security for Private Road Works (Scotland) Regulations provide further information on the exemptions.

2.2 Adoptable Streets

A road/street requires to be built to an adoptable standard and offered for adoption, unless clearly indicated at planning stage that it will remain a private road/private access. Table 1 indicates at which point a road built to an adoptable standard will be required.

The number of dwellings in the following Table 1 are defined as after completion of the development including existing dwellings on a private road.

Table 1 – When an Adoptable Street is Required (No. of dwellings)

Development Type Designed to Adoptable Standard	Within Settlement*	Outwith Settlement*
Development with new streets	More than two	More than five
Development on a brownfield site	More than five	More than five
Development on an existing private road	More than five	More than 10
Development of a courtyard	More than 20	More than 20

** As defined by NAC Planning Services*

2.3 Private Access/Road

A private access/ road – which will not require a Road Construction Consent and will not be available for adoption - can be provided in certain circumstances, with the agreement of North Ayrshire Council. Such accesses should be of a suitable width, provide adequate turning facilities, have suitable lighting infrastructure installed where directed by the Roads Authority, have suitable intervisible passing places, have a satisfactory junction with a public road and appropriate road drainage and, provision of layby adjacent to public road for service vehicles and bin collection area adjacent to public road (Refer to Section 1.4 of Appendix I) The provision of a 'private access' **must be indicated clearly at the planning application stage**, otherwise it will be considered that an adoptable 'street' is being provided.

Examples of when a private road **may** be acceptable:

- One additional dwelling on a private access that currently serves numerous properties, and the access is of an acceptable standard. Will require confirmation that the road owner(s) and the majority of existing users are agreeable to the additional property using the access road.
- Accesses which lead to a car parking area.
- Where the building of an adoptable street makes the development site financially unviable.

Further details can be found in Appendix I – Parking Standards.

2.4 Factoring

Either at planning, Construction Consent stages or prior to the end of RCC maintenance period, developers should provide the Authority with written details and contacts of future factoring arrangements in place for all private open space, play areas or other shared areas that are not being adopted or otherwise maintained by the Local Authority. Factoring responsibility details will include and identify where appropriate, but not be restricted to, the following asset types; landscaped areas; boundary structures; property or other open space lighting; play equipment; drainage etc.

2.5 Supporting Documentation for Planning Application

Development proposals may require to be accompanied by the supporting documentation below, as required by North Ayrshire Council's Planning Services; details of which are contained within the NRDG.

- Transport Assessment.
- Transport Statement.
- Travel Plan.
- Safety Audit.
- "B" Plan.
- Vehicle Flow Assessment.
- Sweep Path Analysis.
- SuDs Management Plan.
- Quality Audit.

3. Street Design Guide

3.1 Introduction

Streets fulfil a complex variety of functions to meet people's needs as a place to live, work and move around, streets are places. Streets are distinct from roads in that they have important public realm functions beyond those relating to motor traffic. Designing Streets also states that there is a clear distinction in function between streets and roads.

Designers should aim to create streets that control vehicle speeds naturally by well-crafted design from the outset rather than through unsympathetic traffic- calming measures added at the end of the design process. *Designing Streets*

This SSDG sets out advice for the design of new streets within residential areas which can be applied to urban, rural, coastal and island locations. The following four street types make up the network of streets in a residential area in urban, rural, coastal and island contexts are:

- Type 1 — Connector Streets (Primary).
- Type 2 — Local Residential Streets (Secondary).
- Type 3 — Residential Link Street.
- Type 4 — Shared Surface Streets.

Key aims of new developments should be to provide structural design features such as:

- Incorporate speed reduction into street design from the offset.
- Make safer residential streets for people with speeds no higher than 20mph.
- Prevent the use of unsympathetic traffic calming measures being utilised in the proposed development.
- Ensure that the level of infrastructure is appropriate for the volume of vehicles, pedestrians and cyclists.
- Ensure green infrastructure is integral to design to provide placemaking and active travel opportunities.
- Incorporate SuDS into placemaking and street design to provide sustainable water management opportunities.

New developments are therefore recommended not to use vertical traffic calming features such as speed cushions and humps as these may have detrimental effects on disabled and infirm road users. Junction tables may be permitted if they add to the sense of place and form part of a feature.

3.2 Placemaking and Street Network

Developments and streets should generally be structured around a compact and walkable layout. Connected or 'permeable' networks encourage walking and cycling and make navigation through places easier. They also lead to a more even spread of motor traffic throughout an area and so avoid the need for distributor roads with less desirable place characteristics.

Evidence should be gathered in the early stages to demonstrate a complete understanding of the site's context and character and to ensure a design is appropriate for the place avoiding a development which could be in any location and follows the use of 'pattern book' design or pastiche.

This hierarchy is important for understanding sense of place, character, wayfinding and where motor vehicle use changes along the routes.

Figure 1 - Examples of Street Design | Designing Streets

3.3 Street Design Principles

The following principles are applicable to all street types and should guide the development of new residential design. The six qualities of successful places' set out in Designing Streets policy should also be referenced.

- Apply Place/Movement hierarchy (refer to NRDG and Designing Streets).
- Street design should be distinctive and respond to the local context, setting and character.
- Streets should be designed to be safe and pleasant with appropriate traffic speeds and prioritisation of pedestrian.
- Streets should be easy to move around for all users and connect well to existing movement and public transport networks.
- Streets should be designed to be welcoming and inclusive.
- Street networks should be adaptable to accommodate service and emergency vehicles.
- Delivering street design which is sustainable, and which creates opportunities to meet carbon zero and environmental objectives.
- Include opportunities for greening of streets through landscape design objectives.

Good street design can promote a better quality of living for everyone. Sustainable patterns of behaviour can be influenced greatly by the intelligent design of streets. Creating good streets is not principally about creating successful traffic movement: it is about creating successful places. All thoroughfares within urban settings and rural boundaries should normally be treated as streets.

The Six Qualities of Successful Places from Designing Streets describes the fundamental qualities expected of successful places, it highlights principles of design which can be applied to new developments in North Ayrshire:

1. **Healthy –** Supporting the prioritisation of women's safety and improving physical and mental health.
2. **Pleasant –** Supporting attractive natural and built spaces.
3. **Connected –** Supporting well connected networks that make moving around easy and reduce car dependency.
4. **Distinctive –** Supporting attention to detail of local architectural styles and natural landscapes to be interpreted into designs to reinforce identity.
5. **Sustainable –** Supporting the efficient use of resources that will allow people to live, play, work and stay in their area, ensuring climate resilience and integrating nature positive biodiversity solutions.
6. **Adaptable –** Supporting commitment to investing in the long-term value of buildings, streets and different uses over time.

Design is a material consideration when determining a planning application/ any application may be refused on design and placemaking grounds.

distinctive	*safe and pleasant*	*easy to move around*	*welcoming*	*adaptable*	*resources efficient*
Street design should respond to local context to deliver places that are distinctive	Streets should be designed to be safe and attractive places	Streets should be easy to move around for all users and connect well to existing movement networks	Street layout and detail should encourage positive interaction for all members of the community	Street networks should be designed to accommodate future adaptation	Street design should consider orientation, the integration of sustainable drainage and use attractive, durable materials that can be easily maintained
Block structure Context and character	Pedestrians and cyclists Achieving appropriate traffic speed Reducing clutter	Connections within a place Public transport Junction types and arrangements	Walkable neighbourhoods Streets for people	Connections to wider networks Integrating parking Service and emergency vehicles	Orientation Drainage Utilities Planting Materials

Figure 2 - The Six Qualities of Successful Places: Key Considerations for Street Design | Designing Streets

Figure 3 – Cairnhouse – Arran, Successful Design in North Ayrshire

3.4 Key Considerations to Develop a Successful Street

As described in Designing Streets (2010), it is important to consider the relevant issues in a hierarchical way, working from issues of structure through to layout and geometry and on to matters of detail. Further information can be found in Section 3.7 but is based on the principals below:

Design Consideration Hierarchy

Street Structure

- Pedestrian and Cyclists
- Connections to the Wider Network
- Connections within a place
- Block structure
- Walkable Neighbourhoods
- Accessible Neighbourhoods
- Public Transport
- Context and Character
- Orientation

Street Layout

- Achieving appropriate traffic speed
- Vehicle flow and volume
- Junction types and arrangements
- Streets for People
- Integrating Parking
- Emergency and service vehicles

Street Detail

- Drainage
- Utilities
- Lighting
- Planting
- Materials and Construction
- Reducing Clutter

Figure 4 – Hope Homes Development – North Ayrshire

Figure 5 – Local Housing Development – North Ayrshire

3.5 Context and Character

When assessing the potential visual impact of new developments, designers should work within the context of broad urban design aims, taking cognisance of aspects such as the existing character and qualities of urban design, architecture and landscape of the area, historical patterns of development and social and cultural factors which impact on the environment of North Ayrshire.

National planning policy contained in Designing Streets and Designing Places illustrates how these issues may be addressed in a comprehensive way to help create development which contributes to local identity and enhances the sense of place. Additionally, specific urban design guidance has been included in the following documents and should be considered for design of the streets in various contexts specifically for North Ayrshire Council:

- Local Development Plan
- Supplementary Planning Guidance

Street Design for new developments in North Ayrshire should seek to integrate and enhance the existing place and develop a 'North Ayrshire-Specific' proposal to provide a legible network of streets. The developments should provide high-quality spaces in the following areas:

Rural developments – should be sympathetic additions and provide sensitive infilling of gap sites in the rural setting. Where possible, proposals should provide easy access to greenspace and the countryside, expanding the green infrastructure and increasing connectivity thus making wider connections to integrate into the rural setting.

Coastal Developments – should have successful public realm which includes integrated public and pedestrian movement and increased connectivity and where possible improve areas which are anonymous or disconnected to provide a legible network of streets. High quality public realm leads the way for characterful development for the unique waterfront location and provide an opportunity for development to repair often fragmented places.

Island developments – should have island community led approvals, provide small scale developments and filling of gap sites in village fabric. The designs should be distinctive and should respond to local context to create places.

Town Centre – Street designs should respond to local setting and provide safe and pleasant places with naturally reduced vehicle speeds for pedestrian movement. Local settlement pattern alternatives to standard road layouts should be used to create characterful places.

Conservation Areas and Listed Buildings – Consideration must be given to street design within Conservation Areas and Listed Buildings in terms of appropriate street pattern, form, density, design and materials that complement the historic environment. Lighting and street furniture should also be designed with the historic character in mind. Standard design lighting columns, street furniture and materials may not be appropriate within a historic setting.

Advice should be sought from the Planning Authority at the early stages to discuss appropriate solutions.

Figure 6 – Historic Signing

Figure 7 – Coastal Development, Hope Homes – North Ayrshire

3.6 Hierarchy of Streets

In the design of new residential developments, it is important that a natural hierarchy is established that is clear and legible to all users who share the same space and where pedestrians are considered the priority. However, the street types should not be fixed; street design must consider place before function. Achieving balance between place and movement is crucial.

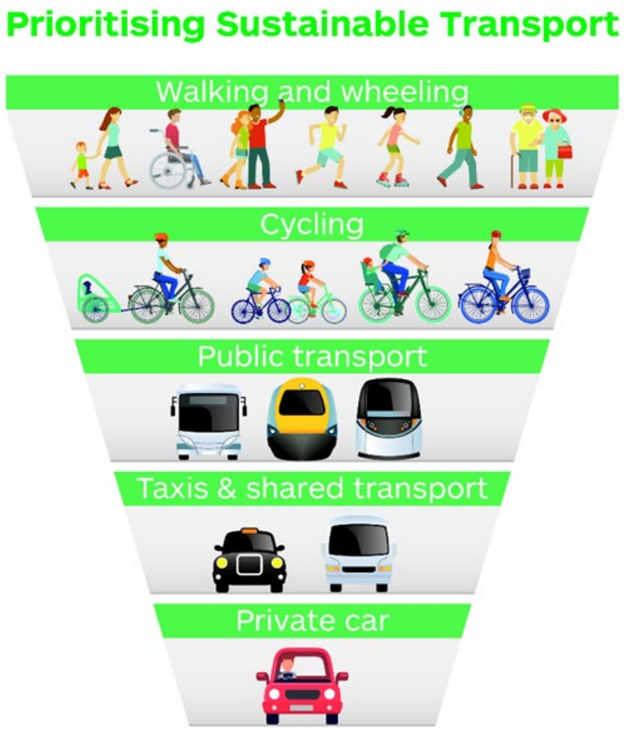


Figure 8 – Sustainable Hierarchy

3.7 River Delta Approach

A River Delta approach to layout should be applied when considering the layout of new developments. The River Delta design establishes a layout with multiple interconnected channels, where the street types changes as it progresses further into the development as flow decreases due to the reduction in the number of dwellings being served. From Type 1 (with the largest flow) to Type 4 (with the lowest flow).

Four street types have been devised to maximise the overall range of design choices which are possible within each category. This enables the overall adopted “corridor” (including carriageways, footways, verges and other areas) to reflect and enhance the overall design, rather than control it (see Section 3.17 for further information on these street types):

- Type 1 — Connector Streets (Primary)
- Type 2 — Local Residential Streets (Secondary)
- Type 3 — Residential Link Street
- Type 4 — Shared Surface Streets

These street types can incorporate a range of streets from High Streets, lanes, mews etc. to narrow rural character streets. However, developer should endeavour to create bespoke street types and hierarchy for each development with more street types where needed.

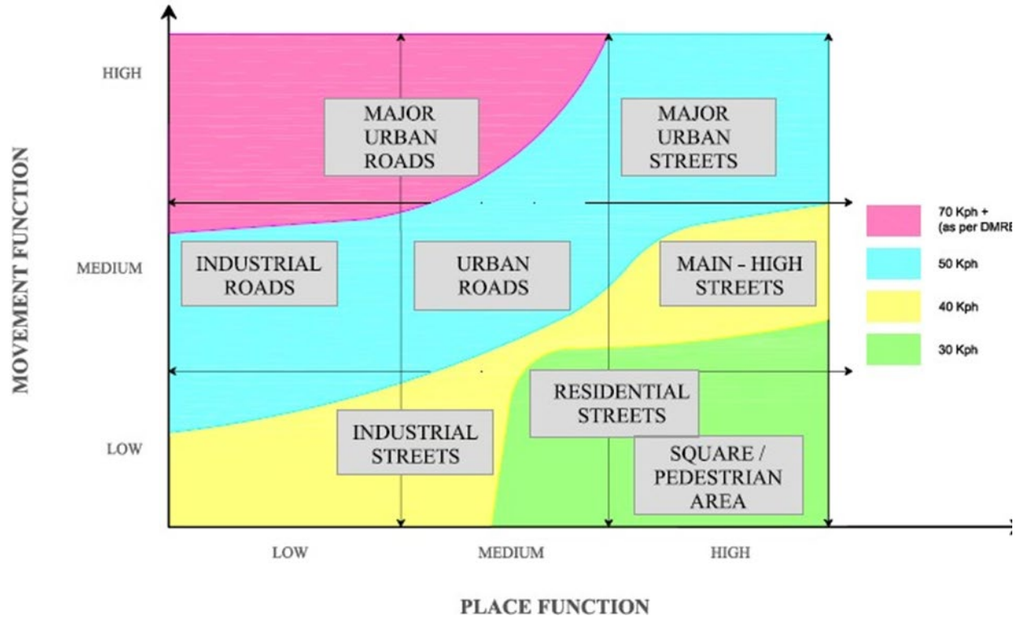


Figure 9 – Place Function Diagram | National Roads Development Guide

3.8 How to Develop a Street?

The below diagram details the process to develop a new street design in North Ayrshire.

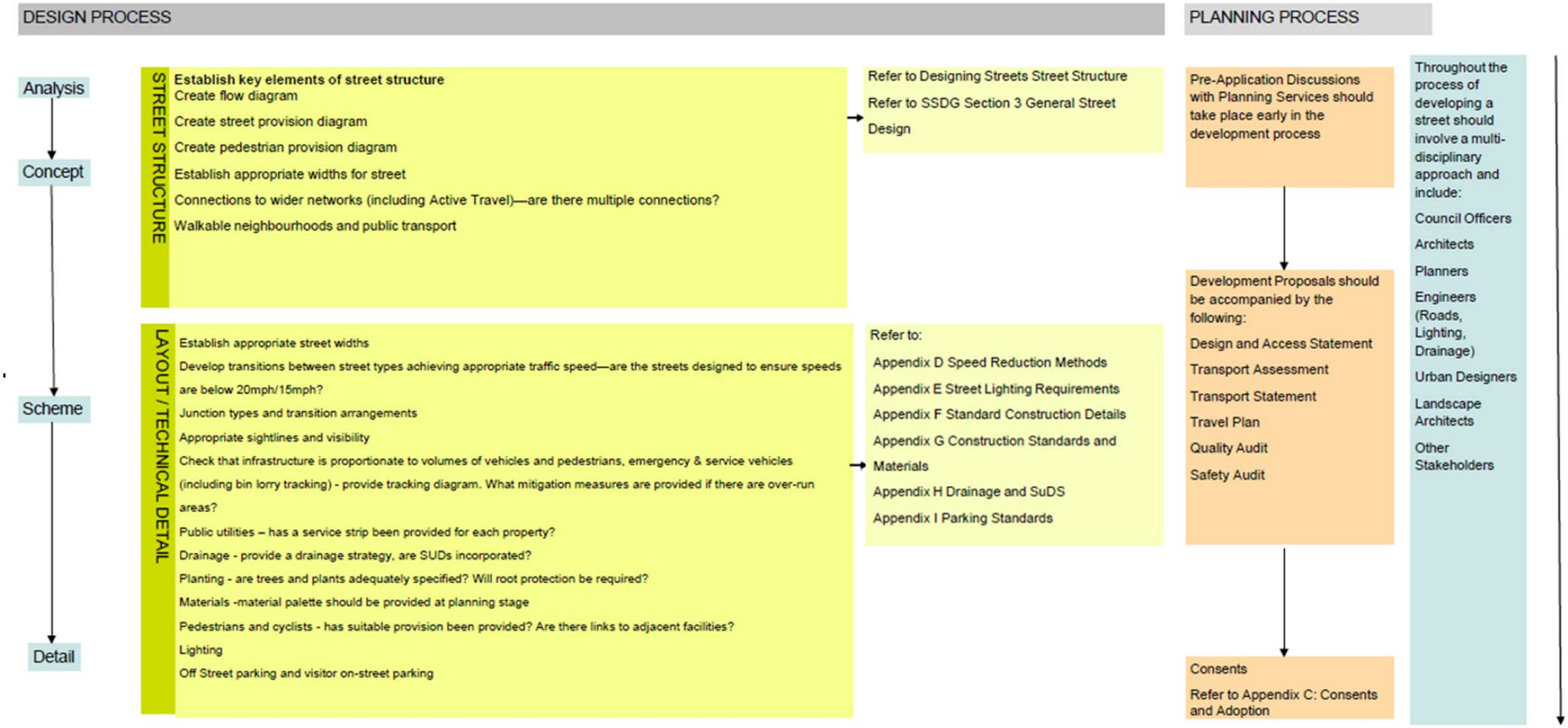


Figure 10 – How to Develop a Street Process Diagram

3.9 Development Traffic Flows

The design of streets is based on the peak flows likely to be encountered. North Ayrshire Council has surveyed a varied selection of housing sites (both private and social housing). It can be seen from Figure 11 that the level of vehicles varies between 0.56 and 1.0 vehicles per dwelling. Based on 2011 figures obtained from TRICS and Census information this is averaged at 0.7vph per dwelling however, agreement with the Active Travel and Transport team is required to determine the figure used and to subsequently create the flow diagram. The figure should be above the AM peak two-way flow.

Using this information, the cumulative two-way flows through the site can then be established for each street as shown on Figures 12 and 13.

3.10 Watershed Points

Where more complex layouts are used the position where the lowest traffic flows are anticipated must be determined. This is designated as the "watershed" point, which is the point on a street where it can be anticipated that traffic can go in either direction and exit the development in the same journey time. "Watershed" points, being points of potential zero flow, should also be reinforced to ensure that drivers can identify them and to ensure that the expected flow patterns are realised. Figures 12 and 13 show different examples of watershed points.

Normally, it can be assumed that traffic will leave a development in equal proportions by the different exits. However, in certain circumstances, where one, or more, factors affect only one of these junctions, such that the majority of traffic leaving the development will use another junction, assumptions will require to made about how this will affect the location of the "watershed" point.

3.11 Traffic Flow Diagrams

Once the proposed traffic flows and watershed points have been established the flow diagram can be developed.

Flow diagrams help establish the river delta approach to street hierarchy and design. This enables the provision of infrastructure to be based upon the anticipated levels of use. The number of dwellings that the street serves are assessed, and this figure is added to the cumulative flow at the junction and carried on to the next “downstream” point.

Figures 12 and 13 show a possible layout with the cumulative traffic based on the number of dwellings. The difference between the two diagrams is the number of accesses. Normally it can be assumed that traffic will leave a development in equal proportions by the different exits. However, in certain circumstances, where one, or more factors affect only one of these junctions an unbalanced flow can be created.

If there is the possibility that a street will serve further properties in the future, for instance if there is an adjacent allocated site which is likely to be developed (and accessed through the first site) then the streets should be designed to accommodate future traffic flows or be capable of being altered in the future. No “ransom strip” or other gap should be left between the adopted road and the site boundary to provide a durable and ‘future proof’ street layout.

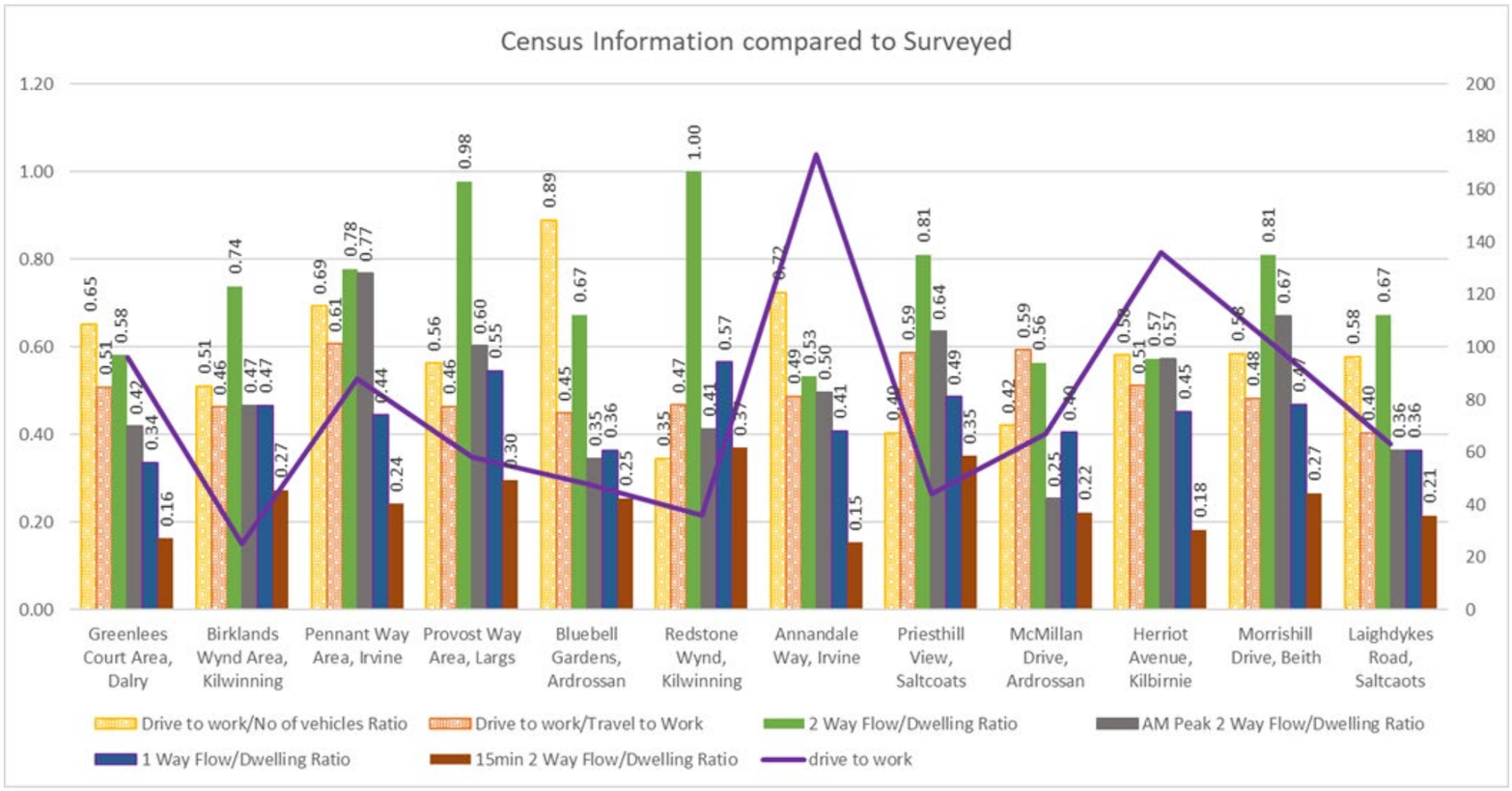


Figure 11 – Census Information compared to Surveyed

The figures below highlight examples of peak vph and street type variation/ position of entrances to highlight demand and better flowing streets.

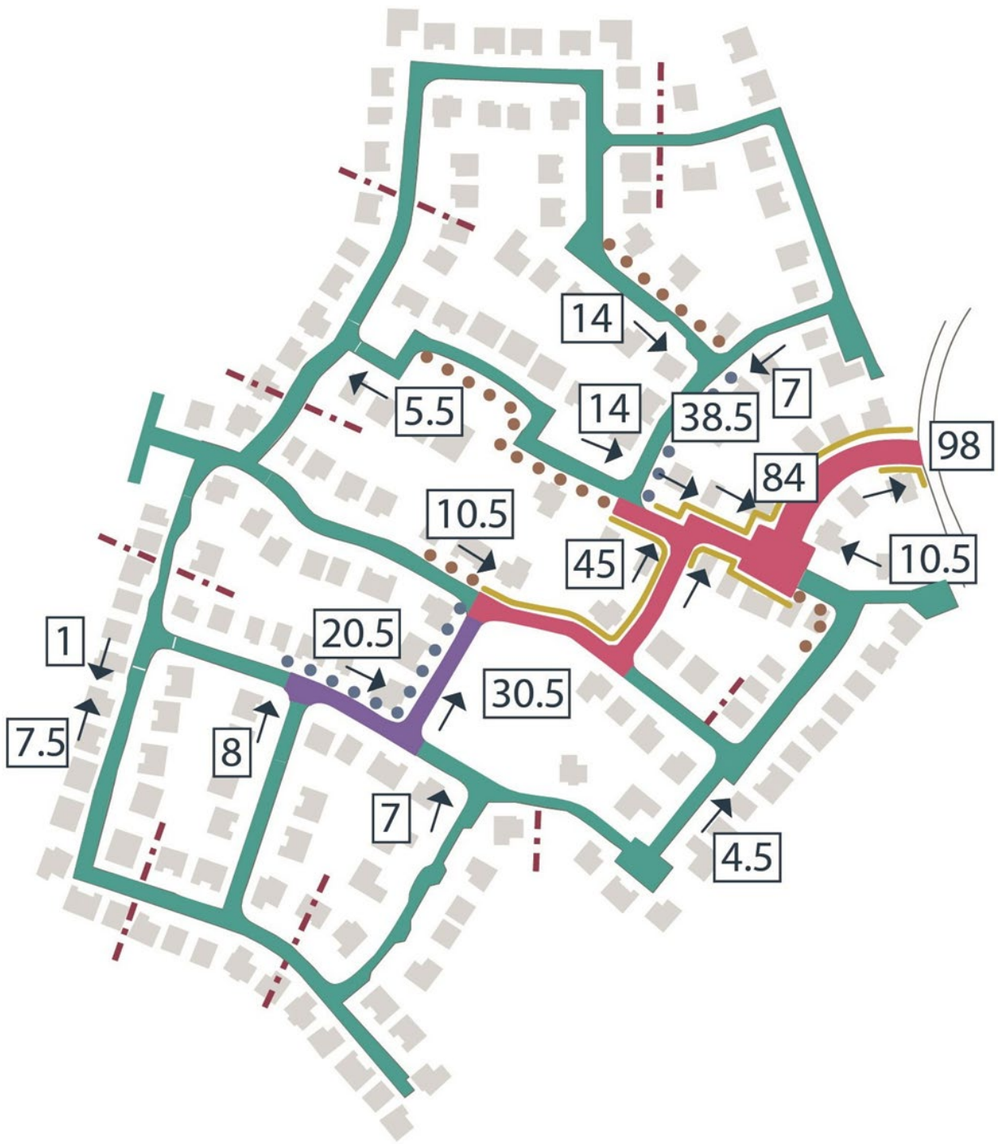
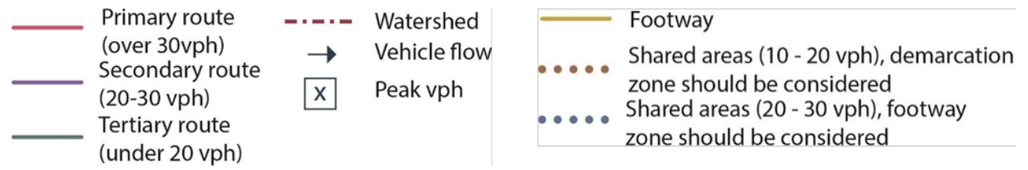


Figure 12 – Development Flow Diagram – Single Entrance



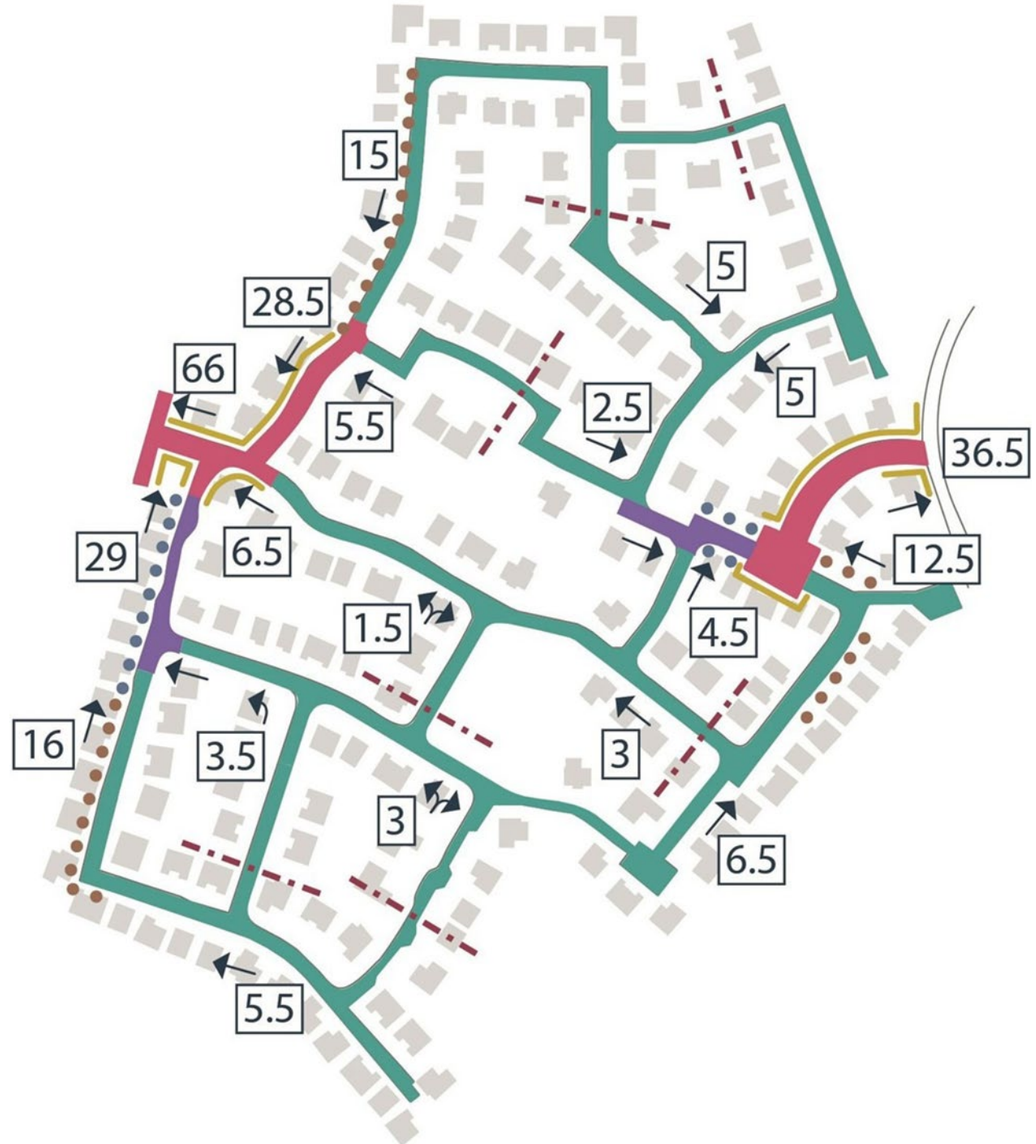


Figure 13 - Development Flow Diagram – Double Entrance

3.12 Street and Pedestrian Hierarchy

Once the flow diagram has been developed then a street hierarchy and pedestrian hierarchy can be established. The table below provides advice on what street types may be appropriate for the expected vehicle and pedestrian flows. Using this information will allow for the creation of a street provision diagram and pedestrian provision diagrams to be created as shown in Figures15 and 16.

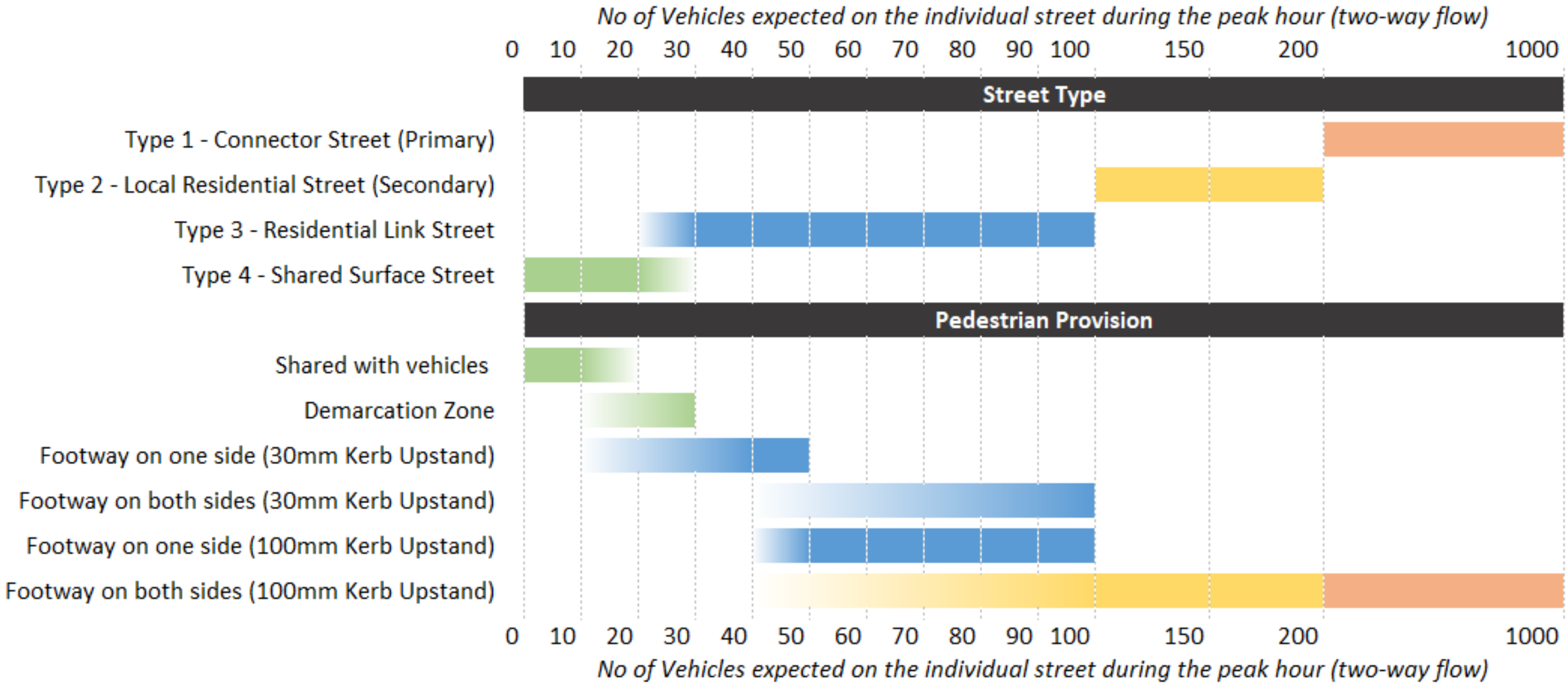


Figure 14 – Number of Vehicles per Hour (two-way flow)

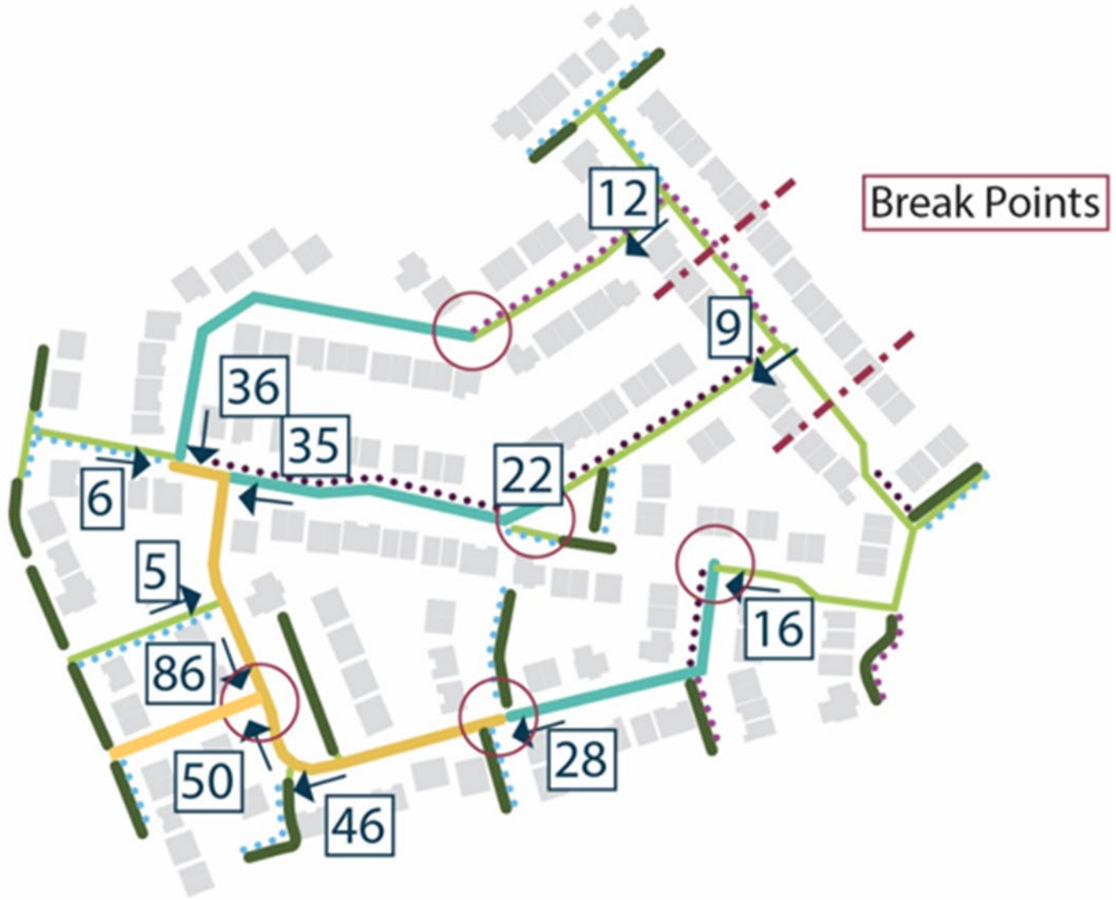


Figure 15 – Street Hierarchy Diagram | Street Provision Based on Development Flow

Notes:

1) AM peak two-way flow equal to 0.7 per dwelling has been agreed with NAC officers and subsequently used to calculate the vehicle volume for each street through the development site.

2) The 'Street Hierarchy' is based on the level of vehicle movements through the site.

3) The proposed 'Street Design Strategy' notes the minimum requirements the eventual detailed site plan should be designed to.

Key

- Vehicle flow
- [x] Peak vph
- Areas where a feature could be provided to indicate a change in street type.
- Break point
- Secondary route
- Private drive/ courtyard access
- Primary route
- Tertiary route
- Shared areas with vehicles (0 - 10vph)
- Footway on one side (30mm Kerb Upstand, 20 - 50vph
- Shared areas (20 - 30 vph), footway zone should be considered

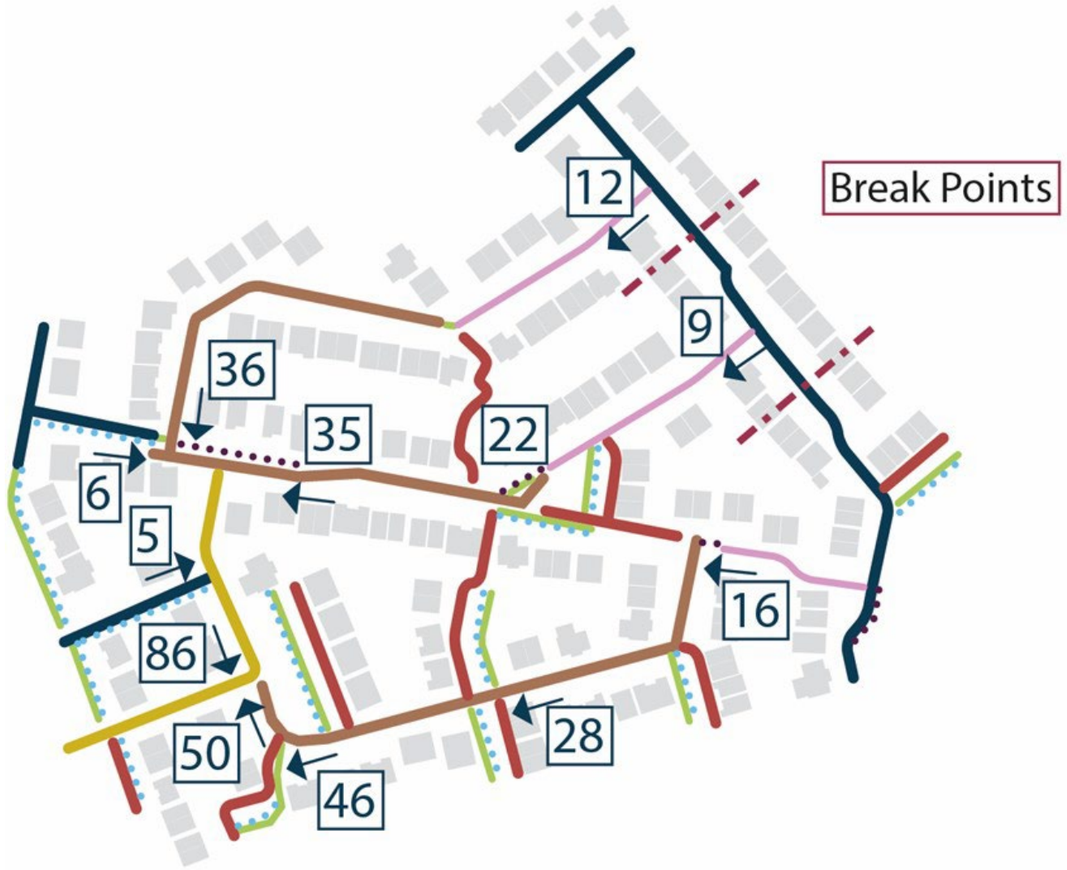
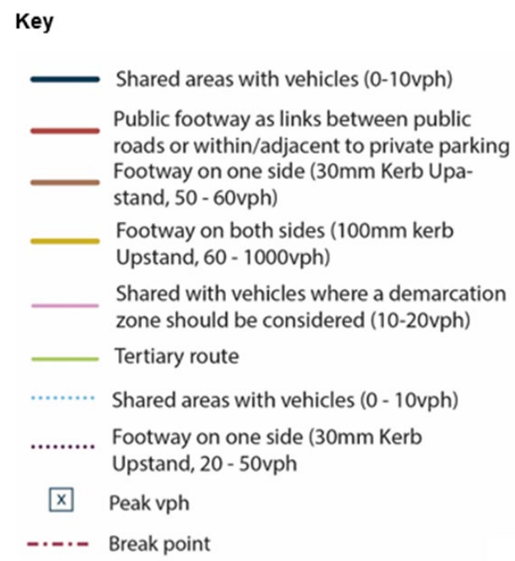


Figure 16 – Pedestrian Hierarchy Diagram | Pedestran Provision Based on Development Flow

Notes:

1) The ‘Pedestrian Street Hierarchy’ is based on the level of vehicle movements through the site. See Figure 15.

Key



3.13 Meeting Design Speeds

Designing Streets (2010) states "Designers should aim to create streets that control vehicle speeds naturally by well-crafted design from the outset rather than through unsympathetic traffic-calming measures added at the end of the design process."

Design should be used to influence driver behaviour to reduce vehicle speed to levels that are appropriate for the local context and deliver safe streets for all. (Designing Streets, Page 32). **Speed reduction by design is essential** to the development, therefore should be integral within the street design and development. Speeds through the development should be in accordance with Section 3.17. Frequent junctions and sudden changes in direction will often be enough to achieve the desired vehicle speed; horizontal features are likely to be more acceptable to all road users. This could be possibly achieved by introducing some horizontal deflection, use of built form, frequent narrowing's, shifts in horizontal plane, street furniture, restricted visibility, reference to external guidance etc. Appendix D provides some guidance on speed reduction measures that could be considered.

Vertical traffic calming measures such as speed cushions and humps may have a detrimental effect on disabled/ infirm road users in new developments. The use of unsympathetic vertical measures is discouraged However, vertical measures such as raised tables at junctions may be suitable in low use residential developments. Features such as raised tables at junctions to provide continuous footways are acceptable.

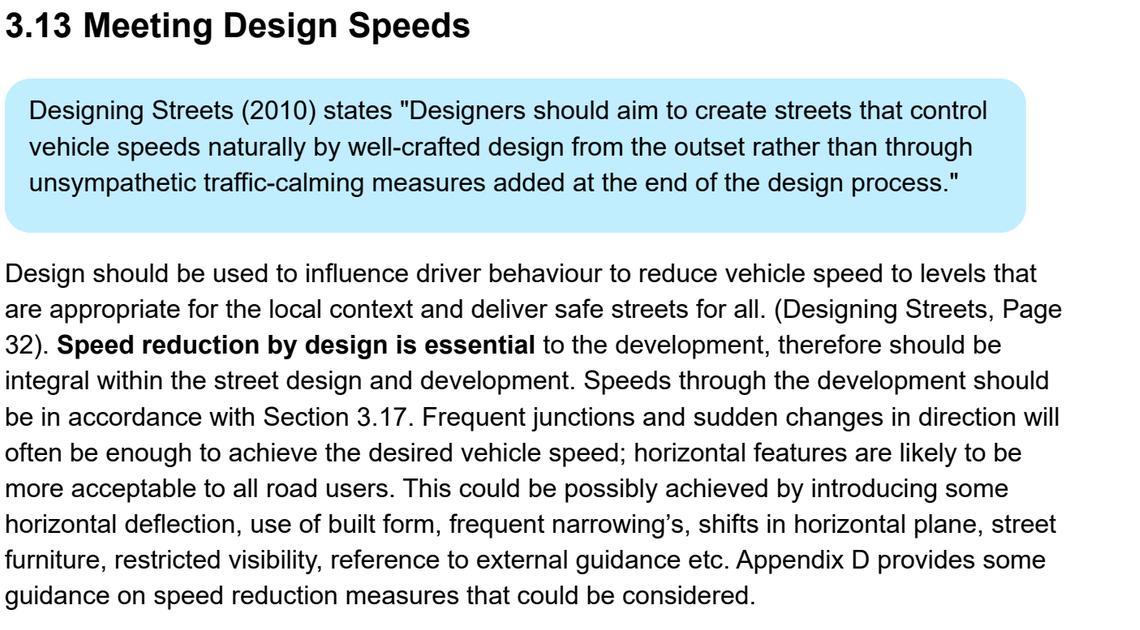


Figure 17 – Example of Shared Surface Street

Developers should ensure that "straight line" desire lines are not created through speed restraint features. This is where vehicles could travel for distances greater than 40 to 60 metres with limited deviation.

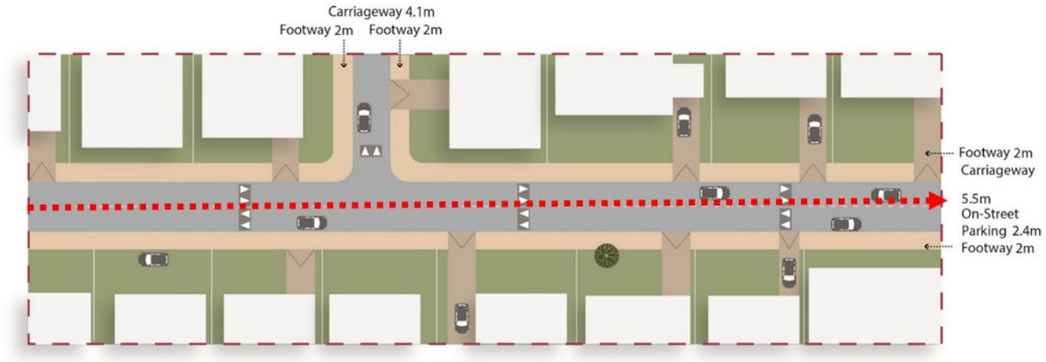


Figure 18 – Straight Desire Line - Clear Path

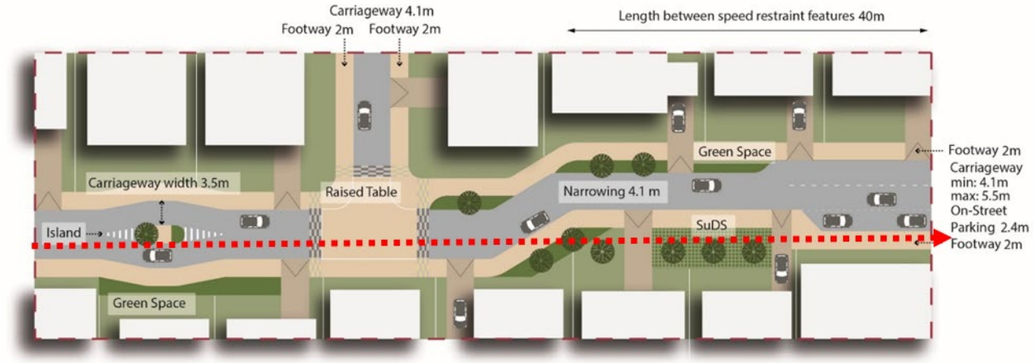


Figure 19 – Straight Desire Line - Path Obstructed

Refer also to the following guidance for speed reduction methods:

- Methods of reducing vehicle speeds (Appendix D – Speed Reduction Measures and Page 37 of National Roads Development Guide)
- Achieving Appropriate Traffic Speeds (Pages 32-35 of Designing Streets)

Figure 20 – Example of Shared Surface Street with Island for Speed Reduction

3.14 Establishing Appropriate Carriageway Widths

A 5.5m width allows all vehicles to pass each other at low speed. Given the infrequency of large vehicles on residential streets, this width will normally be the maximum required to cope with residential traffic, for up to 300 dwellings. Below 5.5m the carriageway will be too narrow for the free movement of large service vehicles such as pantechnicons. Where such vehicles are allowed access, passing places may be required. The carriageway width required between passing places will then depend upon the combinations of vehicle types expected; the frequency with which vehicles may meet each other and the delay which may be caused to traffic movement. These factors may be expected to vary with traffic volumes.

At 4.8m the carriageway will allow a wide car to pass a large service vehicle such as a pantechnicon. At 4.1m the carriageway will be too narrow for large service vehicles such as pantechnicons to pass vehicles other than cyclists. It does however allow wide cars to pass each other. Hence, while being more restrictive on the movement of large vehicles, a width of 4.1m will still provide two-way flow for the majority of residential traffic. Below 4.1m the carriageway will be too narrow for private cars comfortably to pass each other except at very low speed and may be uncomfortable for cyclists in conjunction with large vehicles. Widths of less than 4.1m therefore should be used for single file traffic.

The choice of width below 4.1m will depend largely upon the frequency and ease with which cyclists and cars may need to pass each other. It is suggested that 3.7 metres (4.1 metres preferred) be regarded as the minimum width between passing bays on a single file system. It is suggested that a single file system can be used for flows below 25vph – 30vph peak.

At the very minimum the shared surface streets should be 4.1 metres (3.7metres minimum) wide with intervisible areas of, say, 5.5 metres that would allow vehicles to pass. As traffic increases then the number of widened areas of road should increase to a point where the streets (for example with footways) switch to become predominately, at least, 5.5 metres wide with areas of narrowing.

Passing Areas

Areas where the street width permits two-way vehicle movement, intervisible passing areas must be a minimum of 10 metres in length and spaced no greater than indicated in Section 3.17 (except within the rural environment) apart and be intervisible. The design of visitor parking must be considered to ensure that passing areas do not get occupied by visiting vehicles.

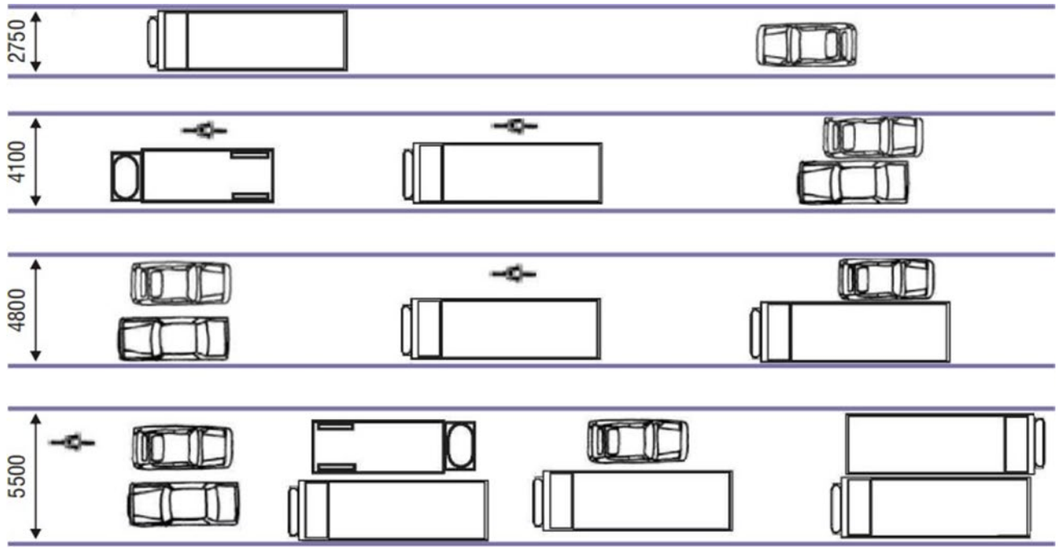


Figure 21 – Carriageway widths Can Accommodate | Manual for Streets

Figure 22 – Minimum Carriageway Street with Speed Reduction Measures

3.15 Industrial Roads

An Industrial Road provides a link to industrial and commercial areas by means of access to servicing yards or allowing frontage development of these premises onto the road.

An Industrial Road may be a cul-de-sac in which case a turning facility should be incorporated. Elsewhere loop roads should be provided to discourage general through traffic movement.

Industrial Roads are transitional in nature between a road and the local industrial/commercial environment and may therefore be constructed to reduced standards of alignment compared with Traffic Distributor Roads. This will largely depend upon the length of the roads. It is still desirable to use a formal design speed for assessing curve radii and visibility. 20mph is suggested as an appropriate figure, with a minimum centreline radius of 25 metres. A minimum carriageway width of 7.3 metres will normally be required, but this may be reduced to 6 metres where commercial vehicle activity is likely to be limited (e.g., in small-scale industrial developments comprising nest units) or where the roads operate one-way.

3.16 Pedestrian Provision

The following table provides the minimum recommendations for pedestrian provision based on the anticipated vehicle flows.

Table 2 – Summary of Pedestrian Provision

Vehicle Flow	Pedestrian Requirement
0 to 20vph	Level and shared
20 to 30vph	Separate demarcation zone (comfort space), level or with 30mm upstand kerbed footway, at least on one side.
30 to 50vph	Segregated footway with 30mm upstand. Preferably on both sides as number of vehicles increases.
50 to 100vph	Segregated footway with 100mm upstand. Preferably on both sides as number of vehicles increases.
Over 100vph	Segregated footway with 100mm upstand on both sides
Note: vph peak vehicle flow per hour	

Figure 23 – Pedestrian Route Through a New Development

Figure 24 – Pedestrian Provision on Type 2 Street in North Ayrshire

3.17 Street Typologies

The proposed residential street types for North Ayrshire are set out in Table 3 'Street Types' below. Should a road, which distinctly caters for vehicles, be required then designers should refer to the National Roads Development Guide (NRDG) which sets out sets out a hierarchy of road types: Primary, Secondary and Tertiary. The key difference between each street type is in relation to the number of dwellings to be served from the street, speed and expected vehicle flow. **For residential streets a maximum design speed of 20mph** should normally be an objective.

Table 3 – Street Types

Street Types				
Primary Streets (Movement corridors / High Streets) ***Not covered in this guide, refer to National Roads Development Guide and Designing Streets for Design Guidance***				
Street Type	**Summary**		**Speed**	
Strategic	For major traffic movement outside of the urban boundary. Movement is prioritised over Place in these circumstances.		Over 30mph	
Main Roads / Primary Streets	These streets are within urban boundaries and link strategic roads to residential and industrial areas. They include arterial 'through routes' and mixed use multi-functional high streets. These are public transport corridors. A careful balance between place and movement is required in the designing of these street.		30mph	
Secondary & Tertiary Streets (Residential)				
Street Type	**Summary**	**Max No. of Dwellings**	**Speed**	**Max Peak Traffic Flow**
Type 1 – Connector Street	Street within residential area with segregated footway	1000+*	20mph	500vph two- way flow
Type 2 – Local Residential Street /Industrial Street	Local Residential Streets are located within residential areas and provide access to properties. Separate footways (segregated by an upstand kerb) are provided for pedestrian movement along this street type.	400*	20mph	200vph two- way flow
Type 3 – Residential Link Street	Residential Link streets are low trafficked residential streets which provide routes to properties. Separate footways (segregated by an upstand kerb) are provided for pedestrian movement along this street type.	200*	15 to 20mph	100vph two-way flow
Type 4 – Shared Surface Street	Shared streets are low trafficked residential streets such as lanes, mews, vennels and courtyards.	40-60*	10 to 15mph	30vph two-way flow
Tertiary Streets (Industrial)				
Street Type	**Summary**		**Speed**	
Industrial Street	An industrial street should follow guidance in Designing Streets as it provides a link to main roads, or primary streets. It could also provide access to industrial and commercial streets by means of accessing to servicing yards or allowing frontage development of these premises onto the road.	n/a	20mph	n/a

** Approximate number of dwellings. Street type to be based on the expected traffic flow*

Type 1 – Residential Connector Street

Residential Connector Streets are the main streets within a new residential development which connect to surrounding strategic roads (e.g., main roads and high streets) and from which the secondary/tertiary residential streets flow. This street type forms a key part in the character of the development as well as providing local public transport connections such as bus routes and bus stops. This street type can also function as part of the active travel network with provision for pedestrians and cyclists. The character of these streets can be enhanced through verges and tree planting which also can provide separation between the footway, cycleway and road creating a safe and pleasant route for pedestrians and cyclists. SuDS such as swales (depending on the location) are recommended for this street type to contribute to surface water management and as opportunities for wildlife.

For Residential Connector Streets within developments over 300 dwellings, there should be at least two points of vehicle entry/exit for effective connectivity, accessibility and to facilitate emergency vehicle operation. There is an opportunity for Residential Connector Streets to also accommodate commercial use and include associated traffic/carparking where appropriate.

Figure 26 – Street Typology Plan for a Residential Connector Street in an Urban Context

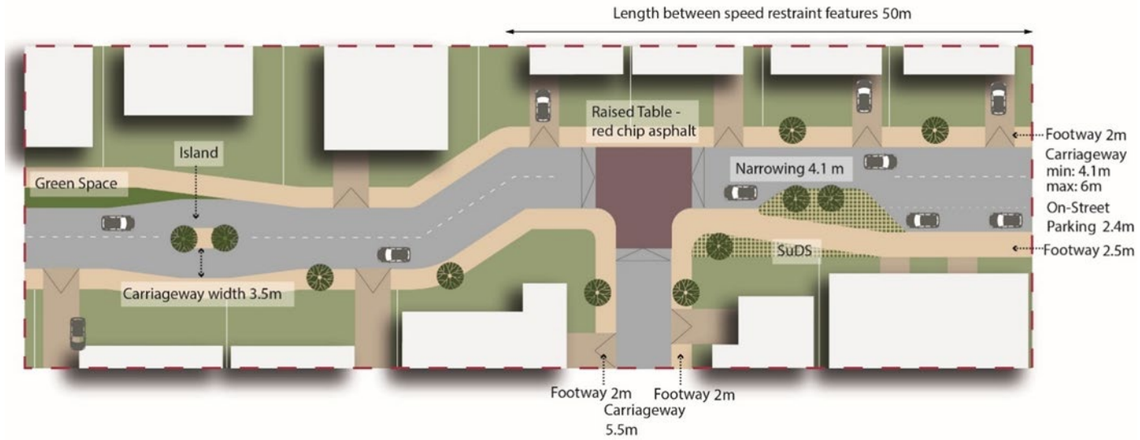


Figure 25 – Street Typology Plan for a Residential Connector Street in an Urban Context

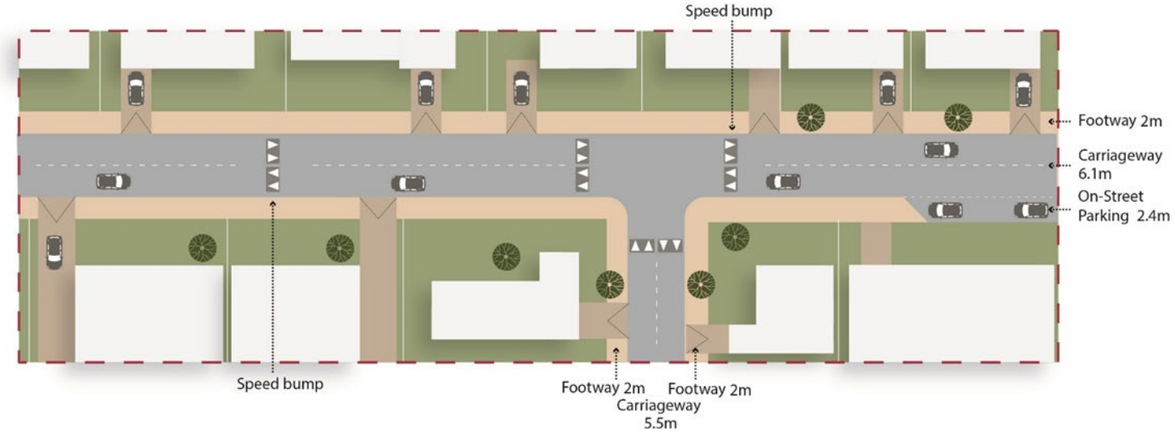


Figure 27 – Street Typology Plan for a Poorly Designed Residential Connector Street in an Urban Context

Table 4 – Type 1 – Connector Street Design Parameters

Type 1 – Connector Street Design Parameters	
Design speed	20mph (except at particular locations, such as outside schools, when a design speed of 15mph is required).
Max number of vehicles / dwellings	200 to 500 vehicles in the peak hour. (approx. 400 to 1000 dwellings)
Number of vehicle access points	Multiple connections preferred with **at least** two minimum
Carriageway width	Non-uniform width is desirable. Shifts in the horizontal plane are preferred to vertical speed control features. Minimum vehicular width to be 6m, or 6.75m if a bus route. Width is dependent on type of traffic, percentage of large vehicles, plus other design considerations, with widening on bends or elsewhere where necessary. On street parking should be accommodated in widened areas that are designed into the street layout.
Footway width (see Section 3.1.4 of the NRDG)	2m minimum (on each side of the road) to increase to 3m or more in areas of identifiably higher levels of pedestrian activity (adjacent to schools, shops, bus stops, railway stations, etc) or if shared with cyclists.
Kerb height for footway	100mm minimum
Verge width and service strip	Minimum 2m width on streets over 150vph (approx. 300 dwellings).
Length between speed restraint features	50m or 60m desirable dependent on design speed
Minimum forward visibilities	33 (or 25m) dependent on design speed
Minimum centreline radius	35m but not fixed; radius geometry to be based on tracking—larger vehicles could generally use whole road turning from / into this street type.
Direct vehicular access	Acceptable if it can be demonstrated that it would not cause an operational problem. Normally only allowed if vehicles do not need to reverse into the carriageway.
Minimum K value	6
Minimum vertical curve length	K x algebraic difference in %age gradient; minimum 25m (absolute minimum 20m)
Maximum gradient	8%
Minimum gradient	0.8% (1.25% Block Paving)

Type 2 – Local Residential Street

Local Residential Streets provide the main setting for homes and allow direct access to individual dwellings. Local Residential Streets are accessed directly from a Connector Street (Type 1) and should ideally contain multiple and linked access points. Separate footways (segregated by an upstand kerb) are provided for pedestrian movement. A designated cycleway should also be allowed for. The priority for these streets is on 'place' over 'movement' where although vehicles should be accommodated, they should not overly dominate the street scene. Careful consideration should also be given to on-street parking. It is unlikely that these streets would carry large volumes of traffic or be part of the public transport network. A non-uniform width is desirable for this street type to control speeds, accommodate on-street parking and accommodate areas of SuDS and tree planting.

Figure 29 – Street Typology Section for a Local Street in a Coastal Context

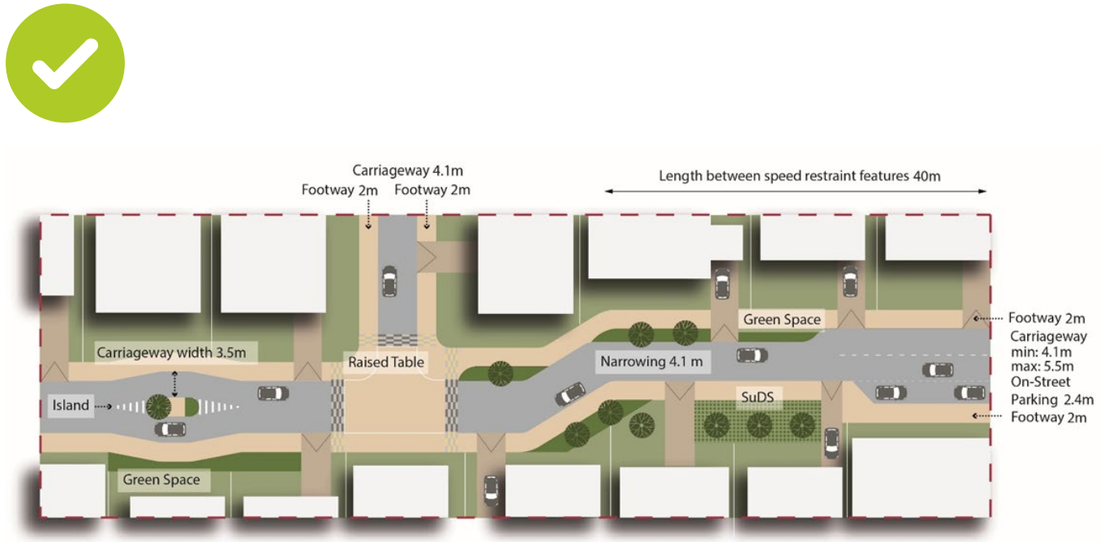


Figure 28 – Street Typology Plan for a Local Street in a Coastal Context

Figure 30 – Street Typology Section for a Poorly Designed Local Street in a Coastal Context

Table 5 – Type 2 – Local Residential Streets Design Parameters

Type 2 – Local Residential Streets Design Parameters	
Design speed	20 mph (except at particular locations, such as outside schools, when a design speed of 15mph is required).
Max number of vehicles / dwellings	100 to 200 vehicles in the peak hour. (approx. 200 to 400 dwellings).
Number of vehicle access points	Multiple and linked connectors are recommended. Up to 150vph (approx. 300 dwellings): - Single access point acceptable if two points of access are not possible. An emergency vehicle access if required for over 100vph (approx. 200 dwellings). 150vph to 200vph (approx. 300 to 400 dwellings) a minimum of two access points. Cul-de-sacs to be avoided. If absolutely necessary, they should have a maximum length of 200m. The layout should incorporate turning facilities for service vehicles where cul-de-sac is more than 20m long.
Carriageway width	Non-uniform width is desirable. Shifts in the horizontal plane are recommended to control speed. Could be relatively constant width but with measures to control speeds at regular intervals, depending on street character and length of links between junctions. Recommended as a minimum, 5.5m up to 300 dwellings, minimum 6m between 300 and 400 dwellings (can vary to respond to built form, public spaces and on streetcar parking, turning from accesses, or a bus route is to be accommodated), plus widening on bends or elsewhere where necessary. On-street parking can be designed into the street layout.
Footway width (see Section 3.1.4 of the NRDG)	2m minimum (preferably on each side of the road) to increase to 3m or more in areas of identifiably higher levels of pedestrian activity (adjacent to schools, shops, bus stops, railway stations, etc) or if shared with cyclists.
Kerb height for footway	100mm minimum
Verge width and service strip	Desirable if not footway present but generally not required as footway is available for services.
Length between speed restraint features	40m desirable, 60m maximum. Horizontal shifts in alignment are desirable.
Minimum forward visibilities	25m. Visibilities significantly above the level should be avoided to deter excess speed.
Minimum centreline radius	20m but not fixed; radius geometry to be based on tracking—larger vehicles could generally use whole road turning from/into this street type.
Direct vehicular access	Allowed
Minimum K value	3
Minimum vertical curve length	K x algebraic difference in %age gradient; minimum 15m
Maximum gradient	8%
Minimum gradient	0.8% (1.25% Block Paving)

Type 3 – Residential Link Street

Residential Link Streets are low trafficked residential streets which provide the setting for residential properties. The priority for these streets is on ‘place’ over ‘movement’ where although vehicles should be accommodated, they should not overly dominate the street scene. Slower speeds should be encouraged through good design such as variable road widths. Pedestrians should feel they can share the whole street; however, a segregated footway should be accommodated for more vulnerable pedestrians. These streets are generally part of the tertiary road network and should be reflected in a change in surface material and detail from Type 1 and 2.

Figure 32 – Street Typology Section for Residential Link Street in a Rural Context

Figure 31 – Street Typology Plan for a Residential Link Street in a Rural Context

Figure 33 – Street Typology Plan for a Poorly Designed Residential Link Street in a Rural Context

Table 6 – Type 3 – Residential Link Streets Design Parameters

Type 3 – Residential Link Streets Design Parameters	
Design speed	15 to 20 mph
Max number of vehicles / dwellings	30 to 100 vehicles in the peak hour. Can be used for vehicle flows between 20 and 30 vehicles. (approx. 60 to 200 dwellings). Maximum length 300m
Number of vehicle access points	Multiple and linked streets are recommended. Should connect to other streets at each end as a minimum. Length should generally reflect block size. Should connect to street of equal or higher status at one end at least. A minimum two points of access required. Cul-de-sacs to be avoided. If absolutely necessary, they should serve a maximum of 6 homes and should be Type 4 streets. Longer (Type 3 streets) cul-de-sac development may be permitted in exceptional circumstances. Should incorporate turning facilities for service vehicles where the cul-de-sac is more than 20m long.
Carriageway width	Variable. Uniform width not acceptable. Shifts in the horizontal plane are essential and a requirement to control speed. Width could vary between 4.1m (3.7m min) and 5.5m depending on use. On-street parking should be designed into the street layout. If the developer wishes to reduce the running carriageway width to below 3.7m, they should consult the local Fire Safety Officer.
Notional carriageway width	Predominately a minimum width of 4.8m for 50 to 100vph and a preferred 4.1m for 30 to 50vph, with 5.5m wide sections to be provided at regular intervals. Can vary to respond to built form and public spaces, on-streetcar parking, turning from accesses, or if a bus route is to be accommodated plus widening on bends or elsewhere where necessary. Frequent narrow sections of 4.1m (3.7m min) width for 50 to 100vph and frequent widened inter-visible sections of 4.8m width for 30 to 50vph. Minimum length of 10m for widened / narrowed sections.
Footway width (see Section 3.1.4 of the NRDG)	2m minimum (preferably on both sides of road as the number of vehicles increase beyond 40 to 50vph).
Kerb height for footway	30mm minimum for up to 50vph, 100mm for flows greater than 50vph
Length between speed restraint features	40m, narrowing's with a horizontal shift in alignment are a requirement.
Minimum forward visibilities	23m. Visibilities significantly above the level should be avoided to deter excess speed.
Minimum centreline radius	14m but not fixed; radius geometry to be based on tracking—larger vehicles could generally use whole road turning from/into this street type.
Direct vehicular access	Allowed
Minimum K value	2
Minimum vertical curve length	K x algebraic difference in %age gradient; minimum 15m
Maximum gradient	8% (7% Block Paving)
Minimum gradient	0.8% (1.25% Block Paving)

Type 4 – Shared Surface Street

Shared surface streets are low trafficked residential streets such as lanes, mews, vennels and courtyards. The priority for these streets is on ‘place’ over ‘movement’. Pedestrian movement is the priority for this street type, reducing the dominance of motor vehicles. A shared surface street should be child and community friendly spaces, rather as just being a corridor for movement.

It is important that drivers enter shared space streets at an appropriate speed. It might therefore be useful to convey this requirement to them on the approach by means of a gateway feature as detailed in Section 3.18. Ideally, the feature would encourage drivers to slow down to the design speed before entering the shared or level area.

Figure 35 – Street Typology Section for a Shared Surface Street

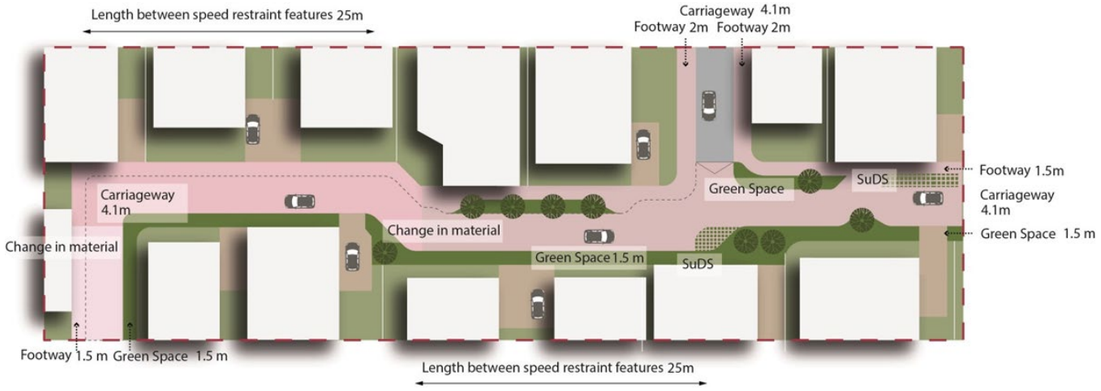


Figure 34 – Street Typology Plan for a Residential Link Street in an Urban Context

Figure 36 – Street Typology Plan for a Poorly Designed Residential Link Street in an Urban Context

Table 7 - Type 4 – Shared Surface Street Design Parameters

Type 4 – Shared Surface Street Design Parameters	
Design speed	15mph,10mph with no pedestrian demarcation
Max number of vehicles / dwellings	Limited to 20 vehicles in the peak hour in a cul-de-sac with a maximum length of 100m. Loop shared surface road can serve up to 30 vehicles in the peak hour. Approx. 40 dwellings in a cul-de-sac and 60 dwellings in a loop.
Number of vehicle access points	Can connect at both ends. Should incorporate turning facilities for service vehicles where the cul-de-sac is more than 20m long.
Carriageway width	Variable, uniform width not acceptable. Shifts in the horizontal plane is essential and a requirement to control speed. Preferred vehicular width to be 4.1m (3.7m min.) with wider areas used for passing. 2m wide service strip can be provided within the vehicle route where width of street is 5.5m or greater. On-street parking should be designed into the street layout. If the developer wishes to reduce the running carriageway width to below 3.7m, they should consult the local Fire Safety Officer.
Notional carriageway width	Predominately a preferred minimum width of 4.1m (3.7m min.) but can vary to respond to built form and public spaces, on-street car parking, turning from accesses, or if a bus route is to be accommodated) plus widening on bends or elsewhere where necessary. Inter-visible widened sections of 4.8m width (minimum length 10m).
Footway width (see Section 3.1.4 of the NRDG)	1.5m minimum demarcation zone or 2m wide segregated footway for peak vehicle flows between 20vph and 30vph
Kerb height for footway	None, delineator strip may be required between the notional carriageway and the demarcation zone where high levels of pedestrian flows are anticipated. 30mm upstand where segregated footway is provided
Verge width and service strip	At least one continuous 2m wide service strip with a 50mm kerb upstand if no footway provided.
Length between speed restraint features	25m to 40m depending on vehicle flow, horizontal shifts in alignment are a requirement
Minimum forward visibilities	20m. Visibilities significantly above this level should be avoided to deter excess speed.
Minimum centreline radius	10m but not fixed; radius geometry to be based on tracking—larger vehicles could generally use whole road turning from/into this street type.
Direct vehicular access	Allowed
Minimum K value	2
Minimum vertical curve length	K x algebraic difference in %age gradient; minimum 10m
Maximum gradient	8% (7% Block Paving)
Minimum gradient	0.8% (1.25% Block Paving)

3.18 Transitions and Junctions from Street Types

It is important that drivers are aware that they are entering a different street type, especially entering shared space streets where they can change their speed appropriately**. At each change of street type a gateway transition feature will be required** to help convey the requirement to alter their driving behaviour. Ideally, the feature would encourage drivers to slow down to the appropriate design speed before entering the shared or level area. Transitions can occur at any point in the street and the changes perceivable by road users, but transitions at junctions are the preferred option (see Figure 39).

The change between street types and from a conventional street could be indicated by various measures used individually or in combination, such as:

- A reduction in road width.
- Visual narrowing (e.g., trees either side of the entry point).
- A portal feature that reduces the visual (or actual) height.
- A change in surfacing material.
- Signing.
- Short lengths of block paving prior to each leg of the junction.

Figure 37 – Change of Surface in Type 4 Street | Gateway

Junctions

For junctions on rural roads, it is necessary to consult the planning authority. In the case of residential streets block spacing will determine the distance – as a guide the minimum stagger between junctions on the opposite sides of a road is X, where X is determined from the table below. Where cells in the table are left blank no restrictions apply. The normal stagger between junctions on the same side of the street 2X.

Table 8 – Junction Spacing

Junction Spacing						
Side Road at Junction	**Main Road at Junction**					
	A	**B**	**C**	**D**	**E**	**F**
A - 40mph Local Distributor	50m					
B - 30mph Local Distributor	50m	30m				
C - Type 1 Street (up to 1000vph)	50m	30m	15m			
D - Type 2 Street (up to 400vph)	30m	15m	15m	15m		
E - Type 3 Street (up to 200vph)	30m	15m	15m	10m*		
F - Type 4 Street (up to 40-60vph)	30m	15m	10m*	10m*		

Notes:

- The cells marked with a * indicate desirable distance.
- Relaxations will be considered depending on the existing street character and the design of the proposed street.
- Right / left staggered junctions are preferred, as they generate fewer conflicting movements.
- Priority crossroads will be allowed on Type 2, 3 and 4 streets.
- Relaxations may be considered.

Table 9 – Junctions Layouts and Sightlines

Junctions Layouts and Sightlines				
Priority Route	**Non-Priority Route**	**Radius (see note (a))**	**X-Distance (see note (b))**	**Y-Distance (see note (c))**
External Road Network	Type 1	6m	2.4 or 4.5m	See note (c)
	Type 2	6m	2.4 or 4.5m	See note (c)
	Type 3	See Table 10		
Type 1	Type 1	6m	2.4m	33m
	Type 2	6m	2.4m	33m
	Type 3	4m splays	2.4m	33m
Type 2	Type 2	6m	2.4m	25m
	Type 3	4m or splays	2.4m	25m
Type 3	Type 3	4m or splays	2.4m	17m
	Type 4	4m or splays	2.4m	17m
Type 4	Type 4	Dependant on tracking	2.4m	11m
External Road Network	Major Industrial Rd	15m	2.4 or 4.5m	See note (c)
	Minor Industrial Rd	15m	2.4 or 4.5m	See note (c)
Major Industrial Road	Major Industrial Rd	15m	2.4m	33m
	Minor Industrial Rd	10m	2.4m	33m
Major Industrial Road	Minor Industrial Rd	10m	2.4m	33m

Notes:

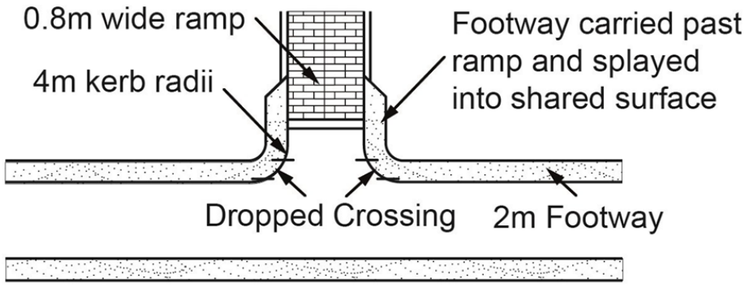
- Radii are typical values but are subject to variation depending on route types and widths. The 15m Industrial radii can be reduced if the development comprises mainly B1 offices. As a principle, radii should be minimised to assist pedestrians and should be checked using vehicle tracking.
- The x-distance will depend on the level of development proposed. An x-distance of 4.5m will be only considered where capacity is an issue. Consideration should also be given to the impact of the x-distance on the built form.
- See Table 14; The y-distance is dependent on the existing speed limit, the design speed of the road or the 85th percentile speed as agreed with NAC. Any reductions in the normal y-distance will only be considered if appropriate speed restraint measures are proposed, they form part of a wider scheme, and are considered appropriate. Reference should be made to the tables 13 and 14 for visibilities at different speeds.

Table 10 – Junctions Layouts and Sightlines

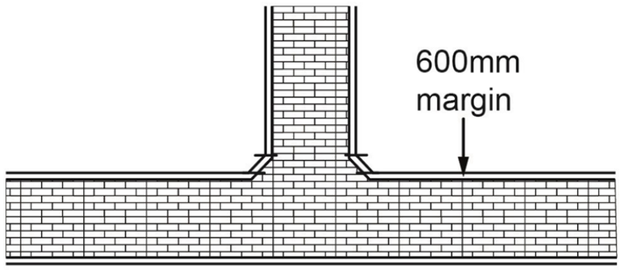
Junctions to Shared Surface / Residential Link Streets				
Road/ Street Connections to Type 3 Streets	**Suitability of Junction Options**			
	A	**B**	**C**	**D**
40mph Local Distributor	Yes	No	No	No
30mph Local Distributor	Yes	No	No	No
Type 1 Connector Street (up to 500vph)	Yes	No	Yes	Yes
Type 2 Local Street (up to 400vph)	Yes	No	Yes	Yes
Type 3 Residential Link Street (up to 200vph)	Yes	Yes	Yes	Yes
Type 4 Shared Surface Street (up to 60vph)	No	Yes	Yes	Yes

Notes:

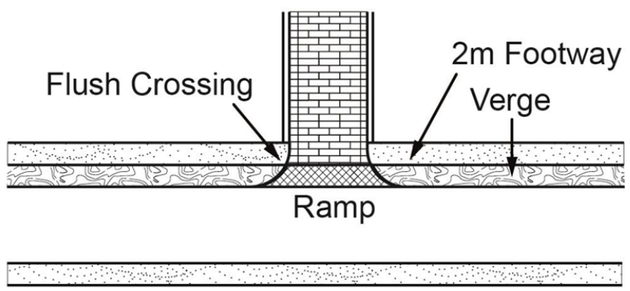
- The junction to a Shared Surface Street can be any of the arrangements shown below.
- Option A with a 6m radii should be used when there is a need to get vehicles off the main route as quickly as possible.
- If Option C is utilised for a junction on to a Type 1 Connector Street, then the ramp will need to be set back 5m (as standard) from the junction with footways extending beyond the ramp.
- Option D should only be used on to a Type 2 Street.



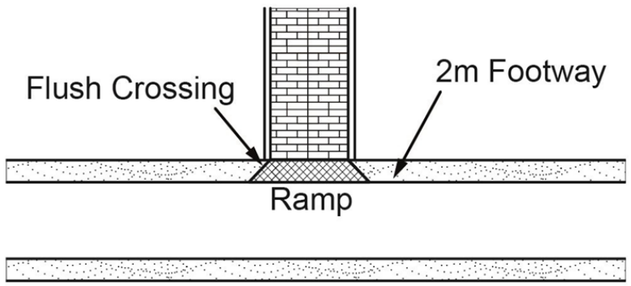
Option A



Option B



Option C



Option D

Figure 38 – Examples of Junction Options onto Residential Link / Shared Surface Streets

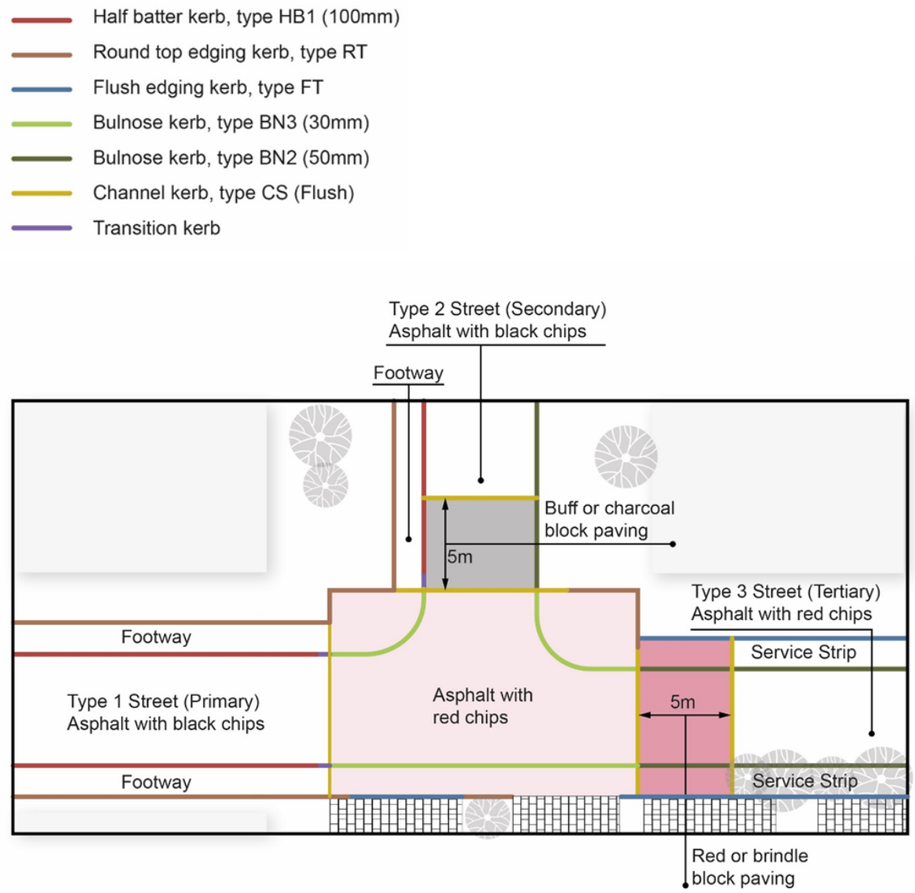


Figure 39 – Junction Material Change to Highlight Transition from Type 1 to Type 2 and 3 Streets

Adoptable Visibility Zones

An adoptable visibility zone should be provided for drivers turning left into a minor route, to enable them to view potential hazards. The required visibility radii, which is tangential to the kerb, for different junction angles and kerb radii, are as follows:

Table 11 – Junction Deflection and Visibility at Kerbs

Junction Deflection (degrees)	Visibility For Each Kerb Radius		
	4m	6m	10m
80	10m	11m	19m
90	9m	10m	19m
100	8m	9m	19m

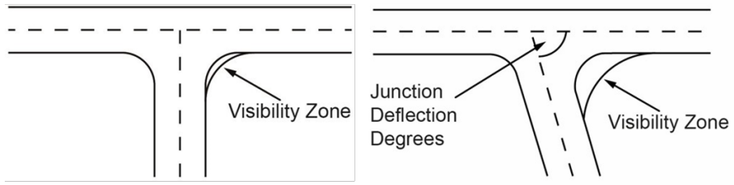


Figure 40 – Visibility Zones

Turning Spaces and Vehicular Sweep Path Tracking

The vehicle path is the width required for vehicle movement within the overall street width, given the nature of vehicles likely to utilise the street, the requirements for non-car users, and any on street parking or servicing. North Ayrshire Council can provide details of the typical waste refuse vehicle that is likely to operate in the development.

The position of buildings and other features needs to be considered alongside the requirements for pedestrian and vehicle movements, so that the design is not dictated by standard road layouts. Vehicle tracking demands need to be accommodated but should not dominate. It should be used to lessen the dominance of the carriageway. Kerblines should not rigidly follow vehicle paths but take note of the building lines, etc. The aim should be to achieve a harmonious mix of user demands.

Following design principals of having connected street networks, this will generally eliminate the need for vehicles to turn around in new developments. Where it is necessary to provide for vehicles turning (e.g., in a cul-de-sac or court), a tracking assessment should be made to indicate the types of vehicles that may be making this manoeuvre and how they can be accommodated. **The turning space provided should relate to its environment.**

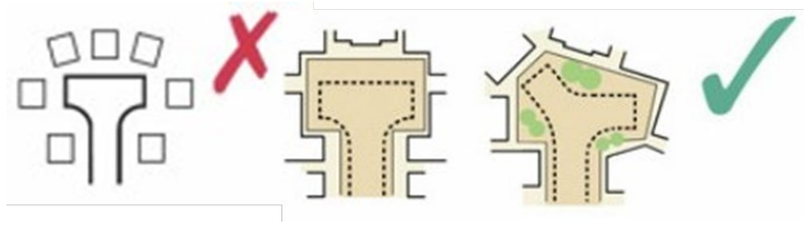


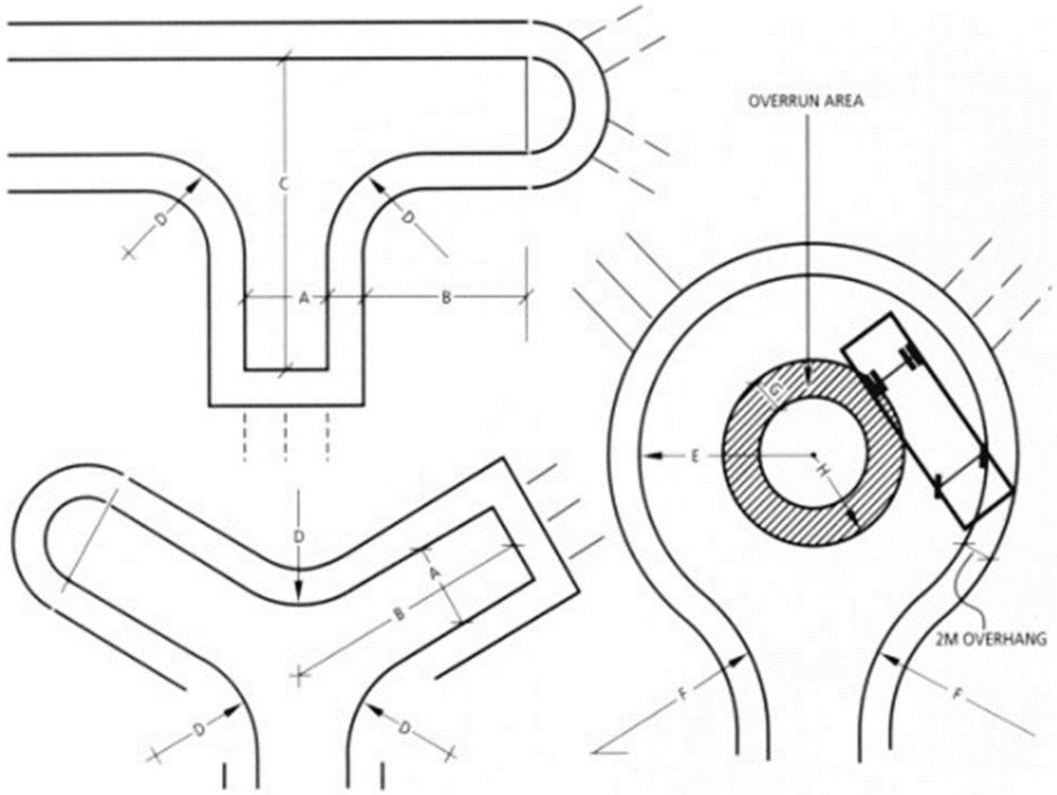
Figure 41 – Turning Heads Responding to Use vs Environment from Design Streets

Overhang

Turning heads should be provided with a 2 metres wide verge or margin to allow for any overhang of vehicle bodies when manoeuvring where there is no adjacent footway.

Self-Policing

Designated or marked parking bays should be provided to prevent vehicles using the turning head for additional on-street parking.



	A	B	C	D	E	F	G	H
RESIDENTIAL DEVELOPMENT	5.0	12.5	15.0	6.0	10.5	10.5	2.0	6.0
INDUSTRIAL/COMMERCIAL DEVELOPMENT	6.0	29.0	22.0	9.0	13.0		N/P	4.0
RESIDENTIAL WITH BUSES	6.0	N/P	N/P	N/P	13.0		2.0	6.0

Figure 42 – Typical Turning Areas (as a Guide) with Dimensions | National Roads Development Guide

Emergency and Service Vehicles

The developer should demonstrate that the street layout can accommodate service and emergency vehicles without compromising the positive sense of place. Wherever possible this should be achieved by the provision of roads forming loops thus avoiding the need for turning areas. Tracking should be used to determine appropriate sizes.

The requirements for emergency vehicles are generally dictated by the fire service requirements. All development proposals should be discussed with the relevant Fire Authorities.

The requirements are as follows:

- A 3.7m carriageway (kerb to kerb) is required for operating space at the scene of a fire. To reach a fire the access route could be reduced to 3.0m over short distances, provided the pump appliance can get to within 45m of all points within a dwelling.
- If an authority or developer wishes to reduce the running carriageway width to below 3.7, they should consult the local Fire Safety Officer.

Waste Vehicles

It is essential that liaison between the designers and the waste operations team takes place at an early stage. Policy for local and regional waste planning bodies is set out in Scottish Planning Policy. BS 5906: 2005 and recommends a maximum reversing distance for refuse vehicles of 12 m. Longer distances can be considered, but any reversing routes should be straight and free from obstacles or visual obstructions.

On streets with low traffic flows and speeds, it may be assumed that vehicles will be able to use the full width of the carriageway to manoeuvre. Larger vehicles which are only expected to use a street infrequently, need not be fully accommodated – designers could assume that they will have to reverse or undertake multi-point turns to turn around for the relatively small number of times they will require access.

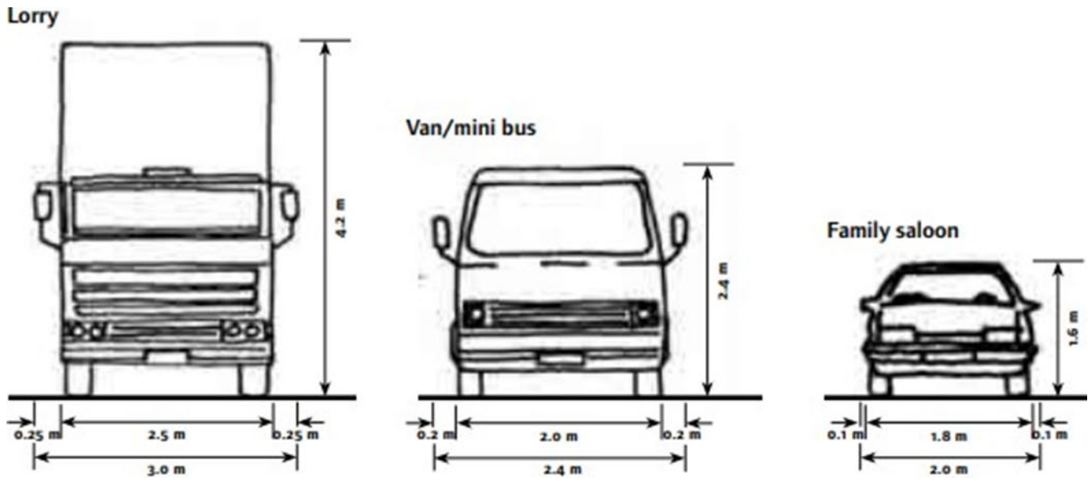


Figure 43 – Typical Vehicle Dimensions | Manual for Streets

3.19 Vertical Alignment

Vertical curves shall be provided at all changes in gradient. The use of permitted vertical curve parameters will normally meet the requirements of visibility, however stopping sight distance should always be checked because the horizontal alignment of the road, presence of crossfall, superelevation or verge treatment and features such as signs and structures adjacent to the carriageway will affect the interaction between vertical curves and visibility.

3.20 Visibility

Designing Streets provides details for visibility. Forward visibility and junction visibility should be measured in accordance with Table 13 and 14. An 'x' distance of 2.4m should normally be used in most built-up situations. A minimum figure of 2m may be considered in some very lightly trafficked and slow-speed situation.

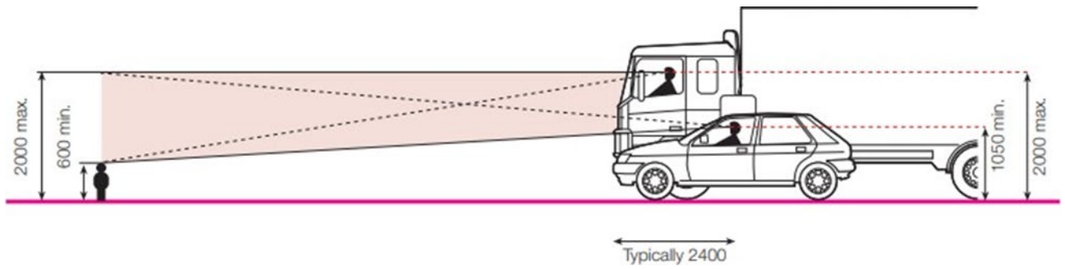


Figure 44 – Stopping Sight Distance (SSD) | Manual for Streets

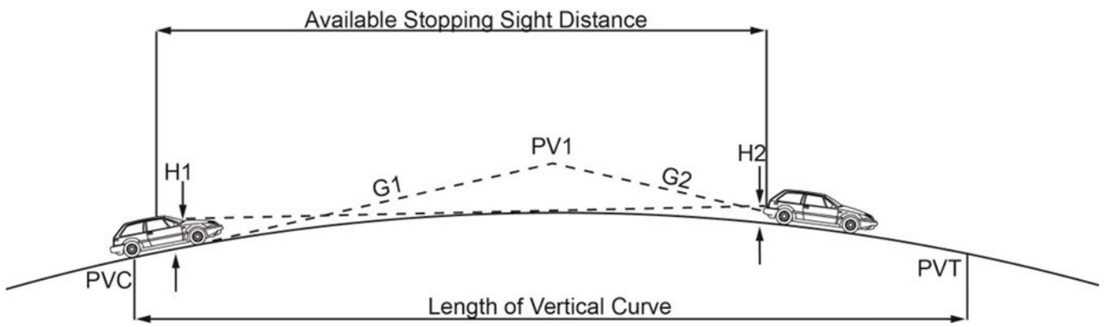


Figure 45 – Stopping Sight Distance (SSD)

Table 12 – Stopping Sight Distance (SSD)

Stopping Sight Distance (SSD)												
Speed	**Km/hr**	**16**	**20**	**24**	**25**	**30**	**32**	**40**	**45**	**48**	**50**	**60**
	mph	**10**	**12**	**15**	**16**	**19**	**20**	**25**	**28**	**30**	**31**	**37**
SSD (m)		9	12	15	16	20	22	31	36	40	43	56
SSD adjusted for bonnet length		11	14	17	18	23	25	33	39	43	45	59

Table 13 – Visibilities (Designing Streets)

Speed	Visibilities (Designing Streets)					
Kph	56	48	40	32	24	15
Mph	37	30	25	20	15	10
Y-distance (m)	59	43	33	25	17	11

For accesses onto the external road network that meet the following criteria the following Y-distances in Table 14 should be utilised;

- It is a Main Distributor Road or Strategic Route.
- It is outwith a built-up area.
- The eighty-fifth percentile wet weather speed is considered to be 37 mph or greater.
- The movement function of the street is more important than the place function in almost all situations.

Table 14 – Visibilities (DMRB)

Speed	Visibilities (DMRB)					
Kph	113	97	80	64	48	32
Mph	70	60	50	40	30	20
Y-distance (m)	295	215	160	120	70	45

Notes:

- Where it can be shown that vehicle speeds will be contained to 30 mph or 20 mph, the respective major road 'y' distance can be amended to 43 metres and 25 metres respectively.
- Departures may be considered if the full recommended standards are not achievable.

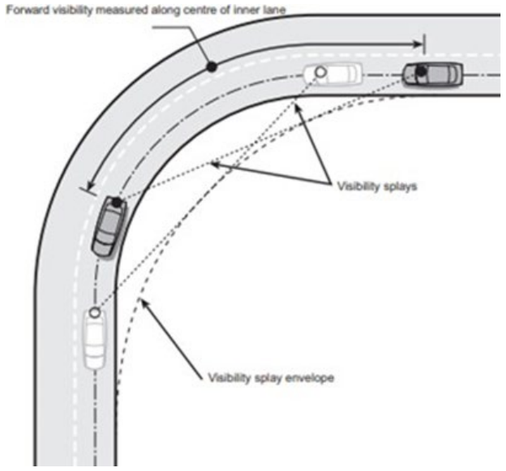


Figure 46 – Forward Visibility from Design Streets

Encroachment of parking spaces into visibility splays should be avoided where practicable, therefore tracking streets may be advisable.

Other street features can impact visibility, such as street furniture and street trees and should be assessed in terms of their impact on the visibility envelope. In general, where these features are deemed not to fully obscure a whole vehicle or pedestrian (including child or wheelchair user) they will not have a significant impact on visibility.

Although parking in visibility splays can be common, it does not appear to create significant problems in practice.

3.21 Driveway Visibility

Vehicle exits at the back of the footway mean emerging drivers will have to take account of people on the footway. The absence of wide visibility splays at private driveways will encourage drivers to emerge more cautiously. Appendix I – Parking Standards, Section 1.4 provides further details.

3.22 Overrun Areas: Verge and Footway Protection

Careful consideration to be given to areas where potential overrun could occur and may require vertical features to highlight street edge. Potential mitigation measures at identified over-run areas could consist of:

- Verge reinforcement to permit over-running.
- Grass-crete.
- Wooden posts.
- Raised verges (mounds).
- Bollards.
- Natural stones.
- High kerbs

The visual impact of kerb heights can impact on the overall street scene. The developer should determine the appropriate kerb height for all locations within the development; to reduce the risk of overrunning. Overrunning is generally to be avoided in residential and mixed-use streets as it can be visually intrusive, interfere with pedestrian desire lines and pose a potential hazard to cyclists.

At locations where it may be expected that over-running of the service strip/verge/footway may occur, localised raising of the kerb to 100mm or greater may be the most appropriate measure.

Designing Streets states ‘overrun areas can, however, help to overcome problems with regular or high-volume access for larger vehicles. In this instance verge or footway reinforcement should be considered.

Figure 47 – Over-run protection | Before and after

3.23 Public Transport

Bus Routes

Public Transport should be considered at an early stage in the design process. The principle streets within a development should be the streets on which public transport runs. Those streets, identified through the design process, should be discussed in consultation with transport operators and detailed requirements agreed throughout the design process. Bus stops and bus routes form a key part of walkable well-connected neighbourhoods.

Streets on bus routes should generally not be less than 6.0m wide (but can be reduced on short sections with good intervisibility). Swept path analysis can be used to determine the ability of streets to accommodate large vehicles as per Figure 48 below.

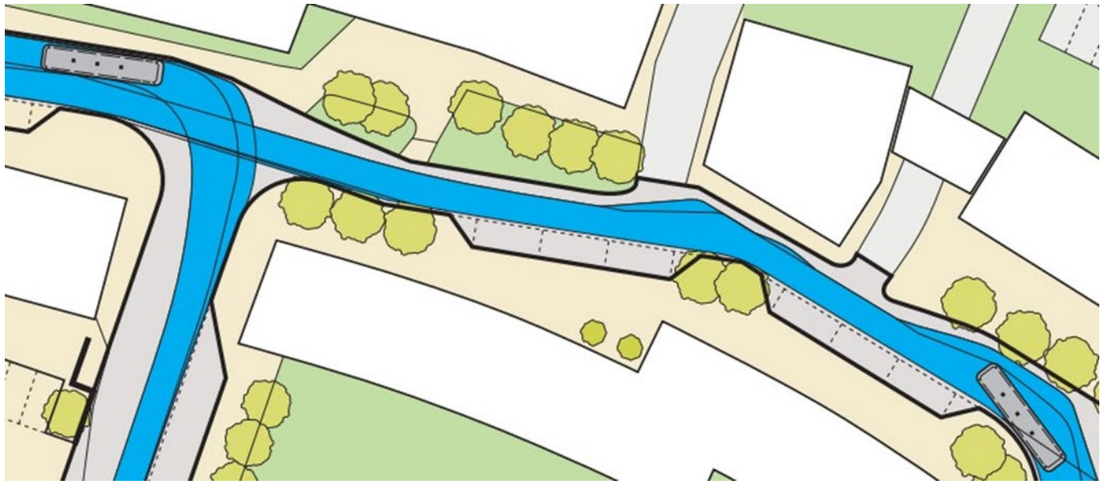


Figure 48 – Bus Tracking in Residential Streets from Designing Streets

Bus Stops

Public transport stops should be sited in relation to pedestrian desire lines at an early stage in the design. The developer should co-operate and consult with local public transport operators and the local authority.

- Bus stops should be sited so they can be easily accessed by all pedestrians.
- Bus stops should be placed near junctions so that they can be accessed by more than one route on foot, or near specific passenger destinations. (Schools, shops, etc.)
- The bus should generally stop on the street and not in a lay-by.
- Bus stops should be high-quality places that are safe and comfortable to use.
- Footways at bus stops should be wide enough for waiting passengers while still allowing for pedestrian movement along the footway. This may require local widening at the stop.
- Provision should be made within the streetscape for features that assist passengers getting on and off buses. This may involve areas of raised footway. It is important that such features are integrated within the overall design of the street and do not pose difficulties for those with visual impairments.
- A bus shelter hardstanding and shelter to be provided to the rear of footway.
- Where real-time information services can be made available, such facilities should also be considered.

Figure 49 – Typical Bus Stop and Shelter

3.24 Pedestrian Movement

Residential pedestrian routes are classified as either footways (which are adjacent to the carriageway or verge) or footpaths (which are not related to the carriageway). Pedestrian movements are also catered for on Shared Surface Streets.

Within new residential areas, pedestrian movement should be:

- Convenient.
- Lit.
- Safe.
- Pleasant and attractive.
- Direct to attractions with good intervisibility and connectivity.

The desirable maximum longitudinal section gradient of adoptable footways or footpaths is 1 in 20 (5%). If this is not achievable, then the specific circumstances should be discussed with the Council. A gradient steeper than 1 in 12 (8.5%) will not be acceptable.

All footways and footpaths should have a crossfall of 1 in 40 (2.5%) towards the drainage channel.

Footway Widths

- In high vehicle volume streets the minimum footway widths should be 2 metres to both sides of the carriageway, although in certain situations one footway may be acceptable if there is no likelihood of pedestrians utilising a second footway. In such a case, sufficient land may need to be dedicated as adopted verge if there is a reasonable likelihood of a

footway being needed at any time in the future.

- The minimum width of footway should increase to 3 metres in areas of identifiably higher levels of pedestrian activity, such as adjacent to schools, shops, bus stops, etc.
- Greater widths may be required at specific points (e.g., around bus shelters).
- A separate footpath should have a total corridor width of 4m containing at least a 1m margin to each side of a 2m surface.

Figure 50 – Pedestrian Connectivity - Tarryholme, Irvine

Steps

Where steps are proposed within the development, a suitable adjacent ramp must also be provided.

Handrails must be provided and should be smooth and continuous where there is more than one flight of steps. The handrail should be terminated no less than 300mm past the end of the flight and 'closed' to the stair wall. Where the steps open on to a pedestrian footway crossing the line of the flight, the handrail should be placed 850mm above ground level and not protrude.

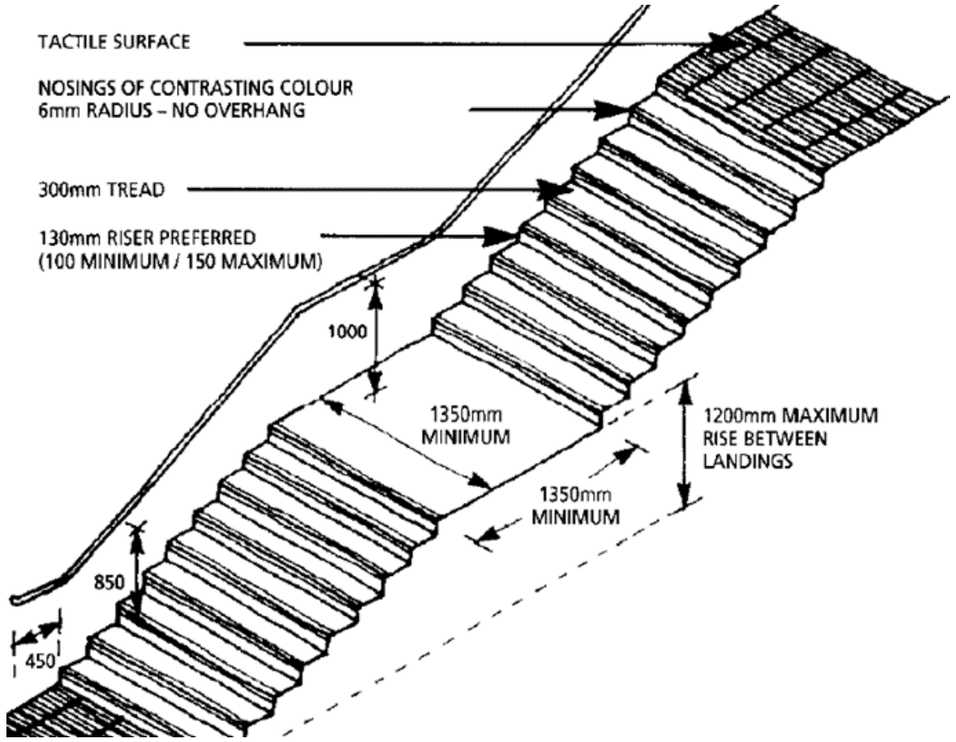


Figure 51 – Step Dimensions

Crossings

Dropped kerbs should be provided at all junctions and pedestrian desire lines, including connections to external and existing footpaths.

Where dropped kerbs are provided across the minor route within a major/ minor junction they can lie within the corner radius for junctions with radii of 4 or 6 metres. However, for junctions with radii of 10 or 15 metres, they should be positioned further from the major route to reduce crossing distances. For low levels of development, dropped crossings are preferable to the provision of kerb radii to give priority to pedestrians. Continuous pedestrian crossing points can be provided by raised plateaus or level crossing points.

Surface level crossings can be a number of types, as outlined below:

- Uncontrolled crossings—which should have dropped kerbs.
- Informal crossings—can be created through careful used of paving materials and street furniture to indicate a crossing place to encourage slow-moving traffic to give way to pedestrians.
- Formal crossings—in which there are four types of signalised crossings (Pelican, Puffin, Toucan and Equestrian, for further information see page 15-16 of Designing Streets) and Zebra crossings.

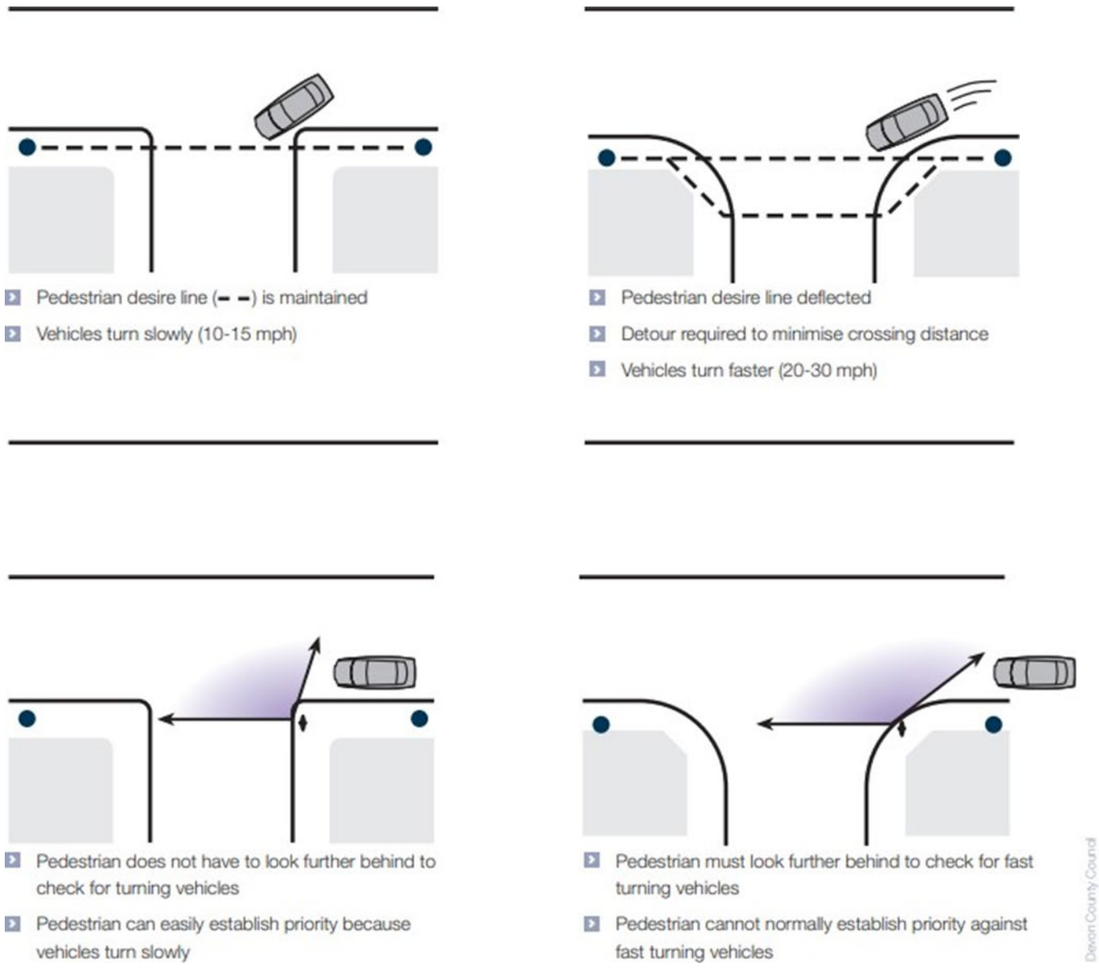


Figure 52 – Pedestrian Connectivity and Junction Radii | Designing Streets

Swept-path analysis can be used to determine the minimum dimensions required. The footway may need to be strengthened locally in order to allow for larger vehicles occasionally overrunning the corner.

Figure 53 – Dropped Kerb Uncontrolled in North Ayrshire

Designing for Inclusive Mobility Access Provision

Developers should design streets and spaces to provide good access and clarity for the elderly, disabled people, including those with visual, hearing and other impairments. They should also seek to ensure that routes are accessible to all and are not obstructed.

This Street Design Guide considers the needs of disabled people within all elements of the design guidance so that their requirements are incorporated from the start of the process rather than added as an afterthought. However, this does not obviate the need for care when assembling design elements and building form.

Ramps

Pedestrian ramps should have a desirable gradient of less than 1:20 (5%) which should be regarded as the norm. Gradients must not exceed 1 in 12 (8.3%) and if this gradient is utilised then it should not be for a greater length than 2 metres. Should this not be achievable, the specific circumstances should be discussed with the Council. Ramps should always be provided next to steps.

The maximum length of a ramp shall not exceed 6m unless provision is made for a level landing of preferred length 2m (with or without an adjacent resting platform). Slopes of between 1 in 12 and 1 in 20 require at least a handrail down one side. Stepped ramps should be avoided. Ramps should be 1800mm wide to permit wheelchairs to pass. The minimum width over short lengths can be 1200mm. Handrails should be set 1000mm above the ramps.

Tactile Paving

Tactile paving to assist blind or partially sighted people should be utilised in accordance with national guidance found at: Inclusive Mobility. A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure (publishing.service.gov.uk).

With the appropriate tactile paving, dropped kerbs should be provided at all side road junctions where the carriageway and footway are at different levels.

Street furniture is typically sited on footways and can be a hazard for blind or partially sighted people. Obstructions in the footway should therefore be minimised, lighting columns for example should always be located at the back of footway.

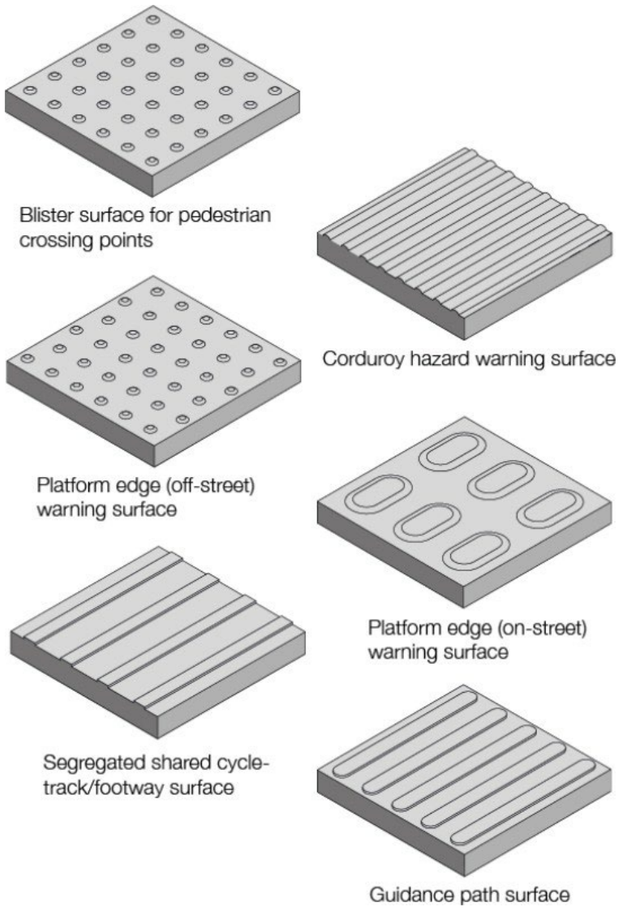


Figure 54 – Tactile Paving Examples and Application

3.25 Vertical and Horizontal Clearance

A general vertical clearance of 2.6 metres should be provided, with an absolute minimum of 2.1 metres beneath signs. Within 450 mm of the carriageway edge the full 5.1m (5.3m for Primary roads) clearance requirement will apply.

A horizontal clearance of 0.45 metres should always be provided between the edge of the carriageway and any vertical objects such as signs. Where the crossfall on the carriageway exceeds 4% this clearance should be increased to 0.6 metres.

3.26 Cycle Infrastructure and Movement

New infrastructure for cycle provision should link to existing and intended routes. While good quality off carriageway routes may be favoured, shared unsegregated use of a path alongside the carriageway by cyclists and pedestrians is an option.

Where this is proposed, the minimum width is 3.0 metres. Ideally, a width of over 3.5m will allow delineation of pedestrian and cycle use. Reduced widths can be provided in exceptional circumstances- please seek advice from NAC officers. If the pedestrian and cycle routes are parallel but segregated by level difference or by a tactile dividing line, different widths apply. Principles and appropriate widths for shared and adjacent facilities for pedestrians and cyclists are considered in detail in the Governments Cycling by Design guide.

Access

Where off-road cycle tracks are installed away from the carriageway, access measures should be used to prevent unauthorised access by cars or motorbikes. All access barriers must comply with Disability Discrimination Act (DDA) regulations.

Visibility

Where a cycle track joins a carriageway, an appropriate x-distance must be provided with a normal minimum of 2.4 metres. Where a crossing or a junction with a carriageway is approached by means of a physical barrier arrangement the x-distance can be reduced to 1.0m. Further details are in the Governments Cycling by Design.

Cycle Parking

The Council's guidelines for cycle parking within development should be followed and guidelines followed as per the Governments Cycling by Design.

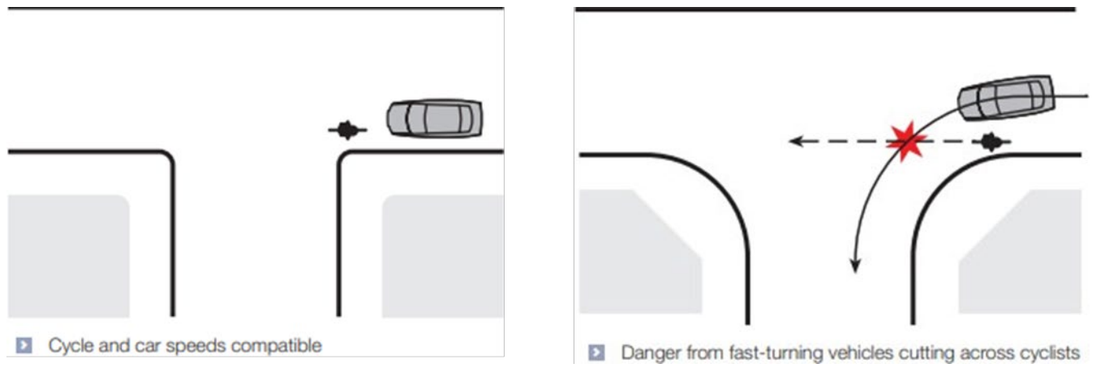


Figure 55 – Junction Design to Slow Travel Speed | Designing Streets

Figure 56 – Cyclist Utilising a Core Cycleway in North Ayrshire

Consideration should be given to the installation of secure cycle parking facilities at shopping and other communal centres in new developments where cycle usage is anticipated. A suitable method of creating secure parking is the "Sheffield" stand design. Communal covered cycle parking should be provided for higher density flatted or mixed use developments.

Cycle parking stands/ spaces should be designated such that they cannot be abused by vehicular parking.

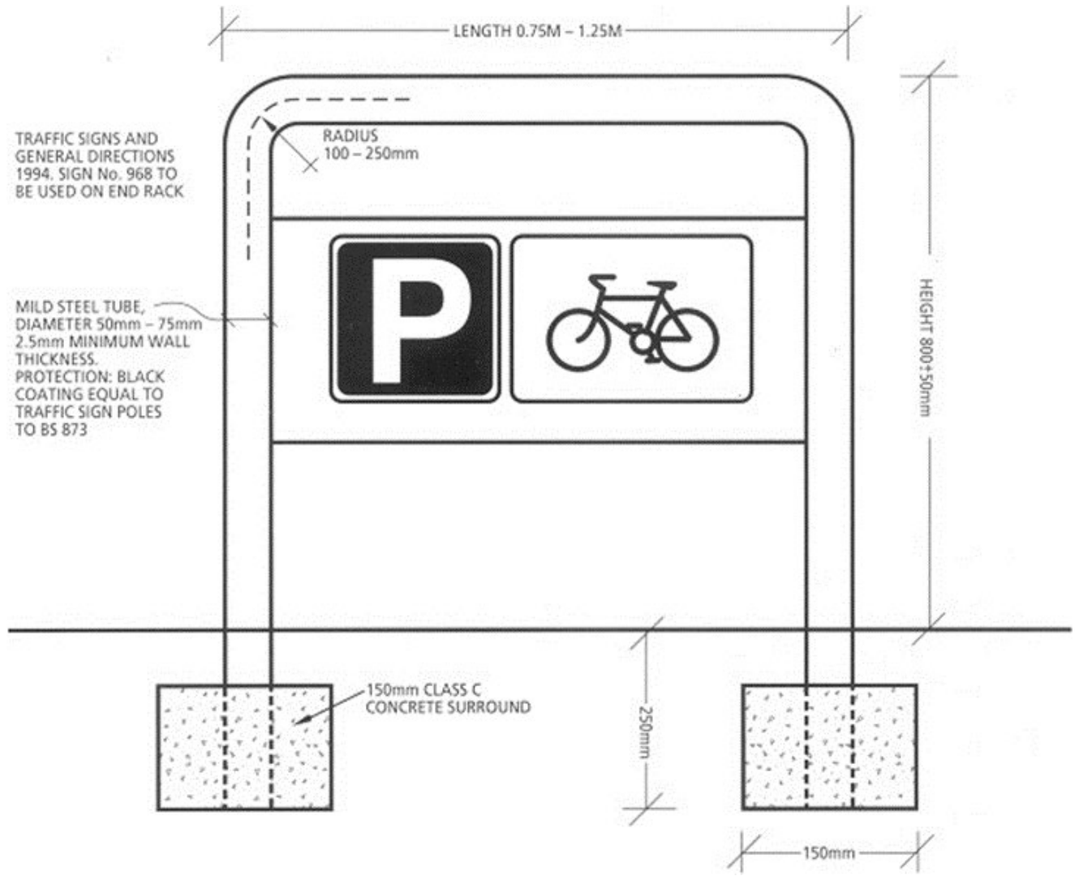


Figure 57 – Sheffield Stand Cycle Parking

3.27 Public Utility Service Strip

At least one service strip (can be within footway), a minimum of 2 metres wide, is required out with the extents of carriageway. Service strips can be located under any footway in a development. A service strip within the carriageway may be permitted at the discretion of the local road's authority. Where a service strip is permitted within the carriageway it requires to be a minimum width of 2.0 metres and 1 metre clear of the nearest public sewer. Local deepening will be required, see Section 3.1.6 (c) of the NRDG.

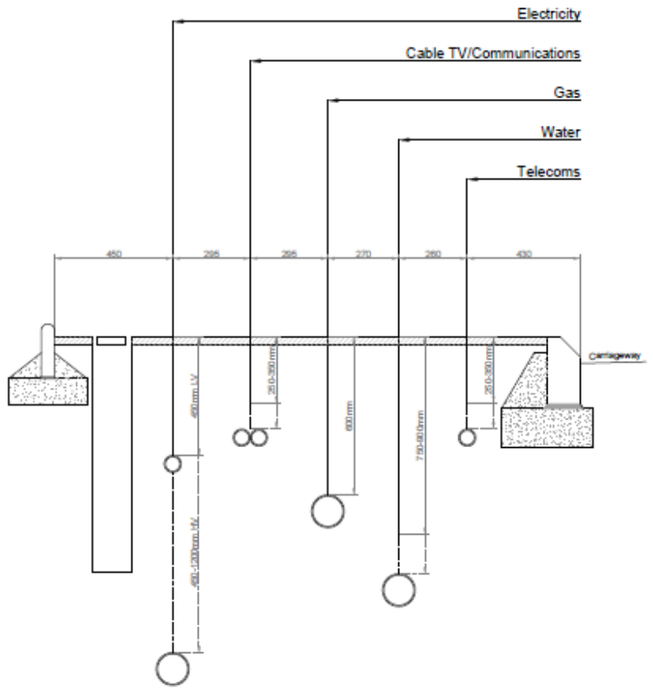


Figure 58 – Public Utilities to be Laid Underground in Footway

Service strips require to be located such that access to the utilities will not result in excessive vehicular diversion for properties affected. In a variation to 3.1.6(j) of the NRDG, maintenance of the adopted service strips will be the responsibility of the adjacent homeowner. This should be written into the relevant title deeds and must be maintained in good condition and not planted or altered without permission from the local road's authority.

Service strips considerations, for further details see NRDG Page 102 Section 3.1.6 (e)

- Located in land available for adoption by North Ayrshire Council.
- Consider utility location and provision in relation to proposed street types.
- Service strips to be planned and located out with the running surface.
- Place utilities within a landscaped zone adjacent to property garden areas.
- If utilities must be located in the running surface, should be situated in an area subject to less traffic and agreed with NAC officers.
- To be maintained at a width of 2.0m.
- Manhole placement should not be located within the 3.5m wide running width of the shared surface unless alternative access can be provided.
- Preferable not to include manholes in service strip, can locate in parking areas or widened areas within total width of road.
- Developers should engage with North Ayrshire Council and Statutory Undertakers to agree location and depth of service strips.

Utility – Visual Requirements

Any utility equipment that is above ground, for example, cabinets, boxes, pillars and pedestals should be sited outwith visibility splays so that it:

- Does not obstruct a driver's view.
- Not affect traffic movements.
- Be positioned so there is enough access for the equipment and the surrounding road to be maintained and cleaned.
- Not be located within any tactile paving (in the case of surface covers).
- Allow space for associated jointing chambers.
- Does not indiscriminately create wide sterile easements within verges or public greenspace (i.e., grassed areas maintained by the Council).
- Is not located within 5m of any other street furniture that would create a double obstruction to pedestrians.
- Any item within 5m must be in line.
- Does not spoil the view of a listed building; or does not result in 'visual clutter' by being in an inappropriate place.
- Does not obstruct pedestrians, wheelchairs, prams, pushchairs, etc.
- At least 2m clearance, increased to 3.5m in areas of high pedestrian flows (500 pedestrians an hour) or in locations such as schools, bus and rail stations, shall be provided.
- Does not constitute a danger to the public or to staff working on it.
- Does not facilitate crime or anti-social behaviour.
- Does not enable illegal access to adjacent premises or property (e.g., locating cabinets adjacent to high boundary walls, where the apparatus could be used to climb over the wall).
- Does not restrict the outlook or surveillance from the window of a house, intrude into areas of open-plan front gardens or disrupt the line of low boundary walls.

Figure 59 – Utility Cabinets and Service Strips Incorporated into Street Design

Drainage and Utilities

The NRDG and Appendix H details the SuDs requirements for North Ayrshire.

Key documents for road drainage and flood risk include:

- The Adopted North Ayrshire Local Development Plan.
- National Flood Risk Assessment (2018).
- Ayrshire Flood Risk Management Plan (2021).
- Ayrshire Local Flood Risk Management Plan (2022).
- Drainage, SuDS & Flooding: Procedure Note for Prospective Developers (2021 as amended).
- Surface Water Management Plans for 'Irvine' (2020) and for 'Saltcoats, Ardrossan, Stevenston & Kilwinning (SASK) (2021).
- Ayrshire Shoreline Management Plan (2018).
- Sewers for Scotland.
- The SuDS Manual.

Key Legislation:

- Flood Risk Management (Scotland) Act (2009).
- The Water Environment (Controlled Activities) (Scotland) Regulations (2011).

Drainage proposals must be formulated to ensure that they meet the requirements of national and local planning policy, all relevant environmental regulations, the identified actions of the Local Flood Risk Management Plan, and relevant design standards for the management of flood risk and for the management of water quality.

North Ayrshire Council's procedure note on Drainage, SuDS & Flooding identifies the matters that should be considered and the documents that should be provided by a developer when applying for planning permission. The procedure note is updated from time to time to reflect the changing understanding of flood risk as well as changing policy and regulatory requirements. The information and approach contained in the procedure note should be considered as general guidance and other relevant or more up to date sources of information should also be consulted.

The term Sustainable urban Drainage Systems (SuDS) covers the whole range of sustainable approaches to surface water drainage management. SuDS aim to mimic natural drainage processes and to remove pollutants from urban runoff at source. In most cases, SuDS are required by regulations. Street design, including drainage, should help to deliver SuDS, which comprise of a wide range of techniques, including:

- Green Roofs.
- Permeable Paving (in non-adoptable areas).
- Rainwater Harvesting.
- Swales.
- Detention Basins.
- Ponds.
- Rain Gardens.

SuDS are more sustainable than traditional drainage methods because they can manage run off flow rates using infiltration and/or the retention of storm water, they protect and/ or enhance the water quality, are sympathetic to the environment setting, provide a wildlife habitat and encourage natural ground water recharge (where appropriate). They do this by:

- Dealing with run off close to where it falls.
- Managing potential pollution at its source.
- Protecting water resources from pollution created by accidental spills or other sources.

Proposals will be expected to make appropriate allowance for both urban creep, climate change and freeboard.

3.28 Car Parking

In general, adequate parking should be provided adjacent to all new developments to ensure that vehicles are not parked on the carriageway of a road where they may impede traffic flow and constitute a safety hazard. Appendix I – Parking Standards details the parking requirements for North Ayrshire.

3.29 Street Lighting

North Ayrshire Council's procedures for the adoption (accrual) of Street Lighting and Illuminative Apparatus are set out in Appendix D - Street Lighting Requirements.

Standard and Quality of Lighting

For appropriate designs standards and quality of lighting, in terms of design selection lighting services should aim to:

- Assist in the safe movement of traffic and reduction of night-time accidents by providing appropriate lighting on roads within the built environment and urban centres.
- Contribute to the commercial and social use of town centres, amenities and tourist activities by improving the night-time appearance and accessibility.
- Assist in reducing the fear of crime and aid visual recognition on public roads through use of white spectrum Light Emitting Diodes (LEDs).
- Protect and enhance the built environment by providing an efficient and effective lighting service for those roads and footpaths that have lighting installations.
- Safeguard and enhance our night time environment by reducing light pollution, obtrusive light and carbon emissions through ensuring that only the road area is illuminated by using more controlled, low carbon, long-life LED lighting that doesn't spill light into private areas.

The lighting levels and outputs required are detailed within the British Standard BS5489-1:2020 A Code of Practice for the Design of Road Lighting", which defines the maximum and minimum illumination levels thresholds for different road classifications, environmental locations and night-time use of the road; and within the ILP Guidance Note for the Reduction of Obtrusive Light to ensure that the outputs are controlled to avoid glare, spill light beyond the road area being lit and general upward pollution contributing to urban "skyglow". Lighting levels should be adequate and appropriate for all users of the street, particularly vulnerable users.

Where it considers it appropriate to do so in achieving the aims set out above and under the provisions of the Roads (Scotland) Act 1984, the Roads Authority Lighting service may direct that privately maintainable lighting be installed in locations that will not subsequently be adopted by the local authority.

Within Conservation Areas standard lighting column designs may not be appropriate and will be subject to agreement with the Local Authority Lighting service.

3.30 Rural Roads and Streets

The developer will have to demonstrate the level of the existing traffic flow and the likely peak generated flow created by the new development and depending upon the new total flow the following road types and widths will be appropriate. A rural road can be defined as any road out with a defined settlement boundary.

Carriageway widths and number of vehicles per hour (vph) permitted are:

- Maximum 100vph single track 3.7m access road with passing places.
- Maximum 150vph 4.1m wide carriageway with passing places.
- Maximum 300vph 5.5 wide carriageway.

All passing places should be intervisible or up to a maximum distance of 150 metres apart. Adjacent passing places should be placed on alternate sides of the road. Consideration to be made on the percentage of HGV's expected to use the rural road/ street network, if a high percentage is expected the above figures/ estimates may not be suitable.

Rural roads should have adequate road drainage to prevent excess water and loose material from being deposited on the public road.

3.31 Materials and Construction

One of the key objectives is the use of simple, appropriate, sustainable, well detailed, high-quality materials that form a cohesive family of components. The selected materials should assist in the making of high-quality places and need to reflect the existing character of an area. Specific instances (e.g., Conservation Areas, in the vicinity of Listed Buildings, or other areas of the historic environment) will sometimes need specific materials not acceptable elsewhere. Further detail on the construction specifications for the various materials can be found in Appendix G - Construction Standards and Materials.

3.32 Landscape

Proposed Planting in New Developments

Space for new street planting can be integrated into layout and building designs, and, wherever possible, located on private land or buildings (generous balconies, roof gardens, walls) or public land/open space intended for adoption, including the road.

Planting adds value; it helps to soften the urban street-scene, creates visual and sensory interest, and improves the air quality and microclimate. It can also provide habitats for wildlife. The aromatic qualities or contrasting colours and textures of foliage are of value to all and can assist the navigation of those with visual impairment. Flowers and fruit trees add seasonal variety.

Planting can provide shade, shelter, privacy, spatial containment, and separation. It can also be used to create buffer or security zones, visual barriers, or landmarks or gateway features. Vegetation can be used to limit forward visibility to help reduce vehicle speeds.

Proposed landscaping within new developments will be required to be outwith the adoptable road boundary. The landscaping including SuDS, grass verges or service strips would be managed by a factor.

Trees proposed near roads should be located 5m from the edge of the carriageway (minimum) and species should be selected which tie into existing woodland matrix and should be suitable for the conditions affecting the site. The following information should be provided to the Local Authority:

- Site conditions.
- Aspect.
- Tolerances.
- Habit.
- Species.
- Watering requirements.
- On-going maintenance requirements.
- Native or non-native.
- Hardiness.

Swales and rain gardens should have appropriate species.

3.33 Structures

Technical Approval

Where design submission includes proposals for road structures (e.g., Bridges, retaining walls, culverts) the application will be subject to a formal Technical Approval procedure as outlined in Roads Authority guidance document CG 300 - Technical approval of road structures. "The submission of proposals for agreement by the technical approval authority and the subsequent provision and acceptance of certificates confirming that the design, assessment, specification or construction works complies with the agreed approval in principle (AIP) and design/assessment and specification certificates as appropriate." CG 300

North Ayrshire Council are the Technical Approval Authority (TAA) for all road structures. The designer must submit to the TAA an approval in principle document to record the agreed design basis and criteria, this should generally consist of completed AIP, a location plan, a general arrangement drawing, relevant parts of any geotechnical investigation report, documents relating to consultation and any other relevant information or reports.

The scope of CG 300 structures requiring technical approval are summarised below –

1. Bridge, buried structure, subway, underpass, culvert and any other structure over the road or supporting the road with a clear span or internal diameter greater than 0.9 m.
2. Overhead crossing carrying conveyor or utility service.
3. Movable inspection access gantry, gantry rail and gantry support system.
4. Earth retaining structure where the effective retained height, i.e. the level of fill at the back of the structure above ground level in front of the structure is greater than 1.5 m.
5. Reinforced/strengthened soil/fill structure, with hard facings where the effective retained height is greater than 1.5 m.
6. Reinforced/strengthened soil/fill which is an integral part of another road structure.
7. Portal and cantilever sign and/or signal gantry.
8. Minor structures listed below:
    - Cantilever mast for traffic signal and/or speed camera.
    - Lighting column.
    - High mast of more than 20 m in height, i.e., the vertical distance from top of post to bottom of flange plate, for lighting.
    - Mast for monitoring equipment. i.e., camera, radio and telecommunication transmission
    - Equipment.
    - Catenary lighting support system.
    - Noise barrier.
    - Traffic sign/signal posts of more than 7 m in height, i.e., the vertical distance from top of post to bottom of flange plate or top of foundation, whichever is the lesser.
    - Other 'mast type' structures identified by the TAA as requiring technical approval.
    - 'Fence type' structures, including environmental barriers, visual screens and fencing, identified by the TAA as requiring technical approval.
9. Proprietary manufactured structure or product.
10. Reinforced/strengthened soil/fill structure where hard facings are not provided and the face inclination exceeds 45 degrees, unless agreed with the Overseeing Organisation that structural TA in accordance with this document is not required.
11. Fitting of M&E apparatus and fixtures to existing structures, including tunnels, either permanent or temporary.
12. Design, selection and installation of cathodic protection systems for reinforced concrete structures.
13. Safety critical fixings.

It is highly recommended that early involvement with the NAC Structures team is established for all schemes involving technical approval.

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Appendix A – Development Assessment Form

Version 1: 2024

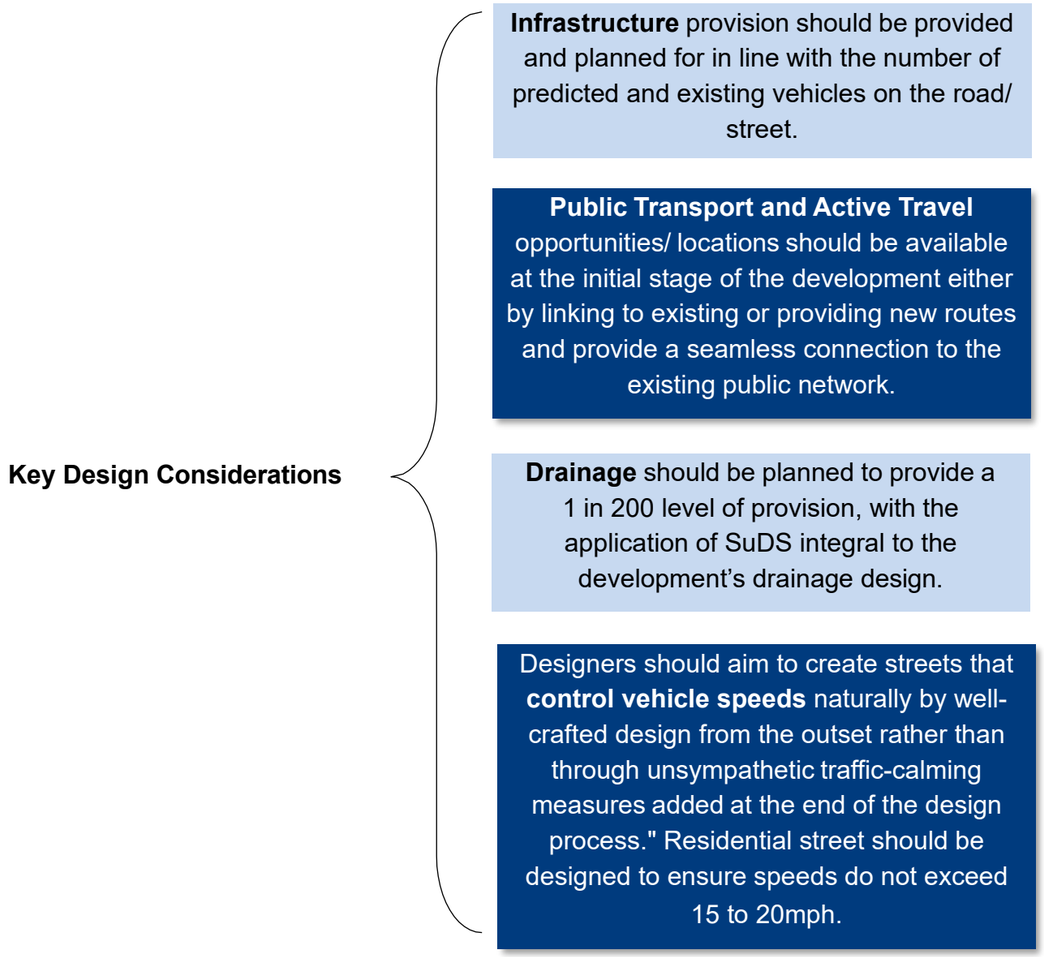
Version Control

Issue	Date	Nature of Change/Pages Affected
Version 1	xxxxxxx	Issue of Supplementary Street Development Guide

Contents

1.1 Notes

This Appendix provides developers with an overview of key points for a development that will be assessed by officers of North Ayrshire Active Travel and Transport. Reference should be made to the key sections listed to ensure that the development has been designed in accordance with this Street Development Guide.



1.2 Development Assessment Form

Development: ..... Assessed by: ..... Date: .....

No.	Item	*(Delete as required)*	Comments
1	<u>Street Hierarchy</u> Has the development a clear street hierarchy with different types of streets. This should be based on the volume of vehicles on each street. Advise developer to use Designing Streets “Street Technique”.	Acceptable Requires slight adjustment Cause for concern	
2	<u>Infrastructure</u> Are the street widths appropriate for the street types? Sightlines appropriate? Junction Spacing appropriate? Multiple connections to existing network for all modes (vehicle/ped/cycle)?	Acceptable Requires slight adjustment Cause for concern	
3	<u>Speeds</u> Are the streets designed to ensure speeds are below 20mph or 15mph in certain circumstances? Has horizontal deflection been utilised?	Acceptable Requires slight adjustment Cause for concern	
4	<u>Pedestrians and Cyclists</u> Has suitable pedestrian/cyclist provision been provided within site? Are the links/connections to the adjacent facilities acceptable? Protected pedestrian routes provided?	Acceptable Requires slight adjustment Cause for concern	
5	<u>Service and Emergency Vehicles</u> Can vehicles that would be expected to travel the street, travel okay? Tracking diagram if necessary. Consider potential for parked cars. Where might they park, and can the vehicle still pass?	Acceptable Requires slight adjustment Cause for concern	
6	<u>Public Utilities</u> Is there a continuous service strip to every property? One could be acceptable but should be positioned to reduce utilities individually crossing the road. Local deepening if located in carriageway. Is the service strip located out with the carriageway?	Acceptable Requires slight adjustment Cause for concern	
7	<u>Drainage</u> What drainage strategy is being provided? Is there space for SUDs feature? Suggest separate 1 in 30 features for everyday use and a separate 1 in 200 that could be used as open space. No manholes in narrow sections?	Acceptable Requires slight adjustment Cause for concern	

No.	Item	*(Delete as required)*	Comments
8	<u>Parking</u> Number of spaces per dwelling, garages of suitable size to be counted as a space, double width driveways where required, location close to door, visitor parking not grouped and spread evenly through site.	Acceptable Requires slight adjustment Cause for concern	
9	<u>Over-run</u> Are there areas of service strip/footway that could be potentially over-run by vehicles? What mitigation measures are proposed?	Acceptable Requires slight adjustment Cause for concern	
10	<u>Materials</u> Have the proposed street materials been identified at planning stage? Should be identified at this stage.	Acceptable Requires slight adjustment Cause for concern	
11	<u>Active Travel</u> Is there a proposed Active Travel strategy? Has cycle parking been provided in key nodal areas? Does the proposed Active Travel network connect to existing routes? What are the widths, gradients and crossfalls are the acceptable? Has suitable pedestrian/cyclist provision been provided within site? Are the links/connections to the adjacent facilities acceptable? Are protected pedestrian routes provided?	Acceptable Requires slight adjustment Cause for concern	

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Appendix B – Variations from National Roads Development Guide

Version 1: 2024

Version Control

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Version 1	xxxxxxx	Issue of Supplementary Street Development Guide

Contents

1.1 Variations from the National Roads Development Guide

Street designs should follow the design principles stated in North Ayrshire Supplementary Street Design Guide (SSDG) and the National Roads Development Guide (NRDG). In certain circumstances there are exceptions, as noted below. Where the documents vary the SSDG should be followed for developments in North Ayrshire.

Variations from the National Roads Development Guide		
NRDG Chapter	**Item**	**Description**
1.5.1	Road Types	This has been interpreted and expanded
2.1.1	RCC Process	For constructing new roads see Appendix C: Consenting and Adopting
2.1.4	Adoption Standards	For adopting new roads see Appendix C: Consenting and Adopting
2.3.1(a)	Phasing of developments	For phasing see Appendix C: Consenting and Adopting
2.4.2(a) & 2.4.13(b)	Submission of Plans for RCC	For submission of plans see Appendix C: Consenting and Adopting
2.4.4	Amendments to consents	For amendments see Appendix C: Consenting and Adopting
2.4.12 (a(3))	Notice of operations	For notice of operations see Appendix C: Consents and Adoption
2.4.13(c)	Road Lighting	For amendments see Appendix E: Street Lighting
2.4.15	Release of Road bond	For release of road bond see Appendix C: Consenting and Adopting
3.1.6 (j)	Surface Finish of Service Strip	Expanded maintenance responsibilities of service strips
3.4.4 (a)	Pavement Design	Expanded and tabularised requirements of footway construction and street construction – See Appendix G: Construction Standards and Materials
3.4.7 (a)	Materials/ Construction	Kerb heights adjusted
3.4.9 (e)	Footpath Drainage	Clarified requirements of drainage – See Appendix G: Construction Standards and Materials
3.4.11	Lighting Design	For amendments see Appendix E: Street Lighting Requirements
3.6.2 (b)	Layout of Parking Bays	Width of 90 degree square parking aisle altered – See Appendix I – Parking Standards
3.6.4 (e) & (f)	Garage Provision	Expanded the driveway and garage requirements – See Appendix I – Parking Standards
3.7	Parking Standards for Use Classes	Expanded the requirements for Class 9: Houses – See Appendix I – Parking Standards

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Appendix C – Consenting and Adopting

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Figures

1.1 Before Applying for Construction Consent

Notification of Owners

Where any person other than the developer owns land which fronts, abuts or is comprehended in the new road(s) or the extension of the existing roads for which Construction Consent is being sought, the developer will be required to declare that all such persons have been notified of the application for Construction Consent. A draft Notice for Service on Owner and Occupiers (Form CC3) is included for the convenience of applicants. A Form CC2 - Docquets of Service to be included in the application.

Owners Objections

Any person to whom the application has been intimated under the provisions of the preceding paragraph may, within twenty-eight days of the date of intimation, make written representation to the Local Roads Authority. Any such representations will be considered before Construction Consent is granted.

1.2 Applying for a Construction Consent

Design

All design must be undertaken in accordance with the Governments “Designing Streets” document, North Ayrshire Council Supplementary Street Design Guide (SSDG) and the National Roads Design Guidance (NRDG).

Responsibility for Design

The granting of Construction Consent does not imply that the Local Roads Authority accepts any responsibility for the accuracy or suitability of the design.

Planning Date of Application

An application for Construction Consent should be made on Form CC1. Completed application forms should be submitted at least three months prior to the intended commencement of construction to the Roads Authority’s Representative. An application will not be registered unless it contains all of the relevant documents/information detailed below.

Docqueting of Plans

It is essential that the plans, detailed drawings and specification submitted with the application are docqueted, ‘This is the plan/drawing/specification referred to in the application’, and signed and dated by the applicant or agent.

Documents to be submitted

The following must be submitted, where required, to enable a Construction Consent application to be registered. If this information is not included the application **will not** be registered or assessed in detail: -

1. The correct CC1 Form used and duly completed correctly.
2. The correct CC2 Form used and duly completed correctly (if required).
3. The correct CC3 Form used and duly completed correctly (if required).
4. The correct CC5 Form used and duly completed correctly (if required).
5. A location plan.
6. Layout plan(s).
7. Longitudinal section(s).
8. Typical cross sections.
9. All drawings docqueted, dated and signed.
10. A safety audit (where required).
11. A factual ground investigation report including interpretative report.
12. Street lighting drawings and design calculations.
13. Report from the Coal Authority/Mining Consultant.
14. Report from the British Geological Survey.
15. Structural design calculations (where required).

The following list details the required documents/information that must be submitted in support of an application for Construction Consent. Applications for Construction Consent should be accompanied by an electronic copy of detailed working drawings which should include the following:

1. **Correctly completed forms.**
    a. CC1 Application for Construction Consent to Construct or Extend a Road.
    b. CC2 Notification of Adjacent Properties (Docquets of Service (if required).
    c. CC3 Notice of Service (if required).
    d. CC5 Agreement to Take over Footpath(s) (if required)
    e. CC9 - Construction consent checklist; completed.
    f. Form DC1 - Structures design and check certificates. (if required).
    g. Form DC2 - Sustainable Urban Drainage System (SUDS) design and check certificates.
2. **A location plan**, showing proposed development on the Ordnance Survey base, to a scale of 1:1250 or 1:2500, showing the proposed road network and its relationship to existing development.
3. **Layout plan(s)** of the carriageways, footways, cycleways, verges, footpaths, cycle paths, retaining walls, bridges, drainage systems long section to show cut and fill to a scale of

1:500 (1:200 where pedestrian/ vehicle/cycle shared surfaces are proposed) showing:

a. The proposed centre, building and kerb lines (and also the back of the footway where this differs from the building line).
b. Curve radii of the road alignment and junctions.
c. Corner radii.
d. Horizontal curve size.
e. Dimensioned visibility splays at road junctions.
f. Vehicular access points to properties.
g. Driveway dimensions and number of bedroom within dwellings.
h. Pedestrian crossing points at junctions and locations where dropped kerbs will be provided. Indicated on kerb layout drawing.
i. Cycle crossing points with dropped kerbs where shared use facilities are proposed.
j. The location of all road gullies.
k. The location of the road drainage system and its discharge points.
l. The location of all underground services and ancillary apparatus.
m. The full extent of all excavated and infill.
n. The boundaries of any areas which it is intended will subsequently be offered for adoption for maintenance.
o. The layout and specification of all road markings, signs, street name plates and traffic signals.
p. Precise site limits.
q. Ground floor levels.
r. Driveway gradients.
s. Locations of speed reduction measures.
t. Adoption plan.
u. Setting out information.
v. Kerbing drawing.

4. **Street lighting** drawings and design calculations. Including the location and type of lighting columns and lanterns, wall-mounted lighting units. (If applicable) control pillars, underground cables and road crossing ducts.

5. **Longitudinal Sections** to a scale 1:500 Horizontal 1:100 Vertical.

6. **Surface Water Drainage Profiles** to a scale 1:500, Horizontal 1:100 Vertical.

7. A **Drainage Assessment** (DA) should be prepared in accordance with current SEPA best practice guidance. The discharge of stormwater from the development should comply with the stipulated design criteria, current SUDS for Roads design guidance and any requirements of Scottish Water.

8. The following information to be submitted in connection with the **SUDS design**.
   - SUDs Design and/or Drainage Design.
   - Overland flow diagram for before and after development.
   - A completed DC2 Form; SUDS and Drainage Self Certificate.
   - A completed self-certification for Flood Risk Assessment, Drainage Impact Assessment.

9. A **"Responsibility Schedule"** and plan for drainage infrastructure detailing Scottish Water, NAC and owner infrastructure for all drainage infrastructure. Refer to Appendix H – Drainage and SuDs for further information.

10. A **SUDs Management Plan** to be provided (Refer to Appendix H – Drainage and SuDs for further information) which will include.
    - A SUDs overview.
    - A "Management Statement" to describe the SUDS scheme and set out the management aims and responsibilities for the site.
    - A "Maintenance Schedule" describing what work is to be done and when it is to be done using frequency and performance requirements as appropriate.

11. A copy of letters from **SEPA and Scottish Water** confirming that your drainage proposals are acceptable. Including confirmation that Scottish Water will vest in the drainage infrastructure.

12. **Site investigation information**, including:
    a. A factual ground investigation report including interpretative report.
    b. Report from the Coal Authority / Mining Consultant.
    c. Report from the British Geological Survey.

13. General Arrangement Drawing of all **structures** showing the structural form, clear span(s) and other leading dimensions, headroom or clearance, materials, finishes and parapets with elevation, plan and typical cross sections to scales 1:50, 1:20, 1:10 as appropriate. If application contains structures (including retaining walls); a DC1 Form - Structural Design Certificate and, if being adopted, a Section 79(1) Agreement for any bridges or structures.

14. Vehicle **swept path** analysis.

15. **A Safety Audit** for the design (if required by North Ayrshire Council).

16. **Consultation Certificates** from appropriate statutory and/ or non-statutory consultees.

17. **Cycling Audit**.

18. **Disability Access Audit** (It will be acceptable for these documents to be submitted in an approved electronic format. The Local Roads Authorities Representative should be contacted to confirm details of acceptable electronic formats).

Construction Period

It will be a standard condition of any Construction Consent that the Construction will be completed within the period specified in the Consent. This period will not be less than **three years** and will be based on the Developer's proposed programme of works. If, as a result of a change in circumstances during construction, it is demonstrated that the specified period is no longer realistic, the Local Roads Authority may grant an extension. In normal circumstances, once homes are occupied, no more than one extension of time will be granted by the Local Roads Authority. If the full development is not completed within the specified period, including any extension, the Developer will be required to amend the Construction Consent to allow adoption of that part which is open to public use.

Alternatively, the roads will be completed by the Local Roads Authority using the Road Bond.

Right of Appeal

If an application for Construction Consent is (i) refused or (ii) granted subject to special conditions, the applicant may within 28 days of the date of intimation of such a decision appeal to the Scottish Ministers.

Hearing of Applicant

Should it be considered that the application for Construction Consent be refused or granted subject to special conditions, the applicant will be afforded an opportunity to be heard prior to such a decision being made.

Phasing

There are two options for phasing a development:

Option 1 – A separate construction consent is required for each phase. A road bond, if required, is then provided for each consent. Each consent could then be adopted separately provided construction traffic has an alternative route.

Option 2 – One consent is issued for the whole site and the developer provides a phasing plan. Each phase then requires an equivalent road bond as each phase starts. The bonds can be reduced for each phase as the development progresses. However, all the phases require to be complete before the site can enter the maintenance period. The developer will initially require a construction consent to be issued indicating a total road bond cost for the entire site. Due to the need to separate the road bond calculation into phases an amendment to the consent will be required for which there is a fee. The developer will require to submit a phasing plan. No work can commence on the next phase until a road bond, if required, is submitted for the phase.

1.3 Commencement of Construction

Prior to commencement of any works on the public road (including the footway) that relate to the development, the contractor must obtain the necessary permits to occupy and work on the public road, contractors must contact the council to book a time slot to undertake the necessary works.

Pre- construction dilapidation survey of existing network to be carried out prior to work commencing. The area for this is contained on CC4 form.

Road Bond

Where the development is for residential use, security in accordance with the current Security for Private Road Works (Scotland) Regulations must be lodged with the council prior to house building operations commencing. No security is required for industrial/ office/ retail development or for residential developments carried out by a recognised Housing Association. The Security for Private Road Works (Scotland) Regulations provide further information on the exemptions.

Where a developer is required to lodge a Road Bond or deposit, Form CC7 (obtainable at the Council offices or the North Ayrshire Council Web Site) should be completed by the Guarantor as part of the application for Construction Consent. The Road Bond must be lodged with the Local Roads Authority before any house building can commence. An A4 size drawing shall be provided showing the Construction Consent area applied for outlined in red. The area for which a bond is required for any section within the Consent area is to be outlined in blue. The Local Roads Authority's Representative shall determine the amount of bond, sufficient to meet the cost of completing the private road in accordance with the Construction Consent.

Inspection Fees

Attention is drawn to Section 140(6) of the Roads (Scotland) Act 1984 which entitles the Local Roads Authority to recover expenses reasonably incurred by them to ensure that the work carried out complies with the Construction Consent. The recovery of these costs will be from the person to whom the Construction Consent was granted. The Local Roads Authority gives notice of its intention to recover those expenses to which it is entitled under the Act.

Information Required Pre-Construction

The developer will be required to submit the following information prior to the commencement of construction:

1. A programme of works which includes the aspects of construction detailed in the general information sheet.
2. Construction vehicles routeing details.
3. Traffic Management Plans.
4. Method of Inspection Fee Payment.
5. Road Bond (where applicable).
6. Contractors Contact Form duly completed.
7. Temporary Traffic Signal Form (PLS-A form) if required.

1.4 During Construction

The new road must be constructed in accordance with the details provided by the Developer and the Full Road Construction Consent as approved and granted by the Council. Unforeseen conditions on- site may however require changes to these. If these are minor changes (e.g., to detail) they may be mutually agreed between the Developer and the Active Travel and Transport Manager but where the changes are of a larger scale (e.g. to layout) then an application for an Amendment to the Road Construction Consent must be made by the Developer. No works involved in such changes should be undertaken until the Active Travel and Transport Manager gives written confirmation.

Inspections

The inspection fee method chosen for the development will either be lump sum or actual costs. Should actual costs be the chosen option then both on-site inspections and subsequent in-house discussions relating to the construction works will be re-charged on a six-monthly basis. You will receive a copy of the on-site inspection record sheets. The following stipulations must be adhered to:

1. Council officers shall have access at all times in connection with the construction of roads covered by Road Construction Consent. The officers will be permitted to take samples and to measure the thickness or quantity of materials used or take any dimensions or levels in order to satisfy themselves that the design requirements and specifications adopted by the council from time to time are being, or have been, complied with.

2. In addition, the Developer must inform the appropriate council officers, giving a minimum of 2 working days' notice, of the following stages of work (It should also be noted that the developer will be charged in respect of the inspection of these works if actual costs are chosen).

Carriageways and Footways / Footpaths

1. Intention to commence work. This includes commencement on or adjacent to a Public Road.
2. Setting Out.
3. Commencement of excavation (inspection of sub-soil conditions).
4. Commencement of laying capping layer or sub-base.
5. Commencement of installing concrete log.
6. Commencement of kerbing.
7. Commencement of laying binder course to carriageway.
8. Commencement of laying surface course to carriageway.
9. Commencement of laying sub-base to footways/ footpaths.
10. Commencement of laying binder course to footways/ footpaths.
11. Commencement of laying surface course to footways/ footpaths.

Road Drainage

12. Breaking into existing pipe runs—before installation of saddle connection or inspection chambers.
13. Completion, bedding and haunching (but before concrete surrounding of haunching and completion of inspection chambers—before backfilling (tests where applicable)).
14. Completion of backfill (tests where applicable).

Road Traffic Signals, Road Lighting and Illuminated Traffic Signage

15. Intention to commence.
16. Determination of exact location of plant by Developer on Site (Street Lighting Officer to be in attendance).
17. Commencement of column and sign erection.
18. Commencement of cable laying.
19. Commencement of electrical work (N.B no connections allowed to existing council supplies except by Street Lighting Officer).
20. Commencement of electrical testing and commissioning of installation (actual connection dates must be noted).

Traffic Signs and Road Markings

21. Commencement of sign installation.
22. Verification of position of signs in accordance with the approved drawings.
23. Completion of all road markings.

Outstanding Works Defined by Council Officers After Formal Inspections

24. Completion of each item of outstanding works as a result of non-conforming works identified on the daily inspection sheets.

Structures

25. Intention to commence construction.

Reduction of Bond

A written application may be made for a reduction in Bond to the Local Roads Authority's Representative. Reductions should normally be at the following stages; however, all reasonable requests should be considered.

1. 50% (completion of the base course, the drainage and the kerb base in the carriageway).
2. 75% (completion of construction, including traffic signs, gully connections, manholes and carriageway lighting).
3. 90% (maintenance period (or the date of completion of any works necessary to rectify defects) of works complete.

The Road Bond will not necessarily be reduced by 50%, 75% or 90%. The Road Bond will be required to cover the value of outstanding works against current rates.

Amendments to Consent

Should the Developer, for any reason, wish to depart from the construction or layout details for which Construction Consent has been granted, they must first seek the approval of the Local Roads Authority Representative for the amendment – for which there is a charge. Major changes may require the submission of a new application for Construction Consent.

1.5 End of Construction

Following completion of a private road constructed in accordance with a Construction Consent an inspection will be undertaken by the Local Roads Authority's Representative to ensure that the road has been constructed to a standard acceptable for adoption.

The developer or contractor is required to contact North Ayrshire Council requesting an end of construction inspection. This will be carried out with representatives from the Council, contractor, and developer. On completion of the inspection the contractor/developer will be provided with a list of any outstanding remedial works related to the Road Construction Consent will be provided. Any defects will have to be made good to the satisfaction of the Local Roads Authority's Representative within an agreed timescale (6 weeks of the date of notification).

The developer contractor will be required to undertake the following maintenance works prior to the development proceeding the 'maintenance period'.

1. Carry out a speed survey (if required). If the speeds are not as per the design, remedial measures will be required to ensure design speed is met.
2. Carry out a drainage survey of all pipes that carry road drainage. Any issues to be rectified. CCTV survey to be submitted.
3. Clean all gullys and manholes.
4. Sweep the development streets.
5. Weed killing to all streets/footways/footpaths within the consent area
6. 'As built drawings' submitted as electronic versions in a suitable PDF format.
7. Submit Street lighting certificates and a SR21 lighting certificate issued.
8. Submit a 1:2500 scale drawing showing the roads, footways, cycle tracks, drainage systems and structures offered for adoption should be shown in colour, and the plans should clearly indicate the ownership of all areas so coloured.
9. Submit a SuDS maintenance responsibility schedule and plan.
10. Provide copies of correspondence from Scottish Water confirming that they will or have adopted all their respective apparatus.
11. Make a formal application to the council for its inclusion in the Local Roads Authority's list of public roads on **Form CC6**.

On completion of the remedials and submission of all the necessary information the development will be put on a one-year maintenance period. The formal one-year maintenance period will not commence until all remedials, and the maintenance works are completed to the satisfaction of the Local Roads Authority's Representative.

1.6 Adoption

One month prior to the completion of the years maintenance period an adoption inspection will be undertaken by the Local Roads Authority's Representative to ensure that the road has not deteriorated to a standard below that required for adoption. Any defects will have to be made good to the satisfaction of the Local Roads Authority's Representative.

The following maintenance works require to be carried out:

1. Sweep the developments streets.
2. Gully and manhole cleaning.
3. Weed killing.
4. If a Stage 3 Safety Audit has been requested the results of this audit shall be provided along with the application.

In addition, the Developer will be required to provide a copy of the site Health and Safety File. This should include details of construction techniques used and maintenance requirements for any features included in the development, such as structures, SuDs systems. Further guidance can be sought on this topic from Managing Health and Safety in Construction, Construction (Design and Management) Regulations 1994, approved Code of Practise and guidance published by the Health and Safety Executive and HSE Information Sheet, Construction Sheet No 44.

Following a satisfactory adoption inspection and completion of remedial works, recommendation will be made to the Local Roads Authority that the roads be added to the list of public roads, in terms of the Roads (Scotland) Act 1984, as appropriate. Subsequently, a written application may be made for the remaining security or Bond to be returned.

1.7 Construction to Adoption Process

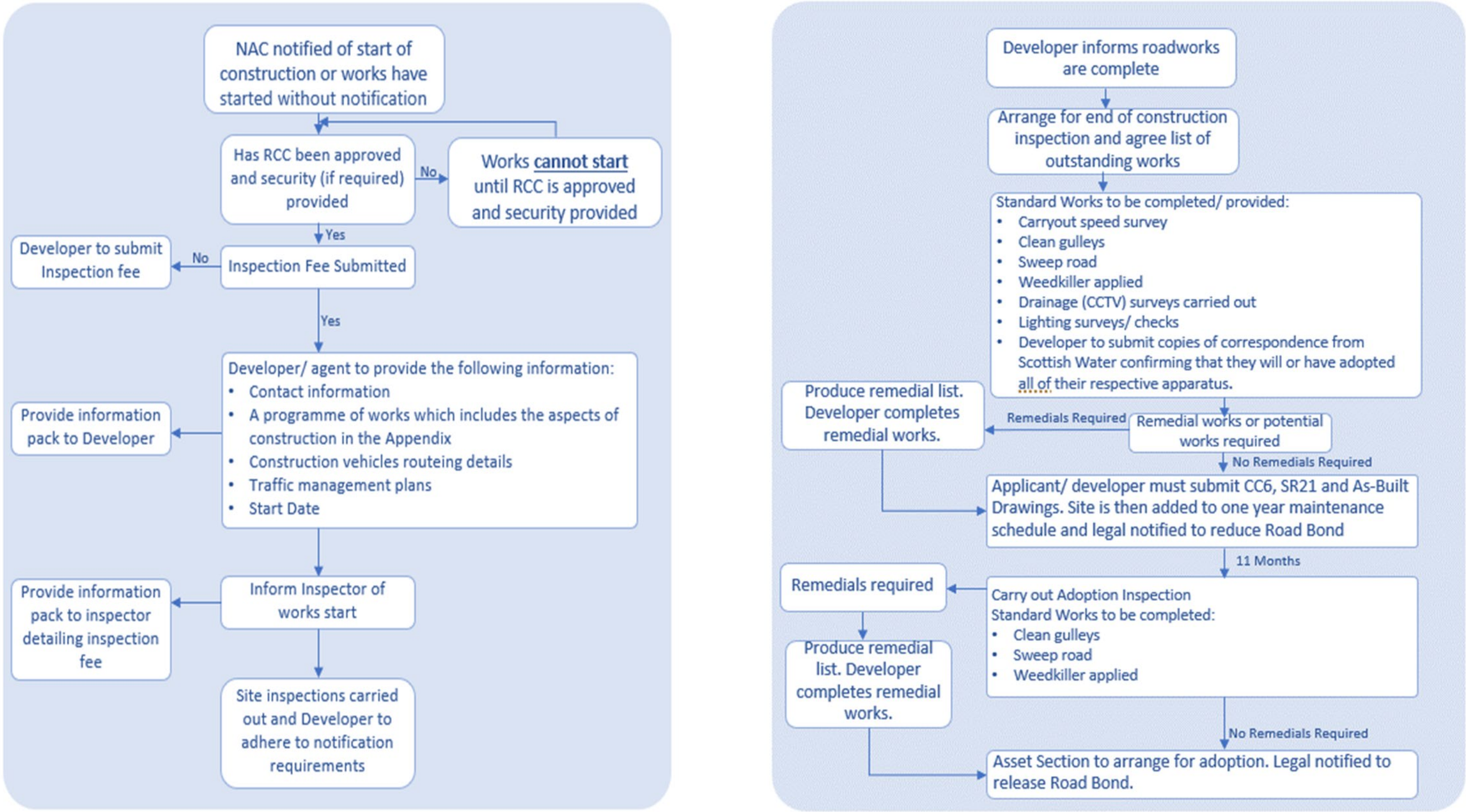

Figure 1 – Construction to Adoption Process Diagram

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North Ayrshire Supplementary Street Design Guide

Appendix D – Speed Reduction Measures

Version 1: 2024

Version Control

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Contents

Figures

1.1 Introduction

Streets and spaces need to meet people's needs for walking, cycling, playing and generally being outside - as well as moving around by car. In most areas traffic travelling at 30mph speed immediately outside homes is generally not safe or desirable and new developments are to be designed to 20mph maximum or less to prevent this.

The Scottish Government's 'Designing Streets' policy is clear that for residential streets, a maximum design speed of 20 mph should be an objective.

The Scottish Government's 'Designing Streets' policy stipulates that "designers should aim to create streets that control vehicle speeds naturally by well-crafted design from the outset rather than through unsympathetic speed reduction measures added at the end of the design process". Although not exhaustive, typical examples of speed restraint measures that may be incorporated into the design are set out in this Appendix.

Forward visibilities should not be so excessive as to encourage high vehicle speeds.

Why Reduce Development Speeds?

Prior to the introduction of Designing Streets most new developments were designed around vehicle access. Although not intended, the dimensions for turning heads, road widths and road junctions has "fixed" the plot sizes and density for residential development. The result is development of uniform character dominated by roads, where buildings are located in whatever shaped spaces are left behind after the streets and access roads have been designed. This vehicle access based starting point does not make or shape characterful external spaces.

Better, more sustainable development design controls traffic impact and speed by design. Well-designed new developments create streets which are "places" and where driver behaviour is controlled by the built form. Designers can design access routes through:

- Locating buildings first and designing traffic access to accommodate them; designers should refer to "Designing for Streets" which recommends "swept path analysis" - a method used to determine access widths and turning spaces for vehicles based upon first principles rather than standard templates.
- Using alternatives to standard adopted roads and footpaths such as "shared surfaces" where pedestrians and traffic share the same access routes.
- Providing drivers with "clues" as to the type of location they are in and thus allowing them to gauge an appropriate speed. For example, through the use of local road narrowing at entries to a new development, gateway features which clearly signal development type, changes in texture of the road surface when moving from one area to the next and a hierarchy of materials linked to different types of public realm.
- Considering street dimensions and geometry to control traffic speed; the use of the sharp bends, junctions, and road width can reduce traffic speed for example, within Type 4 Streets a change in direction is recommended every 30 metres.

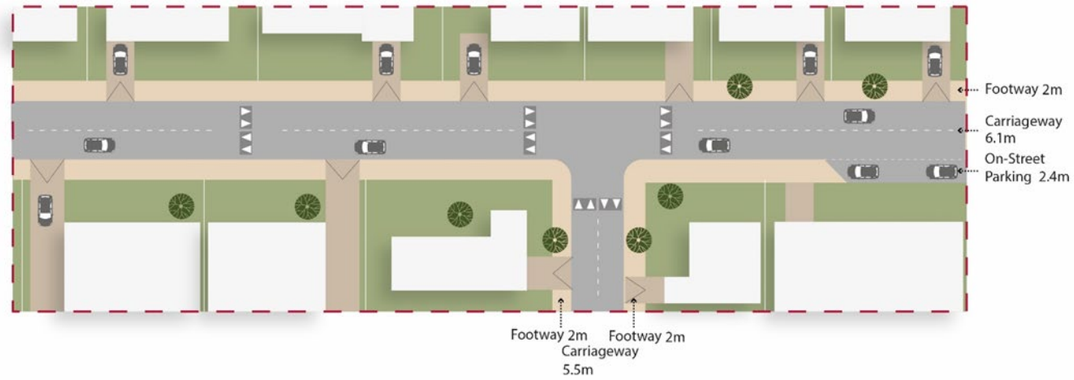


Figure 1 – Street Design – No Deflection

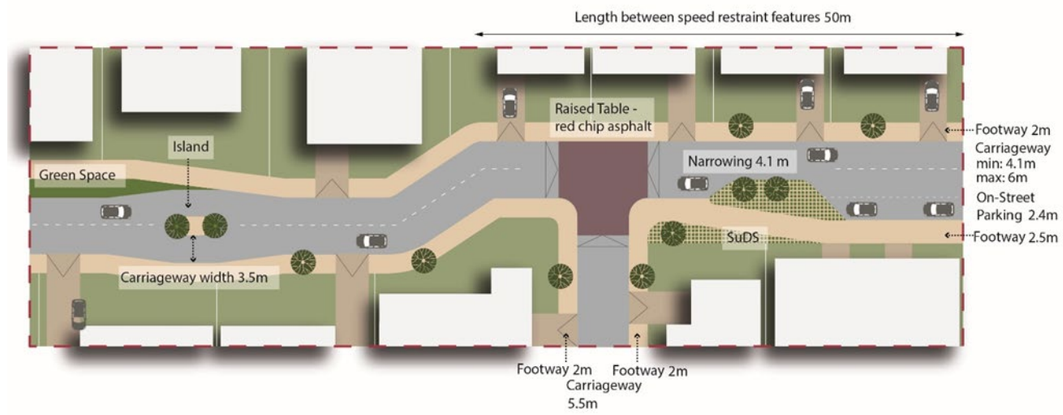


Figure 2 – Street Design – Clear Deflection

1.2 Speed Reduction – Design Considerations

Complementary features to streets can help to reduce speeds by giving emphasis to calming measures that are incorporated into the design. This can affect the behaviour of drivers, cyclists and pedestrians in the following ways:

- **Visual narrowing** - by making the road appear narrower and more enclosed by bringing planting, walls or tall objects close to the road,
- **Perception of speed** - by increasing a sense of speed by, for example, adjusting the spacing of avenue trees,
- **Emphasising changes in road function -** by changing the type of the landscape treatment, altering the perceived scale of spaces or changing materials or colours to underline a transition in the nature of the road,
- **Accentuating speed reduction measures-** by concentrating the deployment of complementary features at the speed reduction measures; and
- **Directing or segregating road users -** by directing pedestrians to crossing points, forming physical barriers where necessary or helping delineate footpaths, footways, cycle tracks and carriageways.

Figure 3 – Narrowing as Speed Reduction Measure (Visual Cue) in North Ayrshire

Three categories of complementary features can be identified as follows:

- **Vertical features** - such features would include bollards, pillars, walls, raised planters, rails and fences. Other types of street furniture such as road signs, lighting columns and pillar boxes can fulfil the same function while avoiding street clutter. Vertical features can be used to restrict unsafe vehicle manoeuvres, channel pedestrians to crossing points and prevent parking on the footway.
- **Planting** - trees, shrubs and ground cover can all be utilised as complementary features in speed reduction design. Trees can be effective in creating an obvious visual narrowing, located minimum 5m away from carriageway edge. Simplicity in design, using a limited number of species is recommended for any shrub and ground cover specification.
- **Change in surface** to paved material can heighten awareness of speed reduction measures. Within paved carriageways the colour of paving can be used to create the same contrasting effect. Textural contrast can also be achieved by changing the paving materials, e.g., from blocks to setts or in the laying of the paved materials (to be kept to a minimum). Different paving surfaces can be used to either highlight an appropriate route for vulnerable road users or alternatively to deter pedestrians from walking on a part of the footway.

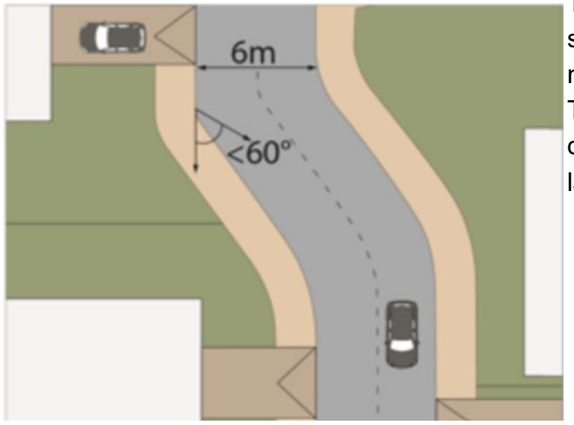
Psychology and perception – play a strong part in influencing driver behaviour. Street features and human activity can influence the speed at which people choose to drive. Features likely to be effective include:

- Edge markings that visually narrow the road – speed reduction is likely to be greatest where the edging is textured to appear unsuitable on which to drive.
- Reduced carriageway width.
- Physical features in the carriageway.
- Features associated with potential activity in, or close to, the carriageway, such as pedestrian refuges.
- On-street parking, particularly when the vehicles are parked in blocks on alternate sides of the street, either in echelon formation or perpendicular to the carriageway.
- The types of land use associated with greater numbers of people, for example shops, schools, and places of work.
- Landscaping.

1.3 Methods of Speed Reduction

To ensure that the design speeds identified for each type of street are not exceeded, it is necessary to design speed restraint measures into the development, which are self-enforcing and do not encourage uncontrolled parking. The speed of vehicles is the key factor in improving road safety and minimising future potential accidents. The list below is not exhaustive, and developers can make suggestions for speed reduction methods.

Lateral Shift

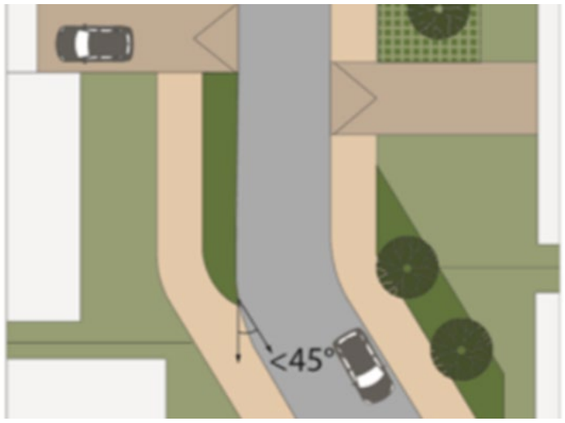


These should be tighter than the minimum specified for each street type, down to a minimum centreline bend radius of 7.5m. The deflection should be minimum 60 degrees with a mountable shoulder to enable larger vehicles to overrun.

Figure 4 – Lateral Shift Diagram

Bend

These should be tighter than the minimum specified for each street type, down to a minimum centreline bend radius of 7.5m. The deflection should be greater than 45 degrees with a mountable shoulder to enable larger vehicles to overrun.

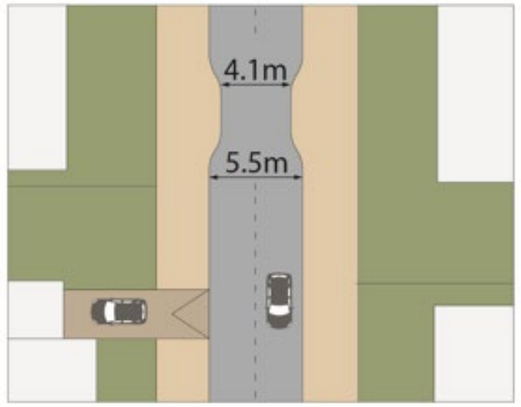


a. Deflection greater than 45°.
b. Centre-line bend radius less than minimum specified for road type.

Figure 5 – Street Bend Diagram

Narrowing

The narrowing of the carriageway to 4.1m (3.7m min) for at least 10m will cause drivers to wait for oncoming traffic to pass. A narrowing should be wide enough for service vehicles without requiring a mountable surface shoulder. This measure is less effective when vehicle flows are low and should be limited to Type 1 and 2 Streets.



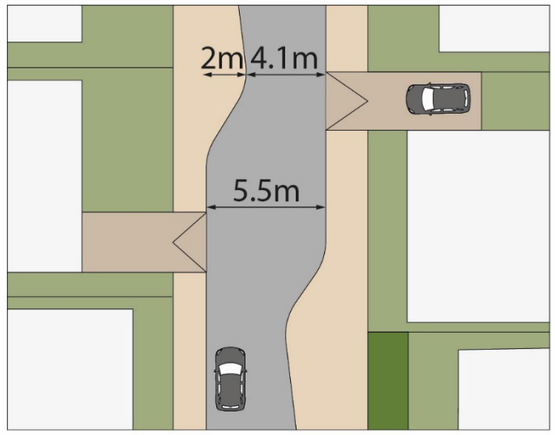
a. Minimum 10m long with 4.1 minimum width shown.

b. Over-run areas to be considered for larger vehicles.

Figure 6 – Street Narrowing Diagram

Chicane

To be effective, the lateral displacement of the running lane must be at least 2m and the length of the displacement no greater than 10m. A reduction of carriageway width to 2.75m at the entrance and exit of the chicane is acceptable, but an overrun area will be necessary to provide a 3.5m to 3.7m wide path for service vehicles.

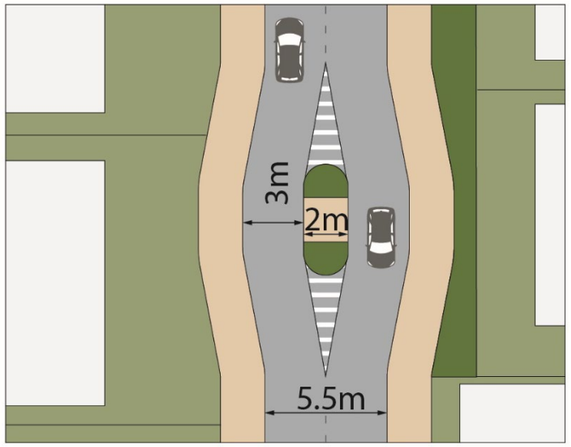


a. Red and white posts and verge markers or alternative vertical indicator, if required.
b. 5.5m maximum and 4.1m minimum carriageway width as shown
c. Normal road width
d. Maximum length of displacement 10m

Figure 7 – Street Chicane Diagram

Island

An island should result in a lateral displacement of the running lane of at least 3.25m. The island may be any shape, subject to the minimum dimensions given below. Mountable shoulders may be used to enable the passage of service vehicles, but no vehicle should be able to overrun the centre of the island. Mountable shoulders to be:

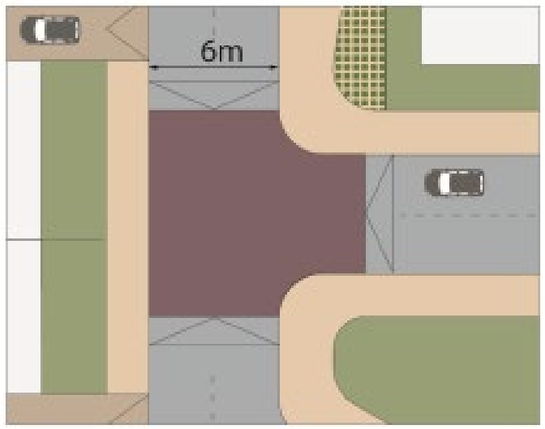


a. Low shrub planting could be incorporated to prevent over-run.
b. 7.1m radius.
c. 2m radius.
d. Upstand to prevent vehicle overrunning.
e. Normal road width shown.
f. Over-run areas to be considered for larger vehicles.

Figure 8 – Street Island Diagram

Raised Table

A raised table crossing should be installed where there is a high degree of pedestrian attraction and raised to provide a raised/ continuous footway. They should be clearly visible and installed at right angles to the direction of travel and suitable for any road width.



a. Low shrub planting could be incorporated to prevent over-run on pedestrian spaces.
b. Normal road width.
c. No upstand surface level with pedestrian footways.
d. Running surface can change materials as visual cue of road level change e.g., red chip with asphalt.
e. Requirement for bollards on the corner.
f. Ramps to respond to levels required.
g. Asphalt with red chip.

Figure 9 – Raised Table Diagram

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Appendix E – Street Lighting Requirements

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1.1 Introduction

The role of street lighting within the street scene is to provide the overall background level of lighting required to encourage a better, safe environment for all public road and footway users, to ensure people and vehicles can see and be seen. Using lighting, where considered appropriate, to contribute to road safety is a statutory responsibility of the Roads Authority. Where it considers it appropriate to do so, under the provisions of the Roads (Scotland) Act 1984, the Roads Authority lighting service may also direct that lighting be installed in locations which will not subsequently be presented for adoption and/or maintenance by the Local Authority.

Energy consumption and carbon reduction requirements are an increasing priority in the national agenda and the UK has set challenging targets for reductions. Any decision on lighting provision must therefore follow strict national guidance on lighting hierarchy, local environmental considerations, appropriate light levels, night-time use of the location and include the assessment of glare or other light pollution emanating from all such installations, but particularly with respect to off-road lighting effects on the public road network. Careful lighting design is required to comply with all of these, sometimes competing, elements and it is important that competent design & verification is undertaken both on installations and improvements carried out by the Council but also ensuring proposed lighting installations associated with development and regeneration works achieve compliance through Planning & Construction Consent approval processes.

The provision of a lighting service is generally taken for granted as a basic service that the Local Authority should provide to its citizens and there are several benefits of providing an effective street lighting service including:

- To reduce night-time accidents.
- To reduce personal injury accidents.
- Assist emergency services to identify locations and shorten response times.
- Reduce the fear of crime.
- Promote sustainable transport & active travel (public transport, cycling and walking).
- Facilitate social inclusion & reduce isolation by providing freedom to use streets after dark.
- Support a 24-hour leisure economy, promoting economic development.
- Provide safe access to educational facilities supporting lifelong learning.

Achieving these benefits is linked to and supports the Council's corporate objectives and priority outcomes relating to Road Safety, community safety, social inclusion, quality of life and sustainability to ensure:

- North Ayrshire is well-connected with effective infrastructure.
- North Ayrshire is a sustainable environment.
- North Ayrshire is a vibrant welcoming and attractive environment.
- An efficient Council that maximises resources and provides value for money.

1.2 Design Parameters

In all cases the proposed lighting design will be within the current BS Street Lighting Standards.

Lighting designs should be based on the current versions of:

- BS 5489-1 - Code of Practice for the Design of Road Lighting (Part 1: Lighting of Roads and Public Amenity Areas) and the associated current BS EN 13201 Standards.
- BS 7671 - Requirements for Electrical Installations. IET Wiring Regulations.
- BS EN 12899 - Fixed, Vertical Road Traffic Signs - Part 1: Fixed Signs.
- BS EN 12464 - Outdoor Lighting.
- BS EN 40-3 - Lighting Columns. Design and Verification – Verification by testing.
- PD 6547 - Guidance on the use of BS EN 40.
- HSG 38 Lighting at Work.
- HSE GS6 Avoiding danger from overhead lines.
- ENA Engineering Recommendation G12 Issue 4 + Amendment 2 (March 2021)

It is the responsibility of the developer to ensure that adequate site measurement of road lighting performance is carried out and reported, prior to the end of the 12 month maintenance period. This should be carried out as per Technical Report 28 (TR28) from the Institute of Lighting Professionals (ILP) and ILP GN 3/16. Failure to submit this information may result in NAC carrying out these measurements with associated costs recharged to the developer.

Additionally, any lighting issues arising during the maintenance period should be resolved by the developer and where necessary verified by design revision (e.g. complaints from residents regarding obtrusive light or glare).

Lighting Levels

Lighting levels are recommended by British Standards based on the nature & usage of an area. This includes consideration of urban and rural, residential and town centre high amenity and allows for understanding the difference between the two in terms of night-time traffic & footfall.

Recommendations are based on the identification of Environmental Zones for exterior lighting within development plans.

Type	Descriptor	Examples
E1	Intrinsically dark landscapes	Country Parks, areas of outstanding natural beauty.
E2	Low district brightness area	Rural, small villages or relatively dark urban locations.
E3	Medium district brightness area	Small town centres or urban locations.
E4	High district brightness areas	Town/city centres with high night-time activity.

These categories help determine the appropriate design level of light output, the limiting factors for light pollution or if lighting is required at all. Using the Scottish Government Urban/Rural Classification Guidance a lighting plan was developed that matched the appropriate lighting classes to areas in North Ayrshire and a lighting class matrix tailored to North Ayrshire was produced.

Table 1 – Lighting Matrix

Note – A minimum Uo of 0.25 is required where P classes are selected.

Lighting Matrix					
Location	**Area**	**Zone**	**Main User**	**Crime Risk**	**Design Class (White Light)**
Urban Major Town Centre (Irvine)	High Amenity	E3	Traffic, Pedestrians and Cyclists	High	P1
Urban Town Centre	High Amenity	E3	Traffic, Pedestrians and Cyclists	Moderate	P2
Urban Town Centre	Distributor Road	E3	Traffic and Cyclists	Low	M4
Urban Town Centre	Link & Access Road	E3	Traffic, Pedestrians and Cyclists	Moderate	P3
Urban Town Centre	Link & Access Road	E3	Traffic, Pedestrians and Cyclists	Low	P4
Rural Village Centre	High Amenity	E2	Traffic, Pedestrians and Cyclists	Moderate	P3
Rural Village Centre	High Amenity	E2	Traffic, Pedestrians and Cyclists	Low	P4
Rural Village	Distributor Road	E2	Traffic and Cyclists	Low	M5
Rural Village	Link & Access Road	E2	Traffic, Pedestrians and Cyclists	Moderate	P4
Rural Village	Link & Access Road	E2	Traffic, Pedestrians and Cyclists	Low	P5
Distributor	>40mph	E2	Traffic	Low	M4
Distributor	<40mph	E2	Traffic	Low	M5
Urban Towns	Industrial Areas	E3	Traffic	Moderate	P4
Rural Villages	Industrial Areas	E2	Traffic	Moderate	P5
Urban Town	Car Park	E3	Traffic and Pedestrians	N/A	10 Lux Uniformity 0.25
Rural Village	Car Park	E2	Traffic and Pedestrians	N/A	10 Lux Uniformity 0.25

General Requirements

The following is a submission checklist of items required by the Roads Lighting Authority, before the lighting element of any construction consent can be formally assessed:

1. Adoptable areas/surfaces drawing showing extents of area to be assessed.
2. Designer risk assessment as per BS 5489-1:2020 (Design Strategy and Road Classification)
3. Layout drawing clearly showing:
   - A satisfactory scaled general lighting layout as well as at junctions and bends.
   - Any contiguous lighting.
   - Legend outlining satisfactory materials with a sufficient level of information provided.
   - Sufficient electrical information and cabling arrangements.
   - Details of proximity to other electrical apparatus which may impact the safe operation of the lighting system (EV charging points for example).
4. A corresponding lighting calculation report showing:
   - Sufficient photometry information.
   - Design classification (as per designer risk assessment).
   - Vertical illuminance calculation report. Guidance on requirements can be found in section 1.5.
   - Separate conflict area design where applicable.

Additionally, it is the responsibility of the developer to take cognisance of any authorised signage (e.g. “Neighbourhood Watch”, “No Dog Fouling” signs etc) mounted on existing lighting columns. If these existing lighting columns are to be removed as part of the construction phase, the signage should be relocated on the nearest available adjacent lighting column and identified on the submitted consent design drawings, or NAC consulted where suitable appropriate adjacent alternative location is not clear.

Private Areas

There are many roads, footpaths, parking areas and service areas in North Ayrshire that are private and for which the Council has no direct responsibility. No new adoptable lighting will be provided on existing private roads and areas. All proposed new development under planning & construction consent review requires the developer to ensure that residents and owners engage private factoring to provide, manage & maintain any lighting that is considered appropriate under the terms of approval by the Authority. Evidence and details of factoring arrangements for lighting or other maintenance in communal or private locations within any proposed development will be provided by the Developer as part of the planning and consent process.

Designs in respect of private & communal areas, while subject to separate maintenance and operational arrangements, will be designed in accordance with the same criteria as adoptable lighting.

Design Competency

All lighting design for developments must be carried out by professional lighting & electrical design consultants who are able to show evidence of specific relevant design experience and qualifications. Lighting designers may work independently or as part of an overall design consultancy, however the developer should provide on request evidence of previous experience and competency for the lighting design consultant engaged.

This requirement ensures that any designer duties for health and safety under relevant lighting, electrical and construction legislation and regulations, should be satisfied by professional designers with competency for the function. Guidance on appropriate competency standards and qualifications can be found by referring to the Institution of Lighting Professionals website. Engaging competent designers will also help support a more streamlined construction consent approval process that encourages a ‘right first time’ approach, reducing costly delays and revisions for developers.

Alternatively, should developers wish, North Ayrshire Council can provide a quotation for design services for lighting. This will provide quality, expertise and highly skilled lighting technical and design services that can ensure designs are competent on a first-time basis and can facilitate and accelerate the design process and construction consent approval.

Urban

Under current legislation, the responsibility to provide street lighting within North Ayrshire is given to the Council as the statutory Local Roads Authority. Section 35, of the Roads (Scotland) Act 1984, (RSA 1984), sets out the powers and duties covered by this legislation. The act does not directly impose an obligation on the Council to provide street lighting. It does however require that the Council considers what lighting is appropriate in terms of road safety and accident reduction. Once street lighting has been provided, it is the Councils statutory duty to ensure that it remains functioning correctly and is inspected and maintained to a safe standard. Road types and night-time usage vary in nature according to location, traffic volume and access to amenities. Therefore, the level, type, design & maintenance requirements of lighting systems will also vary. Roads within speed-controlled areas, i.e. urban and residential areas, and their associated 30mph speed limits are established by the presence of a “system of lighting”, in accordance with the Road Traffic Regulation Act1984. De-restricted areas are not normally lit, however areas with special requirements, such as roundabout conflict areas or identified accident black spots may be considered on their individual merit for a site-specific solution. On principal and distributor roads, where traffic speed and flows tend to be higher, vehicles dominate, and public lighting systems are designed to reflect this purpose. On residential streets and footpaths, where the pedestrian and cyclist are more frequent, the lighting system is designed appropriately around the

combined needs of all users that may be brought into conflict. In high night-time amenity areas and town centres where traffic & footfall is high and subject to high incidences of interaction and potential crime, lighting design of associated roads, footpaths and pedestrianised areas will be of a higher illumination class to reflect this. The maintenance and management of the public road lighting network is undertaken by Roads –Engineering Services: Lighting Section.

Rural and Islands

An intrinsic element of the design process is consultation, particularly with respect to requests for new lighting. It is also recognised that many locations in North Ayrshire are unique in terms of their natural beauty and attractiveness and that residents might have strong feelings about the provision of lighting. The Council, however, as Roads Authority has a statutory duty and legal obligation to consider road safety and the mitigating impact of lighting provision of the correct type to reflect the local environment and night-time use. Where advised by the local authority during the planning process, the Developer, or their design consultants, will be responsible for consultation with adjacent property owners and users to inform the lighting design proposals. The Arran Lighting Policy is available for guidance specific to developments on Arran. In some circumstances NAC Road Lighting will direct the completion of a suitable design but limit installation to underground ducting for future provision only as detailed in the Arran Lighting Policy.

Conservation Areas

The Council has designated several locations as Conservation areas, and these will be lit in accordance with the design output criteria relevant to the environmental zone and area use. However, additional consideration will be given to the selection of specialist amenity or heritage styled materials, including the use of reduced colour temperatures, in these areas. Given the additional budgetary impact of specialist materials of this type and maintenance, as a rule these will be restricted to conservation areas.

Foot and Cycleways

Cycle routes shall be lit in accordance with the Institution of Lighting Professionals Technical Report No. 23 – Lighting of Cycle Tracks and shall respond to the Environmental Zone in which the route is located. The lighting of any cycle route should first be discussed with the Local Authorities Lighting Team.

Public lighting is part of the approach to a sustainable transport policy, helping to increase the use of the road and footpath network after dark.

The duties and responsibilities of specification, management and maintenance of cycle routes falls to Roads Services, either as the Roads Authority as in any other prospective public road or footway under the powers of the Roads (Scotland) Act 1984, or as maintaining service for non-public road asset network belonging to the Council, and as such responsibility for specification, adoption and future maintenance of any cycle path or lighting that the Roads Authority considers necessary, is as directed or designed by Roads Services.

As with any other public footway, there is no duty to provide lighting on any cycle route, however there is still a requirement to contribute to overall road safety and the Road lighting team will consider the appropriate provision of lighting subject to local circumstances.

Cycle routes which run adjacent to an unlit carriageway should not be lit as this can cause difficulties for drivers. Urban routes, particularly shared road routes, within speed-restricted zones will normally be considered for lighting. Off-carriageway tracks within otherwise lit built up areas, for example through parks or running tracks may not be well used after dark, even if lighting was provided. In these cases, determination of an appropriate cycle route should primarily identify suitable alternative routes utilising existing street lighting, while matching the desired line as closely as possible.

Where an off-carriageway track is being considered for lighting within an urban area, the factors that will be taken into account by the Roads Lighting service to determine suitability are based on guidance from Transport Scotland, the Department for Transport, Institution of Lighting Professionals and other national sources and include:

- Identification of possible existing alternative lit routes
- Responsibility and future adoptable status of the considered route-Environmental zone in terms of lighting design guidance (intrinsically dark, urbanised etc.)
- Existing night-time usage that shows evidence of high flows of non-motorised users
- Suitability for increased shared night-time use by cyclists, commuters, dog walkers, school children, other recreational users and for access to local amenities
- Linkage of urban access for higher volumes of commuting or access to centralised amenities
- Underground infrastructure provision for linkage to future development at a later stage-Availability of electricity supply
- Geographic considerations that may impact, e.g., presence of dense tree/vegetation likely to cause obstruction under the provisions of the Roads (Scotland) Act 1984.
- Scale of installation and impact of additional maintenance, particularly evidence of vandalism or anti-social behaviour-Impact of additional energy use and maintenance
- Effects of light pollution (inc. requiring evidence of consultation with local property owners if required
- Impact on wildlife-Impact on carbon reduction commitment

Though it is not expected that routes outside built up areas and used primarily by cyclists for recreation would normally be lit, consideration will be given where there are specific road safety concerns such as crossings, subject to the availability of suitable electrical supply sources.

In accordance with current practice a full lighting impact consultation will be conducted with local residents, prior to finalising a route Option Appraisal. This will be specifically focused on determining the possible impact of additional lighting to identify any risks to the introduction

of lighting in respect of high profile, sensitive concerns relating to light trespass, glare & other light pollution, increased carbon emissions and energy use.

Once the decision has been made, by the Roads Lighting Authority, that a route should be lit, the preferred option will be developed in accordance with relevant lighting design guidance H & S and electrical legislation.

Underpasses, Subways and Tunnels

The following guidance and standards shall be referred to when considering lighting of underpasses, subways, and tunnels; BS5489-1:2020

- BS5489-2:2016
- PLG09 – Ensuring Visibility Within Short Tunnels
- CIE 88-204

Where switching between daytime and night-time levels has been identified, the designer will consult with North Ayrshire Council at the earliest convenience to agree upon an appropriate regime and switching method.

Pedestrian Crossings

Pedestrian Crossings shall be illuminated to the requirements of:

- ILP Technical Report No. 12 - Lighting of Pedestrian Crossings.
- BS 5489-1:2020.
- BS EN 13201 Part 2.

Design of Illuminated Traffic Signs

All traffic signage should be designed in compliance with the current version of the “The Traffic Signs Regulations and General Directions” (TSRDG) document. The TSRDG document places many relaxations on the number of signs and the illumination of traffic signs, by the means of external or internal lighting. Designers should take this into full consideration when specifying traffic signs within their proposal to ensure that proposals are compliant and reduce environmental impact; impact on streetscape access & clutter; and energy management associated with unnecessary (illuminated AND non-illuminated) signage.

1.3 Location

Footway

Lighting should illuminate both the carriageway, the footway and junctions, including any speed reduction features, to enable road users to see potential obstacles and each other after dark. The lighting design should ensure that shadows are avoided in streets where pedestrians may be vulnerable. Adequate lighting helps reduce crime and the fear of crime and can encourage increased pedestrian activity. Consideration should be given to incorporating colour contrast bands on lighting columns and located at the back of the footway where possible.

Traffic Calming

Designers should pay special attention to the illumination of any proposed Traffic Calming measures. The Institute of Lighting Professionals’ “Technical Report 25 – Lighting for Traffic Calming Measures” document should be followed to ensure these features are illuminated adequately.

Verges

Lighting columns should be placed so that they do not impinge on available widths of footways in the interests of wheelchair users and people pushing prams or pose a hazard for blind or partially sighted people.

Service Strips

The width of a service strip will depend on the number and type of premises served. All domestic services (gas, electricity, lighting, water and telecoms) will normally be accommodated in a maximum 2 metres wide reservation, developers should discuss each development with Statutory Undertakers.

Lighting Obstructions

Under the provisions of the Roads (Scotland) Act 1984 the presence of dense tree/vegetation likely to cause obstruction should be considered and similarly with regards to the potential of the blocking of illumination on the roadway and footway. It is the designer’s responsibility to take cognisance of the landscape design e.g., placement of trees, walling etc. in relation to proposed lighting positions.

1.4 Self-Certification and Adoption

During the planning process, where it is determined by the Roads Authority that lighting should be provided, extended or improved, the developer submits lighting proposals, co-ordinated through Economic Regeneration, which are forwarded to Roads Lighting for review. Where the design is agreed to comply with the relevant lighting and electrical design requirements approval is granted, in writing.

Once approval is granted, the Road Lighting Authority reserves the right to review suitability of the design proposal to determine if it requires to be upgraded or redesigned at the developer’s expense in the following circumstances:

- If statutory legislative guidance, or NAC maintenance materials specification, is amended that affects the original proposals/approval.
- If the installation does not commence on site within 3 years of consent approval.
- If the development is not offered for adoption within 5 years of consent approval.

- At renewal of construction consent in all circumstances.

The developer may, at their own discretion, energise parts or whole of the network within their site prior to adoption and subject to compliance with all relevant safety, lighting and electrical legislation. The developer or their design consultant are responsible for the mitigation of any repairs, failures or complaints regarding light pollution arising from their design after energizing before final adoption by the Roads authority.

Lighting installations are not adopted, or part adopted, prior to the road being adopted and placed onto the public roads register. Lighting installations will be subject to the same monitoring, test, inspection and 12mth maintenance period in alignment with the adoptable road before being added to the Register of adopted roads and the Council's lighting asset inventory and maintenance regimes. 12mth maintenance period will begin upon satisfying a compliant final test and inspection on the lighting installation. All necessary access to site and equipment required to inspect prospectively adoptable plant will be provided by the developer, or their agents on-site, upon request by the Council's lighting inspectors.

Where a proposal requires alignment or integration with an existing lighting installation, for example a new junction arrangement, the Council will in certain circumstances, allow connection to the existing network utilising a Permit-to Work authorisation and the subsequent partial adoption of the lighting circuits involved, after a monitored test & inspection. The developer is responsible for all maintenance and cost of energy of their installation until the date of adoption and will require their own MPAN (Metering Point Administration Number) until the installation is formally added to the assets register and appropriate Council MPAN. The developer, or their agents, will provide written details on request of their selected DNO/IDNO and interim MPAN.

All necessary access to site and equipment required to inspect prospectively adoptable plant will be provided by the developer, or their agents on-site, upon request by the Council's lighting inspectors.

1.5 Specification

Lanterns

The proposed unit shall:

- Be compliant with all relevant EN standards and directives with a declaration of conformity to said standards and directives being available at the time of tender.
- Be constructed and tested in accordance with BS EN 60598-1.
- Have a canopy manufactured from Aluminium or other fully recyclable material.
- Finished in RAL7043 or similar approved to be confirmed at the time of order.
- Have an optical compartment sealed to IP66 in accordance with BS EN 60529 by a glass enclosure to ensure minimum lens degradation from long term environmental exposure.
- Have a Dali enabled LED driver compatible with the Philips City Touch CMS system.
- Be supplied with a factory fitted integral Philips City Touch OLC COM SR Node.
- Have a maximum body weight of no more than 10Kg.
- Be designed for Class 1 electrical protection in accordance with IEC 61140.
- Have all integral control gear / drivers mounted on a removable tray with plug and socket connections.
- Have all hinges, toggle catches, captive screws and nuts manufactured in stainless steel or other non-corrodible materials and a minimum of 2 stainless steel Allen fixing screws.
- Have tool-less access to serviceable parts with canopy held captive in open position.
- Have one-part sealing gaskets recessed to avoid damage during normal maintenance operations.
- Have an impact resistance of not less than IK08.
- Have a LED light source that can be replaced with the luminaire canopy in situ.
- Have a LED light source of 3000k for residential streets and 4000k for traffic routes, both must maintain chromaticity consistency of ≤ 5 SDCM throughout the guarantee period.
- Be approved for use under the Balancing and Settlement Code (BSC) Unmetered Supplies Arrangements and shall have all necessary UMSUG codes provided at the time of tender/ submission.
- Be supplied with a universal spigot to allow either 76mm post mount or 42mm side entry connection and without the need of additional accessories.
- Be guaranteed against failure for a period of 12 years (including all components & drivers)
- Incorporate a surge protection device rated to at no less than 10kV in common mode.
- Have a minimum CRI of 70 compliant with Ra8.
- Have a power factor of 0.9 or greater.
- Be fully compliant with the RoHS (2012) Regulations.
- Be fully compliant with the WEEE Regulations.
- Have a ULOR of equal to or less than 1%.
- Incorporate a surge protection device rated at no less than 10kV in common mode and 6kV in differential mode.

Figure 1 – Galvanised Finish Column Lighting with LED Lamps in Public Realm

Columns and Brackets

General Specification

The lighting column manufacturer shall be registered with and certified by either British Standards Institute Quality Assurance Services or Lloyds Register Quality Assurance Ltd for the manufacture, supply and verification of lighting columns under their Quality Assessment Schedule to BS 5750 part 2. An equivalent European Standard shall be acceptable.

Dimensions and Tolerances

Table 2 – Bracket Type C (Web Type with 5° Uplift)

Projection	Height	For use with
0.5m 0.6m	7.4M 9.4M	11.4M
0.5m 0.6m	7.4M 9.4M	11.4M

5,6m columns which have an integral bracket shall have a bracket projection 0.3 metres at a 15 degree angle. Bracket projections do not include the lantern spigot.

Materials and Welding Requirements

The columns, brackets and compartment doors shall meet the requirements of BS5649:/EN4O:, BD 26/99, and shall have a silicon content between approximately 0.12% and 0.3% or below 0.04%. The grade of steel used in the fabrication of the lighting column and brackets shall be hot rolled to BSEN10021 S355J2H.

Test certificates applicable to the grade of steel used shall be supplied on request.

Corrosion Protection for Steel Columns and Brackets

Columns shall be hot-dip galvanised as defined in BS 5649 Part 4, clause 4.1, the requirements of ISO 1459, ISO 1460 and ISO 1461 being applied.

The hot-dip galvanising shall be applied to areas A, B and C of the lighting column as defined in BS 5649 Part 4. In addition a coat of bitumen shall be applied to area B as defined in BS 5649 Part 4, clause 3 - excluding above ground level which shall be 100mm.

Lighting column brackets shall be galvanised as per the above requirements for columns, the hot-dip galvanising being applied to the interior and exterior surfaces of the column bracket. Foundation bolts and all steel fixings including doors, chains, locks and grub screws shall be approved stainless steel or be galvanised in accordance with the above.

Base Compartment and Cable Ways

The column base compartment and cable ways shall comply with the requirements of BS 5649 Part 5.The compartment door shall be protected against corrosion by hot-dip galvanising as specified above. A 3mm nominal diameter closed link stainless steel chain shall be fitted internally between the door and column (not to the backboard, earthing terminals or other removable points). The chain shall be sufficiently long to allow the door to rest freely on the ground with the column in its operational position.

The base compartment(s) shall be fitted with hardwood or other substantially non-hygroscopic material baseboards not less than 90mm wide and 15mm thick securely fixed internally to accommodate the fused cut out assemblies, control equipment, service cables etc.

See drawing sl/spec/cols 4 for dimensions of door and door access. The base compartment shall have a weatherproof access door fitted with a tamperproof and corrosion resistant lock.

The door arrangement shall be such that it can only be opened by releasing a single equilateral triangular headed (with 8mm diameter rounded corners) captive non-corrosive bolt fixing into a door locking bar. The lock face shall be circular in shape,

Doors shall be interchangeable for similar columns without adaptation. All column doors shall have rounded corners of 27mm minimum radius.

Interconnection of Column Shaft and Bracket

Bracket types must be interchangeable on lighting columns of 8m or 10m or 12m nominal height. Web shall be 6mm thick.

The diameter of all column shafts should be equal at the point of interconnection with brackets.

The assembly of lighting column shaft and bracket shall incorporate a mechanical locking system in addition to high tensile socket headed set screws.

The mechanical locking system on the column shaft shall comprise of four 16mm by 25mm deep slots 90 degrees apart located at the top of the column to allow the bracket to be

General

- Door keys shall be provided on the basis of 1 per 10 columns.
- Welded watersheds shall be provided above the column door openings.
- Have an external identification number painted in black on a white background. The numbers shall be 75mm high
- Locking Mechanism shall be greased before dispatch.
- Columns shall have door openings arranged so that when the column is in the erected position an operative facing the door opening will also normally be facing oncoming traffic.
- The cable way shall be located at the front of the column and situated directly beneath the door
- All columns and brackets shall carry a unique identification mark which indicates the name of the manufacturer, year of production, and other information, to enable details of the column and bracket to be determined by a unique design code reference number relating to the appropriate Column and Bracket Data sheet.

The unique reference number shall not be used for any other design of column or bracket.

The column identification mark shall be permanent, legible, clearly visible and be:

- On a permanent fixed label.
- Hard stamped.
- Formed in the material of the column on an external face only.

It shall be located either within the base compartment or, except in the case of hard stamping, immediately above or below the door. It shall not be located on the door.

The bracket identification mark shall be in the form of detachable label supplied fixed to the bracket. This label shall be moved from its temporary position and fixed on erection to a suitably provided hole next to the label on the column. Cable ties are not an acceptable means of attaching identification labels.

- Each column shaft shall have a base compartment large enough to offer easy access to the control equipment. A weatherproof door giving protection to IP42 BS EN 60529 shall be provided for each opening and shall be interchangeable between columns of the same mounting height.
- There shall be no sharp edges within the columns or bracket arms which could cause damage to electrical cables either during installation or whilst in service. An anti-chafe ring shall be welded where cables change direction from the horizontal to vertical within the bracket arm.
- Columns and brackets shall carry a unique identification mark which indicates the name of the manufacturer, the year of production and other design information to enable details of.

Column Planting Depth

Column foundations used in the design were in accordance with Chapter 8 of the Department of Transport standard BD26/92. 8.5.14.10 DESIGN LOADS: The required design loads need to be assessed by the supplier, based on luminaire size and a winding loading factor of K3 , but a length of 150mm positioned above the cable entry. the external dimensions should be adhered to unless a variation has been agreed in writing between the Supervising Officer and Contractor.

Verification of Structure by Testing

The structure of lighting columns shall also be verified by testing by the manufacturer and a third party approved by the Council.

Guarantee

All lighting columns and brackets shall be manufactured from steel which meets the requirements of BSEN40. Columns should be of tubular steel design and shall be manufactured from specified grade of steel to give a minimum design life of 25 years.

Mid-Hinged Raise and Lower Columns

- Columns shall be as galvanized tubular steel columns above with the following exceptions
- Column shall be suitable for operation without a specialist tool.
- Columns must have a discrete internal locking mechanism which has the capability of being internally locked
- Columns to be hinged using a stainless-steel hinge and pin with a suitable with no maintenance dry lubricated bush.
- Column shaft to be profiled to ensure the overlap section of the shaft fits neatly in position ensuring the circular section of tubular steel design and shall be manufactured from specified grade of steel to give a minimum design life of 25 years. is maintained. The gap between where both shaft profiles meet shall not exceed 3mm, to reduce ability for digital ingress and injury.
- Column should be supplied prewired within suitable flexible conduit provided.
- Columns shall be the mid hinged counter balanced type designed such that the fitted lantern provides the counterbalance.

Electrical Supply

Feeder Pillars

- Be manufactured in 3mm thick sheet steel hot dipped galvanised after construction or 2.5mm thick stainless steel, minimum grade 3CR12 or similar throughout, including door and back panels, have degrees of protection IP54 reducing to IP 42 where single ventilator is fitted. It shall comprise two sections, a cabinet (above ground level) of dimensions no greater than 1010mm high x 606mm wide x 288mm deep and a root (below ground level) bolted together or it may be plinth mounted bolted to a concrete foundation. Object impacts at 20 joule. IK10 must be achieved as per EN50102.

- Have a colour finish to (RAL7031 – blue grey or RAL7000) which has been applied by the manufacturer immediately after production.
- Be of adequate size to house lighting distribution units panel(s), incoming and outgoing cables, Electricity Supply Authority service cables and apparatus.
- Have a baseboard (890mm x 525mm) manufactured from substantially non hygroscopic material to mount electrical equipment. A clearly marked position shall be indicated for the Supply Authority Cable Head. This position will not encroach upon the position for the siting of the Distribution panel.
- House such suitable electrical equipment as is described in the specification. 107 Volume 2 Numbered Appendices 3G Roads Minor Works Rev 1 October 2018 Framework Contract (PS/18/04).
- House distribution panels as specified in Appendix 0/2.
- Have a main earth terminal comprising a brass screwed stud M8 x 30mm long complete with 2 No. brass hexagon nuts and plain brass washers at a readily accessible position within the cabinet section of the pillar.
- Have an external identification number painted in black on a white background. The numbers shall be 75mm high.
- Labelling shall be provided to enable ready identification of all protective, switching and isolating devices and all outgoing circuit terminals, with warning notices regarding isolation, and the presence of voltage, appropriately positioned.
- A suitable anti-condensation heater shall be provided within the unit. The rating of this unit will not be greater than 15W. Resistors used as heaters will not be accepted
- Will be provided with sets of all keys and tools required for access supplied by the Contractor
- Lighting circuits shall operate as group control.
- The double pole switch isolator and contactor, shall be suitable for use in switching discharge lighting loads up to 63A.
- Contactors shall be silent in operation and shall be of the electromagnetically operated electrically maintained type with arc control devices and neutral link. The contactor shall be rated with an AC 3 utilisation Category and also have readily replaceable contacts. Auxiliary coil circuits shall be separately fused and suitable for operation at 230V 50Hz.
- Internal wiring between the Scottish Power cut-out, the contactor and outgoing fuses shall be single core PVC insulated the PVC sheathed 300/500 volt grade at least 16mm² unless otherwise specified, and comply with BS 6004:2012.

Mini Feeder Pillar

- The pillar shall be manufactured in two sections, a cabinet (above ground) c/w a root (300mm below ground level) and single door. The pillar shall be constructed of 3mm sheet steel (hot dip galvanised to BS EN 1461).
- The pillar shall be manufactured to prevent ingress of dust and water sprayed from all directions. Minimum rating of IP54 as per EN6059 MUST be achieved. It must also be able to withstand an impact of an object weighing 5kg on a flat surface no greater than 40cm across. Object impacts at 20 joule. IK10 must be achieved as per EN50102 · A distribution cut out shall be fixed to a hardwood backboard no less than 18mm thick and coated with water repellent (minimum size- 585mm high x 155mm width). Unit to be mounted at least 65mm from the top of the backboard. Outline position to be marked (using permanent marker) centrally at the bottom of the backboard for the main Electricity Supply Authority service cut out.
- The paint finish will be in accordance with BS4800 and painted Aircraft Grey (BS693 RAL693) which is a power coated application.
- The pillar MUST have M8 x 32mm long earth bonding studs fitted and located with ease of installation in mind, on both the door and pillar housing. The earth terminal shall be brass and supplied with one full nut, two half nuts and two washers (all brass)
- All electrical bonding and labelling must be completed to the current edition of BS7671
- Earthing
- The location of earth electrodes is described in Appendix 14/2 and shown on the Construction drawings.
- Details of the earth electrodes are shown on Drawing Number SL/SPEC/27/A.
- The earthing of the installation shall comply with the current edition of BS 7671 and ENA ER G12.
- The Contractor shall ensure that throughout the installation all metallic parts other than the current carrying conductors are bonded to form a continuous path by way of the armouring to the Distribution Network Operator earth connection.
- An earth electrode is required at the last or penultimate lighting column on each separate cable run where there are more than three lighting columns.
- The earth continuity conductor between the cut-out and earth rod shall be a copper conductor of at least 16mm2 tri-rated PVC insulated or sheathed coloured green and yellow.
- Traffic Signs
- Sign Lanterns.
- The luminaire shall have an LED light source with sufficient output to provide illumination to the required levels.
- The luminaire shall have electronic control gear.
- The luminaire shall have flat glass.
- The luminaire shall have a facility for fixing miniature Photo Electric Cells as required.
- The luminaire shall have a maximum wattage of 6 watts.
- External sign lanterns shall comply with the current edition of BS EN 12899-1:2007.
- The lantern shall have an IP65 rating as per BS EN 60529:1992+A2:2013.
- Lanterns shall be suitable for mounting either by bracket on 76-114mm dia. column shaft and 76mm post top mounting.
- The body shall be constructed of die cast aluminium, with the lantern and bracket being of ridged one-piece construction to provide for no rotational displacement in service.
- All circuit components should be on a plugged tray which can be removed without disturbing the supply cabling.

- Provision for fixing miniature Photo Electric Cells will be available as required.

Illuminated Bollard – LED Type

- Bollard base lights shall be suitable for positioning in the ground with cable termination box and light source being below ground level.
- The whole unit shall have a minimum ingress protection of IP67 as specified in the current edition of BS EN 60529. All gaskets shall be one part recessed to avoid damage in service. All bolts for the fixing of the bollard shall not penetrate the box internally.
- The bollard shell is to be fitted over the bollard base light unit and secured by using bolts.
- The unit shall be constructed in die cast aluminium. The hinge and lock should be of stainless-steel moving parts.
- The unit shall be fitted with two lead in glands approximately 50mm in length suitable for 6mm2 3 core armour cable. A heat-shrink seal must be fitted between the bollard and the outer cable sheath.
- The unit shall have a LED light source with a maximum running wattage of 18 watts.
- The circuit components shall be on a plugged removable gear tray which can be easily removed without disturbing the supply cabling.
- The light unit lens shall be made from 5mm polycarbonate which can be easily replaceable.
- The unit shall be suitable for accepting a Type 2, cut-out.
- Bollard tops shall be manufactured in a one piece moulding from tough UV stabilised flexible polymer with integral graphics.
- Bollard tops to suit 270mm dia and 600mm dia sign face as required with the graphics outlined in black for improved definition.
- Bollard tops shall be finished in anti-grime finish.
- The photometric performance of the bollard shall, when illuminated from below, provide the illumination levels with uniformity required by BS 8442:2015.
- The light unit lens shall be made from 5mm polycarbonate

Artificial Light Nuisance

Local authorities in Scotland are obliged under the Public Health etc. (Scotland) Act 2008 to consider and mitigate within reason any instance where artificial lighting may constitute a nuisance. The Act considers all fixed light installations and stationary objects (other than lighthouses and certain defence and military premises), including street lighting installations.

While the Act does not define what constitutes as a nuisance, responsibility is placed on the local authority to investigate and consider whether or not any artificial lighting installations adversely impact a person's reasonable use or enjoyment of their property.

In an effort to ensure consistency and align with North Ayrshire Council design specification aswell as current design standards, the following guidance has been developed for use on any adoptable street lighting installations within North Ayrshire.

Table 3 - Maximum values of vertical illumination on single story properties

Environmental Zone	E0	E1	E2	E3	E4
Illuminance on the vertical plane (Ev, Lux)	0lx	1lx	1lx	2lx	5lx

Table 4 - Maximum values of vertical illumination on multiple story properties.

Environmental Zone		E0	E1	E2	E3	E4
Height (m)	Illuminance on the vertical plane (Ev, Lux)	0lx	1lx	1lx	2lx	5lx
3m+		0lx	1lx	1lx	2lx	5lx
0m-3m		0lx	1lx	1.5lx	3lx	7.5lx

NOTE – North Ayrshire Council does not operate a curfew and any external guidance and standards should be based on post curfew values only unless explicitly specified by North Ayrshire Council.

Louvres and Shields

Where louvres or shields are proposed, it will be expected that manufacturers photometry is used which takes such attachments into consideration. Standard photometry will not be accepted. Only integral louvres and shields will be considered.

Vertical Grid Specification

Vertical grids shall meet the following design specification;

- Grid spacing - ≤0.60m
- Width - based on property frontage.
- Height - 3m
- Quantity - 1 per story
- Location – to be agreed with North Ayrshire Council and considered to be the property likely to be most impacted by artificial lighting within the development.

The below (Figure 4) can be seen to demonstrate the above grid specifications.

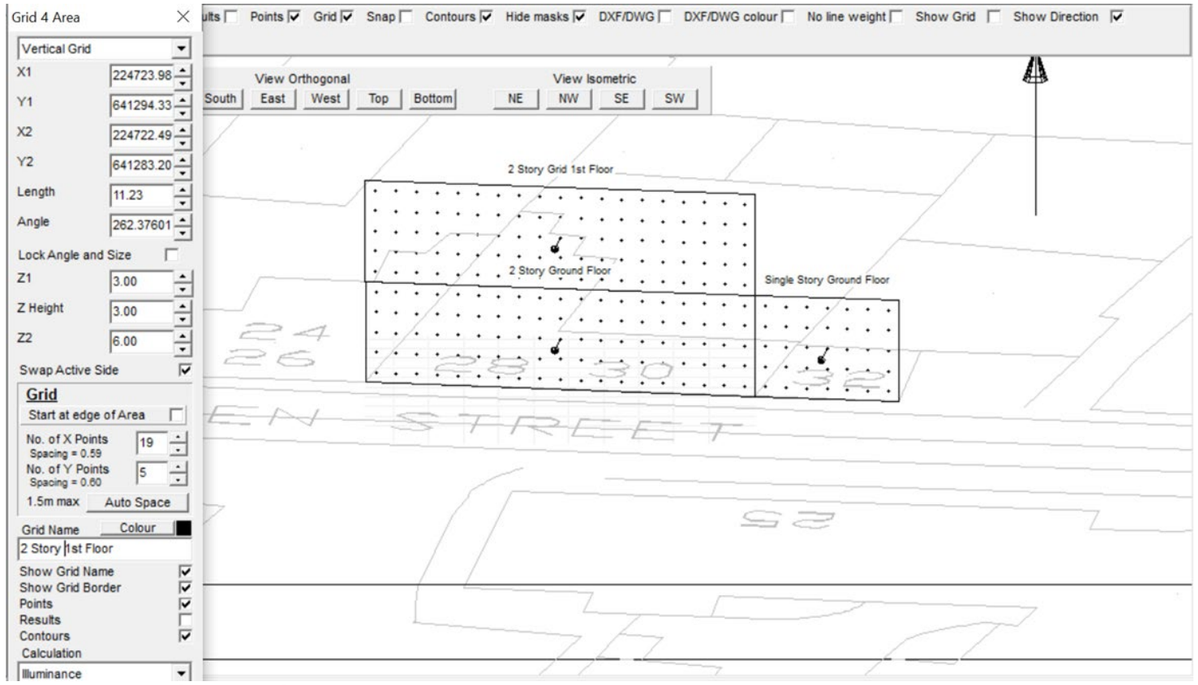


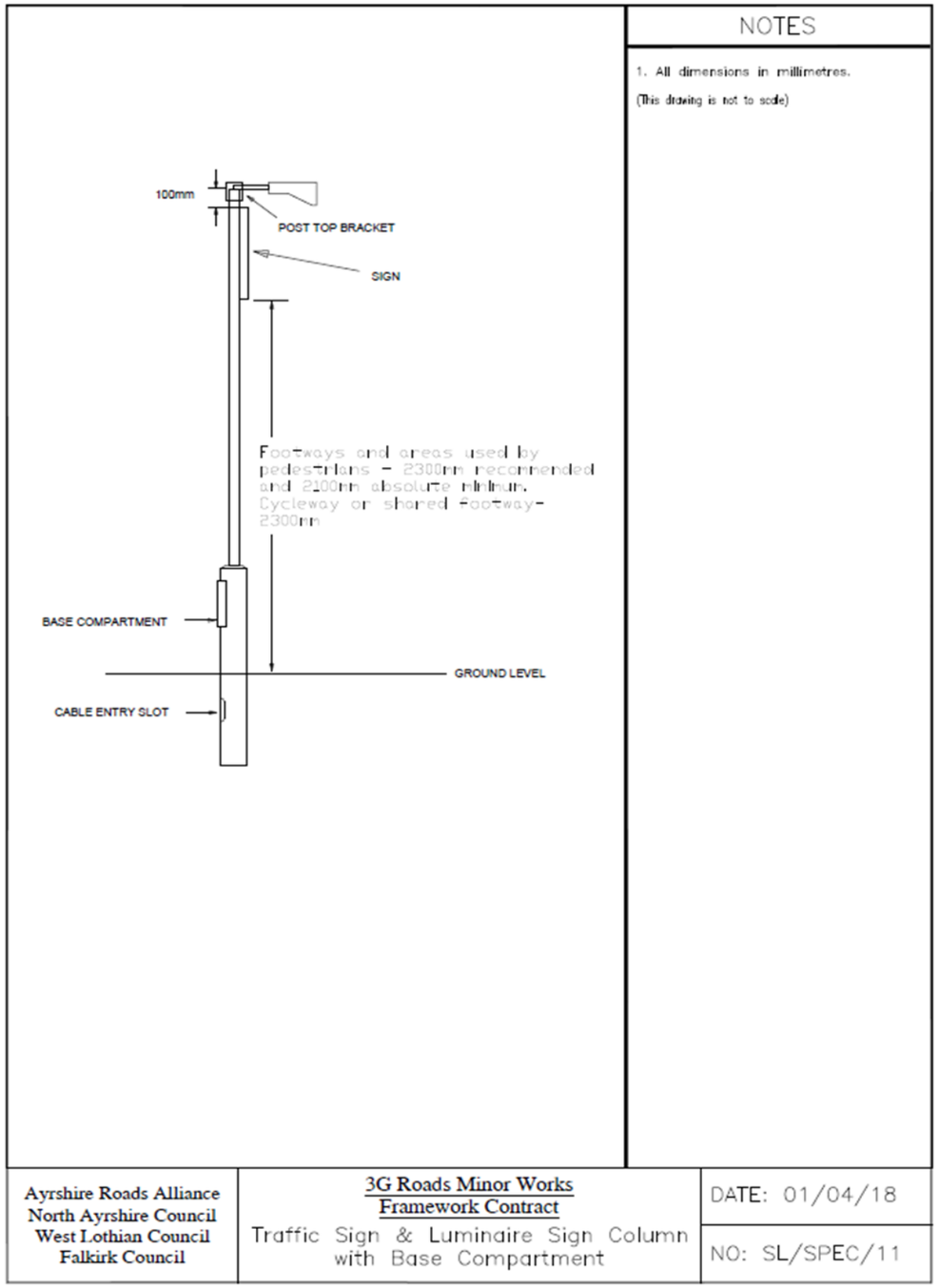
Figure 2 - Grid specification example

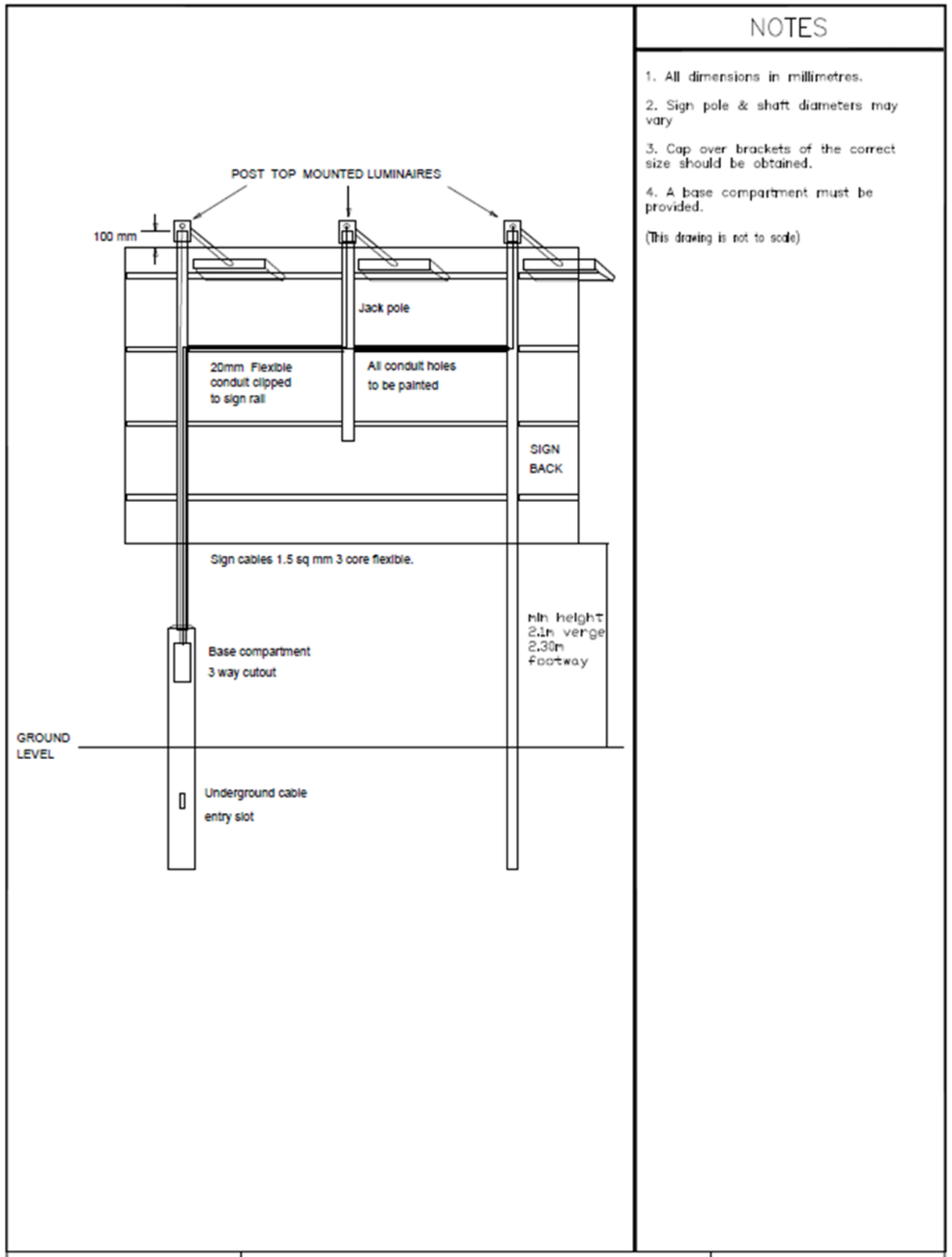
Failure to meet specification

It is inevitable, given individual circumstances, that there will be instances where the aforementioned criteria cannot be met. Where such instances arise, the designer will be required to provide the following detail for review on a case by case basis by North Ayrshire Council:

- Failed designs to demonstrate other manufacturers and/or models have been considered and are also unable to meet specification.
- Risk Assessments to consider artificial light nuisance.
- Design files to demonstrate that alternative location cannot be considered.

Drawings



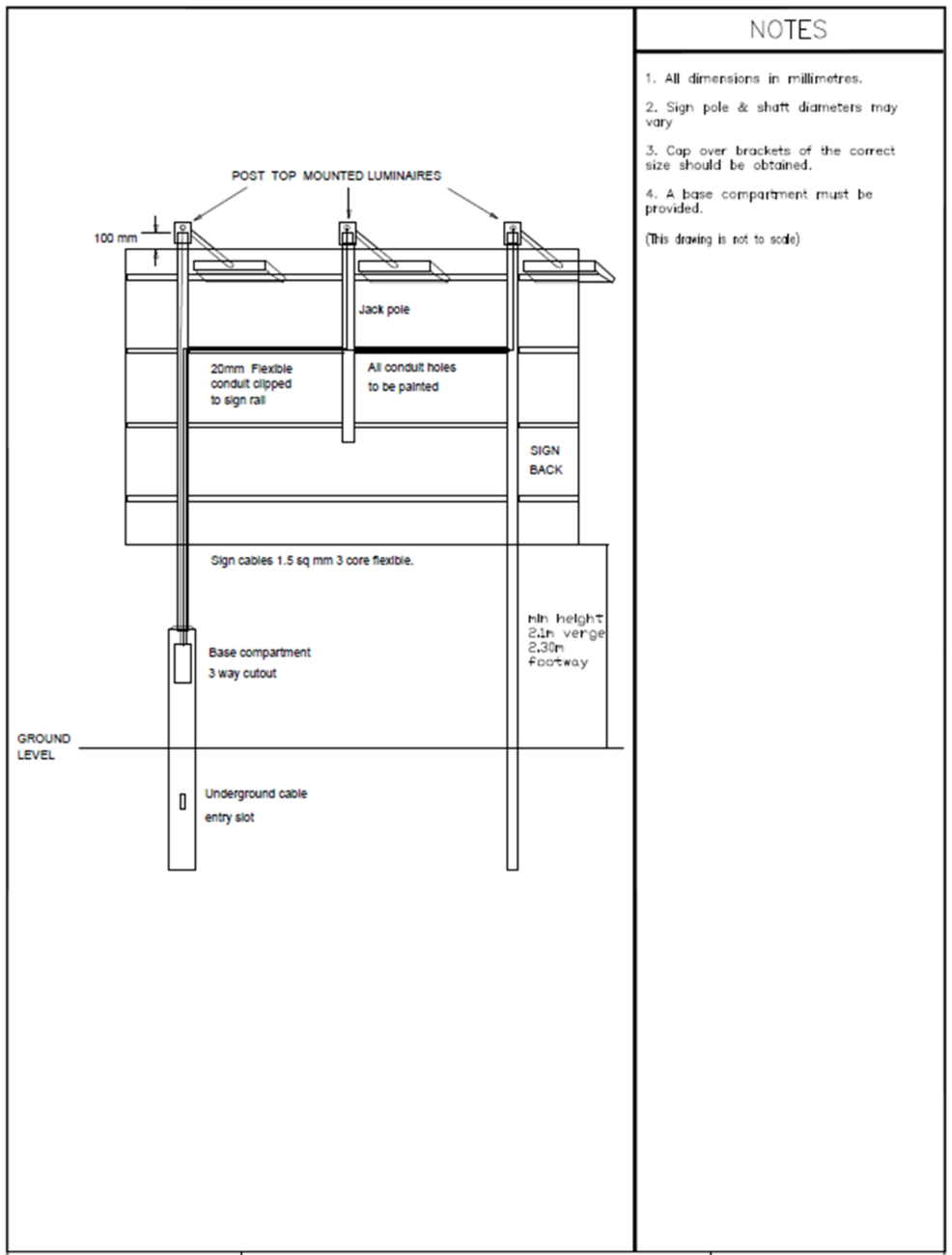


NOTES

1. All dimensions in millimetres.
2. Sign pole & shaft diameters may vary
3. Cap over brackets of the correct size should be obtained.
4. A base compartment must be provided.

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Traffic Sign & Lighting Multiple Luminaire Arrangement	DATE: 01/04/18 NO: SL/SPEC/12

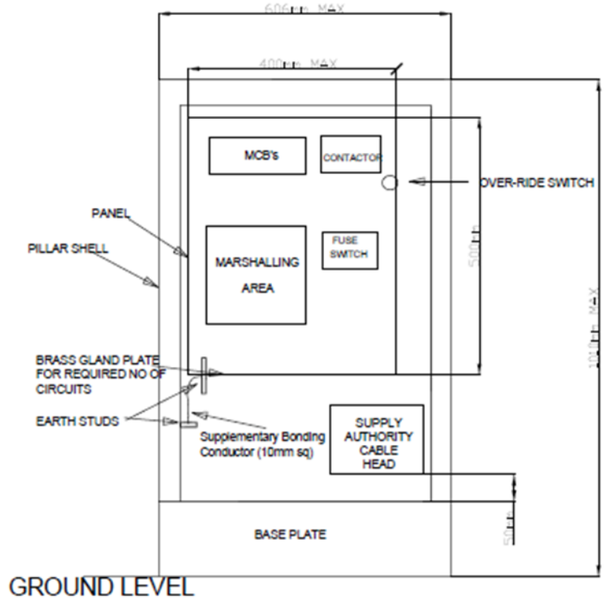


NOTES

1. All dimensions in millimetres.
2. Sign pole & shaft diameters may vary
3. Cap over brackets of the correct size should be obtained.
4. A base compartment must be provided.

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Traffic Sign & Lighting Multiple Luminaire Arrangement	DATE: 01/04/18 NO: SL/SPEC/12

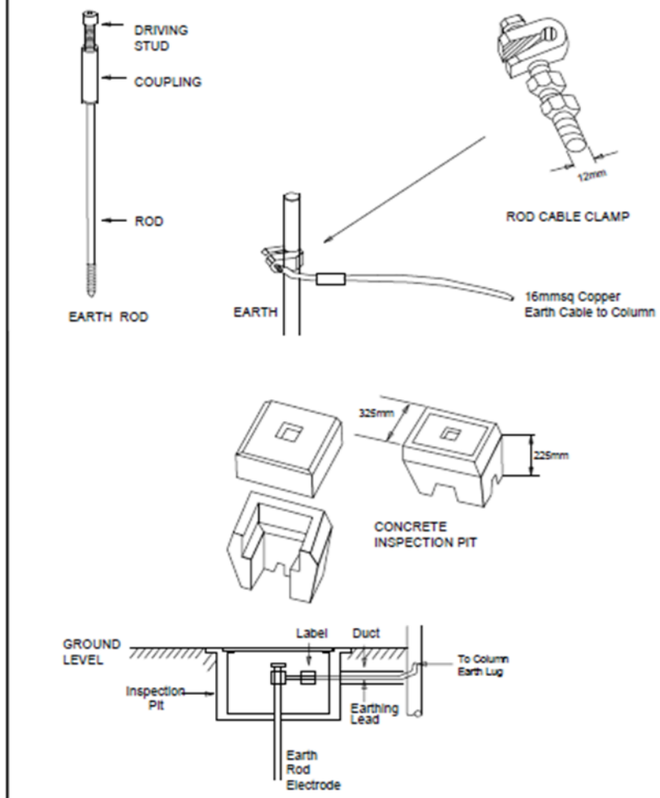


NOTES

1. All dimensions in millimetres.

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Highway Distribution Board – Layout of Panel within Enclosure	DATE: 01/04/18 NO: SL/SPEC/26



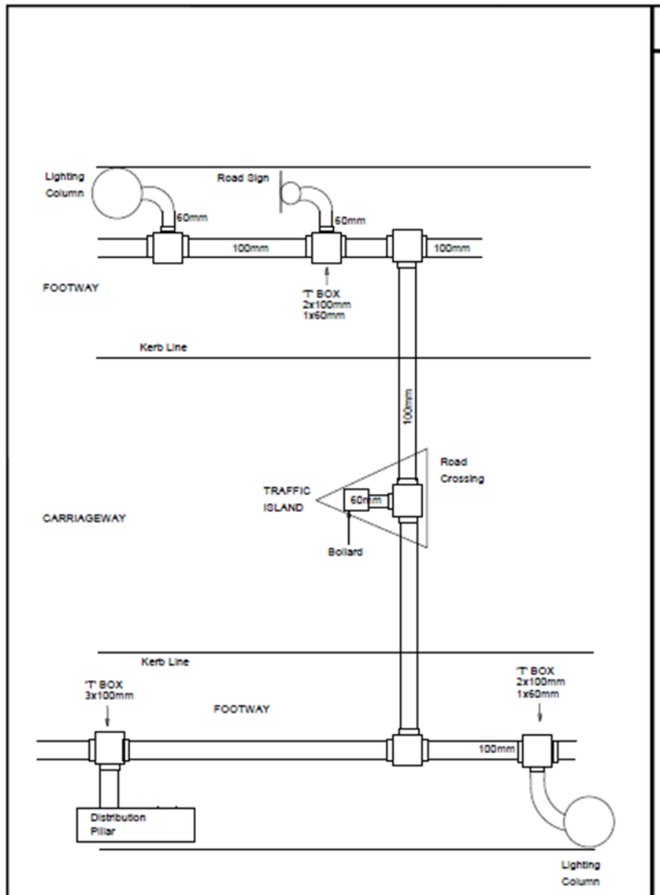
NOTES

1. All dimensions in millimetres.

2. After the installation has been satisfactorily tested the inspection pit shall be filled with sand to the bottom level of the lid.

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Earth Electrode Installation	DATE: 01/04/18 NO: SL/SPEC/27

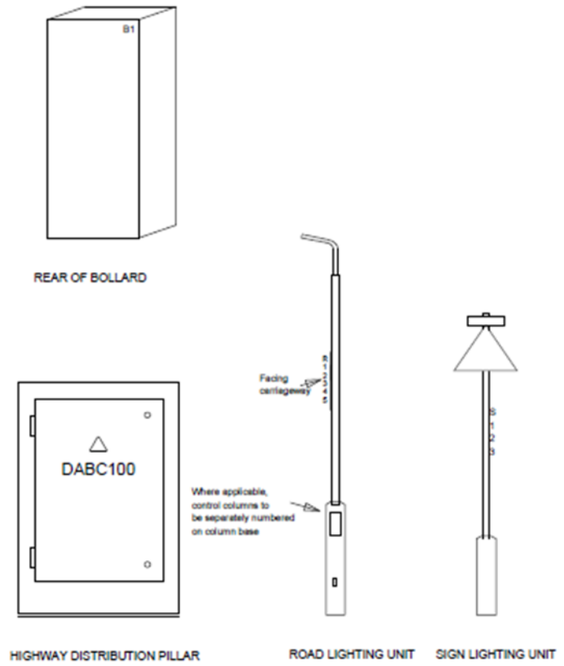


NOTES

1. All dimensions in millimetres.

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Lighting & Traffic Sign Service Ducts General Arrangement	DATE: 01/04/18 NO: SL/SPEC/31

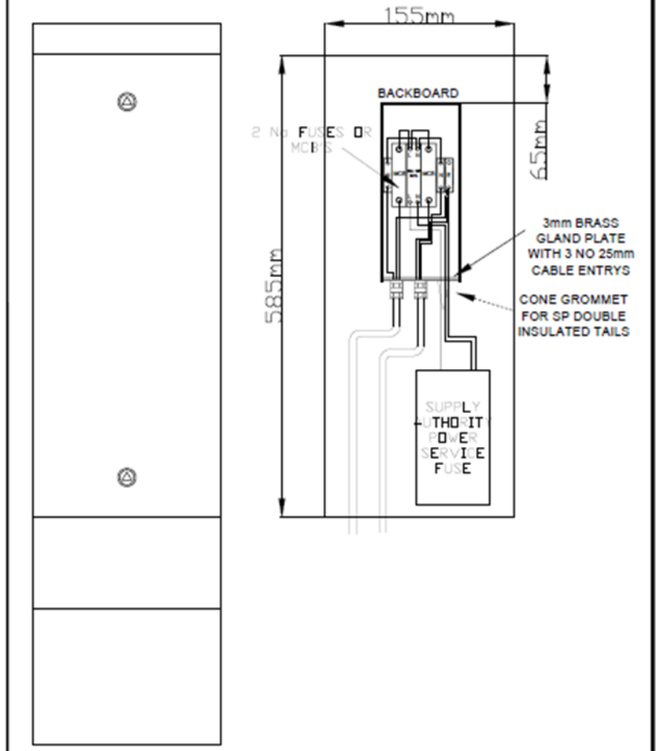


NOTES

1. All dimensions in millimetres.

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Numbering of Street Furniture Typical Examples	DATE: 01/04/18 NO: SL/SPEC/36



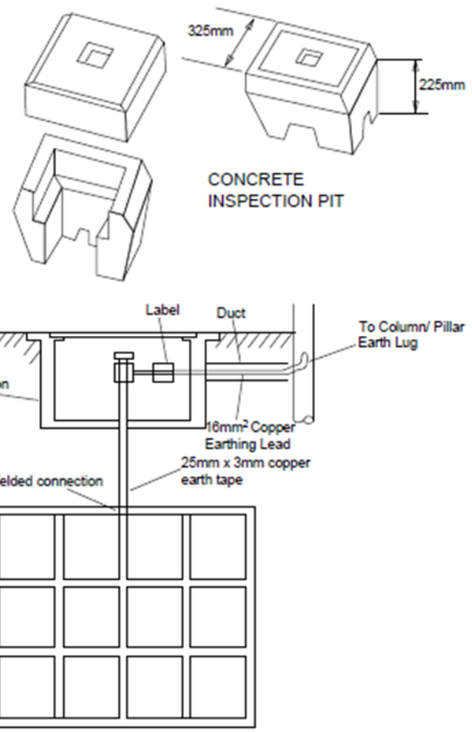
NOTES

1. All dimensions in millimetres.

2. Supply authority fuse position to be marked on backboard at factory.

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Mini Feeder Pillar	DATE: 01/04/18 NO: SL/SPEC/46



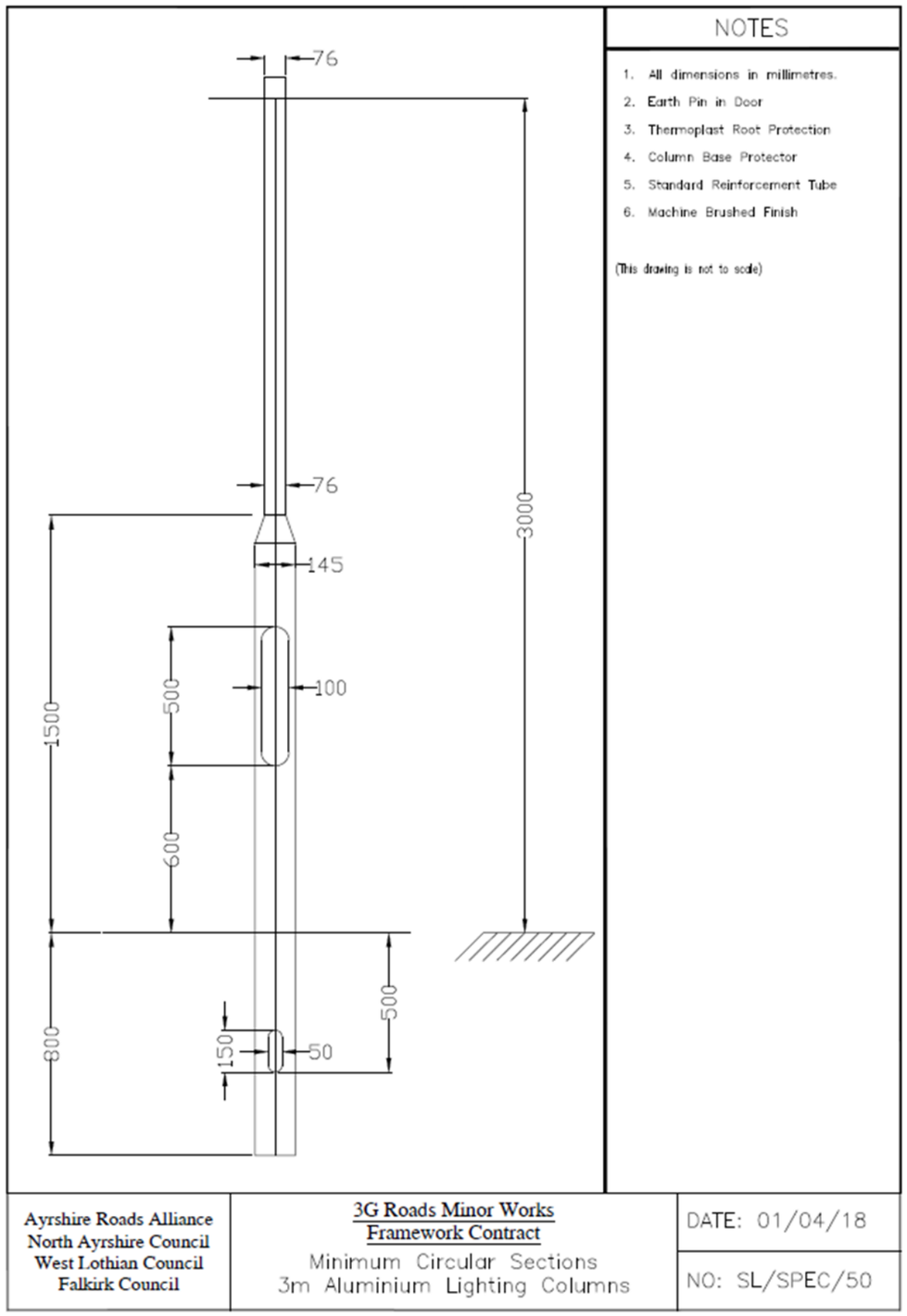
NOTES

1. All dimensions in millimetres.

2. Earth Mat comprising copper lattice grid 600mm x 600mm x 3mm located no closer than 500mm from column at a depth of 550mm on a sand bed

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Installation of earth electrode mat detail	DATE: 01/04/18 NO: SL/SPEC/48

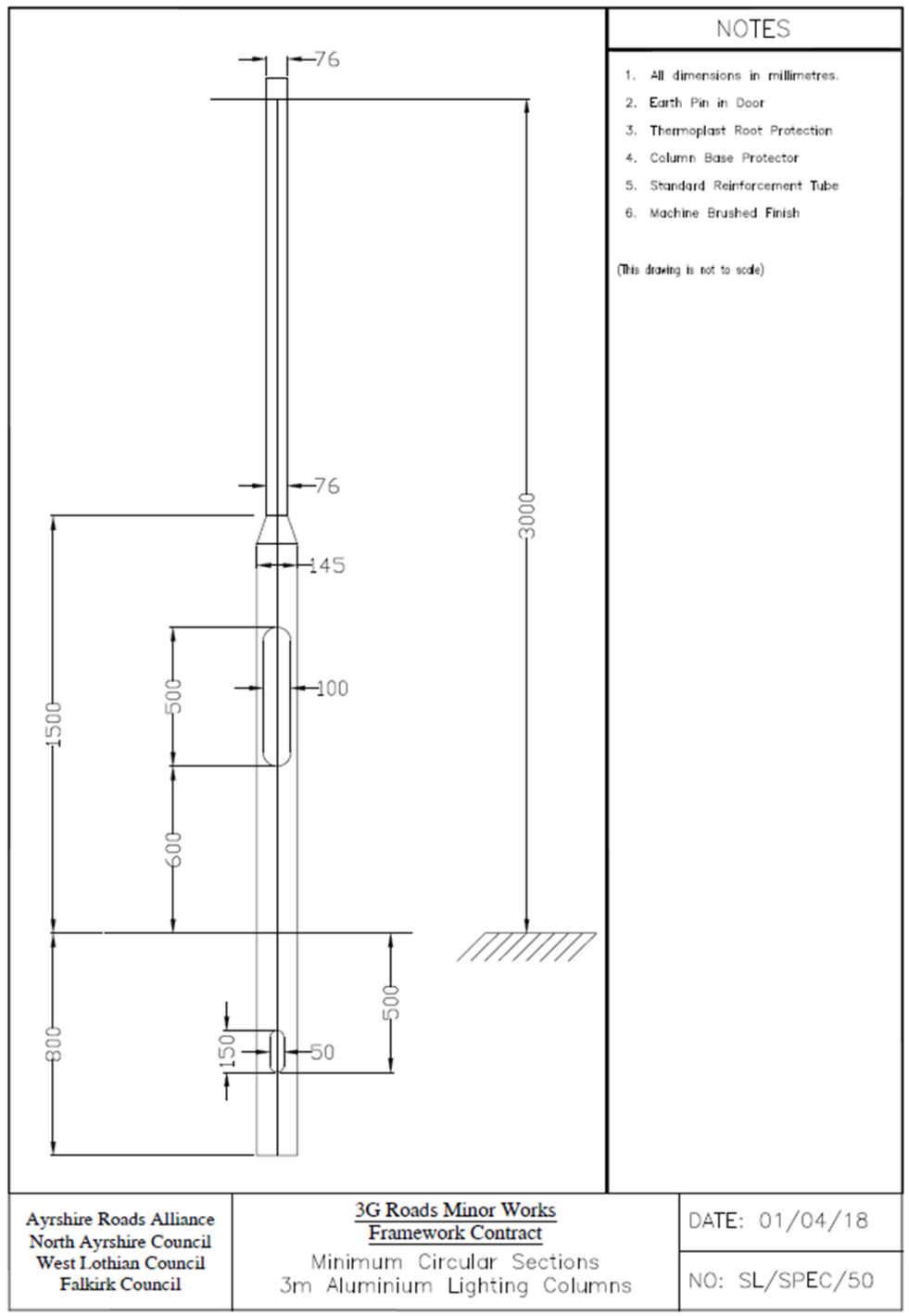


NOTES

1. All dimensions in millimetres.
2. Earth Pin in Door
3. Thermoplast Root Protection
4. Column Base Protector
5. Standard Reinforcement Tube
6. Machine Brushed Finish

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Minimum Circular Sections 3m Aluminium Lighting Columns	DATE: 01/04/18 NO: SL/SPEC/50

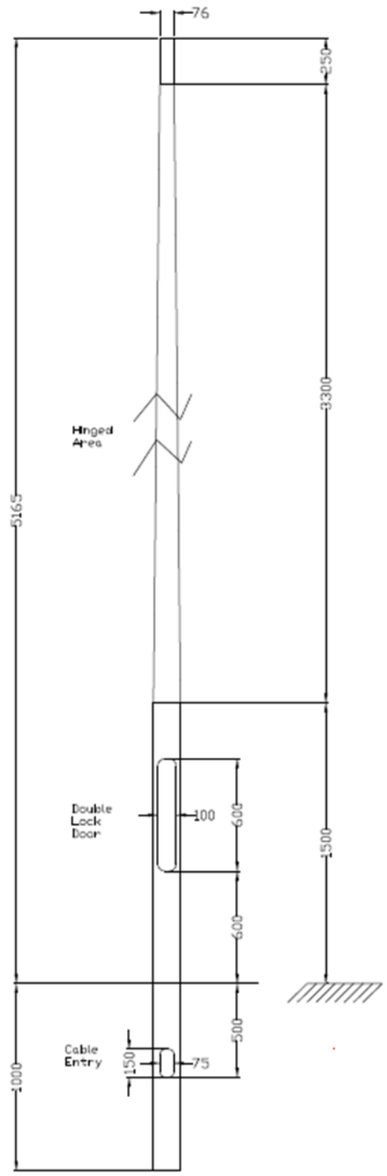


NOTES

1. All dimensions in millimetres.
2. Earth Pin in Door
3. Thermoplast Root Protection
4. Column Base Protector
5. Standard Reinforcement Tube
6. Machine Brushed Finish

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Minimum Circular Sections 3m Aluminium Lighting Columns	DATE: 01/04/18 NO: SL/SPEC/50

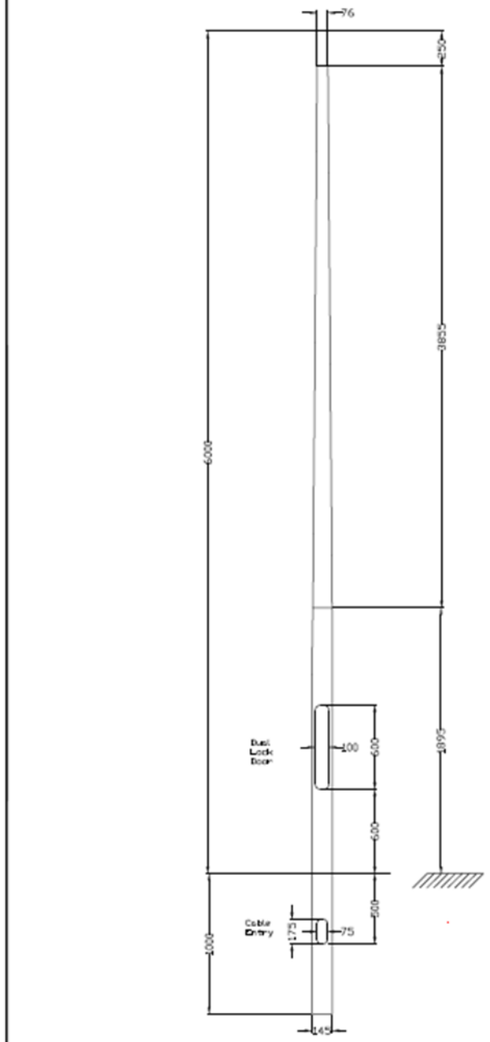


NOTES

1. All dimensions in millimetres.
2. Earth Pin in Door
3. Thermoplast Root Protection
4. Column Base Protector
5. Standard Reinforcement Tube
6. Machine Brushed Finish
7. Columns to be finished as per specification for Non-Hinged Columns

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Minimum Circular Sections 5m Hinged Aluminium Lighting Columns	DATE: 01/04/18 NO: SL/SPEC/52

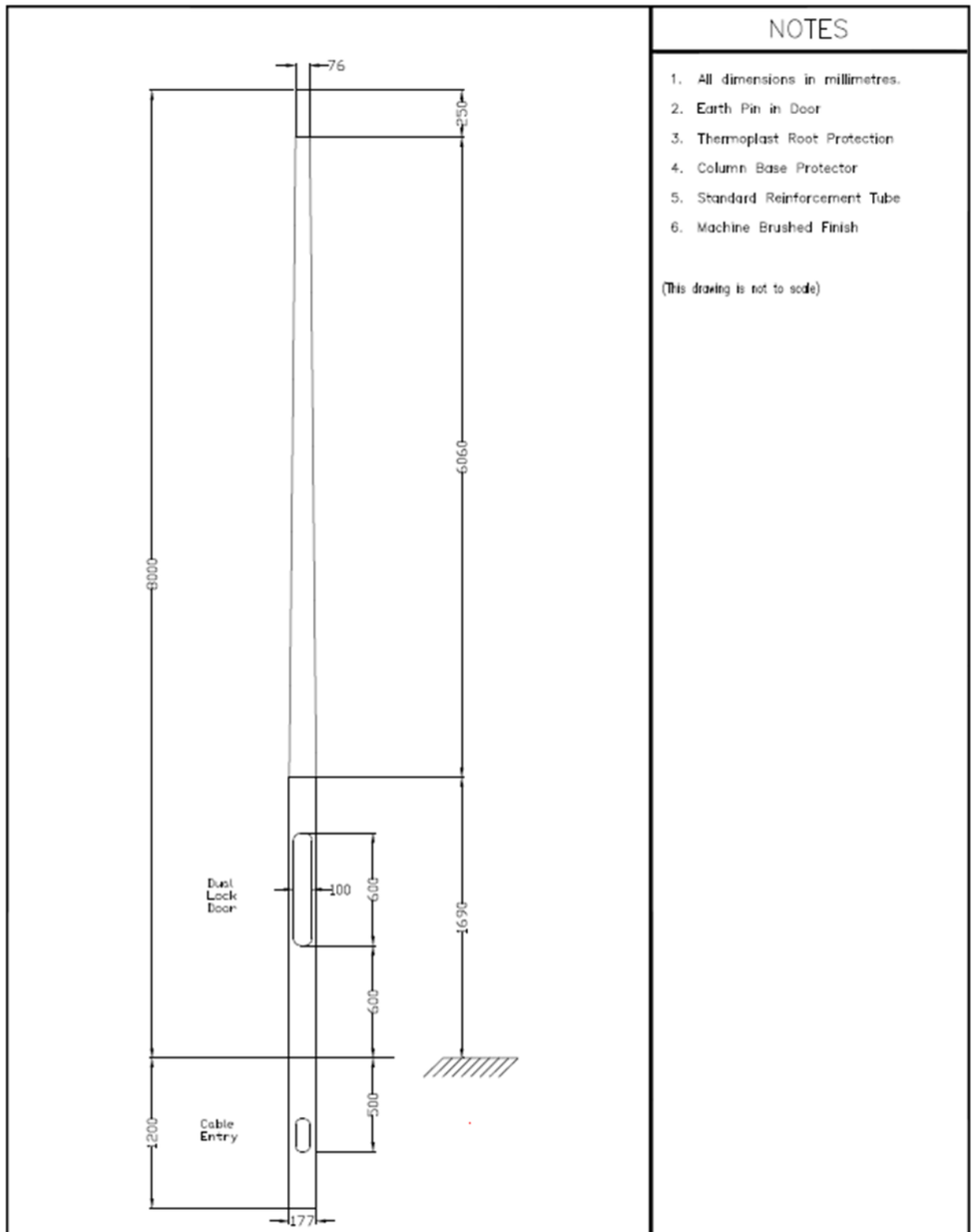


NOTES

1. All dimensions in millimetres.
2. Earth Pin in Door
3. Thermoplast Root Protection
4. Column Base Protector
5. Standard Reinforcement Tube
6. Machine Brushed Finish

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Minimum Circular Sections 6m Aluminium Lighting Columns	DATE: 01/04/18 NO: SL/SPEC/53

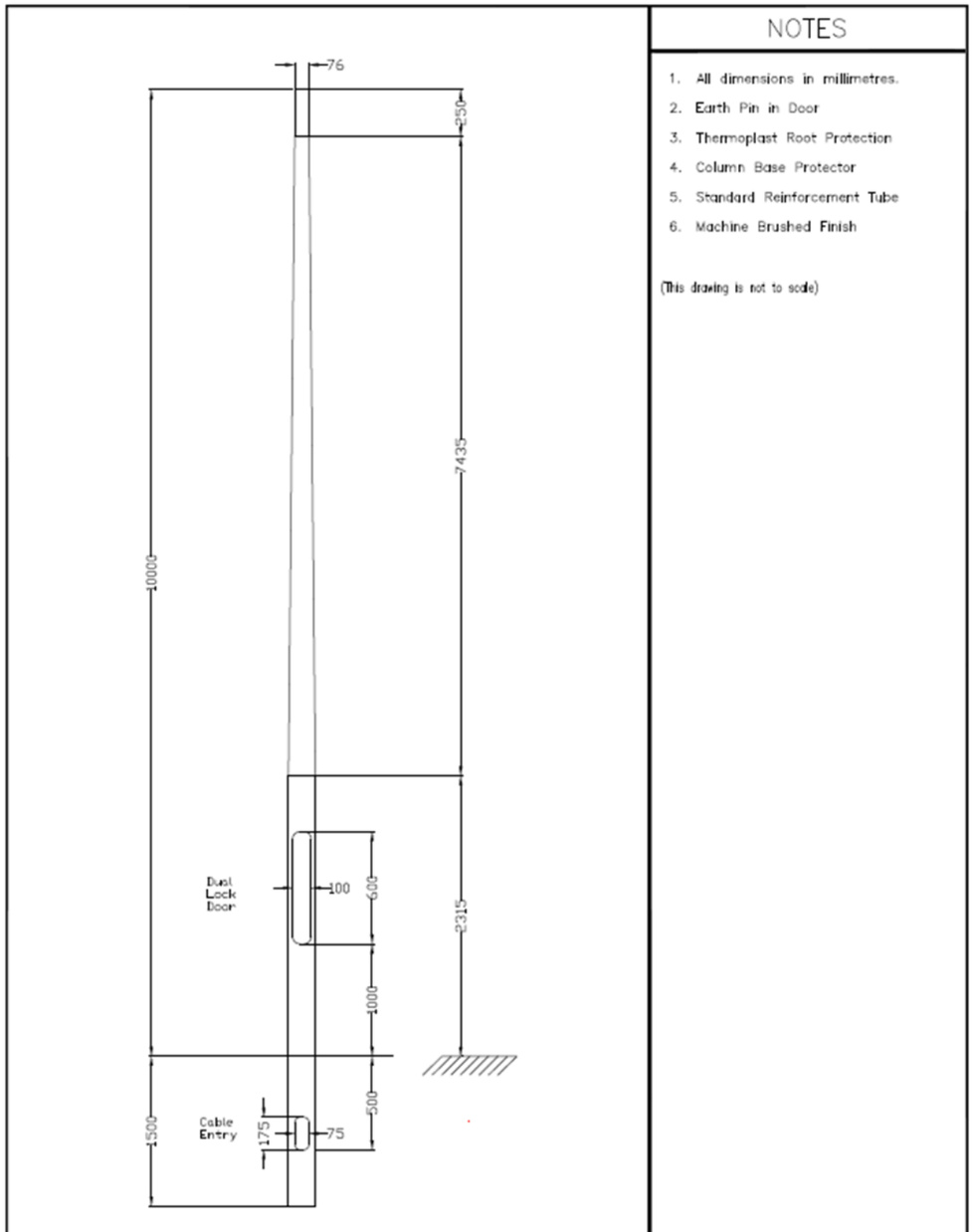


NOTES

1. All dimensions in millimetres.
2. Earth Pin in Door
3. Thermoplast Root Protection
4. Column Base Protector
5. Standard Reinforcement Tube
6. Machine Brushed Finish

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Minimum Circular Sections 8m Aluminium Lighting Columns	DATE: 01/04/18 NO: SL/SPEC/54

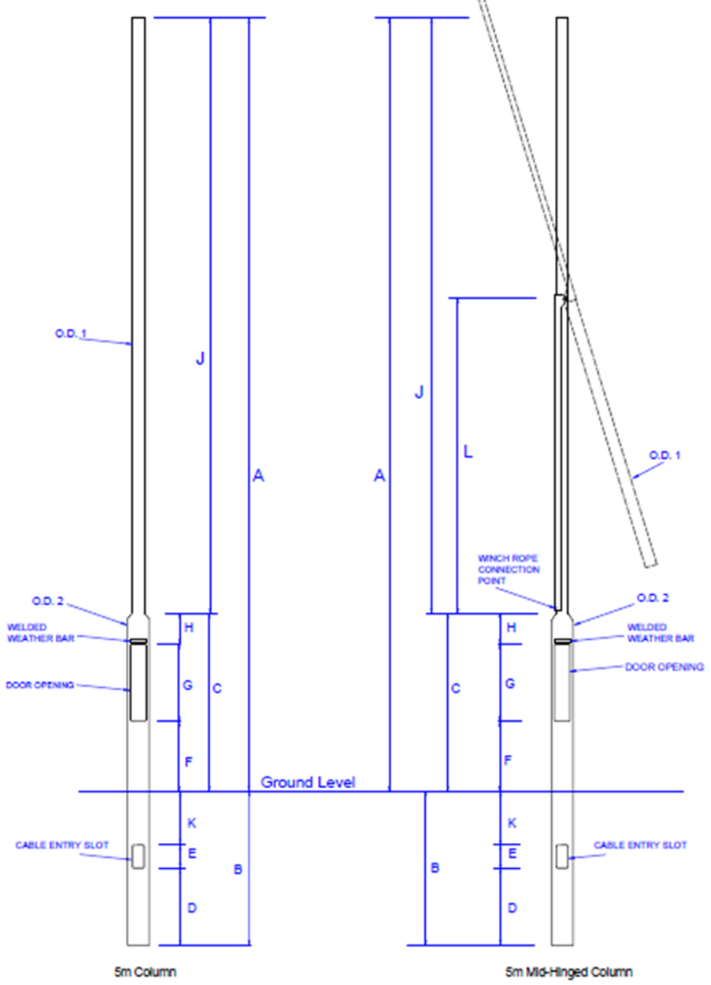


NOTES

1. All dimensions in millimetres.
2. Earth Pin in Door
3. Thermoplast Root Protection
4. Column Base Protector
5. Standard Reinforcement Tube
6. Machine Brushed Finish

(This drawing is not to scale)

Ayrshire Roads Alliance North Ayrshire Council West Lothian Council Falkirk Council	3G Roads Minor Works Framework Contract Minimum Circular Sections 10m Aluminium Lighting Columns	DATE: 01/04/18 NO: SL/SPEC/55



DIMENSION SCHEDULE		
	5.0m	5.0m (MH)
DIMENSION	LENGTH	
A	5000	5000
B	800	1000
C	1000	1250
D	300	300
E	150	150
F	350	500
G	500	600
H	150	150
J	4000	3750
K	350	350
L	n/a	1825

TUBE SCHEDULE	
O.D.	DIA.
1	76
2	140

ALL DIMENSIONS ARE IN MILLIMETRES.

Columns, brackets and compartment doors shall meet the requirements of BS5649:/EN4O: BD 26/99, with silicon content between approximately 0.12% and 0.3% or below 0.04%.
Steel grade: hot rolled to BSEN10021 S355J2H
Test certificates applicable to the grade of steel used shall be supplied on request.

Columns shall be hot-dip galvanised as defined in BS 5649 Part 4, clause 4.1, the requirements of ISO 1459, ISO 1460 and ISO 1461 being applied.
Hot-dip galvanising shall be applied to areas A, B and C of the lighting column as defined in BS 5649 Part 4.
Bitumen shall be applied to area B as defined in BS 5649 Part 4, clause 3 - excluding above ground level which shall be 100mm.
Foundation bolts and all steel fixings including doors, chains, locks and grub screws shall be approved stainless steel or be galvanised in accordance with the above.

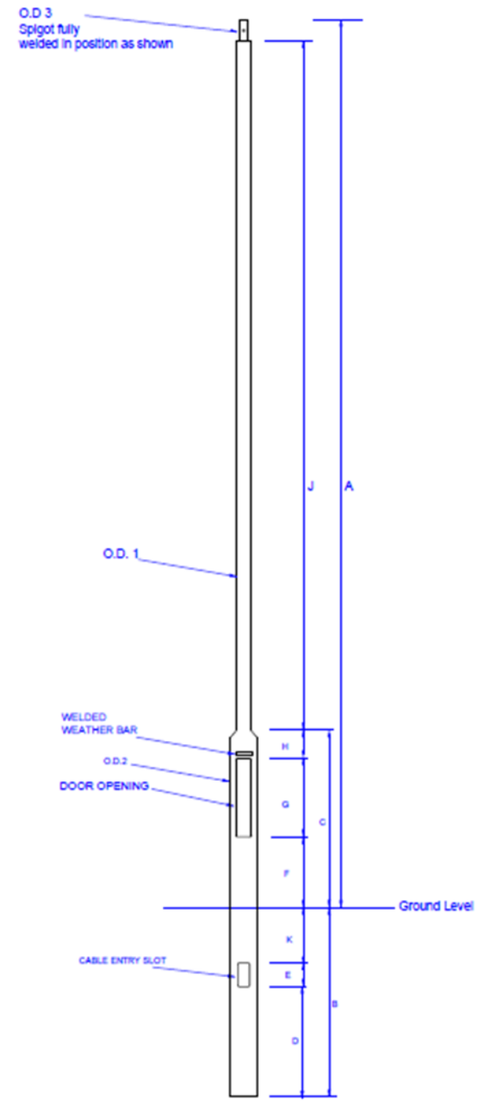
Door openings are 500x100mm
Cable entry slots are 150x75mm
Watershed above door opening shall be 10x10x120mm

Title

5m STEEL COLUMN
5m MID-HINGED STEEL COLUMN

NORTH AYRSHIRE COUNCIL

Scale N.T.S. Date AUGUST 2022
Drawing No. SL/SPEC/COLS/1



DIMENSION SCHEDULE	
	6.0M
DIMENSION	LENGTH
A	6000
B	1200
C	1000
D	700
E	150
F	450
G	500
H	150
J	4850
K	350

TUBE SCHEDULE 6.0M	
O.D.	DIA.
1	89
2	168
3	76

ALL DIMENSIONS ARE IN MILLIMETRES.

Columns, brackets and compartment doors shall meet the requirements of BS5649:/EN4O: BD 26/99, with silicon content between approximately 0.12% and 0.3% or below 0.04%.
Steel grade: hot rolled to BSEN10021 S355J2H
Test certificates applicable to the grade of steel used shall be supplied on request.

Columns shall be hot-dip galvanised as defined in BS 5649 Part 4, clause 4.1, the requirements of ISO 1459, ISO 1460 and ISO 1461 being applied.
Hot-dip galvanising shall be applied to areas A, B and C of the lighting column as defined in BS 5649 Part 4.
Bitumen shall be applied to area B as defined in BS 5649 Part 4, clause 3 - excluding above ground level which shall be 100mm.
Foundation bolts and all steel fixings including doors, chains, locks and grub screws shall be approved stainless steel or be galvanised in accordance with the above.

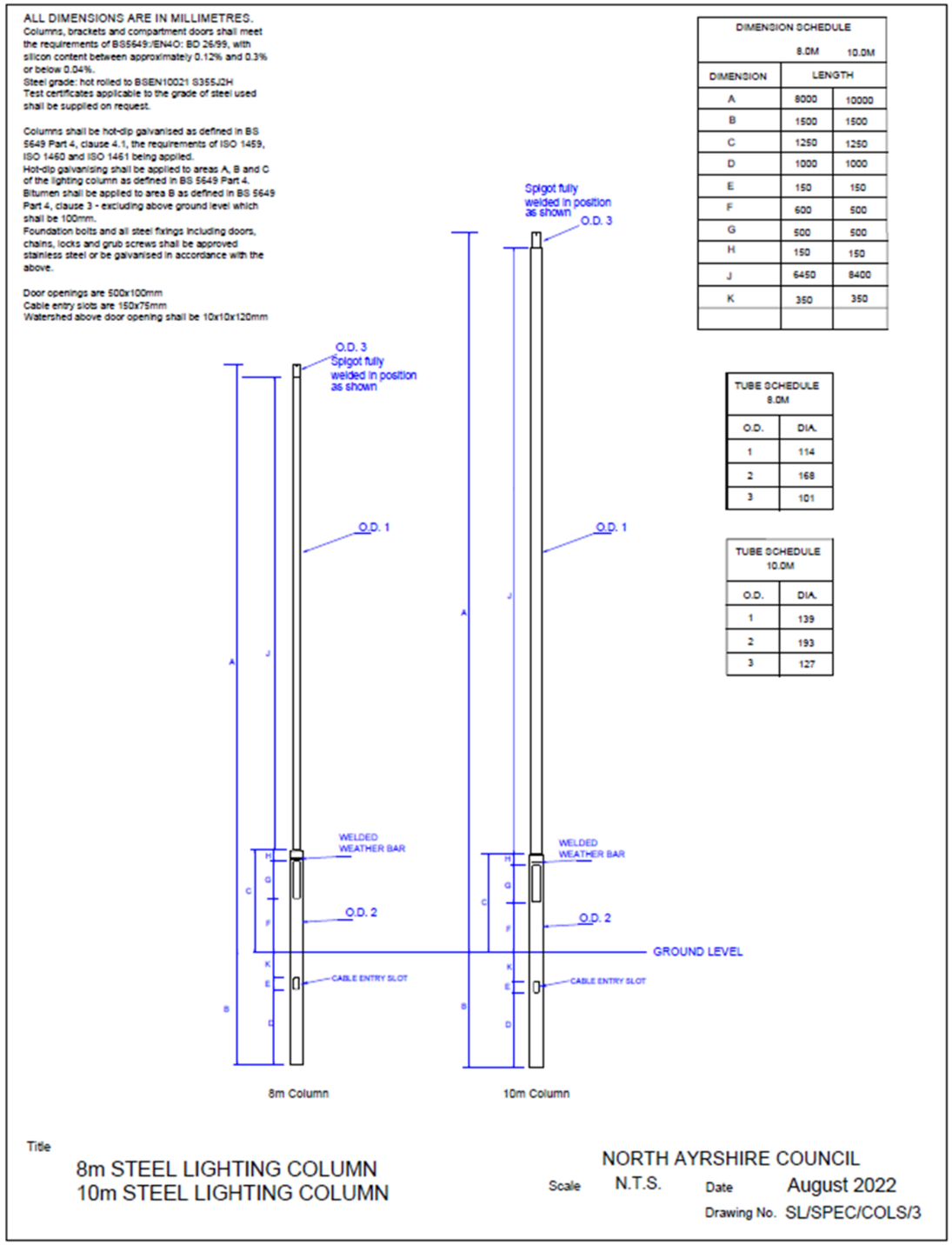
Door openings are 500x100mm
Cable entry slots are 150x75mm
Watershed above door opening shall be 10x10x120mm

Title

6m LIGHTING COLUMN

NORTH AYRSHIRE COUNCIL

Scale N.T.S. Date August 2022
Drawing No. SL/SPEC/COLS/2



ALL DIMENSIONS ARE IN MILLIMETRES.

Columns, brackets and compartment doors shall meet the requirements of BS5649:/EN4O: BD 26/99, with silicon content between approximately 0.12% and 0.3% or below 0.04%.
Steel grade: hot rolled to BSEN10021 S355J2H
Test certificates applicable to the grade of steel used shall be supplied on request.

Columns shall be hot-dip galvanised as defined in BS 5649 Part 4, clause 4.1, the requirements of ISO 1459, ISO 1460 and ISO 1461 being applied.
Hot-dip galvanising shall be applied to areas A, B and C of the lighting column as defined in BS 5649 Part 4.
Bitumen shall be applied to area B as defined in BS 5649 Part 4, clause 3 - excluding above ground level which shall be 100mm.
Foundation bolts and all steel fixings including doors, chains, locks and grub screws shall be approved stainless steel or be galvanised in accordance with the above.

Door openings are 500x100mm
Cable entry slots are 150x75mm
Watershed above door opening shall be 10x10x120mm

DIMENSION SCHEDULE		
	8.0M	10.0M
DIMENSION	LENGTH	
A	8000	10000
B	1500	1500
C	1250	1250
D	1000	1000
E	150	150
F	600	500
G	500	500
H	150	150
J	6450	8400
K	350	350

TUBE SCHEDULE 8.0M	
O.D.	DIA.
1	114
2	168
3	101

TUBE SCHEDULE 10.0M	
O.D.	DIA.
1	139
2	193
3	127

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

North Ayrshire Supplementary Street Design Guide

Appendix F – Standard Construction Details

Version 1: 2024

Version Control

Issue	Date	Nature of Change/Pages Affected
Version 1	xxxxxxx	Issue of Supplementary Street Development Guide

Contents

1.1 Introduction

North Ayrshire Council has produced a set of standard details that can be used in the submission of construction consents within North Ayrshire. Our standard construction details provide useful information for construction consent applications. These can either be duplicated for consents within the area or referenced in any submitted consent. The developer is responsible for ensuring that the standard details are relevant for their construction consent submission.

1.2 Using the Standard Details

If the standard details are copied into construction consent submissions, please add the following to the drawings.

"The standard details (Version 'x') within this submission are obtained from North Ayrshire Council's standard details, with their permission. North Ayrshire Council disclaim all responsibility and accept no liability (including in negligence) for the consequences for any person using these standard details."

1.3 List of Standard Drawings

No.	Code	Drawing No.	Title	Revision	Date
001	CD	NAC/001/CD	STANDARD FOOTWAY/CARRIAGEWAY CONSTRUCTION DEPTHS	C	30/05/24
Kerb Details					
101	HB1	NAC/101/HB1	PRECAST CONCRETE KERB TYPES - STANDARD 125x255mm HALF BATTER KERB (HB1)	A	19/08/19
102	SP1	NAC/102/SP1	PRECAST CONCRETE KERB TYPES - STANDARD 125x255mm SPLAYED KERB (SP1)	A	19/08/19
103	BN1 - 4	NAC/103/BNK	PRECAST CONCRETE KERB TYPES - STANDARD 125x255mm BULLNOSED KERB (Various Upstand)	A	19/08/19
104	BN5	NAC/104/BN5	PRECAST CONCRETE KERB TYPES -STANDARD 125x150mm BULLNOSED KERB (BN5)	A	19/08/19
105	CS	NAC/105/CS	PRECAST CONCRETE KERB TYPES - STANDARD 125x225mm SQUARE CHANNEL KERB (CS)	A	19/08/19
106	RT	NAC/106/RT	PRECAST CONCRETE KERB TYPES - STANDARD 50x150mm ROUND TOP EDGING KERB (RT)	A	19/08/19
107	FT	NAC/107/FT	PRECAST CONCRETE KERB TYPES - STANDARD 50x150mm FLAT TOP EDGING KERB (FT)	A	19/08/19
108	TR	NAC/108/TR	PRECAST CONCRETE KERB TYPES - STANDARD TRIEF KERB (TR)	A	19/08/19
Typical Sections					
201	FCA	NAC/201/FCA	STREET TYPE 1, 2 OR 3 WITH FOOTWAY (100mm kerb upstand)	B	30/05/24
202	FCB	NAC/202/FCB	STREET TYPE 3 OR 4 WITH FOOTWAY (30mm kerb upstand)	B	30/05/24
203	DM4	NAC/203/DM4	STREET TYPE 4 WITH DEMARCATION ZONE	B	30/05/24
204	SC4	NAC/204/SC4	STREET TYPE 4 WITH SERVICE STRIP (50mm kerb upstand)	C	30/05/24
205	DW2	NAC/205/DW2	STREET TYPE 1, 2 OR 3 AT DRIVEWAY/ACCESS	D	30/05/24
206	DW3	NAC/206/DW3	STREET TYPE 4 AT DRIVEWAY/ACCESS	D	30/05/24
207	SNA1	NAC/207/SNA1	STREET TYPE 1, 2 OR 3 - NO ADJACENT ADOPTABLE ASSET (100mm kerb upstand)	B	30/05/24
208	SNA2	NAC/208/SNA2	STREET TYPE 3 or 4 - NO ADJACENT ADOPTABLE ASSET (50mm kerb upstand)	B	30/05/24

209	SFT	NAC/209/SFT	TYPICAL STREET WITH GULLY AND ADJACENT FILTER TRENCH	B	09/06/21
210	RFP	NAC/210/RFP	TYPICAL FOOTPATH WITH FILTER TRENCH	A	20/08/19
211	OVR	NAC/211/OVR	BLOCK PAVED OVERRUN CONSTRUCTION DETAIL	B	02/05/24
212	TRCS	NAC/212/TRCS	TRANSITION FEATURE TO A TYPE 3 OR 4 STREET	C	19/09/24
213	PAR	NAC/213/PAR	STANDARD FOOTWAY/OFF STREET PARKING BAYS CONSTRUCTION	B	30/05/24
Utilities and Drainage					
301	SER	NAC/301/SER	RECOMMENDED POSITIONING OF UTILITY APPARATUS IN A 2 METRE FOOTWAY	A	20/08/19
302	GUL	NAC/302/GUL	PRECAST CONCRETE TRAPPED STREET GULLY - 450 mm NOMINAL BORE	A	20/08/19
303	MH1	NAC/303/MH1	TYPE B MANHOLE - MAXIMUM DEPTH 3 METRES (to be used within carriageway)	A	20/08/19
304	MH2	NAC/304/MH2	TYPE A MANHOLE - DEPTH 3 TO 6 METRES (to be used within carriageway)	A	20/08/19
305	CTP	NAC/305/CTP	CATCHPIT (to be used outwith carriageway)	A	20/08/19
306	ROD	NAC/306/ROD	RODDING EYE DETAIL	A	20/08/19
307	CPD	NAC/307/CPD	CARRIER PIPE DETAIL - PIPE BEDDING DETAIL	A	20/08/19
308	FLT1	NAC/308/FLT1	FILTER TRENCH CONSTRUCTION - SECTION	A	20/08/19
309	FLT2	NAC/309/FLT2	FILTER TRENCH CONSTRUCTION - PLAN	B	09/06/21
310	HCH	NAC/310/HCH	HYDROBRAKE CHAMBER	A	20/08/19
311	PS	NAC/311/PS	TYPICAL SECTION THROUGH POND MARGIN	A	21/08/19
312	PB	NAC/312/PB	TYPICAL SECTION THROUGH BASIN	A	21/08/19
313	PI	NAC/313/PI	DETENTION POND INLET HEADWALL DETAIL	A	21/08/19
314	PO	NAC/314/PO	DETENTION POND OUTLET HEADWALL DETAIL	A	21/08/19
315	PSG	NAC/315/PSG	DETENTION POND OUTFALL SAFETY GRILLE DETAIL	A	21/08/19
316	PPF	NAC/316/PPF	DETENTION POND/BASIN PERIMETER FENCE DETAIL	A	21/08/19
317	SWP	NAC/317/SWP	STANDARD WET SWALE/CARRIAGEWAY CONSTRUCTION	A	21/08/19
318	SWS	NAC/318/SWS	STANDARD WET SWALE/CARRIAGEWAY CONSTRUCTION	A	21/08/19
319	SDP	NAC/319/SDP	STANDARD DRY SWALE/CARRIAGEWAY CONSTRUCTION	A	21/08/19
320	SDS	NAC/320/SDS	STANDARD DRY SWALE/CARRIAGEWAY CONSTRUCTION	A	21/08/19
Footway					
401	TPS	NAC/401/TPS	TACTILE PAVING AT SIGNALS	A	21/08/19
402	TPC	NAC/402/TPC	TACTILE PAVING AT PEDESTRIAN CROSSING POINTS	A	21/08/19
403	BS	NAC/403/BS	STANDARD BUS STOP CONSTRUCTION	A	21/08/19

404	DW1	NAC/404/DW1	STANDARD PRIVATE DRIVEWAY ACCESS (FOOTWAY)	B	25/02/20
405	SMA	NAC/405/SMA	SINGLE MINOR COMMERCIAL ACCESS, HOUSING COURT OR CAR PARK UP TO 50 SPACES	A	21/08/19
406	MCA	NAC/406/MCA	MINOR COMMERCIAL ACCESS OR CAR PARK OVER 50 SPACES	A	21/08/19
407	MAC	NAC/407/MAC	MAJOR COMMERCIAL ACCESS	A	21/08/19
408	DWD	NAC/408/DWD	MINIMUM DRIVEWAY DIMENSIONS	A	21/08/19
409	PCR	NAC/409/PCR	DROPPED KERB DETAIL AT DESIGNATED PEDESTRIAN CROSSING	B	10/01/20
410	DW4	NAC/410/DW4	STANDARD PRIVATE DRIVEWAY ACCESS (SERVICE STRIP)	B	23/09/20
Miscellaneous					
501	CAP	NAC/501/CAP	CAPPING LAYER REQUIREMENTS: SUBJECT TO FROST SUSCEPTIBILITY	A	21/08/19
502	BOL	NAC/502/BOL	BOLLARD DETAIL	A	21/08/19
503	TRE	NAC/503/TRE	TREE PIT DETAIL WITH CONTAINMENT	A	21/08/19
504	SCJ	NAC/504/SCJ	STEPPED CARRIAGEWAY JOINT	B	02/05/24
505	POS	NAC/505/POS	SIGNPOST FOUNDATION DETAIL	A	21/08/19
506	SNP	NAC/506/SNP	STREET NAMEPLATE DETAIL	A	21/08/19

Carriageway Construction

Road Type		Sub-Base	Base Course	Binder Course	Surface Course
1	Connector Streets	300mm Granular Sub-base Type 1 (cl 803)	140mm Dense Base Course Asphalt Concrete Recipe Mixture (cl 906) (AC 32 Dense Base 100/150 rec)	60mm Dense Binder Course Asphalt Concrete Recipe Mixture (cl 906) (AC 20 Dense Bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910) (HRA 30/14 F surf 40/60) Black 14/20mm Coated Chipping 40/60 PSV 60 (cl 915)
2	Local Residential Streets	300mm Granular Sub-base Type 1 (cl 803)	100mm Dense Base Course Asphalt Concrete Recipe Mixture (cl 906) (AC 32 Dense Base 100/150 rec)	60mm Dense Binder Course Asphalt Concrete Recipe Mixture (cl 906) (AC 20 Dense Bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910) (HRA 30/14 F surf 40/60) Black 14/20mm Coated Chipping 40/60 PSV 60 (cl 915)
3	Residential Link Streets	300mm Granular Sub-base Type 1 (cl 803)	80mm Dense Base Course Asphalt Concrete Recipe Mixture (cl 906) (AC 32 Dense Base 100/150 rec)	50mm Dense Binder Course Asphalt Concrete Recipe Mixture (cl 906) (AC 20 Dense Bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910) (HRA 30/14 F surf 40/60) Red 14/20mm Uncoated Chipping 40/60 PSV 60 (cl 915)
			130mm Dense Binder Course Asphalt Concrete Recipe Mixture (cl 906) (AC 20 dense bin 100/150 rec)		
4 (a)	Shared Surface Streets	300mm Granular Sub-base Type 1 (cl 803)	80mm Dense Base Course Asphalt Concrete Recipe Mixture (cl 906) (AC 32 Dense Base 100/150 rec)	50mm Dense Binder Course Asphalt Concrete Recipe Mixture (cl 906) (AC 20 Dense Bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910) (HRA 30/14 F surf 40/60) Red 14/20mm Uncoated Chipping 40/60 PSV 60 (cl 915)
			130mm Dense Binder Course Asphalt Concrete Recipe Mixture (cl 906) (AC 20 dense bin 100/150 rec)		
4 (b)		400mm Granular Sub-base Type 1 (cl 803)		50mm Bedding Layer of Sharp Sand or Crushed Rock (Appendix 7/1)	200 x 100 x 80mm Concrete Block Paving (cl 1043)

Footway/path, Cycle Track Construction

Type	Sub-Base	Binder Course	Surface Course
Flexible Surfacing (Urban)	150mm Granular Sub-base Type 1 (cl 803)	50mm Dense Binder Course Asphalt Concrete Recipe Mixture (cl 906) (AC 20 dense bin 100/150 rec)	30mm Hot Rolled Asphalt Surface Course Recipe Mixture (cl 910) (HRA 15/10 F surf 40/60) Prior To Compaction 6mm Or 10mm Limestone Chippings Shall Be Applied To The Surface At A Nominal Of 1 Kg/m²
Flexible Surfacing (Rural)	200mm Granular Sub-base Type 1 (cl 803) or recycled suitable material (eg planings)	40mm Close Graded Asphalt Concrete (cl 912) (AC 14 close surf 100/150)	25mm Hot Rolled Asphalt Surface Course Recipe Mixture (cl 910) (HRA 15/10 F surf 40/60) Prior To Compaction 6mm Or 10mm Limestone Chippings Shall Be Applied To The Surface At A Nominal Of 1 Kg/m² or subject to the agreement of NAC 25mm Close Graded Asphalt Concrete Surface Course (cl 912) (AC 10 close surf 100/150)
		Combined 50mm Close Graded Asphalt Concrete Surface course (cl 912) (AC 10 close surf 100/150)	
Block Paving or Paviors	150mm Granular Sub-base Type 1 (cl 803)	40±10 mm Bedding Layer of Sharp Sand or Crushed Rock Fines (Appendix 11/1)	200 x 100 x 65mm thick Rectangular Concrete Block Paving (cl 11 07) or Concrete Pavers (cl 1107)

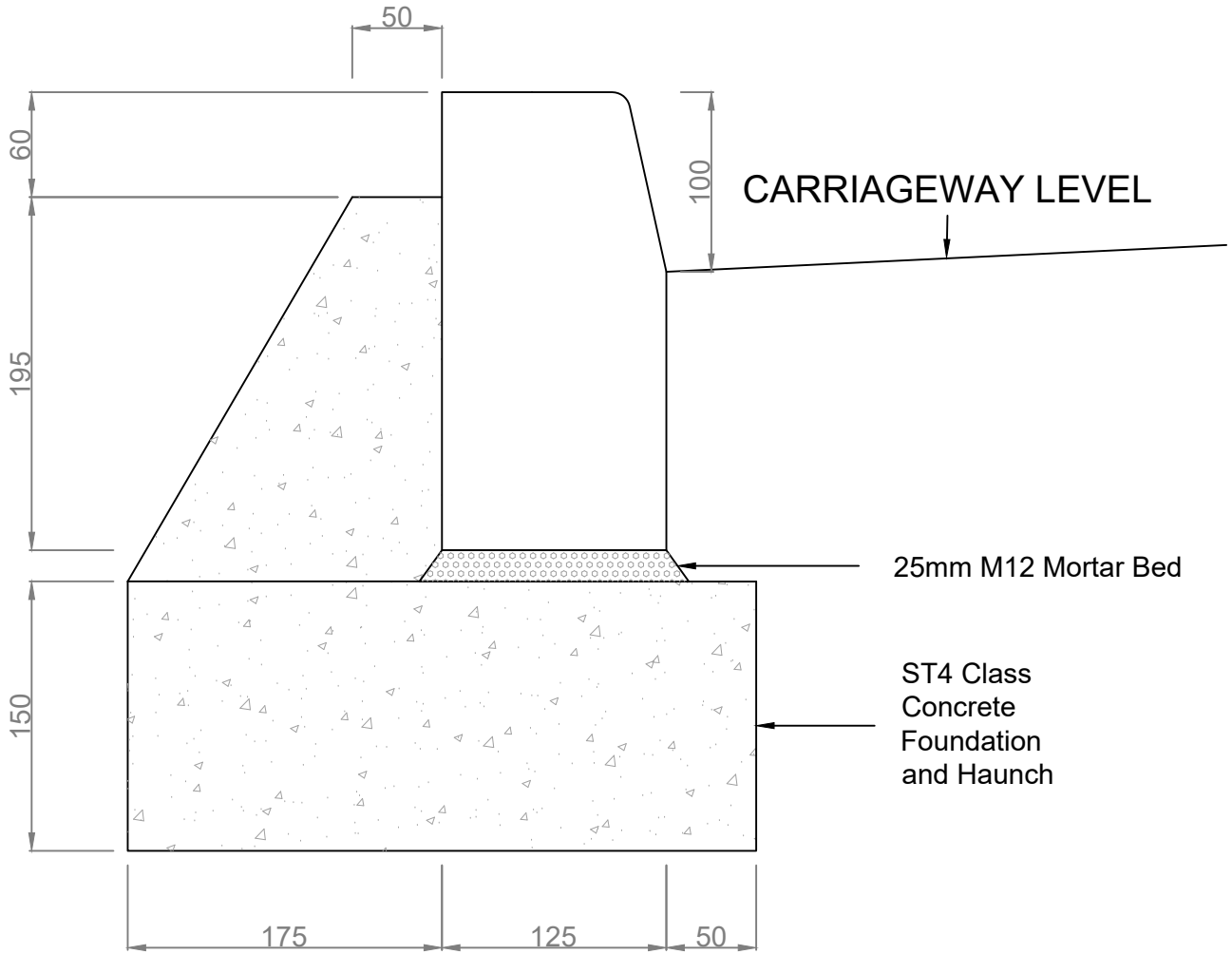
NOTES

1. All dimensions in millimetres.
2. For construction works in Arran HRA should be substituted for the following; HRA 30/14 to AC 10 close surf 100/150 HRA 15/10 to AC 6 close surf 100/150
3. Depending on CBR values a capping layer may be required. Refer to Drg. No. NAC/501/CAP.
4. Block Paving to be in accordance with BS 7533-101.

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STANDARD FOOTWAY/CARRIAGEWAY CONSTRUCTION DEPTHS

DRAWING NO	REV
NAC/001/CD	C



NOTES

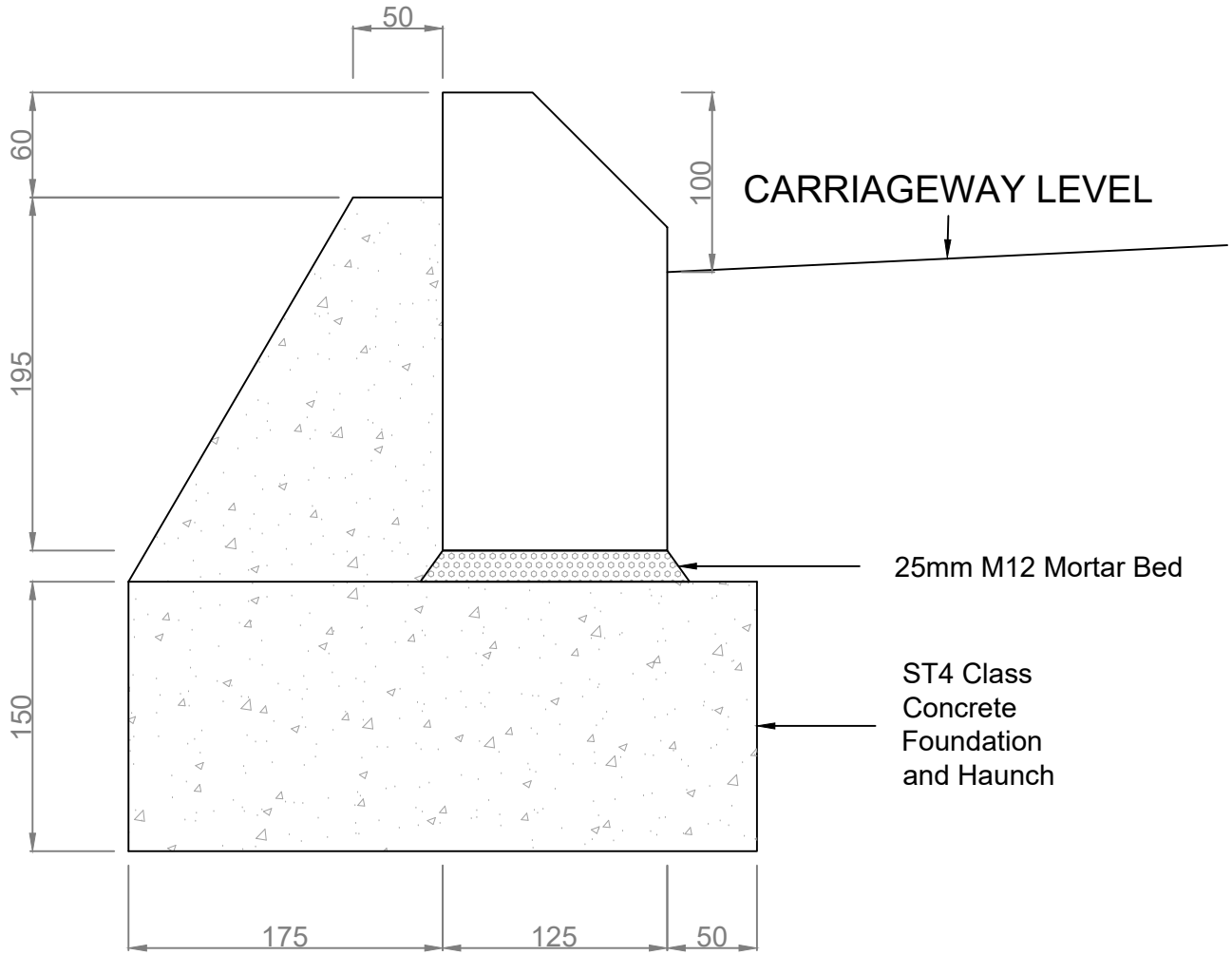
1. All dimensions in millimetres. (This drawing is not to scale)
2. Kerb details to comply with BS EN 1340.
3. Standard Kerb size 125mm x 255mm
4. Standard Kerb upstand 100mm or otherwise directed
5. Kerbs to be hydraulically pressed.
6. Kerb foundation and haunch to be concrete class ST4, 30 slump. Foundation slump may be reduced if kerbs laid wet.
7. Kerbs to be laid and bedded on a layer of M12 mortar not less than 10mm and not more than 40mm thick. Alternatively, kerbs may be laid directly on newly placed concrete foundation.
8. All kerbs to be abutted, except kerbs laid to a radius of less than 40m, which shall be laid with an average gap of 6mm and pointed with M12 mortar.
9. For curves of radius 12m or less, kerbs of appropriate radius shall be used as per BS EN 1340.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

PRECAST CONCRETE KERB TYPES
STANDARD 125x255mm HALF BATTER KERB (HB1)

DRAWING NO	REV
NAC/101/HB1	A



NOTES

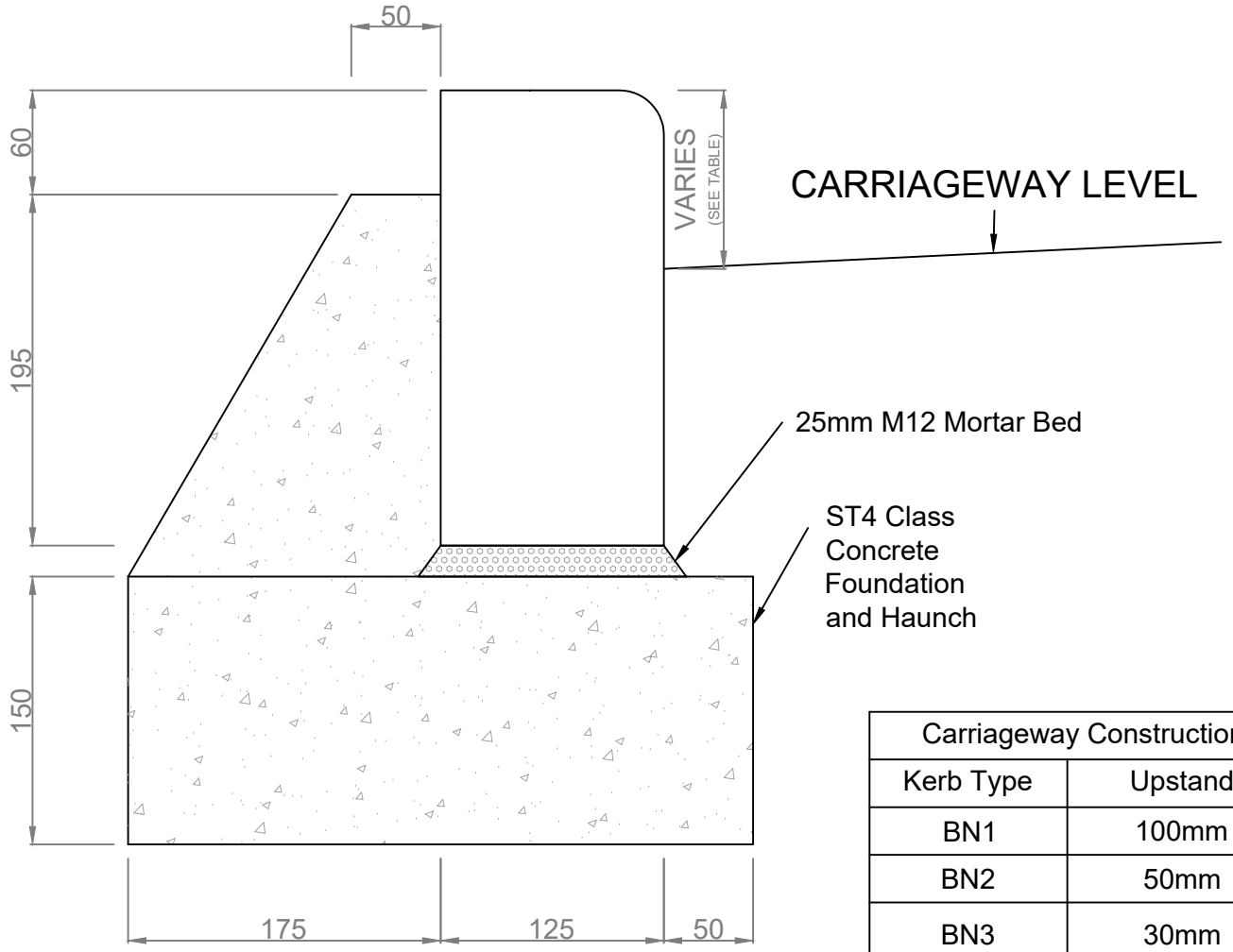
1. All dimensions in millimetres. (This drawing is not to scale)
2. Kerb details to comply with BS EN 1340.
3. Standard Kerb size 125mm x 255mm
4. Standard Kerb upstand 100mm or otherwise directed
5. Kerbs to be hydraulically pressed.
6. Kerb foundation and haunch to be concrete class ST4, 30 slump. Foundation slump may be reduced if kerbs laid wet.
7. Kerbs to be laid and bedded on a layer of M12 mortar not less than 10mm and not more than 40mm thick. Alternatively, kerbs may be laid directly on newly placed concrete foundation.
8. All kerbs to be abutted, except kerbs laid to a radius of less than 40m, which shall be laid with an average gap of 6mm and pointed with M12 mortar.
9. For curves of radius 12m or less, kerbs of appropriate radius shall be used as per BS EN 1340.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

PRECAST CONCRETE KERB TYPES
STANDARD 125x255mm SPLAYED KERB (SP1)

DRAWING NO	REV
NAC/102/SP1	A



Carriageway Construction	
Kerb Type	Upstand
BN1	100mm
BN2	50mm
BN3	30mm
BN4	20mm
BN5	See NAC/104/BN5

NOTES

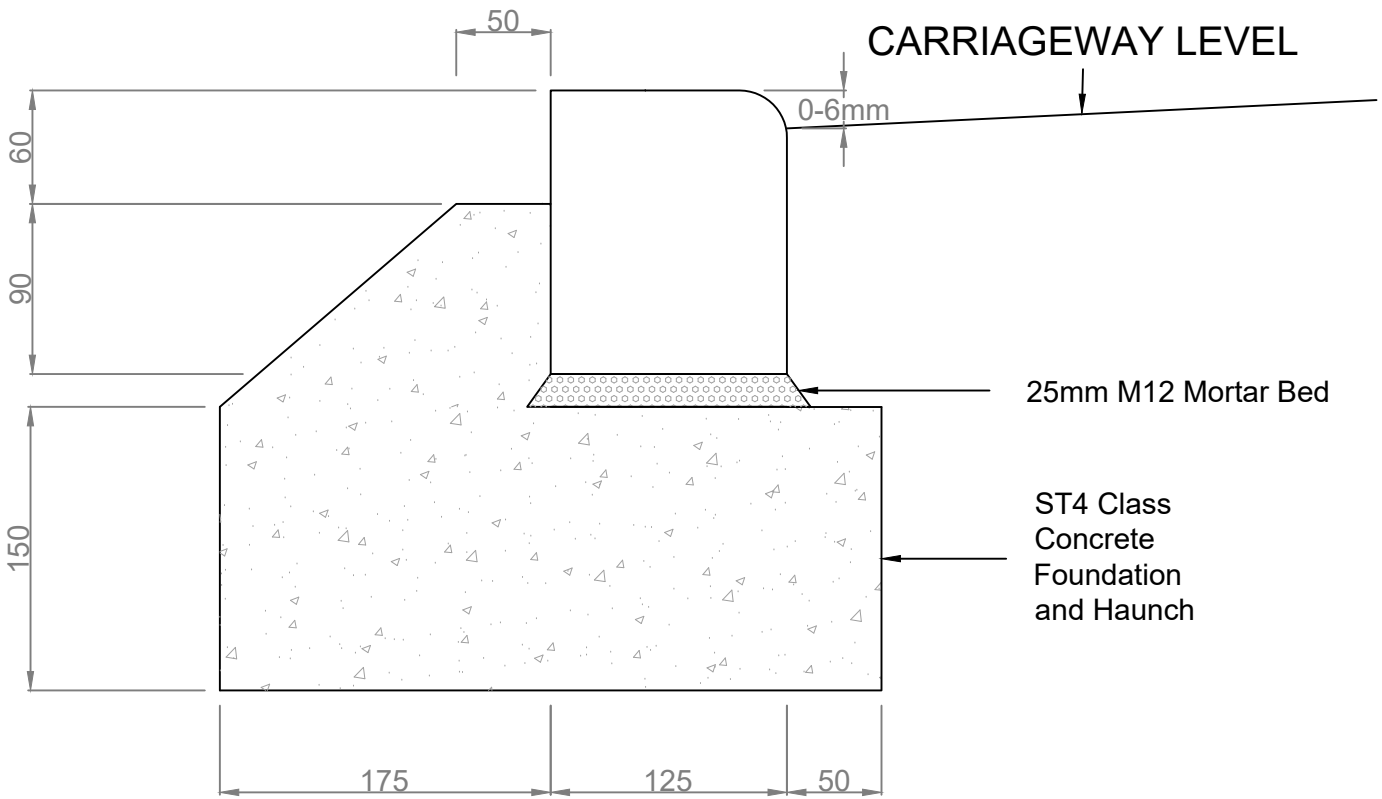
1. All dimensions in millimetres. (This drawing is not to scale)
2. Kerb details to comply with BS EN 1340.
3. Standard Kerb size 125mm x 255mm
4. Kerb upstand to be noted using Type Reference from the table shown
5. Kerbs to be hydraulically pressed.
6. Kerb foundation and haunch to be concrete class ST4, 30 slump. Foundation slump may be reduced if kerbs laid wet.
7. Kerbs to be laid and bedded on a layer of M12 mortar not less than 10mm and not more than 40mm thick. Alternatively, kerbs may be laid directly on newly placed concrete foundation.
8. All kerbs to be abutted, except kerbs laid to a radius of less than 40m, which shall be laid with an average gap of 6mm and pointed with M12 mortar.
9. For curves of radius 12m or less, kerbs of appropriate radius shall be used as per BS EN 1340.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

PRECAST CONCRETE KERB TYPES
STANDARD 125x255mm BULLNOSED KERB (Various Upstand)

DRAWING NO	REV
NAC/103/BNK	A



NOTES

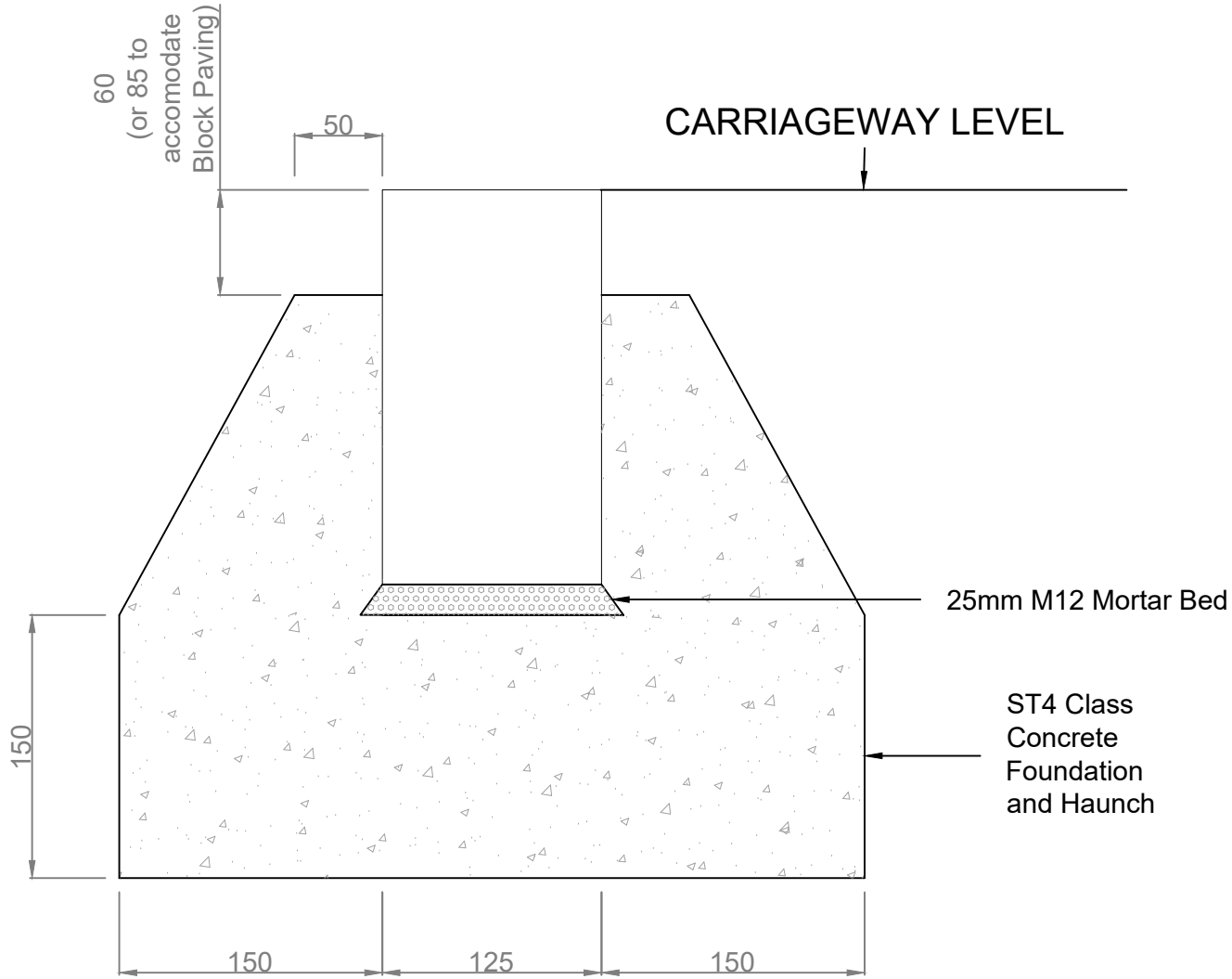
1. All dimensions in millimetres. (This drawing is not to scale)
2. Kerb details to comply with BS EN 1340.
3. Standard Kerb size 125mm x 150mm
4. Standard Kerb upstand 0-6mm at Pedestrian Crossing
5. Kerbs to be hydraulically pressed.
6. Kerb foundation and haunch to be concrete class ST4, 30 slump. Foundation slump may be reduced if kerbs laid wet.
7. Kerbs to be laid and bedded on a layer of M12 mortar not less than 10mm and not more than 40mm thick. Alternatively, kerbs may be laid directly on newly placed concrete foundation.
8. All kerbs to be abutted, except kerbs laid to a radius of less than 40m, which shall be laid with an average gap of 6mm and pointed with M12 mortar.
9. For curves of radius 12m or less, kerbs of appropriate radius shall be used as per BS EN 1340.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

PRECAST CONCRETE KERB TYPES
STANDARD 125x150mm BULLNOSED KERB (BN5)

DRAWING NO	REV
NAC/104/BN5	A



NOTES

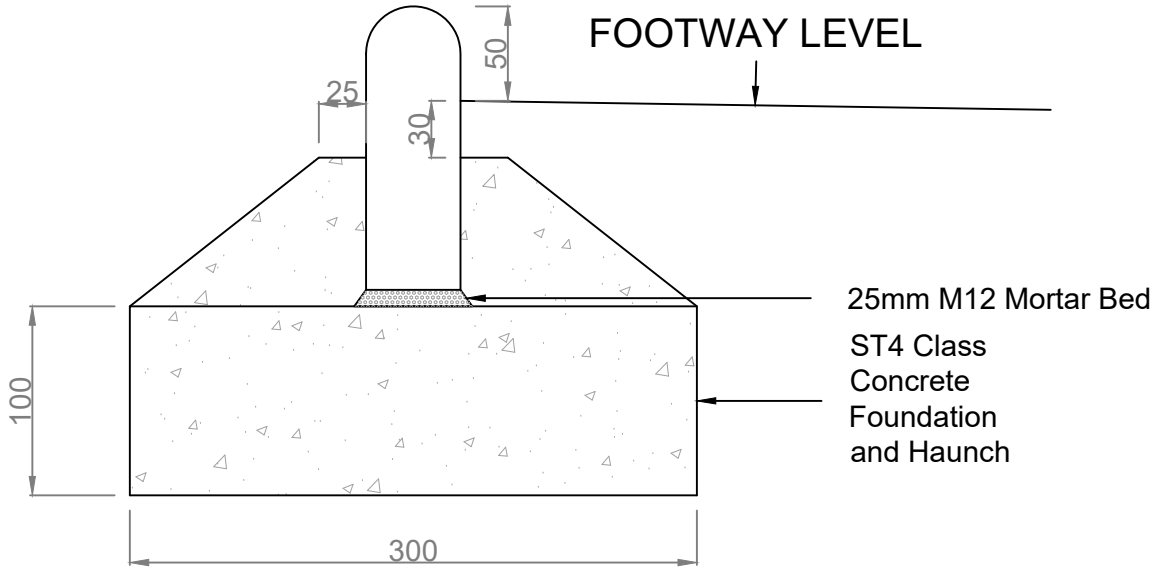
1. All dimensions in millimetres. (This drawing is not to scale)
2. Kerb details to comply with BS EN 1340.
3. Standard Kerb size 125mm x 225mm
4. Standard Kerb upstand 0mm or otherwise directed
5. Kerbs to be hydraulically pressed.
6. Kerb foundation and haunch to be concrete class ST4, 30 slump. Foundation slump may be reduced if kerbs laid wet.
7. Kerbs to be laid and bedded on a layer of M12 mortar not less than 10mm and not more than 40mm thick. Alternatively, kerbs may be laid directly on newly placed concrete foundation.
8. All kerbs to be abutted, except kerbs laid to a radius of less than 40m, which shall be laid with an average gap of 6mm and pointed with M12 mortar.
9. For curves of radius 12m or less, kerbs of appropriate radius shall be used as per BS EN 1340.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

PRECAST CONCRETE KERB TYPES
STANDARD 125x225mm SQUARE CHANNEL KERB (CS)

DRAWING NO	REV
NAC/105/CS	A



NOTES

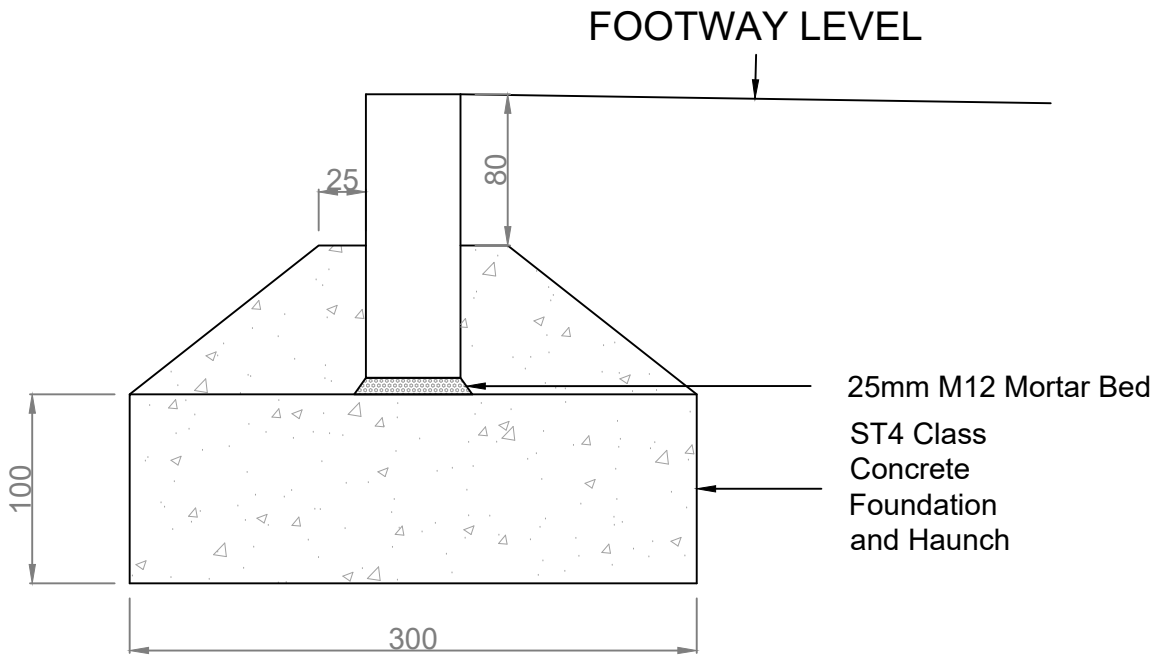
1. All dimensions in millimetres. (This drawing is not to scale)
2. Kerb details to comply with BS EN 1340.
3. Standard Edging Kerb size 50mm x 150mm
4. Standard Kerb upstand 50mm or otherwise directed
5. Kerbs to be hydraulically pressed.
6. Kerb foundation and haunch to be concrete class ST4, 30 slump. Foundation slump may be reduced if kerbs laid wet.
7. Kerbs to be laid and bedded on a layer of M12 mortar not less than 10mm and not more than 40mm thick. Alternatively, kerbs may be laid directly on newly placed concrete foundation.
8. All kerbs to be abutted, except kerbs laid to a radius of less than 40m, which shall be laid with an average gap of 6mm and pointed with M12 mortar.
9. For curves of radius 12m or less, kerbs of appropriate radius shall be used as per BS EN 1340.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

PRECAST CONCRETE KERB TYPES
STANDARD 50x150mm ROUND TOP EDGING KERB (RT)

DRAWING NO	REV
NAC/106/RT	A



NOTES

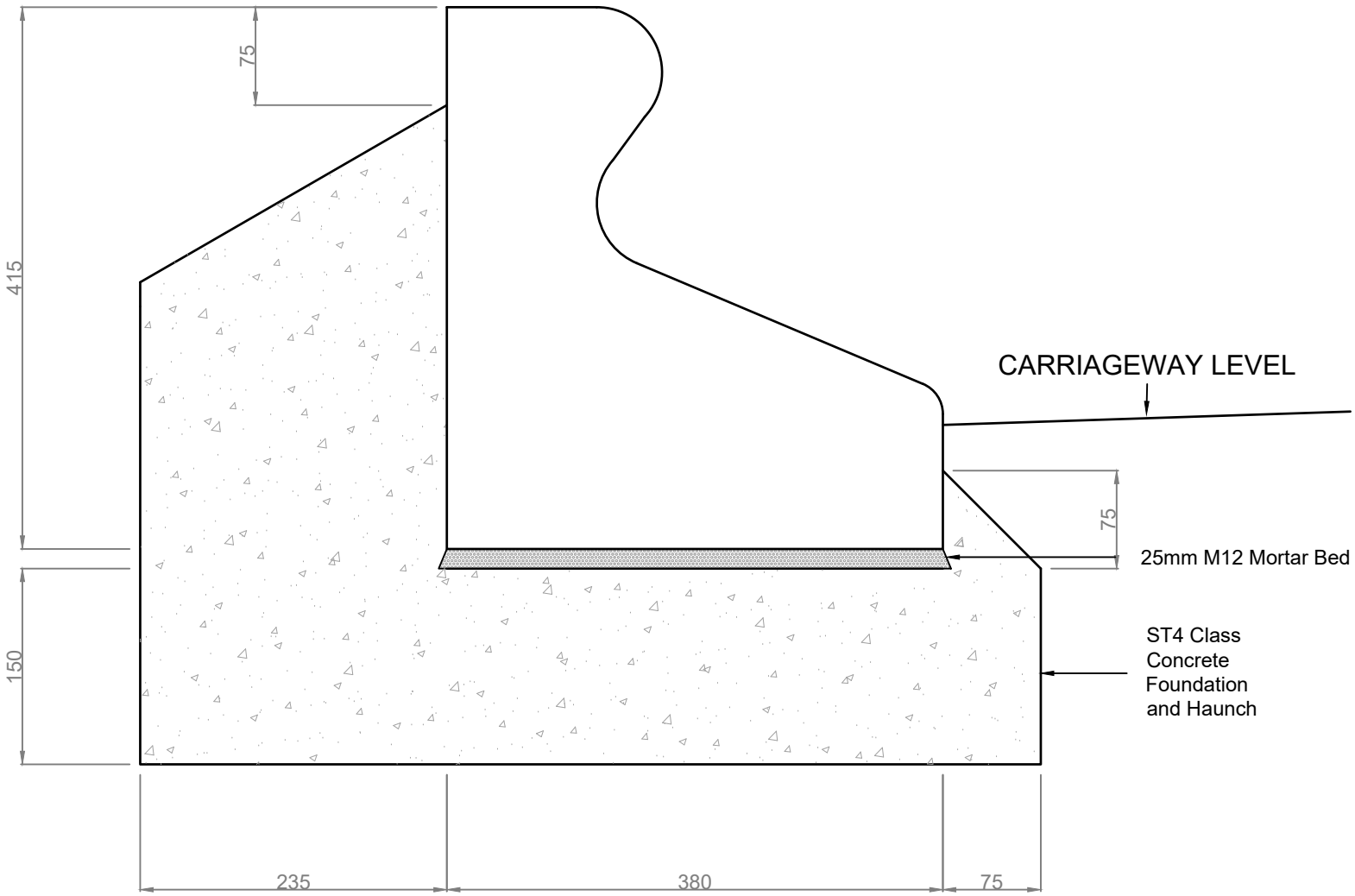
1. All dimensions in millimetres. (This drawing is not to scale)
2. Kerb details to comply with BS EN 1340.
3. Standard Edging Kerb size 50mm x 150mm
4. Standard Kerb upstand 0mm or otherwise directed
5. Kerbs to be hydraulically pressed.
6. Kerb foundation and haunch to be concrete class ST4, 30 slump. Foundation slump may be reduced if kerbs laid wet.
7. Kerbs to be laid and bedded on a layer of M12 mortar not less than 10mm and not more than 40mm thick. Alternatively, kerbs may be laid directly on newly placed concrete foundation.
8. All kerbs to be abutted, except kerbs laid to a radius of less than 40m, which shall be laid with an average gap of 6mm and pointed with M12 mortar.
9. For curves of radius 12m or less, kerbs of appropriate radius shall be used as per BS EN 1340.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

PRECAST CONCRETE KERB TYPES
STANDARD 50x150mm FLAT TOP EDGING KERB (FT)

DRAWING NO	REV
NAC/107/FT	A



NOTES

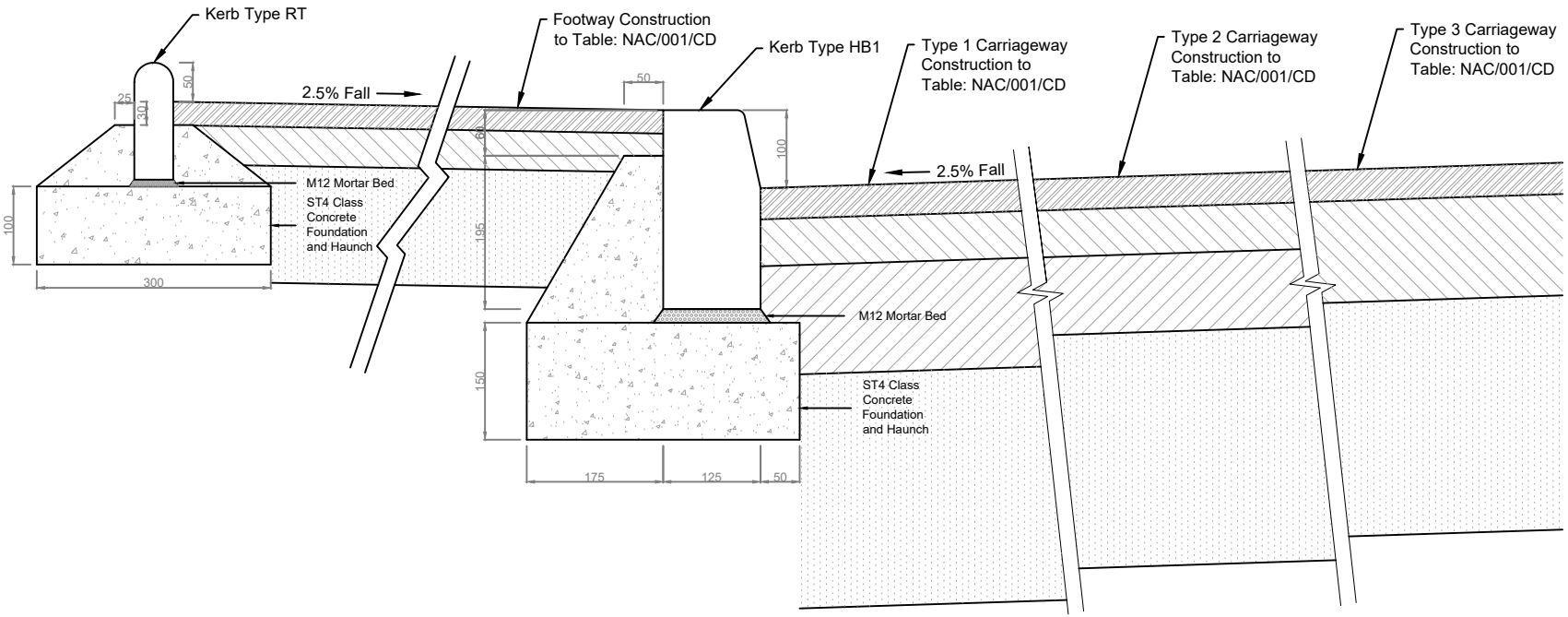
1. All dimensions in millimetres. (This drawing is not to scale)
2. Kerb details to comply with BS EN 1340.
3. Kerbs to be hydraulically pressed.
4. Kerb foundation and haunch to be concrete class ST4, 30 slump. Foundation slump may be reduced if kerbs laid wet.
5. Kerbs to be laid and bedded on a layer of M12 mortar not less than 10mm and not more than 40mm thick. Alternatively, kerbs may be laid directly on newly placed concrete foundation.
6. All kerbs to be abutted, except kerbs laid to a radius of less than 40m, which shall be laid with an average gap of 6mm and pointed with M12 mortar.
7. For curves of radius 12m or less, kerbs of appropriate radius shall be used as per BS EN 1340.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

PRECAST CONCRETE KERB TYPES
STANDARD TRIEF KERB (TR)

DRAWING NO	REV
NAC/108/TR	A



SURFACE COURSE

BINDER COURSE

BASE COURSE

SUB-BASE

Carriageway Construction

Road Type		Sub-Base	Base Course	Binder Course	Surface Course
1	Connector Streets	300mm Granular Sub-base Type 1 (cl 803)	140mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	60mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Black 14/20mm Coated Chipping 40/60 PSV 60 (cl 915)
2	Local Residential Streets	300mm Granular Sub-base Type 1 (cl 803)	100mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	60mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Black 14/20mm Coated Chipping 40/60 PSV 60 (cl 915)
3	Residential Link Streets	300mm Granular Sub-base Type 1 (cl 803)	80mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	50mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Red 14/20mm Uncoated Chipping 40/60 PSV 60 (cl 915)
			130mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)		

NOTES

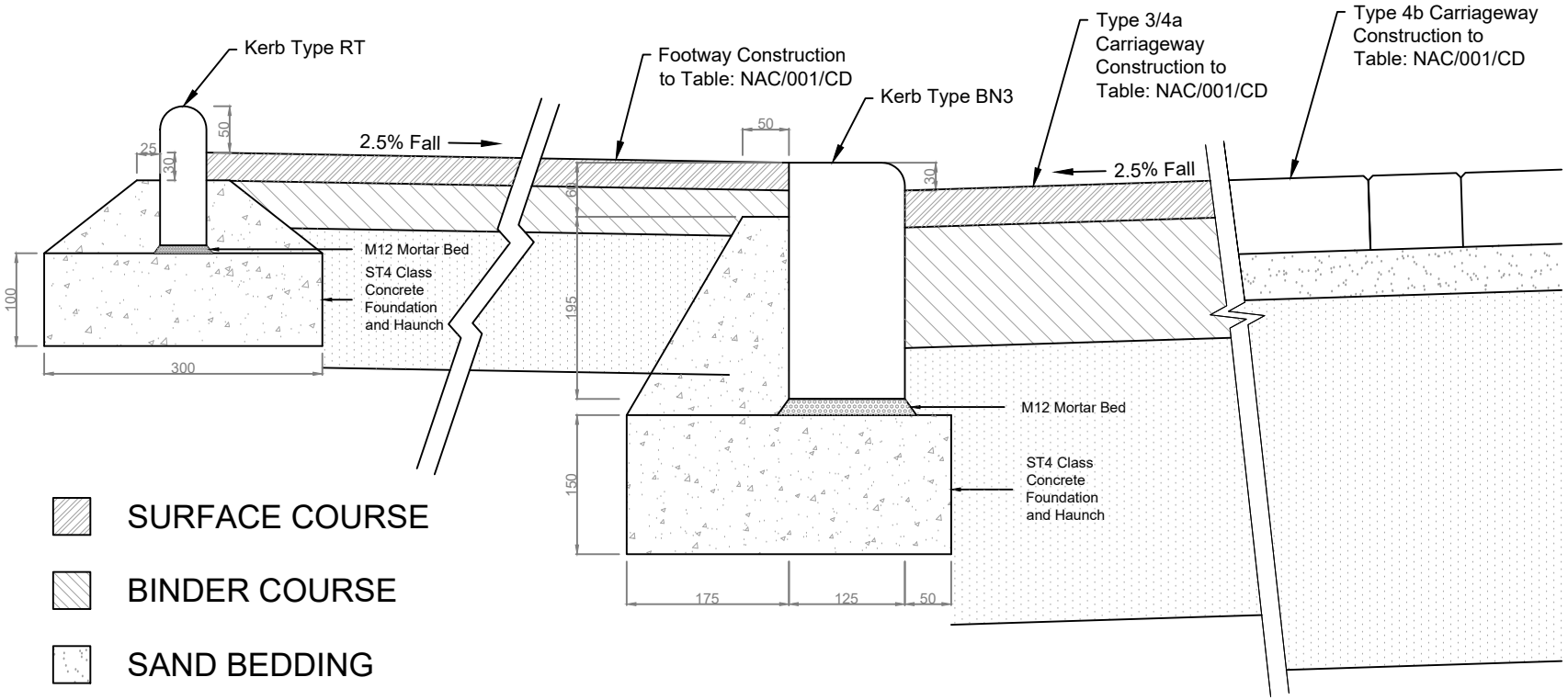
1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD
4. Full Construction Information for Footway to Table NAC/001/CD

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STREET TYPE 1, 2 OR 3 WITH FOOTWAY (100mm kerb upstand)

DRAWING NO	REV
NAC/201/FCA	B



SURFACE COURSE

BINDER COURSE

SAND BEDDING

SUB-BASE

Carriageway Construction

Road Type		Sub-Base	Base Course	Binder Course	Surface Course
3	Residential Link Streets	300mm Granular Sub-base Type 1 (cl 803)	80mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	50mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Red 14/20mm Uncoated Chipping 40/60 PSV 60 (cl 915)
			130mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)		
4 (a)	Shared Surface Streets	300mm Granular Sub-base Type 1 (cl 803)	80mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	50mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Red 14/20mm Uncoated Chipping 40/60 PSV 60 (cl 915)
			130mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)		
4 (b)		400mm Granular Sub-base Type 1 (cl 803)		50mm Bedding Layer of Sharp Sand or Crushed Rock (Appendix 7/1)	200 x 100 x 80mm thick Concrete Rectangular Block Paving (cl 1043)

NOTES

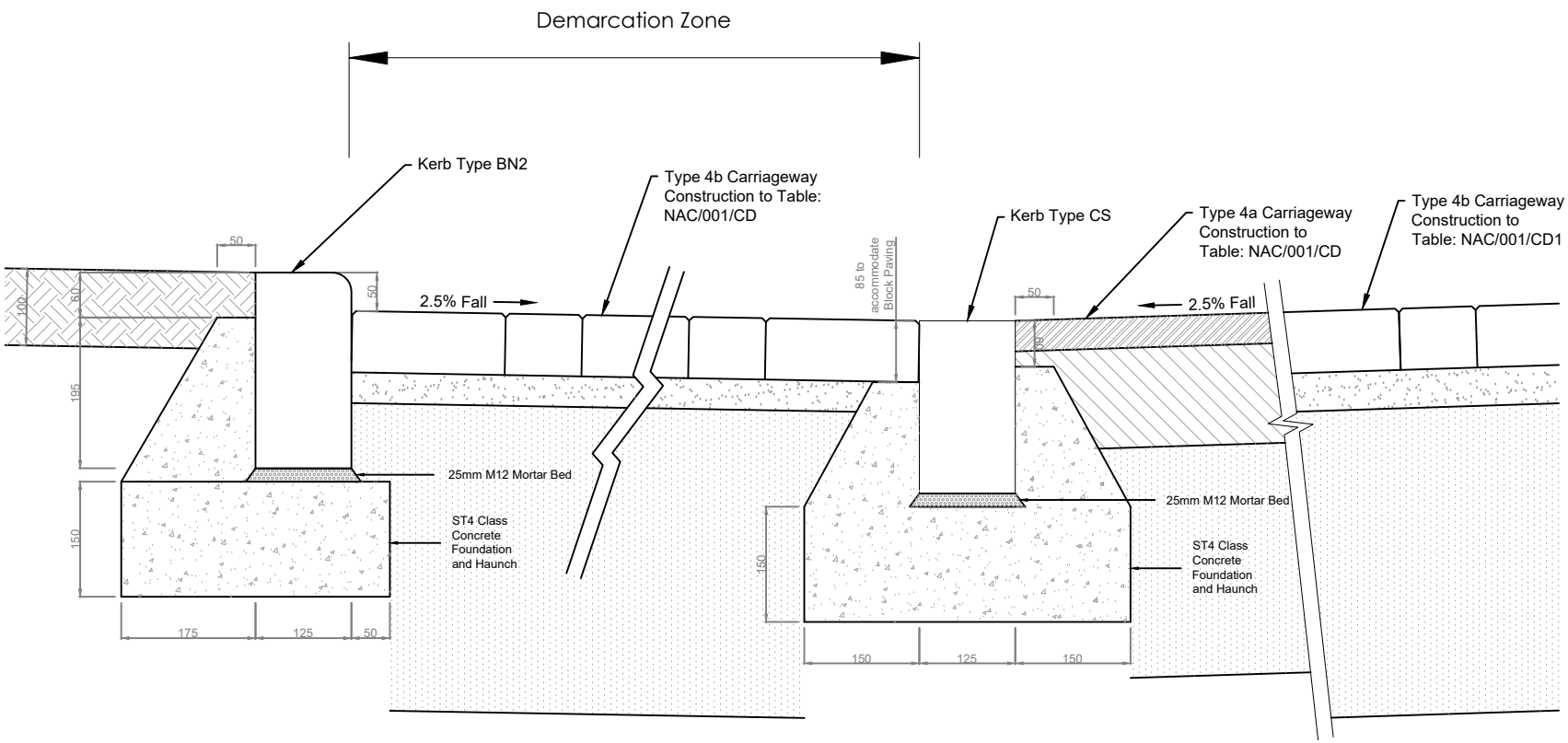
1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD
4. Full Construction Information for Footway to Table NAC/001/CD

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STREET TYPE 3 OR 4 WITH FOOTWAY (30mm kerb upstand)

DRAWING NO	REV
NAC/202/FCB	B



SURFACE COURSE

BINDER COURSE

SAND BEDDING

SUB-BASE

TOP SOIL & GRASS SEED

Carriageway Construction					
Road Type		Sub-Base	Base Course	Binder Course	Surface Course
4 (a)	Shared Surface Streets	300mm Granular Sub-base Type 1 (cl 803)	80mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	50mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Red 14/20mm Uncoated Chipping 40/60 PSV 60 (cl 915)
			130mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)		
4 (b)		400mm Granular Sub-base Type 1 (cl 803)		50mm Bedding Layer of Sharp Sand or Crushed Rock (Appendix 7/1)	200 x 100 x 80mm thick Concrete Rectangular Block Paving (cl 1043)

NOTES

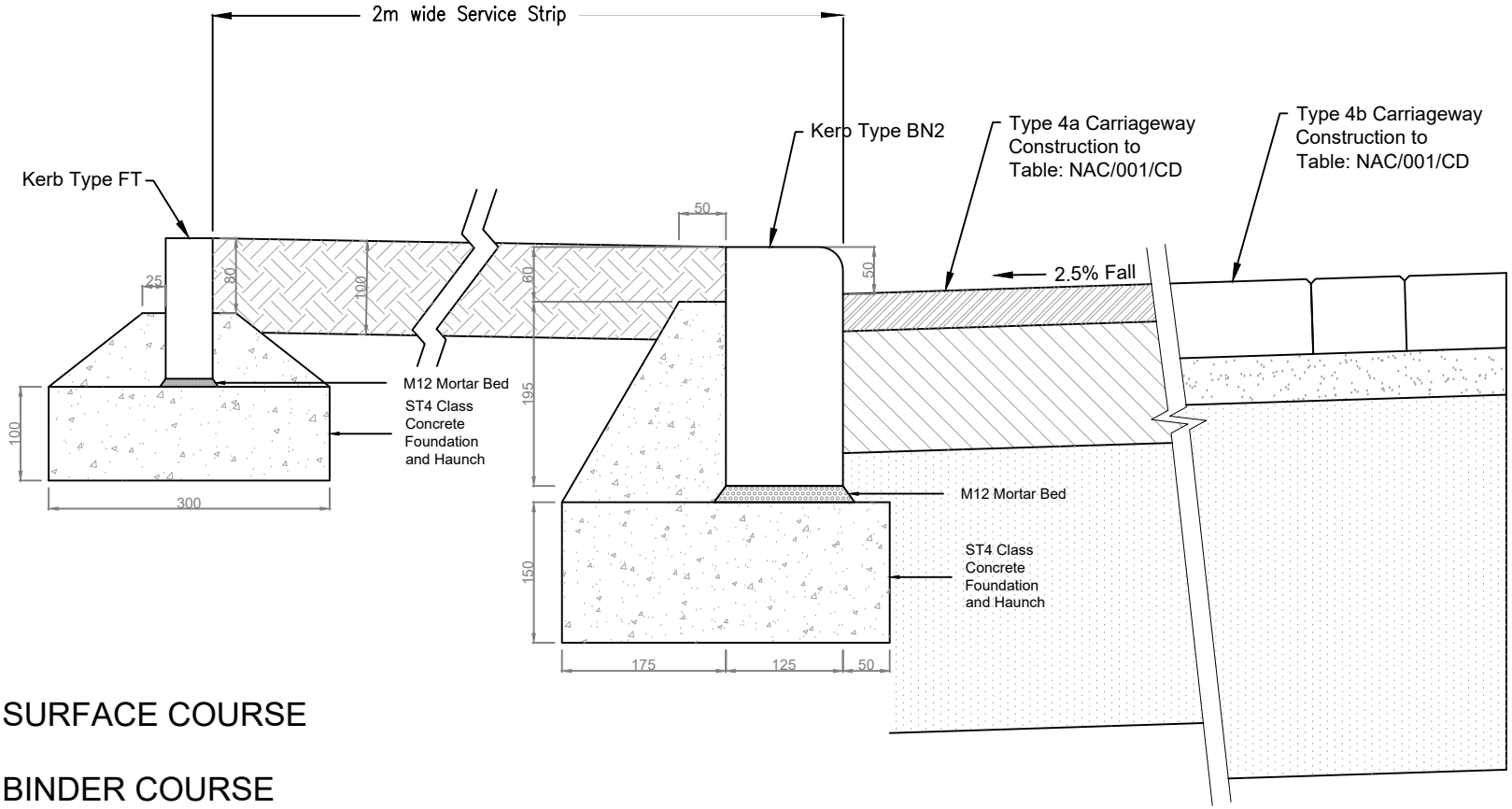
1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD
4. Full Construction Information for Footway to Table NAC/001/CD

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STREET TYPE 4 WITH DEMARCATION ZONE

DRAWING NO	REV
NAC/203/DM4	B



SURFACE COURSE

BINDER COURSE

SAND BEDDING

SUB-BASE

TOP SOIL & GRASS SEED

Carriageway Construction

Road Type		Sub-Base	Base Course	Binder Course	Surface Course
4 (a)	Shared Surface Streets	300mm Granular Sub-base Type 1 (cl 803)	80mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	50mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Red 14/20mm Uncoated Chipping 40/60 PSV 60 (cl 915)
			130mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)		
4 (b)		400mm Granular Sub-base Type 1 (cl 803)		50mm Bedding Layer of Sharp Sand or Crushed Rock (Appendix 7/1)	200 x 100 x 80mm thick Concrete Rectangular Block Paving (cl 1043)

NOTES

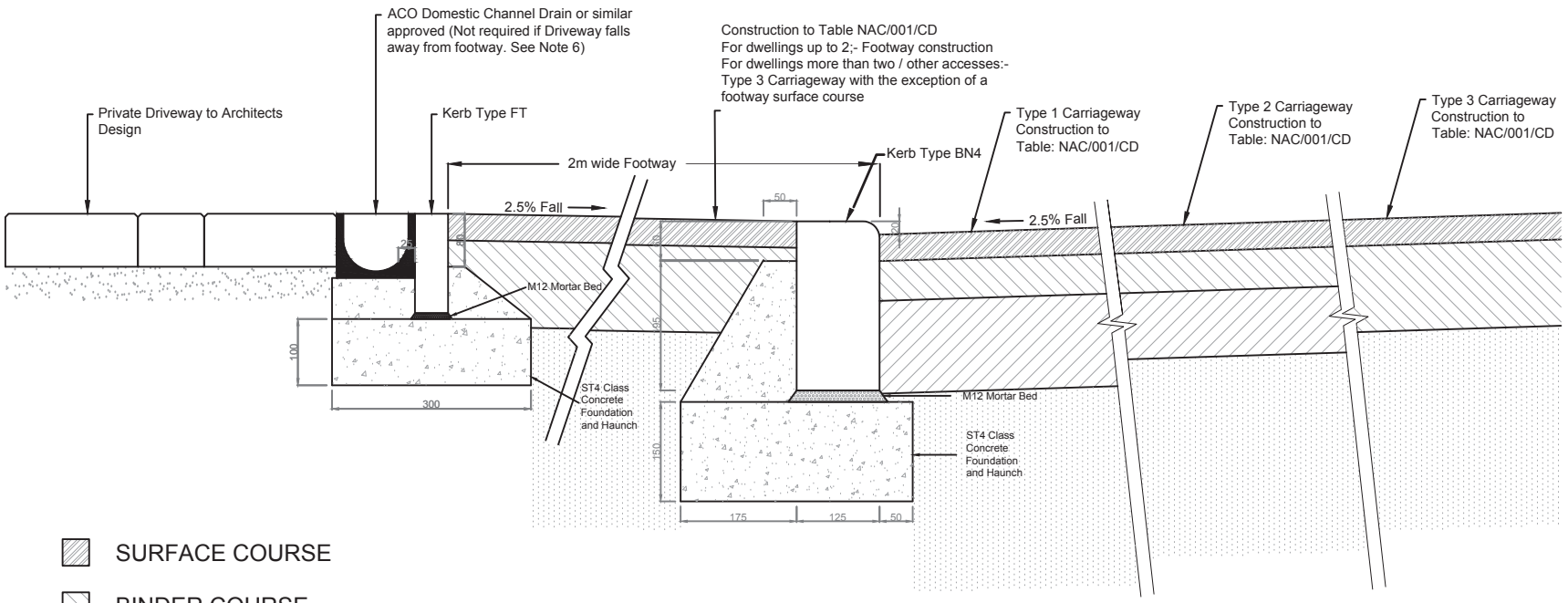
1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STREET TYPE 4 WITH SERVICE STRIP (50mm kerb upstand)

DRAWING NO	REV
NAC/204/SC4	C



SURFACE COURSE

BINDER COURSE

BASE COURSE

SUB-BASE

Carriageway Construction					
Road Type		Sub-Base	Base Course	Binder Course	Surface Course
1	Connector Streets	300mm Granular Sub-base Type 1 (cl 803)	140mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	60mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Black 14/20mm Coated Chipping 40/60 PSV 60 (cl 915)
2	Local Residential Streets	300mm Granular Sub-base Type 1 (cl 803)	100mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	60mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Black 14/20mm Coated Chipping 40/60 PSV 60 (cl 915)
3	Residential Link Streets	300mm Granular Sub-base Type 1 (cl 803)	80mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	50mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Red 14/20mm Uncoated Chipping 40/60 PSV 60 (cl 915)
			130mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)		

NOTES

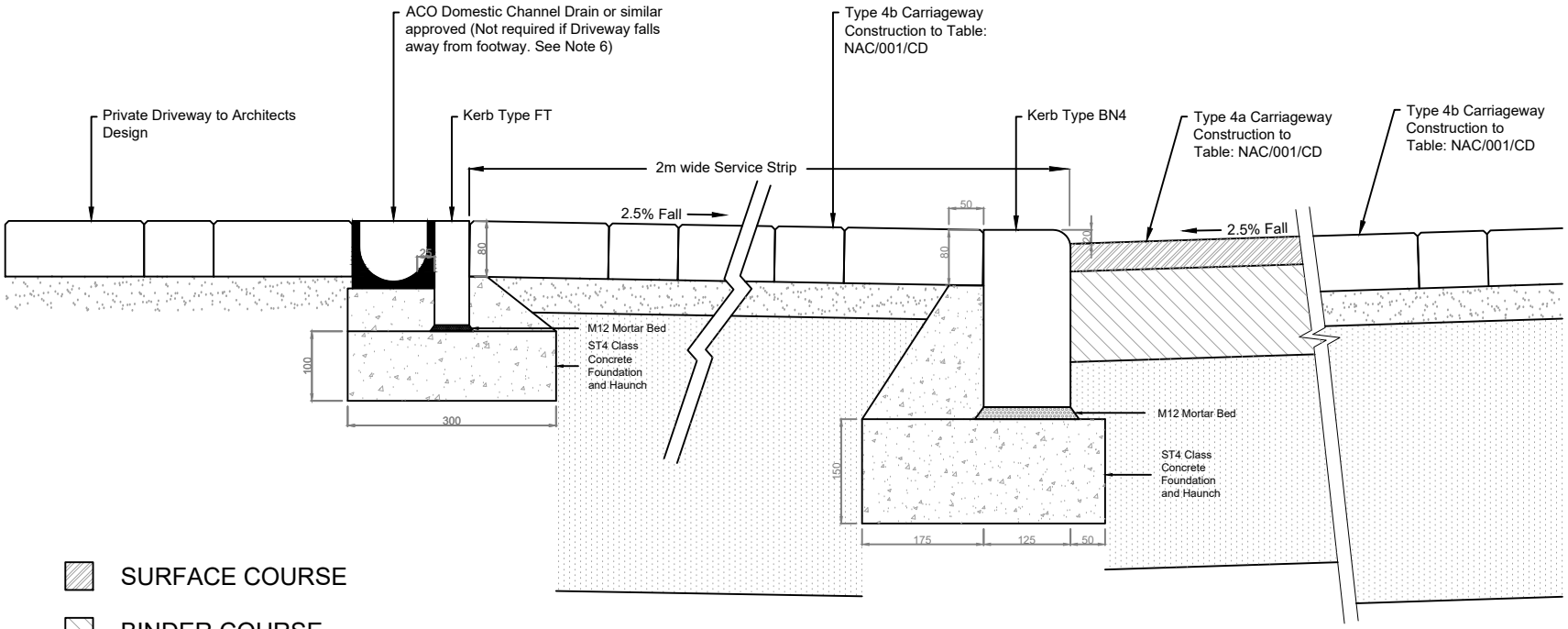
1. All dimensions in millimetres. (This drawing is not to scale)
2. This drawing should be read in conjunction with drawing NAC/404/DW1
3. New Kerbing details to comply with drawing as stated
4. Full Construction Information for Carriageway to Table NAC/001/CD
5. Full Construction Information for Footway to Table NAC/001/CD
6. Where the gradient of the Private Driveway slopes towards the Public Footway, a Drainage Channel as depicted must be installed. It is not required if the Private Driveway slopes into the private grounds.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STREET TYPE 1, 2 OR 3 AT DRIVEWAY/ACCESS

DRAWING NO	REV
NAC/205/DW2	D



SURFACE COURSE

BINDER COURSE

SAND BEDDING

SUB-BASE

Carriageway Construction					
Road Type		Sub-Base	Base Course	Binder Course	Surface Course
4 (a)	Shared Surface Streets	300mm Granular Sub-base Type 1 (cl 803)	80mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	50mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Red 14/20mm Uncoated Chipping 40/60 PSV 60 (cl 915)
			130mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)		
4 (b)		400mm Granular Sub-base Type 1 (cl 803)		50mm Bedding Layer of Sharp Sand or Crushed Rock (Appendix 7/1)	200 x 100 x 80mm thick Concrete Rectangular Block Paving (cl 1043)

NOTES

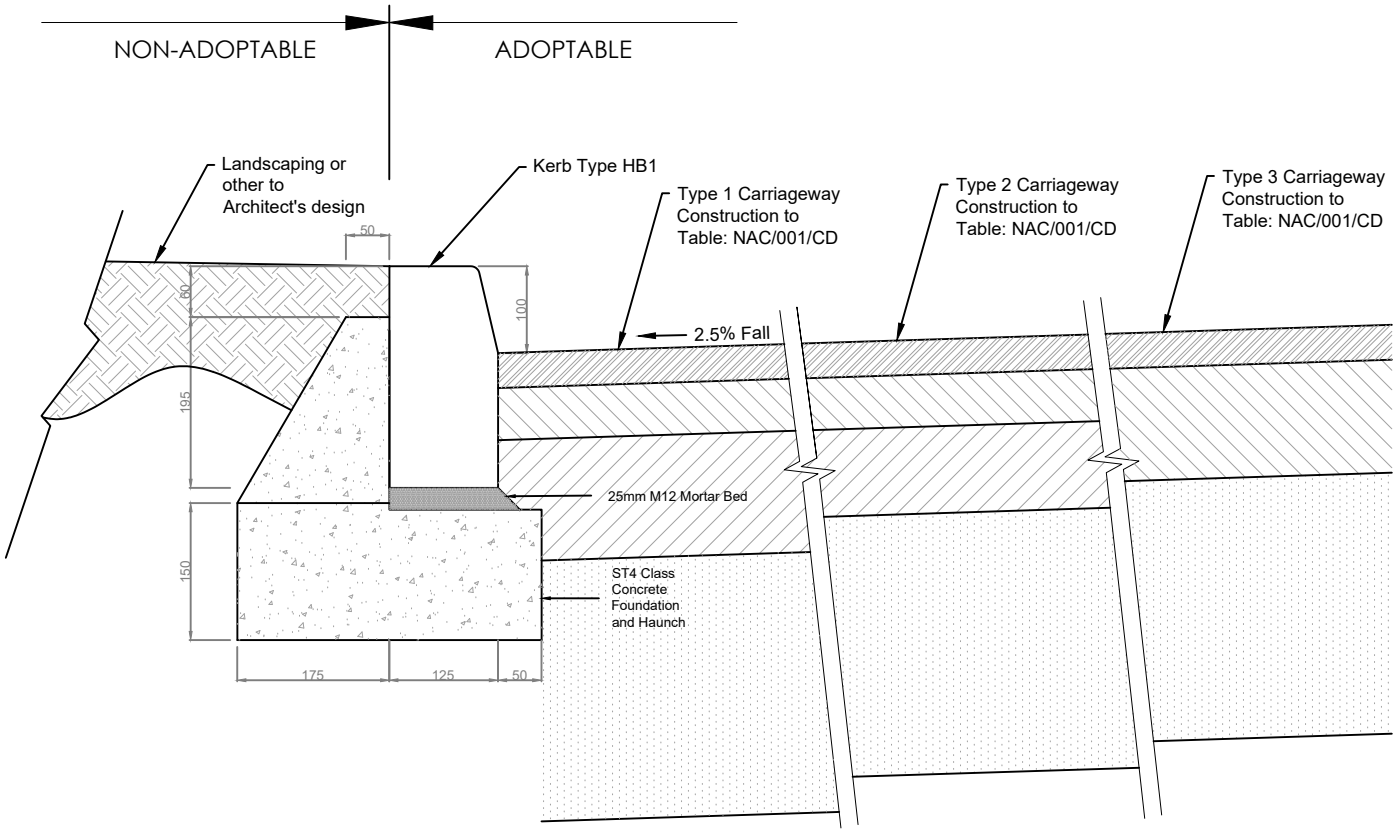
1. All dimensions in millimetres. (This drawing is not to scale)
2. This drawing should be read in conjunction with drawing NAC/410/DW4
3. New Kerbing details to comply with drawing as stated
4. Full Construction Information for Carriageway to Table NAC/001/CD
5. Full Construction Information for Footway to Table NAC/001/CD
6. Where the gradient of the Private Driveway slopes towards the Public Footway, a Drainage Channel as depicted must be installed. It is not required if the Private Driveway slopes into the private grounds.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STREET TYPE 4 AT DRIVEWAY/ACCESS

DRAWING NO	REV
NAC/206/DW3	D



SURFACE COURSE

BINDER COURSE

BASE COURSE

SUB-BASE

Carriageway Construction					
Road Type		Sub-Base	Base Course	Binder Course	Surface Course
1	Connector Streets	300mm Granular Sub-base Type 1 (cl 803)	140mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	60mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Black 14/20mm Coated Chipping 40/60 PSV 60 (cl 915)
2	Local Residential Streets	300mm Granular Sub-base Type 1 (cl 803)	100mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	60mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Black 14/20mm Coated Chipping 40/60 PSV 60 (cl 915)
3	Residential Link Streets	300mm Granular Sub-base Type 1 (cl 803)	80mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	50mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Red 14/20mm Uncoated Chipping 40/60 PSV 60 (cl 915)
			130mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)		

NOTES

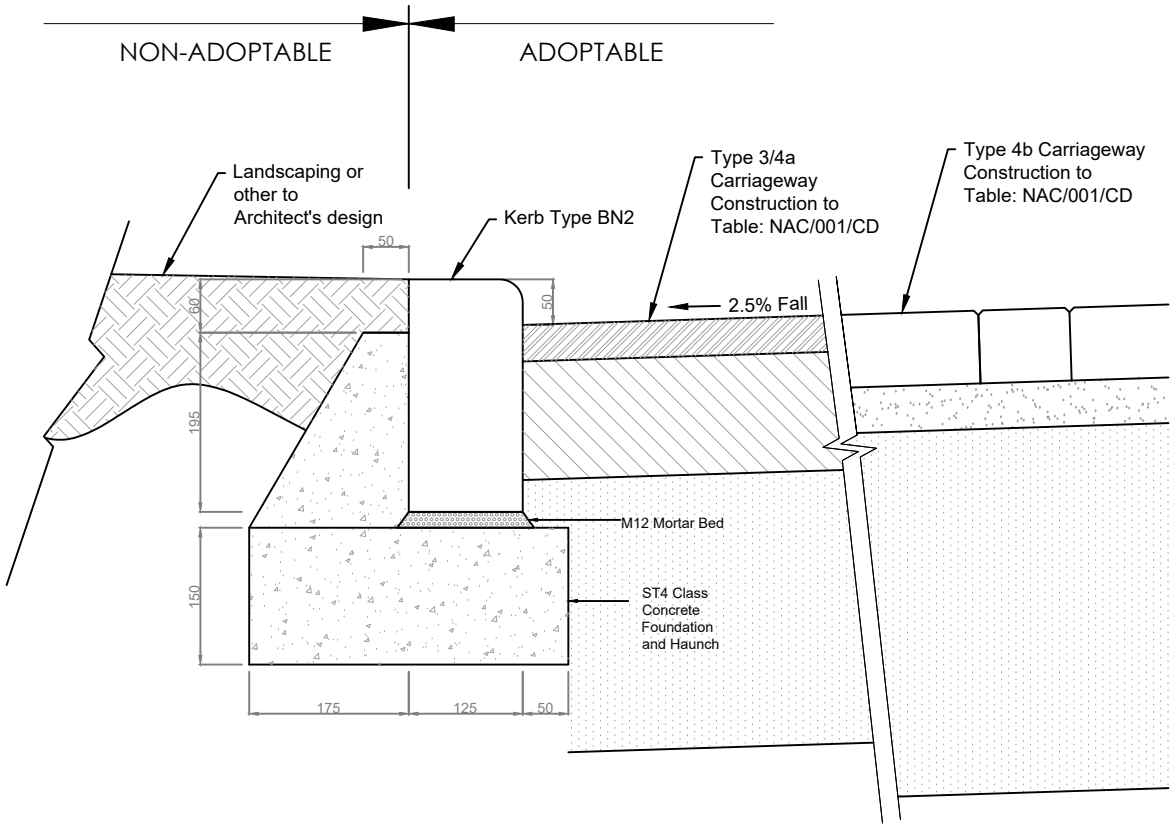
1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STREET TYPE 1, 2 OR 3 - NO ADJACENT ADOPTABLE ASSET (100mm kerb upstand)

DRAWING NO	REV
NAC/207/SNA1	B



SURFACE COURSE

BINDER COURSE

BASE COURSE

SUB-BASE

Carriageway Construction					
Road Type		Sub-Base	Base Course	Binder Course	Surface Course
3	Residential Link Streets	300mm Granular Sub-base Type 1 (cl 803)	80mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	50mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Red 14/20mm Uncoated Chipping 40/60 PSV 60 (cl 915)
			130mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)		
4 (a)	Shared Surface Streets	300mm Granular Sub-base Type 1 (cl 803)	80mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	50mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Red 14/20mm Uncoated Chipping 40/60 PSV 60 (cl 915)
			130mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)		
4 (b)		400mm Granular Sub-base Type 1 (cl 803)		50mm Bedding Layer of Sharp Sand or Crushed Rock (Appendix 7/1)	200 x 100 x 80mm thick Concrete Rectangular Block Paving (cl 1043)

NOTES

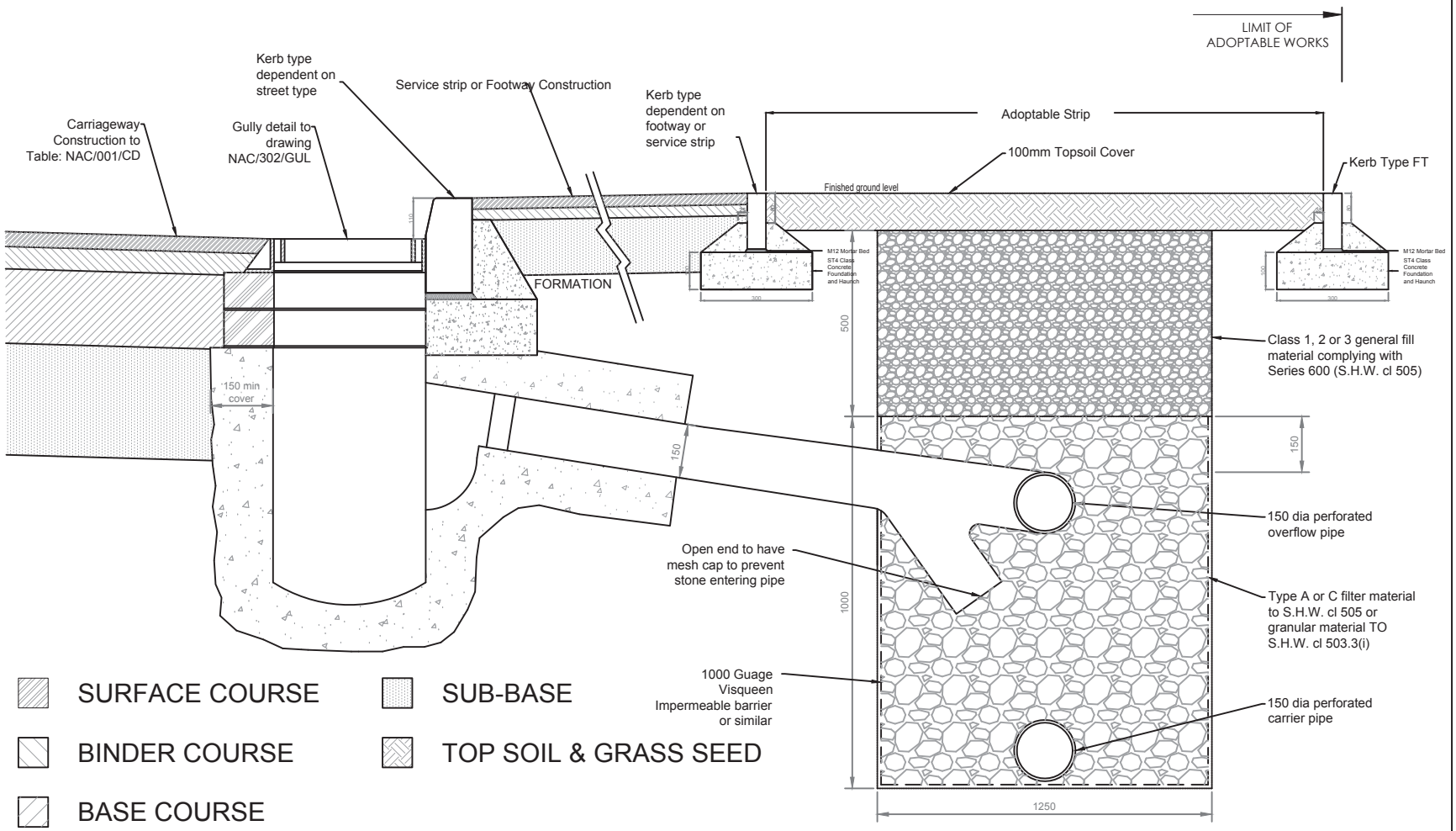
1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STREET TYPE 3 or 4 - NO ADJACENT ADOPTABLE ASSET (50mm kerb upstand)

DRAWING NO	REV
NAC/208/SNA2	B



NOTES

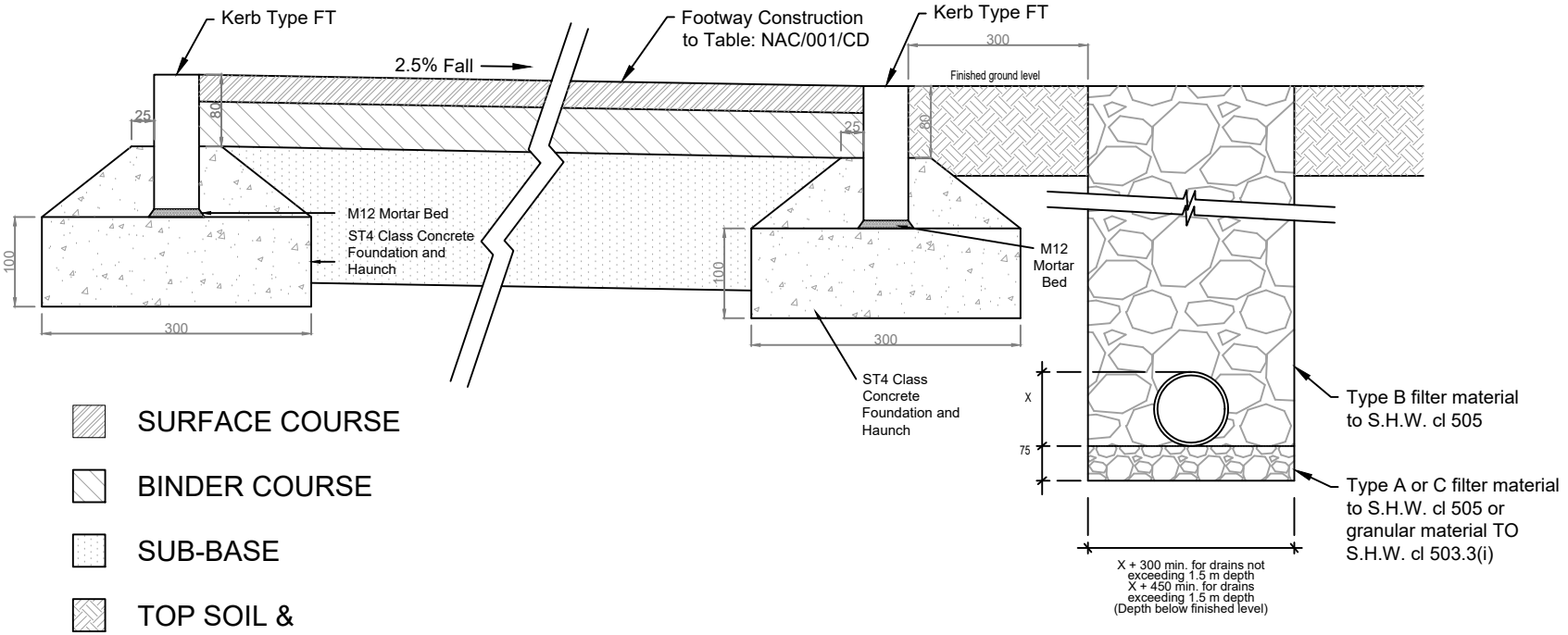
1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD
4. Full Construction Information for Footway to Table NAC/001/CD
5. Gully detail to drawing NAC/302/GUL
6. Acceptable Backfill material to be material excavated from within the site or imported on to the site which meets the requirements of S.H.W. Table 6/1 and contract specific Appendix 6/1 for acceptability for use in the permanent works.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

TYPICAL STREET WITH GULLY AND ADJACENT FILTER TRENCH

DRAWING NO	REV
NAC/209/SFT	B



Footway/path, Cycle Track Construction

Location	Sub-Base	Binder Course	Surface Course
Urban	150mm Granular Sub-base Type 1 (cl 803)	50mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	30mm Hot Rolled Asphalt Surface Course (Recipe Mixture)(cl 910), (HRA 15/10 F surf 40/60)
Rural	200mm Type 1 or recycled suitable material (eg planings)	40mm Close Graded Asphalt Concrete (cl 912) (AC 14 close surf 100/150)	25mm Hot Rolled Asphalt Surface Course (Recipie Mixture) (cl 910), (HRA 15/10 F surf 40/60) or 25mm Close Graded Asphalt Concrete Surface course (cl 912), (AC 10 close surf 100/150)
		Combined 50mm Close Graded Asphalt Concrete Surface course (cl 912) (AC 10 close surf 100/150)	

NOTES

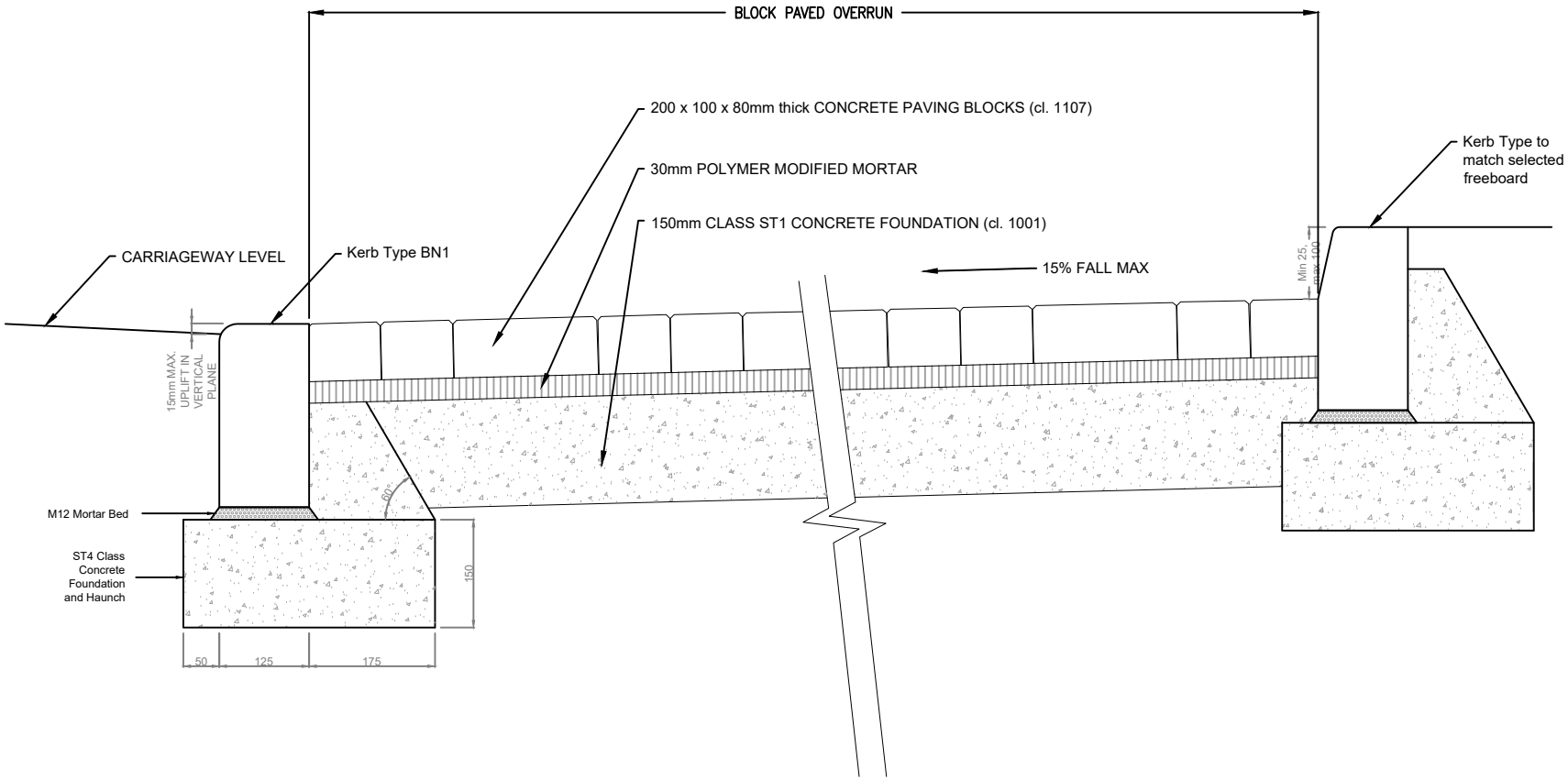
1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Footway to Table NAC/001/CD
4. Desirably, gradients on footways and footpaths should not exceed 5%, with a nominal maximum of 8%. They should be constructed with crossfall of 3%. Steeper gradients may occasionally be permitted, subject to the provision of a handrail on at least one side and rest platforms at 10 metre intervals.
5. Dimension X is the external diameter of the pipe
6. This drawing is to be read in conjunction with Appendix 5/1
7. Pipes shall comply with the requirements for filter drain pipes in Table 5/1 of the S.H.W.
8. Pipes are to be laid with slots or perforations upwards where a concrete bed is used. For other beds the slots shall be orientated as described in Appendix 5/1
9. Minimum drain width;
   X+300 for drains not exceeding 1.5 m depth
   X+450 for drains exceeding 1.5 m depth
   (Depth below finished level)

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

TYPICAL FOOTPATH WITH FILTER TRENCH

DRAWING NO	REV
NAC/210/RFP	A



NOTES

1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. For Construction Information for Carriageway refer to Table NAC/001/CD.
4. Overrun areas should not have any vertical face which exceeds 6 mm in height and sloping areas should not exceed a slope angle of 15°, measured from the surface of the carriageway.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

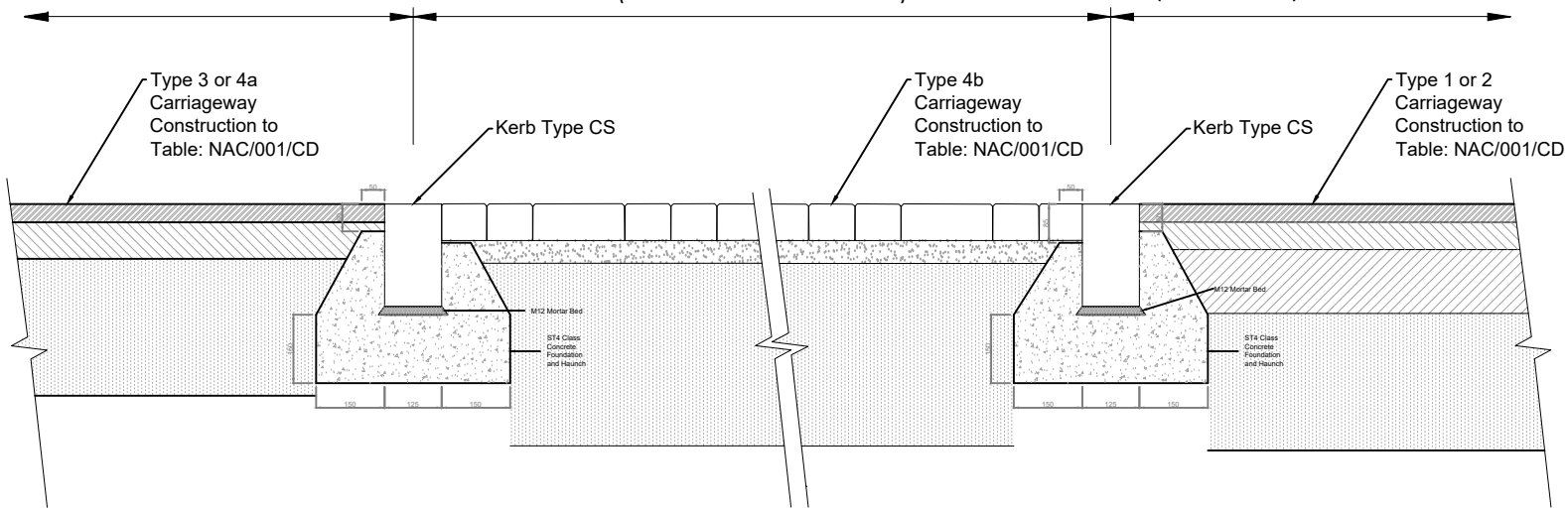
BLOCK PAVED OVERRUN CONSTRUCTION DETAIL

DRAWING NO	REV
NAC/211/OVR	B

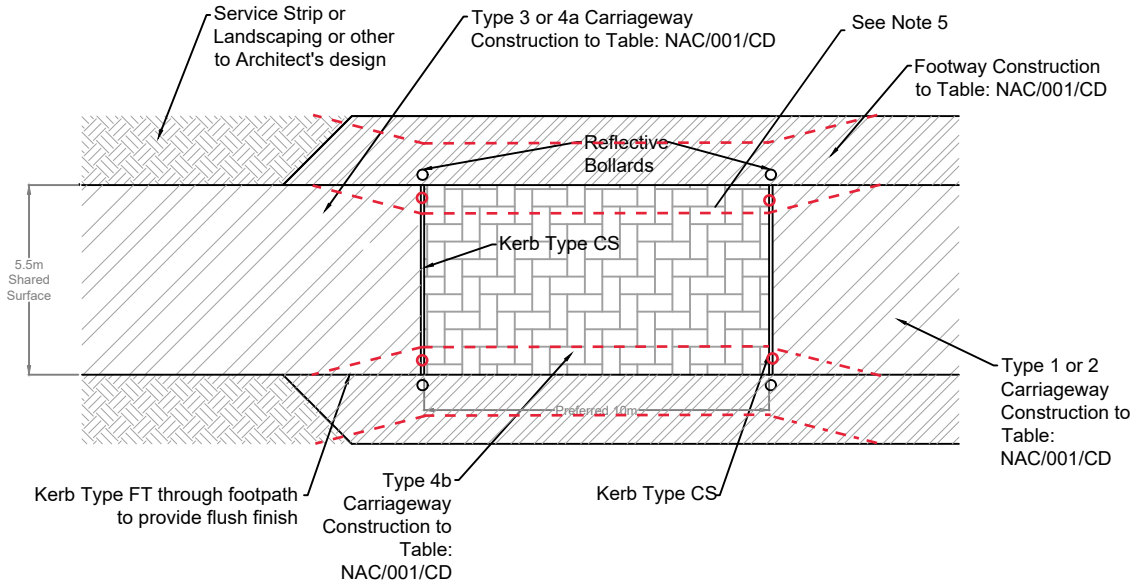
Residential Link/Shared Surface Streets
(TYPE 3 or 4)

BLOCK PAVED TRANSITION
(PREFERRED 10M LONG)

Connector/Local Residential Streets
(TYPE 1 or 2)



- BLOCK PAVING
- SURFACE COURSE
- BINDER COURSE
- BASE COURSE
- SUB-BASE
- SAND BEDDING
- TOP SOIL & GRASS SEED



NOTES

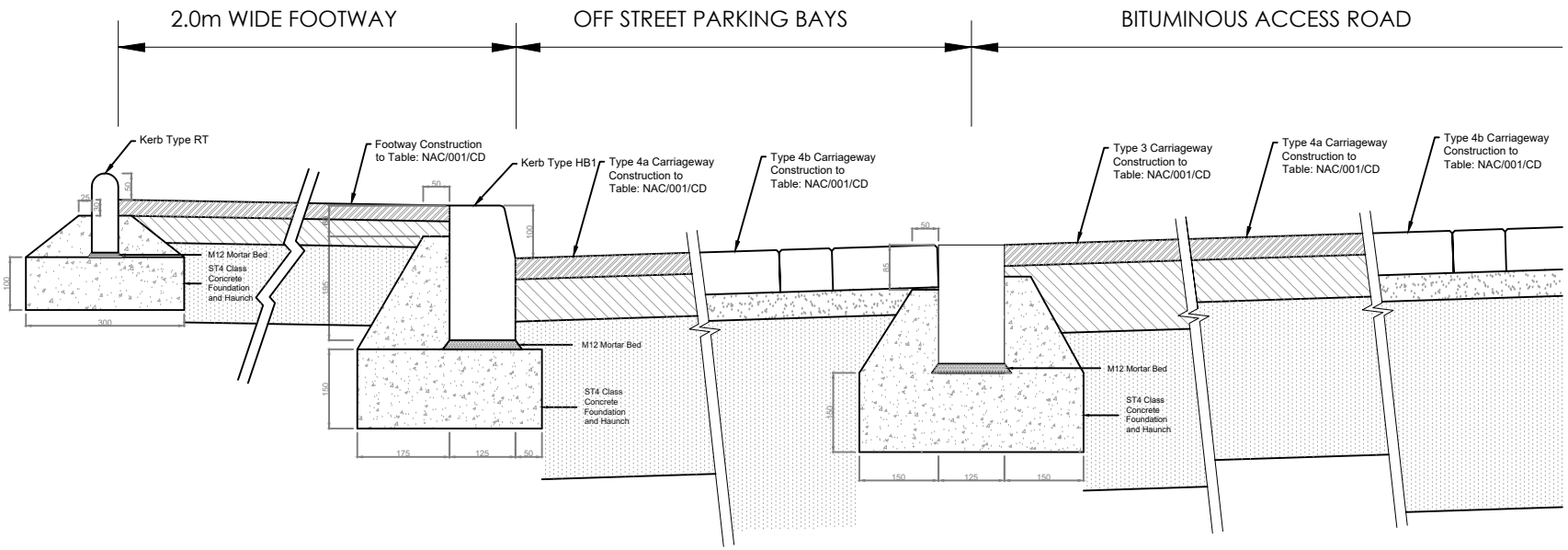
1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD
4. Full Construction Information for Footway to Table NAC/001/CD
5. Transition area can also be narrowed and ramped over the length as shown red.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

TRANSITION FEATURE TO A TYPE 3 OR 4 STREET

DRAWING NO	REV
NAC/212/TRCS	C



SURFACE COURSE

BINDER COURSE

BASE COURSE

SUB-BASE

SAND BEDDING

FORMATION

Carriageway Construction

Road Type		Sub-Base	Base Course	Binder Course	Surface Course
3	Residential Link Streets	300mm Granular Sub-base Type 1 (cl 803)	80mm Dense Base Course Asphalt Concrete (Recipe Mixture (cl 906), (AC 32 dense base 100/150 rec)	50mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Red 14/20mm Coated Chipping 40/60 PSV 60 (cl 915)
			130mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)		
4 (a)	Shared Surface Streets	300mm Granular Sub-base Type 1 (cl 803)		80mm Dense Binder Course Asphalt Concrete (Recipe Mixture) (cl 906), (AC 20 dense bin 100/150 rec)	40mm Hot Rolled Asphalt Surface Course (Recipe Mixture) (cl 910), (HRA 30/14 F surf 40/60) with Red 14/20mm Coated Chipping 40/60 PSV 60 (cl 915)
4 (b)		400mm Granular Sub-base Type 1 (cl 803)		50mm Bedding Layer of Sharp Sand or Crushed Rock (Appendix 7/1)	200 x 100 x 80mm thick Concrete Rectangular Block Paving (cl 1043) or 200 x 100 x 65mm Concrete Pavers (cl 1107)

NOTES

1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD
4. Full Construction Information for Footway to Table NAC/001/CD

(This drawing is not to scale)

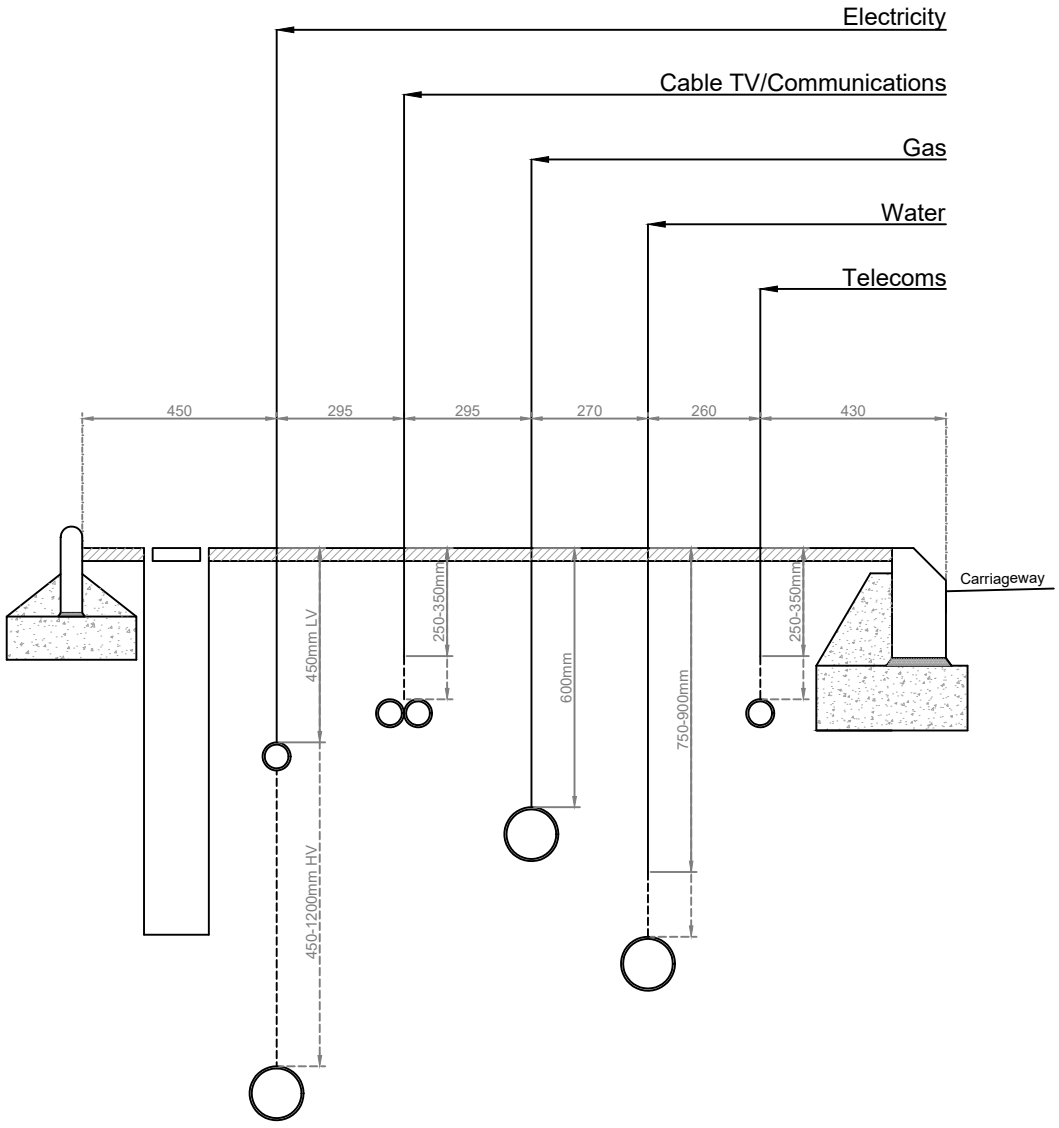
North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STANDARD FOOTWAY/OFF STREET PARKING BAYS CONSTRUCTION

DRAWING NO	REV
NAC/213/PAR	B

NOTES

1. All dimensions in millimetres.
2. Dimensions taking from the NJUG Guidelines on the Positioning and Colour Coding of Underground Utilities' Apparatus.



RECOMMENDED POSITIONING OF UTILITY APPARATUS IN A 2 METRE FOOTWAY

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

DRAWING NO	REV
NAC/301/SER	A

NOTES

1. All dimensions in millimetres.

2. Gully grating and frame shall be to BS EN 124

3. Class D400 with Minimum clear opening 450 x 450 bedding and haunched with rapid hardening cement mortar

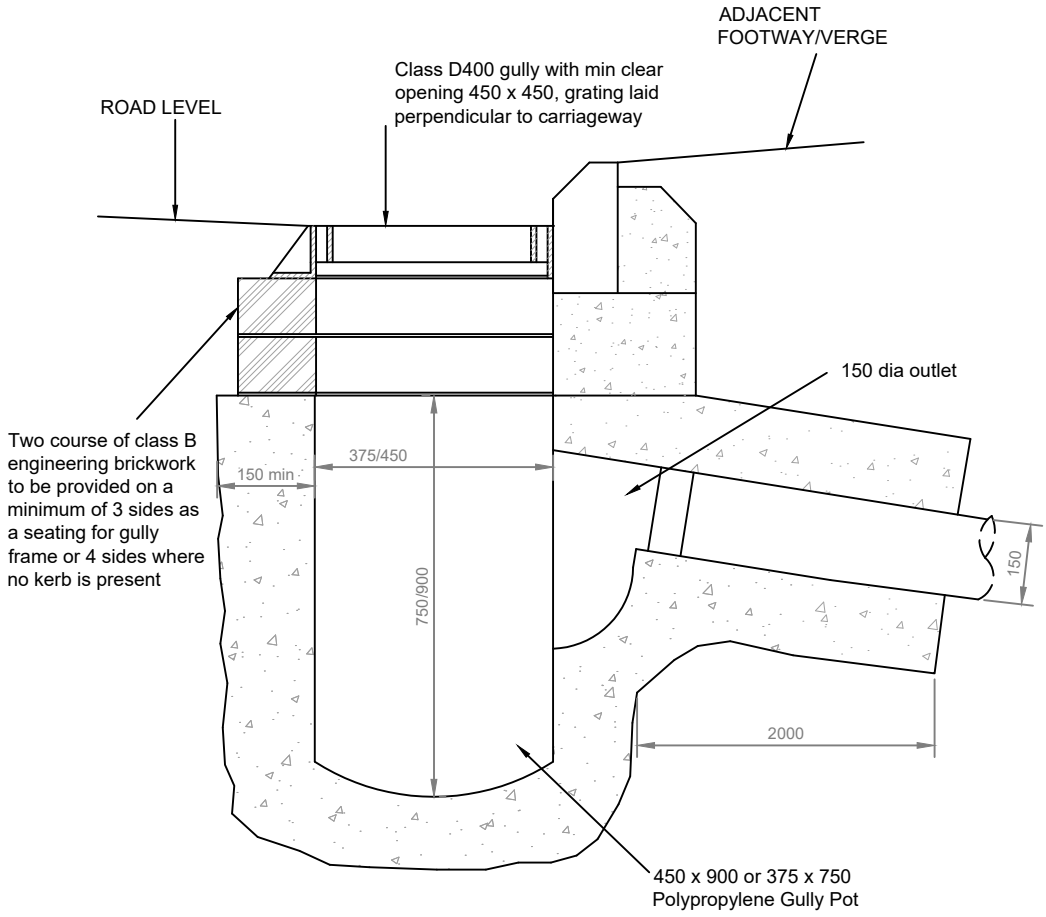
4. Concrete and bedding mortar to achieve 20N/mm within 2 hours.

5. 150mm Thick ST4 Concrete surround & bed

6. Two course of class B engineering brickwork to be provided on a minimum of 3 sides as a seating for gully frame or 4 sides where no kerb is present

7. 450 x 900 or 375 x 750 Polypropylene Gully Pot

8. Flexible pipe may only be used if agreed by the overseeing organisation



North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

PRECAST CONCRETE TRAPPED STREET GULLY 450 mm NOMINAL BORE

DRAWING NO	REV
NAC/302/GUL	A

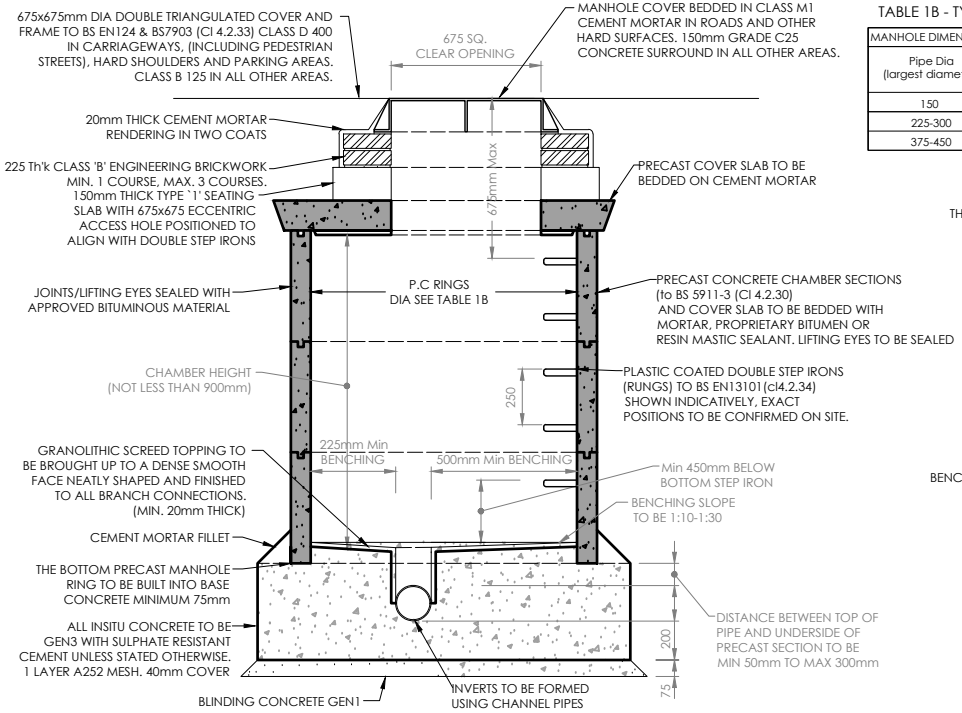
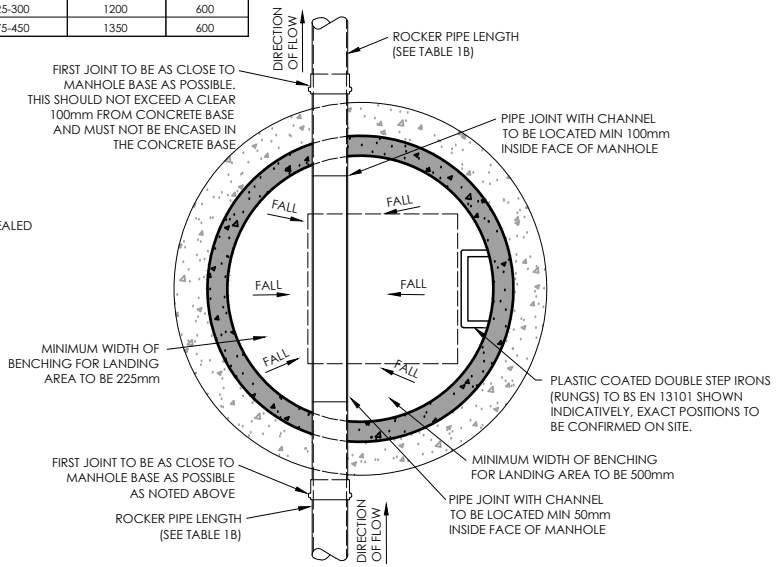


TABLE 1B - TYPE `B' MANHOLE (0-3m d'p)

MANHOLE DIMENSIONS (mm)		
Pipe Dia (largest diameter)	Mh Dia	Rocker pipe length
150	1200	600
225-300	1200	600
375-450	1350	600



NOTE:
MIN. COVER TO PIPES WITHOUT CONCRETE PROTECTION: 1.2m WITHIN ROADWAY, 0.9m WITHIN PARKING.

PIPES WITH LESS THAN THE MIN. COVER SHOULD BE PROTECTED WITH 150mm CONCRETE SURROUND WITH FLEXIBLE JOINTS AT EACH PIPE JOINT.

CONCRETE PROTECTION TO uPVC PIPES: 150 th'k CONCRETE SLAB INSTALLED ABOVE CROWN OF PIPE IN ACCORDANCE WITH Sco.W. DETAILS.

ALL PIPES TO HAVE A 150mm THICK CLASS 'S' GRANULAR PIPE SURROUND UNLESS NOTED OTHERWISE.

MANHOLE & SILT TRAP COVERS

ADOPTABLE ROADS/ PRIVATE CARRIAGEWAY/ PARKING:	DUCTILE IRON HEAVY DUTY DOUBLE TRIANGULAR CLASS D400 BY PETER SAVAGE Ltd. OR SIMILAR.
PEDESTRIAN AND LANDSCAPED AREAS:	DUCTILE IRON CLASS B125 MEDIUM DUTY BY PETER SAVAGE Ltd OR SIMILAR.

- MANHOLE COVERS WITHIN BUILDINGS TO BE DOUBLE SEALED COVERS
- ALL MANHOLE COVERS TO HAVE BS `KITEMARK'

NOTES

1. All dimensions in millimeters.
2. Pipelines and manholes to be constructed in accordance with the `Sewers for Scotland' 3rd edition WRC publication in conjunction with Scottish Water, office specification and requirements.
3. Rocker pipes shall be used for pipes less than 750 nominal diameter entering and leaving manholes. Maximum length not to exceed 600mm uno refer to tables 1B.
4. All precast concrete units to be reinforced and conform to b.s.5911. Step irons to BS EN 13101 double rungs).
5. All joints between p.c. units to be made watertight by the application of cement mortar. "Tokstrip" or other similar approved equal.
6. The lowest chamber ring bearing on the foundation and the highest chamber ring receiving the cover slab shall have plain ends and be bedded in cement mortar.
7. Manhole access hole and step iron positions to be located to give greatest free area of benching immediately below
8. Manhole covers to be class D400 to BS EN 124 double triangular cover & frame 150mm deep with 675mm sq. opening in ductile iron. and bearing the registered certification mark of the british standards institution.
9. Step irons not to protrude into 675 square access opening in shaft cover slab.
10. Precast concrete cover slabs to be heavy duty.
11. Top step iron to be located maximum 675mm from the finished manhole cover level.
12. Concrete foundation to be scabbled before placing granolithic finish.
13. All metalwork to be hot-dip galvanised to BS 729 after manufacture.
14. Buried manholes - covers to be set below ground level (600mm in fields and 300mm in gardens) and covered with a sheet of heavy duty polthene, held in place with waterproof protective tape.

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

TYPE B MANHOLE - MAXIMUM DEPTH 3 METRES
(to be used within carriageway)

DRAWING NO	REV
NAC/303/MH1	A

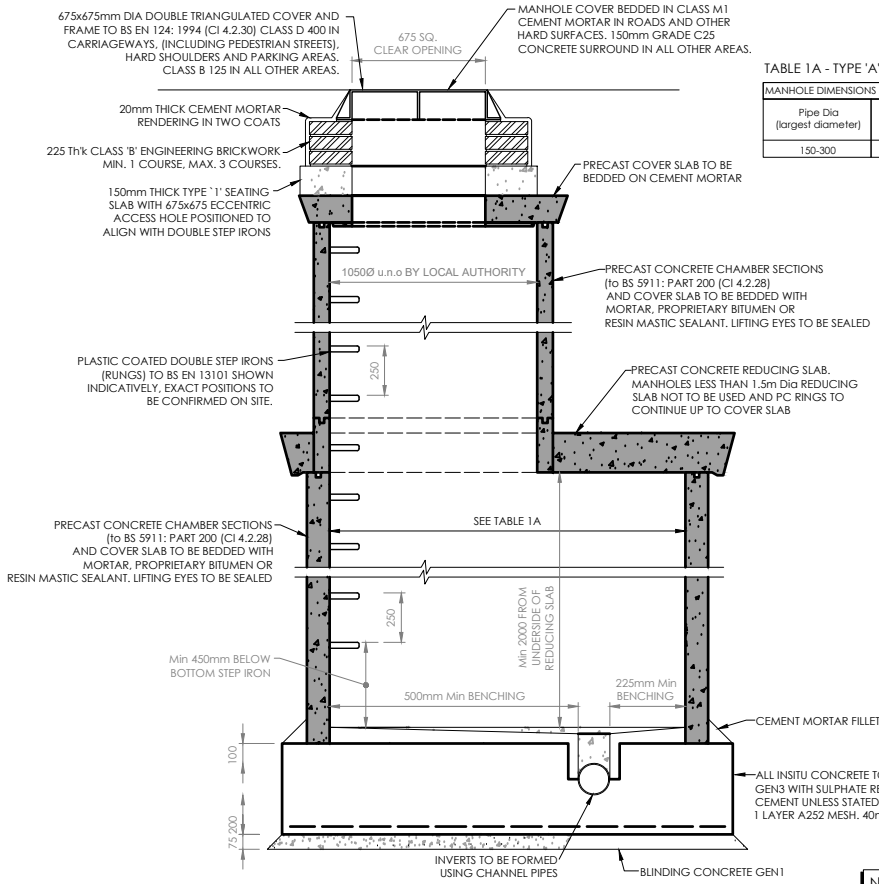
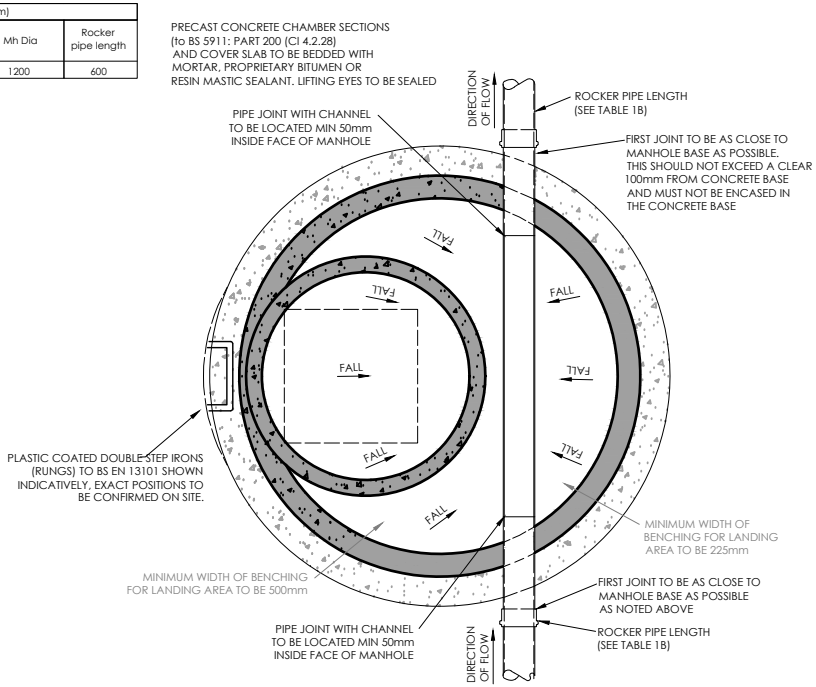


TABLE 1A - TYPE 'A' MANHOLE (3-6m d'p)

MANHOLE DIMENSIONS (mm)		
Pipe Dia (largest diameter)	Mh Dia	Rocker pipe length
150-300	1200	600



NOTE:
MIN. COVER TO PIPES WITHOUT CONCRETE PROTECTION: 1.2m WITHIN ROADWAY, 0.9m WITHIN PARKING.

PIPES WITH LESS THAN THE MIN. COVER SHOULD BE PROTECTED WITH 150mm CONCRETE SURROUND WITH FLEXIBLE JOINTS AT EACH PIPE JOINT.

CONCRETE PROTECTION TO uPVC PIPES: 150 th'k CONCRETE SLAB INSTALLED ABOVE CROWN OF PIPE IN ACCORDANCE WITH Sco.W. DETAILS.

ALL PIPES TO HAVE A 150mm THICK CLASS 'S' GRANULAR PIPE SURROUND UNLESS NOTED OTHERWISE.

MANHOLE & SILT TRAP COVERS

ADOPTABLE ROADS/ PRIVATE CARRIAGEWAY/ PARKING:	DUCTILE IRON HEAVY DUTY DOUBLE TRIANGULAR CLASS D400 BY PETER SAVAGE Ltd. OR SIMILAR.
PEDESTRIAN AND LANDSCAPED AREAS:	DUCTILE IRON CLASS B125 MEDIUM DUTY BY PETER SAVAGE Ltd OR SIMILAR.

- MANHOLE COVERS WITHIN BUILDINGS TO BE DOUBLE SEALED COVERS
- ALL MANHOLE COVERS TO HAVE BS `KITEMARK'

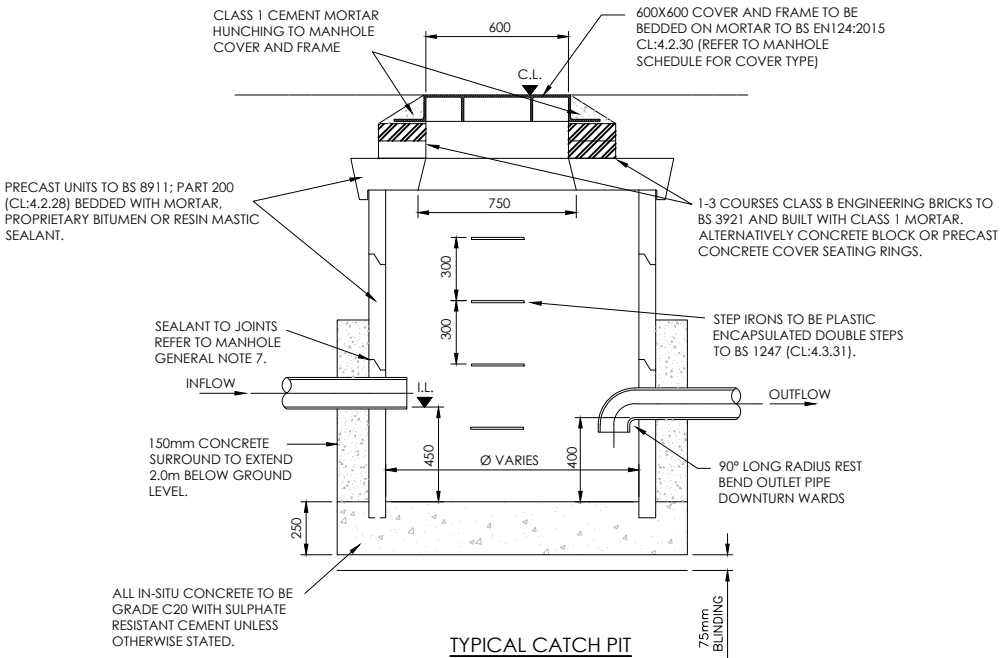
NOTES

1. All dimensions in millimeters.
2. Pipelines and manholes to be constructed in accordance with the `Sewers for Scotland' 3rd edition WRC publication in conjunction with Scottish Water, office specification and requirements.
3. Rocker pipes shall be used for pipes less than 750 nominal diameter entering and leaving manholes. Maximum length not to exceed 600mm uno refer to tables 1B.
4. All precast concrete units to be reinforced and conform to b.s.5911. Step irons to BS EN 13101 double rungs).
5. All joints between p.c. units to be made watertight by the application of cement mortar. "Tokstrip" or other similar approved equal.
6. The lowest chamber ring bearing on the foundation and the highest chamber ring receiving the cover slab shall have plain ends and be bedded in cement mortar.
7. Manhole access hole and step iron positions to be located to give greatest free area of benching immediately below
8. Manhole covers to be class D400 to BS EN 124 double triangular cover & frame 150mm deep with 675mm sq. opening in ductile iron. and bearing the registered certification mark of the british standards institution.
9. Step irons not to protrude into 675 square access opening in shaft cover slab.
10. Precast concrete cover slabs to be heavy duty.
11. Top step iron to be located maximum 675mm from the finished manhole cover level.
12. Concrete foundation to be scabbled before placing granolithic finish.
13. All metalwork to be hot-dip galvanised to BS 729 after manufacture.
14. Buried manholes - covers to be set below ground level (600mm in fields and 300mm in gardens) and covered with a sheet of heavy duty polthene, held in place with waterproof protective tape.

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

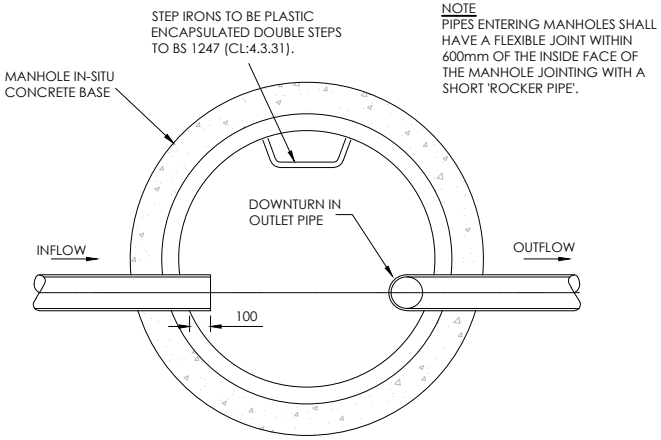
TYPE A MANHOLE - DEPTH 3 TO 6 METRES
(to be used within carriageway)

DRAWING NO	REV
NAC/304/MH2	A



TYPICAL CATCH PIT
PRECAST CONCRETE MANHOLE DETAIL
SECTION C-C

DEPTH FROM GROUND LEVEL TO SOFFIT 1.5m - 3.0m
(Scale 1:20)



TYPICAL CATCH PIT
PRECAST CONCRETE MANHOLE DETAIL
PLAN SECTION D-D

DEPTH FROM GROUND LEVEL TO SOFFIT 1.5m - 3.0m
(Scale 1:20)

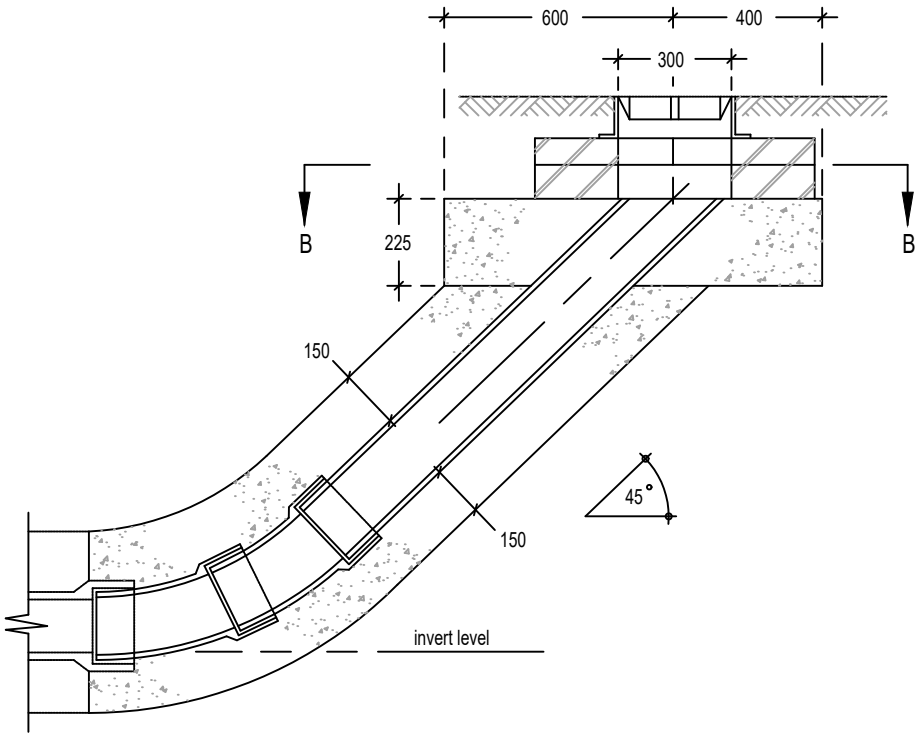
NOTES

1. All dimensions in millimeters.
2. Pipelines and manholes to be constructed in accordance with the `Sewers for Scotland' 3rd edition WRC publication in conjunction with Scottish Water, office specification and requirements.
3. Rocker pipes shall be used for pipes less than 750 nominal diameter entering and leaving manholes. Maximum length not to exceed 600mm uno refer to tables 1B.
4. All precast concrete units to be reinforced and conform to b.s.5911. Step irons to BS EN 13101 double rungs).
5. All joints between p.c. units to be made watertight by the application of cement mortar. "Tokstrip" or other similar approved equal.
6. The lowest chamber ring bearing on the foundation and the highest chamber ring receiving the cover slab shall have plain ends and be bedded in cement mortar.
7. Manhole access hole and step iron positions to be located to give greatest free area of benching immediately below
8. Manhole covers to be class D400 to BS EN 124 double triangular cover & frame 150mm deep with 675mm sq. opening in ductile iron. and bearing the registered certification mark of the british standards institution.
9. Step irons not to protrude into 675 square access opening in shaft cover slab.
10. Precast concrete cover slabs to be heavy duty.
11. Top step iron to be located maximum 675mm from the finished manhole cover level.
12. Concrete foundation to be scabbled before placing granolithic finish.
13. All metalwork to be hot-dip galvanised to BS 729 after manufacture.
14. Buried manholes - covers to be set below ground level (600mm in fields and 300mm in gardens) and covered with a sheet of heavy duty polthene, held in place with waterproof protective tape.

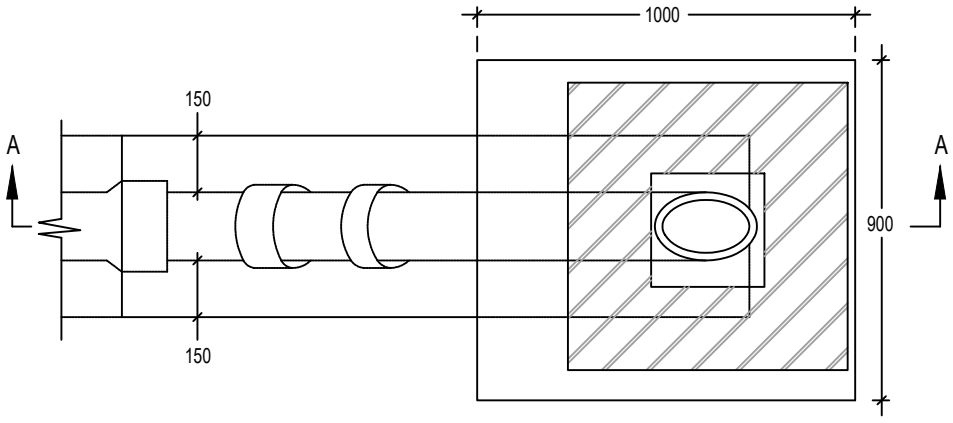
North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

CATCHPIT
(to be used outwith carriageway)

DRAWING NO	REV
NAC/305/CTP	A



SECTIONAL ELEVATION AA



SECTIONAL PLAN BB

NOTES

1. All dimensions in millimetres.

2. This chamber is for use where the pipe diameter does not exceed 225 mm.

3. Two number 22.5° bends shall be used to connect the drop pipe to the main pipe.

4. The drop pipe and bend shall be surrounded with 150 mm thick concrete GEN 1 with consistence class S1 complying with BS 8500–1:2006 + A1:2012.

5. Except for corrugated pipes, the nearest joint in the main pipe shall form part of an articulated section and be not more than 500 mm from the bend.

6. Chamber base to be cast in situ in concrete GEN 1 with consistence class S3 complying with BS 8500–1:2006 + A1:2012 with a smooth finish to Class U3.

7. The drop pipe shall be cast into chamber base.

8. One to two courses of Class B engineering brick to BS EN 771–1:2003, 225 mm thick to be provided to adjust final level of rodding eye cover.

9. Rodding eye cover to be to BS EN 124:1994. Class D400. All mortar to be M12 except that the cover frame shall be bedded on epoxy resin mortar.

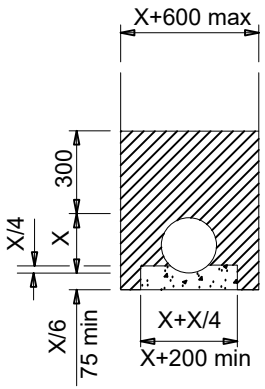
10. For construction of all buried pipes, refer to BS 9295:2010.

(This drawing is not to scale)

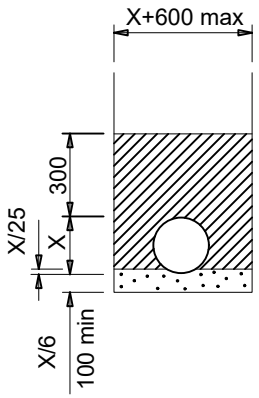
North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

RODDING EYE DETAIL

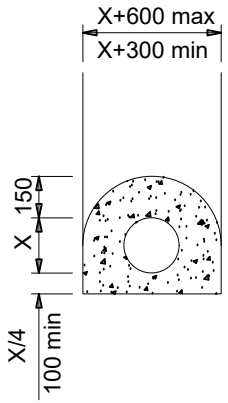
DRAWING NO	REV
NAC/306/ROD	A



TYPE A



TYPE F



TYPE Z

KEY

Granular material to S.H.W. Clause 503.3(i).

Concrete to S.H.W.Clause 503.3 (iii)

Class 8 material to S.H.W. Clause 503.3(iv).

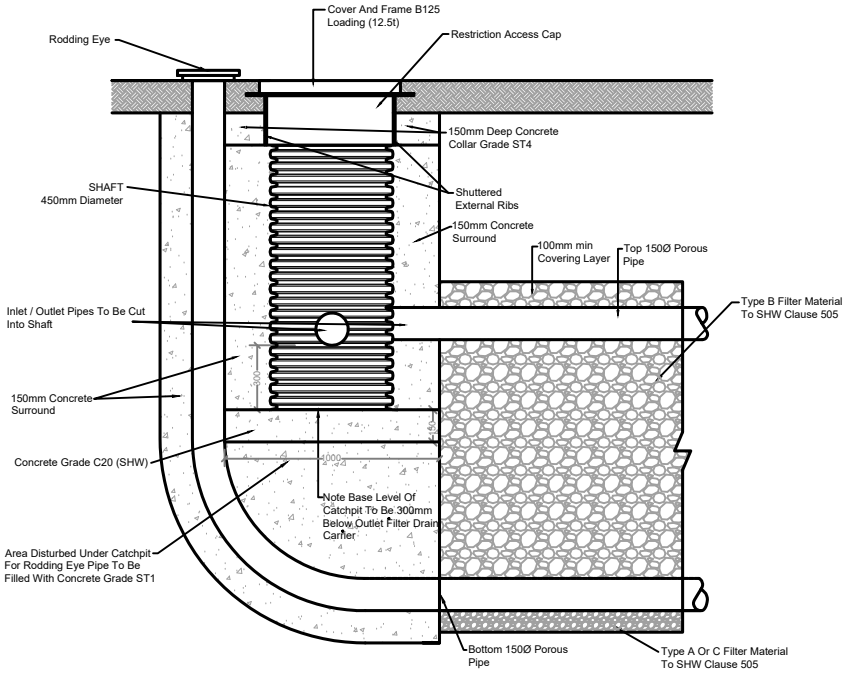
NOTES

1. All dimensions in millimeters.
2. This drawing is to be read in conjunction with Appendix 5/1.
3. Dimension X is the external diameter of the pipe.
4. The minimum or maximum width of the trench applies on and below a line 300mm above the outside top of the pipe. Above the 300mm line, the trunch backfill material shall be as described in Clause 505 of SHW.
5. The concrete bed or surround may extend to the sides of the trench or be of minimum width. Class 8 material is to be used to fill any voids so formed.
6. For Type Z trench the concrete cover may be formed to a radius batter or horizontal surface. Minimum cover of concrete shall be 150mm.

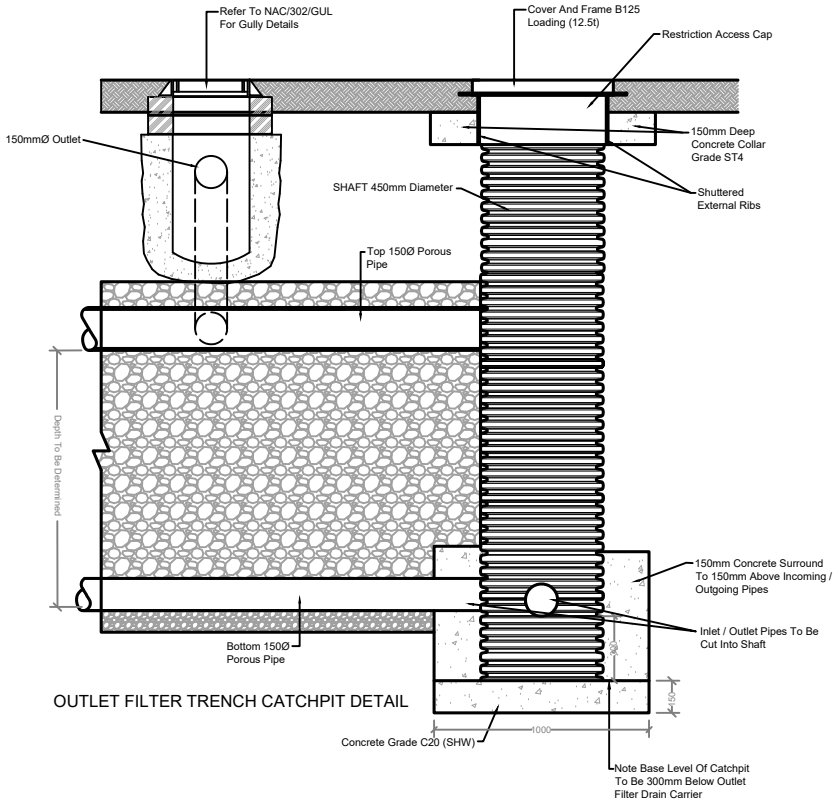
North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

CARRIER PIPE DETAIL - PIPE BEDDING DETAIL

DRAWING NO	REV
NAC/307/CPD	A



INLET FILTER TRENCH CATCHPIT DETAIL



OUTLET FILTER TRENCH CATCHPIT DETAIL

NOTES

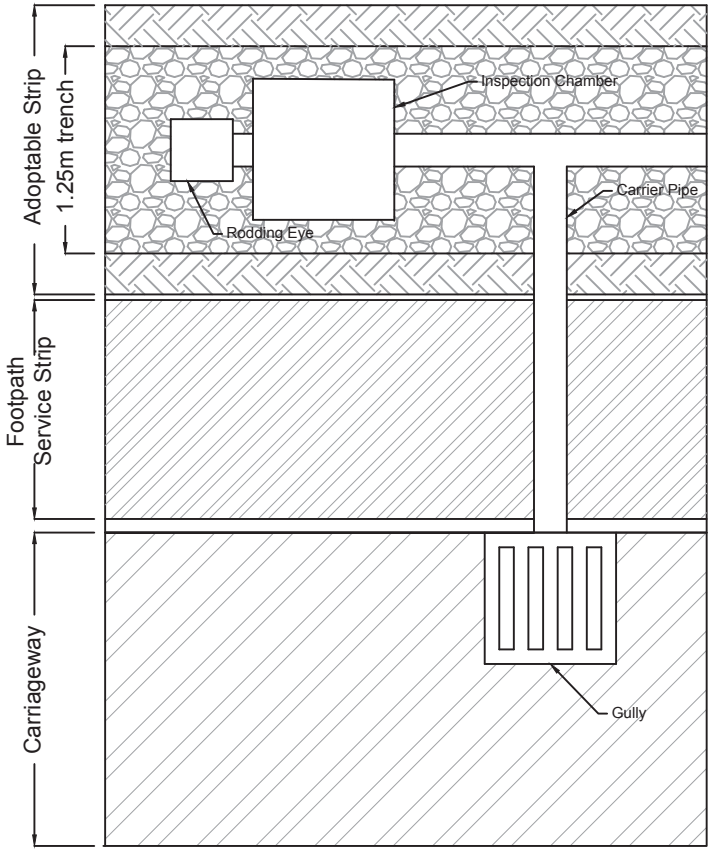
1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD
4. Full Construction Information for Footway to Table NAC/001/CD
5. This drawing to be read in junction with drawing NAC/309/FLT2
6. Gully detail to drawing NAC/302/GUL
7. Acceptable Backfill material to be material excavated from within the site or imported on to the site which meets the requirements of S.H.W. Table 6/1 and contract specific Appendix 6/1 for acceptability for use in the permanent works.

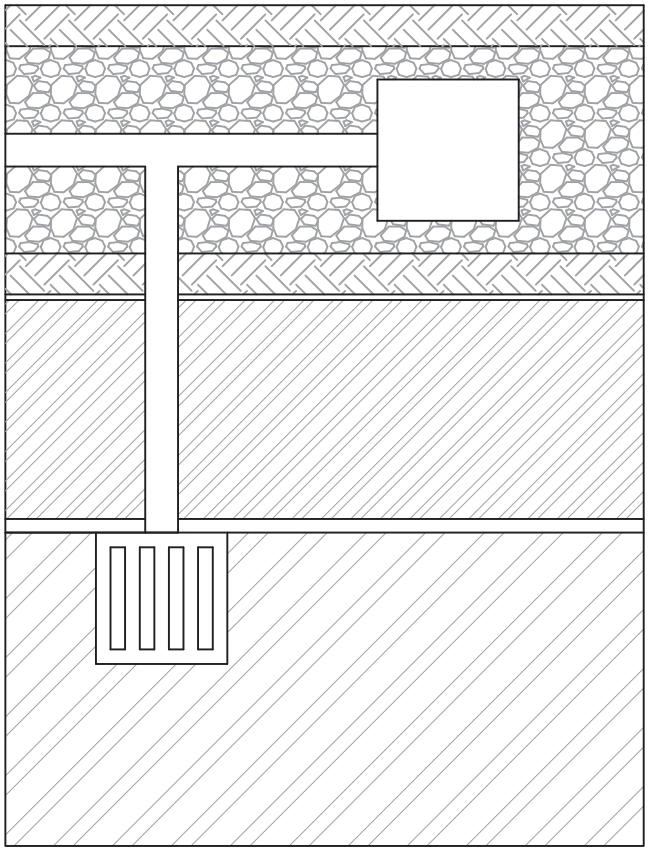
(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

FILTER TRENCH CONSTRUCTION - SECTION

DRAWING NO	REV
NAC/308/FLT1	A





NOTES

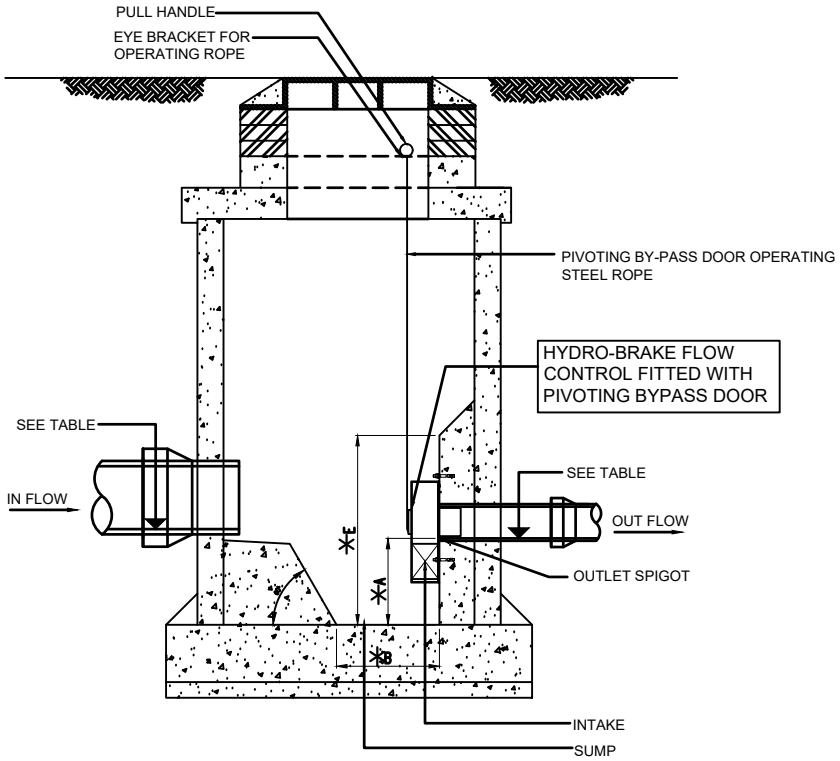
1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD
4. Full Construction Information for Footway to Table NAC/001/CD
5. This drawing to be read in junction with drawing NAC/308/FLT1
6. Gully detail to drawing NAC/302/GUL
7. Acceptable Backfill material to be material excavated from within the site or imported on to the site which meets the requirements of S.H.W. Table 6/1 and contract specific Appendix 6/1 for acceptability for use in the permanent works.

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

FILTER TRENCH CONSTRUCTION - PLAN

DRAWING NO	REV
NAC/309/FLT2	B

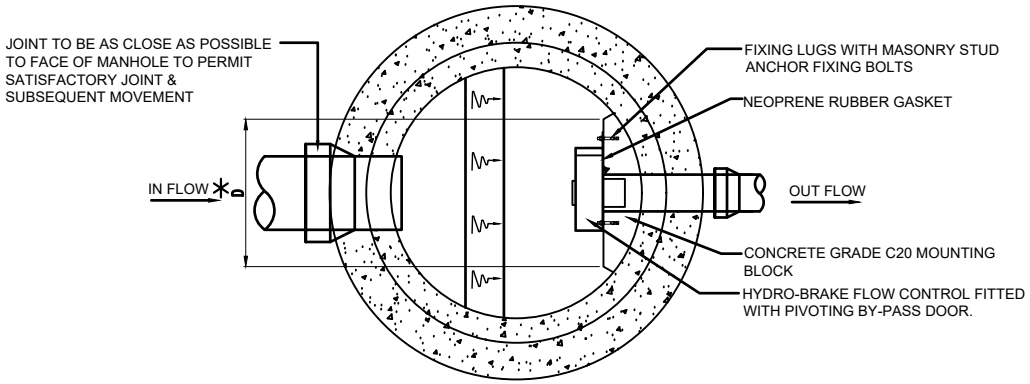


PRECAST CONCRETE HYDRO-BRAKE MANHOLE

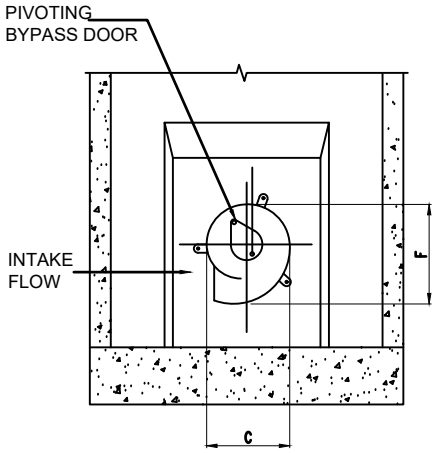
TABLE							
INTERNAL DIAMETER OF LOWER PIPE (mm)	INTERNAL DIAMETER OF UPPER PIPE (mm)	'X' mm	'Z' mm	'H' mm	'A' mm	'D' mm	'W' mm
150	150	150	150	375	300	652	1156
150	225	150	150	375	300	704	1239
150	300	150	150	375	300	748	1328
150	375	250	150	375	400	880	1610
150	450	250	150	375	400	921	1693
150	525	250	150	375	400	962	1775
150	600	275	150	375	425	1028	1908
225	225	150	150	375	300	736	1322
225	300	150	150	375	300	781	1411
225	375	250	150	375	400	922	1693
225	450	250	150	375	400	963	1776
225	525	250	150	375	400	1004	1858
225	600	275	150	375	425	1071	1991
300	300	150	150	375	300	825	1500
300	375	250	150	375	400	966	1782
300	450	250	150	375	400	1007	1865
300	525	250	150	375	400	1048	1947
300	600	275	150	375	425	1115	2080

NOTES

1. All dimensions in millimeters.
2. All Hydrobrakes should provide the flow capacities indicated on drainage layout drawings.
3. The minimum orifice size for all hydrobrake to be 75mm diameter and calculations provided by supplier to engineer for approval.



PLAN ON HYDRO-BRAKE MANHOLE

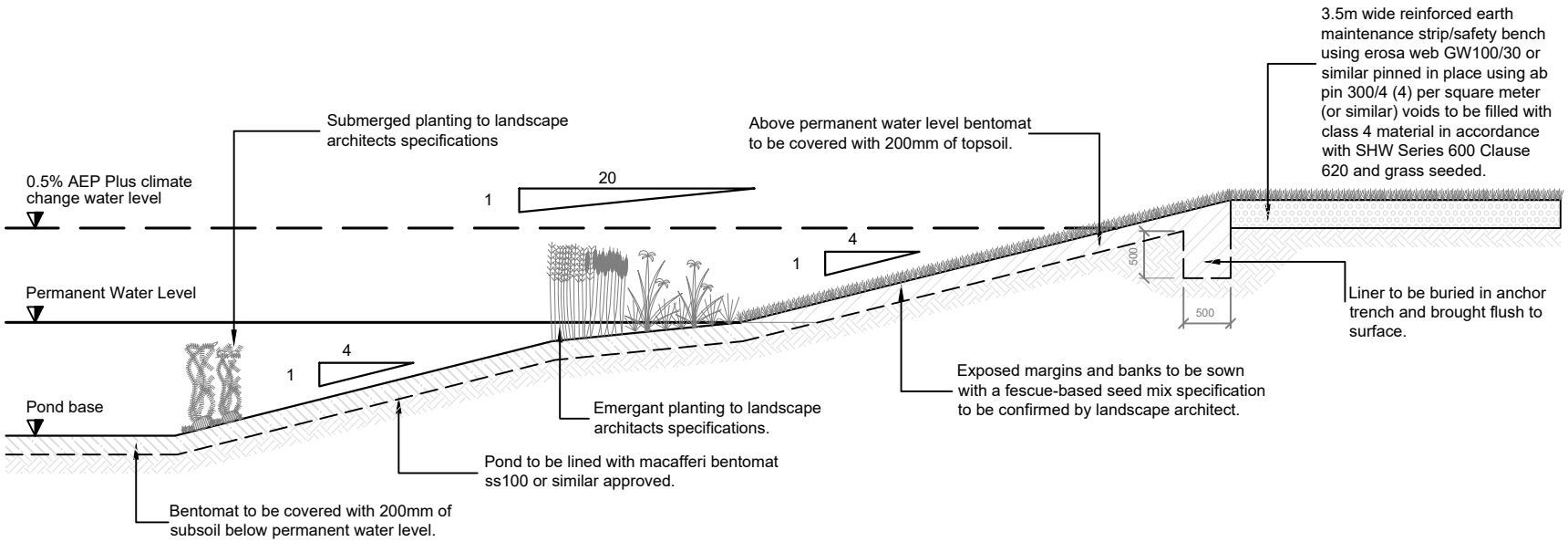


SECTION ON HYDRO-BRAKE

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

HYDROBRAKE CHAMBER

DRAWING NO	REV
NAC/310/HCH	A



NOTES

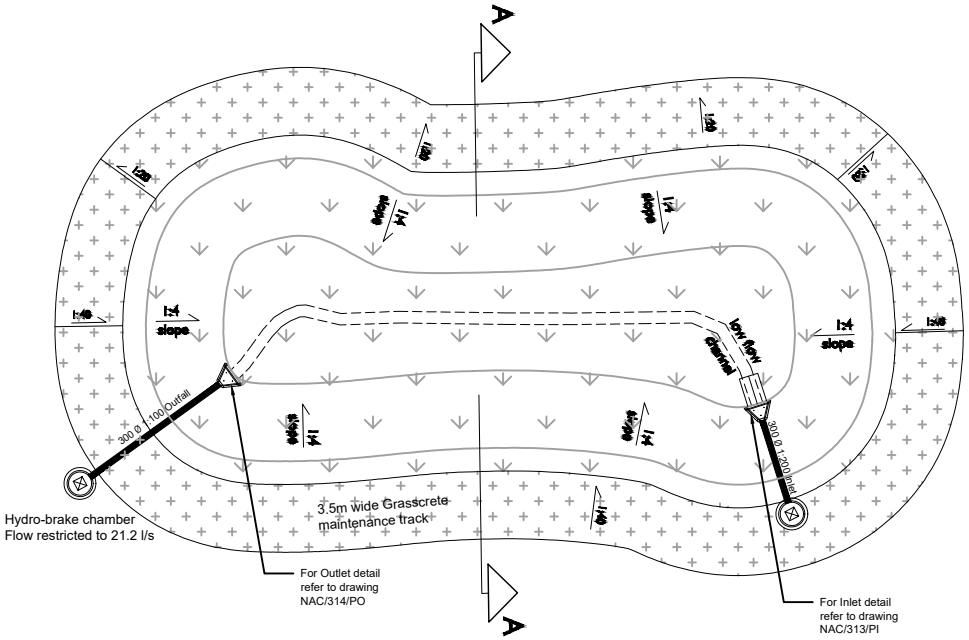
1. All dimensions in millimetres. (This drawing is not to scale)

(This drawing is not to scale)

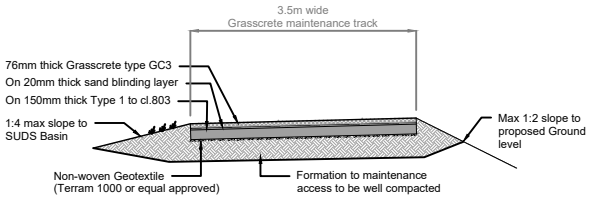
North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

TYPICAL SECTION THROUGH POND MARGIN

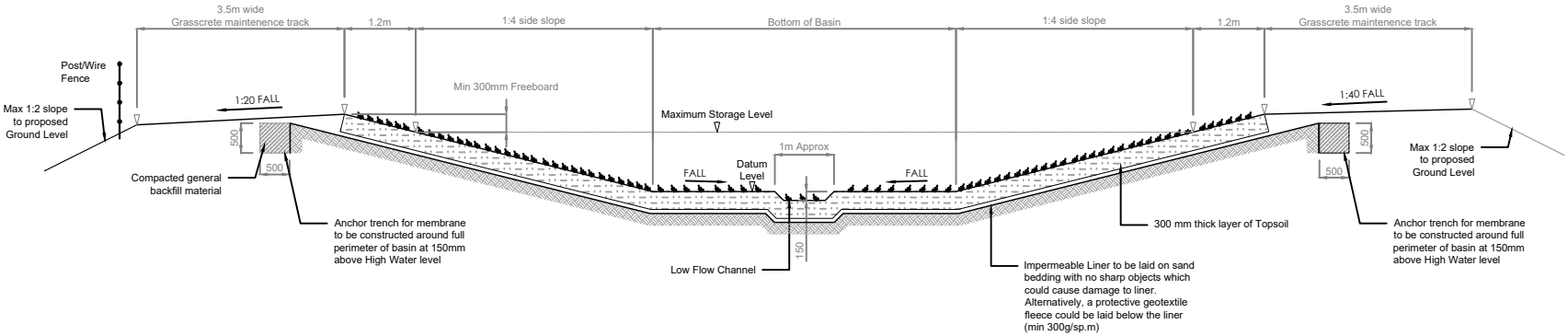
DRAWING NO	REV
NAC/311/PS	A



TYPICAL PLAN - SUDS BASIN



TYPICAL SECTION - GRASSCRETE MAINTENANCE TRACK



TYPICAL SECTION A-A THROUGH SUDS BASIN

NOTES

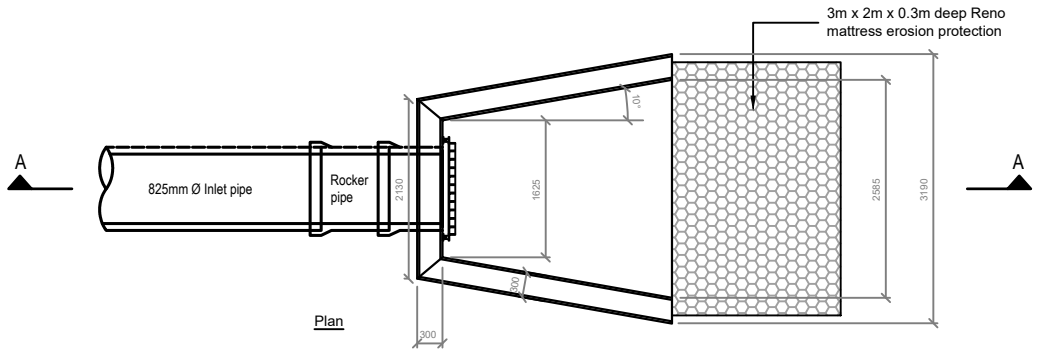
1. All dimensions in millimetres. (This drawing is not to scale)
2. For Inlet detail refer to drawing NAC/313/PI
3. For Outlet detail refer to drawing NAC/314/PO

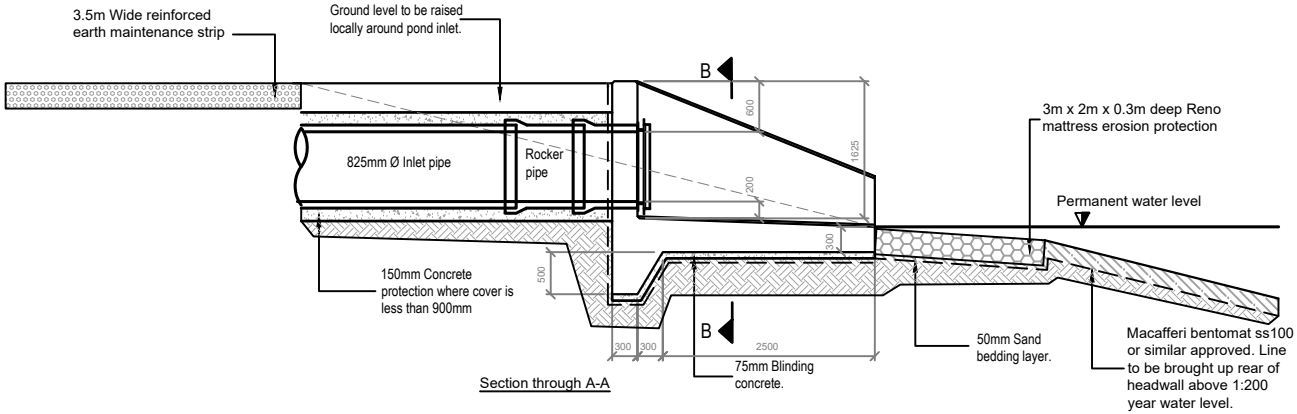
(This drawing is not to scale)

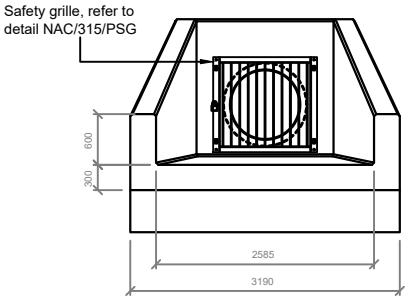
North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

TYPICAL SECTION THROUGH BASIN

DRAWING NO	REV
NAC/312/PB	A







NOTES

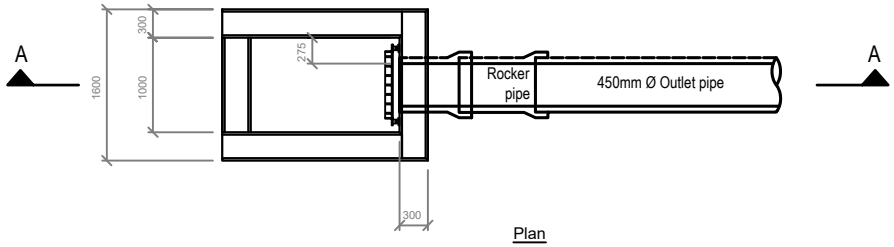
1. All dimensions in millimetres. (This drawing is not to scale)
2. This drawing should be read in conjunction with drawings NAC/312/PB, NAC/314/PO and NAC/315/PSG

(This drawing is not to scale)

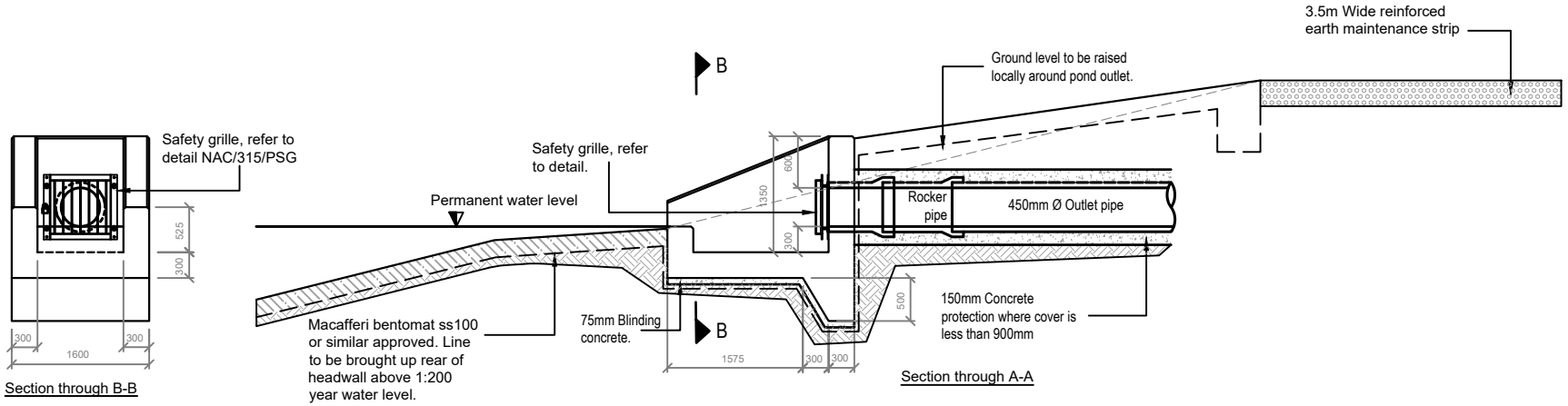
North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

DETENTION POND INLET HEADWALL DETAIL

DRAWING NO	REV
NAC/313/PI	A



Plan



Section through B-B

Section through A-A

NOTES

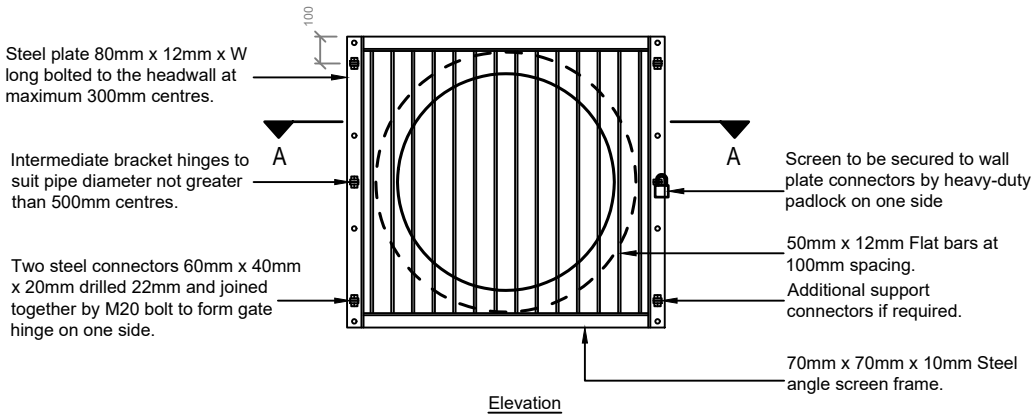
1. All dimensions in millimetres. (This drawing is not to scale)
2. This drawing should be read in conjunction with drawings NAC/312/PB, NAC/313/PI and NAC/315/PSG

(This drawing is not to scale)

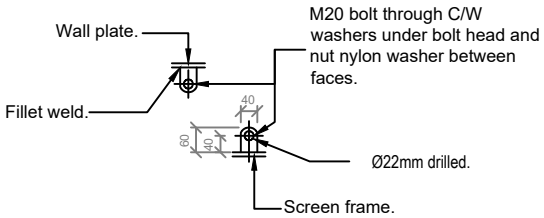
North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

DETENTION POND OUTLET HEADWALL DETAIL

DRAWING NO	REV
NAC/314/PO	A

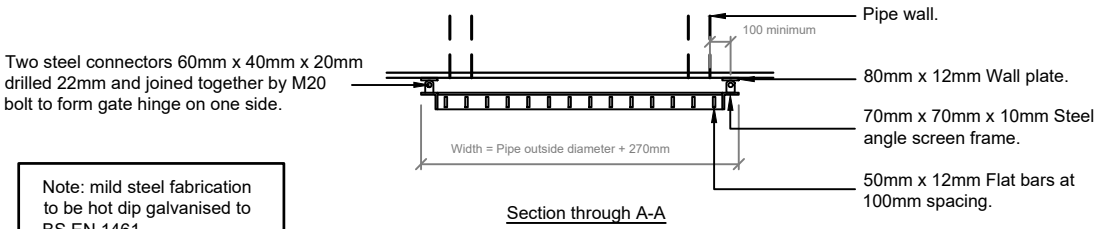


Elevation



Detail of connector

825mm Ø Pipe external diameter taken as 985mm
450mm Ø Pipe external diameter taken as 575mm
External diameter based on available pipe dimensions to be confirmed on site



Section through A-A

Note: mild steel fabrication to be hot dip galvanised to BS EN 1461

NOTES

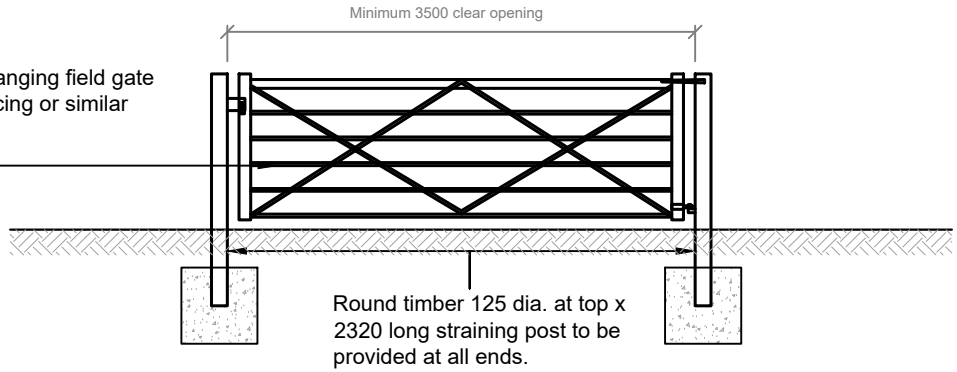
1. All dimensions in millimetres. (This drawing is not to scale)
2. This drawing should be read in conjunction with drawings NAC/312/PB, NAC/313/PI and NAC/314/PO

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

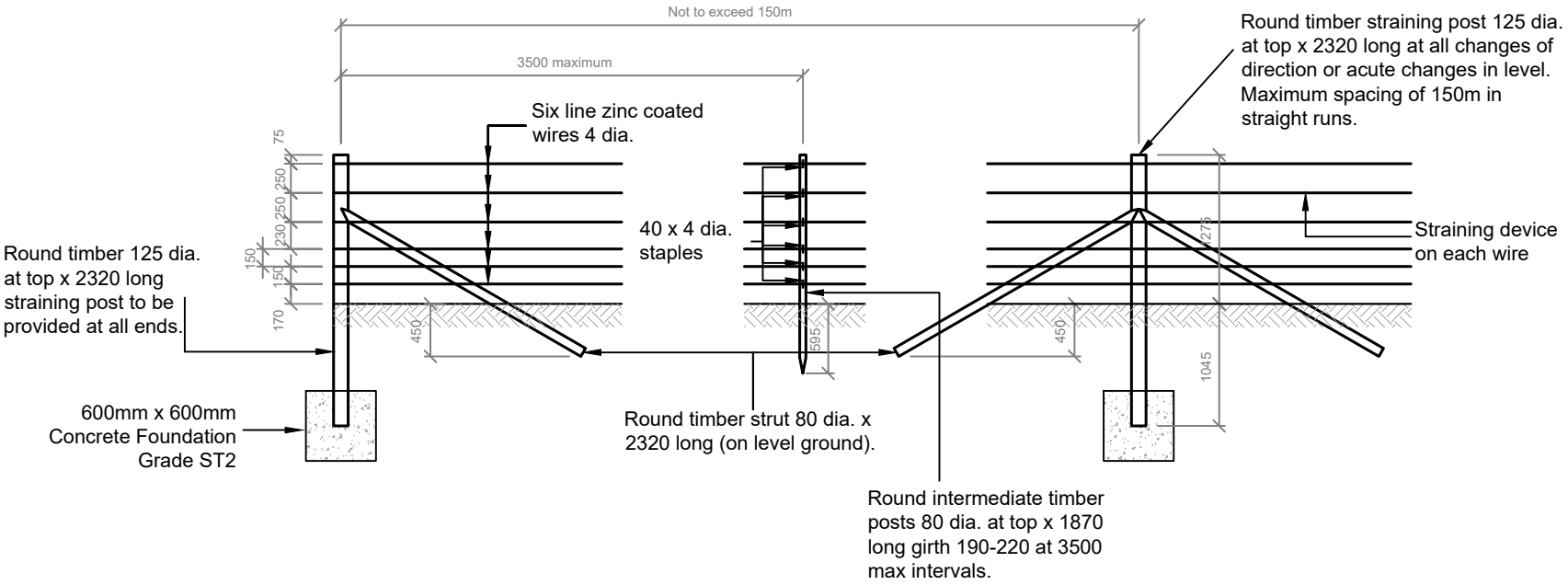
DETENTION POND OUTFALL SAFETY GRILLE DETAIL

DRAWING NO	REV
NAC/315/PSG	A



Typical access gate detail

Signage to be attached to fence



Typical perimeter fence detail

NOTES

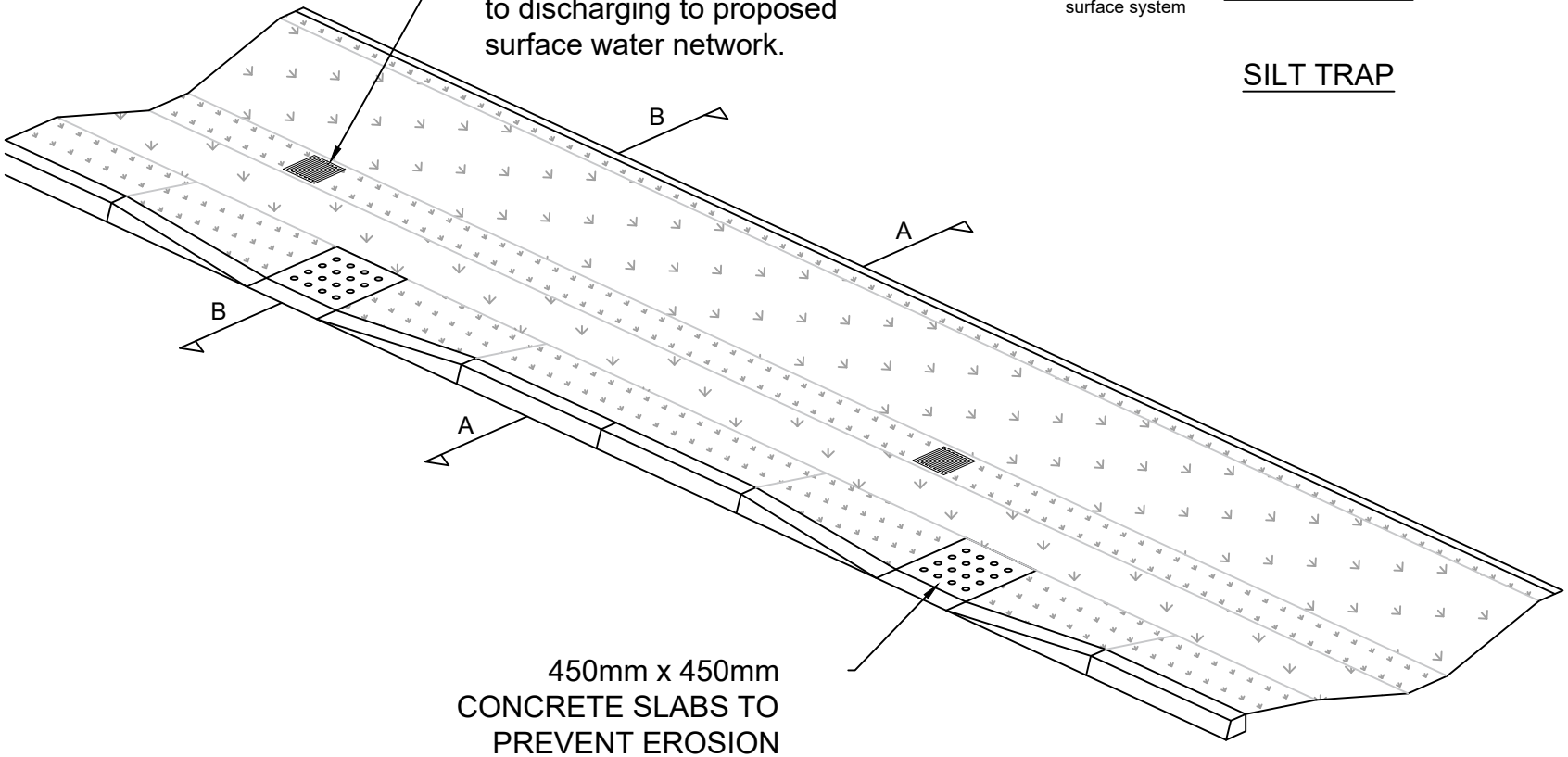
1. All dimensions in millimetres. (This drawing is not to scale)

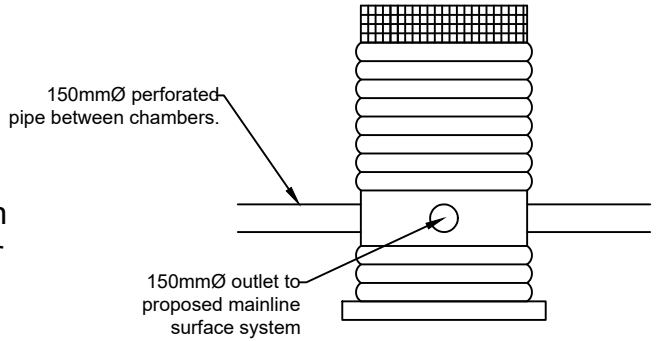
(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

DETENTION POND/BASIN PERIMETER FENCE DETAIL

DRAWING NO	REV
NAC/316/PPF	A





SILT TRAP

NOTES

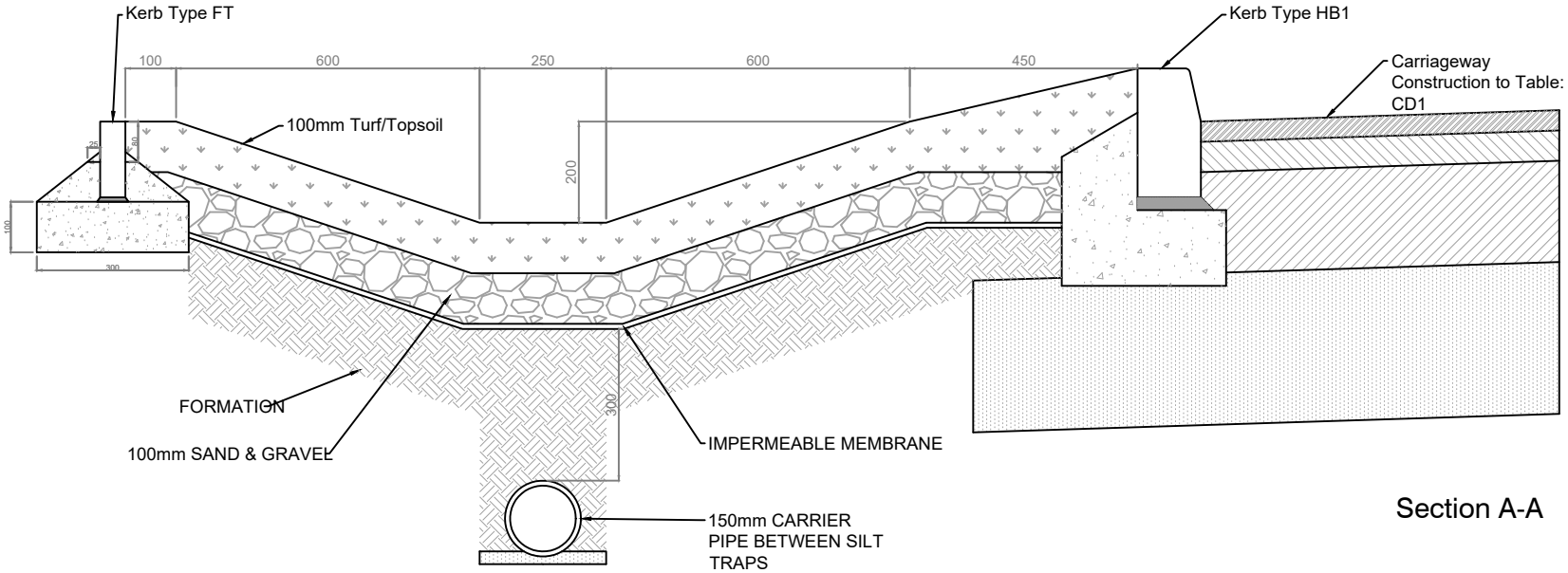
1. All dimensions in millimetres. (This drawing is not to scale)

(This drawing is not to scale)

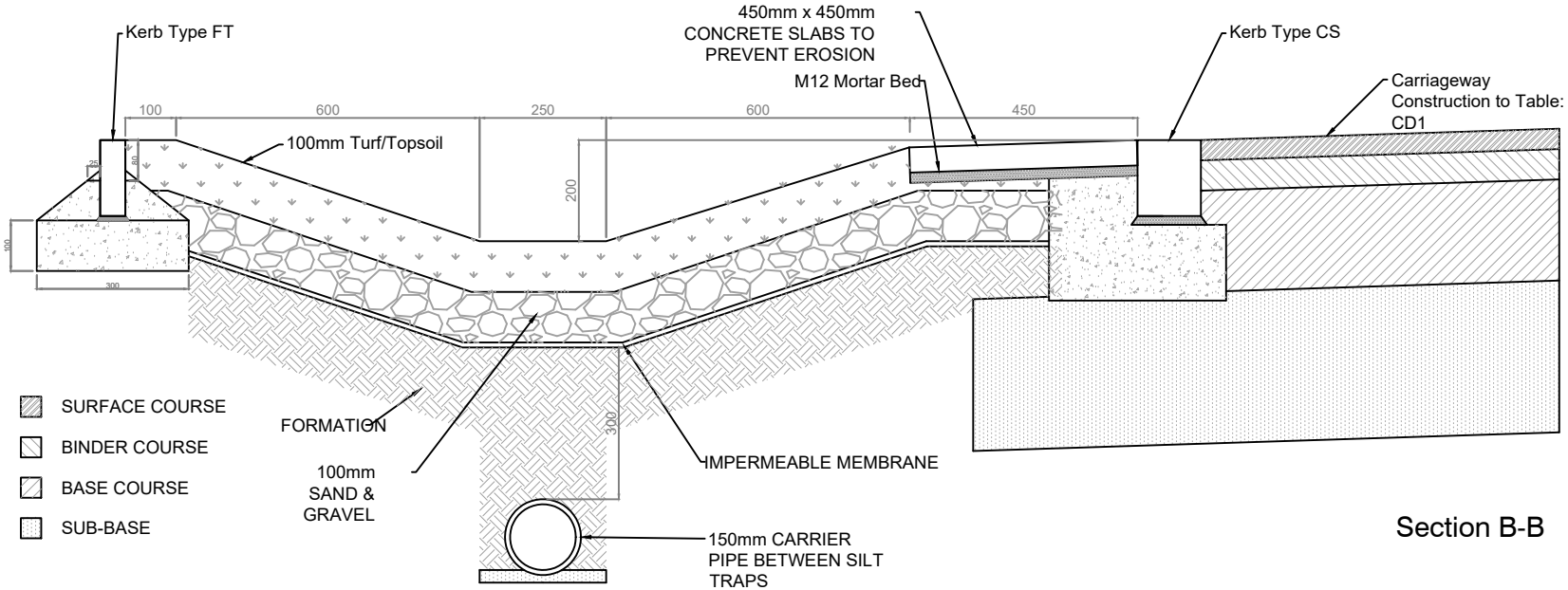
North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STANDARD WET SWALE/CARRIAGEWAY CONSTRUCTION

DRAWING NO	REV
NAC/317/SWP	A



Section A-A



Section B-B

NOTES

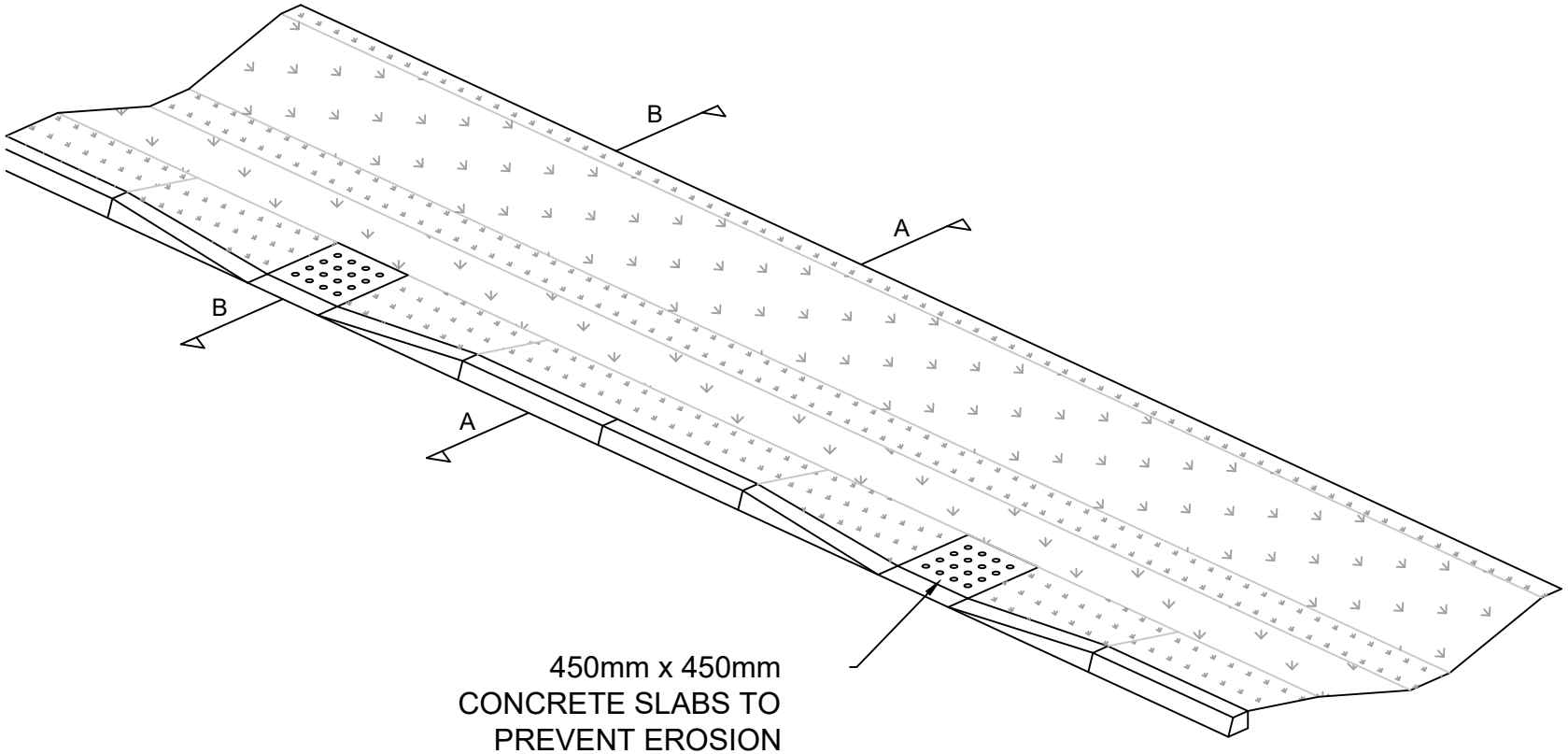
1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STANDARD WET SWALE/CARRIAGEWAY CONSTRUCTION

DRAWING NO	REV
NAC/318/SWS	A



450mm x 450mm
CONCRETE SLABS TO
PREVENT EROSION

NOTES

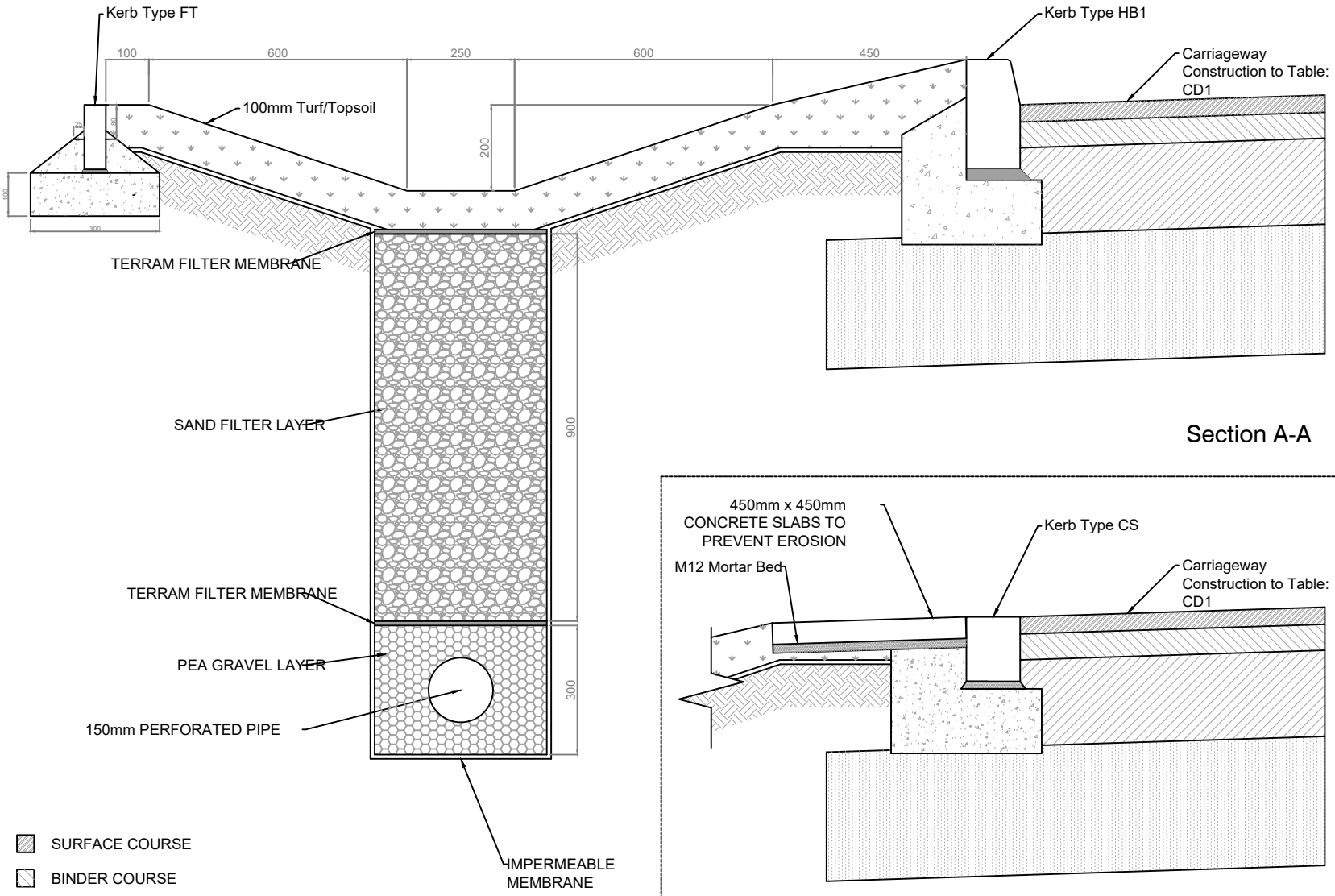
1. All dimensions in millimetres. (This drawing is not to scale)

(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STANDARD DRY SWALE/CARRIAGEWAY CONSTRUCTION

DRAWING NO	REV
NAC/319/SDP	A



NOTES

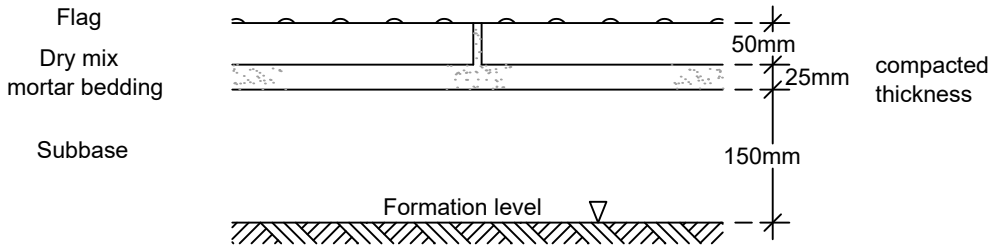
1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD

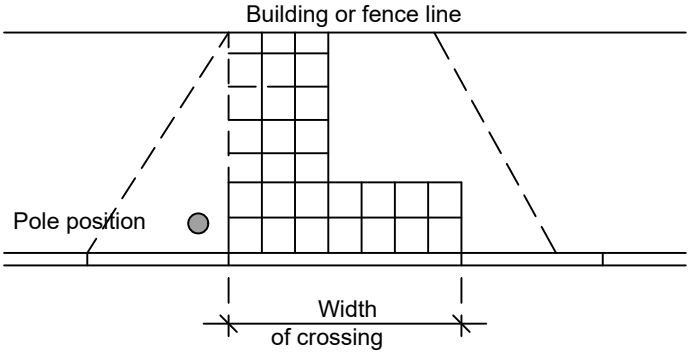
(This drawing is not to scale)

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

STANDARD DRY SWALE/CARRIAGEWAY CONSTRUCTION

DRAWING NO	REV
NAC/320/SDS	A





TYPICAL LAYOUT AT CONTROLLED PEDESTRIAN CROSSING

NOTES

1. All dimensions in millimetres.

2. Precast concrete flags to comply with BS EN 1339:2003.

3. Flags shall be 400mm x 400mm x 50mm thick, coloured red for controlled and buff for uncontrolled.

4. Flags shall only be cut "on the square", and equidistant between rows of surface texturing, except where against a building or fence line.

5. Crossing widths should be chosen, where possible, to avoid the necessity of cut flags.

6. All joints shall not be less than 5mm nor more than 10mm width.

7. Joints shall be filled with M12 mortar of a similar colour to the flags and key pointed.

8. For uncontrolled crossings only the two rows next to the kerb will be laid.

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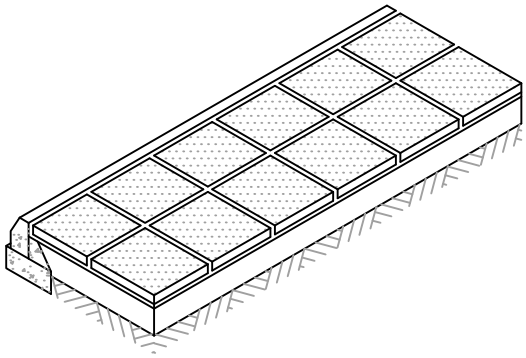
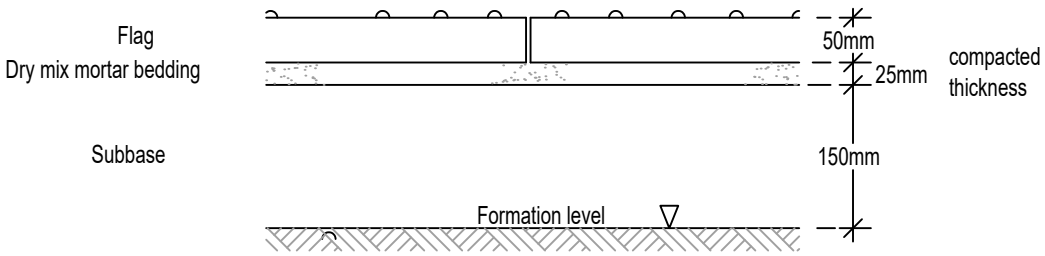
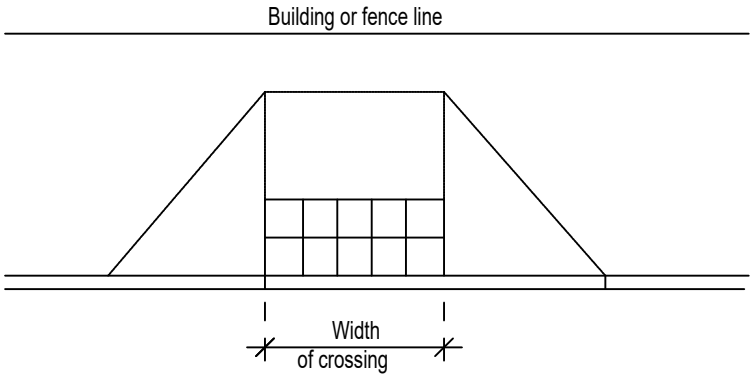
TACTILE PAVING AT SIGNALS

DRAWING NO	REV
NAC/401/TPS	A







TYPICAL LAYOUT AT DROP KERB CROSSING

NOTES

1. All dimensions in millimetres.
2. Precast concrete flags to comply with BS EN 1339:2003.
3. Flags shall be 400mm x 400mm x 50mm thick, coloured buff.
4. Flags shall only be cut "on the square", and equidistant between rows of surface texturing, except where against a building or fence line.
5. Crossing widths should be chosen, where possible, to avoid the necessity of cut flags.
6. All joints shall not be less than 5mm nor more than 10mm width.
7. Joints shall be filled with M12 mortar of a similar colour to the flags and key pointed.

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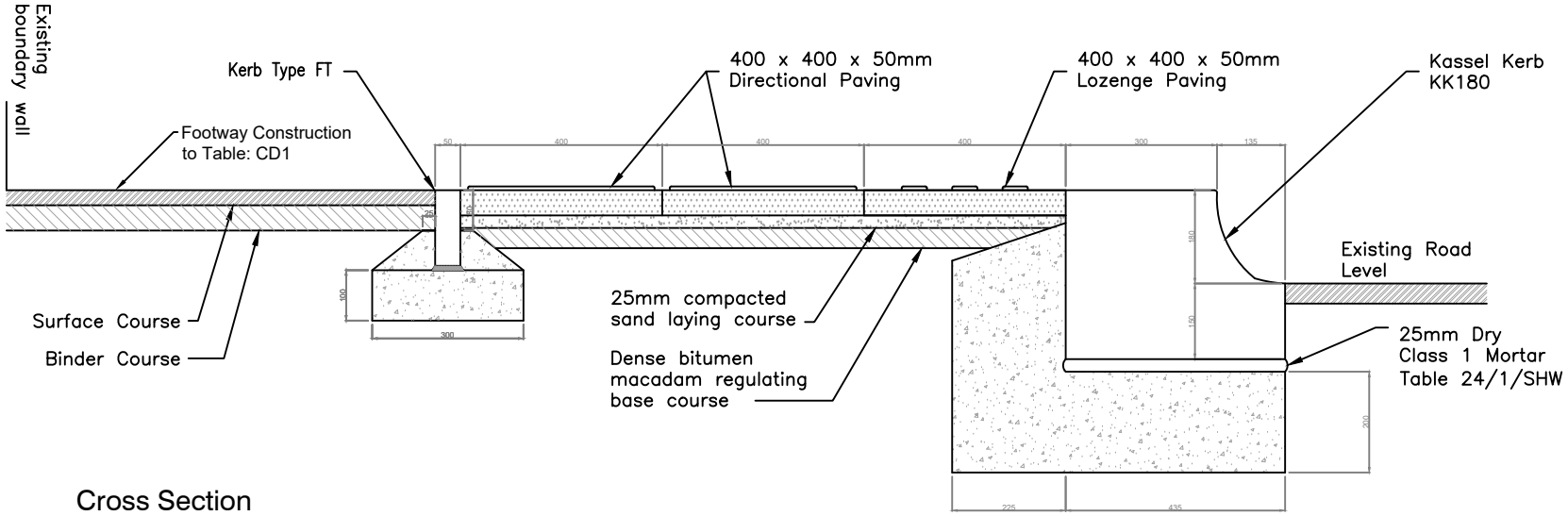
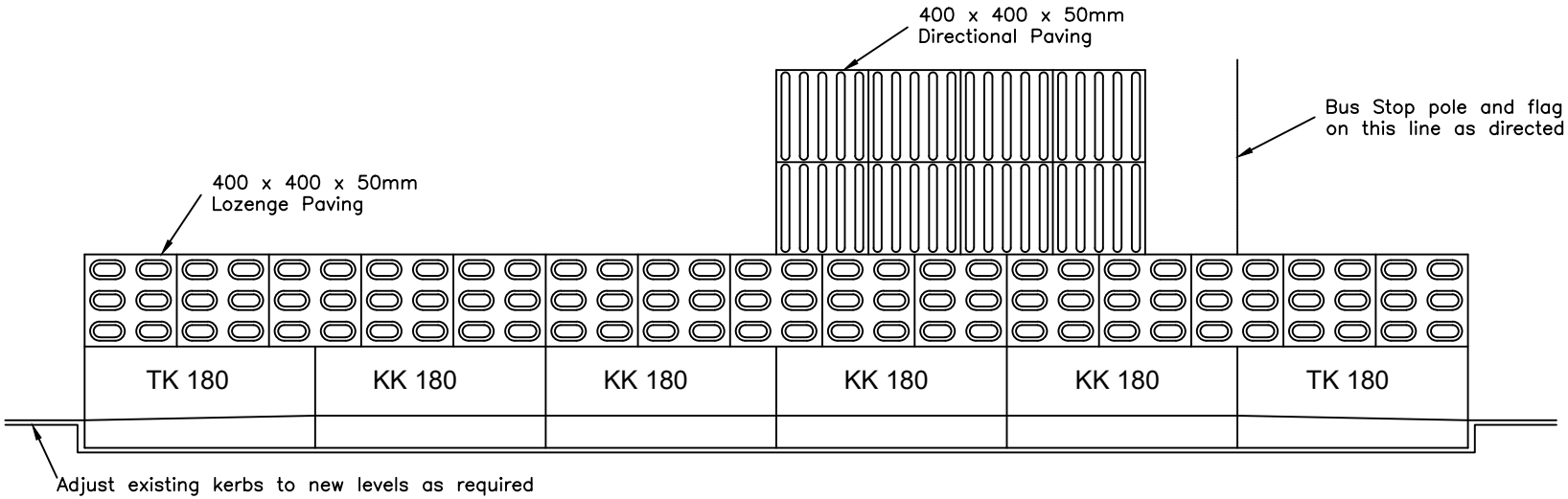
TACTILE PAVING AT PEDESTRIAN CROSSING POINTS

DRAWING NO	REV
NAC/402/TPC	A



Cross Section

Plan View



NOTES

1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD
4. Full Construction Information for Footway to Table NAC/001/CD

(This drawing is not to scale)

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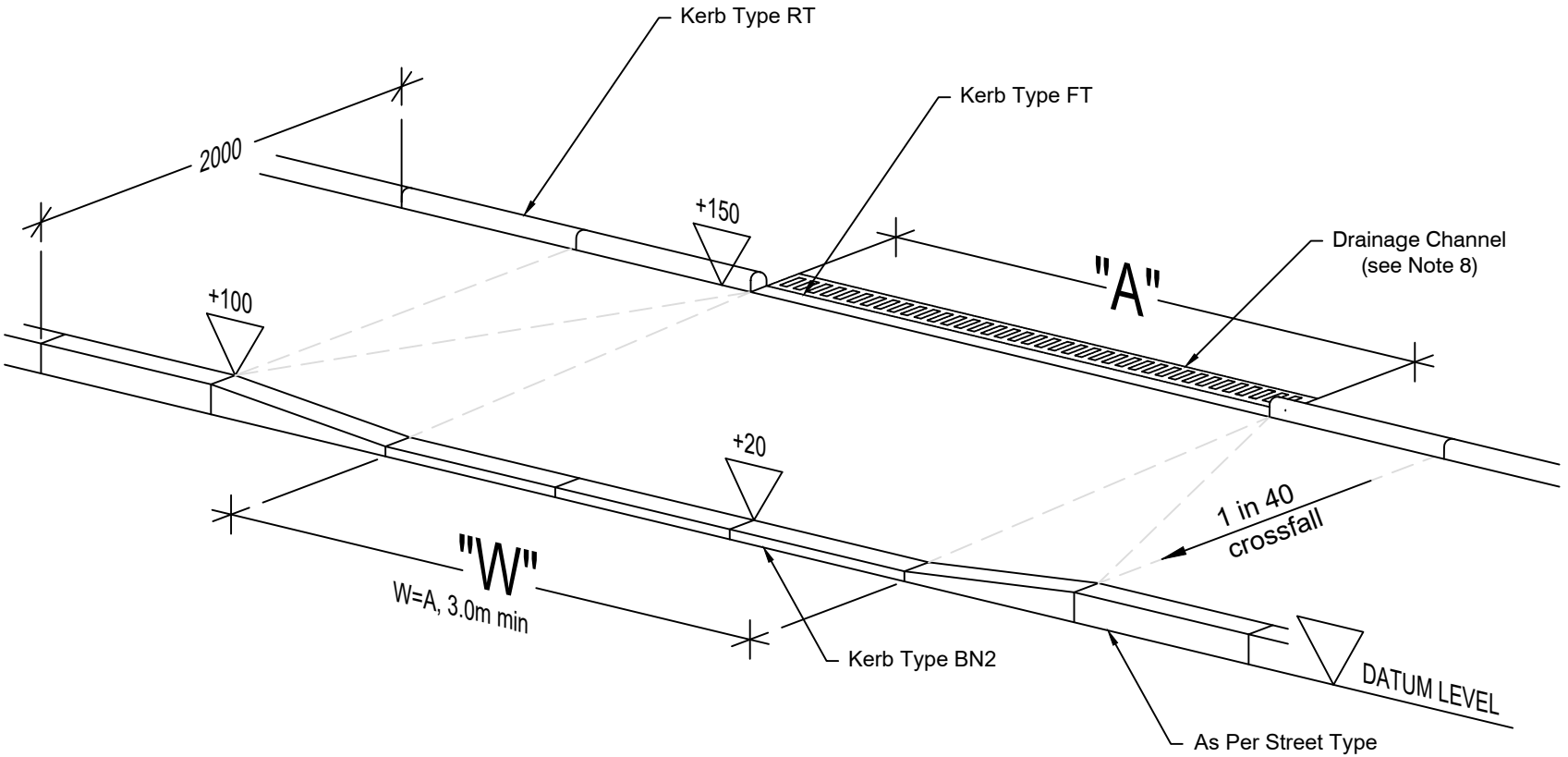
STANDARD BUS STOP CONSTRUCTION

DRAWING NO	REV
NAC/403/BS	A



TYPICAL DETAILS FOR 2.0m FOOTWAY

NOTES

1. All dimensions in millimetres. (This drawing is not to scale)
2. This drawing should be read in conjunction with drawing NAC/205/DW2
3. This access is for vehicular use only. Should provision be required for pedestrians see drawing NAC/409/PCR.
4. Dimension "A" is the width of the access.
5. Dimension "W" is the width of the drop crossing.
6. New Kerbing details to comply with drawing as stated
7. Full Construction Information for Footway to Table NAC/001/CD
8. Where the gradient of the Private Driveway slopes towards the Public Footway, a Drainage Channel as depicted must be installed. It is not required if the Private Driveway slopes into the private grounds.

(This drawing is not to scale)

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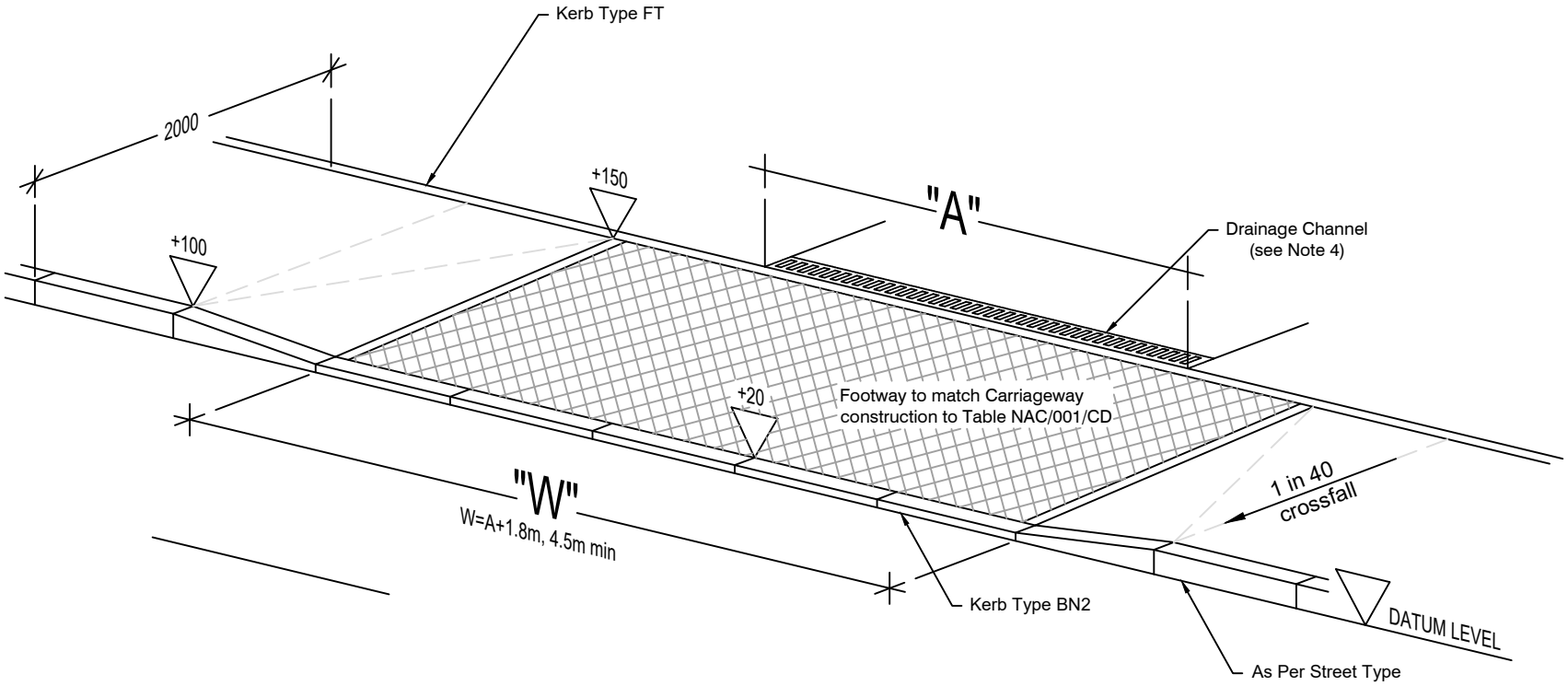
STANDARD PRIVATE DRIVEWAY ACCESS (FOOTPATH)

DRAWING NO	REV
NAC/404/DW1	B



TYPICAL DETAILS FOR 2.0m FOOTWAY

NOTES

1. All dimensions in millimetres. (This drawing is not to scale)
2. This access is for vehicular use only. Should provision be required for pedestrians see drawing NAC/409/PCR.
3. Dimension "A" is the width of the access.
4. Dimension "W" is the width of the drop crossing.
5. New Kerbing details to comply with drawing as stated
6. Footway Crossing to match Full Construction Information for Carriageway to Table NAC/001/CD
7. Full Construction Information for Footway to Table NAC/001/CD

(This drawing is not to scale)

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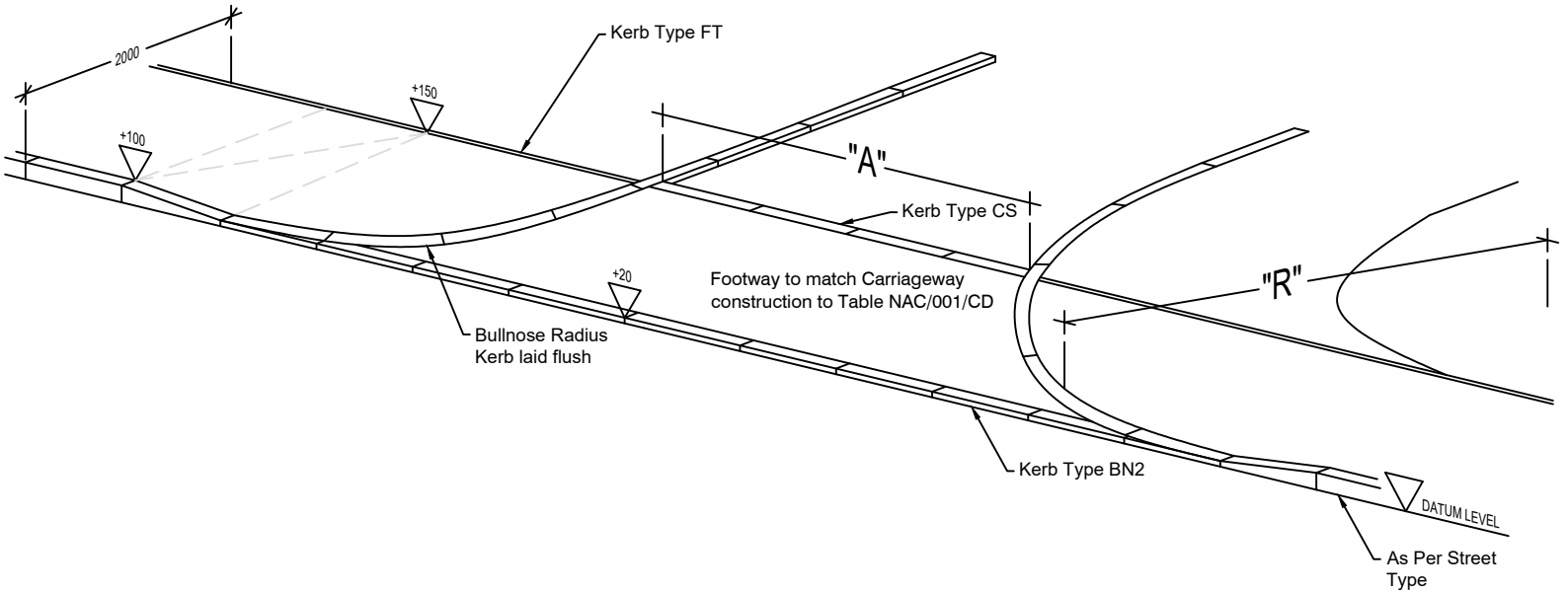
SINGLE MINOR COMMERCIAL ACCESS, HOUSING COURT OR CAR PARK UP TO 50 SPACES

DRAWING NO	REV
NAC/405/SMA	A



NOTES

1. All dimensions in millimetres. (This drawing is not to scale)
2. This access is for vehicular use only. Should provision be required for pedestrians see drawing NAC/409/PCR.
3. Dimension "A" is the width of the access road.
   MINIMUM - 5.5m Car Park
   - 6.0m Commercial
4. Dimension "R" is the corner radius.
   MINIMUM - 4.5m Car Park
   - 6.0m Commercial
5. New Kerbing details to comply with drawing as stated
6. Footway Crossing to match Full Construction Information for Carriageway to Table NAC/001/CD
7. Full Construction Information for Footway to Table NAC/001/CD

(This drawing is not to scale)

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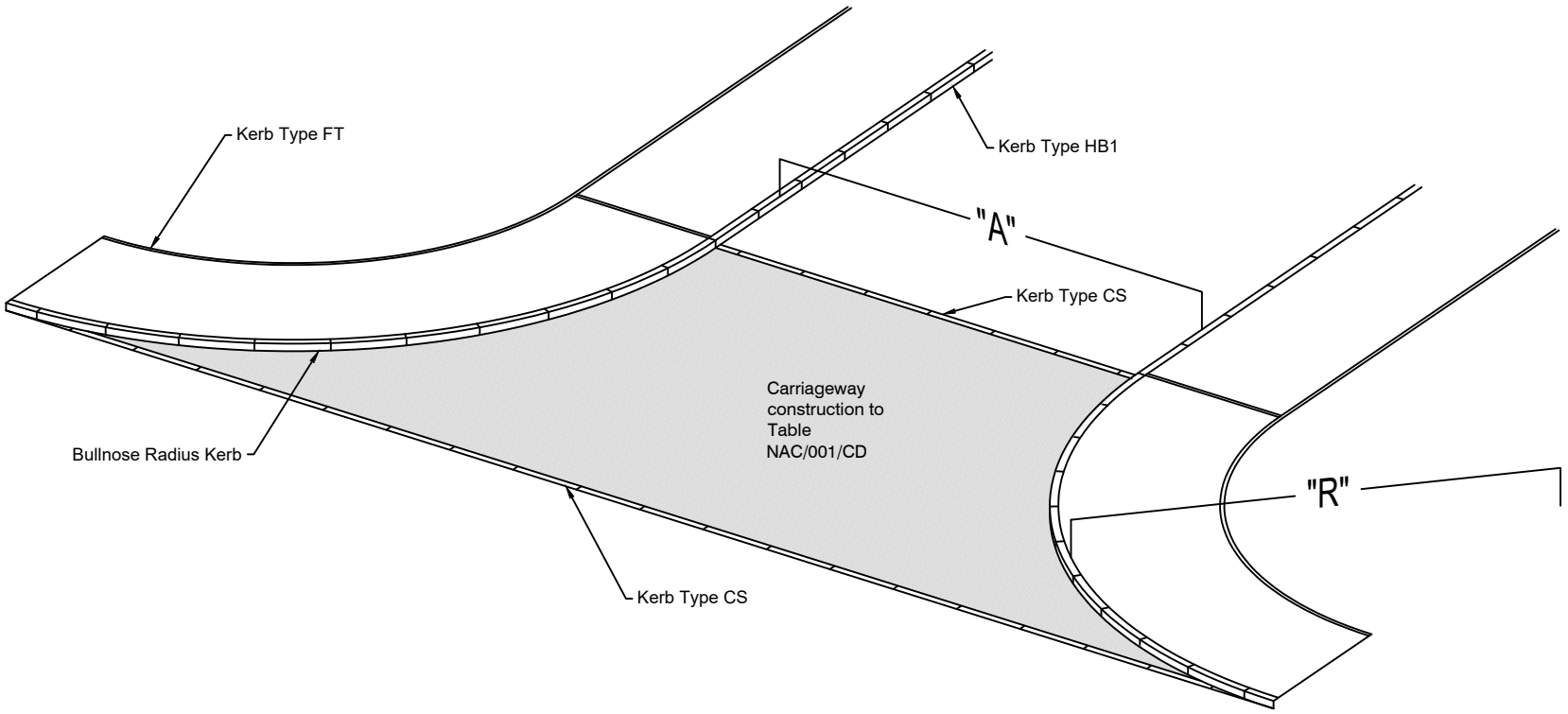
MINOR COMMERCIAL ACCESS OR CAR PARK OVER 50 SPACES

DRAWING NO	REV
NAC/406/MCA	A



NOTES

1. All dimensions in millimetres. (This drawing is not to scale)
2. This access is for vehicular use only. Should provision be required for pedestrians see drawing NAC/409/PCR.
3. Dimension "A" is the width of the access road.
   MINIMUM - 6.0m Non-Industrial
   - 7.3m Industrial
4. Dimension "R" is the corner radius.
   MINIMUM - 6.0m Non-Industrial
   - 9.0m Industrial
5. New Kerbing details to comply with drawing as stated
6. Footway Crossing to match Full Construction Information for Carriageway to Table NAC/001/CD
7. Full Construction Information for Footway to Table NAC/001/CD

(This drawing is not to scale)

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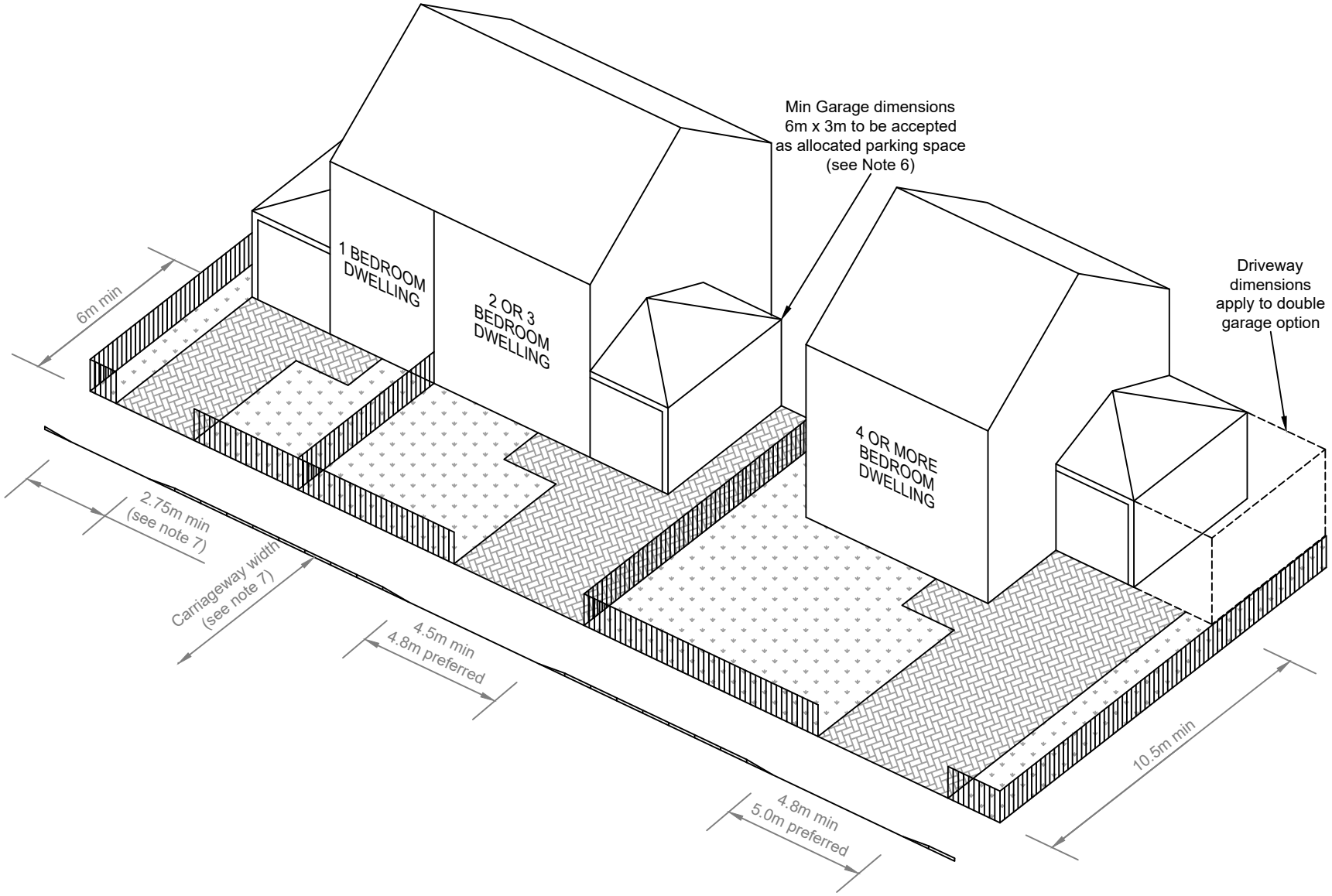
Comhairle Siorrachd Àir a Tuath

MAJOR COMMERCIAL ACCESS

DRAWING NO	REV
NAC/407/MAC	A



NOTES

1. All dimensions in metres. (This drawing is not to scale)
2. This drawing should be read in conjunction with drawings NAC/404/DW1, NAC/205/DW2 and NAC/206/DW3
3. This access is for vehicular use only. Should provision be required for pedestrians seedrawing NAC/409/PCR.
4. Private driveways should normally meet the road at right angles at dropped kerb access
5. Unless giving direct access to a garage, driveways should be at least 12 metres long. This will facilitate the future construction of garages.
6. In order to be accepted as a dwellings allocated parking space, a garage must meet a minimum internal dimension of 6m x 3m.
7. The minimum width of driveways should be 2.75 metres with widening required on narrow carriageways;
   CW over 5m = 2.75m min
   CW 5m to 3.5m = 3.0m min
   CW 3.5m or less= 3.2m min
8. A width of 4.5 metres will accommodate a parked car with sufficient space to allow access.
9. Double width parking can be accommodated on a 4.8 metres wide driveway; however, wheelchair or perambulator access may not be possible in these circumstance and therefore consideration should also be given to providing a segregated pedestrian access or local widening of the driveway.
10. The length of double driveways required in front of a garage to accommodate a parked vehicle and access to the garage should be a minimum of 10.5 metres.
11. Full Construction Information for Carriageway to Table NAC/001/CD
12. Full Construction Information for Footway to Table NAC/001/CD

(This drawing is not to scale)

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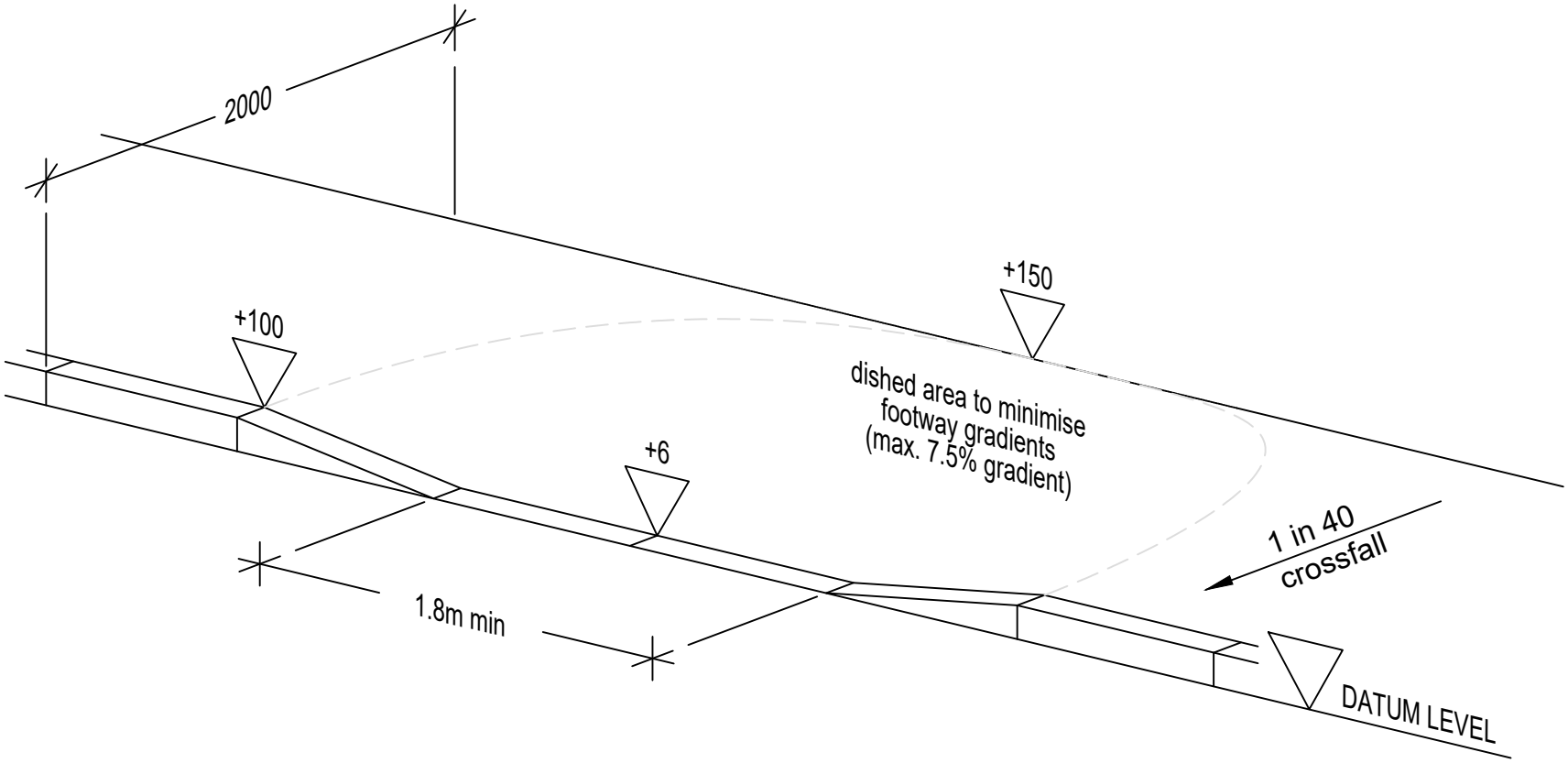
MINIMUM DRIVEWAY DIMENSIONS

DRAWING NO	REV
NAC/408/DWD	A



TYPICAL DETAILS FOR 2.0m FOOTWAY

NOTES

1. All dimensions in millimetres. (This drawing is not to scale)
2. New Kerbing details to comply with drawing as stated
3. Full Construction Information for Carriageway to Table NAC/001/CD
4. Full Construction Information for Footway to Table NAC/001/CD

(This drawing is not to scale)

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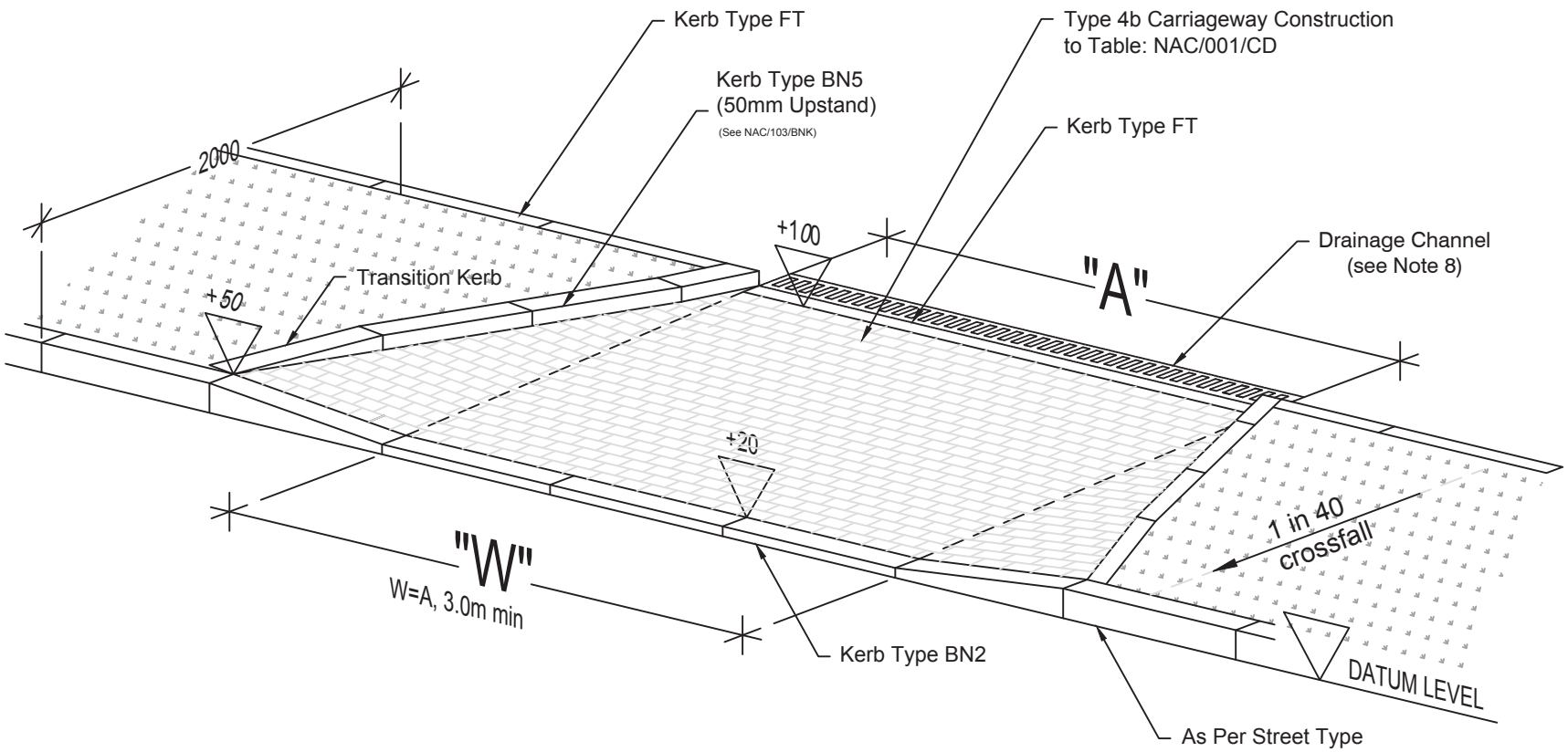
DROPPED KERB DETAIL AT DESIGNATED PEDESTRIAN CROSSING

DRAWING NO	REV
NAC/409/PCR	B



TYPICAL DETAILS FOR 2.0m SERVICE STRIP

NOTES

1. All dimensions in millimetres. (This drawing is not to scale)
2. This drawing should be read in conjunction with drawing NAC/206/DW3
3. This access is for vehicular use only. Should provision be required for pedestrians see drawing NAC/409/PCR.
4. Dimension "A" is the width of the access.
5. Dimension "W" is the width of the drop crossing.
6. New Kerbing details to comply with drawing as stated
7. Full Construction Information for Footway to Table NAC/001/CD
8. Where the gradient of the Private Driveway slopes towards the Public Footway, a Drainage Channel as depicted must be installed. It is not required if the Private Driveway slopes into the private grounds.

(This drawing is not to scale)

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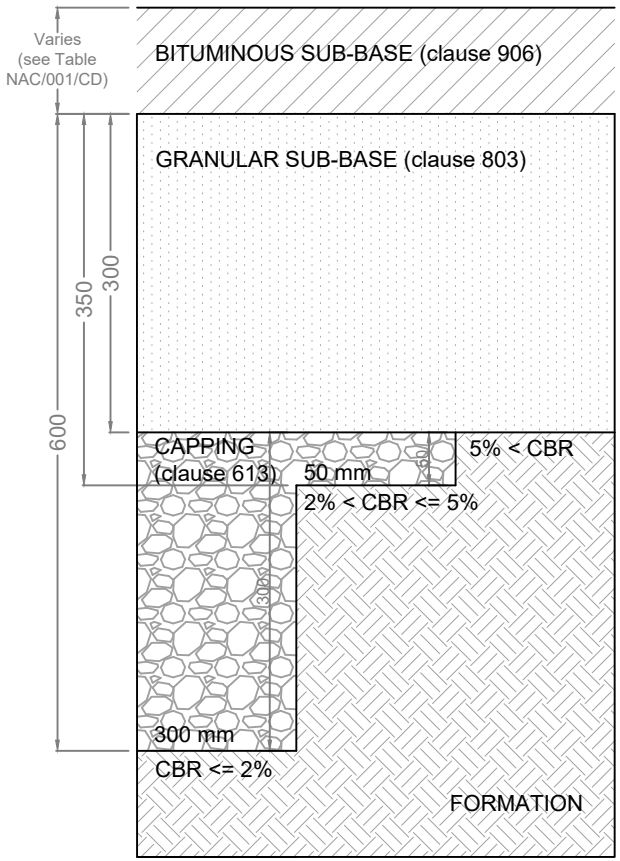
STANDARD PRIVATE DRIVEWAY ACCESS (SERVICE STRIP)

DRAWING NO	REV
NAC/410/DW4	B



For a 2% < CBR <= 5% where the total bituminous thickness and sub-base thickness together are less than 450mm, the sub-base is increased to achieve 450mm of non frost susceptible material and the capping layer can be correspondingly reduced. This need not be done if the capping layer is non frost-susceptible.

Although the table gives various thicknesses of capping layer dependent upon CBR, where CBR is significantly below 2%, these thicknesses may require to be increased dependent upon site and weather conditions prevailing at the time of construction. Additional material may require to be removed and replaced by more suitable material. Although the new material may be of good quality, the subgrade shall be assumed to be equivalent to one of a CBR just under 2% and requiring 300 mm of capping layer. The developer should consult the Network Manager for advice in these circumstances.

Where suitable technical facilities exist, it is recommended that the specific circumstances of each site are catered for by designing the road in accordance with the criteria stipulated above, Subject to a minimum construction as required to carry 0.5 Million Standard Axles (MSA), for all roads. In this circumstance it will be necessary to complete and return form CCS "Carriageway Design Certificate".

NOTES

1. All dimensions in millimetres.

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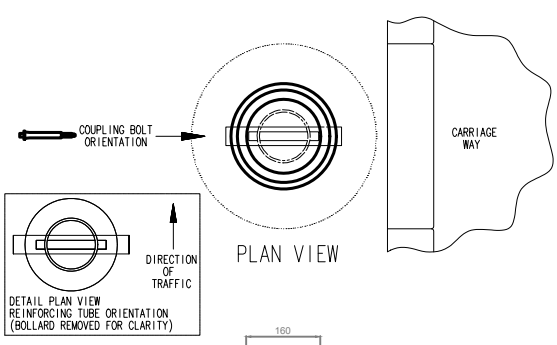
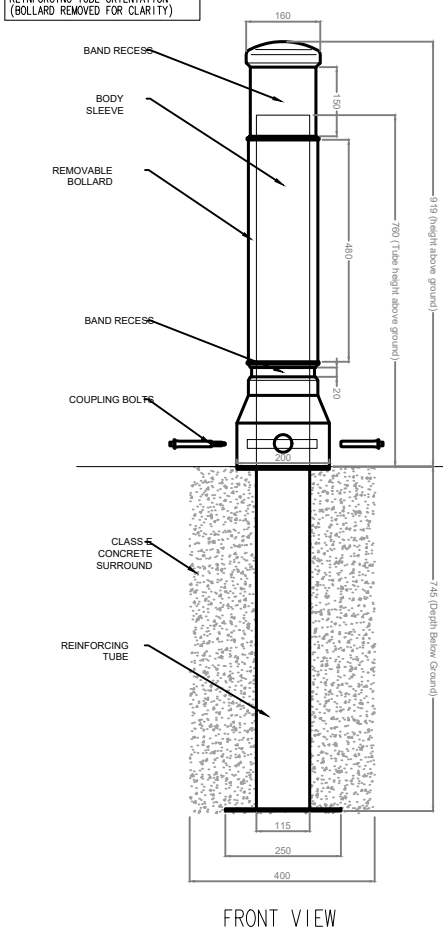
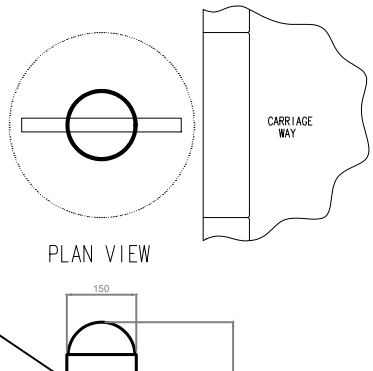
CAPPING LAYER REQUIREMENTS: SUBJECT TO FROST SUSCEPTIBILITY

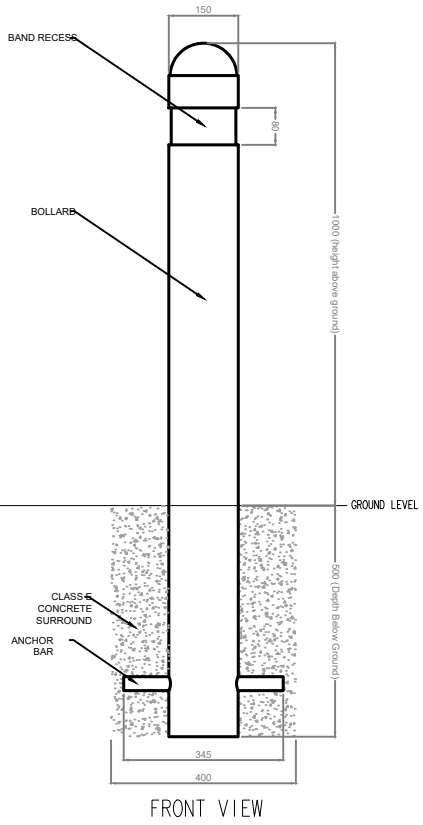
DRAWING NO	REV
NAC/501/CAP	A





NEOPOLITAN 150





ENVIROPOL

NOTES

1. All dimensions in millimetres. (This drawing is not to scale)
2. Ensure reflective banding is in the correct orientation - RED towards oncoming traffic.
3. The reinforcing tube or anchor bar is to be orientated so that the coupling bolt is inserted at 90° to the carriageway (see Plan view).
4. The reinforcing tube should be filled with concrete where required for additional strength.

(This drawing is not to scale)

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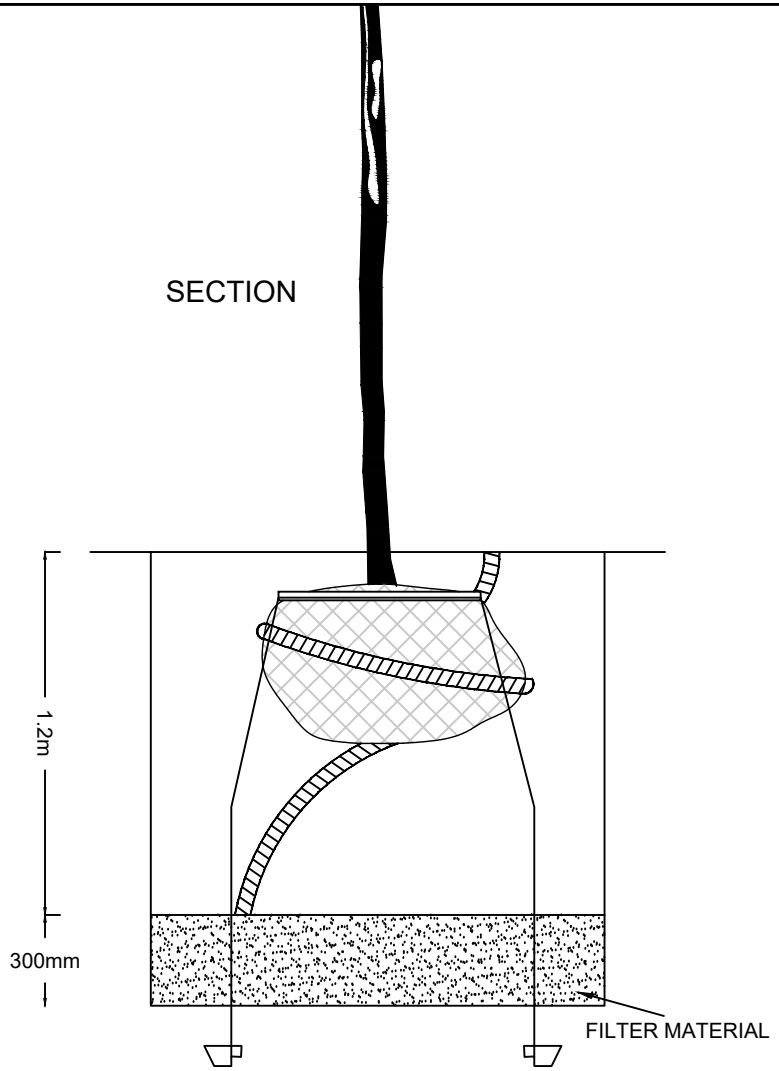
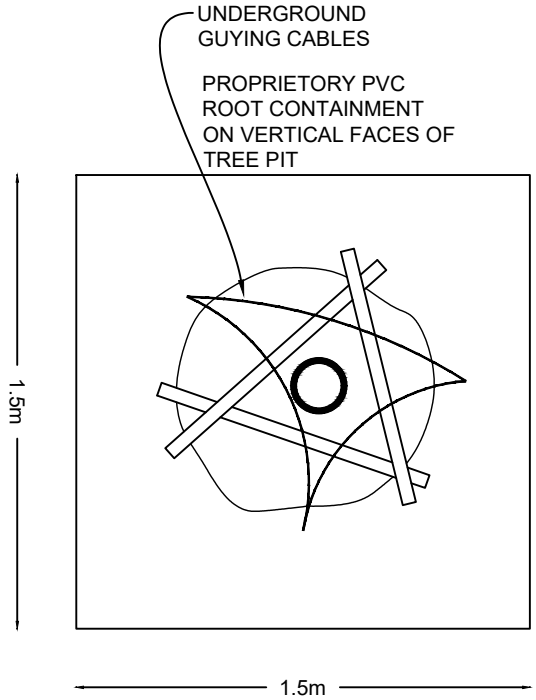
BOLLARD DETAIL

DRAWING NO	REV
NAC/502/BOL	A

SECTION



PLAN



NOTE: FILTER MATERIAL REQUIRED ABOVE IMPERVIOUS GROUND CONDITIONS
FLEXIBLE ROOT LINER ALTERNATIVE TO CONCRETE RING

NOTES

1. All dimensions in millimetres.

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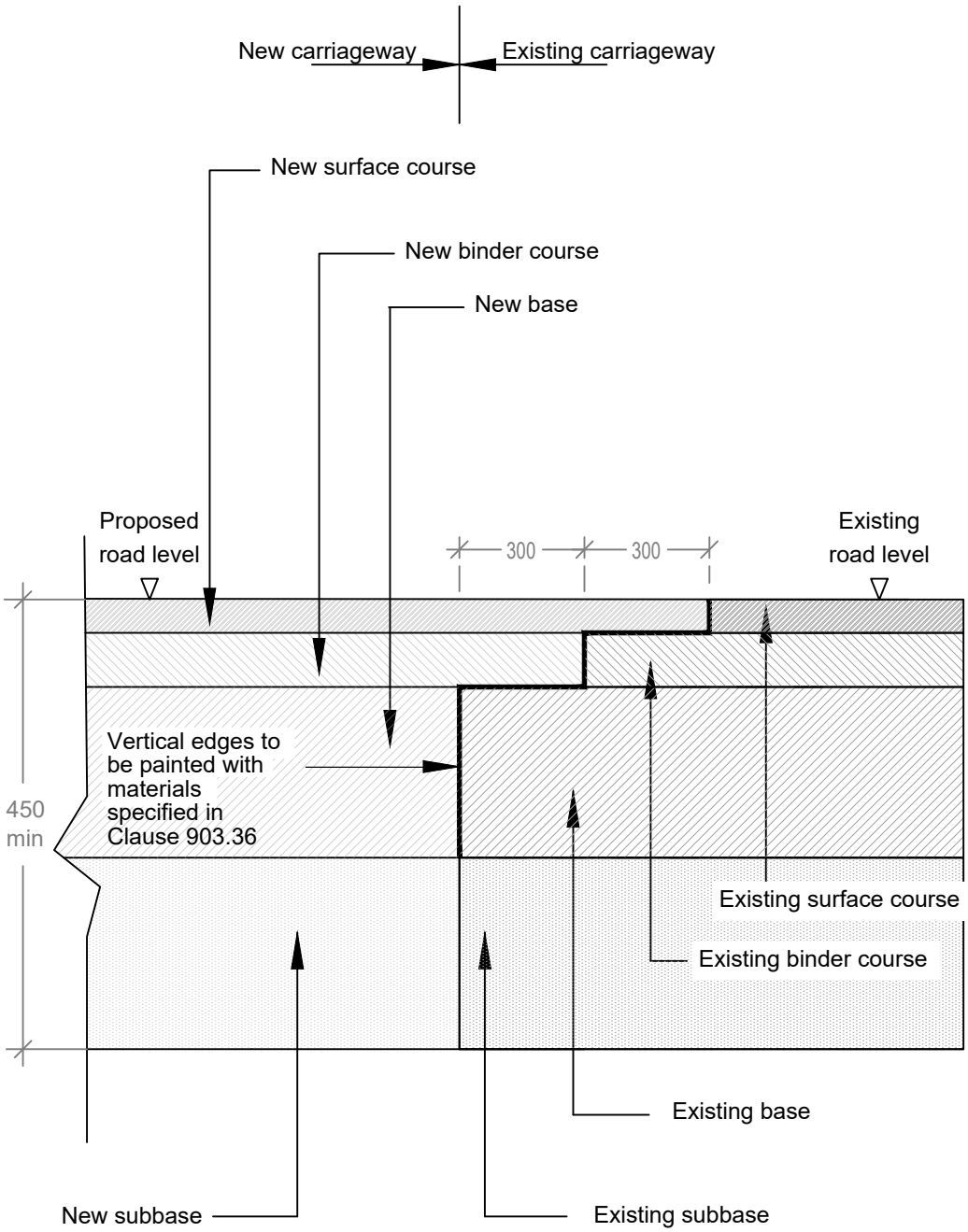
TREE PIT DETAIL WITH CONTAINMENT

DRAWING NO	REV
NAC/503/TRE	A



NOTES

1. All dimensions in millimetres. (This drawing is not to scale)
2. Full Construction Information for Carriageway to Table NAC/001/CD
3. All bituminous joints to be treated to SHW cl 903, Sections 21-25
4. Bond Coat/Tack Coat to SHW cl 920

(This drawing is not to scale)

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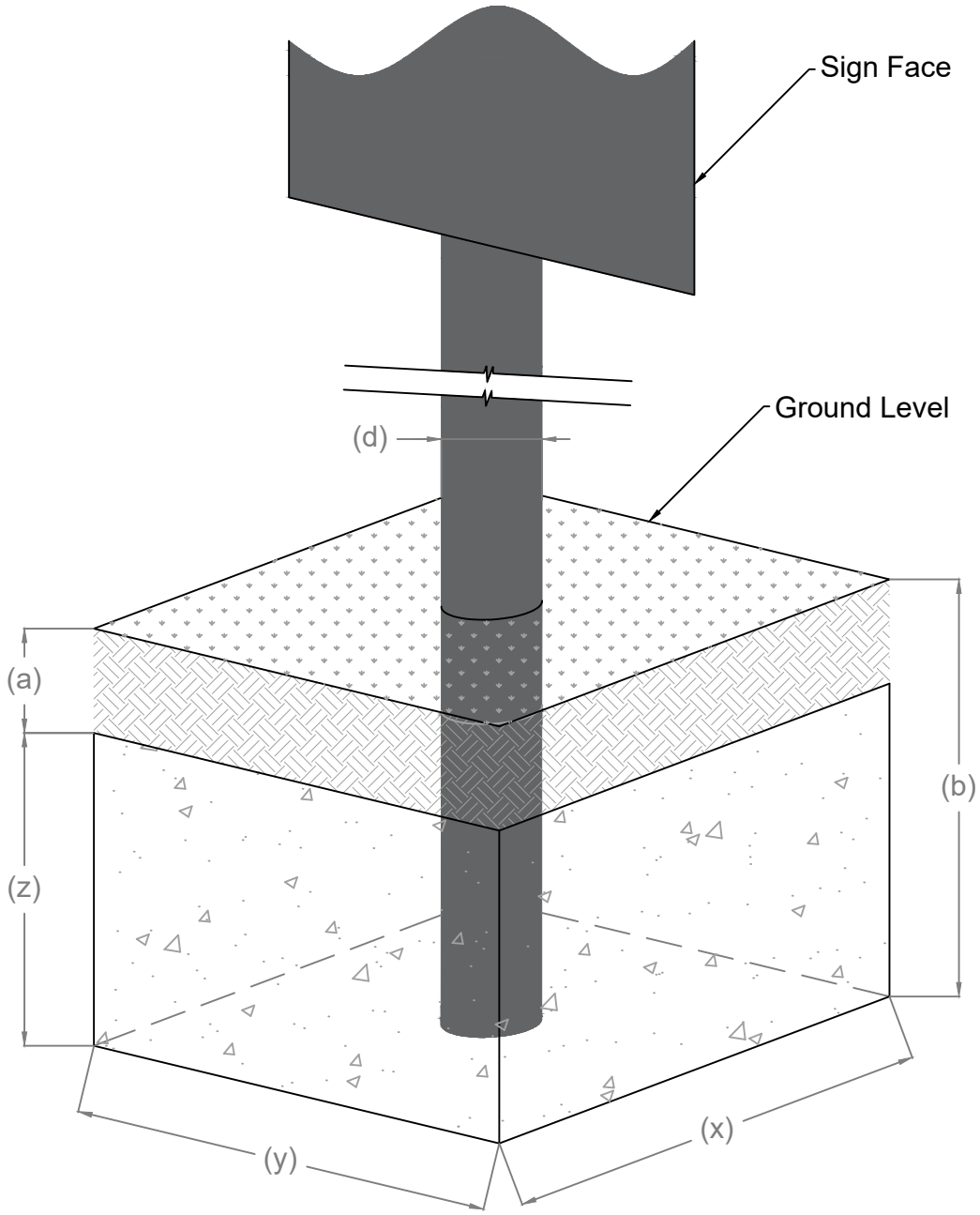
STEPPED CARRIAGEWAY JOINT

DRAWING NO	REV
NAC/504/SCJ	B



Pole Diameter (d)	Base Length (x)	Base Width (y)	Base Depth (z)	Cover to Base (a)	Planting Depth (b)
76	600	600	450	150	600
89	600	600	600	150	750
114	900	600	600	150	750
140	1200	750	750	150	900

(All dimensions in millimetres)

NOTES

1. All dimensions in millimetres.
2. The Specification for road traffic signs and posts shall be laid down in the following documents:
   (a) BS EN 12899–1:2007: "Fixed, vertical road traffic signs", as amended.
   (b) The Traffic Signs Regulations and General Directions 2016.
   (c) The Traffic Signs Manual, as amended.
   (d) The Manual of Contract Documents for Highway Works, as amended.
3. Traffic sign posts shall be manufactured to the dimension stated in the Schedule of Items and comply with the requirements of BS EN 12899–1:2007.
4. They shall be tubular hollow sections complying with BS EN 10210 and shall be manufactured from galvanised steel and coated with PVC complying with BS EN12899–1:2007.
5. The posts shall be new continuous lengths with no welded sections or change in external diameter other than between base section and shaft.
5. Post doors shall have a galvanised 3mm nominal diameter closed link stainless steel chain attached to the column sufficiently long to allow the door to rest freely on the ground when the post is erected in its operational position.
6. Brass or stainless steel earthing terminals shall be provided on the posts (posts with flare bases only) and post door, size M8 x 30mm long complete with two brass or stainless steel hexagon nuts and two plain brass or stainless steel washers. These shall be welded or brazed to the access doors and inside walls of the base compartment and shall be fitted with a distinctly and durably marked metal label marked: SAFETY ELECTRICAL CONNECTION – DO NOT REMOVE.
7. The post manufacturer shall be registered with and certified by either British Standards Institute Quality Assurance Services, Lloyds Register Quality Assurance Limited or other Nationally Approved Body for the manufacture, supply and verification of traffic sign posts under their Quality Assessment Schedule to ISO 9001.
8. Concrete for posts will be Class ST5

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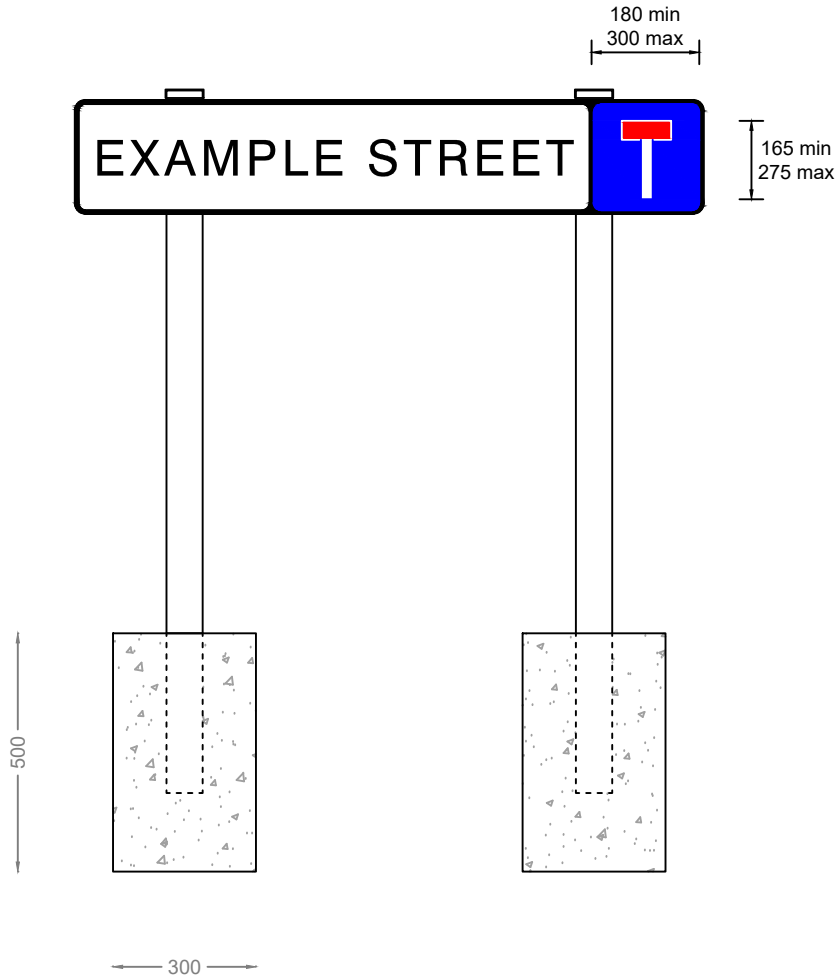
SIGNPOST FOUNDATION DETAIL

DRAWING NO	REV
NAC/505/POS	A



NOTES

1. All dimensions in millimetres. (This drawing is not to scale)
2. Street nameplate to be non-reflective, helvetica medium lettering, black on white background on 3mm aluminium plate, rounded corners and 8mm black border. Sealed with appropriate weatherproof clear protective material. Lettering to be 75mm, uppercase, and on two or more lines if appropriate.
3. Street nameplate to be mounted using rivited channel rails and 4x76mm stainless steel anti-rotational clips, plus 2x76mm diameter grey PVC material coated poles, bitumen coated internal surfaces, galvanised base plates, platic pole caps to allow mounting heignt of 1.0m and foundation depth of 500mm.
4. Poles to be fitted in 300mm x 300mm x 500mm deep hole, ancillary concrete mix ST2 or similar approved mix, concrete foundations to be float finished flush with existing hard surfaces, and painted with bitumen paint to match. Soft soil, verge, turf etc. to be reinstated to original surface, where appropriate on top of concrete foundation.

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STREET NAMEPLATE DETAIL

DRAWING NO	REV
NAC/506/SNP	A

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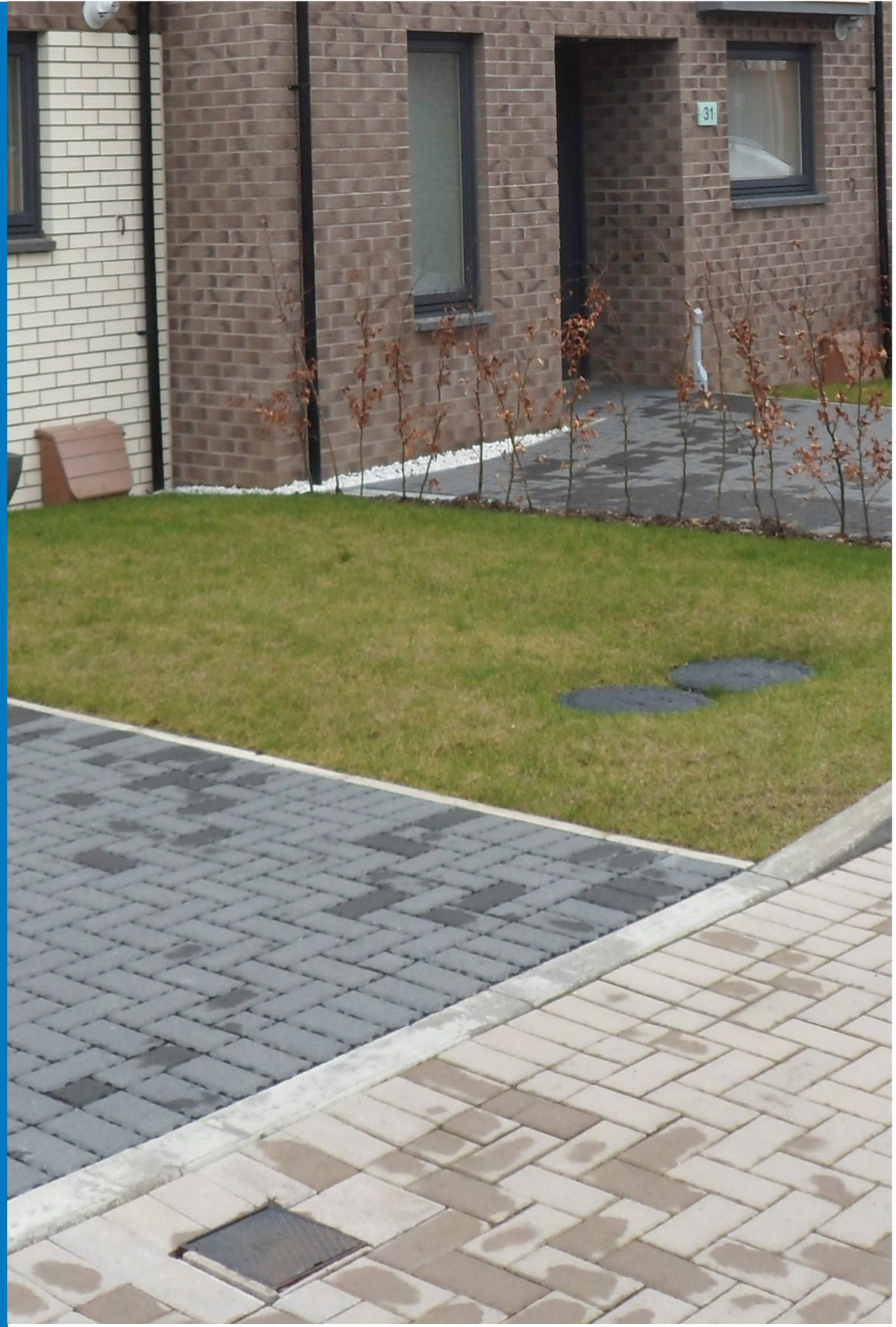
North Ayrshire Supplementary Street Design Guide

Appendix G –Construction Standards and Materials

Version 1: 2024

Version Control

Issue	Date	Nature of Change/Pages Affected
Version 1	xxxxxxx	Issue of Supplementary Street Development Guide



Contents

Tables

Figures

1.1 Introduction

One of the key objectives is the use of simple, appropriate, sustainable, well detailed, high-quality materials that form a cohesive family of components, which are readily available and not imported. The selected materials should assist in the making of high-quality places and need to reflect the existing character of an area. Specific instances (e.g. Conservation Areas, in the vicinity of Listed Buildings, or other areas of the historic environment) will sometimes need specific materials not acceptable elsewhere.

1.2 Geotechnical Considerations

Soil Report

A soil report should be provided giving the C.B.R. test results of the sub-grade, for sub-base determination. The site investigation should also determine the suitability of the underlying soil for the chosen SuDS treatment methods, and this should be considered in the submitted report.

1.3 Subgrade Drainage

Where roads do have frontage development and adjacent ground levels do not involve embankments or cuttings, it is unlikely that specific measures will be required to effect drainage of the permeable layers unless the site investigation indicated that either the water table is likely to rise to within 0.6 metres of formation level or that the material below formation level is highly impermeable.

In either of these cases, sub-grade drainage can be affected by ensuring that backfill material to gully connections is permeable and that water which will accumulate in this backfill is provided with an outlet which, while allowing water to permeate into manholes, ensures that bedding and backfill materials of the drain are retained.

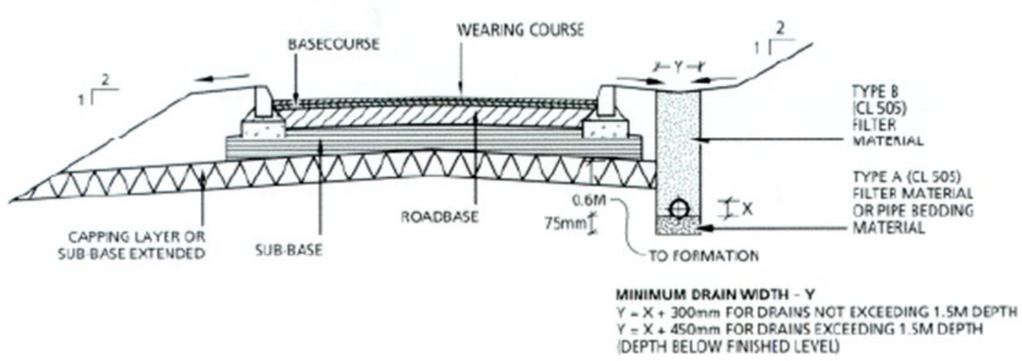


Figure 1 – Section Through Road Indicating Sub Grade Drainage

Figure 2 – Filter Drain

Where Roads have no frontage development, subgrade drainage will be affected as follows:

- In cuttings, filter drains which will be required to cater for surface water run-off from slopes will also provide a sub grade drainage function by being located deep enough to prevent the water table from rising to within 0.6 metre of the formation level.
- In embankments, capping layers and/or sub-base layers must be extended periodically to the face of the embankment to effect drainage of these layers.

1.4 Carriageway Construction

CBR (California Bearing Ratio)

Carriageways should be designed as flexible pavements in accordance with TRRL Report LR1132 for bitumous roads and BS7533 for block paving. 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 to or better than the specified capping material, a full capping layer is required.

Capping Layer

Figure 3 details of the Capping Layer requirements based on the CBR values.

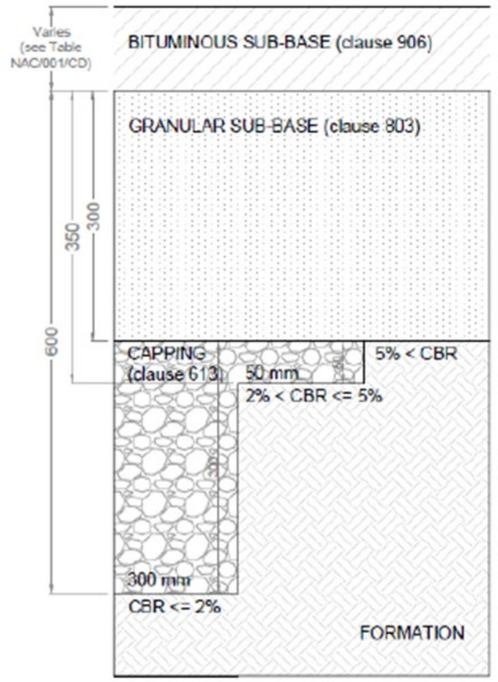


Figure 3 – Capping Layer Requirements (Subject to Frost Susceptibility)

Pavement Construction Table

Example designs for the bound pavement layers are detailed in the tables below, which shows the minimum design thickness for a variety of alternative materials for the various street types within the scope of this guide. The pavement construction for any roads not included in the table shall be subject to site specific designs in Section 3.4.4 of the NRDG. For further details of carriageway and footpath and cycle track construction, see Appendix F detail drawing NAC/001/CD Rev A.

Table 1 – Pavement Construction Mainland and Cumbrae

Pavement Construction (Mainland & Cumbrae)			
Street	**Base course (mm)**	**Binder course (mm)**	**Surface Course (mm)**
1	AC 32 Dense (140mm)	AC 20 Dense (60mm)	HRA (40mm)
2	AC 32 Dense (100mm)	AC 20 Dense (60mm)	HRA (40mm)
3	AC 32 Dense (80mm) 175mm Type 1 Granular Material	AC 20 Dense (50mm) 50mm bedding Layer of sharp sand	HRA (40mm) Concrete block pavers (80mm thick)
4	AC 32 Dense (80mm) 175mm Type 1 Granular Material	AC 20 Dense (50mm) 50mm bedding Layer of sharp sand	HRA (40mm) Concrete block pavers (80mm thick)
Industrial	AC 32 Dense (140mm)	AC 20 Dense (60mm)	HRA (40mm)
HRA = Hot Rolled Asphalt *AC = Asphalt Concrete*			

Table 2 – Pavement Construction in Arran

Pavement Construction (Arran)			
Street	**Base course (mm)**	**Binder course (mm)**	**Surface Course (mm)**
1	AC 32 Dense (140mm)	AC 20 Dense (60mm)	AC 14 Close (40mm)
2	AC 32 Dense (100mm)	AC 20 Dense (60mm)	AC 14 Close (40mm)
3	AC 32 Dense (80mm) 175mm Type 1 Granular Material	AC 20 Dense (50mm) 50mm bedding Layer of sharp sand	AC 10 Close (40mm) Concrete block pavers (80mm thick)
4	AC 32 Dense (80mm) 175mm Type 1 Granular Material	AC 20 Dense (50mm) 50mm bedding Layer of sharp sand	AC 10 Close Concrete block pavers (80mm thick)
AC = Asphalt Concrete			

1.5 Materials

This section sets out the materials that are likely to be adopted by North Ayrshire Council for their residential streets.

Attention to detail in both design and construction are important in determining the final look and feel of an area or development. Such detail can give places character and local identity. The public realm can have a significant effect on the safety of a place as well as affecting the ease and efficiency of management and maintenance.

The choice of materials can be used to create a more attractive street scene while still retaining durability and functionality.

Adopted Materials

The use of an unlimited palette for street materials can produce a confused and untidy appearance and make future maintenance and repair more difficult and costly. The aim of this section is to define a more limited palette of materials that will allow both design and maintenance issues to be resolved. Further detail on the construction specifications for the various materials can be found in the separate document materials specifications available from the Local Authority.

Adoption of other Materials

There will be occasions in some specific circumstances, for example in conservation areas, when the more limited palette of adopted materials does not meet the design aspirations or requirements for the area or development. In these cases, the proposed materials will need to be submitted to the Local Authority for approval. Any such materials, proposed for adoption should be readily available, sustainable in the long term, preferably locally sourced, economically viable, environmentally friendly and meet the necessary properties/specification.

Details of such materials should be provided as early as possible. Outline information concerning the proposed materials will be expected as part of any pre-planning application discussions.

Carriageway Materials

Blacktop

This falls into three main types:

- Stone mastic asphalt
- Hot rolled asphalt with chippings
- Dense/close graded surface course.

These materials provide a good running surface and combined with the correct aggregate gives acceptable skidding resistance properties. Combined with good quality paving and kerbing they provide an acceptable and serviceable surface, particularly in urban areas with higher traffic flows. Large areas of this material can, however, detract from the appearance of a public spaces.

Block Paving

- Coloured concrete blocks.
- 'Tegula' – tumbled concrete blocks.

Concrete block paving can provide an attractive alternative to blacktop. It Is particularly useful to define less traffic dominated areas and to break up otherwise large areas of blacktop.

Block paving should not be used where it is expected that turning by HGV's (refuse vehicles) will occur.

Figure 4 – Concrete Block Paving

Plain concrete blocks are readily available in a variety of colours such as red, brindle and charcoal. As an alternative a tumbled concrete block can give a more random appearance using the range of different sizes, but with a common laying width. Care should be taken to ensure a contrast with all kerbing to assist the partially sighted and guide dogs to detect the kerb edge.

Alternatives

Other options exist such as:

- Natural stone setts

In these cases, the use of such materials would require submission through the adoption process described above.

Unsuitable Materials

Materials which leave loose aggregates or create uneven surfaces will not be acceptable as they cause problems for people with mobility issues, prams and cycles.

Footways and Other Paved Areas

Blacktop

These materials are generally of the dense/close graded type. Such material provides a very flexible option. It is also relatively cheap and easy to maintain, especially if there are significant amounts of services in the footways.

Figure 5 – Asphalt with Decorative Aggregates

Concrete Flags

- Plain concrete
- Textured concrete
- Smooth/ground concrete
- Exposed aggregate.

There is a variety of finishes and colours available that can be used in a variety of layouts/coursing. The use of flags is not suitable where over-run by vehicles is likely unless use is made of fibre reinforced flags. In the latter case advice should be sought.

Natural Stone Flags/Setts

If the use of natural stone flags/setts is being considered advice should be sought from North Ayrshire Council the type and source of the stone and the detailed specification for the bedding and jointing materials.

Figure 6 – Natural flags – Designing Streets

Tactile Paving

At uncontrolled crossing locations buff tactile paving should be detailed, naturally precast concrete paving in standard size. For controlled crossings the tactile paving should be red. The Department for Transport (DfT) produce guidance on the use of such paving and care should be taken to balance the need for paving and visual intrusion. In natural material areas alternatives exist such as specially ground flags and brass studs. Again, the use of such materials needs to be submitted through the approvals process.

Unsuitable Materials

Concrete, slabs, clay blocks and Stone Mastic Asphalt (SMA). The use of kerb drainage units is discouraged due to maintenance issues.

Kerbs, Channel Blocks and Edgings

Concrete

- Standard precast kerbs (grey, pressed)

Natural

If natural stone kerbs, channels and edging are proposed then approval needs to be sought through the process.

Parking Bays

Where parking bays are specified the surfacing material has the same options as carriageway surfacing. From a practical perspective if concrete blocks are used, they should be of a darker colour to cover oil staining etc. Care should be taken to ensure a good edge restraint between any blocks and blacktop, such as a dropped kerb or channel block to prevent distortion in the block paved area.

1.6 Cycle Paths

The Local Authorities do not normally require different materials for Cycle Paths. This applies to both on and off carriageway Paths. Only in limited circumstances would a different coloured surface be required. Advice should be sought from North Ayrshire Council during the RCC process to determine when this treatment is appropriate.

1.7 Footway and Service Strip Crossing

Vehicular

Footway crossings shall not be used for service accesses to commercial properties, industrial accesses, or where particularly heavy vehicles are anticipated. In these circumstances, more formal access junctions shall be provided, and the pavement construction shall meet the same requirements as the adjacent carriageway.

Pedestrian

Crossings to be as per Standard Construction Detail in Appendix F.

1.8 Street Nameplates

Wall Mounted Street Nameplate

Non-reflective, Helvetica medium lettering, black on white background on 3mm aluminium plate, rounded corners and 8mm black border. Sealed with appropriate weatherproof clear protective material. Lettering to be 75mm, upper case, and on two or more lines if appropriate.

Mounted on timber backing plate, 12mm thick, painted and weatherproofed as appropriate, overall size 10mm larger than sign, all secured by 8 steel hardened, galvanised screws, with white caps, and raw plugs.

Free Standing Street Nameplates with Poles

Same specifications as wall mounted nameplate (excluding timber backing plate etc) but with riveted channel rails and 4 x 76mm stainless steel anti-rotational clips, plus 2 x 76mm diameter, 105m grey PVC material coated poles, bitumen coated internal surfaces, galvanised base plates, plastic pole caps, to allow mounting height of 1 metre and foundation depth of 500mm.

Fitted in 300mm x 300mm x 500mm deep hole, ancillary concrete mix ST2 or similar approved mix, concrete foundations to be float finished flush with existing hard surfaces and painted with bitumen paint to match. Soft soil, verge, turf etc. to be reinstated to original surface, where appropriate on top of concrete foundation.

Contractors must secure all necessary road opening permits required for groundworks involved in erection of pole mounted street signs and must also satisfy themselves as to the position of all services, under or in proximity to these groundworks, and take any measures required to safeguard such services, and safety of their operatives. See Appendix F for further information.

1.9 Signing and Road Marking

- All signing and road markings to be in accordance with “The Traffic Signs Regulations and General Directions”.
- All signs to be manufactured in Class Ref 2 of BSEN12899:2007 or equivalent unless otherwise stated.
- All road markings to conform to Traffic Signs Manual Chapter 5 – Road Markings 2003.
- A minimum sign mounting height to be 2.25 metres over footway and 1.8 metres over verge unless otherwise stated.
- The illumination and numbering of traffic signs to be co-ordinated with Road Services Lighting Section.

Signpost Specification.

All Traffic signposts shall conform to the requirements of BS873 part 7 subject to the following restrictions/amendments/additions: -

- Posts shall be manufactured using structural hollow sections to BS4848 part 2.
- Posts shall be galvanised and have a self-coloured grey P.V.C. or E.V.A. plastic coating of thickness not less than 0.3mm applied externally, over the full length of the post, using the fluidised bed process.
- In the case of large base posts, the post shall be welded to the top of the base housing by continuous weld round the entire circumference of the post and by welding the bottom of the post to an internally fitted reinforcing ring.
- All posts shall have a coating of bituminous paint complying with BS 3416 applied internally over the full length of the post.
- In the case of large base posts an 18mm conduit hole shall be provided 75mm from the top of the post as indicated in the enclosed drawing. A base plate (as specified in BS 873 part 7) shall also be provided.
- To prevent the ingress of water all open-ended posts shall be provided with post caps conforming to BS 873-part 7 section 5.4.
- Manufacturers shall state clearly the plastic material to be used to coat the posts.

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Appendix H – SuDS and Drainage

Version 1: 2024

Version Control

Issue	Date	Nature of Change/Pages Affected
Version 1	xxxxxxx	Issue of Supplementary Street Development Guide

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1.1 Introduction

Drainage should be designed to include a Sustainable Drainage System (SuDS). Design calculations and design and check certificates (Form DC2) for the drainage system will be required to show the adequacy of both the system and the discharge points. Drainage layout and design must be approved by Representatives of the Local Roads Authority, Scottish Water and SEPA. Where connections are made to a private drainage system written confirmation is required to show that authority has been obtained from the appropriate proprietor.

All developments shall make adequate provision for draining surface water from the adoptable road. Public road drainage must either be contained within an adoptable system or a system that is managed and maintained by Scottish Water. Road drainage must be located within land to be adopted as public road and not connected to a private drainage system.

The use of Sustainable Drainage Systems including flow attenuation and storage systems and water quality treatment measures are required, in most cases. The term Sustainable Drainage Systems (SuDS) covers the whole range of sustainable approaches to surface water drainage management. SuDS aim to mimic natural drainage processes and remove pollutants from urban runoff at source. SuDS comprise a wide range of features, including green roofs, permeable paving, rainwater harvesting, swales, detention basins, ponds, and wetlands.

Only if SuDS are confirmed not to be feasible will road run-off be intercepted and discharged directly to a public sewer adopted by Scottish Water. Scottish Water will still require flow attenuation and storage measures and the requirement for water quality treatment will depend on the sensitivity of the receiving water environment. Scottish Water's surface water policy may support the connection of road drainage to a surface water sewer.

North Ayrshire Council has prepared a Procedure Note to communicate the expectations that applicants for planning permission should meet when applying for consent for development that includes the provision of SUDS, the development of surface water infrastructure, and/or where the proposal is at risk of flooding or is likely to result in an increase in flood risk elsewhere.

Development proposals will:

- not increase the risk of surface water flooding to others, or itself be at risk.
- manage all rain and surface water through sustainable urban drainage systems (SUDS), which should form part of and integrate with proposed and existing infrastructure. All proposals should presume no surface water connection to the combined sewer;
- seek to minimise the area of impermeable surface.

Road's drainage is generally adopted in accordance with the following diagram. Early discussions with Scottish Water are recommended to establish future maintenance.

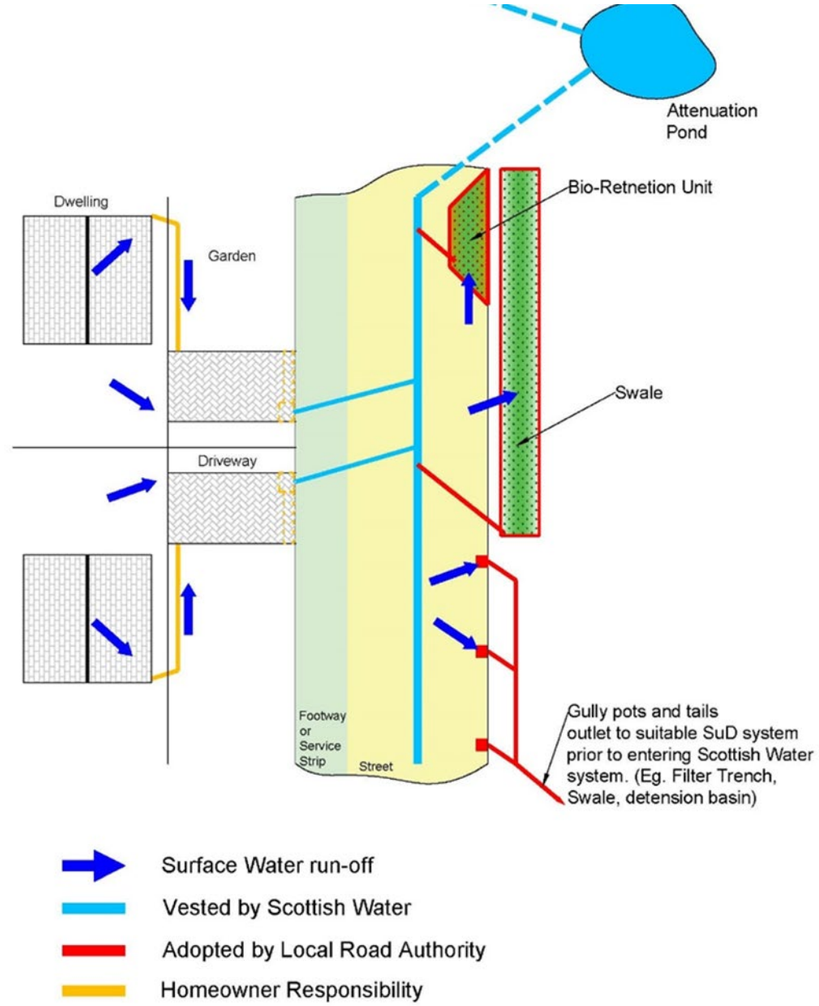

Figure 1 – SuDS Ownership

1.2 Design

Streets should be designed to include Sustainable Drainage Systems (SUDS) which are promoted by the Government as the preferred solution for managing surface water and minimizing environmental impacts. They should be applied wherever practical and technically feasible. Sustainable drainage solutions adoptable by both local authorities and Scottish Water are set out in The SuDS Manual (C753) 2015. Not implementing SuDS could breach Controlled Activities Regulations. In limited circumstances where the discharge location is to

coastal water then a full SuDS system may not be required but certain water quality treatment measures may be required to protect the environment.

When considering the management of surface water, designers, developers and authorities need to take account of the following policy and guidance documents:

- PAN 61: Planning and Sustainable Urban Drainage.
- Scottish Planning Policy NPF4.
- The Water Environment and Water Services (Scotland) Act 2003 (WEWS Act 2003).
- SuDS for Roads (Working Party SUDS 2009).
- The SuDS Manual (C753) 2015.
- North Ayrshire Drainage Policy/ Advice Notes.

SUDS for Roads, 2009 sets out a series of road selection tools and should be used as guidance for scoping and selecting of appropriate SUDS for a development Site. Scoping includes the assessment of Site Characteristics (Site topography, physical drivers, integration with existing road infrastructure, soils properties, integrations with utilities and other infrastructure, contamination etc), Site analysis, opportunities and constraints, exploration of Applicable SUDs options. The scoping stage is followed by the evaluation of Technical Drivers, Social and political drivers, operation and maintenance, development of a Preliminary Outline design and financial considerations which will result in the Selection of appropriate SuDS. SuDS are required to be considered as part of the development cost.

Proposals will be expected to make appropriate allowance for both urban creep and climate change. There is an expectation that drainage proposals will also take account of climate change allowances. Climate change will have ramifications for 'additional' attenuation storage (i.e., over and above that required by Scottish Water, flood flow-paths, the design of access/egress routes and freeboard allowances / finished floor levels). Drainage systems cannot always perform effectively in extreme flood events but future flood risk should be understood and measures should be put in place to manage this risk.

SuDS can be designed for:

- Water quality.
- Amenity.
- Biodiversity.
- Provide drainage for specific site conditions or roads/ streets and provide green infrastructure for urban areas.

Techniques and methods for rainwater management can be but not limited to:

- Filter strips.
- Filter drains.
- Swales.
- Bioretention Systems.
- Trees.
- Porous Paving.
- Detention Basins.
- Ponds and Wetlands.

Figure 2 – Filter Trench for Rainwater Management

Further information on drainage requirements and construction details are contained within Appendix F - Construction Standards.

Footpaths

All footpaths should be positively drained to ensure no ponding or pooling occurs. Details are contained in Appendix F – Standard Details.

Access Strips

Where the drainage is located within private land a 3-metre-wide access strip will be required for maintenance purposes.

Figure 3 – Swale adjacent to street

1.3 Approvals

Approvals/Certificates

Design calculations and design and check certificates (Form DC2) for the drainage system will be required to show the adequacy of both the system and the discharge points. Drainage layout and design must be approved by Representatives of the Local Roads Authority, Scottish Water and SEPA.

Where connections are made to a private drainage system written confirmation is required to show that permission has been obtained from the appropriate proprietor.

All road drains shall be located within land to be adopted as public road. In exceptional circumstances it may be permitted for a road drain to cross private land outside the adopted public road in accordance with Section 31 of the Roads (Scotland) Act 1984 in which case a wayleave agreement shall be required. The wayleave agreement shall be in place prior to or shall be a condition of the Road Construction Consent approval.

The Developer will put in place legally binding and enforceable title conditions, including suitable factoring arrangements, to ensure the SuDS systems serving the development are properly maintained and remain kept in a satisfactory condition for perpetuity. Confirmation that appropriates arrangements are in place will be provided to the Council prior to the occupation of the first dwelling.

1.4 Responsibility Schedule

A “Responsibility Schedule” should be produced for all drainage infrastructure detailing Scottish Water and North Ayrshire Council infrastructure responsibility.

A “Responsibility Schedule” for drainage infrastructure detailing the prospective maintenance responsibilities of Scottish Water, North Ayrshire Council and third parties for the purpose of safeguarding the proper function of the assets. This could ether be a plan showing each drainage item (i.e., filter trenches, carrier drains, gully connection, suds outfalls/inlets, basins etc) coloured appropriately or a schedule listing each asset, or a combination of both. For example, it could read that the Council will be responsible for gullies, gully connections, filter trench and pipe until it meets the main carrier drain etc

A management statement indicating the proposals for who will carry out the maintenance of the above ground drainage assets (NAC) detailed in the responsibility schedule. It is understood that at the construction consent stage the actual factor will not be known however we will require to establish whether these will be maintained by the developer, the residents and/or factored out.

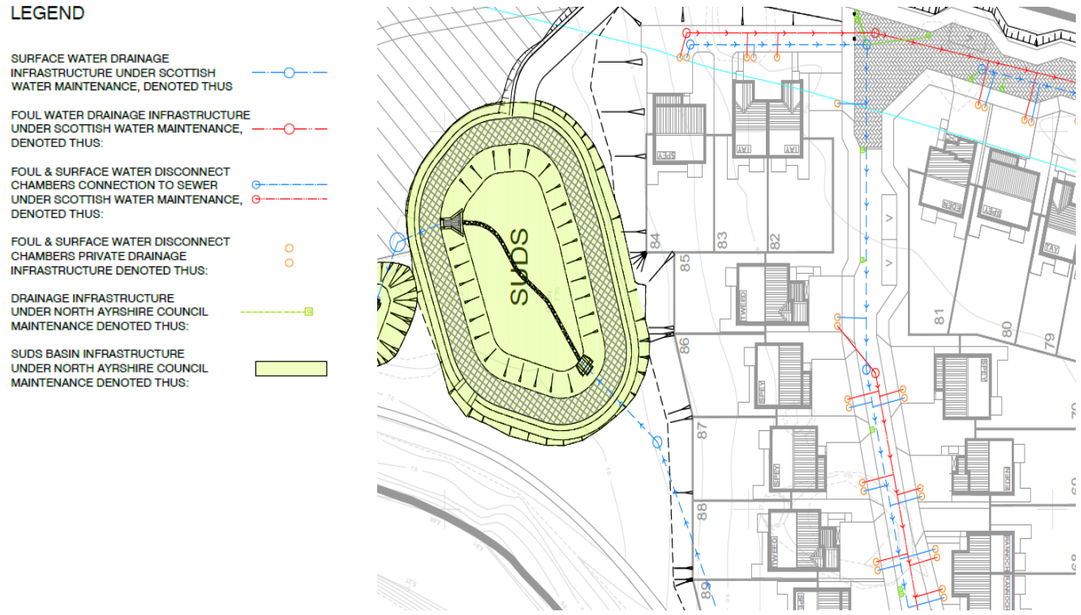

Figure 4 – Responsibility Plan Extract

1.5 Drainage Assessments

The purpose of a drainage strategy is, in part, to communicate the form of SuDS and to demonstrate that the impact of the proposed drainage arrangement in terms of flood risk and water quality have been fully considered.

A Drainage Assessment (DA) should be prepared in accordance with current best practice guidance. The discharge of stormwater from the road should comply with the stipulated design criteria, current SuDS for Roads design guidance and any requirements of Scottish Water. In addition, we require the DA to address the following:

- The effects of a 1 in 200 year critical storm plus climate change, The effects of a 1 in 200 year critical storm plus climate change, which should be identified by modelling a range of storm profiles and intensities to find the event that places most stress on the designed drainage system. Allowances for urban creep to be included.
- The effects of differing storm intensities over and above the 10-year return.
- The extents of differing flood conditions should be shown on a site plan to ensure that no water enters buildings or restricts movement of emergency vehicles, including an assessment of exceedance flow paths from the designed surface water and land drainage systems.
- A strategy for dealing with any land drainage affected by the works.

1:200 Flood Event Plus Climate Change

Within North Ayrshire, surface water drainage networks that are to be vested in Scottish water; shall be designed to Scottish Water's capacity requirements, typically with a capacity to accept the 1 in 30-year critical storm event plus appropriate allowances for climate change and urban creep. SuDS ponds or basins shall be designed to have a holding capacity that will not be exceeded during the 1 in 200-year flood event + an allowance for Climate Change and Urban Creep. Additionally, all SuDS ponds, basins and other storage measures must not be located on the functional flood plain.

Land Drainage Strategy

Land drainage to be provided where any land or open space areas is likely to shed water onto the adoptable road or footpath network. Private drainage is considered to be any system that is not vested in Scottish Water and may include Council assets.

A legal agreement will be required to implement a proposed connection to a private drainage system. Legal agreements should also define arrangements for the future maintenance of the system. While it is not necessary to provide details of legal agreements when applying for planning permission, any Drainage Strategy / Impact Assessment must demonstrate that the proposals will not be at risk of flooding, or increase the risk of flooding in other places, taking account of the constraints of the private drainage system and legal agreements.

Where the assumptions of the Drainage Strategy / Impact Assessment cannot be secured by legal agreement, it is the developer's responsibility to notify NAC Planning and seek further appropriate consent and/or approval.

1.6 SuDS Management Plan

The developer should provide a SuDS Management Plan to be provided which will include;

- SuDS overview
- "Management Statement" to describe the SuDS scheme and set out the management aims and responsibilities for the site.
- "Maintenance Schedule" describing what work is to be done and when it is to be done using frequency and performance requirements as appropriate, including:
    a. A risk assessment for public safety
    b. It should consider how the SuDS will perform and develop over time anticipating any additional maintenance tasks to ensure the system continues to perform as designed.
    c. It must include specification notes that describe how work is to be undertaken and the materials to be used.
- A site plan showing maintenance areas, control points and outfalls.
- Typical cross sections through SUDs basin, pond and swales.
- It should include, but will not be limited to, the following activities:
    - Clearance of debris from screens
    - De-littering of embankments
    - Removal of debris from the watercourse channel / cut-off drains
    - Grass cutting during the growing season
    - Maintenance of a service strips and access ways that, in turn, facilitate the maintenance and monitoring of watercourse channels, cut-off drains, outfalls, filter drains and other SUDS infrastructure.

1.7 Gullies and Chambers

Where gullies are required, the gully spacing to be in accordance with the requirements of Table 1 below. Slots in gratings or between gratings and frames shall not be orientated parallel to the direction of traffic.

Chambers and Gully Specification

Drainage must be considered in detail as vertical and lateral traffic calming measures affect the carriageway channel level and line. This will entail additional gullies being added or a bypass channel being incorporated in the design.

Location

Gully gratings and frames shall comply with BSEN124, the upper surface shall be flat and the slots in gratings or between gratings and frames shall not be orientated parallel to the direction of traffic**.**

Gully Spacing

Table 1 – Gully Spacing

Gradient		Flatter than 1/150 (0.66%)	1/150 0.66%	1/100 1.00%	1/80 1.25%	1/60 1.66%	1/40 2.5%	1/30 3.33%	1/20 5.00%
		Gully Spacing (metres)							
Cross Section	C/Way Width								
1 in 40 (2.5%) Camber	5.5m	20	30	35	40	45	55	60	75
	6.0m	20	25	30	35	40	50	60	70
	7.3m	15	20	25	30	35	40	45	55
1 in 40 (2.5%) Crossfall	3.5m	10	15	17	20	22	27	30	37
	5.5m	10	15	17	20	22	27	30	35
	6.0m	10	12	15	17	20	25	22	27
	7.3m	7	10	12	15	17	20		

1.8 Maintenance and Adoption

For agreements between highway and local authorities: see section 7 of the Sewerage (Scotland) Act 1968). A Memorandum of Understanding (MOU) between Scottish Water and North Ayrshire Council outlines the principles of working together to minimise the costs to roads authorities, Scottish Water and developers when proposing new residential development. Under these principles the surface water drained from the roads and the curtilage of houses within the development will be accommodated within a shared system, with the maintenance agreement, under **Section 7 of the Sewerage (Scotland) Act 1968**, setting out the obligations that fall to the two authorities on adoption of the system.

Under the terms of the MOU, the Local Authority will have ultimate responsibility for ensuring the maintenance of the 'above ground' assets of the shared system. The maintenance and inspection operations will, however, be implemented by a land manager / factor appointed, in the first instance, by the developer on behalf of the owners or prospective owners of properties within the proposed development.

On-going Maintenance

The maintenance of debris screens, open culverts and watercourses within new developments must be carried out by the land manager / factor at regular intervals. **See NRDG 2.3.8 for adoption of SUDS.** This must be reflected in any maintenance schedule

See section 1.6 SuDs Management Plan.

Maintenance schedules must be devised to address invasive species and to take account of the bird nesting season, the presence of protected species and wildlife / habitat conservation sites, including freshwater and saltwater habitats.

NAC Flooding expects that maintenance responsibilities shall fall to a party that is recorded on the Property Factors Register. Registration is compulsory for residential property and land managers whether they are private sector businesses, local authorities or housing associations operating in Scotland. When registered, North Ayrshire Council and third parties can readily contact a Property Factor to discuss and report maintenance concerns.

Planning Approvals Process

Planning applications must be accompanied by a copy of the maintenance and inspection schedule. This schedule will normally be underpinned by a deed of conditions that, for example, sets out the contribution that each property owner will make towards the future maintenance of the above-ground assets. Where the finalised Deed of Conditions omits the maintenance of land included in the maintenance and inspection schedule submitted to support a planning application, it is the applicant's responsibility to notify NAC Planning, NAC Flooding and Scottish Water and to seek appropriate consent / approval.

Pre-application Discussion Stage (Non-Statutory):

- Evidence that the initial development design proposals have considered the integration and linkage of the surface water management with street layouts, architectural and landscape proposals.
- An assessment of strategic opportunities for the surface water management system to deliver multiple benefits for the site – this should be provided by the developer and should include the strategic use of public open space for SuDS.
- Completion of Flood Risk Screening Exercise.
- Any potential local community impacts, health and safety issues or specific local community concerns and drainage approving body requirements that should be addressed by the detailed design.
- An agreed approach between all relevant parties on the design and maintenance of the surface water management features for the proposed site.

Planning Application in Principle Stage:

- Outline drainage strategy to identify all receiving watercourses or pipe networks and how existing flood risk is intended to be addressed.
- FRA to be submitted, where required.

Full Planning Application Stage

- Drainage Strategy and, where applicable, Drainage Impact Assessment to be submitted.
- Details submitted to demonstrate that the design of each element has been undertaken in accordance with best practice (using detailed design checklists, where required) and that this design provides an acceptable level of water quality treatment, attenuation etc.

- Interdisciplinary check to ensure that all elements are compatible and that flood risk and water quality matters within and around the site have been addressed.
- A SuDS Management Plan.
- Confirmation of prospective approval and adoption/vesting applications for all SuDS components.
- Appropriate consideration of the compatibility of suds in relation to the footprint of the development site, which should also take account of the space required for future maintenance (i.e., access tracks etc).
- A self-certified health and safety risk assessment.

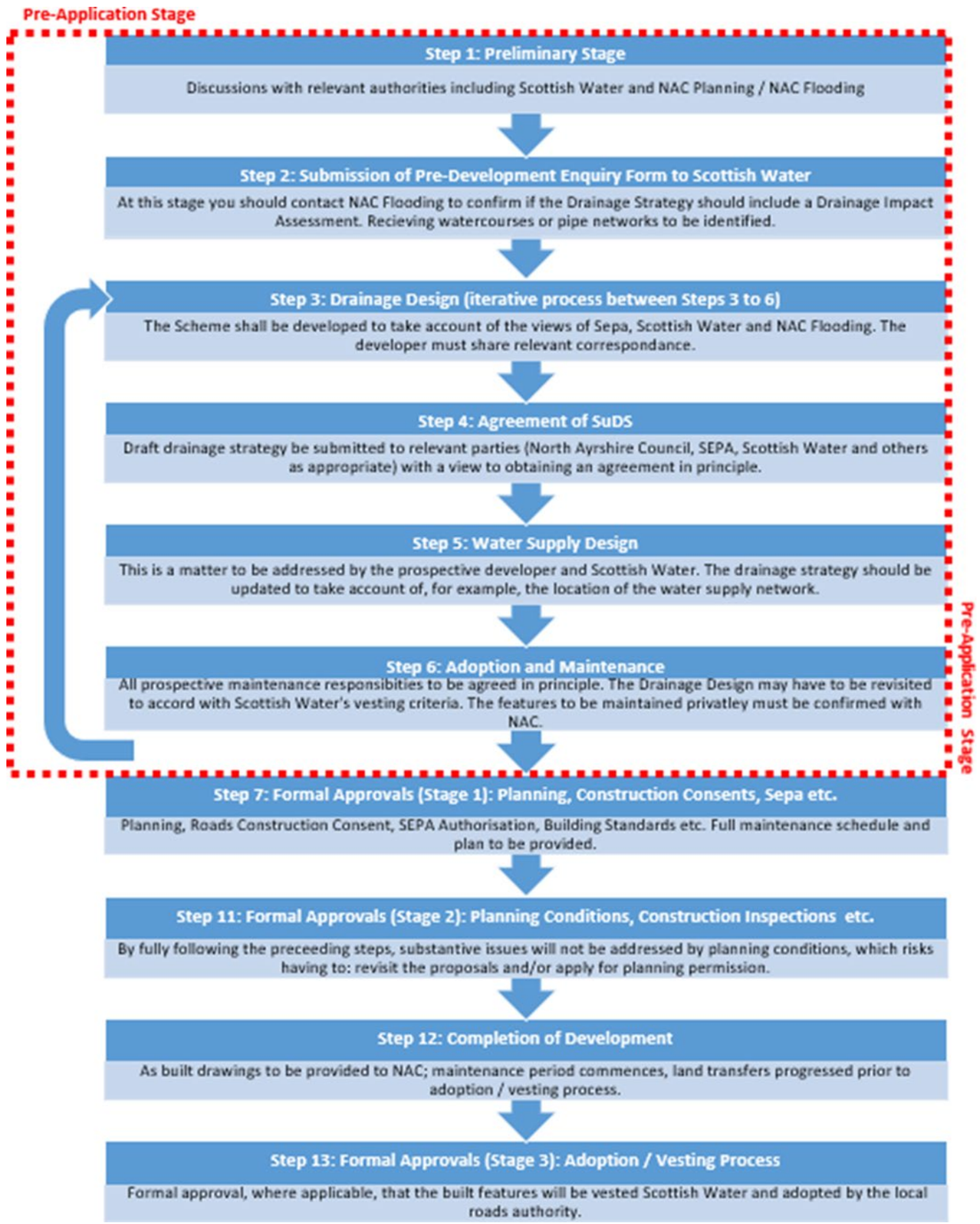

Figure 5 – Drainage Development Planning Flowchart

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North Ayrshire Supplementary Street Design Guide

Appendix I – Parking Standards

Version 1: 2024

Version Control

Issue	Date	Nature of Change/Pages Affected
Version 1	xxxxxxx	Issue of Supplementary Street Development Guide

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1.1 Introduction

In general, adequate parking should be provided adjacent to all new developments to ensure that vehicles are not parked on the carriageway of a road where they may impede traffic flow and constitute a safety hazard.

Parking requirements for developments are given according to their particular function and are classified into the following types:

- Residential
- Commercial
- Industrial, Recreational, Service Industry

Provision for car, coach, taxi, pedal cycle and lorry parking should be considered at an early stage in the design process so that a balanced distribution of spaces can be conveniently sited according to the use and trip destination.

The levels of provision detailed in the following pages are typical requirements. Developments in isolated locations are likely to require parking in excess of these levels. In urban areas, well served by public transport, fewer spaces may be required.

1.2 General Parking Requirements

What is Parking Space?

Car parking provision is usually expressed in terms of ‘spaces’ and includes carports and undercroft parking as well as parking courts but does not include garages under a certain internal dimension (Refer to section 1.4) in residential developments.

On Road Parking

On road parking bays require to be clearly marked and can be provided in any of the following forms.

- End on parking
- Parallel parking
- Angled parking (one-way road or central reserve)

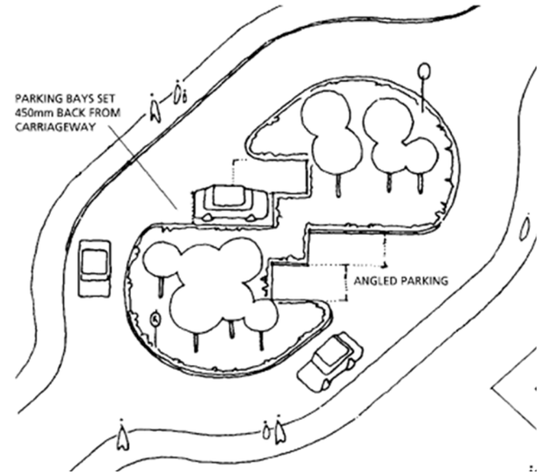

Figure 1 – Angled Parking

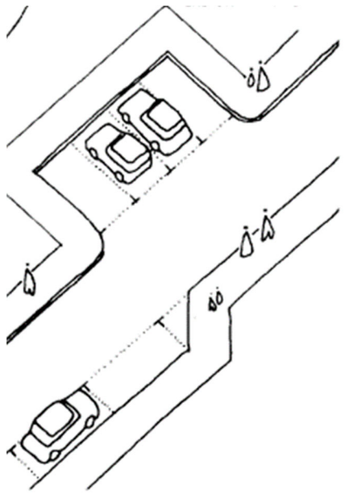

Figure 2 – End on and Parallel Parking

Long rows of parked cars should be avoided, where possible, as this creates difficulty and inconvenience for pedestrians to cross the adjacent carriageway. Conversely, small groups of parking spaces can encourage random pedestrian movements.

Spaces must also be located to ensure that they do not interfere with access points or service bays and create a problem with queuing traffic at junctions. They should be located such that they do not compromise junction or forward visibility splays.

Off Road Parking

Off road parking will normally occur as either spaces located for the use of individual premises, or as a larger area designated as a car park for multiple users. The location of car

parking areas in any development should be considered at an early stage in the design process to achieve a balanced distributor of spaces throughout the site, conveniently related to user destinations.

It should be noted that angled parking layouts tend to be appreciably less efficient in land use than right angled parking layouts even with the narrower aisle widths possible with single way working. The use of angled parking may, however, be appropriate on narrow sites.

Angle of Parking (°)	Aisle Width (m)
30	3
45	3
70	4.5
90	6

Table 1 – Aisle Widths with Angled Parking – One Way Circulation or on Central Reserve

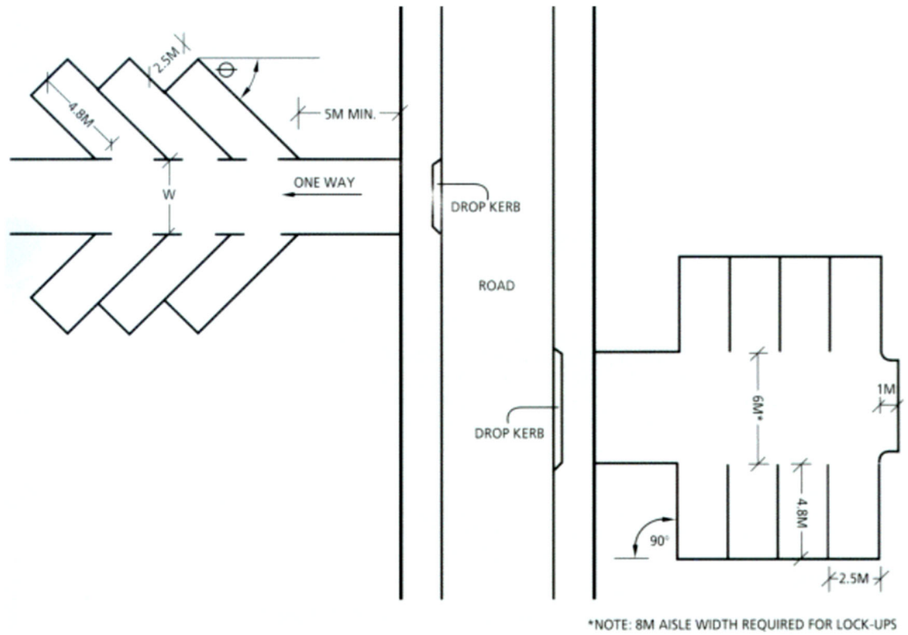

Figure 3 – Off Road Parking

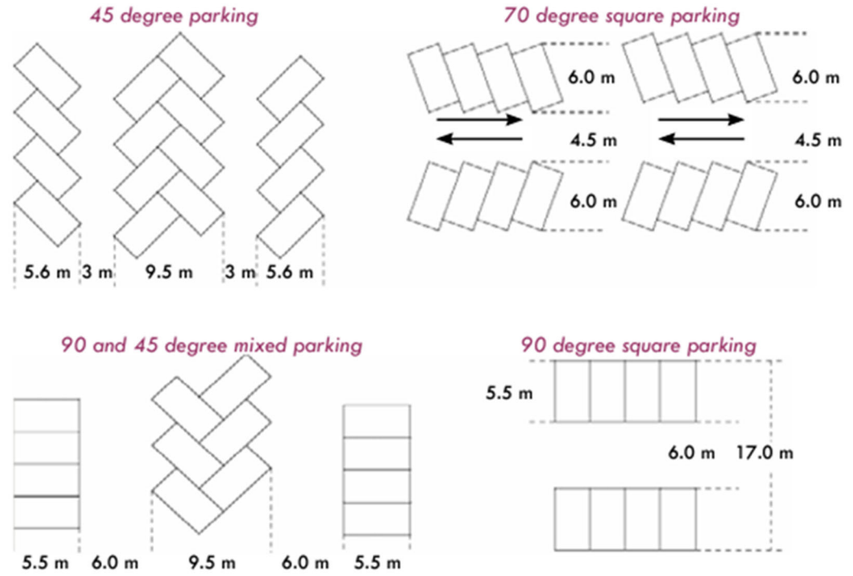

Figure 4 – Examples of parking arrangements | National Roads Development Guide

Relaxation of Parking Standards in Urban Areas

For main urban areas a reduction to the parking standard may be considered. Main urban areas are defined as those having frequent and extensive public transport and cycling and walking links, accessing education, healthcare, food shopping and employment.

North Ayrshire Council has deemed in certain situations, such as listed below, that parking standards can allow for lower levels of off-street parking provision.:

- Locations, such as town centres where services are readily accessible by walking, cycling or public transport.
- In town centre locations where no dedicated-on site parking is available and general town centre parking is not adversely affected, then off-street parking may not be required.
- Housing for elderly people, students and single people where the demand for car parking is likely to be less than for family housing.
- The conversion of housing or non-residential buildings where off-street parking is less likely to be successfully designed into the scheme.

Proposals should be discussed with North Ayrshire Council prior to submission of the planning application.

Commercial Vehicles

Commercial vehicles are regarded as those vehicles delivering goods to, or removing goods

from, premises. It is recognised that servicing requirements may be unique to a particular site. Commercial traffic varies with the type of enterprise within a given use.

The onus is placed with the developer, who should analyse their development's own requirements in terms of the numbers and types of commercial vehicles visiting their premises and should demonstrate that any development proposal includes sufficient commercial vehicle provision to meet normal requirements such as provision for loading, unloading and turning. Such commercial provision should be clearly signed and marked to avoid being utilised as an overflow parking area for cars.

Where a high use of taxis is anticipated, adequate safe and convenient facilities should be provided with an uninterrupted access.

Coaches

Developments likely to generate coach traffic should provide appropriate off-street parking facilities for the stopping, setting down and picking up of passengers as well as appropriate turning facilities (avoiding the requirement for coaches to reverse in or out of a site where possible, taking into consideration pedestrian safety). The onus will be on the developer to demonstrate the development has the appropriate level of provision.

Cycle Parking

Cycle Parking Standards should be applied to all applications for new or extended development. They are expressed as minimum standards to reflect the sustainable nature of this mode of travel.

The provision of convenient secure parking and related facilities are fundamental to attracting modal shift to cycling, particularly from single occupancy motorised journeys made over shorter distances on a regular basis. It is acknowledged that cycle parking demand varies greatly between use classes and a straight ratio of car to cycle trips cannot be used to define the Cycle Parking Standard. In addition to the provision of cycle parking, developers will be required to demonstrate that they have considered additional requirements for cyclists, such as locker, changing and shower facilities and allowed for provision in 'hub spaces' where facilities may be required. Covered parking at secure hubs for long stay may also be deemed necessary as part of the development.

Integrating Parking for Cycling

Providing enough convenient and secure cycle parking at homes and other locations for both residents and visitors is critical to increasing the use of bicycles. In residential developments, designers should aim to make access to cycle storage at least as convenient as access to car parking.

The following key principles should apply:

- Shared cycle parking facilities should be secure, overlooked and convenient to use with shelter provided wherever practical.
- Appropriate provision should be made for all potential users including children and visitors.
- Cycle parking can be provided in a number of ways such as: within garages; bespoke cycle storage; communal areas in flats; and on-street cycle racks.
- Cycle stands need to be located clear of pedestrian desire lines, and generally closer to the carriageway than to buildings.
- Cycle parking should be provided at bus and train stations to assist transition between transport modes.
- Cycle parking should be detectable by blind or partially sighted people.

Further guidance on the design of cycling facilities is provided in LTN 2/08 Cycle Infrastructure design and Designing Streets, p.40.

Provision for Electric Vehicle Parking

Building regulations (updated October 2022) mean that new residential buildings with a parking space have at least one EV charge point with a minimum 7kW rating. For new non-residential buildings with more than 10 parking spaces, 1 in every 10 would be expected to provide an EV charge point socket with a minimum 7kW rating. There are also requirements for residential and non-residential buildings undergoing major renovation to provide charge points.

Electric vehicle (EV) parking and charging should be provided in line with current policy and guidance at the time of producing street design and layout. EV charge points should be provided in line with current guidance and provide:

- New residential buildings with a parking space have at least one EV charge point with a minimum 7kW rating.
- New non-residential buildings with more than 10 parking spaces, 1 in every 10 would be expected to provide an EV charge point socket with a minimum 7kW rating.
- Residential and non-residential buildings undergoing major renovation to provide charge points.

Disabled Parking Provision

Disabled Persons Parking Places (Scotland) Act 2009 Under the Disability Discrimination Act 2005 as amended by the Equalities Act 2010 , it is the responsibility of site occupiers to ensure that adequate provision is made for the needs of disabled people. Parking for disabled people will be required for their exclusive use at all sites. The number of spaces required for disabled motorists varies between classes and the standard has been based on TAL 6/02 Inclusive Mobility 2002 . (NRDG, p.142)

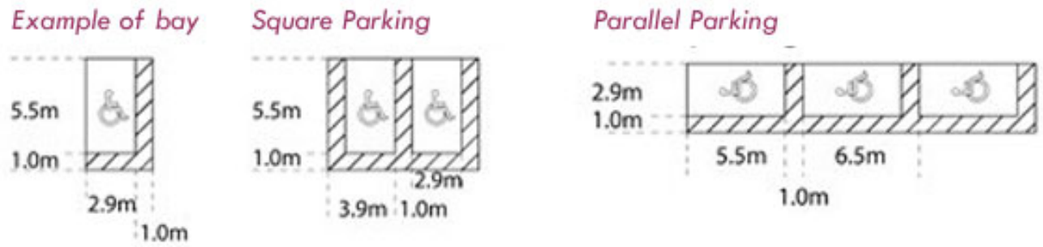

Figure 5 – Disabled Parking Arrangements | NRDG, Section 3.5.11

Table 2 – Car Park Size and Space Provision | NRDG - Section 3.5.11

Car Parking Size – Disabled Parking Provision		
Car Park Used for:	**200 Bays or Less**	**Over 200 Bays 6 bays plus 2% of total capacity**
Employees and visitors to business premises	(Individual bays for each disabled employee plus) 2 bays or 5% of total capacity, whichever is greater	6 bays plus 2% of total capacity
Shopping, recreation and leisure	3 bays or 6% of total capacity, whichever is greater	4 bays plus 4% of total capacity
Educational Establishments (Advisory)	1 Bay or 5% of total capacity, whichever is greater	

Note: Disabled parking provision to be included in the overall vehicle parking standard.

If it is known that there will be a disabled employee, then their space should be exclusive of the disabled parking standard required. It should be noted that a larger number of spaces may be required at facilities where a higher proportion of disabled users/visitors will be expected, for example medical, health and care facilities. The provision at the above levels or any required does not guarantee that the requirements of the Equalities Act 2010 will be met, this is the responsibility of the building occupier or service provider.

1.3 Parking Standards for Use Class

Class 1 – Shops

Shops, hairdressers, travel and tickets agencies, post offices, cold food shops such as sandwich bars, undertakers, funeral directors, launderettes/dry cleaners and repair shops. No permitted change to another Class.

Table 3 – Parking for Class 1 – Shops

Type of Development	Appropriate Provision (spaces per 100 sqm gross floor area (GFA))	Cycle Minimum	Powered two wheelers (PTW) Minimum	Disabled Minimum
Shops *Town Centre* *Other*	 3 spaces 5 spaces	1 space per 400 sqm for staff and 1 space per 400 sqm for customers	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 3 bays or 6% of total capacity, whichever is greater **Over 200 bays** = 4 bays plus 4% of total capacity
Food Superstore *0-500 m^2 GFA* *500-2,000 m^2 GFA* *2,000-8,000 m^2 GFA* *>8,000 m2 GFA*	 5 spaces 6.5 spaces 7 spaces 6 spaces			
Shopping Centre *0-500 m2 GFA* *500-2,000 m2 GFA* *2,000-8,000 m2 GFA* *>8,000 m2 GFA*	 4 spaces 5 spaces 6 spaces 5 spaces			
Retail Park *2,000-8,000 m2 GFA* *>8,000 m2 GFA*	 2 spaces 2.2 spaces			
DIY Superstore *2,000-8,000 m2 GFA* *>8,000 m2 GFA*	 2 spaces 2.2 spaces			

Notes:

1. Parking standards for large, stand-alone developments, such as large department stores and shopping centres will be considered on a case-by-case basis and should be agreed with the Planning team.
2. In all cases adequate off-road provision should be made for the parking and turning of service vehicles serving the site.
3. A lower provision may be appropriate in town centre locations where there is good access to alternative forms of transport and existing car parking facilities.

Class 2 – Financial, Professional and Other Services

Financial, professional or any other service expected in shopping areas, e.g., betting office, lawyers, accountants, estate agents, health centres, surgeries of dentists, doctors and vets (where the principal visitors are members of the public).

Table 4 – Financial, Professional and Other Services

Type of Development	Appropriate Provision *(spaces per public floor area, PFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
A2 *(e.g., Banks, building societies betting office, lawyers, accountants, estate agents)*	1 space per 20 sqm	1 space per 100 sqm for staff + 1 space per 200 sqm for customers	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 2 bays or 5% of total capacity, whichever is greater **Over 200 bays** = 6 bays plus 2% of total capacity
Health Centre/Doctors	3.0 per Consulting Room	1 + 1 per 20 staff (Staff) 1+ 0.5 per consulting room (visitor)		
Vets/Dentists	3.0 per Consulting Room	1 + 1 per 20 staff (Staff) 1+ 0.5 per consulting room (visitor)		

Note: A lower provision may be appropriate in town centre locations where there is good access to alternative forms of transport and existing car parking facilities. In all cases adequate provision shall be made off road for the parking and turning of service vehicles serving the site.

Class 3 – Food and Drink

Restaurant, café, snack bar (use for sale of food or drink on the premises).

Table 5 – Class 3 – Food and Drink

Type of Development	Appropriate Provision *(spaces per public floor area, PFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
A3 *(Public house with food, restaurant and café excluding Transport Cafés)*	1 Space per 5 sqm	1 Space per 100 sqm for staff + 1 space per 1 sqm for customers	1 Space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 3 bays or 6% of total capacity, whichever is greater **Over 200 bays** = 4 bays plus 4 % of total capacity
A3 *(Transport Cafés)*	1 lorry space per 2 sqm	1 space per 200 sqm for staff + 1 space per 200 sqm for customers	n/a	

Notes:

1. A lower provision of vehicle parking may be appropriate in town centre locations where there is good access to alternative forms of transport and existing car parking facilities.
2. In all cases adequate provision shall be made off road for the parking and turning of service vehicles serving the site.

Class 4 – Business

Offices (other than that specified under Class 2), research and development of products or processes, light industry.

Table 6 – Financial, Professional and Other Services

Type of Development	Appropriate Provision *(spaces per gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
B1 *(Call centre, Offices and Research & Development)*	1 space per 30 sqm	1 space per 100 sqm for staff + 1 space per 200 sqm for visitors	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 2 bays or 5% of total capacity, whichever is greater **Over 200 bays** = 6 bays plus 2% of total capacity

Notes:

1. A lower provision of vehicle parking may be appropriate in town centre locations where there is good access to alternative forms of transport and existing car parking facilities.
2. In all cases adequate provision shall be made off road for the parking and turning of service vehicles serving the site, off the road. Consideration should also be given to the requirement for any overnight parking and facilities.

Class 5 – General Industrial

General industrial (use for the carrying out of an industrial process other than one falling within the Class 4 (Business) definition).

Table 7 – Class 5 – General Industrial

Type of Development	Appropriate Provision *(spaces per gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
B2 *Industrial premises (Factory)*	1 space per 50 sqm	1 space per 250 sqm for staff + 1 space per 500 sqm for visitors	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 2 bays or 5% of total capacity, whichever is greater **Over 200 bays** = 6 bays plus 2% of total capacity

Notes:

1. A lower provision of vehicle parking may be appropriate in town centre locations where there is good access to alternative forms of transport and existing car parking facilities.
2. In all cases adequate provision shall be made off road for the parking and turning of service vehicles serving the site. Consideration should also be given to the requirement for any overnight parking and facilities.
3. If a site office is included in the development, then a B1 parking standard should be applied for that area.

Class 6: Storage or Distribution

Table 8 – Class 6 – Storage and Distribution

Type of Development	Appropriate Provision *(spaces per gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
Warehousing (wholesale trading, storage and distribution)	1 space per 150 sqm	1 space per 500 sqm for staff + 1 space per1,000 sqm for visitors	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 2 bays or 5% of total capacity, of total capacity, whichever is greater **Over 200 bays** = 6 bays plus 2% of total capacity
Lorry Parking				
Factories and Warehouses	1.1 spaces			
Warehousing (non-sales)	0.5 spaces			
Business Park	2 spaces			
Science Park	2 spaces			

Notes:

1. Parking standards for retirement developments that are warden assisted yet provide independent living should fall under Class C3.
2. Hospital Parking: With regard to parking, it should be acknowledged that particular needs of hospitals arising from their 24-hour service (which impacts on accessibility for patients and visitors and on staff working patterns) should be taken into account and parking provision provided accordingly.
3. The impact of parking on the surrounding area should be considered and if necessary, provide appropriate traffic management measures (e.g., resident parking scheme) to prevent illicit parking on neighbouring streets by people travelling to the hospital site. Travel plans for staff, patients and visitors play an important role in traffic reduction and encourage modal shift for staff.

Class 7 – Hotels and Hostels

Hotel, boarding and guest house, hostel.

Table 9 – Class 7 - Hotels and Hostels

Type of Development	Appropriate Provision	Cycle Minimum	PTW Minimum	Disabled Minimum
Hotel and B&B	1 space per 2.5 bed spaces (+1 space per 3 staff)	1 space per 5 staff for staff + 1 space per 10 bedrooms	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 3 bays or 6% of total capacity, whichever is greater **Over 200 bays** = 4 bays plus 4% of total capacity
Hostel	1 space per 4 staff plus customer parking on individual merits	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces over 100 car spaces)	1 space per 40 sqm	

Note: A lower provision may be appropriate in town centre locations where there is good access to alternative forms of transport and existing car park facilities. The modern-day hotel is seldom used solely as a hotel and often offers multifunctional amenities such as conference facilities, restaurants and gyms. These multifunctional uses must be considered per individual class use and adequate parking allocated to encompass all uses when considering the potential for cross-visitation.

Class 8 – Residential Institutions

Residential school, college, training centre, residential accommodation with care, hospital, nursing home.

Table 10 – Class 8 – Residential Institutions

Type of Development	Appropriate Provision	Cycle Minimum	PTW Minimum	Disabled Minimum
Residential Care Home	1 space per staff member + 1 visitor space per 3 beds	1 space per 5 staff	1 space +1 per 20 car spaces (for 1st 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	Dependant on actual development, on individual merit, although expected to be significantly higher than business or recreational development requirements
Hospital	1 space per 3 beds + 1 space per doctor/ surgeon + 1 space per 3 other staff	1 space per 4 staff Visitors - to be considered on a case-by-case basis		
Treatment Centres ***(e.g., ISTC*** *(Independent Sector Treatment Centre with overnight facilities)*	4 spaces per consulting room + 1 space per practitioner + 1 space per 3 other staff	1 space per 4 staff Visitors to be considered on a case-by-case basis		1 bay or 5% of total capacity, whichever is greater
Education Establishments – Primary/ Secondary	1 space per staff member + provision for buses where required	1 space per 5 staff + 1 space per 3 students		
Residential Education Establishments – Further/Higher	1 space per staff member + 1 space per 10 students	1 space per 5 staff + 1 space per students		

Note:

1. It is recommended that schools have a dedicated and managed drop-off/pick up lane or zone.

Class 9 – Homes

House occupied by a single person, or a number living together as a family, or as a household of 5 persons or less. Limited use as a bed and breakfast or guest house. Parking standards for Flats and Houses to be determined using the number of bedrooms per dwelling.

Table 11 – Class 9 – Homes

Type of Development	Appropriate Provision	Cycle Minimum	PTW Minimum	Disabled Minimum
1 Bedroom	1 space per dwelling	1 secure covered space per dwelling. None if garage or secure area is provided within curtilage of dwelling	N/A	N/A if parking is in curtilage of dwelling otherwise as visitor/ unallocated
2-3 Bedroom	2 spaces per dwelling			
4 Bedroom	3 spaces per dwelling			
5 Bedroom	4 spaces per dwelling			
More than 5 Bedrooms	To be discussed with Local Authority			
Flatted developments with communal parking **(1 bedroom)** **(2-3 bedroom)**	As above if spaces are allocated. Unallocated: 1.25 spaces per dwelling 1.5 spaces per dwelling	1 secure covered space per dwelling.	1 space + 1 per 20 car spaces (for 1st 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 3 bays or 6% or total capacity, whichever is greater **Over 200 bays** = 4 bays plus 4% of total capacity
Retirement Developments (e.g., warden assisted independent living accommodation)	1 space per dwelling	1 space per 8 units (visitors)	1 space + 1 per 20 car spaces (for 1st 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	N/A if parking is in curtilage of dwelling, otherwise as Visitor/ Unallocated
Amenity and Sheltered Housing	0.25 spaces per dwelling + 1 space per warden	1 space per 4 staff or 1 space per 8 units (visitors), whichever is greater		
Visitor / Unallocated	0.25 spaces per dwelling	If no garage or secure area is provided within curtilage of dwelling, then 1 covered and secure space per dwelling in a communal area for residents plus 1 space per 8 dwellings for visitors	1space + 1 per 20 car spaces (for 1st 100 cars spaces, then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 3 bays or 6% or total capacity, whichever is greater **Over 200 bays** = 4 bays plus 4% of total capacity

Notes:

1. Where internal garage dimensions are below 5.0m x 2.8m the garage will not be counted as contributing to the parking provision. If the garage is 5.0m x 2.8m or larger, then it will be counted as a parking space only if alternative bicycle storage is provided. Garages of 6m x 3m internal dimensions or greater will be counted as a parking space regardless of separate cycle storage.
2. A reduction for Private and Local Authority Housing Association may be permitted in agreement with the local authority.

Class 10 – Non-residential Institutions

Crèche, day nursery, day centre, provision, provision of education, museum, exhibition hall, public library, display of art, public worship, religious instruction, social activities of a religious body.

Table 12 – Class 10 – Non-Residential Institutions

Type of Development	Appropriate Provision	Cycle Minimum	PTW Minimum	Disabled Minimum
Crèche, Child Care	1 space per full-time equivalent staff + drop off/ pick-up facilities	1 space per 4 staff + 1 space per 10 child places	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	1 bay or 5% or total capacity, whichever is greater
Day Care Centre	1 space per full-time equivalent staff + drop off/ pick-up facilities	1 space per 4 staff		1 bay or 5% or total capacity, whichever is greater
Community Centres	5.0 per 20.0 sqm GFA	10 spaces + 1 space per 10 vehicle space		
Education - Primary/ Secondary	1 space per 15 pupils	1 space per 5 staff + 1 space per 3 pupils	1 space + 1 per 20 car spaces (for first 100 car spaces) then 1 space per 30 car spaces (over 100 car spaces)	1 bay or 5% of total capacity, whichever is greater
Education - Further/Higher	1 space per 2 staff + 1 space per 15 students for student parking	1 space per 5 staff + 1 space per 3 students		
Art Galleries, Museums, Public / Exhibition Hall	1 space per 30 sqm public display space + 1 space per 2 staff	10 spaces + 1 space per 10 vehicle space		**200 bays or less** = 3 bays or 6% of total capacity whichever is greater **Over 200 Bays** = 4 bays plus 4% of total capacity
Places of Worship	1 space per 10 seats	1 space per 4 staff + visitor parking (individual merits)		
Libraries	3 space + 1 spaces per 3 staff	1 space per 4 staff		
Crematoria	1 space per seat	1 space per 4 staff		

Notes:

1. A lower provision may be appropriate for educational establishments in an urban location where there is good access to alternative forms of transport to allow sustainable travel.
2. The relationship between a school and the residential area is important and falls within the operational requirements of the school. Schools should represent the heart of the community and community facilities should be considered within the school site.
3. Supported learning school's parking/drop-off arrangements must be taken into consideration as generally extra staff are required and more pupils/students may arrive by taxi or car. Coach parking and facilities must be considered for all D1 uses.

Class 11 – Assembly and Leisure

Cinema, concert hall, bingo hall, casino, dance hall, discotheque, skating rink, swimming bath, gymnasium or for indoor sports or recreation not involving motorised vehicles or firearms.

Table 13 – Class 11 – Assembly and Leisure

Type of Development	Appropriate Provision	Cycle Minimum	PTW Minimum	Disabled Minimum
Cinema/Bingo Halls	1 space per 10 seats	10 spaces + 1 space per 10 vehicle space	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 3 bays or 6% or total capacity, whichever is greater **Over 200 bays** = 4 bays plus 4% of total capacity
Theatres/Concert Halls	1 space per 5 seats	10 spaces + 1 space per 10 vehicle space		
Team Sports *(Outdoor Sports Pitches)*	20 Spaces per pitch	10 spaces plus		
Sports Centres *Swimming Pools Snooker Halls / Other Facilities*	10 spaces per 100 sqm of pool area 1 space per table	10 spaces + 1 space per 10 vehicle space		
Golf Clubs	3 spaces per hole	Individual merit		
Dance Halls / Discotheques	10 spaces + 1 space per 3 staff + 3 spaces for performers			
Conference	1 space per 5 seats			
Golf Driving Range	4.5 per 100sqm or 2 spaces per lane (whichever is greater)			

Note: Coach parking and facilities must be considered for all uses.

Other

Table 14 – Other

Type of Development	Appropriate Provision *(spaces per 100sqm gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
Garden Centres *(see informative notes)* *0-2,000 m^2 GFA* *2,000-5,000 m^2 GFA* *>5,000 m^2 GFA*	1 space per full-time staff equivalent 5.5 5.0 4.0	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces)	**200 bays or less** = 3 bays or 6% of total capacity, whichever is greater. **Over 200 bays** = 4 bays plus 4% of total capacity **200 bays or less** = 3 bays or 6% of total capacity whichever is greater **Over 200 bays** = 4 bays plus 4% of total capacity	**200 bays or less** = 3 bays or 6% of total capacity whichever is greater **Over 200 Bays** = 4 bays plus 4% of total capacity
Student Flats	1 space per 7 students + 1 space per 3 staff + 1 space per warden	1 space per 5 students		
Motor Trade Vehicle display area Spaces department Services / Bodywork Tyre & exhaust centre Car wash Scrapyards Staff	 2 spaces 4 spaces 4 per service bay 2 per service bay 5 queuing spaces 2 spaces 1 space per 2 staff			
Hot food takeaways	2.5 per 100m2 PFA			
Public house (Non-Food)	10 spaces			

Notes:

1. Coach parking and facilities must be considered for all uses.
2. Multifunctional uses must be considered per individual class use and adequate parking allocated to encompass all uses, when assessing the parking requirements of a development, taking into account cross-visitation.
3. A lower provision of vehicle parking may be appropriate in urban locations where there is good access to alternative forms of transport and existing car parking facilities.

1.4 Residential Car Parking

Residential parking should be close to people's homes and be located to provide natural surveillance whist not compromising householders sense of privacy. For information on number of spaces see Table 11.

Residents' car parking spaces and garages should not dominate the street scene. Residents' spaces may also be located at the rear of dwellings and accessed from a separate road, street or drive. However, if this is likely to encourage on-street parking to the front then this should be designed for.

Communal visitors' spaces may be provided by widening the carriageway to accommodate a row of cars parallel to, at right angles to or at an angle to the kerb. Areas should be limited in size and numbers of spaces and should form part of a landscaping and urban design proposal and again should serve the additional purpose of restraining vehicle speed. In the case of angled parking, the footway should be widened by 800mm to allow for vehicle overhangs.

Visitor spacing should be grouped to a maximum of two spaces and spread evenly around the street to reduce visual impact.

Proposals should use a mixture of parking strategies such as private drives and parking courts so that the reliance of on-street parking is reduced. **Relying only on street parking can lead to wide streets where parking becomes visual dominant on the street.**

Trees and shrub planting and verges should be integrated into on-street parking so as to soften the appearance of cars on the street and help define the character of the street. Front of plots should be designed to contain both parking and garden areas and avoid swathes of block paved residential frontages.

Calculations for resident and visitor demand should take into account location, access to public transport and local transport trends.

Materials

For residential areas parking in front of dwellings should be permeable (excluding any adopted service strip at vehicle crossover points). In rural and island locations parking should be of a natural appearance. The first 2 metres of private parking areas / driveways to be hard surfaced.

Private Accesses, Garages and Driveways

A private access serving 2 to 5 houses should have a minimum width of 3.3 metres, with the first 10 metres (if access is taken from a Type 1 Connector Street or a more major route) having a minimum width of 4.8 metres to allow two way passing (subject to tracking).

The following should also be considered;

- No footway or service margin is required, with services being located within the driveway / private access.
- The horizontal alignment and any need for passing places are based on practical requirements and vehicle tracking where necessary.
- Intervisible passing areas.
- The requirements for a refuse vehicle to be able to get within 25 metres of all drive-ends or communal storage locations and for a fire tender to get within 45 metres of all front doors needs to be considered.
- On-site turning facilities provided where necessary.
- Private drives / access roads must incorporate adequate visitor car parking provision in addition to private curtilage parking.
- Any gates should be set at least six metres back from the adopted road boundary, with the exception of private drives on minor roads or streets.
- The first 10 metres of private access/driveway to have a desirable maximum gradient of 10% (absolute maximum 12.5%).

The junction of a private drive/access onto a Type 1, 2, 3 or 4 Street should be formed using a dropped crossing and be hard surfaced for a minimum of 6 metres. On higher standard routes or where the private access will have a higher level of traffic, 4m minimum radii should be provided. Where access is taken from a Type 1 Street or a higher standard route, the initial 10m section of private drive/access should be 4.8m wide

Garage doors must not open over the adopted road. On minor streets garages to be set back a minimum of 1 metre from public road. Consideration will be given to garages flush with the adoptable road on Shared Surface Streets provided visibility splays are adequate and roller shutter doors are used.

Where internal garage dimensions are below 5.0m x 2.8m the garage will not be counted as contributing to the parking provision. If the garage is 5.0m x 2.8m or larger then it will be counted as a parking space only if alternative bicycle storage is provided. Garages of 6m x 3m internal dimensions or greater will be counted as a parking space regardless of separate cycle storage.

Single driveways should be at least 3m wide (2.75m minimum), or 3.3m if the drive provides the main pedestrian access to the dwelling. To accommodate two cars the driveway must be a minimum length of 10 metres, from the rear of the footway/service strip, and a minimum length of 6 metres for one vehicle.

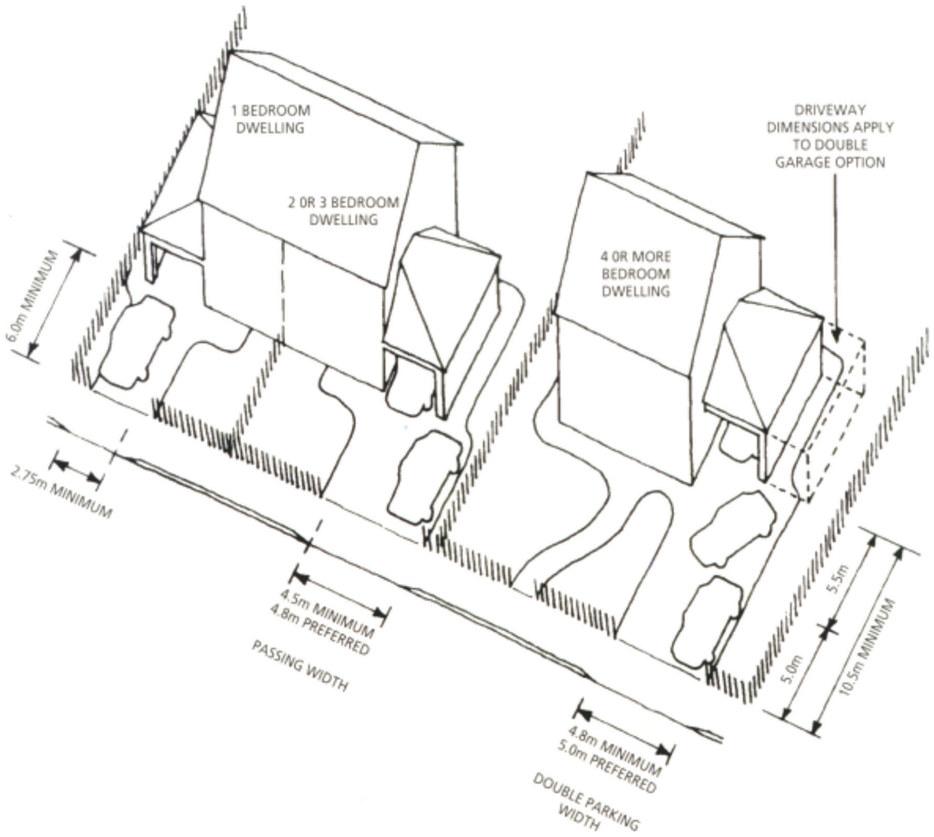

Figure 7 – Driveway Dimensions

Double width parking can be accommodated on a 4.8m wide driveway, or 5.2m if the drive provides the main pedestrian access to the dwelling. To accommodate two cars the driveway must be a minimum length of 6 metres from the rear of the footway/service strip. Dwellings with four or more bedrooms will require a double width driveway and recommended for three-bedroom dwellings.

The first 2 metres of a driveway should be paved to prevent loose material (e.g., stones, gravel etc) being carried on to the road or street.

Severe gradients, which render driveways unsuitable for car parking, should be avoided (desirable maximum 10%, absolute maximum 12.5%).

The gradient of the private access on the approach to a public road should be no steeper than 1 in 40 (2.5%) for the initial 10 metre length with an absolute maximum of 1 in 25 (4%).

No surface water must issue from the driveway or garage onto the public road or footway.

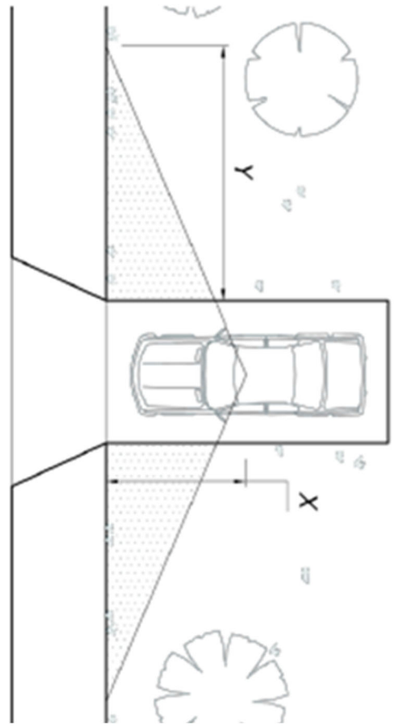

Figure 6 – Driveway Visibility Splays

Driveway Visibility

2.0m (X) by 2.0m (Y) pedestrian sight lines should be provided where the drive meets the back of the footway and 2.0m (X) by 20m (Y) to edge of carriageway should there be no footway or demarcation zone. There should be no physical obstructions or planting within these areas, that are above 0.6 metres high. The areas should also be easy to maintain to avoid future obstructions.

1.5 Shared-Use Provision

Often, especially in urban areas, parking provision can be shared with other uses. For example, many leisure activities in urban areas can rely on existing public parking as leisure peak times are often different to retail peak times.

Shared use of parking areas is highly desirable, provided this works without conflict and that car parking provision is within the standard that requires the greatest number of car spaces applicable. Conflict should not occur as long as the shared use developments operate at differing times of day or days of the week, or the development is considered ancillary to other activities (i.e., food and drink within a small residential retail area). Shared use may result in a reduction of the number of parking spaces which a developer is required to provide. For example, a mixed-use development of shops requiring 100 spaces for daytime use and leisure requiring 120 spaces for evening use, can suffice with 120 spaces in total.

Where applicable long-term agreements should be confirmed as part of the application to support the required parking standards. Proposals for shared use parking must be supported by a parking appraisal undertaken by the applicant, to a scope agreed with the Roads Authority.

Prior to any extension or change of use, the developer must demonstrate that adequate parking provision will be provided.

Proposals for shared use parking must be supported by a parking appraisal undertaken by the applicant, to a scope agreed with the Local Authority.

Shared use may result in a reduction of the number of parking spaces a developer is required to provide.

Figure 8 – Shared-Use Residential Parking

1.6 Industrial, Recreational and Service Industry Parking Requirements

Where a development contains a mix of differing facilities then each part should be considered in its own right, and the appropriate parking should be provided to give an overall total parking figure. It will be permissible to provide parking at one centralised location provided the differing facilities are clearly signed from the car park.

Provision will be required for staff parking and visitor parking. There is no need for separate accesses, but staff parking should be clearly marked to ensure that it is only available for staff.

The location of car parking areas in a development should be considered at an early stage in the design process to achieve a balanced distribution of spaces throughout the site, conveniently related to user destinations.

Where different units are serviced from one car park, the car park should be located such that indiscriminate parking will not occur on internal development roads or on roads adjacent to the development and the pedestrian routes from the car park must follow a safe and convenient route.

In industrial developments consisting of individual units the provision of communal car parking, instead of parking for each unit, may lead to parking adjacent to the individual units on the road possibly causing difficulties for larger vehicles.

At certain developments, especially in the service industry, such as schools and railway stations, a minimum number of 5 spaces should be provided to allow the dropping off/ picking up of car passengers. Where these points are required, they should be located within the curtilage of the development. Bays adjacent to the carriageway may be considered. Particular attention should be given to the provision of facilities for buses and their passengers at schools.

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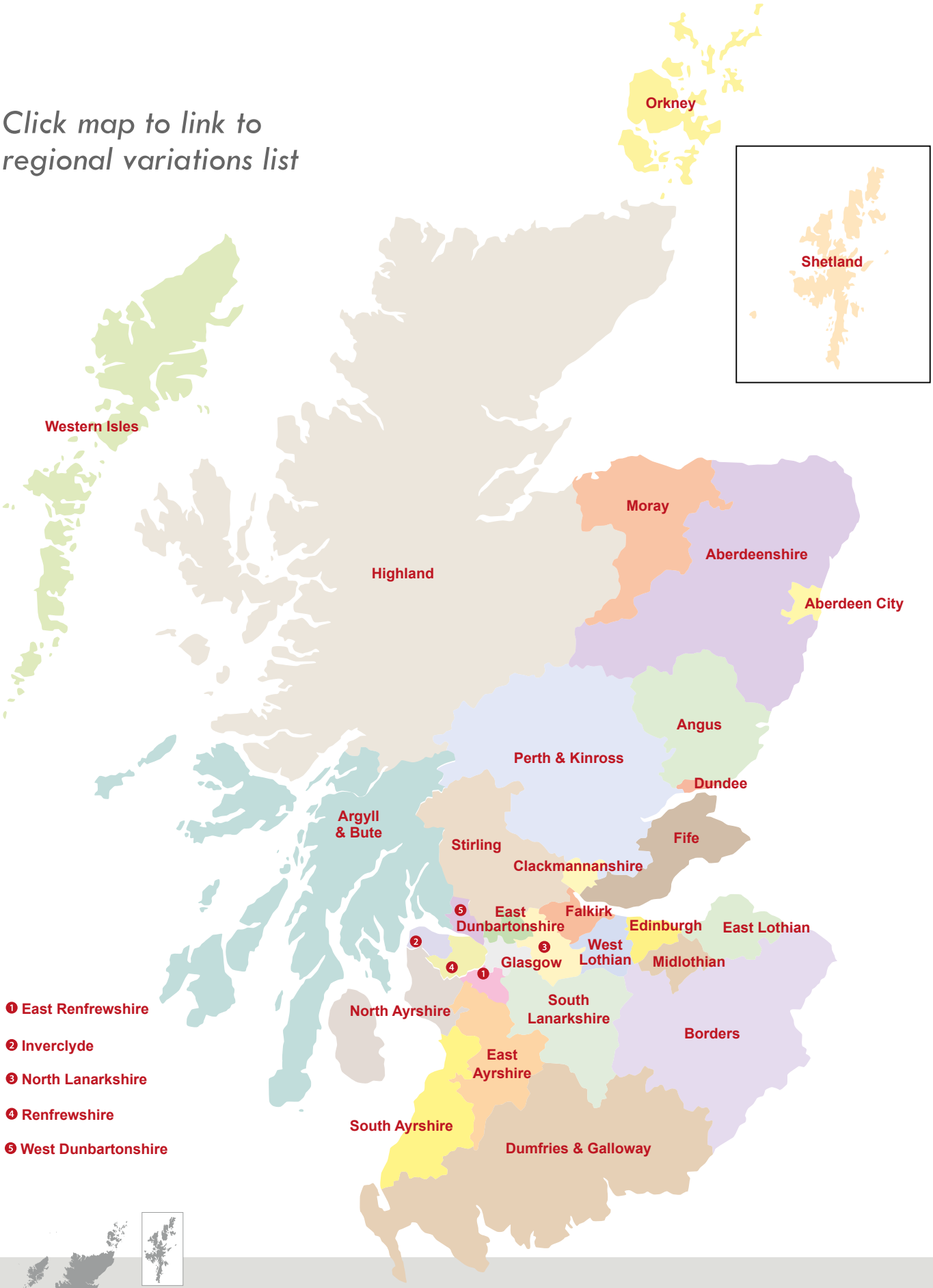

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June 2017

Part 1

ROADS DEVELOPMENT GUIDE

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INTRODUCTION

SCOTS

Last updated June 2017

Part 1 - Introduction

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Introduction

This National Roads Development Guide has been produced by the Society for Chief Officers of Transport in Scotland, supported by Transport Scotland and Scottish Government Planning and Architecture Division.

This document supports **Designing Streets** and expands on its principles to clarify the circumstances in which it can be used.

1.1 Purpose

The purpose of this document is to:

- *provide guidance on how to obtain a Road Construction Consent;*
- *provide a consistent, accessible and relevant source of information that links related detailed and complex infrastructure requirements in one place;*
- *support the Scottish Government Policy* ***Designing Streets*** *and expand this to address the interface with other roads. This national guide is considered the technical enabler to that policy document.*
- *advocate a re-designation of road hierarchy to* ***user hierarchy****;*
- *support the principles of adopting a multi-disciplinary approach and early engagement to achieve a balanced outcome based on a* ***user function****;*
- *accommodate Local Authority variances, such as parking standards or road details. These local departures are intended to be easily identified and accessed and as such form a section appended to this baseline document;*
- *advocate the creation of a review board and update procedure so that changes to legislation, best practice, codes of practice, guides and other such documents can be regularly included such that the guide is maintained efficiently and will provide a positive long-term legacy;*
- *encourage high-quality environments that place a focus on people and enable developments to be designed on an individual methodology rather than following standard and rigid specifications where possible;*
- *support a more holistic, integrated approach to the planning and approvals process with early discussions between all parties actively encouraged.*

1.2 Status and Use

Evidence provided by Transport Research Laboratory (TRL) and TMS Consultancy has updated geometric guidelines for low traffic residential streets including changes to junction spacing, visibility splays and forward visibility. This evidence has a major impact on roads design and is fundamental to altering previously accepted standards with the intention of slowing traffic speeds of compliant drivers

This evidence is adopted in Designing Streets which provides policy that should be followed in designing and approving all streets. Whilst its technical advice is aimed particularly at residential and lightly trafficked streets, many of the key principles are also applicable to other types of street, for example rural, arterial routes and high streets. As such, this National Roads Development Guide adopts the above evidence led conclusions reached for residential streets and develops this for use on all prospectively adoptable roads.

Note: ***for the purposes of clarity all streets are deemed to be roads under the*** Roads (Scotland) Act 1984.

The design standard for trunk roads and motorways in England, Scotland, Wales and Northern Ireland (Design Manual for Road and Bridgeworks (DMRB)).

The National Roads Development Guide provides advice and does not set out any new policy or legal requirements.

1.3 Principles and Scope of Documents

Designing Streets was launched by the Scottish Government to support the placemaking agenda. It raises the importance of street design issues from that of guidance and advice to policy.

It considers that roads within certain environs cater for more important functions than just the movement of people and traffic. To emphasise the different nature of this road type they should be considered as streets. Designing Streets emphasises that well-designed and well-connected streets are crucial components in sustainable placemaking and sits alongside the 2001 policy document Designing Places, which sets out the role of the planning system in delivering good design and Scottish Planning Policy (SPP).

A locally appropriate balance should be struck between the needs of different user groups. Traffic capacity will not always be the primary consideration in designing individual roads and road layout. However, it is recognised many journeys will still require to be made via vehicular traffic (including buses). As the movement of goods and services is paramount to sustaining and growing a successful national economy, the consideration of movement also remains vital on strategic and rural Scottish routes.

An inclusive environment that recognises the needs of people of all ages and abilities must recognise the importance of way-finding and legibility, especially with regards to the sensory and cognitive perceptions of children, older people and disabled people.

This Guide follows the same principles introduced in Designing Streets with a change in policy to move away from a standards-based approach to one where designers, planners and roads engineers collaborate to develop a design-led solution.

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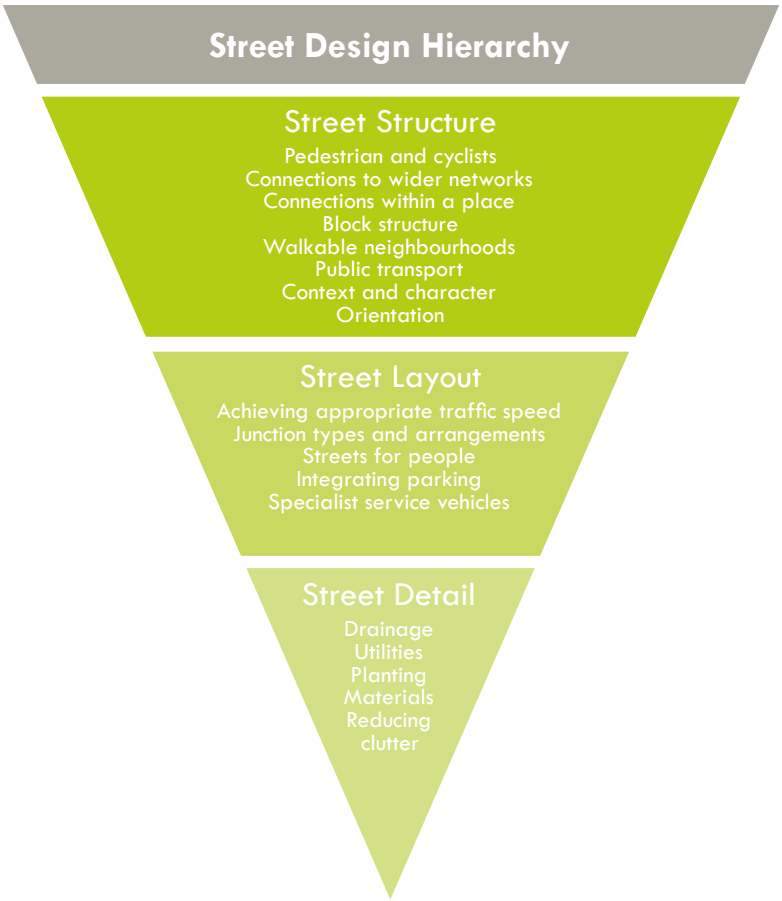
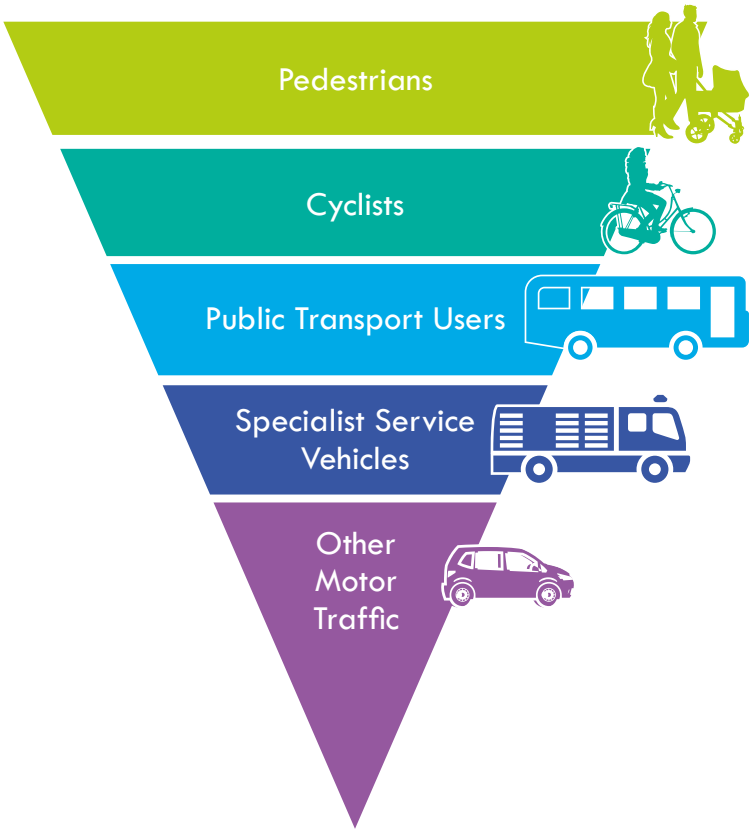
The key to a successful design is ensuring that the correct balance between place and movement is struck.

Designing Streets contains five policies:

- *Street design guidance, as set out in* ***Designing Streets*** *can be a material consideration in determining planning applications and appeals.*
- *Street design should run planning permission and Road Construction Consent (RCC) processes in parallel.*
- *Street design should be based on balanced decision-making and must adopt a multidisciplinary collaborative approach.*
- *Street design must consider place before movement.*
- *Street design should meet the six qualities of successful places, as set out in* ***Designing Places***.

They confirm the fundamental principle that place should be considered before movement, and are supported by 18 key considerations which are outlined in the **Designing Streets** document and supported by guidance within it.





Both documents apply a user hierarchy to the design process with pedestrians at the top. This means considering the needs of pedestrians first when considering the design of any road layout.

Many roads, in both urban and rural locations, require a 'non-standard' approach in response to context and this can be achieved by working as a multidisciplinary team and by looking at and researching other similar places that work well.

In urban areas, it is important to recognise the importance of the community function of streets as spaces for social interaction, and they should integrate communities not segregate them. Consequently, the user hierarchy should be followed and users at the top of the hierarchy should be supported in detailed designs.

Layouts should be designed to restrict vehicle speeds to below 20 mph where there is a high level of place but layouts should create networks which provide permeability and connectivity to main destinations and a choice of routes.

It is intended to move away from hierarchies of standard road types based on traffic flows and/or the number of buildings served and instead design roads which fit the context of the location.

Innovation with a flexible design approach is encouraged as is the use of locally distinctive, durable and maintainable materials.

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1.4 The Benefits of Better Streets

It is important to take into account multiple objectives when developing transport strategies and schemes, and not simply congestion reduction. These other priorities include economic regeneration, climate change, casualty reduction, reducing air and noise pollution, minimising the impact of transport on the natural environment, heritage and landscaping, and encouraging more sustainable and healthy patterns of travel behaviour.

Making appropriate provision for road-based public transport, cycling and walking can help to encourage modal shift from the private car, and so contribute to the sustainability and health agendas. Enhancing street environments through a high-quality public realm incorporating local materials and historic street features, removal of clutter and pedestrian barriers, use of shared space where appropriate and enhanced street lighting can help to stimulate local economic activity, reduce street crime and encourage a sense of local community; this in turn encourages more local, shorter distance travel on foot or by cycle.

It is important to include green spaces within these living spaces. Trees are one of the most visible elements of green spaces as their use is considered in more detail in Scottish Government's Green Infrastructure: Design and Placemaking.

This evidence together with the Scottish Government's commitment that placemaking should be encouraged at every opportunity when development is put forward for planning decisions, requires a completely new approach to road design where new developments or re-development of an area is contemplated. A wide range of other considerations may apply, such as but not limited to: sustainable urban drainage systems (SUDS), waste management, parking, understanding of secure environments, a desire to deliver modal shift from cars to walking and cycling and encourage the use of public transport.

At the outset of design it is necessary to consider the requirements of the wider context of the environment, existing and proposed infrastructure, user needs and related transportation issues. Depending on the development scale this is best demonstrated through the use of flexible masterplanning or for minor developments, a design and access statement.

1.5 Types of Roads and Streets

Designing Streets advocates that the former road hierarchy formerly used in previous local authority design guidance be removed to permit a more non-standards basis for street design. Within its section on Street Structure, it contains guidance on how to form networks of streets that are permeable (page 19); responsive to context (page 22); punctuated by squares and public spaces (page 25); and, accommodating of different street character types (page 29).

However, there are a range of minimum design standards required to guide the safe and efficient passage for various types of street users. **A street layout that fails to recognise the street character types and frequency of its users is also likely to fail with regard to the wider structure of the street network.** Any street whilst considering place before movement must balance all associated functions and considerations to deliver a sustainable and adaptable outcome. Much of this is expected to be addressed and demonstrated through a Quality Audit.

Streets that serve a limited number of residential properties are very much a place function and as such can be innovative in that regard. However, they are likely to differ from streets that connect to other areas and as such it is reasonable to assume connecting streets serve a greater movement function. As the connecting function of streets increases towards a main road or primary street they will inevitably carry greater traffic loads over their design life and will require a more robust pavement design as well as the capacity within the road boundary to adapt over time. Consequently it is essential that such streets are not designed on a space limiting basis.

1.5.1 Road Types

In considering the road infrastructure for new developments, **Designing Streets** can be useful to identify different types of street generally under the following headings:

Primary

(a) **strategic roads -** *provide for major traffic movement between centres of population and economic activity on a national and regional level.*

(b) **main roads or primary streets -** *within urban boundaries these link traffic from strategic roads to residential streets or industrial roads. They include 'arterial' through routes and mixed-use, multi-functional 'high streets' (at least in part along their length), providing access to properties as well as other amenities. Likely to be public transport routes they require a careful balance of place and movement when improving or connecting into with new development.*

Secondary

(c) **residential streets -** *provide access to properties and through routes within a residential area. As secondary connectors they are much less likely to be public transport routes.*

Tertiary

(d) **residential and service lanes -** *solely access to properties within a residential area. These tertiary streets could be mews, vennels, or courtyards.*

(e) **industrial roads -** *link multi-functional industrial/commercial premises and associated parking and service areas to main or strategic roads. When within urban boundaries some elements of* **Designing Streets** *may be applied, dependent on context and an assessment of future adaptability, but the balance is towards vehicle movement.*

Other routes, not for motor vehicles:

(a) **footways -** *a pedestrian route that adjoins a carriageway*

(b) **footpaths -** *a pedestrian route not adjoining a carriageway*

(c) **cycleways -** *a cyclist route that adjoins a carriageway*

(d) **cycle track -** *a cyclist route not adjoining a carriageway*

(e) **shared surfaces** *- low trafficked single level street that serves a range of user types, normally limited to residential streets where traffic speeds do not exceed 10 mph.*

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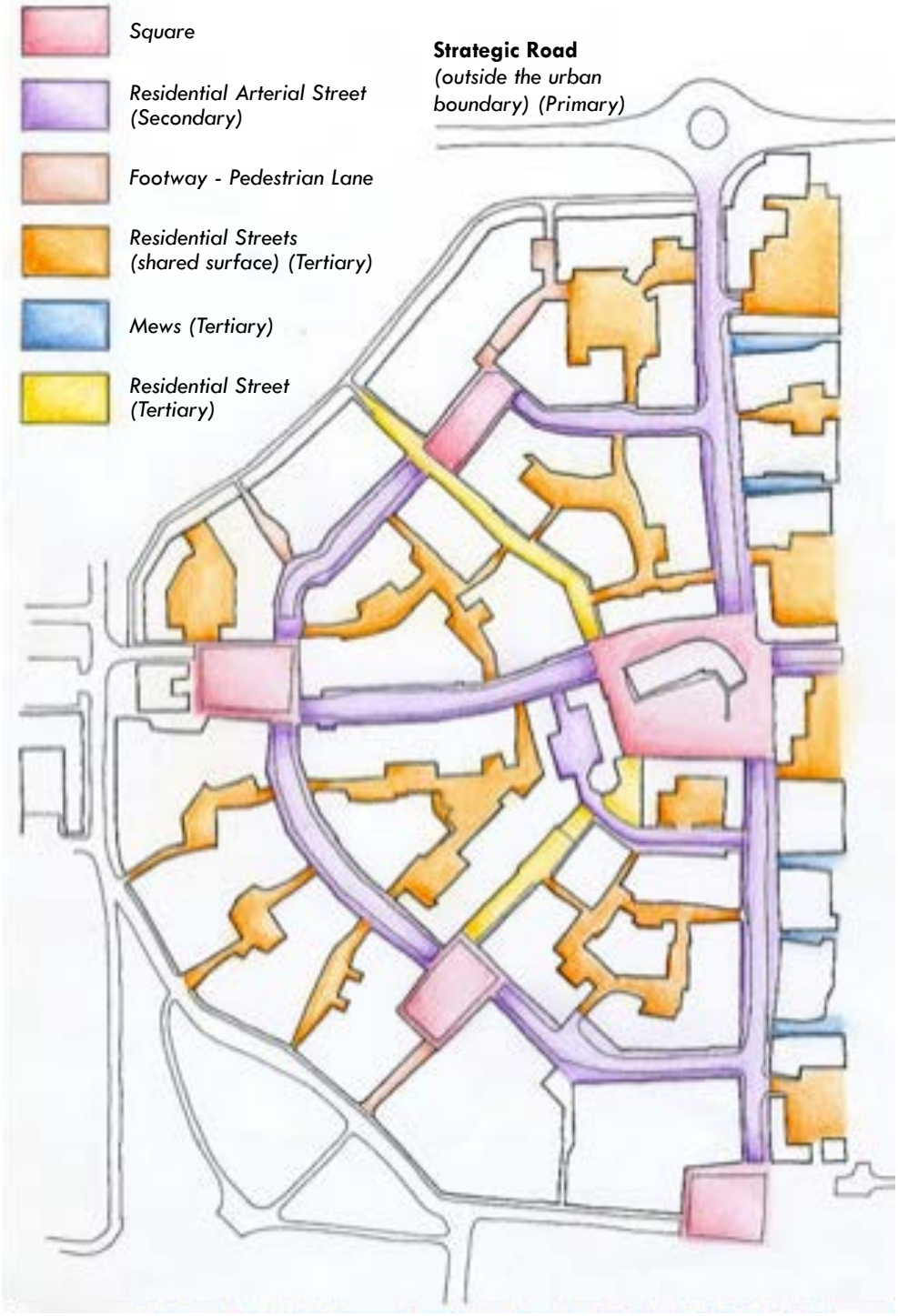


Figure 1

The colouring process illustrated here can be a useful tool in defining streets appropriate for Defining Streets as part of an analysis of function of submitted development proposals, ie Designing Streets page 21 B-Plans.

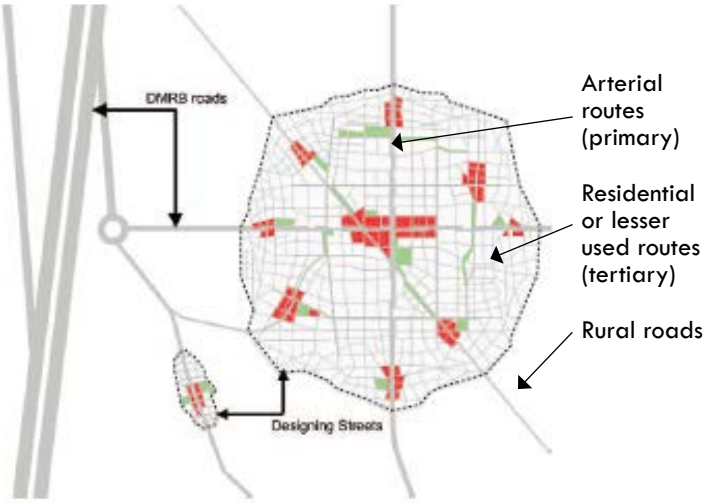
1.6 Road Network and Context

To assist designers with the place/movement graph in Designing Streets and addressing situations beyond the residential and low trafficked areas that *Designing Streets* predominantly addresses, the graph and illustrations are expanded to reflect all areas and types of roads with an additional indicator of possible appropriate traffic speeds

The plan (shown right) within *Designing Streets* indicating the relationship between *Designing Streets* to DMRB is expanded to assist with identifying arterial and rural roads which may not comply with either standard easily.

The graph on page 9 of Designing Streets provides a '*Place and Movement Matrix*' diagram.

Figure 2 *Designing Streets policy and guidance should be applied within all urban and rural boundaries*



Place: *Place status denotes the significance of a street, junction or part of a street and therefore consideration of* ***place*** *is considered critical in the design of good transport networks.*

Movement: *Movement is activity and can be expressed in terms of traffic volume and strategic importance of the street, or section of that street, it also considers other street users such as pedestrians and cyclists.*

To understand the balance between place and movement, the relative importance of the two aspects need to be defined. Some streets will have a high movement status but a low place status, such as strategic or main urban roads. Others will have a low movement status but high place status such as residential streets. In between will be streets such as shopping streets, which are likely to have both high movement and place status.

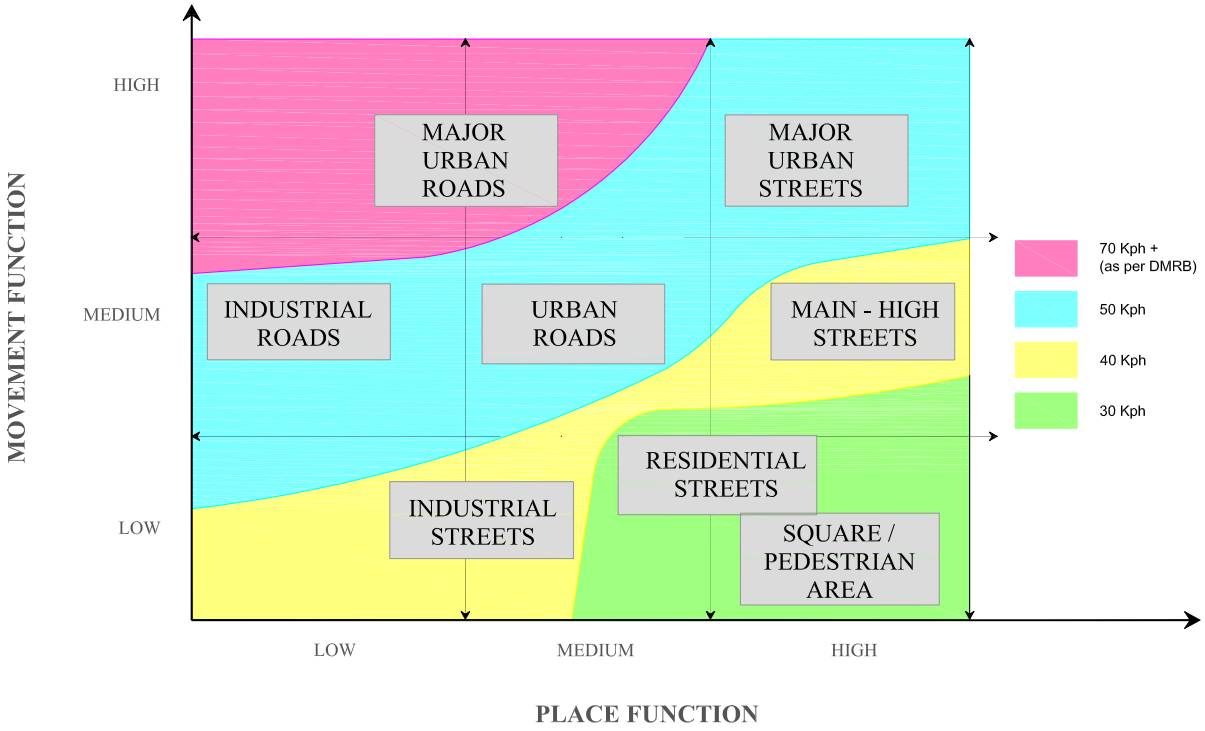
DMRB only applies directly to trunk roads, but the standard has been adopted on higher speed Local Authority roads where there may be more latitude to depart from these standards at the discretion of the roads authority.

Designers do refer to DMRB and the related Specification for Highway Works (SHW) for detailed technical guidance or specification on specific aspects, for example on strategic inter-urban non-trunk roads, but it is recommended that the key principles of Designing Streets are applied consistently in a way that respects local context.

Examining the relationship between '*Place and Movement*' in a different context it can be seen that there is a relationship between the place and movement matrix and the expected traffic speed.

Click map to see regional variations

Figure 3



It is clear from this graph that adopting speed may be one way forward to identify where Designing Streets can be utilised. However, there are still many other principles which affect the design and any new design has to take account of local context and even identify where some aspects of *Designing Streets* may be less relevant.

Much of the research utilised in the preparation of Designing Streets is based on the stopping sight distance (SSD) at locations with traffic speeds of less than 40 mph. Similarly, in rural areas many parts of the road network are subject to the national speed limit but have traffic speeds significantly below 60 mph. Generally, in these situations where speeds are lower than 40 mph, evidenced by examination of the 85th percentile, the parameters used in Designing Streets are appropriate.

Town Centres, Commercial/Business areas and Residential areas should be the most walkable part of the network; they should accommodate public transport services, cycle routes and cycle parking, while remaining accessible by service vehicles and private car. Therefore, it is expected that *Designing Streets* applies.

Strategic and arterial routes form essential parts of the wider road network acting as key links between towns, cities and local centres. They can also be part of the core network for the town or city where it is not easy or appropriate to remove or redirect traffic, including HGVs and buses. The level of activity along these links varies depending on location.

Along some sections of arterial routes the movement function will be most important; arterial routes are key to the functioning and economy of urban areas. Strategic and arterial routes within urban areas may have higher speed limits, in these limited cases it may be appropriate that DMRB balance with Designing Streets principles can be adopted for a range of reasons.

Road networks interlace and connect residential, commercial, urban and suburban areas of cities, towns and villages. They fulfil many functions along their routes catering for many types of journey by different modes. Their interrelated nature means that changes to one part of the network can have implications for adjacent routes and therefore must be understood and taken into account when designing and implementing road improvements.

Major routes in the road network are most commonly classified by the volume of traffic they carry and have been known as Principal Routes or Distributor Roads. In the past these standard classifications have remained constant for the whole route. However, by failing to take account of the changing context along the route this classification system limits understanding of how improvements or maintenance should reflect the wider functions such routes serve.

It is also recognised that the local context of place and movement can vary not only from road to road but also along the length of a road as detailed in images below.

Residential

Urban Road

Shopping Area

Strategic Road

Click map to see regional variations

This Figure shows that the Movement function remains largely the same along the route, but the Place function varies according to the changing importance of place within the road length; the predominant type of land use and the level of pedestrian activity. As the Place function becomes more important, the relative weight given to the Movement function will be reduced when deciding on priorities and an appropriate design.

Direct frontage access is common in all urban areas, including where 40 mph speed limits apply, without evidence to suggest that this practice is unsafe. This is confirmed in **TD41/953** (Annex 2 paragraph A2.10) which states that "*in the urban situation there is no direct relationship between access provision and collision occurrence*". However, this is not true of rural roads (**TD41/953** A2.5) where the research identified a "*statistically significant relationship for collisions on rural single carriageways with traffic flow, link length and farm accesses. On rural dual carriageways, the significant relationship extended to lay-bys, residential accesses and other types of access including petrol filling stations*". Consequently the level of access to the road network is a factor in deciding the appropriate balance of **Designing Streets** for busier routes.

A more formal approach to the determination of status level is given to the Place and Movement methodology in the following Table 1. This provides some definitions for different levels of Movement and Place, resulting in a '*matrix*' defining where it is appropriate to use Design Streets, **DMRB** and other variations.

Table 1 identifies where there are significant levels of pedestrian activity associated with the movement of people along the road and this is related to the demand for pedestrians to cross the street. Where there are also high levels of kerbside activity generated by parking, loading and public transport, it would be appropriate to consider that the high level for pedestrian crossings should be utilised.

Four categories are included in the table and definitions of each are detailed below:

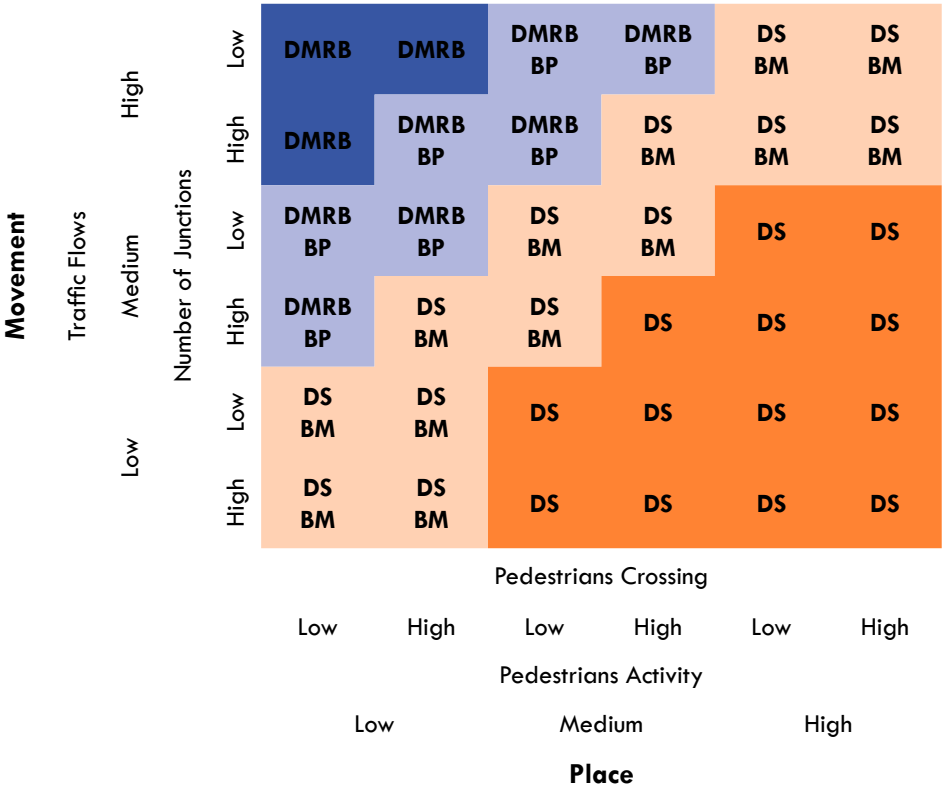
(a) **DS:** *The principles of* **Designing Streets** *should be applied.*

(b) **DS BM:** *This location is predominantly Place dominated and the general principles of Designing Streets should be applied. However, there is also a higher level of traffic on these roads and this should be reflected in the design. The design should therefore be pedestrian dominated but the design elements such as road width, visibility, alignment should be less stringent such that vehicles are allowed to travel more freely at a slightly higher speed.*

(c) **DMRB BP:** *This location is predominantly Movement dominated and the general principles of* **DMRB** *should be applied. However, there is a higher pedestrian movement at these locations and this should be reflected in the design. The design should therefore allow the free flow of traffic such that drivers realise the change in nature of the road and drive in a more considerate manner.*

(d) **DMRB:** *The principles of* **DMRB** *should be applied. Strict adherence to* **DMRB** *is required on trunk roads but departures can be granted on application to Transport Scotland. Local Authority Roads may not require such strict adherence to the design parameters.*

Table 1



Indications of 'Place' can also be given by other uses for example where there are high levels of kerbside activity generated by parking, loading and public transport, it would be appropriate to consider a higher level of 'Place'

The Movement function is defined by a combination of the level of traffic flow and the number of accesses on a particular section of road. It is not intended to define levels of traffic flows are the interpretation will vary depending upon the location within Scotland and where the road serves.

The characterisation of junction spacing within 'Movement' will also be location specific where urban situations will have a higher number of junctions than rural area. The decision whether the number of junctions is high or low should therefore be related to the typical number of junctions for that particular area.

An indication of the status of 'Movement' can also be gained from the actual speed of traffic for existing roads and the proposed traffic speeds for new developments. Where speeds are lower, Designing Streets parameters are recommended. Where there may be some doubt as to which guidance to adopt, actual speed measurements could be undertaken to help recommend a starting point for any design.

This approach demonstrates that the key Designing Streets principles can be applied widely to improve the quality of roads and their application is not necessarily limited to low speed or lightly trafficked routes.

Click map to see regional variations

1.7 A Staged Process

The process to be followed is highlighted in the following table that indicates the conjoined approach for both planning and roads construction consent.

Design is a multi-stage process with each stage considering the design hierarchy of Designing Streets: Structure, Layout and Detail.

Early processes define the parameters of the design which must consider the area and scope of the development, uses and trip generation within the defined user hierarchy.

Then how the development links into the wider area has to be considered. This must consider where all the various hierarchical users link into the existing network, considering pedestrians, cyclists, public transport and vehicles. Environmental issues need to be fully understood so that a drainage and green space strategy is efficiently accommodated and all considered for inclusion within the Quality Audit.

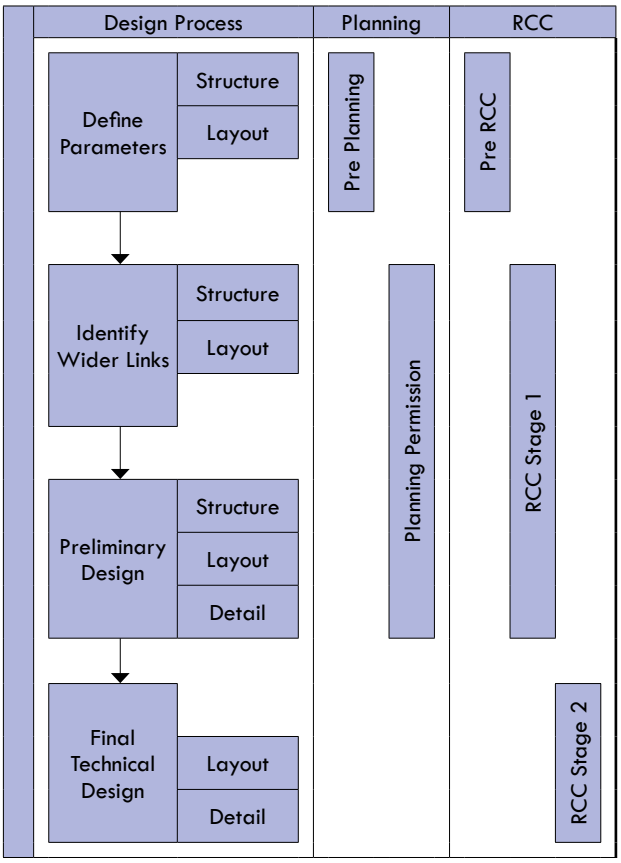
Having established the parameters of the development and how it links into the wider area, it is then necessary to undertake a preliminary design. This will consider all aspects of the design at a level that is suitable for submission for planning permission and Stage 1 roads construction consent. This part of the design process will require consultation with planning and roads officials and is likely to be an iterative process until sufficient detail is provided to meet the necessary requirements of both planning and roads authorities.

The penultimate stage allows all elements in the design to be checked for functionality. Some of these technical checks could be conditioned through the planning process. Detailed alterations may still be permissible within the Stage 2 Roads Construction Consent although the first stage should have established enough certainty so that any changes to street design would not require a material change to planning consents.

Following from the checks on functionality, the final design can be completed within the constraints of the planning consent and will allow roads construction consent Stage 2 to be submitted.

This process has been developed to allow the designer to apply for planning permission and Roads Construction Consent concurrently (Figure 4).

Figure 4 *Planning and Roads Construction Consent*



Quality Auditing using the design considerations within this document as well as within Designing Streets is encouraged as a method to reach balanced decisions. Further advice on this is provided in the annex tool boxes, together with a quality audit summary template.

1.8 The Need for Consultation

Initial Consultation

It is considered essential to ensure a holistic approach to the planning and the Roads Construction Consent (RCC) processes that developers consult with all officers at an early stage.

Consultation should consider items such as, but not necessarily limited to the following:

- *the suitability of the location chosen for development in terms of access and/or effect on future roads schemes;*
- *acceptability of the proposed layout in relation to development control standards;*
- *a list of the main materials that will be used, and if there are deviations from the materials palette, appropriate approval process;*
- *the proposed provision of new road structures and alteration of existing road structures (eg bridges, culverts and retaining walls) are subject to **Technical Approval** procedures as outlined in BD2 of the Design Manual for Roads & Bridges;*
- *Transport Assessment (TA) requirements in support of a planning application;*
- *drainage and flood risk assessment to identify treatment of surface water discharge and additionally if there is a related flood risk;*
- *SUDS selection, design and prospectively adopting body;*
- *Quality Audit, based on the approach set out in this guide;*
- *officers may be able to advise developers in respect of variations to the specification to suit certain specific local conditions.*

Note: ***If the issues above are not considered at an early stage, any changes could result in abortive work.***

The Developer is required to provide the Roads Authority with completed formal Consultation Certificates included in this guide before Construction Consent can be granted.

1.9 Consultation with Other Bodies

The information contained in these guidelines refers principally to the Local Roads Authority requirements. The requirements of the Planning Authority, Public Transport Unit, Statutory Undertakers, Scottish Fire and Rescue Service, Scottish Ambulance Service, Police Scotland, Scottish Water and Scottish Environment Protection Agency (SEPA) will be extra to these requirements and should be checked out individually at an early stage.

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Part 2

ROADS DEVELOPMENT GUIDE

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PRINCIPLES

SCOTS

Last updated
June 2017

Part 2 - Principles

Click on the titles to go to that section

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2.1 Consents

In order to deliver a successful road development proposal in a timely fashion, a range of statutory consents are necessary and are instrumental in guiding the design to an effective and efficient conclusion.

2.1.1 Statutory Consents

The current policy context to the planning approval process is set out in Local Development Plans and the Strategic Development Plans:

(a) ***Development:***

Planning Permission in Principle**, followed by **Approval of Matters Specified in Conditions

or

***Planning Permission**.*

(b) ***In addition, before any new road construction begins:***

*Section 21 of **Roads (Scotland) Act 1984** requires that prior to any work commencing; written consent in the form of a **Roads Construction Consent** is obtained from the road authority.*

*The Security for Private Road Works (Scotland) Regulations may also require a **Road Bond** where appropriate. Refer to paragraph 2.3.12.*

*It should be noted that the granting of Planning Permission does not necessarily imply the granting of Roads Construction Consent. Additionally it is an offence to work without addressing these consents. **SCOTS Guide for the Road Construction Consent and Road Bond process**.*

*It should be noted that the granting of Detailed Planning Consent does not relieve the developer of the requirement, in terms of Section 21 of the **Roads (Scotland) Act 1984**, to obtain Construction Consent from the Local Roads Authority for permission to construct new roads.*

(c) ***Work on the existing public road (Road Opening Permits):***

*Where any work either on the existing public road is to be undertaken or if works are undertaken adjacent to the existing public road that imposes for any reason onto that public road written consent, under **Section 56 of the Roads (Scotland) Act** from the Roads Authority is required. Please note: the Road Authority may require technical approval, similar to RCC requirements, as a condition of S56 approval.*

The Road Authority may enter into a Section 48 agreement for Contributions towards expenditure on constructing or improving roads.

*Additionally, where these works require the placing and maintenance of apparatus in a road that imposes for any reason in or under that public road, written consent under **Section 61 of the Roads (Scotland) Act 1984** from the Roads Authority is required.*

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Developers should note that applications for the granting of statutory consents require significant lead-in times as they may involve a range of technical procedures, consultations and processes to be completed prior to submitting an application. ***The developers are strongly advised to make allowance for this in their project management plans especially where they have known key deadlines.***

(d) ***Construction of a New Access from a public road:***

Where construction of a New Access is taken from a public road, written consent detailing the standard of works together with any reasonable conditions from the Roads Authority is required.

2.1.2 Construction Consent

In terms of Section 21 of the Roads (Scotland) Act 1984, any person other than a Roads Authority who wishes to construct a new road or an extension (including lateral widening) to an existing road must obtain Construction Consent, irrespective of whether or not such roads are to be submitted for adoption as public. It is an offence under this Act to commence any construction of a road prior to obtaining Construction Consent. Construction Consent is granted by the Local Roads Authority and road construction works may only be undertaken while the Construction Consent (Form CC1) remains valid.

2.1.3 Section 75 Agreements

For infrastructure improvements outwith the development site deemed necessary by the Local Roads Authority, the Developer may be required to enter into a Section 75 Agreement Under Town and Country Planning (Scotland) Act 1997) with the planning authority.

2.1.4 Design Guidance and Adoption Standards

Construction Consent should be granted only where proposals for the layout and construction of roads, structures, road drainage and lighting meet the guidance as detailed in this document and any variations permitted by the Local Authority. Within an urban situation the balanced approach contained within Designing Streets to design means any 'standards' for street structure, layout or detail must be considered in context and the guidance within this document should be used to influence specific aspects or elements of the street design.

6 or more individual dwellings should normally be served by a 'road' which will require Construction Consent and the submission of a Road Bond in a residential area.

Generally 5 or fewer dwellings (more if a 'brownfield site', eg redeveloped farm steadings) will be served by a 'private access' which, as there is no right of public access, will not require Construction Consent and will not be available for adoption. Such layouts should provide adequate turning facilities and a satisfactory junction with a public road. The provision of a 'private access' must be indicated clearly at the planning application stage, otherwise it will be considered that a 'road' is being provided.

2.2 Design

2.2.1 Design Context

This guide reflects Designing Streets as the policy statements for street design in Scotland in that it does not pursue a standards-based approach and is determined heavily on a user-based approach.

Roads or Streets are key determinants of rural and urban character respectively and along with economic viability their treatment must seek to create harmonious relationships between the road, building and landscape as well as function. Successful design requires that the functioning of all the various elements are considered together, eg the road itself, buildings and utility servicing, pedestrian areas, open spaces, drainage systems and parking layouts as well as gardens and play areas in residential areas, with the aim of creating a safe, connected and attractive environment for and all users.

Adopting a comprehensive approach it is more likely to produce an acceptable design. This Guide describes methods by which the policy can be more consistently applied.

It is critical that at the earliest stage the designer understands all the requirements of supporting civil infrastructure and using this knowledge creates a functional layout to meet requirements by balancing all decisions to that end.

The six qualities identified in Designing Places and referenced in *Designing Streets* to create successful places are:

- *distinctive;*
- *safe and pleasant;*
- *easy to move around;*
- *welcoming;*
- *adaptable;*
- *resource efficient.*

A good practice would be to use the key considerations, explained in more detail in Designing Streets, as a checklist to judge a proposed layout against and thus ensure compliance: refer to Quality Audit section.

An integrated and balanced approach is necessary for the design of new development layouts, such that all factors are co-ordinated to give a final result which creates a pleasing and attractive environment, enhances the community function and is not an excessive drain on community resources.

The layout design is required to balance a range of essential considerations and elements in developing an acceptable road layout and therefore **a sense of place**. **Note:** *A designer who uses minimum road standards is likely to swing the balance towards movement rather than place and this approach is not acceptable for streets with a higher place function.*

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These elements may consist of but are not limited to traffic flows, design speed, needs of all users including pedestrians and cyclists, the young and the elderly), place, movement, function, dwellings or adjoining buildings, road widths, forward sight lines and integration of SUDS.

This guide supports methods of Sustainability and encourages resource efficiency in all aspects of construction, management and maintenance of Infrastructure.

2.2.2 Site Evaluation

Before starting a site layout design it is important that an analysis is carried out of the existing assets and constraints of the site which will have a bearing on the layout or treatment of the road. Issues to be considered include:

- ***existing road layout*** *- to assist with design and connections to the existing road and path network;*
- ***intended road function*** *- to help determine factors such as the geometry, scale and detailed treatment of the road;*
- ***potential for future adaption*** *- links function or potential function to road geometry;*
- ***existing structures (buildings, retaining walls, fences, signs, historical artefacts etc)*** *- to take protection measures and guide the design;*
- ***established patterns of use*** *- identifies traffic patterns and informs traffic management needs or guides alternative provision for all uses;*
- ***significant buildings or public open spaces*** *- to identify potential areas for environmental enhancement and desire line traffic management;*
- ***key views to and from the area*** *- to enhance important views and identify areas for screening;*
- ***drainage and consideration of natural flow paths*** *- any site layout must ensure that rainfall that exceeds the capacity of drainage systems has minimal impact upon new infrastructure. Flow paths that lead to property flooding or to critical roads being inaccessible are not acceptable.*

For guidance that covers topography and natural features items, Scottish Government's **Green Infrastructure: Design and Placemaking** should be referred to:

- ***topography*** *- identify design constraints and assist with the alignment of new roads and location of drainage systems;*
- ***hydrology*** *- to assist with defining the SUDS selection and design;*
- ***street trees*** *- identifying existing to be retained or provided to enhance public space considerations;*
- ***significant flora and fauna habitats*** *- to protect and enhance features of ecological importance.*

Following site analysis then the design team, with the architect or master planner working in tandem with infrastructure designers, engineers and landscape architect should work through the design aspects or building blocks of street design, roughly as the hierarchy set out in **Designing Streets**.

2.2.3 Street Design Hierarchy

The pages that follow use the same aspects of design as Designing Streets and are noted, for ease of reference, in the same order as the policy document. The triangle contains links to the relevant page of guidance within *Designing Streets* each aspect refers to. Table 2 opposite is adapted from the table in *Designing Streets* showing how each aspect of street design links to the Six Qualities of Successful Places.

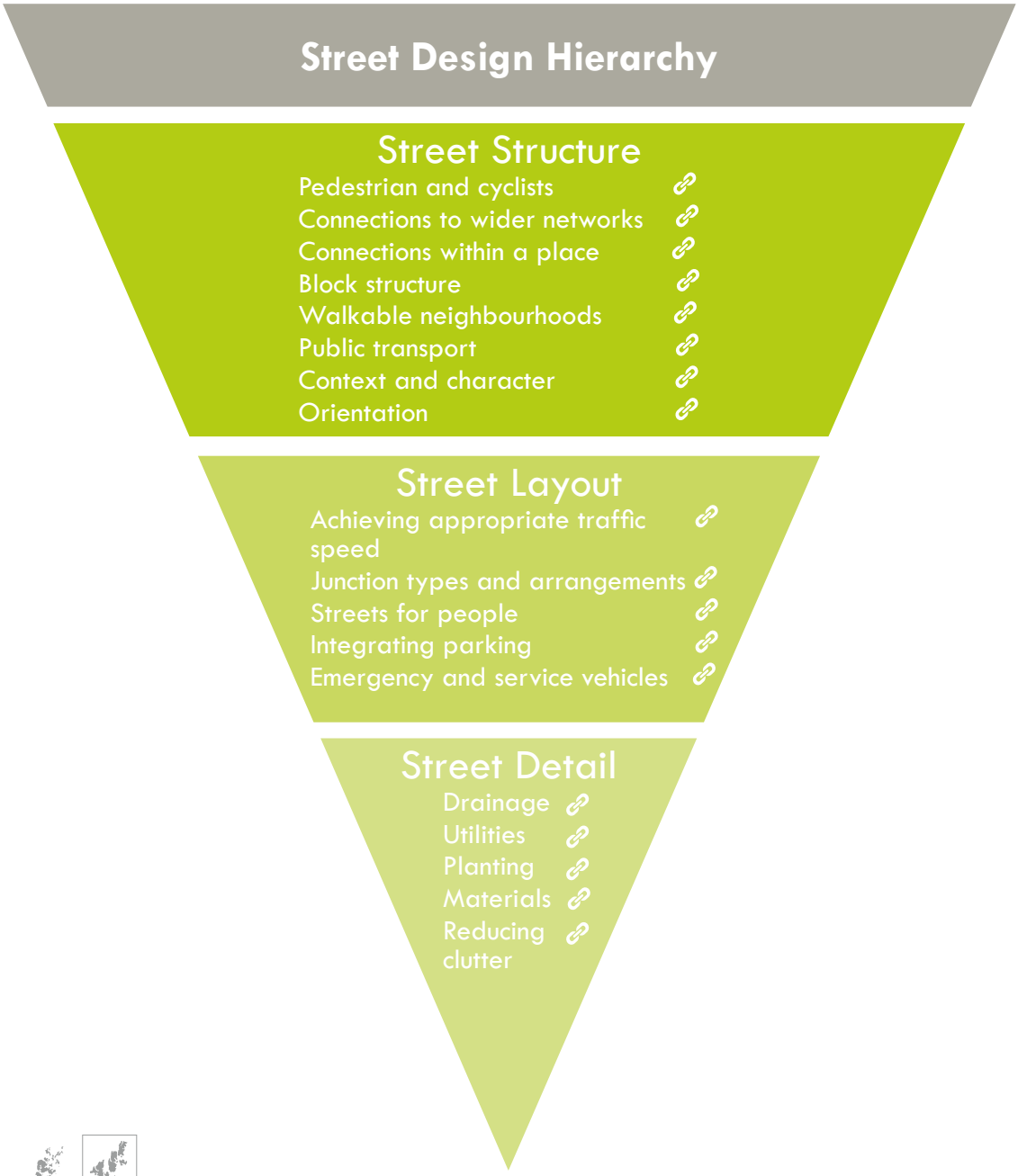

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Table 2 *The Six Qualities of Successful Places: Key Considerations for Street Design*

distinctive	*safe and pleasant*	*easy to move around*	*welcoming*	*adaptable*	*resources efficient*
Street design should respond to local context to deliver places that are distinctive	Streets should be designed to be safe and attractive places	Streets should be easy to move around for all users and connect well to existing movement networks	Street layout and detail should encourage positive interaction for all members of the community	Street networks should be designed to accommodate future adaptation	Street design should consider orientation, the integration of sustainable drainage and use attractive, durable materials that can be easily maintained
Block structure Context and character	Pedestrians and cyclists Achieving appropriate traffic speed Reducing clutter	Connections within a place Public transport Junction types and arrangements	Walkable neighbourhoods Streets for people	Connections to wider networks Integrating parking Service and emergency vehicles	Orientation Drainage Utilities Planting Materials

2.2.4 Street Structure

(a) Pedestrians and Cyclists

Developments can take a variety of forms, with different requirements both internal and external to the site. The designer must therefore examine the user hierarchy in the proximity of the development to ensure that relevant design standards are achieved and that the needs of all road users are met, especially the requirements of pedestrians, cyclists, public transport and disabled users.

Designing Streets identifies a change to mode hierarchy for residential and low use street with pedestrians having greatest consideration. Consideration of pedestrians and cyclists first means that conditions should be reviewed to determine whether changes can be made to volume, speed and road space provided to other traffic, before segregation and formally defined at-grade crossings are provided.

This user hierarchy is endorsed by this guide for strategic and main roads also. If developments are to meet the needs of pedestrians and cyclists and establish those as the preferred modes of travel within a new neighbourhood, the design of infrastructure must be focused, firstly on those needs. The removal of the requirement for a traditional roads hierarchy and the introduction of this National Road Development Guide provide designers with the freedom and flexibility to produce layouts that take full cognisance of the mode hierarchy.

Where a combined cycle and pedestrian route is proposed reference should be made to Transport Scotland's Cycling by Design and LTN 1/12 Shared Use Routes for Pedestrians and Cyclists to assist with design guidance.

(b) Connections to Wider Networks

To meet the objectives outlined in this guidance, developments need to be well connected to their surroundings. It is acknowledged that the provision of multiple access points has implications on the amount of land available for development, but to create quality neighbourhoods a balance needs to be struck.

It is important to note that the number of vehicle accesses into a development should not preclude the provision of additional, high-quality pedestrian, cyclist or public transport only accesses via footpath, cycle track or bus-only links.

A key aspect of connectivity is adaptability and to consider connections for future adjacent developments without leaving ransom strips. An outward looking block structure by necessity considers development edge treatment, which permits future adaption readily.

Developers are recommended to work with Local Authority officers to ensure their proposals are well connected as part of a strategic approach to the transportation network.

The existing road network must be capable of coping with the existing as well as levels of all types of traffic generated by the development. The road and paths created within a development must connect into the existing road and other user networks in a logical and progressive manner.

Click map to see regional variations

The extent of a proposed development may require existing routes for vehicular traffic as well as pedestrians or cyclists to be assessed to ensure that the traffic generated by the new development does not exceed the road capacity. Where a Transport Assessment identifies a need for additional traffic management, particularly to a strategic or main road, the resultant design requires early and detailed consultation with the road authority to develop proposals. Where any requirement to mitigate the effect of the development on adjoining roads is identified, the developer will be required to fund appropriate remedial measures as a part of their development that could be for vehicles but equally could be for higher pedestrian use such as new or improved controlled crossing points.

(c) Connections within a Place

Permeable layouts make navigation through developments simpler and easier and reduce frustration. They shorten distances and increase the attractiveness of walking and cycling as preferred modes for certain journeys.

Policy states that street structure should be connected and permeable, as such the use of cul-de-sac layouts is strongly discouraged. An alternative layout to address infill sites could consist of a courtyard development which provides a good sense of place as well as limits the scale of such a street network. Refer to Designing Streets, page 19.

(d) Block Structure

The block structure readily enables a range, variety and choice of desire lines for all road user modes as well as addressing adaptability. Grid structure patterns traditionally sit comfortably alongside strategic or main roads.

Roads bordering the rear of housing areas enclosed by high boundary fences to provide private rear space result in unattractive isolated and unsecure links. A multi-function courtyard approach can greatly benefit this design aspect.

(e) Walkable Neighbourhoods

Good connectivity to surroundings should enable access to shops and services outwith the development. However, within the development there is still a need to ensure that movement can flow through the development creating places in their own right.

(f) Public Transport

Public Transport routes must be positively identified at the outset of a development and provision made prior to private transport plans being established and adopted by those moving to the new development. The potential for bus penetration within large developments to give convenient accessibility should be highlighted within any Transport Assessment report.

Good public transport provision should be available at the initial phase of any new development, either by linking to existing networks or by establishing new routes and should therefore be discussed with local transport operators at an early stage.

All details in relation to the provision of bus stops and related infrastructure requirements should be obtained at an early stage by consultation with the Roads Authority's Transportation Manager or nominated representative.

(g) Context and Character

When assessing the potential visual impact of new development, designers should work within the context of broad urban design aims, taking cognisance of such aspects as the existing character and qualities of urban design, architecture and landscape of the area, historical patterns of development and social and cultural factors which impact on the environment. National planning policy contained in Designing Streets and Designing Places illustrates how these issues may be addressed in a comprehensive way to help create development which contributes to local identity and enhances the sense of place. This National Roads Guide describes methods by which the policy can be more consistently applied.

(h) Orientation

Refer to page 31 of Designing Streets for the principles of guidance on how streets should be orientated to maximise the benefits of sun and wind, elements of the micro-climate of the placer that should be considered also by the roads engineer in the positioning of more technical elements of design.

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2.2.5 Street Layout

Achieving Appropriate Traffic Speed (Pages 32-35 of Designing Streets *)*

(a) Low Use and Residential Streets

This section that covers the principles of design speed is a vital area where engineering input at an early stage can help to create a balanced solution that takes account of the safety of all road users and the crucial factor of driver behaviour. Transport Research laboratories report TRL 661 notes that, in their study, the largest effect on speeds was found to be associated with reduced lines of sight.

New developments are recommended not to use vertical traffic calming features such as speed cushions and humps as these may have detrimental effects on disabled and infirm road users. However, vertical traffic calming features such as raised tables at junctions may be suitable in new low use residential developments. Wherever possible, slower speeds should be promoted through other road alignment.

Methods of reducing vehicle speeds include (findings from TRL 661 Report):

- *reduced forward visibility (reduced forward visibility from 120 m to 20 m = 20 mph on links and 11 mph at junctions);*
- *narrower lane widths (5 m wide road = 4 mph on links, approaching junctions = 10 mph);*
- *shorter block lengths (see forward visibility);*
- *block paved or setted road surfaces (= 5 mph reduction);*
- *presence of on-street parking features within the carriageway (=2 mph to 5 mph - CAUTION aim for off-street or reduce interaction with pedestrians - near miss concern).*
- *informality in street and junction layout.*

Since each method has different impacts in speed, clear understanding of each type of speed reducing element and what impact it can have is expected from the designer rather than a simplistic assumption of effect.

(b) Strategic, Arterial or Roads Serving Commercial and Industrial Use

Due to the detrimental effect vertical traffic calming techniques, such as speed bumps, has on disabled or infirm passengers its use is limited and restricted to residential areas, the use of this on other types of roads requires detailed substantiation and consultation with the Local Authority in advance. The proposed use of such vertical traffic calming measures in the vicinity of hospitals and such establishments is unlikely to be supported.

Street layout information within Designing Streets identifies acceptable SSD values for both x and y terms for cars and light vehicles. This section gives guidance on Stopping Sight Distance (SSD) for streets where 85th percentile speeds are up to 60 Kmh (37mph), this will generally be achieved within 30mph limits with the potential to be achieved within 40 mph limits. The SSD, the distance drivers need to observe and stop within a given speed, includes the perception and reaction time. For new streets the designer sets the design speed but on existing streets the 85th percentile, wet weather speed is used. It is important to note that the updated SSD values are appropriate for cars and light vehicles but bus and HGV have different deceleration characteristics.

(c) Rural Areas

In rural areas not subjected to local speed limits, TD9/93 is taken as a starting point for new routes which aligns design speed to the Alignment Constraint (bendiness and sight distance) and

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Layout Constraint such as determined from carriageway width, verge width and junction and access frequency. It is essential that the designer understands the concepts of road width and forward visibility to reduce traffic speeds into the overall design of a scheme to ensure that appropriate speed levels conducive to road safety are evidenced and designed into proposals.

2.2.6 Road and Lane Widths

Whilst not a specific aspect of design within DS, this guide goes into more depth on the subject of widths of carriageways as part of an overall layout.

This guide is not as prescriptive as previous versions of Roads Development Guides regarding road widths; this is specifically to enable a designer to select an appropriate road treatment in keeping with the placemaking and design concept. Where the movement function is high, a range of minimum standards associated with a roads function will be identified to assist designers.

There are also a number of locations where the road will change its function and as such it is possible that the design parameters will change along the length of a road and it is essential that the designer understands the parameters used for place and movement to understand the standards which must be followed. These parameters are explained in more detail in Part 1.

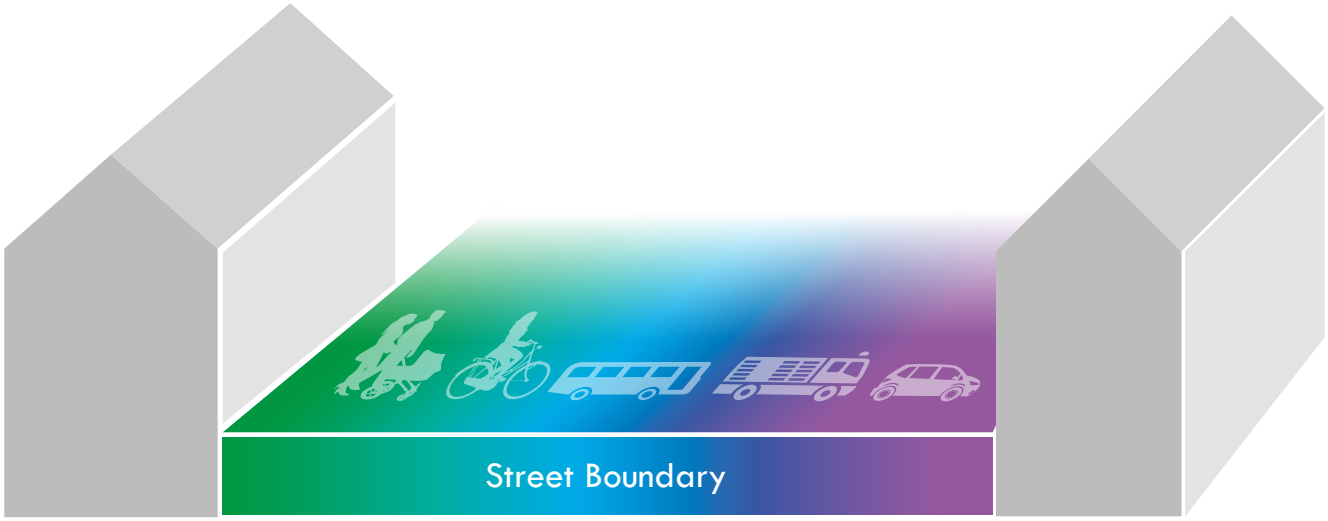
It can also be seen that even on roads where either place or movement dominates the designer's thinking there can be changes to the balance between them and the road design should alter to reflect locations where the balance moves between the two parameters.

However, user requirements are considered critical in the road design and the use of swept path analysis to provide evidence in support of proposed road width and other design factors are considered critical in support of a proposal. Swept path analysis, or tracking, is used to determine the space required for various vehicles and is a key tool for designing carriageways for vehicular movement within the overall layout of the street. The use of this technique often proves to be beneficial in determining how the street will operate and how vehicles will move within it.

Layouts designed using a high 'place' function should be designed to enable buildings to be laid out to suit the character of the street, with footways and kerbs helping to define and emphasise spaces. Designers have the freedom to vary the space between kerbs or buildings. The kerb line does not need to follow the line of vehicle tracking if careful attention is given to the combination of sightlines, parking and pedestrian movements.

Every road needs to be designed to match its place and movement function, but it must also be capable of coping with the types of traffic and other maintenance events. All types of traffic using a road require to be able to manoeuvre along the road while not adversely impacting on the place function and must remain safe for the road users. Refer to 3.1.3 for details.

This should not be interpreted in a manner where roads widths in areas with a high 'place' function are designed for the movement of occasional HGV traffic as the use of the road by vehicles such as waste management vehicles, as clearly their use is minimal. Refer to Emergency and Service vehicle provision, page 44 of Designing Streets.



When allocating dimensions for road boundaries a number of criteria need to be considered, which includes both vehicular and non-vehicular/pedestrian demands; current and potential future requirements of the infrastructure and the impact different drainage methods would have on the design.

Traffic congestion impacts on air quality and as a result place quality. Where traffic assessment figures indicate a traffic volume in excess of 10,000 Annual Average Daily Traffic (AADT) advice is required from the road authority regards minimum road widths. Where cycle lanes are provided and specifically on a strategic or main road, a minimum allowance as detailed in **LTN 2/08 Cycle Infrastructure Design** should be made to permit safe overtaking.

The design process to be followed should be to progressively build up the road width by creating 'lanes' to meet the requirements of all road users. An effective understanding of this system permits the designer latitude to develop a road with adequate facilities to suit the location and the place function while ensuring that the overall final design is safe and adequate for movement. In essence, the 'lane' width and therefore road width is built up within the design based on User Requirements.

The requirements of each of the roads users is detailed below, while remembering that the road is made up of elements for vehicles, both motorised and non-motorised; pedestrians and other areas for parking, landscaping and 'place' functions. Incorporating SUDS, trees, street furniture or other such aspects become straightforward to include in the overall design. Due regard for disabled users is required.

One of the six qualities of successful places is 'adaptability'. The design of a road, particularly strategic roads, using the above lane analysis will identify a minimum road width readily. However

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the resultant creation of 'the Road' between property boundaries has a permanent effect of defining public space. Careful consideration needs to be given to this regards future integration within the overall context of the area.

(a) Junction Types and Arrangements

Pages 36 to 37 of Designing Streets indicates a range of junction types and arrangements. Research provided by TRL and TMS Consultancy has updated geometric guidelines including changes to junction spacing, visibility splays and forward visibility. The immediate effect changes road layout design substantially, over former understandings, permitting more traditional layouts in urban areas. For detailed understanding of visibility at junctions, reference to Designing Streets, Manual for Streets and *Manual for Streets 2* is strongly recommended. Reduced sightline requirements at residential road junctions, based on evidence to reduce speed, permits tighter corner details. Junctions are an integral aspect of any development design and are critical as they influence the inclusion of larger public spaces such as squares and meeting points as well as deal with traffic conflicts.

(b) Streets for People

Page 38 of Designing Streets describes how streets are about places of activity where people of all ages can interact as well as provide for the movement of motor vehicles. This tendency to favour co-operative rather than segregated streets referred commonly as a shared spaces require careful consideration regards the design and creation.

(c) Shared Surfaces

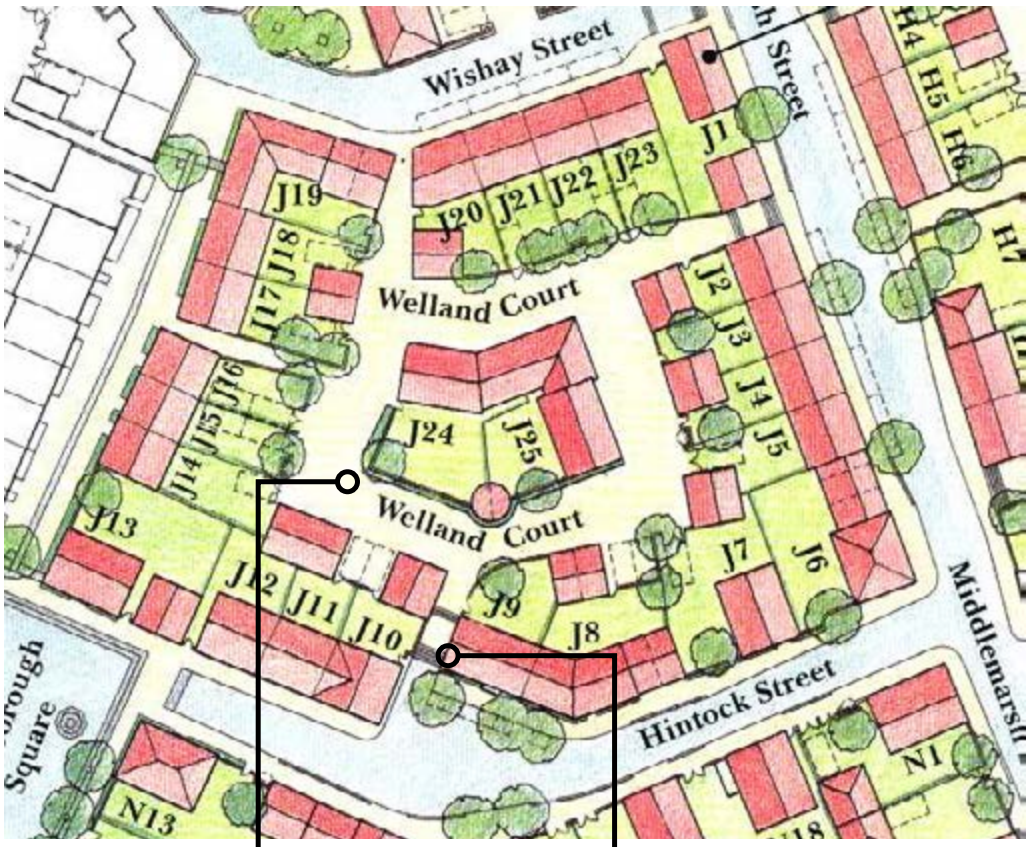
Shared Surfaces are areas where streets are shared between pedestrians, cyclists and all motor vehicles. This technique is normally restricted to areas where vehicle speeds and volumes are demonstrably low so an environment is created in which all road users have equal priority within the street. Particular regard must be given to disabled users. Reference to Sight Line is encouraged to support such applications.

Community courtyards, contained within a block structure layout readily provides for shared surfaces and amenity space, these areas should be designed for low traffic speed and volume and can address waste management, utilities and SUDS (Figure 5).

Shared surfaces normally contain street furniture or planting, to add to the sense of place and assist in keeping vehicle speeds to appropriate levels. However, shared surfaces can also be used in high street and other pedestrian dominant environments to reinforce the user hierarchy.

Note: An audit of such areas which indicates clear regard and consideration to disabled users and equalities legislation during design is required to support such street proposals. Additionally, designers are required to provide a holistic understanding of these areas which not only address layout and equality requirements but underground servicing also: refer to Quality Audit. It is recommended that underground utilities are considered at an early stage and maintenance access together with reduced pavement disruption is designed in.

Figure 5



Example of shared surface with integrated parking

Example of typical court access

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There are some key design principles that should be taken into account when considering a shared surface scheme. **These principles are important in the implementation of successful schemes such that if not incorporated, it may be inappropriate for the scheme to be considered.**

In terms of the principles, shared surface streets should:

- *have a design speed close to walking/cycling speed, ie less than 10mph;*
- *feature controls on parking, permitted parking only in designated and well defined areas and limiting parking so that it does not dominate the street;*
- *feature measures to encourage social activity within the street, such as benches, play areas and street furniture;*
- *be clearly a different environment from a traditional street, by means of surfacing, signing and the presence of planting green space, trees or street furniture;*
- *be designed wherever possible with community involvement, to ensure the buy-in of the main end users of the scheme;*
- *take full cognisance of the needs of disabled people and vulnerable road users, in appropriate locations, providing safe space to protect users and assist with navigation through the area; and*
- *provide considered access to underground services, drainage and location of street lighting systems such that comply with regulation and best practice.*

(d) Integrated Parking *(Page 40 of* Designing Streets *)*

Parking and Servicing requires recognition of the development's function balanced against reducing the visual dominance of parked vehicles. Internal accommodation or possibly year round landscaping to parking areas needs consideration.

In addition, the evolution of car design has resulted in increased car sizes over recent years, rendering much of the previous car parking spaces guidance outdated and no longer fit for purpose. Refer to Parking Standards in Part 3.

To better accommodate vehicle parking whilst balancing the impact on a place, garage parking allowance should be considered providing the garage dimensions permit the effective use of that building for that purpose. Key requirements for a garage space is that a car can easily access the garage and the driver can egress the car comfortably thereby encouraging the garage's use for that purpose. Consideration to the in-curtilage parking and positioning of a building within a plot together with storage and cycle parking should be given to reduce visual impact. Refer to Parking Standards in Part 3.

For flatted or other types of developments, underground or internal undercroft parking is a good solution and is practical for developments of a size where access ramps can be accommodated or topography easily permits its use. Effective design of internal parking permits buildings to be located forward on the building plot thereby removing the traditional parking area at the front of buildings and maximising private space to the rear of the building.

Research by Transport Research Laboratory (TRL 661) has shown that the presence of on-street parking can reduce vehicle speeds. However, there remains concern that crossing the road between parked cars remains a safety issue, particularly for young children. Additional design challenges need to be met where the road constitutes an arterial road and where the surrounding function is more than residential only. Car free developments are not considered appropriate, as residents will park in surrounding streets, thereby limiting effectiveness. Parking should be allocated on an estate-wide basis

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Provision for bicycle parking requires particular attention when considering the form of a new development. Reference to Cycling by Design and LTN 2/08 Cycle Infrastructure Design is recommended for all new road layouts. Larger developments with significant infrastructure may warrant off-street or parallel-to-street dedicated facilities. The guidance above relating to the designer making the road up from user defined lanes can assist in this provision. In encouraging cycling it is important that safe, secure and convenient places are provided within developments for the storage of cycles. Inconvenient or difficult to access facilities should be avoided.

(e) Emergency and Service Vehicles

Types of traffic using a road do require adequate facilities to ensure a safe environment; HGV and bus traffic lanes by necessity are wider than car only lanes. The sharing of road space for cyclists requires additional space as does on-street parking. In essence, the lane width and therefore road width is built up within the design based on User Requirements. This should not be interpreted as merely all residential streets must always cater for HGV waste management and winter maintenance vehicles as clearly their use is minimal. Reference for Emergency and Service vehicle provision is detailed in Designing Streets. Further guidance on this is detailed later: refer to 3.1.5.

2.2.7 Street Detail

(a) Drainage and Sustainable Urban Drainage Systems (SUDS)

Water quality and the need to consider controlling rainwater runoff rates and its infrastructure are two key factors that have driven the need to identify more sustainable drainage solutions for all forms of new development. There is now a legislative requirement, through the introduction of The Water Environment (Controlled Activities) (Scotland) Regulations 2011, commonly referred to as CAR, that to comply with General Binding Rule (GBR) 10, surface water runoff from areas constructed after 1 April 2007 must be drained by **Sustainable Urban Drainage Systems (SUDS)** so that all reasonable steps are taken to ensure the discharge will not result in the pollution of the receiving water environment.

The design of an integrated sustainable urban drainage system needs to be considered by the developer at an early stage to ensure the benefits of such a system are fully realised within the proposed development.

Design guidance can be obtained from The SUDS Manual, CIRIA no C753 and from SUDS for Roads. Additional local guidance for developers may also apply.

Developers are recommended to consider a SUDS system in terms of a master planned approach as a sectionalised or phased approach is unlikely to gain approval.

A key requirement is that the in-perpetuity maintenance and management of any Road SUDS system is clearly attributed to a regulatory body such as Scottish Water or the Local Authority

and that this agreement together with boundaries of responsibility is clearly indicated on plans submitted for RCC.

The design of new residential developments should apply the following principles:

- *SUDS must be an integral component of the design from its inception, with the connections into the wider network identified.*
- *All parts of a shared surface water system for road and curtilage water must be designed to allow future adoption/vesting by an in perpetuity regulatory body. This will normally mean that on any specific site, Scottish Water and/or the local authorities entering into an agreement to confirm adoptable standards together with future maintenance boundaries at the outset and that agreement forms a material part of the RCC application. Refer to the SUDS Schedule pn page 172.*
- *SUDS should be developed in conjunction with the roads layout and landscape strategy, have regard to any sensitive environmental receptors and be integrated with the wider wetland habitat networks.*

Click map to see regional variations

Initial investigations on drainage and SUDS need to establish the soil and hydrological conditions of the area and the site. This information directs the design principles for the development and are submitted as part of the RCC application process including future regime for maintenance, discharge location and methodology of calculating surface water discharge rates.

The levels of treatment listed below represent best practice. Please be advised that for mixed use developments, the level of treatment required will be determined by the use with the highest sensitivity within the development.

- *All roads schemes typically require two levels of treatment, except for residential developments of 50 houses or less and retail/commercial/business parks with car parks of 50 spaces or less. For technical guidance on SUDS techniques and treatment for roads please refer to the* **SUDS for Roads** *manual.*

More detailed information:

- *Residential developments of 50 houses or less and retail/commercial/business parks with car parks of 50 spaces or less require one level of treatment for all hard standing areas including roads.*
- *Residential developments of more than 50 houses and retail/commercial/business parks with car parks of more than 50 spaces require two levels of treatment for all hard standing areas including roads. An exception is run-off from roofs which requires only one level of treatment. Recommend best practice, the second level of treatment to be a basin or pond designed in accordance with* **Sewers for Scotland Third Edition**.
- *Industrial developments require three levels of treatment for hard standing areas and two levels of treatment for roads. An exception is run-off from roofs which requires only one level of treatment. Recommend best practice - the second level of treatment to be a basin or pond designed in accordance with* **Sewers for Scotland Third Edition**.

Developers should also note the following:

- *The appropriate levels of SUDS treatment should be provided in new developments. Further advice regarding the surface water treatment, and levels of treatment, is available from the following* **SEPA link**.
- *Any in-curtilage SUDS (private)* ***must*** *have a strategy and evidence for long-term maintenance.*
- **Whole Life Costs (WLC model)** *and future maintenance issues will be key to the successful selection of any given SUDS design. Surface water discharge from SUDS does not require a licence under the WEWS CAR regulations unless they are draining:*
  - *>1,000 residential houses;*
  - *>1,000 car parking spaces;*

- *industrial areas;*
- *major road/motorway;*

in which case a simple license is required. This applies to surface water discharges arising from the above activities which are new or enlarged. It does not apply to existing surface water discharges, unless SEPA considers that additional controls in the form of a licence are required.

In the case where soil saturation levels have been reached, flood paths are required to be identified such that roads are kept free of ponding water and that housing or buildings are not put at risk.

(b) Flood Risk Management

A key requirement for any development is flood management and determining any potential flood risks. All developments should be screened to determine if there are any potential flood risks from the following sources:

- *fluvial (flooding from rivers and burns);*
- *pluvial (ponding of rainwater which has not entered any drainage network, normally occurring in low lying areas);*
- *sewer;*
- *overland flow/flood routing;*
- *ground water;*
- *coastal flooding.*

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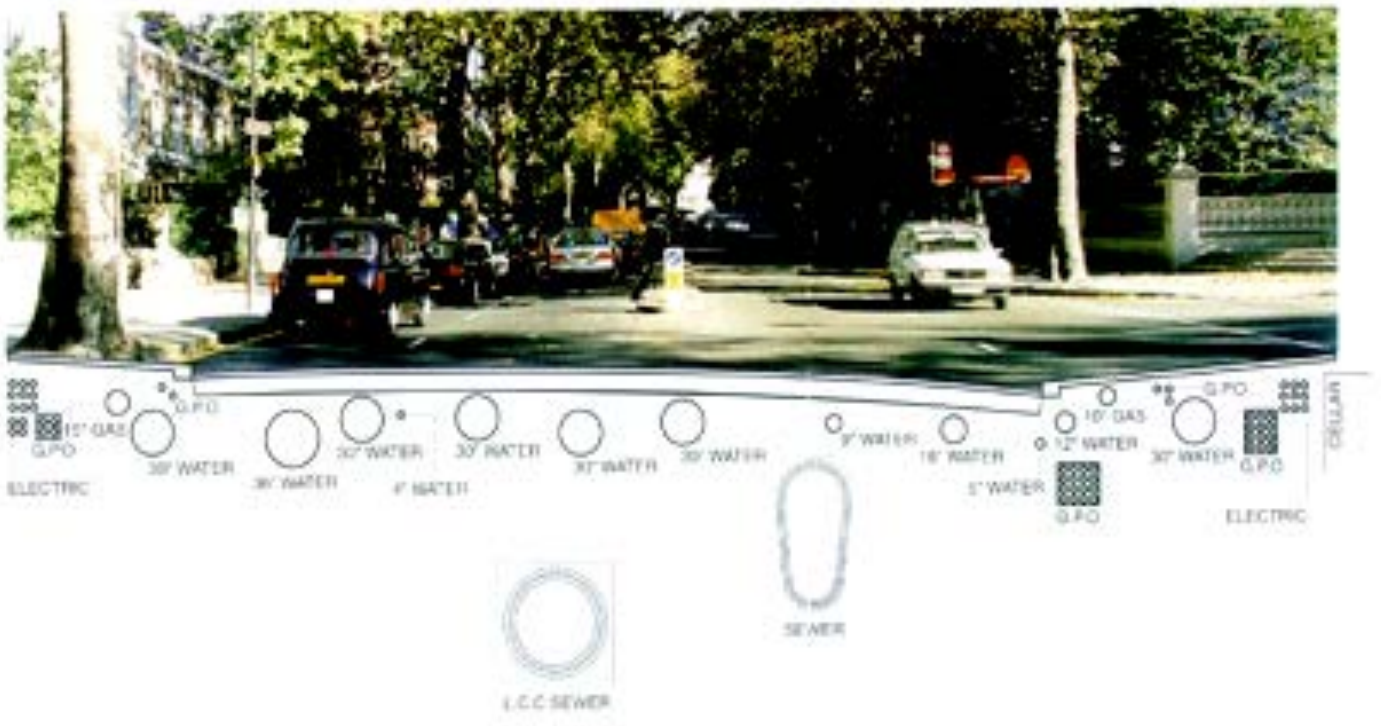
If any of the aforementioned flooding sources are identified there will be a requirement to carry out a **Flood Risk Assessment**.

The Local Authority's Flood Management team should be consulted at the conceptual stage of all development to discuss these requirements.

(c) Utilities

All developments require utility servicing and this should be planned at the outset so as not to conflict with other road aspects and as a rule are placed within the road boundary. The use of ducting and utility combined ducts which result in minimum disturbance to the road surface for maintenance is encouraged. The provision of service strips requiring ground management requires clear demarcation from private ground. Where green service strips are proposed alongside shared space, these are intended to connect to adjacent garden grounds. These are unlikely to be supported where walls, fences or hedges are proposed separating these from such gardens

Where high-quality surfaces are proposed, ducting of utility apparatus is highly recommended to maintain the long-term integrity of such surfaces and reduce risk to such utility apparatus.



(d) Planting

Developers will require to arrange maintenance of planting or by an agreement with the Local Authority. Local Roads Authorities will not generally adopt planted areas except for grass verges within the road boundary, main road visibility splays and elements of the SUDS systems. Developers must detail management undertakings on proposed road adoption plans.

(e) Materials

Page 50 of Designing Streets outlines the principles of distinctiveness and durability to allow ease of maintenance. Section 2.4.10 in the adoption chapter that follows goes further in outlining the needs from the Roads Authority point of view.

(f) Reducing Clutter

Page 51 of Designing Streets outlines the principle to keep road or street marking and signage to a minimum. Locate furniture for maximum pedestrian benefit and light our streets discreetly.

Click map to see regional variations

2.2.8 Risk and Liability

Changes to road layouts and updated technical details as a result of Designing Streets (see page 60-63 of DS), SUDS and traffic management processes has caused some concerns for designers regarding litigation and liability. This is largely unfounded but to assist with these concerns reference should be made to UK Roads Liaison Group's Highway Risk and Liability, Second Edition for clarity based on stated case law.

2.2.9 Transport Assessments (Public Transport and Travel Plans plus Quality Audit)

Initial considerations should be to seek confirmation from Local Authority on whether a Transport Assessment (TA) or Transport Statement (TS) is required. There is no requirement to appoint a firm of Transport Engineers to undertake a TA but seeking advice from suitably qualified professionals would be recommended. The next stage is to submit a proposed scope for the TA for comment by the Local Authority and/or Transport Scotland (as necessary) and seek agreement to this before undertaking the assessment. If the scope is not agreed there may be a requirement to provide an addendum to the submitted document or a completely new submission.

Detailed advice on Transport Assessments can be found in the Transport Assessment Guidance and refer to section 3.2 in this Guide.

The Scottish Government guidance on Transport Assessments sets out requirements according to the scale of development being proposed; from a local development which requires a simple Transport Statement providing an explanation of transport issues through to a major development where detailed technical analyses will be required in a Transport Assessment accompanied by a supporting Travel Plan.

A Transport Assessment (TA) is required for most large developments where there is the potential for a major traffic impact on the surrounding transport network. These developments will typically include the following:

- *food and non food retail stores of over 1,000m² Gross Floor Area;*
- *hotels with more than 50 beds;*
- *residential developments with 100 dwellings or more.*

Transportation Statements which are a slimmed down version of a full TA are usually required in the following circumstances:

- *hotels with less than 50 beds;*
- *residential developments with between 50 and 99 dwellings.*

Please note however, that these are only guidelines and that a full TA can be asked for if the Council considers that the traffic impact of a proposed development merits such an investigation.

2.3 Adoption of Infrastructure

Adoption and Maintenance (Roads, SUDS, Landscaping (Public open space) etc)

2.3.1 Adoption of Roads

In Terms of Section 151 of the Roads (Scotland) Act 1984, a road is defined as any way (other than a waterway) over which there is public right of passage etc (by whatever means) and includes the road's verge, and any bridge (whether permanent or temporary) over which, or tunnel through which, the road passes: and any reference to a road includes a part thereof. In terms of Section 16 of the Roads (Scotland) Act 1984, the Local Roads Authority will, **upon request**, adopt, ie **add to its list of public roads**, any new road (including any associated footway or verge) constructed in accordance with a Construction Consent.

Click map to see regional variations

The Local Roads Authority will also include this road and associated footways, verges, drainage systems, green space, public areas and any other related infrastructure into its Roads Asset management Plan. However, clear demarcation of responsibilities must be identified and agreed by local authorities, Scottish Water and any other third party agencies party for the future maintenance of any element of the road and its drainage system, including open public space as a part of the RCC application.

Private Accesses

It is important to make the distinction between roads (recorded on the list of public roads or not) and private accesses. Roads have a public right of passage whereas private accesses are controlled by the owner(s) and there is no public right of passage. At the planning of a new road, its status as a Private access is identified and that it is not the intention of either the Developer or the road authority to ever have the road added to the list of Public Roads.

The suitability of a private road can be judged against some or all of the following criteria:

- *the road serves less than the adoption standards (2.1.4);*
- *the development is enclosed with no right of passage;*
- *the development consists of dwellings that are never to be adopted as permanent dwellings. For example, holiday homes that limit occupation to no more than 11 calendar months of any year regardless of numbers.*

For a road that for any reason has not been added to 'the list of roads' it is necessary to identify a responsible person as Road Manager who is identified through the Road Authority on the Scottish Road Works Register as defined in terms of the **Transport (Scotland) Act 2005** in perpetuity.

Phased adoption of a project:

To avoid long delays between construction and adoption of roads, developers are recommended to programme construction to enable the adoption of roads to be phased as sections of work are completed, subject to the following:

(a) *Each phase should have a separate Construction Consent* ***and if applicable, a Road Bond for Residential Developments****.*

(b) *Carriageways, footways, verges, relevant elements of a SUDS systems and lighting will not be adopted separately.*

(c) *In general only lengths of road between junctions will be adopted.*

(d) *All roads submitted for adoption should form a continuous system with existing public roads.*

Note: *Roads Authorities may choose not to adopt a completed section of road which is being used by construction traffic to access further phases of the development.*

2.3.2 Adoption of Parking Areas

In both new development and redevelopment, the developer will normally be required to provide parking spaces in accordance with the parking standards detailed and agreed at a Loads Authority level. The suitability of such areas for adoption or maintenance by the Local Roads Authority will normally be judged against the following criteria:

(a) *Parking areas should be constructed in accordance with a Construction Consent.*

(b) *Parking areas contiguous with the carriageway will normally be adopted as public roads provided that their use by the general public is not restricted in any manner.*

(c) *Off-road parking areas, which have been identified as meeting a general public parking need and have been constructed to appropriate standards may be taken over for maintenance purposes (as agreed in advance by the Local Authority guides).*

(d) *Parking areas provided in lieu of garages or private driveways for the regular parking of residents' cars will not be taken over for maintenance purposes by the Local Roads Authority and must, therefore, be subject to private maintenance agreements. They will remain either the responsibility of the Local Housing Authority or of the proprietors or factors in the case of private housing.*

(e) *Clear demarcation must be provided between the prospective public road and privately maintained parking areas.*

2.3.3 Housing Courts

Housing Courts consist of a combination of the above elements and may be considered for adoption by the Roads Authority. Housing courts should be constructed in accordance with a Construction Consent.

Housing Courts serving less than 20 dwellings may be considered unsuitable for adoption.

2.3.4 Service Areas

Service areas in industrial or commercial developments, which provide loading facilities for the premises, will not normally be considered for adoption even though these may take the form of paved areas contiguous with the carriageway. A clear delineation of the private area will be required.

2.3.5 Adoption of Road Lighting and Electronically Controlled Signals etc

Lighting installations or electronically controlled signals on publicly maintainable roads, footpaths and parking areas may be taken over by the Roads Authority for operation and maintenance prior to the completion of the road works, provided that the following requirements are met:

(a) *The submission of a separate acceptable* ***Completion and Inspection Certificate*** *for any lighting installation or part thereof that requires to be adopted during the construction period.*

Click map to see regional variations

(b) *Acceptance by the developer of responsibility for any necessary repairs or replacements, arising from faulty workmanship or from the failure of materials, during the twelve months following adoption of the road as detailed in the RCC.*

(c) *Written assurance from the developer that all roads concerned will be offered for future adoption in a timescale commensurate with the lighting adoption maintenance period.*

(d) *Final acceptance will be withheld until all columns and control pillars etc have been numbered and, if required, painted.*

The road will not be adopted until the road lighting and control is completed.

2.3.6 Adoption of Cycle Tracks

A cycle track is a road for use by pedal cycles only or by pedal cycles and foot only. The adoption of cycle tracks will therefore follow the procedures for the adoption of roads. The suitability of cycle tracks for adoption will be judged against the following criteria:

(a) *Cycle tracks should be constructed in accordance with a Construction Consent.*

(b) *Cycle tracks must form part of a general cycling network interconnecting houses, shops, schools, public transport, etc and be available to cyclists and pedestrians on an unrestricted basis.*

(c) *At least one end of the cycle track should be connected to a public road carriageway to facilitate access for maintenance purposes.*

Where a cycle track is constructed by the developer on land primarily intended for recreational or similar purposes to be managed by Council's Services, the cycle track will not require to be adopted but a Construction Consent may be required; Road (Scotland) Act 1984 Section 151(3). If built by a Developer it needs technical approval.

2.3.7 Adoption of Cycle Parking, Bus Shelters, etc

The provision of bus shelters, cycle parking and other facilities may be constructed as part of a development to satisfy the requirements of the Council.

These will normally be adopted subject to the following criteria:

(1) *They should be constructed in accordance with the Council's requirements.*

(2) *They should form part of a general network connecting centres of activity or other sections of public road and be available to users on an unrestricted basis.*

2.3.8 Adoption of Sustainable Urban Drainage Systems (SUDS) for Roads

In terms of this guide where any part of a road is drained into SUDS that system is subject to a Construction Consent.

As a fundamental element of that Consent, a clear demarcation in the form of a **schedule of agreement** (refer to section 3.9) together with plans indicating the prospectively adoptable elements by the Road Authority and Scottish Water which identifies the detailed SUDS adoption agreements in advance of each specific development will be required as part of the Construction Consent process.

The element of SUDS that is apportioned to the Road Authority will be adopted providing:

(a) *all elements of the SUDS for roads should be constructed in accordance with a Construction Consent;*

(b) *written evidence that the proportion of SUDS to be vested by Scottish Water is to be constructed to their standard.*

2.3.9 Pipes and Culverts Under Roads

For pipes and culverts under roads a hydrological study of the catchment area along with a hydraulic design of the proposed pipe or culvert and outfall should be provided along with confirmation that this has been checked independently. Grilles should be designed to facilitate ease of maintenance and prevent flooding and, where possible, grilles should allow for overflow during flood conditions or where the grille face is blocked with debris: refer to section 3.9.

(a) Drainage Outfall to Watercourse

Where connection of the road drainage to a public sewer is not possible alternative arrangements for road drainage should be agreed with the Roads Authority, Water Authority and Scottish Environmental Protection Agency (SEPA).

Click map to see regional variations

2.3.10 Structures Agreements

Where a Construction Consent provides for a road to be supported by a bridge, the Roads Authority will normally enter into an agreement with the developer, in terms of Section 79(1)(c) of the Roads (Scotland) Act 1984, whereby the bridge will heritably vest in the Local Roads Authority. Other essential structures such as retaining walls will also require an agreement to enable these structures and solums to vest in the Local Roads Authority. However, where the bridge or other structure and solum has not been so acquired, the Local Roads Authority will be responsible only for maintaining the road surface.

2.3.11 Roads Bonds

In terms of Section 17 of the Roads (Scotland) Act 1984 and the *Security for Private Road Works (Scotland) Regulations 1985 Amended 1998 (SI 2080)* developers are required to make financial provision with the Local Roads Authority in order to safeguard the completion of roads detailed under the Act and which are the subject of a Construction Consent. Refer to SCOTS RCC and Bond Guidance.

To clarify this issue, everything that conventionally constituted a road will be included in that valuation and includes carriageway, footways, cycle tracks, remote footpaths, verge, service strips, lighting, drainage and any other works normally associated with the road works.

The valuation of the Road Bond is set by the Local Authority based on costs for them to have the works completed up to the standard of the Construction Consent and is not subject to negotiation by the Developer.

Such provision may take the form of a Road Bond or deposit and protects prospective house purchasers from having to bring incomplete roads up to adoptable standards. **It should be noted that no building works can commence until such securities have been lodged and Developers must give *"at least four weeks"* prior written notice of intention to commence such works to the Local Roads Authority.**

A security in favour of the Roads Authority will also require to be lodged in cases where substantial works for commercial developments affecting the existing road network are being undertaken by private bodies eg roundabout, underpass etc (this by means of a Section 75 Agreement or Planning Obligation made under the Town and Country Planning (Scotland) Act 1997 as amended by the Planning etc (Scotland) Act 2006). The Regulations concerning Road Bonds do not, however, cover private accesses.

Evidence of a sewer bond may be required from a developer prior to works commencing as part of the RCC process.

2.3.12 Delineation Public/Private

Delineation will be required between all private areas and the public road. This should be achieved by means of flush kerbs or other agreed form of delineation at the boundary and may incorporate gateways and/or change of surfacing.

2.3.13 Dilapidation Surveys

In a case where construction traffic from a major development exceeds previously experienced volumes on the adjacent public roads serving the site and this results in an increased rate of deterioration in those roads, the developer may be asked to enter into an agreement with the Local Road Authority in terms of Section 96 of the Roads (Scotland) Act 1984. This agreement allows the Council to recover extraordinary expenses in repairing roads damaged by heavy vehicles or other extraordinary, vehicles or traffic, as a direct result of a development.

2.3.14 Quality Audit Including Safety Audit

Quality Audit should be incorporated into the overall street design submission, advice. Reference to Quality Audit - section 3.3.

A consistent approach to QA using DS should to be encouraged. A method that forms part of a toolbox aimed to gain wider, more consistent implementation of Designing Streets is described in section 3.3, Quality Audit Summary Report.

Click map to see regional variations

2.4 Applying for Construction Consent

2.4.1 Responsibility for Design

It is important to recognise that the granting of Construction Consent does not imply that the Local Roads Authority accepts any responsibility for the accuracy and suitability of any elements of the design. The responsibility of the Designer under the CDM Regulations 2007 shall remain with the applicants design consultant or agent.

2.4.2 Application Content Details

An application for Construction Consent should be made on Form CC1. Completed application forms should be submitted **at least three months prior to the commencement of construction** to the Local Roads Authority. Layouts which clearly do not conform to the Guidelines may have the drawings and documents returned for a new application to be submitted.

It is important to note that an application for Construction Consent will only be accepted once the submitted documentation is of a sufficient standard that it is judged by the Local Authority to describe all the construction details sufficiently that permits construction to progress without further information. Confirmation that a construction consent is acceptable and is being progressed should be confirmed by the Local Authority in writing.

(a) Submission of Plans

Applications for Construction Consent should be accompanied by one electronic and three paper copies of each of the following (initially only one paper copy is required for a preliminary check of the proposals):

(a) ***A location plan***, *preferably on the Ordnance Survey base, to a scale of 1:1250 or 1:2500, showing the proposed road network and its relationship to existing development and road network.*

(b) ***A layout plan*** *of the carriageways, footways, drainage system, verges, footpaths, retaining walls, cycle tracks, bridges and earthworks to a scale of 1:500 (1:200 where pedestrian/ vehicle shared surfaces are proposed) showing:*

(i) *the proposed centre, building and kerb lines (and also the heel of the footway where this differ from the building line);*

(ii) *curve radii of the road alignment and junctions;*

(iii) *traffic calming measures where appropriate;*

(iv) *dimensioned visibility splays at road junctions and private accesses;*

(v) *forward visibility distances at bends;*

(vi) *vehicular access points to properties;*

(vii) *pedestrian crossing points at junctions and other locations;*

(viii) *the location of all road gullies, (if applicable);*

(ix) *the location of all the road drainage system and SUDS components and its discharge points (applicants can obtain information on discharge points from Scottish Water);*

(x) *the location and type of lighting columns and lanterns, wall-mounted lighting units (if applicable), control pillars, underground cables and road crossing ducts;*

(xi) *the location of all underground services and ancillary apparatus;*

(xii) *the full extent of all cut and fill slopes;*

(xiii) *the boundaries of any areas which it is intended will subsequently be offered for adoption or maintenance;*

(xiv) *road signs and road markings etc;*

(xv) ***future maintenance responsibility of road drainage system by (a) Local Authority, (b) Scottish Water, (c) the developer;***

(xvi) ***future maintenance responsibility of roads, footways, remote footpaths, cycle tracks, service strips, verges, SUDS, green space and public areas;***

(xvii) *fences and wall heights*

(xviii) *swept path analysis.*

(c) ***A longitudinal section*** *along the carriageway, footpaths and cycle tracks giving vertical alignment details, road drainage gradients with manhole positions marked thereon, together with the nature of the substrata to a depth of 1 metre below road formation level or to rock head where bedrock is at a depth less than 1 metre.*

(d) ***Typical cross sections*** *through the carriageways, footways, footpaths, verges, cycle tracks and adoptable parking areas detailing widths, crossfalls, construction depths and materials used, kerb and edge details and typical details of gullies, gully connections, filter trenches, swales, detention basins and underground storage.*

(e) ***A Quality Audit*** *should also be included following the template in section 3.3 of this guide. Where appropriate it should* ***include a range of audit or reports as identified, including a safety audit*** *for the design.*

(f) ***A Factual Ground Investigation Report*** *and corresponding* ***Interpretative Report*** *making specific recommendations on the design of the proposed road.*

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

Click map to see regional variations

(b) Design of Structures

Where the submission includes proposals for road structures (eg culverts, retaining walls or bridges) the application will be subject to Technical Approval Procedures as outlined in BD2 of the Design Manual for Roads & Bridges.

(c) Docqueting of Plans

It is essential that the plans, detailed drawings and specification submitted with the application are docqueted. *"This is the an/drawing/specification referred to in the application"*, and personally signed and dated by the applicant or agent.

(d) Notification of Owners

Where any person other than the developer owns land which fronts, abuts or is comprehended in **the new road(s) or the extension of the existing road(s)** for which Construction Consent is being sought, the developer will be required to declare on Form CC2 that all such persons have been notified of the application for Construction Consent by the issuing of Form CC3, Notice for Service on Owner.

(e) Owner's Objections

Any person to whom the application has been intimated under the provisions of the preceding paragraph may, within twenty-eight days of the date of intimation, make written representation to the Local Roads Authority. Any such representations will be considered before Construction Consent is determined.

(f) Hearing of Applicant

Should it be considered that the application for Construction Consent should be refused or granted subject to special conditions, the applicant may within twenty-eight days of the date of intimation of such a decision appeal to Scottish Ministers.

2.4.3 Construction Period

It will be a standard condition of any Construction Consent that the construction be completed within the period specified in the Consent. This period will not be less than three years. If, as a result of a change in circumstances during construction, it is demonstrated that the specified period is no longer realistic, the Local Roads Authority may grant an extension subject to any conditions they consider necessary. In certain circumstances where requested by the Local Roads Authority a new application for Construction Consent must be made as well as a re-evaluation of the bond.

2.4.4 Amendments to Consent

Should the developer, for any reason, wish to depart significantly from the construction specification or layout details for which Construction Consent has been granted, he must submit a new application for Construction Consent. The new application will be subject to a revised Road Bond valuation.

Major changes may also require the submission of a revised Planning Permission. Under such circumstances, the local planning authority should be consulted for further advice.

Construction Consent approvals may be transferred from one applicant to another at the discretion of the Local Roads Authority, but may under certain circumstance result in a resubmission.

2.4.5 Recycled Materials

In accordance with Environmental Policies, local authorities actively encourage the use of recycled or alternative materials in road construction to minimise the environmental impact of the extraction of aggregates.

Recycled materials should be from a licenced recycling station which has demonstrated to the satisfaction of the Local Roads Authority its ability to produce recycled materials to the required performance standards.

Where Council specification are not available for the use of a particular material, proposals shall be submitted to the Local Roads Authority along with test certificates and details of source of supply for consideration. Refer to MCDHW - Series 600, 700 or 800; also WRAP Resource Efficiency in Highways.

2.4.6 Road Lighting and Signing

The developer will be responsible for the provision of all road, footpath and cycle track lighting, signing (whether illuminated or not) and alterations to existing lighting deemed necessary under Construction Consent.

2.4.7 Private Signs

It should be noted that it is illegal to erect private signs on street furniture or within the road boundary; for example, signs directing the public to developments. Approved signs, to the recognised standard, can be erected with the prior approval of the Local Roads Authority.

2.4.8 Road Bond

Where a developer is required to lodge a Road Bond or deposit, it should be submitted to the Road Authority at least 14 days prior to any house building commencing. Refer to 2.3.11 and SCOTS RCC and Bond Guidance.

2.4.9 Construction Consent Forms

All the relevant Construction Consent forms, as detailed opposite, are included in the Appendices for the use of the applicant. Permission is hereby granted for these forms to be photocopied.

Click map to see regional variations

Form	Title
CC1	*Application for Construction Consent to Construct or Extend a Road*
CC2	*Notification of Adjacent Properties (Docquets of Service)*
CC3	*Notice of Service*
CC6	*Application for Addition of Roads (including footways/cycle tracks) to List of Public Roads*
CC8	*Carriageway Design Certificate*
CC9	*Construction Consent Checklist*

2.4.10 Non-Standard Materials

Where the developer proposes or is required to use, in the opinion of the Local Roads Authority, non-standard materials the developer should maintain a stock of 5% of non-standard materials at all times for the design life of the road. Alternatively the developer should deposit a stock of 5% of these materials with the Local Roads Authority within 3 years of completion of the contract subject to the availability of depot space

2.4.11 Failure to Comply

It should be remembered by developers that failure to comply with the procedures given in this document may result in refusal of Construction Consent. Developers are therefore encouraged to liaise with the relevant Authority at all stages of a scheme.

2.4.12 Inspection Procedures During Construction

(a) Notice of Commencement

(1) ***Four weeks' notice*** *must be given to the Local Roads Authority of the start of roadworks together with names and telephone numbers of responsible persons who may be contacted in connection with the construction of the works.*

(2) ***Inspection and Testing***

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

(3) *Notice of Operations*

The developer or his contractor must give the Local Roads Authority representative a minimum 48 hours' notice (excluding weekends and public holidays) of:

(a) *completion of formation;*

(b) *commencement of each pavement layer to the carriageways, cycle tracks, footways and footpaths;*

(c) *each concrete pour (including blinding) and commencement of steelfixing where reinforced concrete is used;*

(d) *striking of formwork;*

(e) *setting out of road lighting plant positions, backfilling of cable trenches and painting of lighting columns;*

(f) *placing and testing of drainage systems.*

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

Developers should also note that failure to notify the representative as above can result in covered over work to be exposed for inspection at the developer's expense to ensure that the construction complies with the Construction Consent.

Finally, failure to notify can result in delays to adoption or potentially seriously compromise the adoption process.

(4) *Charges for Inspection and Testing*

The Local Roads Authority reserves the right to charge for expenses incurred in inspecting, including any resultant undertakings, along with testing arising from the granting of Construction Consent. Samples of the various materials proposed to be used should be supplied, free of cost to the Local Roads Authority, together with particulars as to the source of supply or manufacture of such materials; or, at the discretion of the Local Roads Authority, test certificates may be submitted indicating the suitability of the materials proposed for use.

(b) Maintenance Period Inspection

On completion of a development road constructed in accordance with a Construction Consent, a request should be made to the Local Roads Authority to have a inspection carried out. As a result of this inspection, a list of any remedial work required to bring the road(s) up to the Local Roads Authority's standards will be prepared. Following the satisfactory completion of any such remedial work and the required maintenance period, an application may be made for the addition of the road(s) to the Local Roads Authority's list of public roads.

Click map to see regional variations

2.4.13 Applying for Adoption of Development Roads

(a) Application for Adoption

Following completion of a development road constructed in accordance with a Construction Consent, an application (using Form CC6 for its inclusion in the Local Roads Authority's list of public roads) may be submitted to the Local Roads Authority by the person to whom such consent was granted.

It should be noted that where at the planning stage it is the clear intention of the developer to have the road added to the list of Roads on completion, some Local Authorities may streamline this process by wording the Construction Consent's application forms in such a manner that this is agreed at that stage which precludes completion of this form at the later stages.

(b) Documents to Accompany Application

Prior to the Construction Consent being entered into its Maintenance Period, submission in the form of two copies of the plans, one paper set and an electronic set, containing all relevant as-built details, must be made to the Local Authority. The roads offered for adoption should be shown in colour, and the plans should clearly indicate the ownership of all areas so coloured. The application for adoption should include the Safety File as required under the Construction (Design and Management) Regulations 2007.

(c) Road Lighting

Similar to above the submission should include two copies of a signed Lighting Completion and Inspection Certificate CC10 together with as installed plans which must show the positions and circuit arrangements of all lighting apparatus.

(d) Road Drainage

The road drainage offered for adoption should be shown in colour and should clearly show future maintenance responsibility by:

(a) the Local Authority;

(b) Scottish Water.

The application for adoption should also include a CCTV survey of the road drainage to be adopted by the Local Authority.

(e) Adoption Inspection

Within a period of twelve months from the time of application for adoption of a development road, an inspection will be undertaken by the Local Roads Authority to ensure that the road has not deteriorated to a standard below that required for adoption.

2.4.14 Addition to List of Public Roads

Following a satisfactory adoption inspection, the road(s) shall be added to the list of public roads, in terms of Sections 16 and 18 of the Roads (Scotland) Act 1984, as appropriate.

2.4.15 Release of Road Bond

The Local Roads Authority may on request of the Developer release an appropriate amount of the Road Bond in respect of a section of road within a Construction Consent where:

Stage 1 - *In accordance with the Road Construction Consent and the road being constructed up to Binder Course, Surfacing Course where modular blocks are specified, the Sustainable Urban Drainage System or other drainage system is complete and functioning, all underground infrastructure is fully installed and standards of work agreed with the adopting authority and any appropriate kerb log is completed.*

Stage 2 - *Completion of all other items as detailed on the Construction Consent up to substantial completion which should only omit such items as grass or soft landscaping elements due to annual planting periods.*

Stage 3 - *Expiry of the Maintenance period (or the expiry of maintenance period of defects required identified during that period) or the addition of the private road concerned to the local Authorities List of Public Roads, which ever is the earlier.*

The Local Roads Authority will retain **a minimum** of 10% of the original security lodged until such time as the road has completed satisfactorily its maintenance period or been added to the list of Public Roads, whichever is earlier.

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Part 3

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DETAILS

SCOTS
Last updated
June 2017

Part 3 - Details

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3 Details

3.1 Road Design

3.1.1 Junctions

The range of junction types and arrangements are discussed in Designing Streets (page 36). This section details required junction criteria to enable a design to function correctly in relation to its user demands.

The functionality of a junction design should be demonstrated by swept path (or tracking) analysis based on the defined user needs appropriate to that junction. The swept path defines the minimum road space required to serve that junction's needs but is not considered necessarily the required kerb boundary line. It merely demonstrates the junction's ability to accommodate the intended traffic use.

(a) Form of Junctions

Where any new development gains access to the existing road network, the detailed form of the junction will depend on various factors including user demand in the form of volume and type of traffic, the manoeuvres made by these vehicles, the potential delays and queues, provision for vulnerable road users etc.

(b) Location

It is preferable to site any junction on level ground or in sags rather than at, or near, the crests of hills. Where possible, T-junctions on curves should be sited so that the minor road is on the outside of the curve. Junctions on the inside of sharp curves are most undesirable.

(c) Visibility Splay Area

Stopping sight distances and visibility requirements are detailed in Designing Streets (pages 33-35).

Figure 6 *Visibility Splay*

(d) Visibility Splay at Bend

Where the side road joins the road at a bend the Y distance should be measured on the kerb line along the bend but the visibility splay will be determined in a straight line (see Figure 6).

(e) Effects of Gradients on Visibility

When a minor road forms an uphill approach to the major road care should be taken to ensure that objects within the visibility triangle although less than 1.05 metres above carriageway level do not interfere with visibility.

Click map to see regional variations

(f) Frontage Access and Parking at Visibility Splays

Obstructions to visibility are detailed in Designing Streets (page 35). Encroachment of parking spaces into visibility splays should be avoided where practical.

(g) Speed Control

Within residential areas low radii corners and/or narrow trafficked lanes can be incorporated which will assist speed reduction.

(h) Forward Visibility

Application

In residential developments, the reduction of drivers forward visibility heavily influences the reduction of vehicle speeds which is considered essential for the road network to function safely.

However, on main and strategic routes, forward visibility is considered where journey time is an economic factor.

Height of Visibility Envelope

Refer to page 33 of Designing Streets.

Construction of Forward Visibility Splay

To ascertain whether the appropriate forward visibility will be achieved a line should be drawn along the vehicle path at a distance of 1.5 metres from the kerb to represent the driver's position (page 35 Designing Streets).

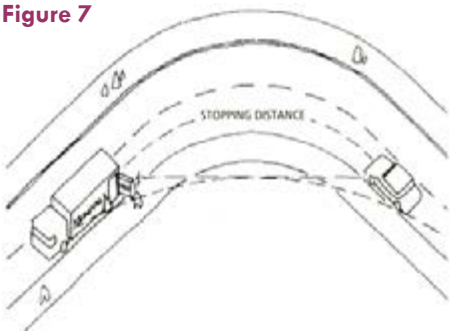
Visibility at Curves

Refer to Designing Streets.

Reduced Forward Visibility

Forward visibility can be reduced below the constructed visibility splay process in Designing Streets page 35 by applying to the road authority and outlining the reasons justifying the reduction within the Quality Audit (see Figure 7).

Figure 7



Main and Strategic Roads or Steep Gradients

MfS2 suggests that Bus/HGV SSD should not be assessed except where it is in excess of 5% of traffic flow. Additionally, where steep road gradients are considered to be factors the basic formula for calculating SSD (in metres) is recommended: refer to section 2.2.5.

$$SSD = vt + v^2/2(d + 0.1a)$$

Where: v = speed (m/s)

t = driver perception - reaction time (seconds) (for HGV and bus traffic, use pre MfS1 value of 0.375g)

d = deceleration (m/s^2)

a = longitudinal gradient (%) (+ for upgrades, - for downgrades)

3.1.2 Private Access

(a) Access Criteria

Similar to the above criteria, private vehicular access to developments will require to accommodate the numbers and types of vehicles using the access in a safe manner. The form of access may also require to be enhanced in order to accommodate pedestrians and cyclists.

(b) Segregation at Commercial Accesses

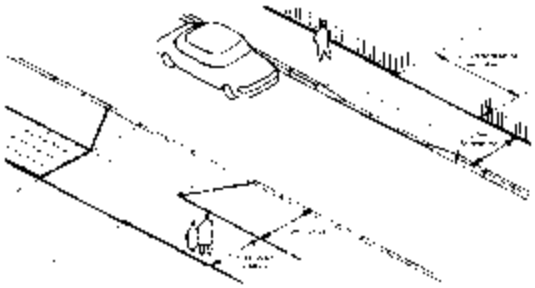
In the case of commercial developments, vulnerable users should be provided with a separate pedestrian access.

(c) Individual Dwellings

In general, access to individual dwellings should be by means of a dropped kerb footway crossing as shown in Figure 8. In rural or semi-rural areas the x and y distance is dependent on the speed of traffic on the road based on the relevant speed limit applicable at that location.


Private Commercial Access

Figure 8 *Driveway Access*



Click map to see regional variations

(d) Access Layouts

Access layouts are shown in Figures 9 to 11. Note: These details require to be updated to narrow ramps and consistent passage along footway.

Figure 9 *Single Minor Commercial Access, Housing Court or Car Park up to 50 spaces*

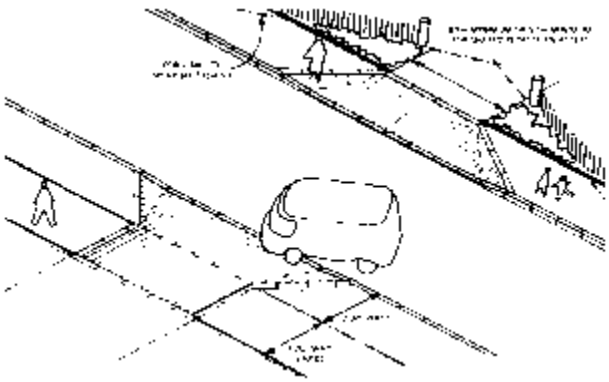


Figure 10 *Minor Commercial Access or Car Park with more than 50 spaces*

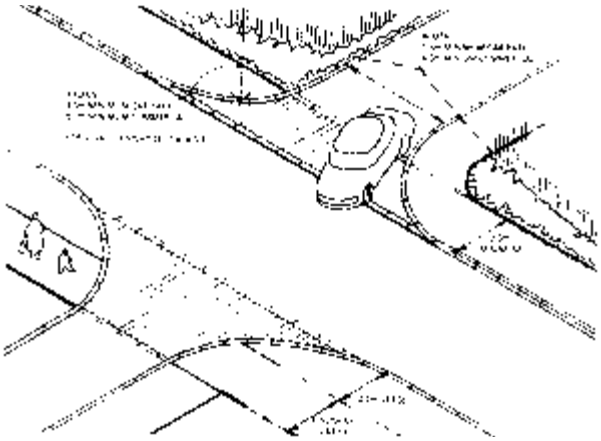
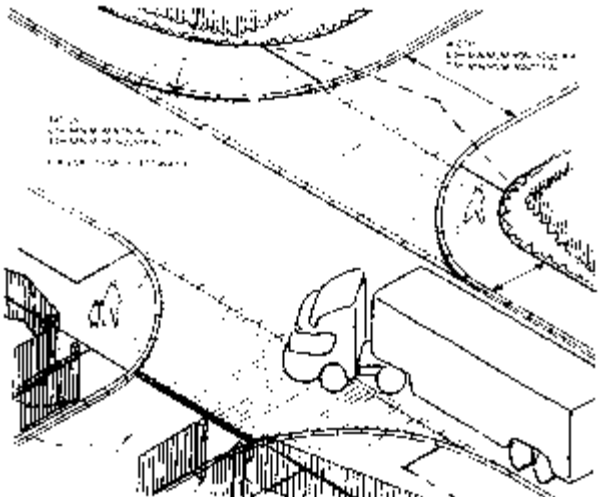


Figure 11 *Major Commercial or Industrial Access*



3.1.3 Design Details

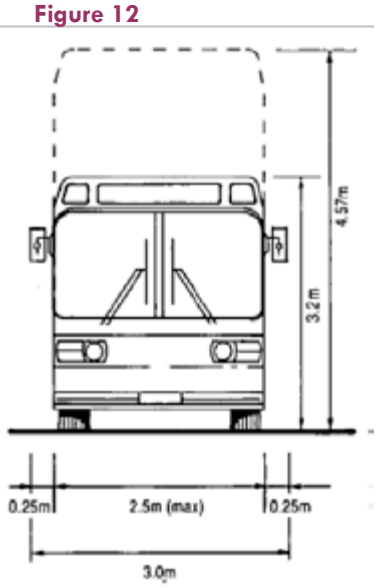
(a) Minimum Traffic Lane Widths

Public Transport

Carriageways on bus routes should not generally be less than 6.0m wide, although this could be reduced on short sections with good inter-visibility between opposing flows.

Bus priority is most commonly achieved by providing with-flow bus lanes, and unless signed to the contrary they can be used by cyclists. Bus lanes should be 4.25m wide and the minimum preferred width is 4m; this allows buses to overtake cyclists safely and reduces the likelihood of interference from general traffic in the adjacent lane. The minimum recommended width is 3m.

Figure 12

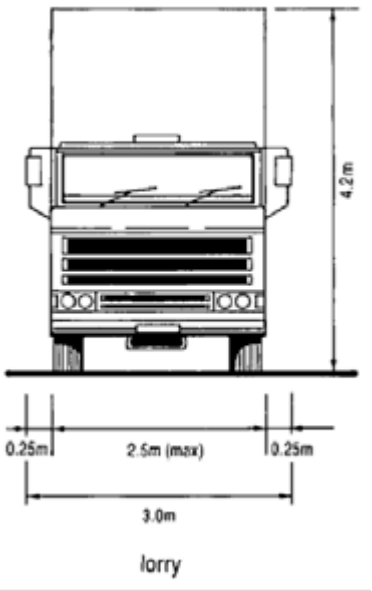


Service Vehicles

Service vehicles by their very nature are infrequent users of the road and their incorporation into the design should not dominate the overall design.

The frequency with which they use each road should be considered and the road should be designed to match the need. High frequency use of HGV service vehicles will require that the road width is suitable to accommodate these vehicles traveling in both directions and the width should ensure that they can pass each other safely and at the appropriate speed. Where indicated by a swept path analysis, bends may also incorporate appropriate widening to ensure that they can travel along the road in a safe and appropriate manner.

Figure 13



Where their use is less in residential areas with a high place function and they are unlikely to meet each other traveling on opposite directions, the road width can be reduced accordingly. In these circumstances HGVs can use all parts of the road and cross the centreline. However, and road design in these situations must incorporate a swept path analysis to ensure that all HGV service vehicles can travel along the road without complicated manoeuvres being required.

Click map to see regional variations

Design Considerations

UK practice has generally adopted a standard lane width of 3.65m but this should not be taken as a preferred value in all circumstances.

On strategic and arterial routes generally subject to national speed limits, this road width should be used and the layout should generally meet the standards in DMRB.

The geometric design of a carriageway has generally been based on the notion of a design speed, which in the past has tended to be fixed along a route, or a substantial section of a route. The images on page 17 of this guide indicate that it is insufficient to consider that a road remains unchanged along its length and the balance between place and movement alters along its length. Therefore it is acceptable to vary road widths to suit circumstances.

The findings in TRL661 indicates that the context through which drivers pass does have an effect on their chosen speed and that speeds will be affected by road width and alignment and areas where conflict may be perceived by drivers.

Narrower lanes will be appropriate in many circumstances, particularly in built up areas, resulting in carriageways that are easier for pedestrians to cross and encouraging low traffic speeds without causing a significant loss of traffic capacity. The needs of cyclists will need to be expressly considered however, as discussed above.

Road design should therefore create an environment where drivers tend to slow down to an appropriate level in areas with a high place function which are generally urban areas, where road space is shared between motorised traffic, pedestrians, cyclists and public transport, and keeping speeds low has been demonstrated to have significant safety benefits.

The lane widths should be determined based on the following local consideration:

- *the volume and composition of vehicular traffic;*
- *pedestrian and cyclists' needs;*
- *the demarcation, if any, between carriageway and footway (eg kerb, street furniture or trees and planting);*
- *whether parking is to take place in the carriageway and, if so, its distribution, arrangement, the turnover of spaces, and the likely level of parking enforcement (if any);*
- *the design speed; and*
- *the curvature of the street (bends require greater width to accommodate the swept path of larger vehicles).*

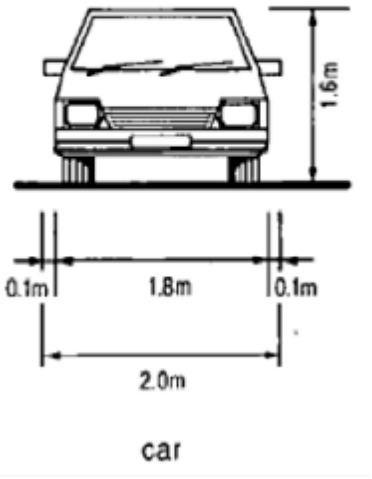
Road design should therefore commence with an analysis of the types of road users anticipated on the route along with the design speed.

This should be considered along with the percentage of HGVs and buses and where this is expected to be high then widths should be able to accommodate these larger vehicles to pass each other in free flowing traffic.

The road width should be considered by the creation of lanes which allow the appropriate vehicles to travel along the road.

Typical vehicle widths are shown in figures 12 to 14 and summarised in the table below and these can be taken as a guide to minimum lane widths.

Figure 14



Vehicle	Width (m)	Total Width (m) (see figures)
Bicycle	0.6	1.0
Bus	2.5	3.0
HGV	2.5	3.0
Van	2.2	2.6
Car	1.8	2.0

The road width can then be defined by the clearance necessary to allow vehicles to travel at the appropriate speed. Clearances need to be specified between vehicles and between the vehicle and the kerbline as detailed in the table below.

	20 mph Design Speed	30 mph Design Speed
Kerb to vehicle clearance	200 mm	250 mm
Vehicle to vehicle clearance	300 mm	800 mm

Thus for example, where HGVs and buses make up only a small proportion of traffic flow, 2 m wide lanes would be sufficient for most vehicles. For a design speed of 20 mph the appropriate clearances would give a carriageway width of 4.7 m. Note: refer to minimum road widths. Conversely for a design speed of 30 mph with a large number of HGVs and buses then 3 m wide lanes with the appropriate clearances would give a carriageway width of 7.3 m.

Click map to see regional variations

Carriageway and lane widths do not have to be constant. Varying the width through non-parallel kerb lines or other physical limits can create interest, provide informal parking opportunities at widenings and traffic speed reduction at narrowings. The needs of cyclists at narrow points should be considered in detail.

These widened areas should be sympathetically designed to address the visual intrusion of unsympathetic road features such as traffic signs, road markings, street furniture and excessive carriageway width. These can be in conflict with local place functions. The opportunity for designers to employ 'natural' features should be considered, for example grass or grassy banks, appropriate trees and shrubs and also seating. Experience has shown that a more sensitive approach can bring sensitive benefits.

Where HGV and/or bus flows are low, it may not be necessary to design carriageways to cater for two large vehicles meeting at any point on the road. This will include refuse vehicles, delivery vehicles and removal vehicles. Tracked routes for these vehicles will need to prove that the road width is capable of allowing these vehicles to pass along the road in a forward gear without requiring to reverse at any point along the route.

Where HGV and/or bus flows are higher carriageway widening may be required for horizontal curves. This should be assessed using tracking software.

The use of overrun areas can be considered to accommodate larger vehicles and further guidance is given on their use in Designing Streets.

Drivers' perception of the appropriate driving speed is also influenced by the relationship between the width of the street and the height of vertical elements. It can be shown that speeds are lower where the height of vertical features is greater than the width of the street. Therefore care should be taken where the carriageway is widened that a vertical effect to narrow the visual width is created by the inclusion of trees or other vertical features.

One of the six qualities of design included in *Designing Streets* is 'adaptability' and the design of a road must consider any future development to ensure that property boundaries do not define the end of a road. Careful consideration needs to be given to road widths to allow future integration with other areas, particularly in the context of larger master planned residential areas.

Design Parameters

The design parameters to be utilised for each type of road within the road hierarchy are given in Table 3 on the following page.

Table 3 *General Road Geometry*

Maximum Gradient	
Strategic Road	6%
Industrial Road	5%
Primary Street	8%
Residential Street	8%
Shared Surface Road	8%
Minimum Gradient	
Strategic Road	0.8% (0.5% with special drainage provision)
Industrial Road	0.8%
Primary Street	0.8%
Residential Street	0.8%
Shared Surface Road	0.8%
Minimum Vertical Curve Length ***(K x algebraic difference in gradient)***	
Strategic Road	Crests: K=17 (10 if traffic calmed) Sags: K=13 (9 if traffic calmed)
Industrial Road	K=6 (minimum length = 20m)
Primary Street	K=6 (minimum length = 20m)
Residential Street	K=3 (minimum length = 15m)
Shared Surface Road	K=2 (minimum length = 10m)

Notes:

(1) *Roads intended for use by buses are subject to a maximum gradient of 6.7%.*

(2) *Roads constructed with modular surfacing are subject to a minimum gradient of 1.25% and a maximum of 7%.*

Click map to see regional variations

(b) Housing Road Widths

Minimum Road Width

The development of a road layout must consider the user defined use in the quality audit. This approach permits variance on a road design however the functionality must be retained with minimal road widths. Where roads are narrow, consideration for placing street lighting such that it is set back from vehicular passage whilst being on adoptable land must be demonstrated in application plans.

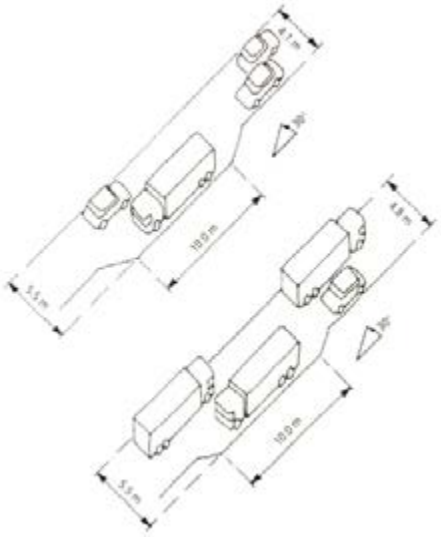
Shared Surfaces

The above hold true for shared surfaces however provision for pedestrian passage and disabled users must be demonstrated in application plans as well as regard for locating and protecting street lighting columns.

Passing Place Configuration

A passing place should provide a minimum road width of 5.5 metres and the length is proportionate to the mean average vehicle type of the road users, reference to on street car parking bays sizes together and vehicle types will assist this design (see Figure 15).

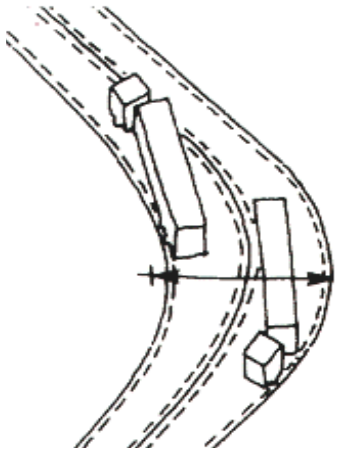
Figure 15 *Car and HGV Passing Places*



(c) Carriageway Widening on Curves

Swept path analysis will dictate minimum road width criteria at such locations. As a rule, vehicles should not cross the center line of a road which has a speed limit of 30mph or more or carries more than 500 vpd. On a swept path analysis, where a large vehicle is indicated as crossing the center line of the carriageway to negotiate a bend or junction, traffic volumes must be minimal with associated speeds less than 10 mph for the crossing vehicle (see Figure 16).

Figure 16 *Car and HGV Passing Places*



(d) Gradients and Crossfalls


Steep gradients can cause mobility problems

Minimum Gradients

Channel gradients should not be flatter than 0.8% (1 in 125). A change from camber to crossfall should not coincide with a sag point in the longitudinal gradient or on a section of road where the gradient is less than 1% (1 in 100).

Crossfalls

Carriageways should be cambered with a fall of 2.5 per cent from the centerline to the channel except on curves where, to eliminate adverse camber, a crossfall between channels should be provided as per the place/movement link design tables in Part 1.

The carriageway cross fall may vary when applying other design criteria such as roundabouts and corners and is dependent on design speed and change of direction refer to TD 16/07 and TD 9/93.

Maximum Gradients

Steep gradients should be avoided as the associated footways can cause problems for those with a mobility handicap. Gradients in excess of those shown may be permitted in hilly terrain at the discretion of the Local Roads Authority.

Lay-by

Lay-bys should be provided with a 2.5 per cent crossfall. Channel gradients should not be flatter than 0.8% (1 in 125).

Shared Surface

For roads surfaced with block paving a 2.5 per cent crossfall should be provided throughout with a minimum longitudinal fall of 1.25% (1 in 80).

Junctions

The maximum gradient, rising or falling, on the final approach of a minor road at a junction should be limited to 2 per cent for a minimum distance of at least 12 metres from the major road. At other locations the gradient of the minor road over the X distance at a junction should not exceed 4%..

Length of Maximum Gradient

The lengths of gradients which are near to the maximum permitted gradient should be kept as short as possible and should not include any horizontal curves within them, except where the radius of the horizontal curve is very large.

Vertical Curve Length

The length of a vertical curve is based on the difference in gradient multiplied by the factor K. See Table 3 on page 78 for the appropriate K value.


Click map to see regional variations

(e) Vehicle Clearance

Vertical Clearance

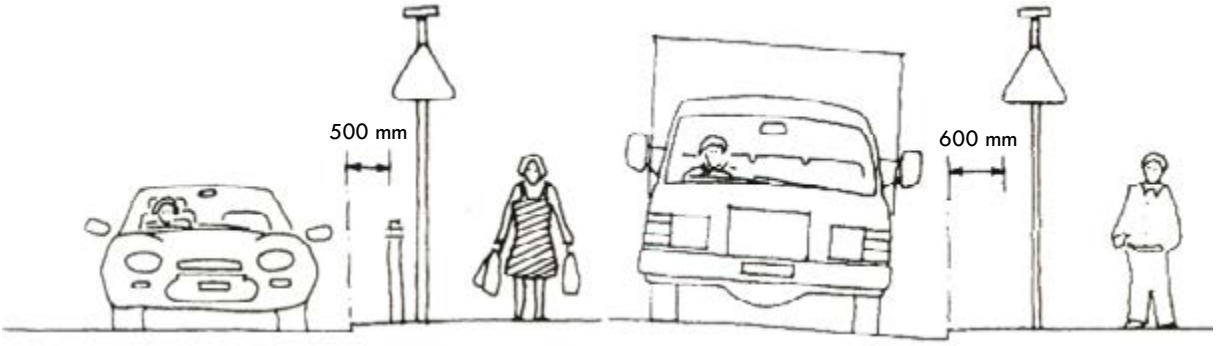
The minimum headroom for any structure, other than a footbridge (which must be constructed with a 5.7 metres clearance), must be 5.3 metres when spanning a Strategic or main Road and 5.1 metres for all other roads, including access through pends where servicing is required.

Generally, 2.1 metres clearance will be all that is required for an access, or covered parking area, which will only be used by private cars, but care should be taken to ensure that refuse vehicles can safety service the area without blocking the adjacent road. Consideration must also be given to changes in the longitudinal profile of the driving surface approaching a vertical clearance and how vehicles negotiate the vertical restriction in comparison to a simple level approach and exit to a vertical clearance.

Horizontal Clearance

A horizontal clearance of 0.5 metres should always be provided between the edge of the carriageway and any vertical objects such as signs. Where the crossfall on the carriageway exceeds 4% this clearance should be increased to 0.6 metres.

Figure 17 *Horizontal Clearance*



(f) Turning Areas

Loop Road Preferences

Turning areas are referred to in Designing Streets (page 37). The developer should demonstrate provision of servicing route so that service vehicles do not need to reverse. Wherever possible this should be achieved by the provision of roads forming loops thus avoiding the need for turning areas and minimising mileage for delivery, service and public transport vehicles, alternatively, reducing development impact so that all aspects are accommodated.

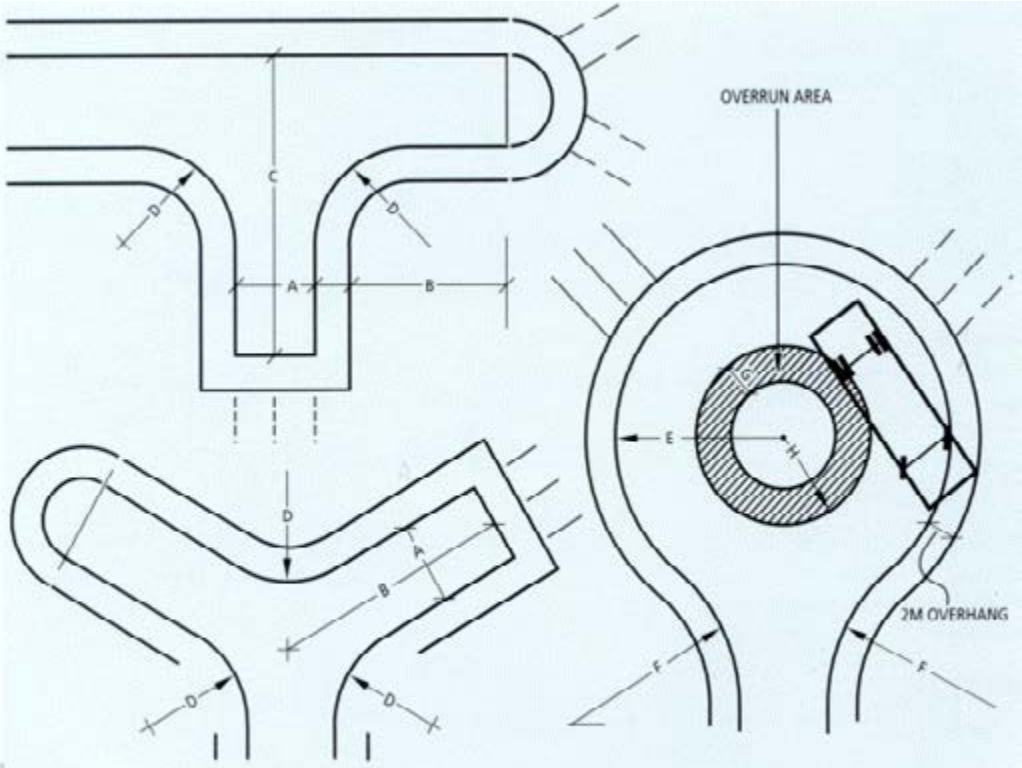
Provision

In general where roads are not provided in a loop form and culs-de-sac are used in a layout, they should terminate in turning circles. Where lack of space precludes the creation of a turning circle, turning heads may be substituted. However it should be noted that over-development of a site to the detriment of such infrastructure requirements is likely to be unacceptable.

Dimensions

The dimensions of turning areas should suit the characteristics of the largest vehicles to use the facility regularly. In residential roads these will normally be refuse collection vehicles, while in industrial/commercial development it may be necessary to cater for 15.5 metres long articulated vehicles or 18 metres long drawbar trailers. The turning areas detailed in Figure 18 are based on the turning circles of these vehicles between kerbs. The length of any hammerhead may be extended from the minimum values shown in Figure 18 at the discretion of the Local Roads Authority.

Figure 18



	A	B	C	D	E	F	G	H
RESIDENTIAL DEVELOPMENT	5.0	12.5	15.0	6.0	10.5	10.5	2.0	6.0
INDUSTRIAL/COMMERCIAL DEVELOPMENT	6.0	29.0	22.0	9.0	13.0		N/P	4.0
RESIDENTIAL WITH BUSES	6.0	N/P	N/P	N/P	13.0		2.0	6.0

Click map to see regional variations

Overhang

Where there is no adjacent footway, turning areas should be provided with a 2 metres wide verge or margin to allow for any overhang of vehicle bodies when manoeuvring.

Self-Policing

Parking in turning areas should be discouraged by locating turning circles well clear of frontage development, or by arranging for premises and designated parking bays to take access via the turning area.

Environmental Design

In residential areas the use of less formal shapes for turning heads may be acceptable as illustrated in Figure 18 as long as the shape used still incorporates the basic turning head dimensions which must be detailed on drawings submitted for construction consent.

(g) Provision for Public Transport

Provision for Buses

Amendments including facilities on existing roads to accommodate bus penetration may be required, at the developer's expense. All details in relation to the provision of bus operation should be obtained at an early stage by consultation with the Local Roads Authority.

Scottish policy is:

- *to provide the environment for bus to act as an effective economic enabler by providing competitive, high-quality public transport;*
- *to enable bus to provide an effective alternative to the car by improving reliability, average bus speed and encouraging improvements to the quality of services and infrastructure;*
- *to encourage investment in more efficient vehicles that produce less greenhouse gases and contribute to the targets in the Climate Change (Scotland) Act 2009;*
- *to link communities, people, places of business and employment and essential services through encouraging the maintenance and development of the bus network in Scotland.*

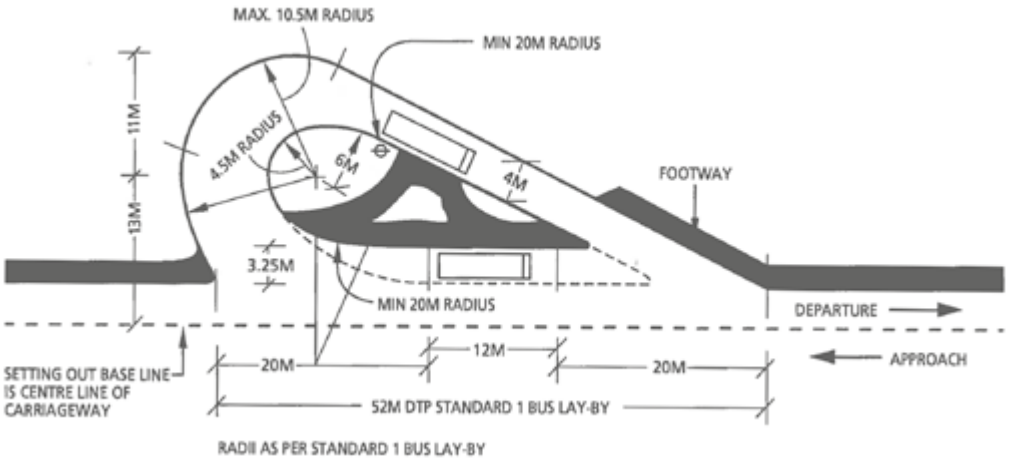
Public Transport

Developers should be aware of the existing structure of the public transport network, including proposed additions or alterations. Measures can be provided in the design of a development to encourage the use of the public transport network by ensuring that it is readily accessible. This will require direct footpath and cycleway links to existing or proposed bus and light rail stops and railway stations. Direct vehicular access may also be made available to permit dropping off and picking up, where space and demand exists. For exceptionally large developments, developers may be asked to provide a new station within the rail network.

Bus routes should have a minimum road width of 6.0 metres.

For details of bus stops and other public transport facilities information is available in I.H.T. Guidelines for Planning for Public Transport in Developments.

Figure 19 *Bus Turning Area (2 metre overhang required)*



Bus Stop Provision

Good public transport provision should be available at the initial phase of any new development, either by linking to existing networks or by establishing new routes and should therefore be discussed with local transport operators and the Local Authority's Transportation manager at an early stage.

Designing for Bus Passengers

When a new bus stop is likely to be used by more than 50 passengers a day, shelter facilities should be provided. Where real-time information services can be made available, such facilities should also be considered.

All details in relation to the provision of bus stops should be obtained at an early stage by consultation with the Local Authority's Transportation manager or nominated representative.

Click map to see regional variations

3.1.4 Pedestrians and Cyclists

(a) Provision for Vulnerable Users

A network of routes, which are safe and convenient, should be established to cater for the needs of the pedestrian, including those with a disability and cyclists.

An audit which indicates how due regard to disabled road users was considered is required as part of the RCC submission.

Cycle routes can comprise either cycle tracks (for pedal cycles only or pedal cycles and pedestrians), or cycle lanes, (part of the carriageway reserved for the exclusive use of pedal cycles).

(b) Pedestrian Provision

Pedestrian Network and Routes

Pedestrian movements should be made as convenient, safe and pleasant as possible by careful attention to the design and layout of pedestrian routes. The pedestrian network should reflect nature desire lines and be more attractive for pedestrians to use than the vehicular route. The provision for cyclists should be examined at the same time as the provision for pedestrians as the two can often be combined.

Definition of Footways and Footpaths and Bridleways

The Roads (Scotland) Act 1984 defines a "footway" as a way, over which there is a public right of passage by foot only, which is associated with a carriageway and a "footpath" as a way, over which there is a public right of passage by foot only, which is not associated with a carriageway.

Pedestrian Crossings Considerations

Particular attention should be paid to the locations at which pedestrian routes cross the carriageway (eg at road junctions) so that footway and footpath users are not exposed to unappreciated dangers. Judicious use of hard and soft landscaping can guide pedestrians to suitable crossing points and help prevent children running directly onto the carriageway and consideration should be given to the possible need for crossing facilities adjacent to shops, clinics, community facilities and other generators of pedestrian traffic. Desire line should be considered and tighter radii of the carriageway kerblines (if kerbs exist) are helpful in encouraging direct connections for users on foot.

Pedestrian Crossings

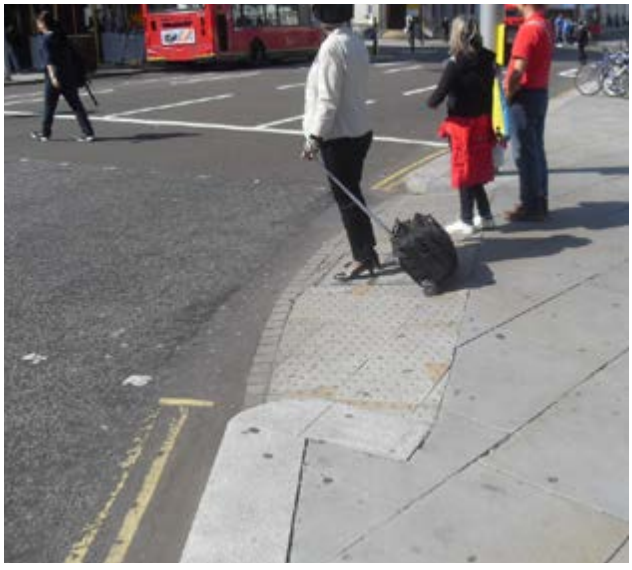
At designated pedestrian crossing points, kerbs should be dropped to permit easy access to and from the carriageway for pedestrians with prams and wheelchairs. Kerb upstands range from 0 mm to 10 mm at such crossings

Grade Separated Pedestrian Crossings

Where both vehicular and pedestrian flows are very high, footbridges and underpasses may be appropriate for carriageway crossings. They should be designed to be obviously more convenient, pleasant and safe to use than any alternative route. This will often involve elevating or depressing the carriageway to ensure that footways and footpaths have minimal changes in level.

Controlled Pedestrian Crossings

Where grade separated can not be justified or provided it may be necessary to balance the competing demands of pedestrians and vehicles by providing a controlled crossing, eg a pelican crossing or pedestrian stage in traffic signals.



Tactile Slabs at Controlled Crossings

A tactile surface should be provided on the approach to all controlled crossing points. Further details of the layouts and use of tactile slabs are given in the DfT Guidance on the Use of Tactile Paving Surfaces.

Click map to see regional variations

Enhancement of At-Grade Uncontrolled Pedestrian Crossings

Uncontrolled crossings may be necessary where the path and road networks cross but the flows are not high enough to justify a controlled or grade separated crossing. These crossing points may be enhanced by introducing traffic calming, thereby making it easier for pedestrians to cross the road and where possible a tactile surface should be provided in accordance with D.E.T.R. Guidance on the Use of Tactile Surfaces.

Pedestrian Routes on Arterial Roads

Where pedestrian routes of necessity run beside arterial Roads, separation from the carriageway by either a hard or soft landscaped strip, at least 2 metres wide may be advisable, in the interests of road safety and of improving the environment of the road. Reasoning should be included in the quality audit.

Width of New Footways

There is no maximum width for footways; widths should take account of pedestrian volumes and composition. In locations with a high 'place' function footways should be of sufficient width to cater for peak demand without causing crowding and the risk that people will be pushed into the carriageway.

Table 4 specifies the required widths of footways which depend upon the level of pedestrian activity. These widths may require to be increased to cater for high pedestrian volume.

Table 4 *Footway Widths*

Frontage Development	Width (metres)
None	2.5 - 3.0*
Industrial	2.0 - 5.0
Residential	2.0 - 3.0
Local Shops	4.0
Major Shops	5.0

** minimum 3.0 metres for arterial road*

Width of New Footpaths

Table 5 on the following page details appropriate widths for footpaths and pedestrian areas intended for adoption. These widths may require to be increased to facilitate maintenance of the footpath and/or underlying services.

Table 5 *Footpath Widths*

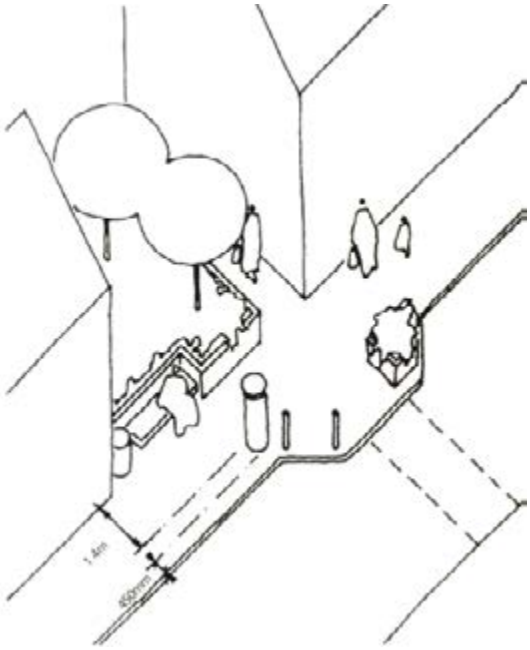
Type of Footpath	Width (metres)
Minor pedestrian routes	2.0*
Major pedestrian routes	3.0
Shopping precinct	3.0
Footbridge	2.5
Underpass (2.3 headroom)	2.5

* *May be inadequate for maintenance purposes in order to accommodate services*

Obstacle to Pedestrian Desire Lines

Any street furniture which is to be provided, such as planters and litter bins should be located in such a way as to maintain a 2 metre wide obstacle free footway. Local narrowing to 1.4 metres over a 3 metre length may be permitted to accommodate street furniture, however, furniture should be reduced to a minimum and grouped together outwith the pedestrians' desire lines of movement (Figure 21).

Figure 21 *Obstacles to pedestrian desire lines*



Reduced Footway Width at Refurbished Buildings

Where existing buildings are being rehabilitated or modernised it may be permissible, with the approval of the Local Roads Authority to reduce the footway width.

Pedestrian Priority at Vehicle Access

Where vehicular access to premises is taken across a footway, the ramped portion should be confined to the front 600 mm that is immediately adjacent to the carriageway, thus emphasising the pedestrians' priority. The short ramp adjacent to the dropped kerb also encourages a reduction in the speed of vehicles crossing the footway.

Desirably, gradients on footways and footpaths should not exceed 5 per cent, with a nominal maximum of 8 per cent. They should be constructed with maximum crossfall of 2.5 per cent. Steeper gradients may occasionally be permitted, subject to the provision of a handrail on at least one side and rest platforms at 10 metre intervals.

Click map to see regional variations

Steps or Ramps on Footway

Pedestrian ramps should have a maximum gradient of 10 per cent. Ramps with gradients of between 5 per cent and 8 per cent should be no more than 6 metres long and steeper ramps a maximum of 3 metres in length. Landings should be provided at the top and bottom of every ramp, and at every turn within a ramp. Stepped ramps should be avoided wherever possible and must not provide the sole means of pedestrian access or be used on wheelchair routes.

Steps will not normally be adopted as they pose problems not only for prams and wheelchairs but also for mechanised maintenance. They should therefore never form the sole pedestrian route and wherever practicable steps should be avoided. However, since some people find walking on any sloping surface difficult or impossible, steps may be provided in addition to long ramps where they are essential to meet the requirements of a pedestrian desire line. Each flight should rise a maximum of 1.2 metres and comprise between three and twelve uniform steps. Longer flights should be split into sections by landings. Steps should have 0.3 metre permanently nonslip treads and a minimum clear width of 1.4 metres.

Street lighting should be provided to light steps adequately and provision of Winter maintenance grit boxes should be made at the top of all steps.

Landings

Landings on ramps and stairways, and rest platforms provided adjacent to footpaths and footways, should preferably be 2 metres long x 2 metres wide with an absolute minimum dimension of 1.35 metres by 1.35 metres.

Handrails

Refer to DfT Traffic Advisory leaflet 6/02 Inclusive Mobility.

Handrails should be provided at both sides of steps (or centrally on steps a minimum of 3 metres wide) so they can be used by either hand. Handrails should comprise 50 mm diameter, galvanised, mild steel tube and must be securely fixed. They should be set 1 metre above a ramp and 0.85 metres above the tread of a step. They should extend at least 0.3 metres horizontally beyond the top and bottom of a ramp or flight of steps and should be returned at each end. Handrails can sometimes be difficult for people to grip and the most comfortable cross section for a handrail is circular with a diameter of 45 or 50 mm. Handrails where fixed to a wall should have a gap of 45 mm between the rail and the wall. Free standing handrails should be complemented with a lower rail set not more than 0.3 metre above the walking surface.

Disabled and Equalities Requirements

Refer to UK Government guidance: Inclusive Mobility 2005.

Disabled Access to Buildings

For disabled access to buildings, ramps should be incorporated off road. Where this is not possible then ramps on existing footways may be permitted for refurbishment of existing buildings as per Figure 20 and Table 6. Reference should be made to the Technical Standards (Scotland) Buildings Regulations and DfT advice 6/02 Inclusive Mobility 2002.

The categories of buildings requiring disabled access are:

(1) *Home**
(2) *Institutional*
(3) *Offices*
(4) *Any Shops above 500m2*
(5) *Assembly place, eg pubs, halls*
(6) *Industrial*

** Where a house contains a Surgery, ie Doctor, Dentist, then the requirement applies.*

Click map to see regional variations

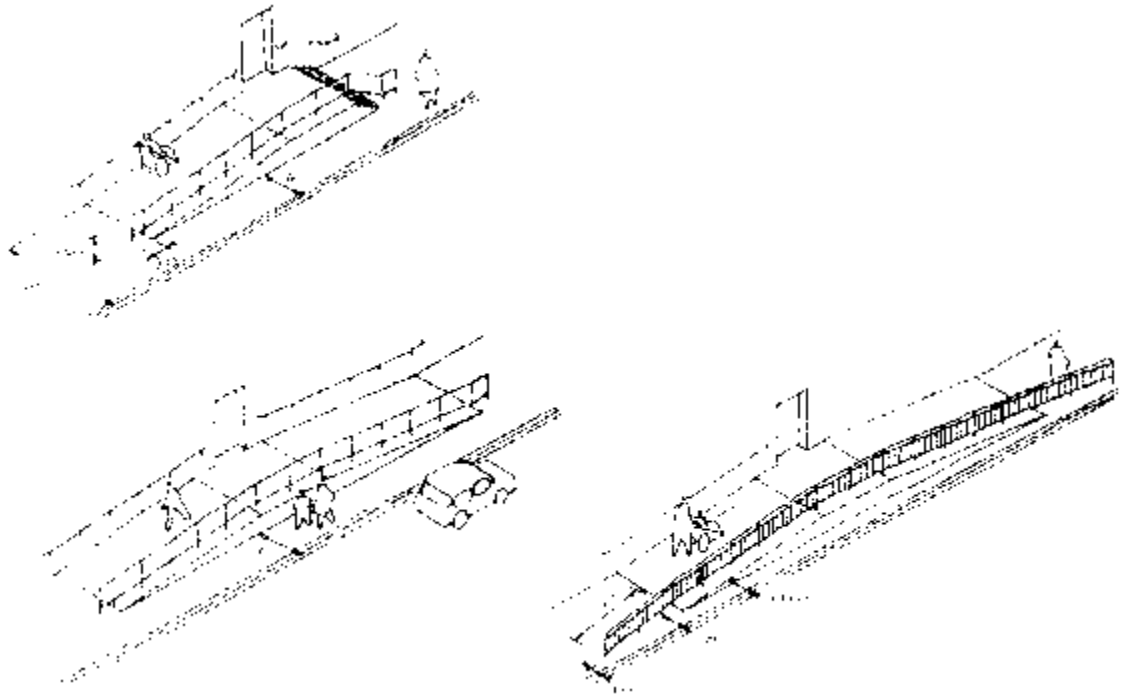
Table 6 *Footway Ramp Widths*

	W(m)	O/A Width (m)			
		Type A	Type B	Type C	
Non Shopping	1.40	3.20 - 3.00	3.20 3.00 2.80	2.25 - 2.05	Desirable Minimum "W" on Ramp* Absolute Minimum**
Local Shopping	2.80	4.60 - 4.40	4.60 4.40 4.20	3.65 - 3.45	Desirable Minimum "W" on Ramp* Absolute Minimum**
Major Shopping	3.50	5.30 - 5.10	5.30 5.10 4.90	4.35 - 4.15	Desirable Minimum "W" on Ramp* Absolute Minimum**

* *On the through ramp layout original footway level is preferred to have minimum width. However, marginal o/a width reduction possible if ramp is made to provide minimum width with 1m footway alongside.*

** *Absolute minimum achieved with min edge width 400m reducing to 200m in Type A & B, and 600 to 400mm for Type C.*

Figure 20 *Ramp Dimension*



Vertical Features

Generally free standing objects such as bollards and seats should be 1 metre high so that they are more obvious and can be more readily seen at waist height then at knee height. Where possible they should also be in a contrasting colour to further highlight their position. Consideration for these details require to be demonstrated through a disability audit.

(c) The Cycle Network

Objectives

A cycle network should be established to serve the needs of cyclists with the main objectives being the following:

(a) *Cyclists should be segregated from large volumes of vehicular traffic, especially where roundabouts are located, or fast moving traffic (>40mph).*

(b) *Vehicle speeds should be reduced where there is a large number of cyclists.*

(c) *Safe crossing points should be provided for cyclists at roads with major traffic flows.*

Further Advice

Further and more comprehensive details of provision for cyclists can be obtained from Transport Scotland's publication **Cycling by Design** *(Revision 1, June 2011).*

Cycling Facilities

The following definitions apply to facilities for cyclists:

(i) *A safer signed route is a route signed along minor roads, cycle tracks and cycle lanes.*

(ii) *A cycle track has the same meaning as described in the* **Roads (Scotland) Act 1984**. *It is thus a 'road' for cyclists or cyclists and pedestrians segregated from the carriageway.*

(iii) *A cycle lane is a lane provided for cyclists within a carriageway.*

Collectively these facilities can be used to form a cycle route.

Click map to see regional variations

(d) Geometric Standards for Cycle Routes

Dimensions

To allow the free movement of cyclists certain standards will require to be met and typical dimensions are given in Table 7 on page 94.

Surface

The surface of all cycle routes should preferably be a smooth non-skid wearing surface with a different colour from any adjacent traffic surfaces. Where the cycle route is part of the carriageway then particular attention should be paid to the surface condition on the inside edge where cyclists ride.

On Road Cycle Lanes

Cycle lanes should be 2 metres wide on busy roads, or where traffic is travelling in excess of 40 mph. A minimum width of 1.5 m may be generally acceptable on roads with a 30 mph limit. Cycle lanes less than 1.2 m width are only recommended at lead-in lanes to advanced stop lines where there is insufficient width for wider lanes.

The ideal minimum widths required for vehicles to overtake cyclists in comfort given in LTN 2/0838 are:

Car passing at 20 mph - 3.8 m

Car passing at 30 mph - 4.3 m

Bus/HGV passing at 20 mph - 4.6 m

Bus/HGV passing at 30 mph - 5.05 m

These are not necessarily lane widths, however. If traffic flows are generally light enough for vehicles to pass cyclists fairly readily by moving at least partly into the opposite lane then the overall carriageway width will be available. Lane widths of 3 m or less will make it less likely that drivers will try to squeeze past cyclists without pulling around them.

If traffic speeds are higher and motor vehicles are not able to move into the opposite lane to pass cyclists with comfort, then cycle lanes may be justified so that excessive lane widths are not provided, which would otherwise encourage higher speeds. Where there is more than one lane in either direction, some authorities have divided the carriageway into unequal lanes, giving more space on the nearside lane to assist cyclists.

Crossfalls

A standard crossfall of 2.5% is required generally but may be increased over short lengths, such as superelevation being applied on a tight bend.

Minimum Radius

The minimum desirable radius for a bend on a local cycle track is 15 metres. At junctions where turning speeds should be low, junction radii may be designed down to an Absolute Minimum radius of 4.0 m.

Gradients

Generally, cycle track gradients should not exceed 3% but a gradient of 5% is allowed over a maximum length of 100 metres and 7% over a maximum length of 30 metres. Gradients of 7% or more are not recommended except over very short lengths.

Table 7 *Dimensions for Cycle Routes*

Constraints at Boundary	Segregated			
	Footway/ Footpath	Cycle Track	Verge	Shared
Open Site or 0.5 m verges	1.2 m	1.5 m	-	2.5 m
Wall, bushes etc on kerbline	1.2 m	1.5 m	-	2.7 m
Carriageway on cycle track side	1.2 m	1.5 m	0.5 m	3.2 m

Road Crossings

Care must be taken where a cycle route crosses a road and that adequate visibility is provided, otherwise barriers or posts will be required to slow cyclists down. Where cycle routes cross pedestrian routes then it may be necessary to introduce some form of traffic calming, such as a footway rumble strip, on the cycle route itself to alert cyclists that pedestrians are likely to be crossing ahead.

Grade Separated Crossings

Grade separated crossings where facilities have been provided for the mobility handicapped will also be suitable for cyclists. However, where subways are concerned a clear headroom of 2.5 metres is required as a desirable minimum and on bridges a parapet height of 1.5 metres will be required.

Roundabouts

Care should be taken in the installation of roundabouts where there is a large number of cyclists using the junction as they often experience difficulty in using roundabouts. Further information and guidance on junction control may be obtained from the appropriate technical memoranda or advice may be given by the Local Roads Authority.

Traffic Calming

Where the use of the road by the cyclist is high, ie where a cycle route uses residential roads, or traffic calming has been added to an arterial road, then it may be appropriate to consider alterations which would assist the cyclist.

Click map to see regional variations

3.1.5 Servicing

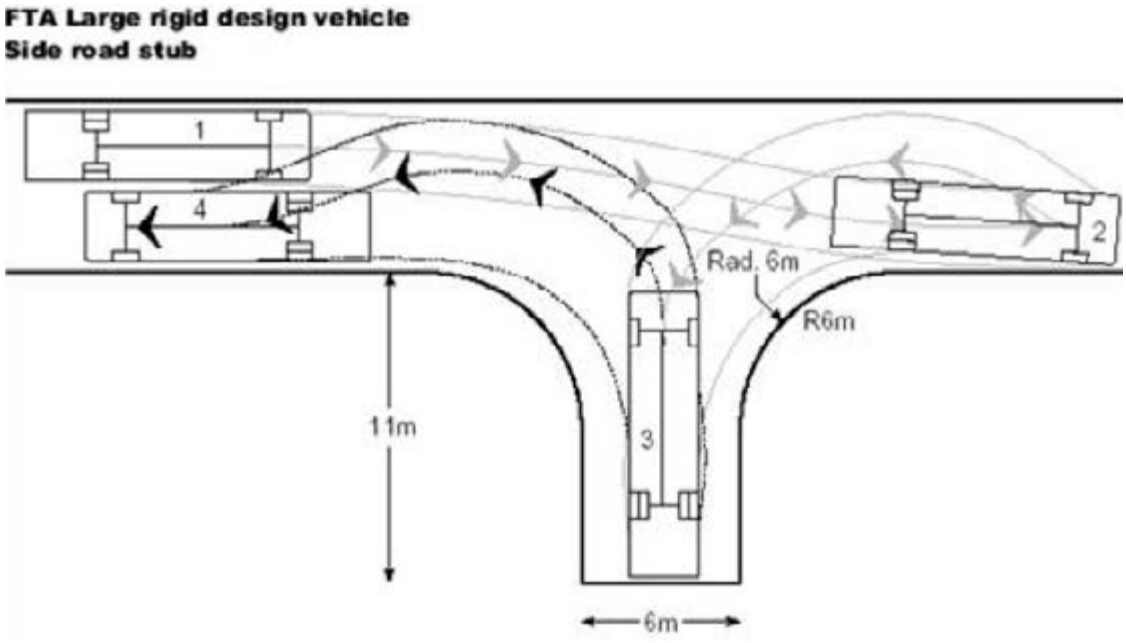
(a) Off Road Servicing

All development should be designed such that premises can be serviced from vehicles parked off the main carriageway without adversely affecting road safety. For residential and small commercial properties, servicing can generally be satisfactorily undertaken via access driveways but, for major commercial and industrial premises, a separate service area should be provided.

(b) Range of Servicing Provision

Service areas range from single bays to sophisticated structures incorporating loading bays and mechanical goods handling equipment. The size and layout of all service areas should be such that all vehicles can enter and leave in a forward gear and do not need to reverse on the public road. Developers will be required to prove through swept path analysis that all the necessary manoeuvres can be successfully completed (Figures 22).

Figure 22 *Refuse vehicle swept path envelope*



(c) FTA Guidance

Advice given in the Freight Transport Association's (FTA) guide '*Designing for Deliveries*' will assist in producing an internal layout suitable for the type of goods vehicle likely to be servicing the development.

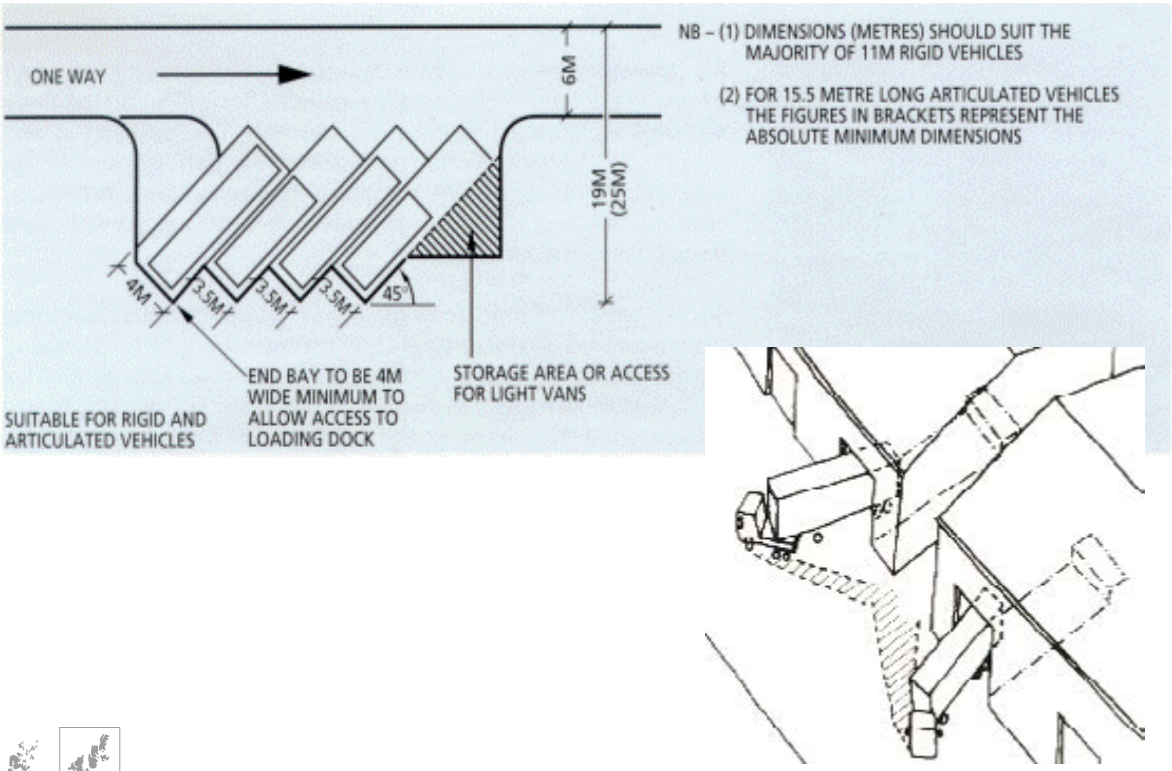
(d) Interpretation of FTA Guidance

The standards given in the FTA guide are representative of the standard driver in standard conditions and should not be compromised. Use of the recommendations will ensure that all drivers and vehicles can manoeuvre in the service yard within reasonable safety margins.

(e) Service Yard Design

Service Yards should be designed to allow access from the adjacent road without causing delay to through traffic, even if a vehicle is waiting to exit. Loading bays should be provided to allow goods vehicles to load and unload in a convenient and safe manner. Most of these loading bays will be arranged to allow access to the rear of the vehicle and consequently adequate space must be provided to allow the goods vehicles to turn and reverse into the loading bay. The total depth of the bays can be reduced where vehicles are parked at an angle with a saw-tooth loading deck but this arrangement is appropriate only when used with a one-way circulation system. Drivers should not incur blind spots when manoeuvring in the yard (Figure 23).

Figure 23 *Reversing blindspots*

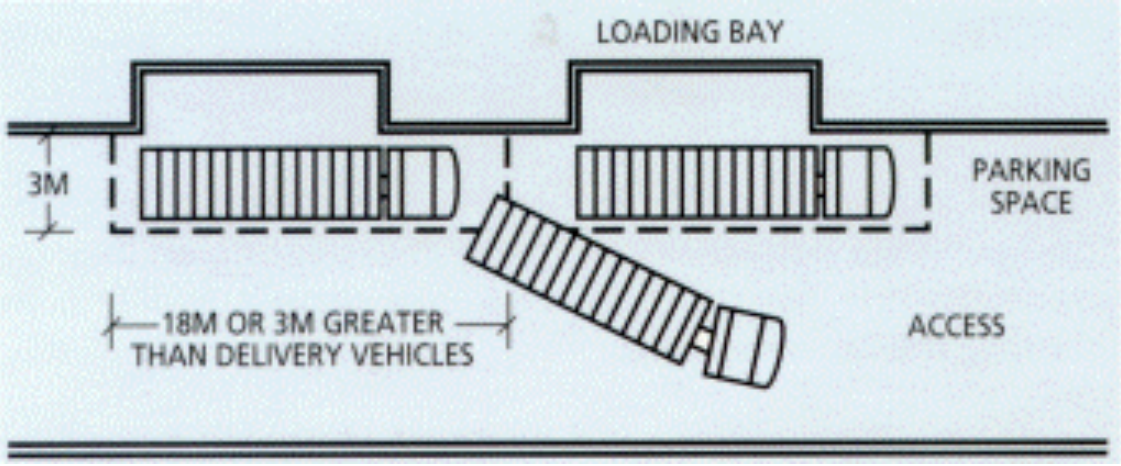


Click map to see regional variations

(f) Loading from Parallel Bays

Where vehicles are to be loaded or unloaded while parked parallel to the kerb in service roads, parking bays, 3 metres wide and at least 3 metres longer than the vehicles using them, should be clearly designated. The width of the service road should be increased accordingly. Bay widths should be increased where side loading of vehicles by fork lift trucks is contemplated to give a clear width of 3 metres between adjacent vehicles (Figure 24).

Figure 24



(g) Refuse Collection

Where Standard issue wheeled bins or sack collection are used, a designated collection area is required (ie nearest kerbside or other place agreed by the Council).

Where communal waste and recycling facilities are provided, the maximum distance from bin storage area to refuse vehicle should be no more than 10 metres and should incorporate a level hard surface and dropped kerbs where appropriate to aid correct manual handling techniques. There should be an available width of 1.5 metres and head room of 2 metres to enable bins to be manoeuvred safely.

The refuse collection vehicles are a maximum of 12 metres long and 2.54 metres wide (excluding mirrors). The working length of the vehicle should taking account of the size of the bin and space to allow operatives to stand clear of the bin whilst on the lifting equipment should be 16 metres (Figure 24).

Waste bin storage

Access roads should be built to withstand a gross vehicle weight of 32 tonnes with an axle loading weight of 11.5 tonnes. The turning circle requirement should be in the region of 24 metres or a suitable swept path hammer head detail. Refuse collection vehicles should not be expected to carry out a lengthy reverse manoeuvre if at all possible.

(h) Overnight Parking

Provision must be made in commercial and industrial developments for the overnight parking, off the public road, of all associated vehicles. Where large numbers of servicing movements are anticipated, consideration should be given to the provision of parking bays for vehicles awaiting access to loading bays. It is essential that these vehicles can park at locations which will not interfere with the safe manoeuvring of any other vehicles. The dimensions of the parking bays should be similar to those of the loading bays but reference should be made to *'Designing for Deliveries'* published by the FTA for layout details. Provision must also be made for car parking as detailed in *Chapter 7*.

3.1.6 Statutory Undertaker Services

(a) Consultation

The provision of statutory or other services laid underground constitutes a basic element of development design. It is essential that the Statutory Undertakers, who provide such services are consulted during preparation of design briefs, in order that their requirements can be co-ordinated in the design and a balance struck between their needs and other objectives. Refer to NJUG Publications.

Developers should be aware that the local Water Authorities have no statutory responsibility for the disposal of road surface water. Connection of road water into a surface water/combined sewer will only be allowed through agreement with Scottish Water. This must be considered up-front to confirm the proposed road drainage system and as part of the planning process.

(b) Services Located in Roads

In the interests of both the Statutory Undertakers and other providers such as district heating schemes, and their consumers, all mains and services serving more than one proprietor should be located in land which is both publicly maintained and readily accessible. It has been recognised that these criteria are best met by public roads and, as well as making provision for pedestrian and vehicular movement, it is therefore a function of most roads to provide routes for underground services.

Click map to see regional variations

The key driver should be that all services are provided such that they can be maintained without damaging or affecting the road design life. Ducting is considered an acceptable method of providing denser utility provision which permits upgrades without extensive road disruption.

(c) Services in the Carriageway

Regards sewers, early consultation should be made with the Local Water Authority regarding their provision, in accordance with the Sewerage (Scotland) Act 1968. Early consultation should include surface water sewers for the drainage of roofs and paved areas within the curtilage of premises, and the foul water drainage system. All services other than sewers, and occasionally water mains, should be grouped in 'service strips' located within the limits of the footways, verges and adoptable footpaths with a minimum of service connections across the carriageway.

Other utilities will not normally be placed under carriageways, with the exception of road crossings. This is due to the need to ensure that the road is not compromised as a result of inability to provide proper compaction, or due to collapsing ducting and the likes. Also, there is a need to ensure that the utility is not at risk of damage due to vehicle loading - either during the construction or operation of the road.

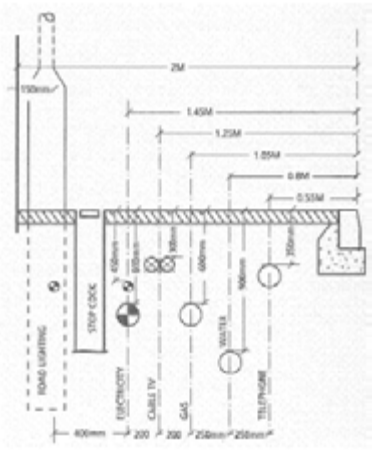
Where service crossings are required within carriageways, there should be a local deepening to provide 900mm cover from the finished road surface to the top of the service. Alternatively, protection (such as concrete surround or cover) can be applied, however it should be noted that this can give rise to future maintenance issues, and this should be agreed with the Statutory Undertaker at early stages. All services should be individually ducted at increased depths in accordance with the requirements of the Statutory Undertakers as directed by the Local Roads Authority.

Crossings of narrow residential roads should be located at passing places to minimise disruption to traffic flow during maintenance/repair works.

(d) Services in Service Strips

The width of a service strip will depend on the number and type of premises served. All domestic services (gas, electricity, lighting, water and telecoms) will normally be accommodated in a maximum 2 metres wide reservation and Figure 25 shows typical positions. This diagram is, however, only a guide and does not absolve the designer from negotiating with each Statutory Undertaker at the earliest possible stage. Special arrangements will require to be made where a footway is less than 2 metres wide and local widening in excess of 2 metres may be necessary to accommodate access chambers or where roads have tight bends.

Figure 25 *Services Under Footway*



(e) Services in Shared Surfaces

In shared surface layouts, all services should continue to be located in land eligible for adoption by the Local Roads Authority. Where the development calls for the use of a shared surface road construction, particular attention must be paid to the placement and provision of service strips. Where possible, service strips should be located outwith the running surface, and consideration should be made for their placement within a landscaped zone adjacent to property garden areas. If locating service strips within the running surface, care should be taken to ensure that it is situated within an area which is subject to less traffic where possible, eg to the side of the surface. Service strips should be maintained at a width of 1.8-2.0m, with an absolute minimum of 1.5m permissible for shorter lengths or to accommodate road geometry or restrictions.

In the event that the service strip must be located within the shared surface running area, early consultation with the utility providers is essential. A modified layout for the placement of services and/or a modified road construction detail may be required. Typically, the standard arrangement for the placement of services does not lend itself to situation where the service strip is located within a running surface zone of a shared surface; the typical depth of utilities is likely to result in the service being situated within the road construction layers. This gives rise to concerns over both the integrity of the road, and the protection of the service, with particular issues being raised surrounding the adequate compaction of construction layers immediately above the service.

Where a service strip must underlie a Shared Surface road, under no circumstances should any manhole be located within the 3.5 metres wide running width of the shared surface unless an alternative vehicular access is provided. Manholes should preferably not be located in the service strip but may be located within parking areas or widened areas within the total road width, by agreement with the Statutory Undertakers.

Engagement should be sought with the Statutory Undertaker and the Local Authority to determine whether the services should be installed at an increased depth, or whether a modified road construction detail is used.

Care should be taken when specifying the use of geogrid or geotextile in lieu of additional depth of construction material, as the maintenance and access arrangements for servicing utilities located beneath these elements must be taken into account.

Where service strips are under private control, they must continue to be maintained, and agreed maintenance methods determined. This may therefore require a wayleave agreement.

(f) Street Furniture and Lighting Columns

All street furniture should always be located within adopted or prospectively adoptable land and normally be located at the rear of footpaths/footways or recessed behind them and no furniture or structures should obstruct any road junction sight line. Conversely, no services other than road lighting cables should be located within 0.5 metre of the rear of the footway to allow for lighting columns and joint pillars or other street furniture. Guidance regarding the provision of road lighting is contained in section 3.4.11.

Click map to see regional variations



(g) Service Strip Remote from Carriageway

Where service strips are not located adjacent to carriageways their width must allow for access by mechanical plant and/or vehicles for maintenance or repair. In all cases there must be a permanent and continuous demarcation of the boundary between the service strip and any adjacent private property (eg by a fence, wall or concrete edge kerbing).

(h) Maintenance and Emergency Access

Ready access must be available at all times to all parts of service routes for maintenance and in cases of emergency. Lorry access will be needed to some places such as manholes, electricity sub-stations, telecom junction boxes and gas governor house installations; and the Statutory Undertakers requirements for such facilities should be ascertained at an early stage. They should be positioned so as to minimise disruptions to vehicle and pedestrian access when service maintenance is being carried out, whilst ensuring that access to services will not itself be obstructed by parked vehicles. Special consideration in this respect will be necessary where services run beneath or adjacent to single lane carriageways and parking bays.

(i) Hydrants

The position of all hydrants should be agreed with the Firemaster and Water Authority. Hydrants should not be located where vehicles are likely to park.

(j) Surface Finish of Service Strip

The surface finish of all service strips must form an integral part of the environment and be acceptable for general maintenance by the Local Roads Authority. Service strips should be protected when there are risks from damage from occasional overriding by vehicles.

(k) Planting and Service Strips

It is essential that any trees adjacent to service strips are located so that their roots will not damage services underground or be damaged themselves during the maintenance of such services.

Ducting services past tree roots can provide normally an acceptable compromise for all parties.

Advice should always be sought from the Statutory Undertakers when considering planting in the vicinity of services. Refer to NJUG Publications.

(l) Road Opening Consultations and Consents

The developer is responsible for contacting the Statutory Undertakers regarding the position of, and connection to, any existing underground plant. In all cases, the necessary Road Opening Permit under the Roads (Scotland) Act, 1984 or Permission in Writing under the New Roads and Street Works Act, 1991 must be obtained from the Road Authority before any excavation is undertaken in a public road.

3.1.7 Rural Areas

(a) Introduction

The main part of the Guidelines considers the urban situation and its immediate environs. However, areas of a rural nature should be considered differently.

(b) Hierarchy

Circumstances when rural standards may be applied should be discussed early in the planning stage and may include:

- *developments adjacent to and accessing directly onto an existing unrestricted road;*
- *developments which are likely to remain remote from existing settlements for the foreseeable future and require a new road that ultimately accesses to the existing unrestricted road network.*

Rural areas can be treated similar to the urban areas but the significant difference will be to ensure that adequate visibility is provided on roads which are subject to speed limits which are in excess of 30mph.

Required provision for public transport and footways should be referred to the local authority.

Click map to see regional variations

(c) Road Widths

Introduction

Consideration will also require to be given to road widths in a remote rural situation. The basic road widths for Residential Roads, within this document, are based on user defined swept path analysis and this remains the case. However, consideration must be given to the additional traffic flow which will be generated by the development on the existing surrounding road network.

Dwellings/Traffic Flow/Road Widths

The developer will have to demonstrate the level of the existing traffic flow and the likely peak generated flow created by the new development and depending upon the new total flow the following new road types and minimum widths are suggested as likely to be appropriate.

Adjacent future development identified through either Master planning or Local Development Plans need to be considered such that developments are adaptable to these future requirements.

Developing on Existing Roads

Where a development is proposed on a road which does not meet these criteria then the developer will be required to widen the road along the frontage of the development or the access road to the development to the appropriate width and provide new and/or passing places where required to mitigate the development traffic. Note this requires statutory consents such as a Section 56 Roads (Scotland) Act 1984.

Passing Places on Existing Roads

On an existing narrow rural road, passing places should be constructed to enable user defined traffic to pass. The design of such a passing place should consider functionality against a balanced view of placemaking aspirations and a presumption against urbanising the countryside.

All passing places should provide a minimum overall width of 5.5 metres. Locating passing places is dependent on gaining the maximum benefit balanced with planning legislation.

Where possible, it is advisable to have intervisible passing places, adjacent passing places should be placed on alternate sides of the road or on corners where maximum benefit is gained.

Locating passing places on bends on existing roads is advisable to assist vehicle conflict where reversing or anticipating and negotiating passing vehicles is more difficult.

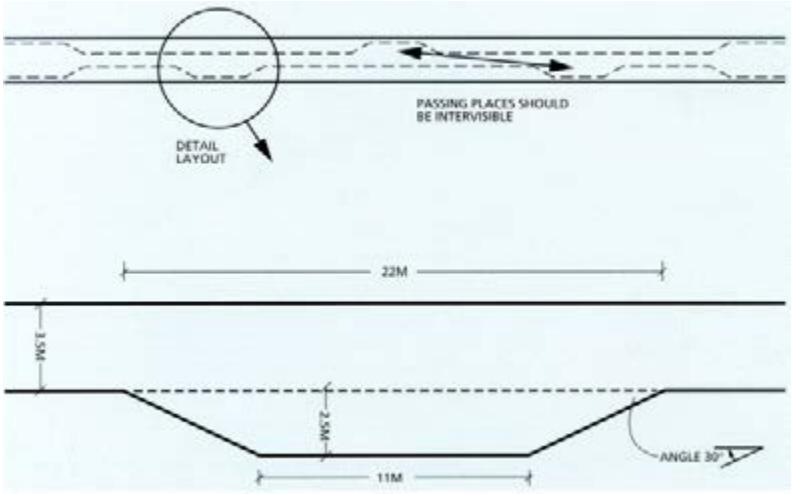
Advice on specific numbers and locations should be sought from the Local Authority in advance.

Click map to see regional variations

Passing Places on New Access Roads

All passing places on a new access road should be constructed to the dimensions given in Figure 26. All passing places should be intervisible. Adjacent passing places should be placed on alternate sides of the road. Advice on specific numbers and locations should be sought from the Local Authority in advance.

Figure 26
New Access Passing Places



Visibility Splay

Visibility splays are calculated in the same manner to the method used in the Urban area for the X distance, but the speed which the Y distance is based on will be higher. In certain circumstances, the design speed for the road will not be known and it may be necessary to measure the actual speed at which the traffic is travelling in order to calculate the Y distance.

Speed Visibility Relationship

Where the traffic speed can be measured, the 85%ile speed should be measured in wet weather and then this measured speed can be compared against the speed, or the next highest speed in Table 8, which then gives the Y distance. If there is not an opportunity to measure the speed then Table 9 should be used and the Y distance obtained from the appropriate speed limit.

Table 8 *Wet Weather - 85 Percentile Speed*

Major Road Speed (mph)	75	62	53	44	37.5	30
Y Distance (m)	295	215	160	120	60	43

Table 9 *Speed Limit*

Speed Limit (mph)	70	60	50	37	30
Y Distance (m)	295	215	160	59	43

Access Points

Where a development is proposed from a road with a high traffic flow which is not subject to a 30 mph speed limit, particularly in more rural areas, and the access is to be gated then the gate should be set back by at least 6 metres so that cars entering or leaving do not require to stand on the carriageway while the gates are opened and closed. All gates must open inwards towards the site. If the development is to cater for larger vehicles or is a field access when it will be necessary to set the gate back by a distance which will accommodate a turning manoeuvre appropriate for the vehicles which are likely to be using it. On roads with a low traffic flow this requirement may be waived at the discretion of the Local Roads Authority.

Consultation

Developers are advised to consult the Local Roads Authority at an early stage to determine the road requirements of the development.

3.1.8 Street Planting Considerations

This aspect should be considered in conjunction with any SUDS design.

(a) Visual Aspects of Housing Developments

It is important to the general appearance of a housing development that emphasis is placed on the careful design of gardens and public open spaces. Every attempt should be made to reduce the visual intrusion of roads in a housing environment by the judicious use of hard and soft landscape treatments while ensuring that security is not compromised.

Maintaining existing trees that are in good condition and of value is well understood to accentuate the value of a new development.

Reference to the Scottish Government's Green Infrastructure: Design and Placemaking.

Trees in Hard Landscapes: A Guide for Delivery

Trees in the Townscape: A Guide for Decision Makers

Click map to see regional variations

(b) Function of Planting

A clear planting concept is required which satisfies the relevant functional and aesthetic objectives and helps form a relationship between the road and the surrounding environment. For example, planting may be employed to provide:

- *absorption of pollution and carbon capture;*
- *screening;*
- *reduce impact of noise;*
- *direct pedestrians;*
- *create vistas or focal points;*
- *act as a barrier;*
- *create shade;*
- *provide seasonal colour.*

The style of planting should suit the context of the road; for example, an urban environment will often demand more formal, geometric planting design whereas in rural areas naturalist planting and informal treatments can be more appropriate. Simplicity is often the best approach; a correct choice can create maximum impact while minimising initial and maintenance costs.

(c) Maintenance Consideration

Landscape design should seek to provide an attractive environment. In a planted area to be offered for adoption, consideration must not only be given to the function but also to the maintenance requirements. Management and maintenance problems can be largely avoided by appropriate design and proper consideration from the initial stages of the design process. The role of the Local Authority with regard to maintenance of planting is discussed in section 2.3.

(d) Other Landscape Features

Other landscape elements such as lighting, signs, barriers, walls and bridges should be considered within the overall design of the scheme and seen as opportunities to give a sense of place. Colour, scale and style all require careful consideration to ensure that these elements reflect an appropriate character. Boundary treatments are especially important; appropriate wall and fencing techniques should be used to create enclosure and properly define land in private or public ownership.

3.1.9 Additional Considerations

(a) Traffic Management

The layout of a development may be influenced by existing or proposed traffic management measures and the Local Roads Authority should be consulted about these at an early stage. Where the Local Roads Authority decides that traffic management measures should be introduced to facilitate a particular development, the developer may be required to reimburse the Authority for expenses incurred in the promotion and implementation of these measures. Note, that due to the process, the successful promotion of a Traffic Regulation Order is not guaranteed.

(b) Traffic Noise

The developer should consult with the Local Planning Authority to determine their requirements for dealing with external noise. Traffic noise from the following sources should be taken into account:

(a) *existing roads;*

(b) *new roads being constructed as part of the proposed development;*

(c) *alterations to the road network to accommodate the proposed development;*

(d) *Road Authority's alterations to the road network for construction within a period of five years and/or included in the Structure Plan.*

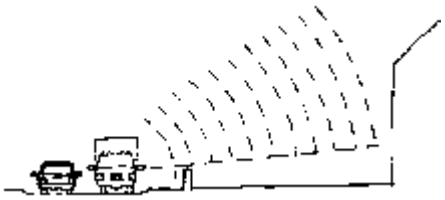


Figure 27 *Traffic Noise*

(c) Grit Bins

In all residential developments, and especially where pedestrian or vehicular routes have maximum permissible gradients, it will be necessary for the developer to provide either a widened portion of footway or an area of hardstanding to facilitate the placing of grit bins and to provide grit bins where required by the Local Roads Authority.

Click map to see regional variations

The provision and location of grit bins can be contrary to placemaking impacts and requires to be considered in context with function and place and should be considered as a part of the quality audit. Access for winter maintenance vehicles to maintain winter supplies must be considered in context also.

(d) Fire Fighting

Notwithstanding the recommended road widths in these guidelines, all roads should accommodate access and operation of fire tenders. The width of roads and reinforced emergency vehicle paths and their proximity to buildings is detailed in Part E of the Building Standards (Scotland) Regulations. This document specifies **a minimum width of 3.7 metres adjacent to low rise dwellings** to facilitate the use of pumping appliances (this width is increased to 4.5 metres to permit the use of heavy rescue and fire fighting equipment where buildings are 9 metres or more in height). **It should be noted that a basic vehicle path of 3.5 metres width (2.75 metres at pinch points) is appropriate for access but not operation of the fire tender.** Refer to Designing Streets.

3.2 Transport Assessment

A Transport Assessment (TA) will be required to be submitted to the Local Roads Authority (LRA) for all developments which have transportation implications. Developers must refer to the guidance contained within the current edition of the Scottish Government publication Transport Assessment Guidance. All developers must initially contact their Local Roads or Planning Authority to determine whether within any current local plan, the need for a Transport Assessment has been identified. The Transport Assessment Form in the Scottish Government publication Transport Assessment Guidance **must** be submitted to the Local Roads Authority for all developments regardless of size. If the thresholds in the Scottish Government publication Transport Assessment Guidance Table 3.1 are exceeded then a Transport Assessment must be submitted.

Following receipt of the Transport Assessment Form:

(a) *Where threshold levels are met or exceeded, the Local Roads Authority will determine the extent and scale of any Transport Statement/Transport Assessment required, the details of which must be agreed by submission of a Scoping letter by the developer to the Local Roads Authority.*

(b) *Where threshold levels are not met, a Transport Statement/Transport Assessment may still be required by the Local Roads Authority depending on the traffic sensitivity and transport implications of the development site.*

Further information can be obtained by reference to the Scottish Government website using this link.

A TA should examine the potential impact of a development on the surrounding transport network. This includes all transport modes such as walking, cycling, public transport and the private car. It should demonstrate that the site is a sustainable site in terms of transport usage and that private car usage can be minimised. A TA should include the following:

- *a description of the proposed development, including plans showing the site location and site layout;*
- *a description of the current and existing transport network in the area that should include current footways and cycle routes (both off-road and on road);*
- *a description of the current public transport provision in the area. Current guidance states that the development should be no more than 400 m (a 5 minute walk away) from a bus stop. It is important that the most accurate information is provided and public transport information can be found on the Council's Public Transport bus timetable web pages;*
- *a forecast of the likely vehicle trip generation figures for the year of opening of the proposed development. This is normally provided by using the industry standard* **TRICS** *trip generation database. It is imperative that the current version is used and that all outputs are included as an appendix in the final report and all assumptions made are clearly stated in the report.*

Committed development in the vicinity of the development should be included within the report.

Full traffic counts and junction analysis for all junctions 'in scope' of the development. Junctions in scope are usually those within the vicinity of the proposed development or those which will be impacted by traffic travelling to and from the proposed development. Junction analysis can be carried out by using several industry standard packages such as **ARCADY, OSCADY and PICCADY**.

A Travel Plan (or Travel Plan Framework) showing what measures will be taken to reduce the dependence on the private car for trips made to and from the development.

The first step would be to appoint a firm of transport consultants to carry out the assessment. Most transport planning consultancies are able to fulfil this task and applicants should therefore obtain a number of quotations before deciding on which firm should undertake the work. The consultants should produce a 'scoping report' stating the methodology that they propose to adopt in carrying out the full assessment. This must be agreed by the Council before they can proceed to undertaking the full report. It is strongly recommended that the consultants actively engage in discussions with Council officers at the outset to agree the parameters for the study.

A full study should then be prepared and this should be agreed with the Council. The final report should be submitted as part of the planning application in order for the application to be determined fully by planning officers of the Council.

References

- *Transport Assessment Guidance 2012*
- *Scottish Planning Policy (SPP) 2014*
- *Planning Advice Note PAN 75 (Planning for transport)*

Click map to see regional variations

3.3 Quality Audit
Auditing Quality Using Designing Streets

Designing Streets is a policy document that contains guidance on getting street design right - so it should be the central reference when checking the quality of proposals for new streets within all urban and rural boundaries in Scotland. Checking quality should be a clear consistent method to reach collaborative agreement on how a proposal complies with Designing Streets. This page(s) and the associated Quality Audit Summary Report explain what should be done and how

Why?

Quality Auditing (QA), as noted on page 58 of Designing Streets, can simply be a sequence of checks to inform the design process and provide opportunities for developers to explain their reasoning. Any process that notes observations and records the decision-making process should help to deliver and maintain high quality places, for the benefit of all end users. QA joins-up assessment so one aspect of design doesn't dominate. A barrier to previous QA approaches has been a perceived duplication of work, so this method uses to the key considerations of Designing Streets, as used also in SCOTS guidance to avoid repetition. It should assist in a streamlined process of aligned consents:

Previous approach with multiple audits	v	New approach to auditing quality based on Designing Streets 🔗 Building Blocks	
Non-motorised User/Walking Audit and Cycle Audit/Review Accessibility and Equality Audit	v	*A Single Quality Audit Against Designing Streets*	Pedestrians and Cyclists
Functionality Audit	v		Block structure, public transport, junction types and arrangements, service and emergency vehicles, connections within a place
Visual Quality & Amenity Audit, Street Lighting Audit, Street Character Review	v		Context and Character, streets for people, reducing clutter
Parking Review	v		Integrated parking
Drainage Report	v		Drainage, utilities
Maintenance Audit	v		Materials, planting
Road Safety Audit	v		Achieving appropriate traffic speed
Traffic Generation Report Community Use Audit	v		Connections to wider networks, walkable neighbourhoods, orientation

10+ audits	**v**	**1 unifying audit**
Which audit gets priority?	**v**	**A balanced approach**
Duplication and overlap	**v**	**DS broken down to building blocks or design aspects**
Planning/roads assessed separately	**v**	**Planning/roads (layout) assessed in parallel**
Overall 'place' gets missed	**v**	**Streets contribute to places**

Who?

Engineers make individual value judgements on appearance, functionality and safety. But, when quality checks are done collaboratively by a professional team, balanced decisions are verified. This QA process encourages the team to engage as positive 'placemakers', to become adept at contributing creatively to places, and not be restricted to applying one particular infrastructure standard. The QA should be produced by the developer's team and openly discussed with local authority officers during pre-application discussions. At key stages the planning case officer and local authority officers responsible for Roads Construction Consent (RCC) should keep a summary on file, have access to an audit trail and any subsequent adoption agreement.

Click map to see regional variations

When?

Reviewing proposals to ensure that broad objectives are achieved cannot be solely undertaken at the finished scheme stage so QA should be an iterative part of the design, construction and stewardship process, particularly beneficial in the following circumstances:

- *option testing stage;*
- *pre-application stage, then updated for planning and RCC applications;*
- *where strong tensions exist between different objectives;*
- *for schemes within existing streets, providing an opportunity for decision-makers to make a balanced assessment before approving a particular improvement solution; or,*
- *to explain thinking on street design aspects such as accessibility that can feed into a Design Statement, or Design and Access Statement, if one is required.*

A summary report could be updated a few times but should at least be submitted along with a RCC application that should align with the planning application. The same information will sum up the layout of roads/streets and public spaces.

How?

1 Briefing

The project brief setting out the vision of development is possibly the most important reference for any project so QA begins by checking against design objectives set at this early stage. All project briefs for works that impact on the design of street should define clear objectives related to the *6 Qualities of Successful Places* as defined in Scottish Planning Policy (SPP).

2 Design Stages

As a project's design evolves, assessing the quality of street design depends on breaking the 6 qualities down into **Designing Streets** *18 'key considerations' or aspects of design*:

Block structure	**Pedestrians and cyclists**	**Connections within a place**	**Walkable neighbourhoods**	**Connections to wider networks**	**Orientation**
Context and character	**Achieving appropriate traffic speed**	**Public transport**	**Streets for people**	**Integrated parking**	**Drainage**
	Reducing clutter	**Junction types and arrangements**		**Service & emergency vehicles**	**Utilities**
					Planting
					Materials

Considering all aspects together puts *place before movement*, with streets designed to facilitate quality of life rather than only be only transport corridors.

The following steps describe how to complete the **Quality Audit Summary Report** template that follows, designed to concisely record a snapshot:

Step A *Reference the brief and an annotated plan, a 'B-Plan' colour-coded analysis (see page 21 of* **Designing Streets** *) to help identify and precisely locate specific design issues that the QA deals with.*

Step B *Summarise and record an assessment of each aspect of design (ordered in the hierarchy of street structure, street layout and street detail) to form a decision-making trail.*

Step C *Summarise or link to additional audits (that form part of an overall balanced view, with no superior status) such as:*

***A Road Safety Audit**, if required, to build on achieving appropriate traffic speed. Agree the scope at the initial stages, identify potential safety problems and assess possible actions to reduce risk. Included summaries of balanced decisions to mitigate residual conflicts (ref:* **HD 19/15** *).*

***A Transport Assessment**, if required, will appraise the operational implications of development then look at mitigations such as physical changes to existing connected networks, or travel plans (ref:* **Transport Assessment Guidance** *).*

***An Equalities Audit**, with due regard to the* **Equalities Act 2010** *, will appraise desire lines together with material colours adopted in the design.*

Other Audits, depending on the scale and nature of a project, considered in more depth, for example: security or lighting of public spaces. Some aspects such as drainage or materials specification may be agreed in principal at planning then supplemented later. Any specific report that significantly affects overall quality, can be linked or appended.

Step D *End with a judgement, reached via multidisciplinary collaboration (on the overall quality of street design). This judgement should be supported with a risk assessment (severity/likelihood of occurring) appended (see* **HSE Risk Assessment** *) which addresses all the audit/report findings into a final balanced conclusion report.*

3 Construction

As completion nears a QA review should ensure recommendations have been taken on-board and objectives delivered. Consideration of the findings of a post-completion RSA (stage 3), if applicable, can be taken into account.

4 Maintenance and Monitoring

During the maintenance period a review should establish if the objectives and any expected changes in road user behaviour have been achieved. This could include the conclusions of a stage 4 RSA.

Click map to see regional variations

5 Quality Audit Summary Report

This QA report template should be used to summarise the process undergone as part of the design and implementation of a new road or street project.

It should demonstrate what consideration has been given to all the key areas outlined in Designing Streets and should provide an audit trail of the decision making process where a compromise or departure from normal standards has been opted for.

Quality Audit Summary Report Template

3.4 Construction Design

3.4.1 Geotechnical Considerations

(a) Introduction

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

The Interpretative Report which must be submitted with the application for Construction Consent will be examined against the engineering drawings submitted and the supporting factual information.

(b) Supporting Technical Documentation

All ground investigation reports should comply with BS 5930: 1999 Code of Practice for Site Investigation. The Factual Ground Investigation Report should include the following minimum information:

(a) *exploratory hole logs to BS 5930: 1999;*

(b) *laboratory test data to BS 5930: 1999 and BS 1377: 1990 relevant to the proposed form of road construction;*

(c) *a location plan of the site at 1/2500 scale with the proposed road superimposed;*

(d) *a plan at 1/500 scale showing the co-ordinated location of all exploratory holes and the proposed road.*

The spacing between and the nature of the depth of exploratory holes is dependent upon the ground conditions and nature of development (Figure 28). Typically, exploratory holes should be sunk at a maximum spacing of 25 metres offset from the centreline of the proposed road where necessary to ensure sufficient transverse coverage along the site. Where changing conditions demand clarification closer spacing may be necessary.

Where it is proposed to locate a road over land previously used for industrial purposes or waste disposal, it is essential that chemical analysis and gas monitoring information is submitted in addition to standard laboratory testing to BS 5930: 1999 and BS 1377: 1990.

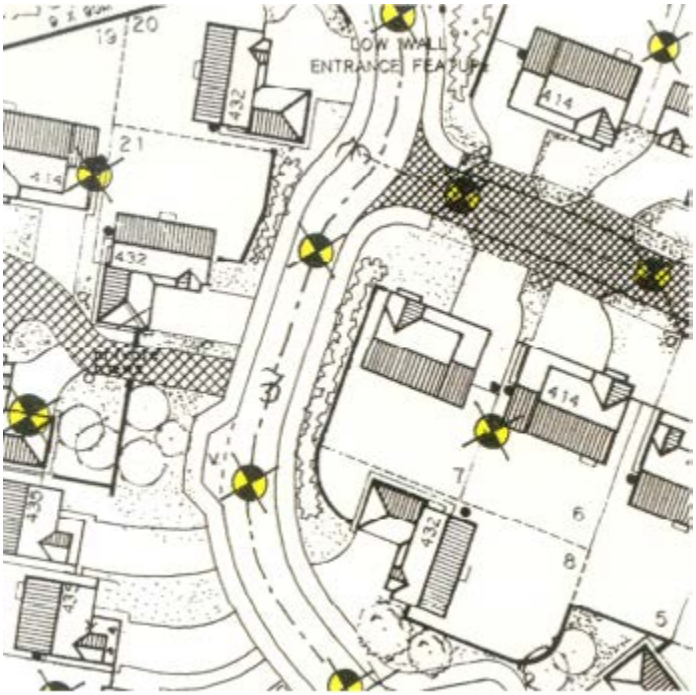


Figure 28
Exploratory Borehole Survey

(c) Interpretative Report

The Interpretative Report must include a Mineral Report specifically dealing with the implication for the proposed road construction.

(d) Brownfield Sites

Where a site has formerly been developed it will likely be covered in fill material, ie a brownfield site. The nature, depth and extent of this material should be defined. The possibility of the ground being contaminated must be considered. The Interpretative Report should assess any contamination and its implications for both road construction and maintenance of the completed road and its drainage system.

Click map to see regional variations

(e) Peat

Where a proposed development road is to be constructed over peat or buried peat, it will be necessary to excavate and replace the peat in virtually all cases.

(f) Geotextiles/Polymer Grids

Geotextiles or polymer geogrids may be used as a construction expedient to assist construction; however they cannot prevent consolidation settlement or secondary compression in soft compressible soils.

Geotextiles or polymer geogrids may not be used as a substitute for a capping layer or as a means of reducing sub-base thickness in normal road construction. They may be used in addition to a capping layer or normal pavement construction to resolve a particular problem. The decision to use geotextiles or polymer geogrids must consider the need for long-term integrity, damage from road openings and the practicality of effective repairs to the geotextile/geogrid. Developer to provide a manufacturer quality check of geotextiles/ polymer grid.

(g) CBR

The CBR value of the soil shall be determined by the laboratory CBR test in accordance with BS 1377: Part 4: 1990 and test data shall be incorporated in the Factual Ground Investigation Report.

3.4.2 Specifications

The specification for the construction of road pavements and associated structures is detailed in the following link: DMRB HD 26/06. Clause and Appendix numbers in the following text refer to that specification.

3.4.3 Subgrade Drainage

In addition to the requirement for surface water drainage, it is important to provide efficient permanent drainage of the subgrade and any other permeable layers of the Road.

Where Roads have no frontage development, subgrade drainage will be effected as follows:

(a) *In cuttings, filter drains which will be required to cater for surface water run off from slopes will also provide a sub grade drainage function by being located deep enough to prevent the water table from rising to within 0.6 metre of the formation level.*

(b) *In embankments, capping layers and/or sub-base layers must be extended periodically to the face of the embankment to effect drainage of these layers.*

Where roads do have frontage development and adjacent ground levels do not involve embankments or cuttings, it is unlikely that specific measure will be required to effect drainage

of the permeable layer unless the site investigation indicated that either the water table is likely to rise to within 0.6 metres of formation level or that the material below formation level is highly impermeable.

In either of these cases, sub-grade drainage can be effected by ensuring that backfill material to gully connections is permeable and that water which will accumulate in this backfill is provided with an outlet which, while allowing water to permeate into manholes, ensures that bedding and backfill materials of the drain are retained.

3.4.4 Carriageway Construction

(a) Pavements

Carriageway Pavement design should be in accordance with Section 2: Volume 7 of the DMRB HD 26/06. This requires details of the ground bearing capacity and the traffic type and volumes to be identified to arrive at a suitable load spreading pavement. A composite construction may be acceptable providing agreement with the road authority is sought in advance.

BS 7533 for block paving and the additional qualifications and exceptions listed here.

Capping Layer

Where the CBR value is less or equal to 5%, a capping layer is required as per Figure 29.

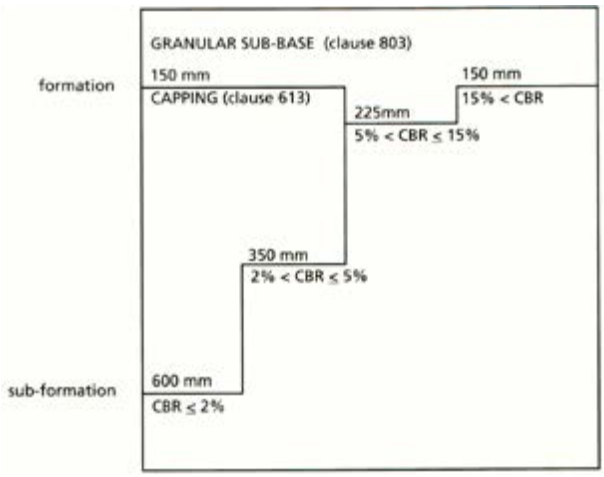


Figure 29 *Capping Layer Requirements: subject to frost susceptibility*

NB: The design California Bearing Ratio (CBR) should be obtained either by testing or by measurement of the plasticity index of the subgrade material. In the case of CBR testing, the method described in the laboratory test in accordance with BS 1377-4:1990, clause 7 should be used and 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 to or better than the specified capping material, a full capping layer is required.

Frost Susceptibility

It is possible for roads designed to have a total bituminous thickness of 170 mm and, with a CBR value < or + to 2%, a 150 mm sub-base and 600 capping layer. In such circumstances

Click map to see regional variations

the upper 130 mm of the capping layer should be non frost-susceptible. In practical terms this effectively means that the sub-base becomes 280 mm with a capping layer of 470 mm. For a 2%<CBR<or+5% where the total bituminous thickness and sub-base thickness together are less than 450 mm the same principle applies (ie the sub-base is increased to achieve 450 mm of non frost susceptible material and the capping layer can be correspondingly reduced). This need not be done if the capping layer is non frost-susceptible.

Increased Capping Layer Thickness

Although Table 10.1 gives various thicknesses of capping layer dependent upon CBR, where CBR is significantly below 2%, these thicknesses may require to be increased dependent upon site and weather conditions prevailing at the time of construction. This requirement will be accompanied by an additional CC8 Engineers report to certify the design. Additional material may require to be removed and replaced by more suitable material. Although the new material may be of good quality, the subgrade shall be assumed to be equivalent to one of a CBR just under 2% and requiring 600 mm of capping layer. The developer should consult the Local Roads Authority for advice in these circumstances.

Formation on Rock

Where the formation is on rock, the granular sub-base will act as a 150 mm depth regulating layer.

Carriageway Construction

Where suitable technical facilities exist it is recommended that the specific circumstances of each site are catered for by designing the road in accordance with the criteria stipulated above, subject to a minimum construction as required to carry 0.5 Million Standard Axles (MSA), for all roads. In this circumstance it will be necessary to complete and return form CC8 'Carriageway Design Certificate' (see Appendices).

(b) The Use of Secondary or Recycled Materials

The use of recycled materials in carriageway and footway construction will comply with HD 35/04 Part 2: Section 1; Volume 7 of the DMRB. Developer to provide test certificates and details of source of supply for secondary or recycled materials.

Based upon the Specification for Highway Works (SHW) [MCHW Volume 1] and HD 35/04 Part 2: Section 1; Volume 7 of the DMRB and advice from WRAP reclaimed asphalt can be used in:

- *Bitumen bound materials - base, binder and surface courses (up to 10% by mass reclaimed asphalt may be used in surface courses and up to 50% in all other layers). Asphalt can be recycled back into hot asphalt, a process which gains the benefit from the original bitumen and high quality aggregate; or into cold lay foamed bitumen, which is growing in popularity.*

- *Concrete - can contain up to 5% asphalt as a foreign material, but reclaimed asphalt is generally not viewed as a concreting aggregate.*
- *Pipe bedding - Recycled asphalt should not be used in pipe bedding or drainage applications.*
- *Hydraulically bound mixtures (HBM) for sub-base and base - up to 100% reclaimed asphalt.*
- *Unbound mixtures for sub-base - Series 800 permits up to 50% reclaimed asphalt in types 1 and 2 and 100% in type 4.*
- *Capping - 100% reclaimed asphalt can be used in this layer.*
- *Embankments and Fill - where permitted, up to 100% reclaimed asphalt may be used. Reclaimed asphalt is not permitted as backfill to structures.*

Asphalt containing tar or tar bitumen is generally not appropriate for recycling WRAP.

(c) Two Stage Construction

Where, owing to the continued use of the road by construction traffic, it is necessary (in order to avoid damage to the surface course) to adopt a two stage construction. The pavement design is required to confirm the load spread pavement capacity over the period of the construction such that the foundation and base is not overstressed, thereby ensuring the initial whole life design period.

Stage One

The first stage for both bituminous and block paved road, shall be the top of the specified bituminous base. Consideration should be given to the temporary drainage of the first stage, to minimise ponding caused by the projection of gully gratings, above the temporary surface, either by adjustment of gully frames or other approved method. This applies particularly in large projects where the construction period may be long and the surfacing course not laid before a winter work period. Any settlement which may occur in the base of bituminous roads shall be made up with regulating course before the laying of the surfacing course, and early reinstatement of openings or failed areas is essential.

Stage Two

Before the binder and surface course - where it is bituminous - is laid, the top surface of the base must be well cleaned and a tack coat applied at the rate of 0.6 litres per square metre. In the case of block paved roads the bituminous base material must be adequately maintained during the first stage and any openings or failed areas reinstated as soon as possible to ensure that the bedding layer thickness is regular and within tolerance.

Design Depth Minimum Requirements

The following criteria, which must be used in designs for specific circumstances:

(i) *design life - 40 years;*

(ii) *traffic growth rate - 4%.*

Click map to see regional variations

Based on the above, the construction specified caters for the following traffic:

- *Main Road or Industrial Access Road - up to 75 commercial vehicles per day on day of opening.*
- *Residential Main Road - up to 40 commercial vehicles per day on day of opening.*
- *Housing Road and Pedestrian/Vehicular shared surfaces or Minor Commercial Access - up to 15 commercial vehicles per day on day of opening.*

In specific circumstances which would permit future overlay in order to extend the pavement life to 40 years (eg where there is no frontage development and the number of commercial vehicles exceeds 100 per day), the design life can be restricted to 20 years, with the agreement of the Local Roads Authority.

(d) Clay, Natural Stone or Block Paving Pavements

All pavements being constructed with Clay, natural stone or Block Paving will be in compliance with BS 7533.

Light colours of blockwork are not appropriate where there is a risk of staining from diesel or oil spillage.

3.4.5 Street Transitions Methods

Direct reference to be made to 'Streets for People' section of Designing Streets and TRL 661.

Vertical Displacements

Definition

A vertical displacement may be defined as a vertical change to the carriageway which, in residential areas, takes the form of a flat top platform or transition to a shared surface.

Dimensions

Flat top platforms at Raised Junctions in new developments should have a 2.5 metres ramp length and should extend across the whole junction.

Figure 30 details vertical displacement construction. Surface material for Raised Junctions may be asphalt, blockwork or preformed elements laid in accordance with Figure 30 on page 122.

Road Markings

All vertical measures should be highlighted to identify their presence which can be achieved by a change in colour or texture. Where the Local Roads Authority has advised that a 20 mph zone will not be introduced then vertical measures require to be marked in accordance with The Traffic Signs Regulations and General Directions 2002 (and as amended).

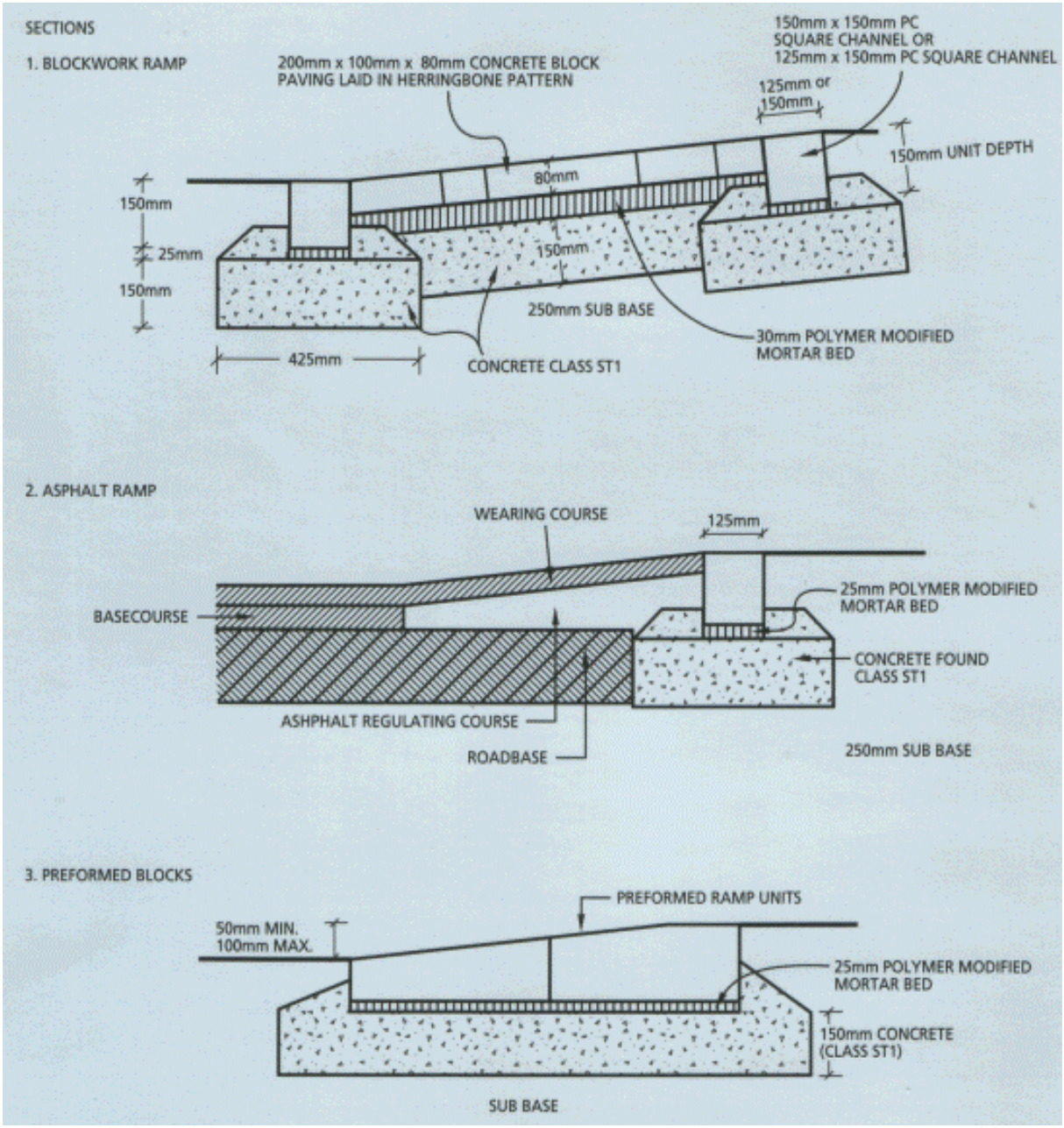


Figure 30 *Vertical Displacement Ramp*

Click map to see regional variations

3.4.6 Footway, Footpath and Cycle Track Construction

Construction Material

Footways, footpaths and cycle tracks pavement design should be in accordance with Section 2: Volume 7 of the DMRB unless an alternative design is agreed with the Local Roads Authority

3.4.7 Kerbs and Edging

(a) Materials/Construction

All carriageways, footways and footpaths should be provided with precast concrete kerb or edging. Alternatively and with the agreement of the Local Roads Authority natural stone kerbs may be acceptable.

On conventional roads, kerbs should be set 125 mm above finished carriageway channel level, except at pedestrian and vehicular crossings where this dimension is reduce, pedestrian crossings range from 0 mm to 10 mm and vehicle access range from 25 to 40 mm. Edging at the heel of footways and footpaths should be set flush with the walking surface.

On shared surfaces an upstand of 40 mm should normally be provided except at junctions with footpaths and private accesses where kerbs should be flush with the walking surface. Approval for any departure from, or clarification of, these standard details should be sought from the Local Roads Authority prior to construction commencing.

(b) Remote Areas

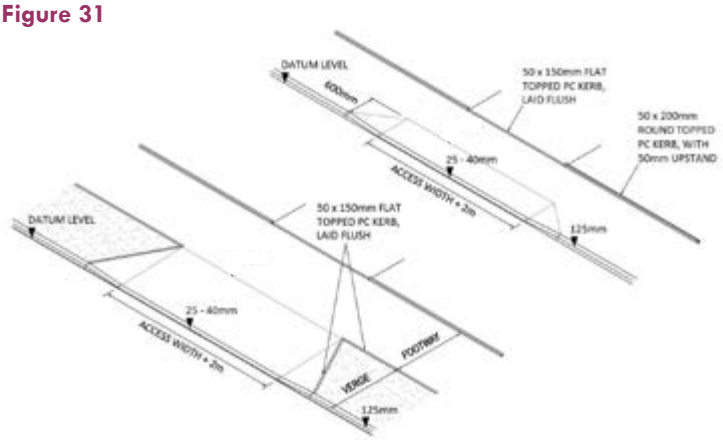
In remote areas, and with the agreement of the Local Roads Authority, cycleways may be constructed without kerb edgings, where the sub-base is laid 500 mm wider than the surfacing to provide shoulders.

3.4.8 Accesses

(a) Driveways

Vehicular access crossings of the footway for individual dwellings should comply with Figure 31 and be constructed to the footway specification. Maintenance difficulties preclude the use of slab footway construction for vehicle access crossings. Pre-cast concrete is more durable.

Figure 31



(b) Other Access Details

Where vehicular access, other than to individual dwellings, is taken over a footway, a crossing, as detailed in section 3.1.2 should be constructed. If the crossing is being built in isolation from other roadworks it is recommended that the specification be agreed with the Local Roads Authority. Rigid construction may be acceptable but reinforcement may be required where the use of heavy vehicles is expected.

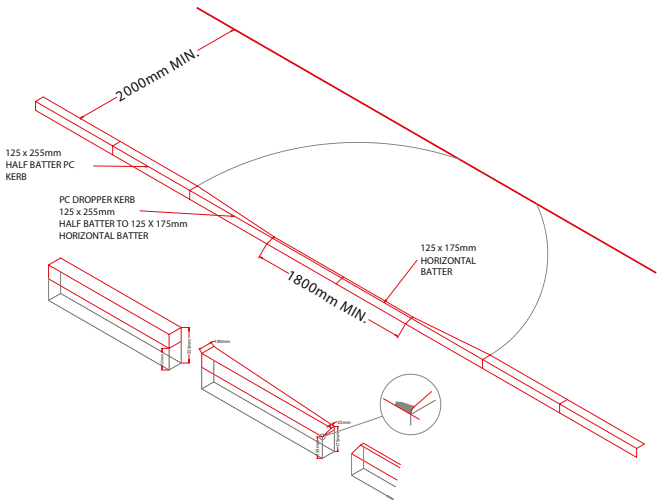
(c) Pedestrian Access/Crossings

Reference should be made to Designing Streets: Street Structure where crossing locations are discussed.

Click map to see regional variations

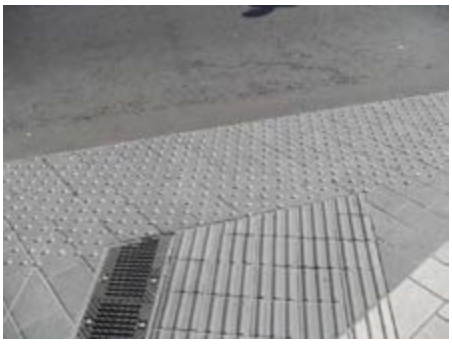
Figure 32 details the requirement for dropped kerbs where pedestrian routes cross the carriageway from adjacent footways, eg at T-junctions and pelican crossings. Pedestrian crossings of a carriageway with an adjacent grass verge should comply with Figure 31 except that the dropped kerb should be set flush, or not more than 6mm upstand, with the carriageway and extend for a minimum length of 1.8 metres.

Figure 32 *Dropped Kerb Detail at Designated Pedestrian Crossing*



Tactile Paving Surfaces

Reference to Department for Transports publication Guidance on the Use of Tactile Paving Surfaces should be sought for formal crossing points however this must be read with further advice from Designing Streets regards some layouts.



3.4.9 Road Drainage and SUDS

(a) Specification Best Management Practices

The specification for the construction of road drainage shall be the Specification for Highway Works (SHW). Volume 1 of the Manual of Contract Documents for Highway Works. In addition, road drainage should meet with the requirements of Scottish Water and the Scottish Environmental Protection Agency (SEPA).

Design

Road drainage design should be in accordance with the current edition of Sewers for Scotland as regards hydraulic design subject to the qualification that the minimum pipe diameter permitted will be 150mm and the Design Manual for Roads and Bridges as regards pipe strength and bedding for main road loading for pipes in or adjacent to carriageways. Land drainage or other appropriate measures must be taken to prevent water flowing on to the road from adjacent properties.

The road drainage must take full account of sustainable urban drainage systems and use 'Best Management Practice' structures and techniques in dealing with discharges to existing watercourses or public sewers.

Sustainable Urban Drainage Systems

Advice on the design concepts are contained in SUDS for Roads, Ciria C753 The SUDS Manual and Ciria C635. The final design of the drainage system must be to the satisfaction and meet the requirements of the local Roads Authority, the appropriate Water Authority and Scottish Environmental Protection Agency (SEPA).

(b) Gully Spacing

Table 10 details the acceptable channel distance between gullies for a road comprising carriageway with two number 2 metres wide footways, based on criteria adapted from TRRL Report LR 277. (Table 10 is based on rainfall intensity of 50mm/hour and width of channel flow of 600mm). The spacing may require to be altered according to the road layout (eg at junctions) and special measures will be required where the grade is necessarily flatter than 0.8 per cent (sags, crests, etc). Advice on these matters should be sought from the Local Roads Authority who should be consulted at an early stage by an developer wishing to carry out a full drainage design. Irrespective of design spacing's, a gully should be positioned:

Click map to see regional variations

(a) *just upstream of the tangent point at road junctions;*

(b) *short of the point where adverse camber is removed when applying super-elevation;*

(c) *at any local low point;*

(d) *at speed control measures, where necessary.*

They should not be positioned:

(a) *at pedestrian crossing points,*

(b) *at driveways;*

(c) *at extended channel line of parallel lay-by parking;*

(d) *at channel line at bus bays.*

Table 10 *Gully Spacing for Carriageways*

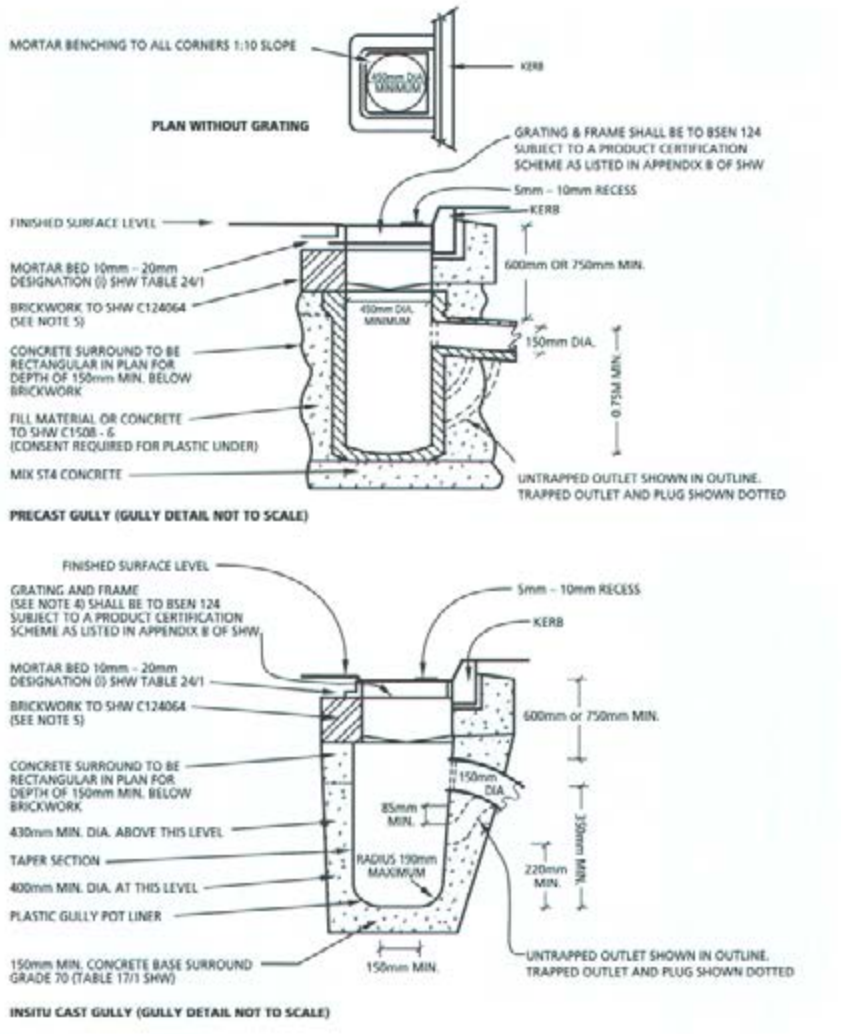
Gradient:		Flatter than	1/150*	1/100	1/80	1/60	1/40	1/30	1/20
		1/150 (0.66%)*	0.66%	1.00%	1.25%	1.66%	2.50%	3.33%	5.00%
Cross Section	**C/Way Width**		**Gully Spacing (metres)**						
1 in 40	5.5m	20	30	35	40	45	55	60	75
(2.5%)	6.0m	20	25	30	35	40	50	60	70
Camber	7.3m	15	20	25	30	35	40	45	55
1 in 40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

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

(c) Irregular Areas

For large, irregularly shaped areas the empirically derived formula of one gully for each 100 square metres of catchment may be used. Additional gullies will be required where gradients are steeper than 1/20 or flatter than 1/150 and where surface water draining from adjacent areas may be anticipated.

Figure 33 *Road Gullies*

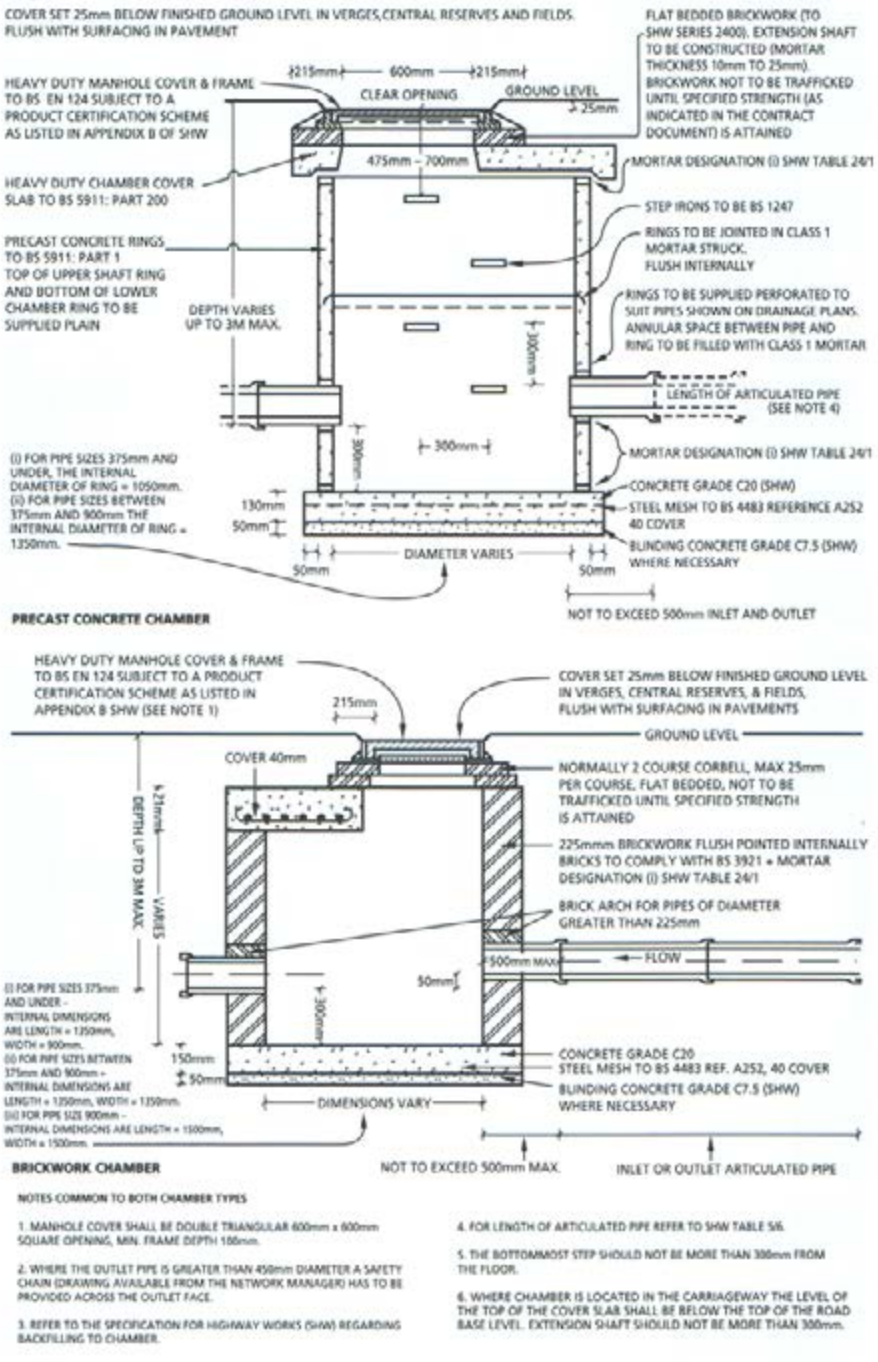


NOTES

1. THE MINIMUM DEPTH FROM THE TOP OF THE GRATING TO THE TOP OF THE GULLY OUTLET IS TO BE 750mm WHEN THE CONNECTING PIPE IS UNDER A CARRIAGEWAY OR A HARD SHOULDER AND 600mm ELSEWHERE.
2. PRECAST CONCRETE GULLIES SHALL BE TO BS 5911: PART 2.
3. WHEN AN INSITU CAST GULLY HAS A TRAP, THE STOPPERS SHALL COMPLY WITH REQUIREMENTS OF BS 5911: PART 2.
4. THE GULLY GRATING NORMALLY SHALL BE D400 OR C250 TYPE AS APPROPRIATE WITH MINIMUM FRAME DEPTH OF 100mm OR B125 FOR NON-CONTIGUOUS PARKS.
5. BRICKWORK SHALL BE FLAT BEDDED (MORTAR THICKNESS 10mm to 25mm) AND NOT TO BE TRAFFICKED UNTIL SPECIFIED STRENGTH (AS INDICATED IN THE CONTRACT DOCUMENT) IS ATTAINED.
6. THE BACK FACE OF THE GULLY POT SHALL BE IN A VERTICAL LINE WITH THE FRONT FACE OF THE KERB AND THIS WILL PRECLUDE CORBELLED BRICKWORK.
7. CORBELLING TO BRICKWORK IF NECESSARY, 25mm MAXIMUM.
8. LEVELLING BRICKWORK DEPTH SHALL BE A MULTIPLE OF 75mm.
9. WHERE INSITU CONCRETE GULLIES ARE FORMED WITH PERMANENT SHUTTERING SUCH SHUTTERING SHALL HAVE A CURRENT BRITISH BOARD OF AGREEMENT ROADS AND BRIDGES CERTIFICATE.
10. WHERE BOTH NON ROCK AND CAPTIVE HINGE GRATING IS REQUIRED, THEN TYPE D400 SINGLE PIECE, HINGED, NON ROCK WATERSHED OR SIMILAR APPROVED TYPE CAN BE USED.

Click map to see regional variations

Figure 34 *Chamber Construction*



(d) Lay-by Drainage

Lay-bys should be drained by means of gullies located on the road channel line or rear of lay-by or other sustainable means clearly demonstrated and which does not encourage flows back onto the road.

(e) Footpath Drainage

Remote footpaths should be constructed with flush edging. Only in exceptional circumstances, and where there is appropriate access for gully cleaning vehicles as agreed with the Roads Asset Manager, should direct drainage into gullies be considered.

(f) Gullies

Road gullies should be trapped and constructed in accordance with clause 508 of the Specification. Gully gratings and frames must be positioned with grating bars not parallel to the kerb to facilitate cyclists and shall be of the captive variety. They shall comply with BS EN 124 and Class D400 in all adopted and adoptable areas, (minimum nominal width 450 mm, minimum area of waterway 900 cm^2 and minimum depth of frame 100 mm). The use of Class B125 (minimum nominal width 325 mm, minimum area of waterway 650 cm^2 and minimum depth of frame 100 mm) may be permissible in non contiguous car parks at the discretion of the Roads Authority.

(g) Connections

Connections should be constructed in accordance with clause 508 of the Specification. They must be formed with junction pipes unless the Local Roads Authority has specifically approved the use of saddles.

(h) Chambers

Chambers should be constructed in accordance with Clause 507 of the Specification. Manhole covers and frames shall be non rock and comply with BS EN 124 and be Class D400 (minimum clear opening 600 mm dia or equivalent, minimum depth of frame 100 mm) except in non contiguous car parks or verges where the use of Class B125 (minimum clear opening 600 mm dia or equivalent, minimum depth of frame 100 mm) will be permissible.

(i) Outfall Connection

The connection of road drainage systems to the public sewer network should be undertaken only on the authority and to the requirements of Scottish Water. Similarly, when connecting to an existing watercourse, approval should also be sought from the Local Authority Flood Risk Management team.

Click map to see regional variations

3.4.10 Landscape Treatment

Refer to Roads Authority landscaping departments for agreement on maintenance requirements and definition of standard planting in association with any SUDS system - refer to Specification for Highway Works Series 3000 - Landscape and Ecology.

(a) General Issues

Materials chosen should be appropriate in appearance and performance and should be used in a consistent manner according to the function of different areas. Local materials and styles should be used, avoiding over-elaborate detailing and pastiche. Inappropriate standard details should not be imported from an area with a different landscape character.

(b) Planting

Required Permission

Any planting carried out within the road or on land adjacent to the road will require to receive written permission from the Roads Department prior to the commencement of the planting Landscape treatments should be designed for effective long-term maintenance and the highest standards of ground preparation are required to ensure successful establishment and the ongoing health of plants.

Appropriate Species Selection

Plant material comprises trees, shrubs, ground cover, climbers, bulbs and grass. Plant selection must take into account the following points as well as the desired design objectives:

- *suitability for the site;*
- *hardiness and tolerance to pollution and road salts;*
- *commercial availability;*
- *initial and eventual size above and below ground;*
- *shape;*
- *colour and seasonal variation;*
- *growth rate;*
- *maintenance requirements;*
- *other traits such as over-searching roots, weak branches, attractiveness to aphids.*

With all "native" or "naturalised" planting, advice on suitable species, mixes, densities and soil preparation can be sought from various sources such as local Landscape Professionals and Ecologists. Many areas of Scotland have appointed Area Ecologists. Ecological societies can also be a valuable source of information.

Siting Plants

Trees should be located to allow full branch spread as trees which are too close to the kerb may grow asymmetrically due to continuing contact with tall vehicles. This can be avoided by ensuring that all tree branches do not encroach within 450 mm of the kerbline up to a height of 5.3 metres. Tree planting proposals should also take full cognisance of the road lighting layout to ensure that no inappropriate shaded areas are created.

Protection of Services

Trees and shrubs should not be located where they are likely to cause damage to adjacent pavings, building, or services underground: refer to **NJUG Publications**; where necessary protection should be provided. Care must also be taken in the siting of trees to make allowance for access to buildings by emergency vehicles and fire engine turntables.

Maintaining Visibility

Trees can be located on their own, in a group, or in lines which can be parallel to the carriageway or at an angle to the carriageway. They should not obscure visibility when planted or when mature. To ensure good visibility without having to rely on frequent maintenance, the growth potential of shrubs planted in verges should be under 600 mm in height.

Soft Verges

Soft verges should be grassed (see clause 618 in **Specification for Highway Works Series 3000 - Landscape and Ecology**) unless an alternative form of surfacing is authorised by the Local Roads Authority. There must be a permanent demarcation of the boundary between the verge and the adjoining private property (eg by concrete edge kerbing or boundary walls).

Topsoil

Topsoil is to comply with clause 618 and appendix 6/8 - see **Specification for Highway Works Series 3000 - Landscape and Ecology**.

Click map to see regional variations

Grass Seed

Unless otherwise agreed by the Local Roads Authority, grass seed should comprise the mixture listed in Appendix 6/8 of Specification for Highway Works Series 3000 - Landscape and Ecology. The developer will be responsible for resowing, in the following season, any area where the seeding is not successful for carrying out all requirements of clause 618 of Specification for Highway Works Series 3000 - Landscape and Ecology until the road is adopted.

Hard Verges

The form of any hard landscaping should be agreed with the Local Roads Authority at an early stage of the design process. Where hard verges are provided on Traffic Distributor Roads, they should be surfaced with pedestrian deterrent paving.

Statutory Undertakers' Requirements

The restrictions which can be enforced on planting by Statutory Undertakers' services have to be identified at an early stage and the appropriate selection and modifications made as necessary: NJUG Publications.

Root Containment

Whenever possible trees should be planted in free draining, uncontained tree pits as this creates the best environment for establishment and the ongoing health of the tree. However, it is acknowledged that in certain locations it may be necessary to restrict root growth through containing the root zone. In such cases, it is vital that the container provide an adequate volume for root growth; 3 m^3 is considered acceptable. It may be noted however, that root growth is rarely symmetrical and an irregular shape of container can still provide healthy growing conditions. Typical details for growing trees with or without containment and showing the implications for tree anchorage are shown in Figures 35 and 36.

Tree Protection

In urban locations, where new trees are likely to be vulnerable to vandalism or impact from vehicles, tree guards should be employed to provide a measure of protection.

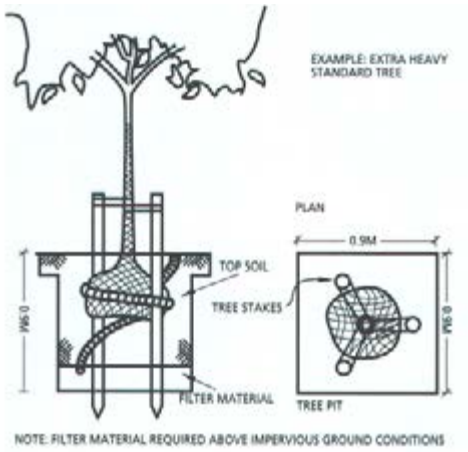


Figure 35 *Tree Planting Detail Without Containment*

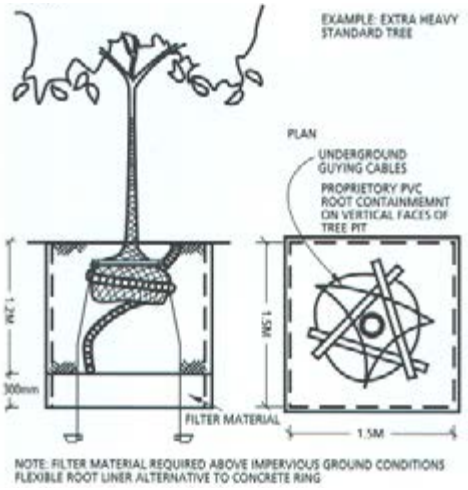
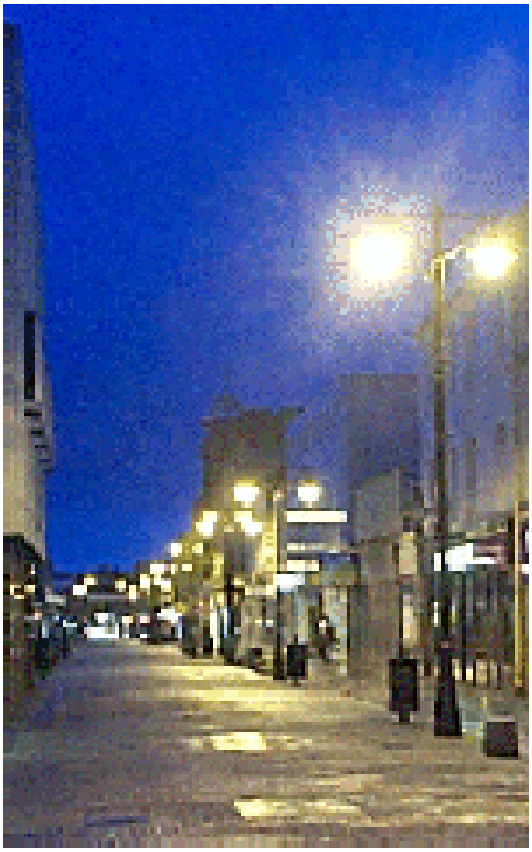


Figure 36 *Tree Planting Detail With Containment*

3.4.11 Lighting Design



(a) Compliance

Lighting shall generally be in accordance with the European and British Standards BS EN 13201 Road Lighting and BS 5489 Code of Practice for the Design of Road Lighting in 2003.

BS 5489-1 2013 contains guidance and recommendations to support BS EN 13201 and to enable designers of road lighting schemes to comply with it.

(b) Connection to Existing Apparatus

Where the road lighting in a development is to be connected electrically to any existing Roads Authority lighting column or feeder pillar, the Local Roads Authority's representative will, on receipt of Construction Details and Visual Inspection Certificate DCC2 carry out the necessary connection or connections at the point of supply in accordance with the Electricity at Work Regulations 1989, the cost to be borne by the developer. The Local Roads Authority representative will require a minimum of 5 working days notice (excluding weekends) from receipt of the Construction Details and Visual Inspection Certificate DCC2 to provide the connection facility. Alterations to existing services and equipment which the Local Roads Authority deems necessary to accommodate the development will be charged to the developer on a time and material basis. The Local Roads Authority's representative should be afforded the opportunity to witness the tests, and may disconnect the installation from the Roads Authority's supply network in the event of the test results proving unsatisfactory. Test results must be recorded on Electrical Inspection Test Certificate DCC3 and be submitted to the Local Roads Authority within 5 working days.

(c) Network Manager

Prior to any street lighting design, applications must be made to the Local Roads Authority who will advise on it's requirements.

(d) Planning Consents

The developer is responsible for the procurement of listed building or other planning consents as necessary.

Click map to see regional variations

(e) Remedial Action

In the event of failure to meet the specified standards the developer shall effect the necessary remedial actions at his expense within four months or responsibility for operation and maintenance shall revert to him.

(f) Residential Areas

In residential areas columns should be sited with consideration to the house design and remote from the visual line of the main house windows, the preferred position being at the division of property where possible, with allowance for entrances and drives.

(g) Column Siting

Columns must not be sited at the toe of the footway, on service areas or SUDS areas.

(h) Spacing

The distance between any two lighting columns in any direction shall not be less than 15 metres.

(i) Spacing at bends

Where calculations or luminance templates require the spacing on bends to be reduced from the design spacing, the following minimum spacing shall apply:

- *Mounting Height* — *8 metres*
- *Minimum Spacing* — *20 metres*

(j) Electrical Design

Electrical Design

The electrical design shall in all respects comply with the requirements of the '*17th Edition of the IEE Wiring Regulations (BS 7671)*', Electricity at Work Regulations 1989 and the Roads Liaison Group Well-Lit Highways.

Main Supply

Live services from the supply authority will only be taken into distribution pillars.

Distribution Pillars

Distribution pillars shall be sited in the side road away from major traffic routes and the junction itself, in positions where they are least likely to sustain impact or malicious damage whilst being readily accessible for maintenance purposes and to facilitate cable links to the adjacent lighting network.

Road Distribution Circuit

Road Distribution Circuits shall be 230 volt single phase primarily looped in or spurred from road lighting units. All other items of street furniture shall be spurred from a convenient road lighting unit; these spurs looping through two or more such items as appropriate. The maximum number of supply cables entering/leaving a road lighting unit shall be three. The maximum for other items of street furniture shall be two.

Earth Fault Loop Impedance

In the event of the supply earth fault loop impedance not being provided by the supply authority or obtainable by measurement the under note typical values shall be applied:

- *TN-C-S systems 0.35 ohms*
- *TN-S system 0.8 ohms*

For fixed equipment which can be touched by persons in contact with the general mass of the earth, including lighting columns and other illuminated street furniture, the earth fault loop impedance shall be such that disconnection under fault conditions occurs within 5.0 seconds. Earth electrodes should be installed at all salient points, ie at each feeder pillar and at the end of the circuits with three or more lighting units.

(k) Drawings

Schematic Circuit Layout

A schematic circuit layout for each feeder pillar shall be provided on all drawings giving:

(i) *phase and number of circuit;*

(ii) *size and type of protective device;*

(iii) *size and type of cables;*

(iv) *calculated values of line-earth fault loop impedances at all salient points.*

Column and Pillar Numbering

All column and distribution pillars shall be numbered to accord with schematic diagrams.

Click map to see regional variations

Protection
All columns and structural steelwork shall be hot dip galvanised. Further protective coatings, if required, shall meet the requirements of the Local Roads Authority.

Geometry and Compatibility
Drawings shall show such detail of contiguous lighting installations that the geometry can be fully assessed and the compatibility of the proposed system confirmed. Alterations to existing services and equipment which the Local Roads Authority deem necessary to accommodate will be charged to the Developer on a time and materials basis.

Roads and Footpath Adoption
Where relevant, roads and footpaths scheduled for adoption shall be clearly differentiated from those that are not.

As-installed Drawings
'As-installed' drawings at 1:500 must be provided prior to adoption. The drawings must also incorporate a legend and symbols as described in Appendix B. The contractor should certify that installation complies with BS 7671 before connecting to network.

3.5 Parking Considerations

3.5.1 The Application of Parking Provision

The consideration of parking provision at any development or redevelopment is an essential attribute that if undertaken correctly will enhance a project Factors affecting parking provision such as public transport provision and walkable access to services and provisions are recognised in these parking standards.

This guidance reflects the key consideration within Designing Streets (pages 40-43) to integrate parking and encourages a designer to use innovation that whist making parking provision, reduces the obvious impacts of car or vehicle parks.

3.5.2 Environmental Considerations

Consideration must be given to 'parking' and its relationship to the built environment which it serves. The form and function of the parking can have a determining influence on the successfulness of the development design concept.

Underground, internal and undercroft parking is encouraged and should be considered in all developments to enhance the place making options.

The location of the development itself may have an impact on the way parking is treated. A location near to other attractors such as employment or commercial areas may lead to residential

areas being used as overflow car parks to the adjoining uses. Consideration may need to be given to some form of parking control during working hours to discourage inappropriate parking.

3.5.3 What is a Parking Space?

Car parking provision is usually expressed in terms of 'spaces' and includes car-ports and undercroft parking as well as parking courts but does not include garages under a certain internal dimension.

3.5.4 Parking Standards in Urban Areas

For main urban areas a reduction to the parking standard may be considered. Main urban areas are defined as those having frequent and extensive public transport and cycling and walking links, accessing education, healthcare, food shopping and employment.

3.5.5 Shared Use Provision

Often, especially in urban areas, parking provision can be shared with other uses. For example, many leisure activities in urban areas can rely on existing public parking as leisure peak times are often different to retail peak times.

Shared use of parking areas is highly desirable, provided this works without conflict and that car parking provision is within the standard that requires the most number of car spaces applicable. Conflict should not occur so long as the shared use developments operate at differing times of day or days of the week, or the development is considered ancillary to other activities (ie food and drink within a retail area). Shared use may result in a reduction of the number of parking spaces which a developer is required to provide. For example, a mixed use development of shops, requiring 100 spaces for daytime use and leisure requiring 120 spaces for evening use, can suffice with 120 spaces in total. Where applicable long term agreements should be confirmed as part of the application to support the required parking standards.

Proposals for shared use parking must be supported by a parking appraisal undertaken by the applicant, to a scope agreed with the Roads Authority.

3.5.6 Extensions and Change of Use

Prior to any extension or change of use, the developer must demonstrate that adequate parking provision will be provided.

3.5.7 Commercial Vehicles

Commercial vehicles are regarded as those vehicles delivering goods to or removing goods from premises. It is recognised that servicing requirements may be unique to a particular site. Commercial traffic varies with the type of enterprise within a given use class.

The onus is placed with the developer, who should analyse their development's own requirements in terms of the numbers and types of commercial vehicles visiting their premises and should

Click map to see regional variations

demonstrate to the Local Authority that any development proposal includes sufficient commercial vehicle provision to meet normal requirements such as provision for loading, unloading and turning. Such commercial provision should be clearly signed and marked to avoid being utilised as an overflow parking area for cars.

3.5.8 Coaches

Developments likely to generate coach traffic should provide appropriate off-street parking facilities for the stopping, setting down and picking up of passengers as well as appropriate turning facilities (avoiding the requirement for coaches to reverse in or out of a site where possible, taking into consideration pedestrian safety). The onus will be on the developer to demonstrate to the Local Authority the development has the appropriate level of provision.

3.5.9 Provision for Cycle Parking

Cycle Parking Standards should be applied by Local Authorities to all applications for new or extended development. They are expressed as minimum standards to reflect the sustainable nature of this mode of travel.

The provision of convenient secure parking and related facilities are fundamental to attracting modal shift to cycling, particularly from single occupancy motorised journeys made over shorter distances on a regular basis. It is acknowledged that cycle parking demand varies greatly between use classes and a straight ratio of car to cycle trips can not be used to define the Cycle Parking Standard. In addition to the provision of cycle parking, developers will be required to demonstrate that they have considered additional needs for cyclists, such as locker, changing and shower facilities.

Where it is not possible to provide cycle parking spaces on-site, developers will be expected to make a financial contribution towards public provision of such facilities.

For information for cycle parking please refer to the Cycling by Design or LTN 2/08 Cycle Infrastructure Design.

3.5.10 Provision for Powered Two-Wheeler Parking

The use of Powered Two-Wheeled vehicles (PTW) for short regular journeys can create significant benefits, most notably in the form of reduced congestion and reduced land use for parking.

Parking standards for PTWs are represented as the minimum provision required, which reflects the advantages they have over the car and single occupancy vehicles in particular. As with cycle parking, these standards represent a basis for helping to provide sufficient PTW parking facilities.

In addition to the provision of secure parking, developers will be required to demonstrate that they have considered additional needs for PTW users, such as locker and changing facilities.

UK Government transport statistics show that the ratio between car and PTW ownership is 1:25. However, with regard to the congestion benefits that the PTW provides, a varied ratio parking standard linked to car parking spaces should be applied.

Car Spaces	PTW Spaces
For the first 0-100 spaces	1 space, plus 1 space per 20 car park spaces
Additional spaces over 100	1 per 30 car park spaces

For example a development that proposes a car park of 130 spaces should calculate their PTW requirement in the following way:

1 space provided regardless of car park size = 1

1 space per 20 car parking spaces for first 100 spaces = 5

1 space for the remaining 30 car parking spaces = 1

Total = 7

3.5.11 Provision for Disabled Parking

Disabled Persons Parking Places (Scotland) Act 2009

Under the Disability Discrimination Act 2005 as amended by the Equalities Act 2010, it is the responsibility of site occupiers to ensure that adequate provision is made for the needs of disabled people. Parking for disabled people will be required for their exclusive use at all sites.

The number of spaces required for disabled motorists varies between classes and the standard has been based on TAL 6/02 Inclusive Mobility 2002.

Click map to see regional variations

Car Park Used for:	Car Park Size	
	200 Bays or Less	Over 200 Bays
Employees and visitors to business premises	(Individual bays for each disabled employee plus) 2 bays or 5% of total capacity, whichever is greater	6 bays plus 2% of total capacity
Shopping, recreation and leisure	3 bays or 6% of total capacity, whichever is greater	4 bays plus 4% of total capacity
Educational Establishments (Advisory)	*1 Bay or 5 % of total capacity, whichever is greater*	

Note: *Disabled parking provision to be included in the overall vehicle parking standard.*

If it is known that there will be a disabled employee, then their space should be exclusive of the disabled parking standard required.

It should be noted that a larger number of spaces may be required by the LPA at facilities where a higher proportion of disabled users/visitors will be expected, for example medical, health and care facilities.

The provision at the above levels or any required by the LPA does not guarantee that the requirements of the Equalities Act 2010 will be met, this is the responsibility of the building occupier or service provider.

3.5.12 Planning Obligations

There may be opportunities to accept a S75 developer contribution/obligation in lieu of the full parking standard in sustainable locations. For further guidance on developer contributions, refer to local authority.

3.6 Parking Design and Layout

Parking is a key element in any new development. As well as providing an appropriate level of car parking, it is important that new or extended developments incorporate good design for the layout, landscaping and lighting of parking. This should be user-friendly, and not interfere with the public road or access adjacent to the parking area.

Parking requirements for developments are provided in terms of the planning classification.

3.6.1 Pedestrians

The needs of pedestrians should be taken into account when designing the layout of parking for all modes. This includes both those who have parked and those accessing the development on foot.

Pedestrian access to the development should be considered and pedestrian desire lines identified. Pedestrian access should then be provided along these routes rather than simply relying on the vehicular access.

A tactile distinction should be made between pedestrian areas and vehicular areas, in order that people with visual impairment can distinguish between the two. The provision of raised areas, footway areas and tactile paving at all dropped kerbs should achieve this.

3.6.2 Vehicles

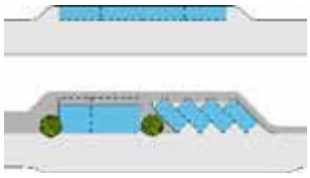
(a) Parking Bay Size

Preferred bay size for cars	5.5m x 2.9
(Parallel parking bay length)	6.0m
Desirable bay size	*5.0m x 2.5m*

Notes: Minimum bay size for vans 7.5m x 3.5m*

Minimum bay size for HGVs:

Articulated	17.0m x 3.5m
Rigid	12.0 x 3.5m



On-street parking Options

* *To allow for the trend of increasingly long vans (eg Mercedes-Benz Sprinter - up to 7,345mm; Fort Transit - up to 6,403mm)*

Any smaller than the above minimum bay size and an occupant might be unable to get in or out of an average sized family car parked in the bay with cars parked adjacent and consequently bay sizes smaller than the minimum stated above will not be considered a usable parking space.

(b) Layout of Parking Areas

The location and overall design should encourage maximum use of the parking areas in order to minimise the risk of on-street parking problems. As well as taking into account design features such as security and landscaping, adequate bay sizes that are easy to enter and exit and clear directional markings such as exit signs, will increase the appeal of the parking area.

There are a variety of parking styles including:

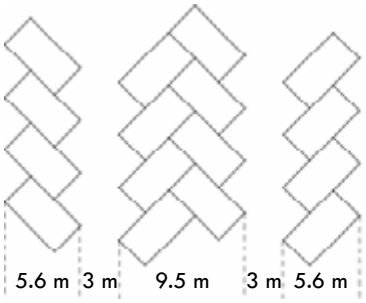
Square Parking (or 90° Square Parking) Angled Parking

Parallel or 'End to End' Parking

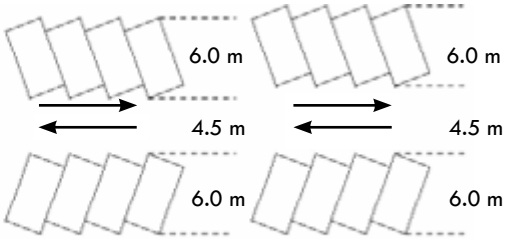
Click map to see regional variations

Examples of parking arrangements are shown below:

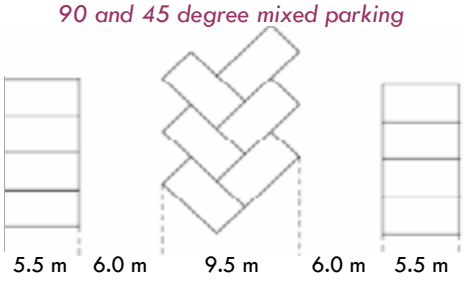
45 degree parking



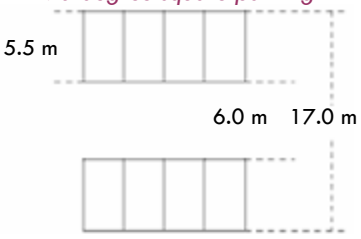
70 degree square parking



90 and 45 degree mixed parking



90 degree square parking



Further guidance can be obtained from the Department for Transport. Although it should be noted that this document recommends large parking bays than DfT guidance, due to the increase in size of the modern car.

Advice regarding Commercial Vehicles can be sought via the Freight Transport Association.

Examples of parking arrangements (note: tree planting photo on right reducing bay size availability to be changed)

3.6.3 Disabled Parking Design

(a) Location of Disabled Parking Bays

Spaces for disabled people should be located adjacent to entrances, where possible, should be convenient to use and the dimension conform to the relevant regulations. At the very most disabled parking spaces should be located no more than 150 m from the site.

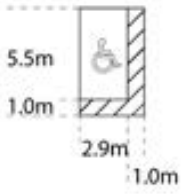
(b) Disabled Parking Bay Dimensions

Parking bays for disabled people should be designed so that drivers and passengers, either of whom may be disabled, can get in and out of the car easily and safely. Bays should be longer and wider than a standard bay. This ensures easy access from the side and the rear for those with wheelchairs, and protects disabled people from moving traffic when they cannot get in or out of their car on the footway side of a bay on the road.

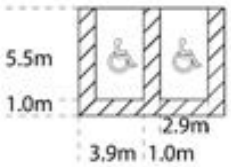
Off-street disabled parking bays should be at least 5.5 m long by 2.9 m wide with additional space as follows:

Disabled parking arrangements

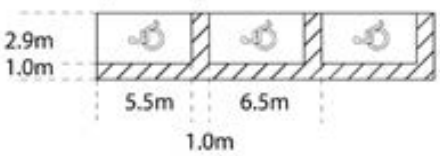
Example of bay



Square Parking



Parallel Parking



Blue Badge parking at a supermarket

Click map to see regional variations

Where bays are parallel to the access aisle and access is available from the side, an extra length of at least 1.0 m.

Where bays are marked perpendicularly to the access aisle, an additional width of at least 1.0m along each side. Where bays are adjacent, space can be saved by using the 1.0m 'side' area to serve the space either side.

When parallel to the access - 6.5 m by 2.9 m

When perpendicular to access - 5.5 m by 3.9 m

(c) Disabled Parking Design Consideration

Bays should be marked with lines and the International Symbol for Access with the safety zone/ aisle between the bays marked with hatchings.

Dropped kerbs should be provided where necessary and pedestrian routes to and from car parks for people with disabilities should be free from steps, bollards and steep slopes. Further guidance can be sought from 'Guidance on the use of Tactile Paving Surfaces' DETR.

Further guidance can be obtained from the DfT's Traffic Advisory Leaflet 05/95 (although it should be noted that this information is somewhat out of date), the DfT's Inclusive Mobility document and from BS 8300:2009 Appendix C.

3.6.4 Residential Parking Design

When planning residential parking, consideration of the type and scale of the development should be taken into account. Safe and secure parking can be achieved where cars can be seen by owners and neighbours. Layouts must accommodate the safe passage of emergency, delivery and refuse collection vehicles.

(a) Shared Surface

Where Shared surfaces are deemed appropriate within the street structure, they can offer opportunities for parking to be integrated within the street.

Shared surface design should be appropriate for the location.

Shared surfaces can lead to indiscriminate parking, blocking of footway and the narrowing of the road which hampers access by service and emergency vehicles. Shared Surfaces should therefore only be used in appropriate circumstances, at very low densities.

(b) On-Street Parking Provision

By using careful and innovative design, streets can be made to incorporate a certain level of unallocated on-street parking in the form of parallel or angled parking bays or parking squares. However, consideration must be given to location, proximity to accesses, sight lines and manoeuvring requirements so that indiscriminate parking and the obstruction of footways and carriageways is avoided. It is also important that the requirements of emergency and other service vehicles are catered for together with the needs of the disabled.

On-street parking options 90 degree! Boulevard! between trees

Bus routes within residential developments will require a minimum clear passage which must be available where on-street parking is proposed. Refer to section 3.1.3 and further street design advice is contained in the Designing Streets.

On-street parking spaces which are not allocated to particular dwellings may be considered for adoption by the Road Authority subject to appropriate design. Those which are part of

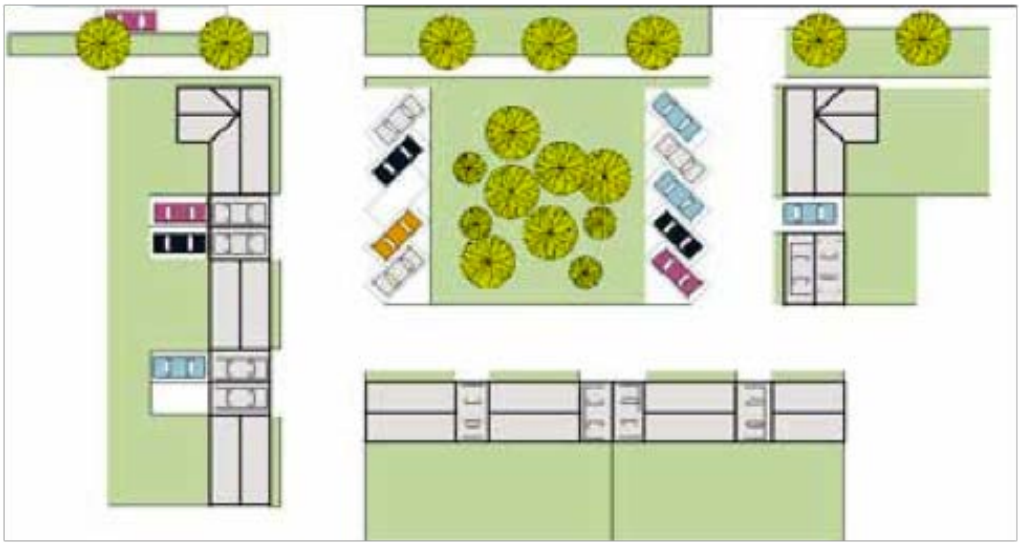
Click map to see regional variations

the allocated parking provision of individual dwellings will not be adopted and therefore the developer must make arrangements for their future management and maintenance.

(c) Parking Squares

These are pedestrian/vehicle shared surfaces, often consisting of a junction of routes. A parking square should be directly fronted by buildings.

Car parking can be provided in those areas which are not occupied by the carriageway or footway. Parking requirements of the frontage dwellings can be accommodated within the square, with the remaining requirement between of behind the dwellings. Clear demarcation between private and public parking is required.



Parking adjacent to landscaped square

Alternative layout includes 90 degree parking

(d) Parking Courts

Parking courts need to be designed carefully and be overlooked with direct access to/from the surrounding dwellings and have adequate lighting. Boundary fencing should be designed to allow observation from dwellings over the parking spaces.

They must be high-quality in design terms and have a sense of place and feel secure, to encourage ownership.

They should not be located in inaccessible areas at the extremity of the development.

Rear parking courts should ideally serve only those properties adjoining the court.

Overlooked rear spaces

Small courtyard generously landscaped using appropriate planting and quality materials

On plot parking and small parking courts

Small parking courts

Access to properties from rear parking court

Overlooked rear parking court

Click map to see regional variations

(e) In-Curtilage

Where housing densities are lower, space for car parking can be, in conjunction with careful positioning of the house provided "on plot", within the curtilage of the dwelling, such that car parking is less obvious, this can be in the form of a garage, car port, parking bay or private drive.

No surface water or loose material will be discharged onto the public road from within a curtilage.

Sufficient unimpeded access aisle space to vehicles giving due regard to disabled uses must be provided.

(f) Garage Provision and Size

It is recognised that despite being an important design feature of residential developments, garages are being used for other purposes, such as general and cycle storage. It is acknowledged that storage space is important, particularly as many properties do not have much storage space within the dwelling itself. It is also known that cars are getting bigger.

A garage can be counted towards a parking space allocation. However, any change of use will result in less availability of parking and increased pressure to on-street parking. For this reason:

- *Minimum Garage size for Cars* — *7.0 m x 3.0 m (internal dimension)*
- *Associated minimum clear door access dimensions* — *2.1m wide x 1.98m height*

Garages of the above dimension and over will be considered a parking space as they are large enough to accommodate the average sized family car and cycles, as well as some storage space. To encourage garage use, functionality is equally important therefore reasonable access and egress from a car within a garage is essential. Additionally, provision for electric vehicle charging facilities should be provided with a garage space.

(g) Mixed Use Streets

In certain areas residential development will form part of a wider mixed use development where other uses (retail/business) will dominate at ground floor level.

(h) Underground, Underdeck and Undercroft Parking

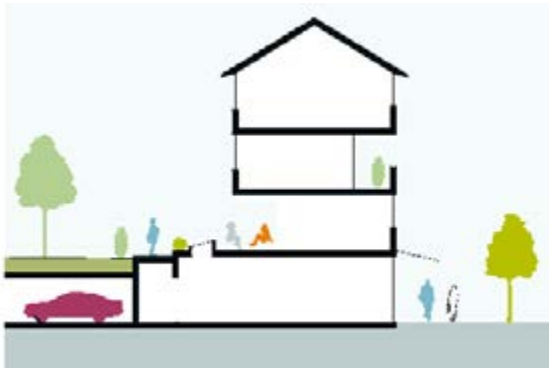
For developments of higher dwelling density, it is unlikely that sufficient space for car parking can be provided by in-curtilage and garage provision (without a detrimental effect on the quality of the development).

Click map to see regional variations

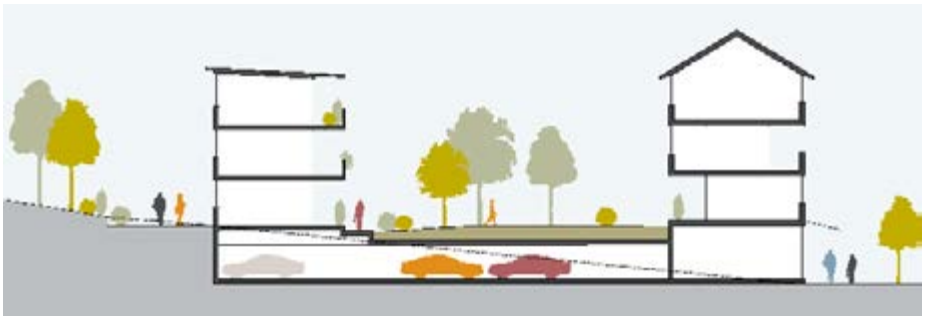
Underground, underdeck or undercroft parking should be provided wherever possible.

Underground parking with communal space above

Partial underground parking with raised floor



Single aspect ground floor uses with rear Underdeck access



Underground parking using ground slope

Locating car parking either under buildings, above or below ground level, can significantly improve the quality of a development. Planning Authorities will need to ensure that underground underdeck and undercrofts parking are safe, secure and retained for parking.

(i) Tandem Parking

Tandem Parking should be discouraged where possible especially in parking courts, as studies have shown that their use for parking is reduced, often used instead for bin storage, and that their provision encourages on-street parking.

(j) Set Backs

Construction of garages or gates adjacent to the road using a previous standard 1.5m setback have led to widespread abuse by residents who use this area plus the adjacent footway/cycleway/verge to park vehicles perpendicular to the main carriageway. This creates an obstruction of the footway/cycleway and whilst this is an enforcement issue in existing situations, it is appropriate to amend the standard so that this does not occur as frequently in future.

In order to reduce occurrences in future, the following standard should be adopted. Where garages/gates (all gates to open inwards) are placed directly adjacent to the road the setback should be either:

(1) *no more than 0.5 m to allow for the opening of the garage door and with the adjacent distance between edge of road and edge of carriageway being no more than 2 m. This gives a maximum distance between garage/gate and running carriageway of 2.5 m, thus discouraging inappropriate parking;*

(2) *greater than 6 m from the edge of the road to allow for parking in front of the garage/gates. In these circumstances there no need to restrict the width of the adjacent footway/cycleway/verge as there is less likelihood of abuse.*

Click map to see regional variations

Good Practice Examples

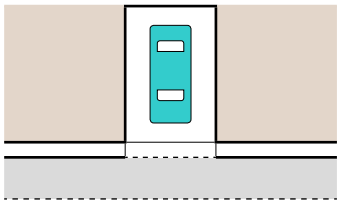
Top left: *Setback in excess of 1.5m, yet with parking restrictions to prevent obstruction.*

Top right: *Parking space clear of footway, in line with vegetation.*

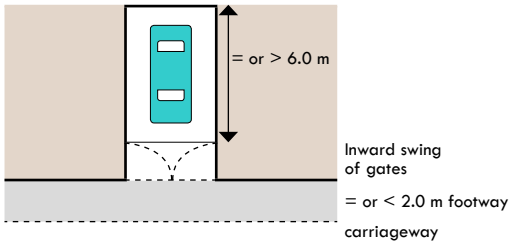
Bottom left: *Reduced setback but demarcated to show footway limit and allow room for garage door to open.*

Bottom right: *Setback in excess of 1.5m, yet parking can occur between dwelling and landscaping (trees), causing no obstruction to footway/ carriageway*

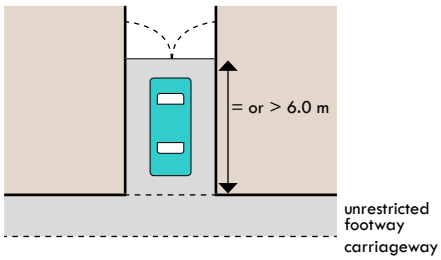
(1a) Up and over garage door



(1b) Gates



(2) Driveway



(k) Retirement/Warden Controlled Developments

Many residents are car owners and parking should be provided for each unit unless there is the evidence base to support a reduction in the standard. Additionally, parking provision should be made for visitors who support the residents of such developments, carers, health visitors, etc.

Consideration should be given to safe storage and charging point locations for mobility scooters when designing Retirement/Warden Controlled Developments.

3.6.5 Powered Two-Wheeler Parking Design

(For general advice on design for M/C, refer to Guidelines for Motorcycling ***)***

Note: *cobbles are not appropriate surface treatment for PTW parking*

In terms of convenience, flexibility and security PTW's have the same characteristics as cycles. Consequently the behaviour and requirements of the powered two wheeler rider often follow that of the cyclist.

Powered two wheeler parking should be clearly signposted from the road and signed in situ, indicating that it is reserved for powered two wheelers only. Sites should have anchor points, quality level surfacing, CCTV and/or natural surveillance, be located away from drain gratings and protected from the elements as well as having good lighting. For long stay parking, such as workplaces, lockers to allow storage of clothing and equipment and changing facilities should be provided. PTW parking can be vulnerable locations, particularly long stay parking. Ideally there should only be access for PTW's, not vehicles, which can be done by using a causeway or pinch point. The parking area should be in a wide open location, not in an isolated, secluded place.

Motorcycle parking bays are generally not marked out for individual machines, allowing flexible and efficient use of limited space by machines of different sizes. Consideration should also be given to height clearance, with many bikes measuring upwards of 1.5 m not including the rider.

- *Preferred bay size for a PTW* — *2.5 m x 1.5 m*
- *Absolute minimum bay size* — *2 m x 0.8 m*
- *With a minimum space of 1 m between each bike.*

Provision should be made in which to secure PTWs. There are 2 basic types of anchor points to which motorcycles can be secured to reduce the risk of theft:

- ***Ground Level -*** *An anchor point below the surface, with a loop allowing the user's own lock to be passed through. Anchor points require regular maintenance and can be dirty to use.*

Click map to see regional variations

- ***Raised*** *- A horizontal bar is provided at a height of approximately 400-600 mm and requires the user to use their own lock. The continuous rail allows for efficient use by machines of varying style and size, is well understood by users and is compatible with most types of shackling devices.*

Further information can be sought from the DfT's Traffic Advisory Leaflet 2/02.

3.6.6 Cycle Parking Design

Key considerations regards cycle parking is referred to in Designing Streets (page 40). Providing well-located, safe and secure cycle parking is a key factor in encouraging people to cycle as an alternative to using the private car. Further guidance can be found in Cycling by Design and LTN 2/08 Cycle Infrastructure Design.

All cycle parking must be overlooked, sheltered from strong winds and be Well Lit.

Long stay cycle parking, for example for employees, should include secure, covered cycle storage situated close to the building but preferably out of sight to the general public (possibly to the rear of the building), to reduce the chance of theft or tampering. Facilities should be present such as showers, changing rooms and lockers.

Short-term cycle parking, for example, for shoppers or visitors should be secure and ideally covered and situated as close to the main entrance as possible. The location should be highly visible to people, thus reducing the chance of theft or tampering.

Normally Sheffield stands should be provided. Stands that grip only the front wheel do not provide adequate support or security. When placed 1 m apart and 0.5 m from the wall, Sheffield stands can accommodate two cycles. Where more than two stands are required, you may need to provide a 'toast rack' facility.

Where children are likely to attend (schools, leisure facilities etc) an extra horizontal bar at 650 mm above ground level or a reduced sized stand to support the smaller frame of a child's cycle should be considered.

More detailed information can be found in the Scottish Government's publication Cycling by Design. Sustrans, the UK's national cycling organisation can also provide detailed design information.

Care should be taken to ensure that the cycle parking (when in use) does not cause an obstruction to pedestrian flow.

3.7 Parking Standards for Use Classes

Class 1: Shops

Retail sale of goods, hairdresser, undertaker, travel and ticket agency, post office. Dry cleaner, laundrette, cold food consumption on premises. Display of goods for sale, hiring out of domestic goods or articles, reception of goods to be washed.

Type of Development	Vehicle Maximum *(spaces per 100 m² gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
Shops *City Centre* *Other centres*	 2 spaces 3 spaces	1 space per 400 sqm for staff and 1 space per 400 sqm for customers	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 3 bays or 6% of total capacity, whichever is greater **Over 200 bays** = 4 bays plus 4% of total capacity
Food Superstore *0-500 m² GFA* *500-2,000 m² GFA* *2,000-8,000 m² GFA* *>8,000 m² GFA*	 5 spaces 6.5 spaces 7 spaces 6 spaces			

Click map to see regional variations

Use	Vehicle Maximum *(spaces per 100 m^2 gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
Shopping Centre				
0-500 m^2 GFA	4 spaces			
500-2,000 m^2 GFA	5 spaces			
2,000-8,000 m^2 GFA	6 spaces			
>8,000 m^2 GFA	5 spaces			
Retail Park				
2,000-8,000 m^2 GFA	2 spaces			
>8,000 m^2 GFA	2.2 spaces			
DIY Superstore				
2,000-8,000 m^2 GFA	2 spaces			
>8,000 m^2 GFA	2.2 spaces			

Informative Notes

Parking standards for large, stand-alone developments, such as large department stores and shopping centres will be considered on a case by case basis and should be agreed with the relevant Local Planning and Road Authorities.

In all cases adequate provision should be made for the parking and turning of service vehicles, serving the site, off the road.

A lower provision may be appropriate in town centre locations where there is good access to alternative forms of transport and existing car parking facilities.

Class 2: Financial, Professional and Other Services

Financial, professional or any other service expected in shopping areas, eg betting office, lawyers, accountants, estate agents, health centres, surgeries of dentists, doctors and vets (where the principal visitors are members of the public).

Type of Development	Vehicle Maximum *(spaces per 100 m^2 gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
A2	1 space per 20 sqm	1 space per 100 sqm for staff + 1 space per 200 sqm for customers	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 2 bays or 5% of total capacity, whichever is greater **Over 200 bays** = 6 bays plus 2% of total capacity

Informative Notes

A lower provision may be appropriate in town centre locations where there is good access to alternative forms of transport and existing car parking facilities. In all cases adequate provision shall be made for the parking and turning of service vehicles serving the site, off the highway.

Click map to see regional variations

Class 3: Food and Drink

Restaurant, café, snack bar (use for sale of food or drink on the premises).

Type of Development	Vehicle Maximum *(spaces per 100 m^2 gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
A3 ***(excluding Transport Cafés)***	1 Space per 5 sqm	1 Space per 100 sqm for staff + 1 space per 1 sqm for customers	1 Space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 3 bays or 6% of total capacity, whichever is greater **Over 200 bays** = 4 bays plus 4 % of total capacity
A3 ***(Transport Cafés)***	1 lorry space per 2 sqm	1 space per 200 sqm for staff + 1 space per 200 sqm for customers		

Informative Notes

A lower provision of vehicle parking may be appropriate in town centre locations where there is good access to alternative forms of transport and existing car parking facilities.

In all cases adequate provision shall be made for the parking and turning of service vehicles serving the site, off the road.

Class 4: Business

Offices (other than that specified under Class 2), research and development of products or processes, light industry.

Type of Development	Vehicle Maximum *(spaces per 100 m² gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
B1	1 space per 30 sqm	1 space per 100 sqm for staff + 1 space per 200 sqm for visitors	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 2 bays or 5% of total capacity, whichever is greater **Over 200 bays** = 6 bays plus 2% of total capacity

Informative Notes

A lower provision of vehicle parking may be appropriate in town centre locations where there is good access to alternative forms of transport and existing car parking facilities.

In all cases adequate provision shall be made for the parking and turning of service vehicles serving the site, off the road. Consideration should also be given to the requirement for any overnight parking and facilities.

Click map to see regional variations

Class 5: General Industrial

General industrial (use for the carrying out of an industrial process other than one falling within the Class 4 (Business) definition).

Type of Development	Vehicle Maximum *(spaces per 100 m² gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
B2	1 space per 50 sqm	1 space per 250 sqm for staff + 1 space per 500 sqm for visitors	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 2 bays or 5% of total capacity, whichever is greater **Over 200 bays** = 6 bays plus 2% of total capacity

Informative Notes

A lower provision of vehicle parking may be appropriate in town centre locations where there is good access to alternative forms of transport and existing car parking facilities.

In all cases adequate provision shall be made for the parking and turning of service vehicles serving the site, off the road. Consideration should also be given to the requirement for any overnight parking and facilities.

If a site office is included in the development then a B1 parking standard should be applied for that area.

Class 6: Storage or Distribution

Storage or distribution.

Type of Development	Vehicle Maximum *(spaces per 100 m² gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
	1 space per 150 sqm	1 space per 500 sqm for staff + 1 space per 1,000 sqm for visitors	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 2 bays or 5% of total capacity, whichever is greater **Over 200 bays** = 6 bays plus 2% of total capacity
Lorry Parking				
Factories and Warehouses	1.1 spaces			
Warehousing (non-sales)	0.5 spaces			
Business Park	2 spaces			
Science Park	2 spaces			

Informative Notes

A lower provision of vehicle parking may be appropriate in town centre locations where there is good access to alternative forms of transport and existing car parking facilities.

In all cases adequate provision shall be made for the parking and turning of service vehicles serving the site, off the road. Consideration should also be given to the requirement for any overnight parking and facilities.

It is acknowledged that there is an increasing trend for B8 developments with a retail element where there is the option for customers to visit a counter at the premises and make purchases, for developments such as this, additional customer parking should be allocated, equivalent to the A1 standard for the floor space that has public access.

If a site office is included in the development then a B1 parking standard should be applied for that area.

Click map to see regional variations

Class 7: Hotels and Hostels

Hotel, boarding and guest house, hostel.

Type of Development	Vehicle Maximum *(spaces per 100 m^2 gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
Hotel and B&B	1 space per 2.5 bed spaces	1 space per 5 staff for staff + 1 space per 10 bedrooms	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 3 bays or 6% of total capacity, whichever is greater **Over 200 bays** = 4 bays plus 4% of total capacity
Hostel	1 space per 4 staff plus customer parking on individual merits	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces over 100 car spaces)	1 space per 40 sqm	

Informative Notes

A lower provision may be appropriate in town centre locations where there is good access to alternative forms of transport and existing car park facilities. The modern day hotel is seldom used solely as a hotel and often offers multifunctional amenities such as conference facilities, restaurants and gyms. These multifunctional uses must be considered per individual class use and adequate parking allocated to encompass all uses when considering the potential for cross- visitation.

Class 8: Residential Institutions

Residential school, college, training centre, residential accommodation with care, hospital, nursing home.

Type of Development	Vehicle Maximum *(spaces per 100 m² gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
Residential Care Home	1 space per staff member + 1 visitor space per 3 beds	1 space per 5 staff	1 space +1 per 20 car spaces (for 1st 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	Dependant on actual development, on individual merit, although expected to be significantly higher than business or recreational development requirements
Hospital	1 space per 3 beds + 1 space per doctor/ surgeon + 1 space per 3 other staff	1 space per 4 staff Visitors - to be considered on a case by case basis		
Treatment Centres *(eg ISTC (Independent Sector Treatment Centre) with overnight facilities)*	4 spaces per consulting room + 1 space per practitioner + 1 space per 3 other staff	1 space per 4 staff Visitors to be considered on a case by case basis		1 bay or 5% of total capacity, whichever is greater
Education Establishments - Primary/ Secondary	1 space per staff member + provision for buses where required	1 space per 5 staff + 1 space per 3 students		
Residential Education Establishments - Further/Higher	1 space per staff member + 1 space per 10 students	1 space per 5 staff + 1 space per students		

Informative Notes

Parking Standards for retirement developments that are warden assisted yet provide independent living should fall under Class C3.

Hospital Parking: With regard to parking, it should be acknowledged that particular needs of hospitals arising from their 24 hour service (which impacts on accessibility for patients and visitors and on staff working patterns) should be taken into account and parking provision provided accordingly.

The impact of parking on the surrounding area should be considered and if necessary provide appropriate

Click map to see regional variations

traffic management measures (eg resident parking scheme) to prevent illicit parking on neighbouring streets by people travelling to the hospital site. Travel plans for staff, patients and visitors play an important role in traffic reduction and especially encourage modal shift for staff.

Class 9: Houses

House occupied by a single person, or a number living together as a family, or as a household of 5 persons or less. Limited use as a bed and breakfast or guest house.

Trip Origin

Dwellings are predominantly travel origins as opposed to destinations. Previously parking standards have attempted to reduce car use by restricting parking spaces at origin and destinations. It is now recognised that providing a reduced number of parking spaces at a travel origin does not discourage people from owning a car. Therefore parking standards for origins should be used as a minimum standard. For travel destinations the standard will continue to be a maximum.

Standard

Flats and Houses are to be treated the same, with parking standards decided by the number of bedrooms the dwelling has.

Type of Development	Appropriate Provision *(spaces per 100 m² gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
1 Bedroom	1 space per dwelling	1 secure covered space per dwelling. None if garage or secure area is provided within cartilage of dwelling.	N/A	N/A if parking is in cartilage of dwelling, otherwise as Visitor/ Unallocated
2-3 Bedroom	2 spaces per dwelling*			
4 Bedroom	3 spaces per dwelling			
Retirement Developments ***(eg warden assisted independent living accommodation)***	1 space per dwelling	1 space per 8 units (visitors)	1 space + 1 per 20 car spaces (for 1st 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	N/A if parking is in cartilage of dwelling, otherwise as Visitor/ Unallocated

Type of Development	Appropriate Provision *(spaces per 100 m² gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
Private Sheltered Housing and Housing Associations	0.2-0.5 spaces per dwelling + 0.3 spaces visitor parking per dwelling + 1 space per warden			
Amenity Housing	0.5 spaces per dwelling + 0.3 spaces visitor parking per dwelling			
Local Authority Sheltered Housing	0.25 spaces per dwelling + 1 space per warden			
Visitor/ Unallocated	0.25 spaces per dwelling (unallocated)	If no garage or secure area is provided within cartilage of dwelling then 1 covered and secure space per dwelling in a communal area for residents plus 1 space per 8 dwellings for visitors	1 space +1 per 20 car spaces (for 1st 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 3 bays or 6% or total capacity, whichever is greater **Over 200 bays** = 4 bays plus 4% of total capacity

** Excluding garage if less than 7 m x 3 m internal dimension*

Informative Notes

Standards excluded garages under 7 m x 3 m (internal dimension) as a parking space but can include under croft parking and car ports providing they have no other use.

Visitor/unallocated vehicle parking can, subject to appropriate design, be located on or near the road frontage.

Unallocated cycle parking for residents to be secure and covered, located in easily accessible locations throughout the development.

Reductions of the standard may be considered if there is development within an urban area that has good links to sustainable transport.

Click map to see regional variations

Class 10: Non-Residential Institutions

Crèche, day nursery, day centre, provision, provision of education, museum, exhibition hall, public library, display of art, public worship, religious instruction, social activities of a religious body.

Type of Development	Vehicle Maximum *(spaces per 100 m² gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
Crèche, Child Care	1 space per full-time equivalent staff + drop off/ pick-up facilities	1 space per 4 staff + 1 space per 10 child places	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	1 bay or 5% or total capacity, whichever is greater
Day Care Centre	1 space per full-time equivalent staff + drop off/ pick-up facilities	1 space per 4 staff		1 bay or 5% or total capacity, whichever is greater
Community Centres	5.0- 20.0 m² GFA			
Education - Primary/ Secondary	1 space per 15 pupils	1 space per 5 staff + 1 space per 3 pupils	1 space + 1 per 20 car spaces (for first 100 car spaces) then 1 space per 30 car spaces (over 100 car spaces)	1 bay or 5% of total capacity, whichever is greater
Education - Further/Higher	1 space per 2 staff + 1 space per 15 students for student parking	1 space per 5 staff + 1 space per 3 students		
Art Galleries, Museums, Public/ Exhibition Hall	1 space per 30 sqm² public display space + 1 space per 2 staff	10 spaces + 1 space per 10 vehicle space		**200 bays or less** = 3 bays or 6% of total capacity whichever is greater **Over 200 Bays** = 4 bays plus 4% of total capacity
Places of Worship	1 space per 10 seats	1 space per 4 staff + visitor parking (individual merits)		
Libraries	3 spaces + 1 space per 3 staff			
Crematoria	1 space per seat			

Informative Notes

A lower provision may be appropriate for educational establishments in an urban location where there is good access to alternative forms of transport to allow sustainable travel.

The relationship between a school and the residential area is important and falls within the operational requirements of the school. Schools should represent the heart of the community and community facilities should be considered within the school site.

Special Schools parking/drop-off arrangements must be taken into consideration as generally extra staff are required and most pupils/students arrive by taxi or car. Coach parking and facilities must be considered for all D1 uses.

Class 11: Assembly and Leisure

Cinema, concert hall, bingo hall, casino, dance hall, discotheque, skating rink, swimming bath, gymnasium or for indoor sports or recreation not involving motorised vehicles or firearms.

Type of Development	Vehicle Maximum *(spaces per 100 m² gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
Cinema/Bingo Halls	1 space per 10 seats	10 spaces + 1 space per 10 vehicle space	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	**200 bays or less** = 3 bays or 6% or total capacity, whichever is greater **Over 200 bays** = 4 bays plus 4% of total capacity
Theatres/Concert Halls	1 space per 5 seats			
Team Sports ***(outdoor sports pitches)***	20 Spaces	10 spaces plus		
Sports Centres *Swimming Pools* *Snooker Halls/ Other Facilities*	10 spaces per 100 sqm² of pool area 1 space per table	10 spaces + 1 space per 10 vehicle space		
Golf Clubs	3 spaces per hole	Individual merit		
Other Sports Facilities	Individual merit	Individual merit		
Dance Halls/ Discotheques	10 spaces + 1 space per 3 staff + 3 spaces for performers			

Informative Notes

Coach parking and facilities must be considered for all uses.

Click map to see regional variations

Other: Sui Generis

Type of Development	Vehicle Maximum *(spaces per 100 m² gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
Garden Centres *(see informative notes)* *0-2,000 m² GFA* *2,000-5,000 m² GFA* *>5,000 m² GFA*	1 space per full-time staff equivalent 5.5 5.0 4.0	1 space + 1 per 20 car spaces (for first 100 car spaces), then 1 space per 30 car spaces)	**200 bays or less** = 3 bays or 6% of total capacity, whichever is greater. **Over 200 bays** = 4 bays plus 4% of total capacity **200 bays or less** = 3 bays or 6% of total capacity whichever is greater **Over 200 bays** = 4 bays plus 4% of total capacity	
Student Flats	1 space per 7 students + 1 space per 3 staff + 1 space per wardem			

Type of Development	Vehicle Maximum *(spaces per 100 m² gross floor area, GFA)*	Cycle Minimum	PTW Minimum	Disabled Minimum
Motor Trade				
Vehicle display area	2 spaces			
Spares department	4 spaces			
Servicing/ bodywork	4 per service bay			
Tyre and exhaust centre	2 per service bay			
Car wash	5 queuing spaces			
Scrapyards	2 spaces			
Staff	1 space per 2 staff			
Public Houses	10 spaces			

Informative Notes

Coach parking and facilities must be considered for all uses.

Multifunctional uses must be considered per individual class use and adequate parking allocated to encompass all uses, when assessing the parking requirements of a development, taking into account cross-visitation.

A lower provision of vehicle parking may be appropriate in urban locations where there is good access to alternative forms of transport and existing car parking facilities.

Click map to see regional variations

3.8 Structures Technical Approval

Structures Technical Approval Requirements

From clauses 2.8.2 and 2.8.3 of the COP:

> *"All structural design and assessment should be subject to a formal Technical Approval procedure such as those used by the Highways Agency [BD 2; Technical Approval of Highway Structures, 43j or Network Rail [GC/RT5J OJ Technical Approval Requirements for Changes to the Infrastructure, 44"*

The Local Authorities are the Technical Approval Authority (TAA) for all road structures and pedestrian footbridges that are owned by each Council (independent of maintenance responsibility).

Whilst the scope of **BD 02/12 (available June 2014)** and **HD 22/08** fully apply, Structures requiring technical approval are summarised below:

- *All road retaining structures greater than 1.5 m in height require technical approval in accordance with* **BD 02/12 (available June 2014)**.
- *All culverts and bridges greater than 2 m in span, or greater than 0.9 m in diameter for corrugated steel pipes requite technical approval in accordance with* **BD 02/12 (available June 2014)**.
- *Any geotechnical works (ie embankments) "which may pose a risk to the general public, the Overseeing Organisation and/or the Overseeing Organisations's asset" require Technical Approval in accordance with* **HD 22/08**.

It is highly recommended that early involvement with the Local Authority Structures team is established for all schemes involving the above.

3.9 SUDS Schedule

The following Sustainable Urban Drainage System details (only forming a part of the road drainage system) are required to be submitted as part of the Road Construction Consent/Technical Approval to clearly convey the standards and responsibilities identified between Local Authorities/Scottish Water.

1. Site layout plan.
2. Type of SUDS - justification for SUDS selected.
3. Marked plan clearly showing responsibility for any particular part of the system - SW/LA/Another (if appropriate) along with construction details.
4. A maintenance schedule should be produced for each scheme, detailing what, when and how.
5. Agreed discharge rates to be incorporated into design details. Details of where discharging to, ie Sewer or watercourse should be clearly stated.
6. Planting details (where appropriate).

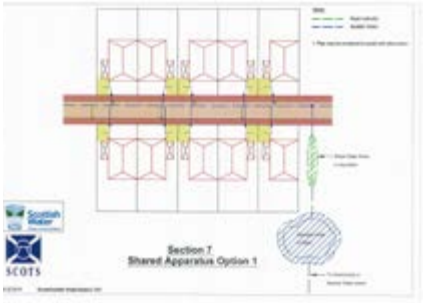
7. Whole life costs including decommissioning plan.
8. Where SUDS are within a private curtilage clear evidence of householders responsibilities to maintain. Scottish Water and LA to agree appropriate action should consequential overspill or polluting of associated SUDS takes place.
9. When sacrificial SUDS are to be used during construction, full detail including decommissioning plan to be provided.
10. Independent design certificate (similar to structures) to be provided for the overall drainage Design including SUDS.
11. Confirmation that all required parallel approvals have been obtained, ie SW/SEPA/SNH etc*
12. Consultant certification - written confirmation that consultant can design SUDS**
13. Identify appropriate Professional Indemnity for the above.
14. Adoption of road, including SUDS must coincide with Scottish Water vesting the associated sewer network.*
15. Depending on type of SUDS, eg membrane lined soakaways etc, the road will need to be entered into symology as of '*engineering difficulty*'.
16. SUDS Schedule Points to be included in RCC/Technical Approval.
17. Construction detail including design calculations - who installed/when installed (these details to form part of a maintenance schedule).
18. Maintenance schedule to include methodology for disposal of SUDS waste, eg silt from ponds, contaminates grass and plant cuttings (arisings).
19. CCTV survey of systems (where appropriate).
20. Health & Safety Plan/inclusion in CDM Safety file.
21. Contractor certification - written confirmation that contractor can deliver SUDS?**
22. Defects period - a minimum of 24 months will be required to ensure the SUDS system has been established. A reasonable portion of the road bond may be retained in accordance with Regulation 15.
23. Specification
    Measures to be used to independently test the suds system performance before adoption is required this should include the following:
    - *sewer pipes shall be tested in accordance with* **Sewers for Scotland Third Edition** ;

Click map to see regional variations

- *road drainage pipes shall be air or water tested to* **BS EN 1610** *and where velocities are less than 1 m/s a Mandrel Test may be required where appropriate;*
- *infiltration systems shall be tested in accordance with Appendix B of* **SUDS Manual, CIRIA no C753** *to determine suitability. Thereafter a test load will be applied and timed to ensure the design infiltration rate is being achieved;*
- *ponds and basin will require the following tests:*
  - *fill pond to test overflow facility operates correctly;*
  - *control device tested against design head to verify agreed greenfield runoff rate being achieved (flow measurement device may be required);*
  - *fill pond to undertake drop test to ensure no leakage; and*
  - *fill pond to test required storage capacity has been provided.*

This may be achieved by extending the testing period to allow for the pond and basin to be filled naturally by rainfall.

References made to a suite of SCOTS/Scottish Water drawings (click on image opposite) at this stage shows potential splits in maintenance responsibilities. This work in relation to Section 7 Agreement is ongoing.



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Glossary
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APPENDICES

SCOTS

Last updated
June 2017

Appendices

Click map to see regional variations

Glossary

Adsorption
The adherence of gas, vapour or dissolved matter to the surface of solids.

Adopted road
*

Antecedent conditions
The wetness of a catchment prior to a particular rainfall event.

Attenuation
Reduction of peak flow and increase of duration of runoff during and following a storm event.

Base
The lowest bound layer of an asphalt pavement, formerly known as roadbase.

Basins
A ground depression acting as a flow control or water treatment structure that is usually dry and has a proper outfall, but is designed to detain stormwater temporarily.

Binder
The second layer of an asphalt pavement, formerly known as basecourse.

Biodegradation
The decomposition of organic matter by micro-organisms and other living things.

Bioretention areas
A landscaped ground depression that collects runoff so that it percolates through the soil below into an underdrain system, thus promoting pollutant removal.

California Bearing Ratio
An empirical measure of the stiffness and strengths of soils, used in road pavement design.

Capping layer
A layer of unbound aggregate of lower quality than sub-base that is used to improve the performance of the foundation soils before laying the sub-base and protect the sub-grade from damage by construction traffic.

Carriageway
The portion of the road which is used to carry vehicular traffic.

Catchment
The area which contributes surface water flow to a point in a drainage system. Can be split into sub-catchments.

Climate change
Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer).

Combined sewer
A sewer which is designed to carry both foul sewerage and surface water in the same pipe.

Combined Sewer Overflows
Overflow systems built into combined sewer networks which allow a certain amount of flow to discharge directly into a watercourse untreated, to ensure the sewer network does not become surcharged in storm conditions.

Control structures
A structure to control the flow rate or volume of water passing through or over it.

Controlled waters
Water defined and protected under the Water Resources Act 1991. Any relevant territorial waters that extend seaward for three miles from the baselines, any coastal waters which extend inland from those baselines to the limit of the highest tide or the freshwater limit of any river or watercourse, any enclosed dock which adjoins coastal waters, inland freshwaters, including rivers, watercourses, and ponds and lakes with discharges and ground waters (waters contained in underground strata). For the full definition refer to the Water Resources Act 1991.

Conveyance
The movement of water from one location to another.

Diffuse pollution
Pollution arising from land-use activities (urban and rural) that are dispersed across a catchment or sub-catchment, and do not arise as a process industrial effluent, municipal sewage effluent, deep mine or farm effluent discharge at a single point.

Dry swale
Shallow vegetated channel with filter in the base to convey surface runoff to the sewer network or infiltrate into the surrounding soils.

Embodied energy
The energy required to produce a service or product, eg during the manufacturing or processing stages. Can be related to CO2 emissions.

Evapotranspiration
Process where moisture is lost from soil by evaporation of water and from transpiration by plants.

Exceedance
An event which has a result which exceeds a set target level, or in the case of drainage networks, a flow which exceeds the capacity of the sewers, causing surcharging and/or flooding.

Click map to see regional variations

Filter drains
A liner drain consisting of a trench filled with a permeable material, typically with a perforated pipe at the base to assist drainage. Can be used to convey water into a receiving drainage system or for infiltration.

Filter strips
A vegetated area of gently sloping ground designed to drain water evenly off impermeable areas and to filter out silt and other particulates.

Filtration
The removal of sediment or other particles from a liquid by passing it through a filter.

First flush
The initial runoff from an impermeable area or catchment subsequent to a rainfall event. As the runoff passes over the impermeable surface, it collects or dissolves pollutants and sediment, and this first portion of the runoff tends to be the most contaminated.

Footpath
*

Footway
Area at the side of carriageways for pedestrian movement.

Full bore
A pipe flowing at full capacity.

Geocellular
A plastic box structure situated below ground, used to attenuate runoff.

Geogrid
A plastic grid structure used to increase the strength and stability of soils and aggregates.

Geotextile
A permeable plastic fabric. It can be used to filter water and protect, reinforce, separate or drain soils.

Greenfield runoff
The rate of runoff which would occur from a site prior to any development, in its undisturbed state.

Groundwater recharge
The process of surface water passing downwards through the soils into the groundwater in the saturated zone.

Gulley
An opening in the road pavement to allow surface water to enter the drainage system, typically constructed from a prefabricated gully with metal grate cover.

Habitat
An environment where an organism or group of organisms live.

Hydrocarbons
Any chemical compound made up of hydrogen and carbon. A major pollutant formed by the engine as a by-product of combustion.

Hydrodynamic systems
Proprietary systems designed to remove floated debris, sediments and other associated pollutants from surface water, using fluid dynamics to separate the solids from liquids.

Impermeable membrane
An artificial plastic fabric which is impermeable to prevent infiltration.

Infiltration
The passage of surface water into the ground, or groundwater into a sewer.

Infiltration basins
A dry basin which is designed to promote infiltration of surface water into the ground.

Infiltration coefficient
This is a measure of the soil's permeability and determines the rate at which infiltration occurs.

Infiltration testing
Carried out during site investigation works to determine the permeability and the infiltration coefficient of the soil.

Infiltration blanket/trenches
A trench, typically filled with a permeable material, which is designed to promote infiltration of the surface water into the ground.

Local roads
Roads under the control of local roads authorities, such as general access roads, distributor roads and rural roads.

Metals
Pollutants which can be found on the road surface, such as lead, chromium, copper, nickel and zinc.

Microbial
Action of a bacterium causing disease or fermentation.

Moisture content
The amount of water present in the soil, usually given as a percentage.

Nutrients
Substances providing nourishment for living organisms, eg nitrogen & phosphorus.

Oil separators
Prefabricated proprietary system used to remove any spilled oils or hydrocarbons from surface runoff.

Peak flow
The maximum volume of water flowing in a watercourse or sewer over a certain period of time following a rainfall event.

Click map to see regional variations

Permeable concrete block paving
A surface which drains through voids between concrete blocks.

Ponds
A permanently wet depression designed to retain stormwater above the permanent pool and permit settlement of suspended solids and biological removal of pollutants.

Precipitation
The falling to earth of any form of water (rain, snow, hail, sleet or mist)

Rainfall intensity
The amount of rainfall occurring during a set unit of time, typically mm per hour.

Regional control
Surface water management for individual or multiple sites, normally in a balancing pond or wetland.

Residual risk
The risk still present after mitigation procedures have been implemented.

Retention time
The length of time that runoff is stored or detained to allow for settlement, or possibly biological action, to occur.

Return period
The frequency of an event occuring, eg a 100 year storm refers to the storm which occurs on average once every hundred years, or in other words its annual probability of exceedance is 1%.

Road Construction Consent
The process of gaining consent to construct roads, over which there is a public right of passage, to an agreed standard set by the local roads authority.

Road
*

Runoff
Water flow over the ground surface into the drainage system. This occurs when the ground is impermeable, saturated or the rainfall is particularly intense.

Sand filters
Above or below ground structures comprising single or multiple chambers with a sand bed as a filter medium providing treatment of runoff.

Scottish Water
Statutory corporation in Scotland that provides water and sewerage services.

Sedimentation
The process by which particles in suspension in a liquid settle to form a sediment.

Sediments
Particulate material that can be transported by water flow.

Sewer
A conduit taking surface water and foul sewage from roads, footways, buildings and hardstandings from two or more curtilages' and having a proper outfall, adopted by a water authority.

Silt traps
Often referred to as catchpits, they are chambers constructed within a piped system located at regular intervals not exceeding 100 m, at changes in direction and gradient and often prior to discharge of a piped system to a SUDS component. Provision is made for collection of silt by a sump which provides a permanent wet well.

Site control
Surface water management in a local area or site, eg picking up building roofs, car parks and other impermeable areas.

Source control
The control of surface water runoff at or close to the source.

Sub-base
A layer of unbound material laid onto the subgrade that provides a stable foundation for a pavement surface.

Sub catchments
A division of a catchment, to allow runoff to be managed as near to source as possible.

Subgrade
The material onto which the road pavement is constructed, usually natural in-situ, but may include capping layer.

Surcharge
Flow conditions where the hydraulic gradient is above the pipe soffit.

Surface course
The top layer of the road pavement which is in contact with the vehicular traffic.

Sustainable Urban Drainage Systems
A sequence of management practices and control techniques designed to drain surface water in a more sustainable way than some previous practices.

Swale
A shallow vegetated channel designed to convey and retain surface water runoff, and which can also allow for infiltration. The vegetation filters suspended solids.

Treatment volume
The proportion of the total runoff from impermeable areas which is required to be retained and treated to remove pollutants.

Trunk roads
Managed by Transport Scotland, a major road, usually connecting cities or large settlements, which is the recommended route for long-distance and freight traffic. Quite often dual carriageways or motorways.

Click map to see regional variations

Verge
Grassed margin bordering the carriageway and footways, but still located within the adoptable road extent.

Void space
The open spaces between gravel media which can are used as storage in permeable pavements and other treatment facilities.

Vortex separators
A proprietary SUDS system used for removal of suspended solids using hydrodynamic forces (see Hydrodynamic systems).

Waste Water Treatment Works
A facility to treat and make less contaminated domestic and/or industrial effluent.

Watercourse
Any natural or manmade channel which water flows through.

Wetlands
A flooded area in which the water is shallow enough for the growth of bottom rooted plants.

Acronyms

CAR	*Controlled Activities Regulations*
CBR	*California Bearing Ratio*
CDM	*Construction Design & Management*
CIRIA	*Construction Industry Research Information Association*
CSO	*Combined Sewer Overflow*
DMRB	*Design Manual for Roads and Bridges*
NIEA	*Northern Ireland Environment Agency*
NIHE	*Northern Ireland Housing Executive*
NIW	*Northern Ireland Water Ltd*
PAN76	*Planning Advice Note 76*
PEPG	*Planning and Environmental Policy Group*
RAMP	*Roads Asset Management Plan*
RCC	*Road Construction Consent*
RoSPA	*The Royal Society for the Prevention of Accidents*
SEPA	*Scottish Environment Protection Agency*
SFRA	*Strategic Flood Risk Assessment*
SNIFFER	*Scotland & Northern Ireland Forum For Environmental Research*
SPP	*Scottish Planning Policy*
SUDS	*Sustainable Urban Drainage Systems*
SWMP	*Surface Water Management Plan*
TRRL	*Transport and Road Research Laboratory*

Click map to see regional variations

UID *Unsatisfactory Intermittent Discharge*

WEWS Act *Water Environment and Water Services (Scotland) Act 2003*

WLC *Whole Life Costing*

WWTW *Waste Water Treatment Works*

Application Forms

Click on the form titles below to access editable PDF versions for your own use.

Quality Audit Summary Report Template

CC1 - Construction Consent Application

CC2 - Docquets of Service

CC3 - Notice of Service

CC6 - Adoption Certificate

CC8 - Carriageway Design Certificate

CC9 - Construction Consent Checklist

DCC1 - Design Certificate for Road Lighting

DCC2 - Construction Details and Visual Inspection Certificate

DCC3 - Electrical Inspection and Test Certificate

Click map to see regional variations

Local Authority Variations

Click on the form titles below to access each local authority's variations. The 'Master' form is an editable PDF which can be completed with your own details.

* NB no variations intimated at this stage

Master Local Authority Variation Form

Aberdeen City

Aberdeenshire*

Angus*

Argyll & Bute*

Clackmannanshire*

Dumfries & Galloway

Dundee City

East Ayrshire*

East Dunbartonshire*

East Lothian

East Renfrewshire*

Edinburgh*

Falkirk

Fife

Glasgow

Highland

Inverclyde*

Midlothian*

Moray

North Ayrshire*

North Lanarkshire*

Orkney*

Perth & Kinross*

Renfrewshire

Scottish Borders*

Shetland*

South Ayrshire*

South Lanarkshire

Stirling*

West Lothian*

West Dunbartonshire*

Western Isles*