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DESIGN GUIDE NEW RESIDENTIAL AREAS

Glasgow
CITY COUNCIL

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Development and Regeneration Services
Land and Environment Services

Glasgow
CITY COUNCIL

MARCH 2013

People want to live in Glasgow. In order to address the demand for new houses Glasgow City Council is committed to building 3500 new homes over the next 5 years.

In spite of the challenges the City is called to respond to, this is an exciting time for Glasgow as the city is at the heart of delivering a series of high profile residential projects including The Commonwealth Games Village in 2014; the on-going Transformational Regeneration Areas and the Community Growth Areas. All these will give the City the opportunity to create the new neighbourhoods of the future.

This design guide builds on the principles established in *Designing Streets* and seeks to lay the foundations for good quality residential neighbourhoods that can foster safety and equality in the community, have a positive sense of place and that can last the test of time.

The Design Guide is the result of the inter-disciplinary work between Development and Regeneration Services and Land and Environmental Services and advocates the need for good multidisciplinary design teams working together from the start of the process as a crucial ingredient for successful development.

The City is well aware that the design of successful places cannot happen without the commitment and integrated thinking of all stakeholders involved and is determined to positively making change for an improved dialogue among all parties from the early stages.

This guide is also about putting in place the mechanism to ensure an aligned process involving planning permission and road construction consent for an effective and quicker decision making process.

FOREWORD

In the guide the themes of integrated place, movement and open space have been used to develop the Core Principles (*Placemaking; Movement; SUDS; Flood risk and management; Integrated open space* and *Integrated parking*) with a view to help us understand how sites could be developed in a sustainable way by taking cognisance of the varied characteristics that make each site unique and of its context from the early stages of the design.

The City is ready to meet the challenges that it faces in the forthcoming years and will continue to work hard to encourage and create the conditions that will attract inward investment.



Liz Cameron

Convenor of Development
and Regeneration Services



James Coleman

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PURPOSE AND VISION

Glasgow's *Design Guide for New Residential Areas* builds on and interprets the guidance set out in *Designing Streets*, taking cognisance of the City's physical context and policy requirements, to assist in the delivery of better designed new residential areas.

The Guide draws together the Council's key planning and road design requirements. It will be used by Council officials to support their assessment of residential proposals that require planning and/or road construction consent. Developers and all professionals involved in the regeneration of the City should use it to understand Glasgow's expectations for the design of new residential areas. The Guide seeks to provide a clear and consistent approach to design, embodying the core principles of Designing Streets, to deliver higher quality neighbourhoods and efficiency savings for developers. Its principal aims are:

- To promote best practice and improve the process for obtaining planning permission and roads construction consent;
- To provide developers/applicants with easy-to-use guidance that explains the steps necessary to secure planning and road construction consent in the most time-effective manner;
- To promote the creation of safe and integrated neighbourhoods that offer choices of movements for all users and foster healthy active lifestyles; and
- To encourage overall quality and distinctiveness in new developments.

All developments must also take into account planning policy, which is set out in the local development plan: *Glasgow City Plan 2* and the strategic development plan: *the Glasgow and the Clyde Valley Strategic Development Plan 2012*.





STATUTORY CONSENTS

Development of new residential areas would require:

Full Planning Permission,

or

Planning Permission in Principle, followed by **Approval of Matters Specified in Conditions**

and also require

Roads Construction Consent for associated new roads and Road Bond where appropriate;

and (if required)

Written consent (Section 56) from the roads authority for any works on or adjacent to the existing public road.

(*See Appendices 1 and 2 for further guidance*)

EXECUTIVE SUMMARY

This document sets out guidance for developers and designers of new residential areas.

In summary, this document sets out the following key changes in approach:

When considering a residential development, the developer will now be required to take on board the six Core Principles set out in the Guide. These are: Placemaking, Design for Movement, Sustainable Urban Drainage Systems, Flood Risk Assessment and Flood Management, Integrated Landscape and Open Space, and Integrated Parking Strategy.

The developer must then carry out appraisals of the site and its context, and form a conceptual strategy which can then be developed into a detailed design. Both the urban design and street layout will need to be considered as part of this. The design of a new development therefore will be informed by the local characteristics, topography and setting, and this should result in a development which has a distinctive identity.

The process should involve discussions with both the planning and roads authority at key points, starting before the detailed design is reached. A design audit which confirms how this process has been followed, and how this has influenced the resulting design, should be submitted with any application for planning permission. Once a developer has followed this process, an application for Roads Construction Consent could be submitted at the same time as the planning application. This would reduce consideration times for the two processes. If these detailed pre-application appraisals and discussions do not take place, the potential for reducing timescales will not be as great. The Council undertakes to provide resources for these pre-application discussions.

As Sustainable Urban Drainage Systems (SUDS) need to be provided for new housing developments, it is important that a drainage strategy is worked out for the whole development at an early stage, and should form part of the conceptual layout. The surface water drainage requirements can have a significant effect on the layout of the site.

The design and layout of new residential areas should create a network of streets, places and paths which will encourage walking and cycling. The network should be clear, easy to navigate and allow cyclists and pedestrians to feel safe.

New streets should provide an attractive environment for pedestrians by slowing vehicle traffic, normally to a maximum of 20 mph. This should be achieved, where possible, by a combination of urban form, junction and carriageway design, rather than vertical traffic calming measures.





Good public transport opportunities should be available at the initial phase of any new residential development, either by linking to existing networks or providing new routes. Pedestrian and cycle routes should be linked to public transport provision, and proposed bus routes and bus stops should be marked on the plans submitted for planning permission.

The width of the street is important. If streets are too wide this does not create a positive sense of place and community. Streets now often have to accommodate swales and other sustainable urban drainage features as well as pedestrian footways, the carriageway and street trees. Private parking in front gardens also makes streets wider, and means that cars become over-dominant in the street. Front gardens should be reduced to discourage front garden parking. Parking spaces and garages should be located to the side of dwellings or in rear gardens or parking courts.

In order to maintain an appropriate street width, carriageways can be reduced in width, except where they are identified as a public transport route. Where streets are narrower they should widen out in appropriate places to provide visitor parking in parallel bays. The design should make it clear to drivers which areas are suitable for on-street parking.

Street trees are encouraged as part of the public street to enhance biodiversity and link habitats. They can also help to provide a human scale to the proportions of the street. Street trees can also have a traffic calming effect. Street trees planted in the verge of streets will be considered as part of the adopted street.

Open space should be provided within new residential developments and linked to existing open spaces. The use of a properly integrated green infrastructure is encouraged. It should be clear from an early stage in discussions who would be responsible for the maintenance of open spaces including both hard landscaping such as public realm areas, and green space or parkland. In smaller developments, designers should consider areas of “playable” space which provides opportunities for children’s play in landscaped spaces without traditional play equipment.

Shared surfaces, where the carriageway is shared by vehicles and pedestrians, should only be considered where the volume of traffic is low and consists mainly of residents of that street. Vehicle speeds in shared surface roads should not exceed 10 mph and the road layout and design should encourage this. Street materials, if they are not asphalt, should be discussed at an early stage.

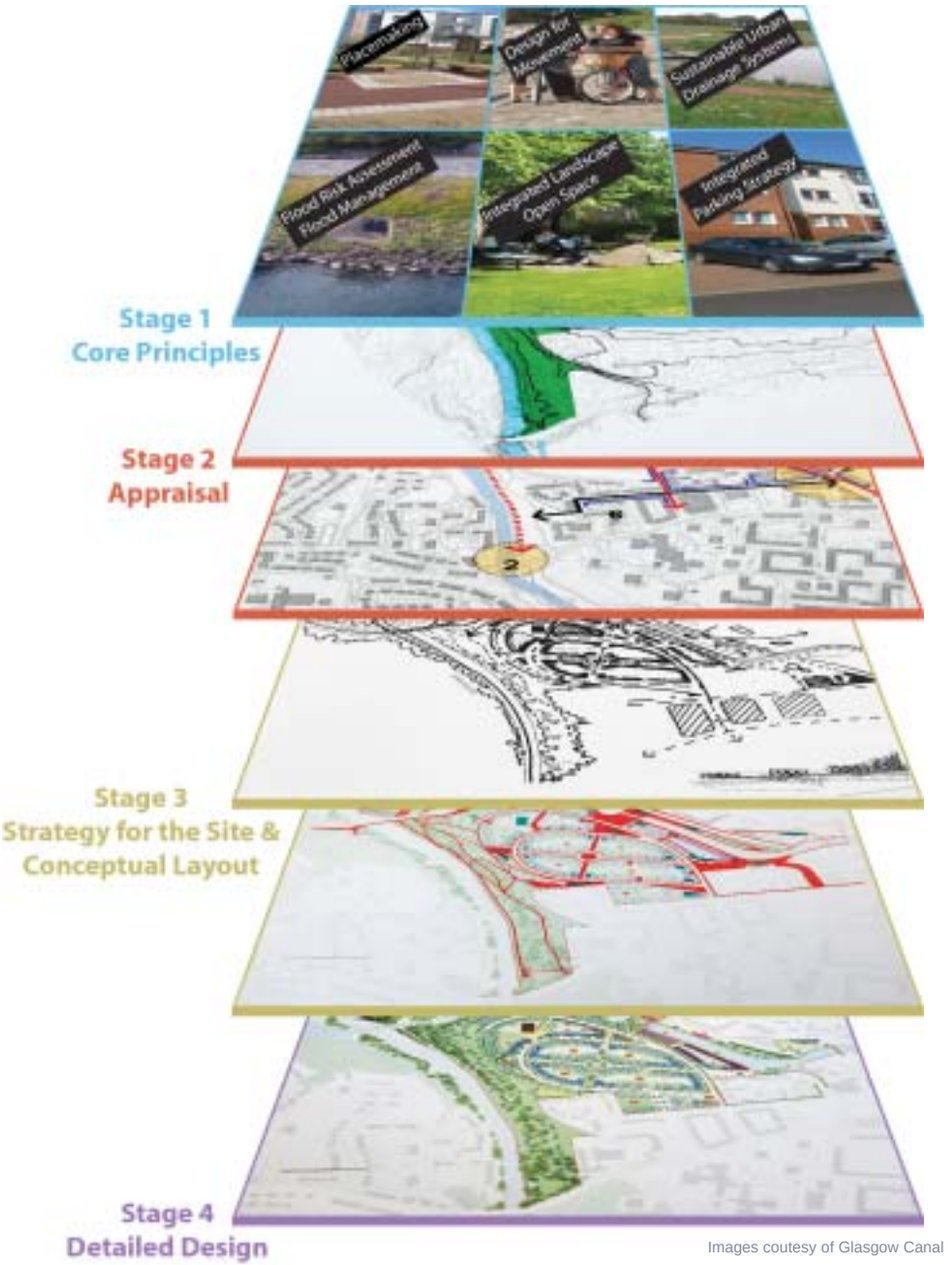
The guidance in the document has taken into account the needs of people using the street who have visual impairment or restrictions on mobility.

DESIGN GUIDE: THE PROCESS

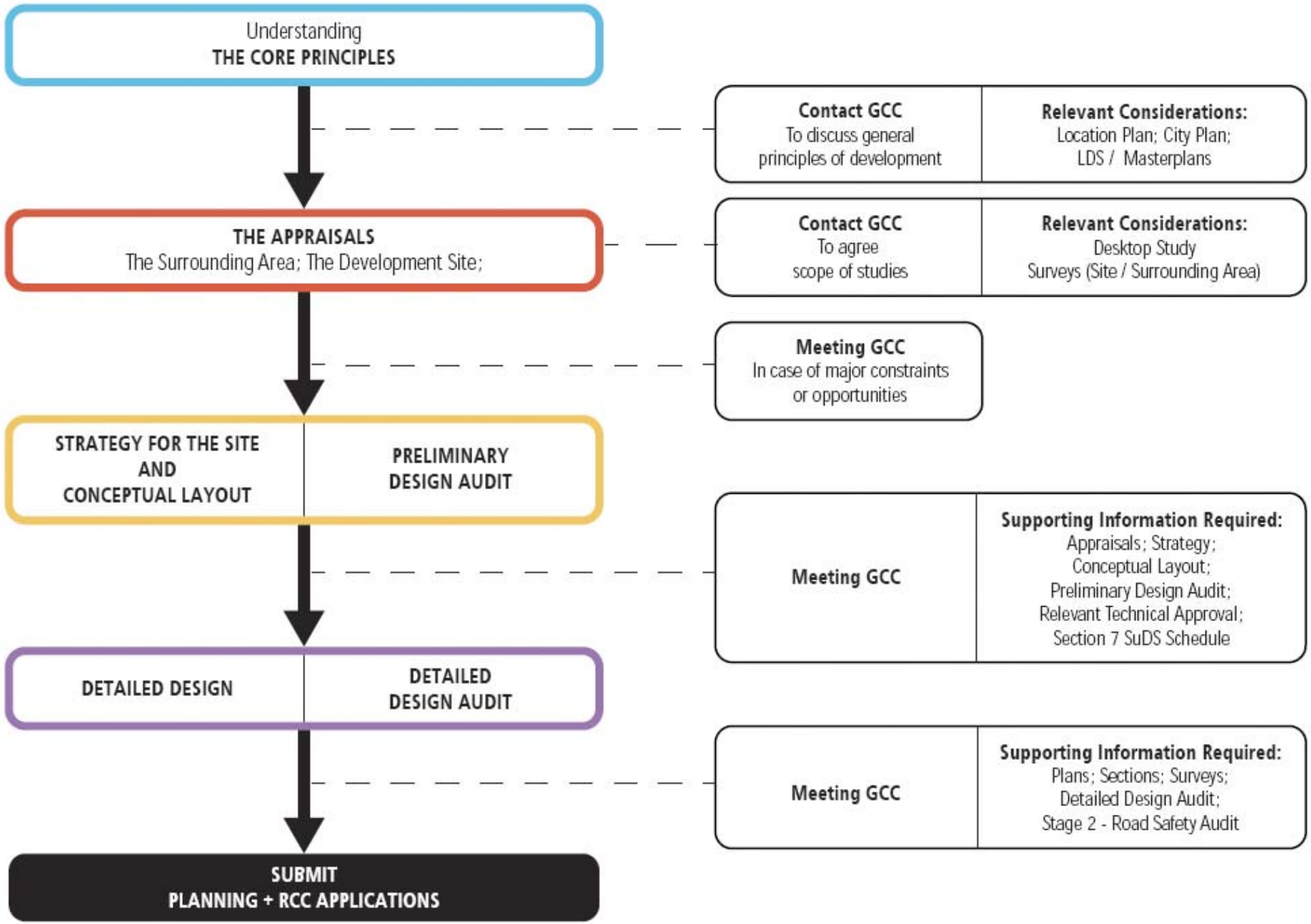
The Design Guide sets out what is expected of both the Council and developers when considering new residential developments. It breaks the process into key elements that, taken together, represent a holistic approach to the design. Applicants should demonstrate, through these process stages and a Design Audit process, that all core principles have been successfully addressed.

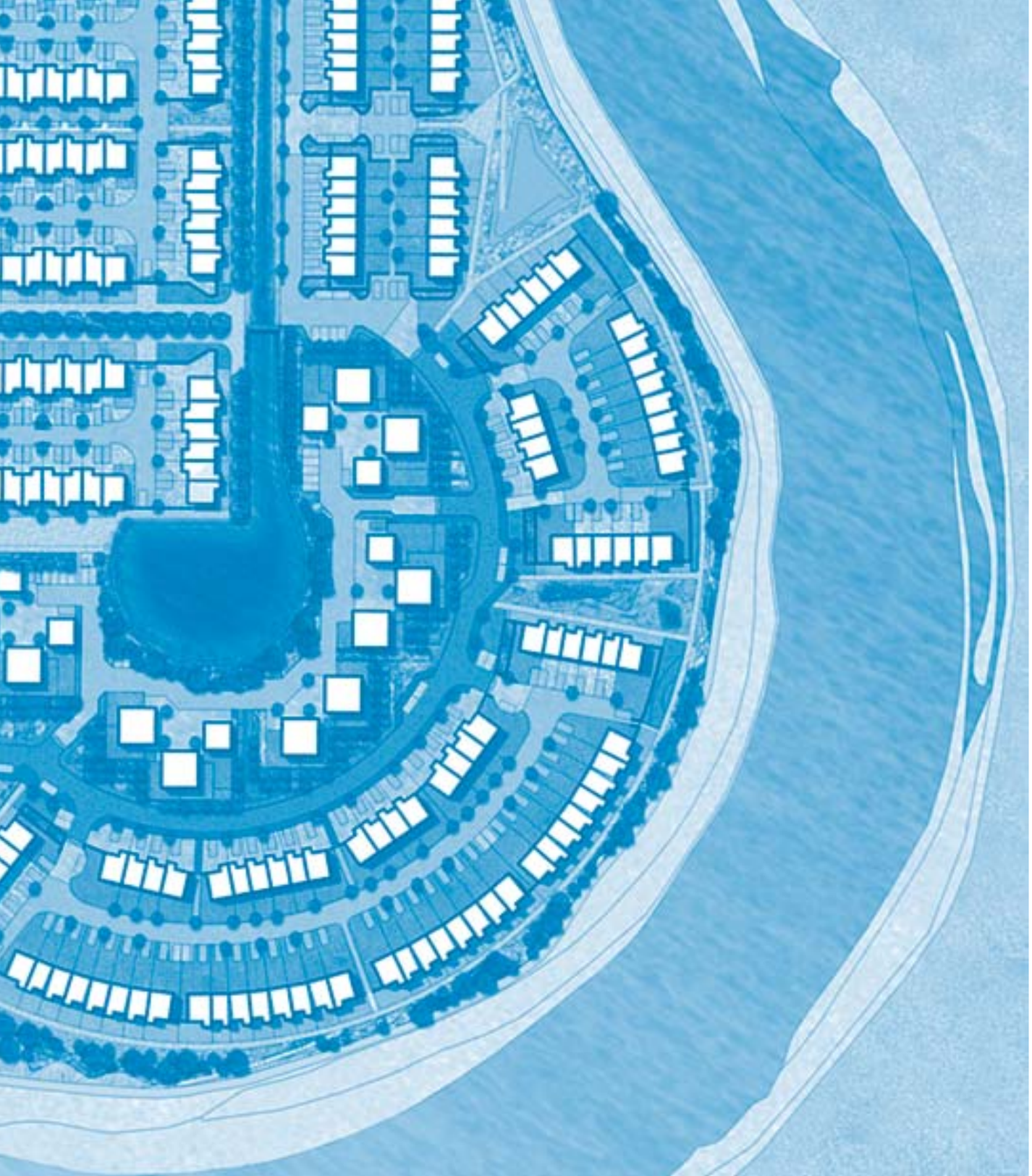
The Design Guide identifies the supporting material, evidence and criteria that the Council will use to assess proposals at each stage. The Guide will also identify those stages where it is either advisable or recommended to meet with Council officers.

The Council undertakes to provide more detailed pre-application advice if the process below is followed.



Images coutesy of Glasgow Canal Partnership/ Elder & Cannon


Understanding
THE CORE PRINCIPLES
Contact GCC
To discuss general principles of development
Relevant Considerations:
Location Plan; City Plan; LDS / Masterplans
THE APPRAISALS
The Surrounding Area; The Development Site;
Contact GCC
To agree scope of studies
Relevant Considerations:
Desktop Study
Surveys (Site / Surrounding Area)
Meeting GCC
In case of major constraints or opportunities
STRATEGY FOR THE SITE AND CONCEPTUAL LAYOUT
PRELIMINARY DESIGN AUDIT
Meeting GCC
Supporting Information Required:
Appraisals; Strategy; Conceptual Layout; Preliminary Design Audit; Relevant Technical Approval; Section 7 SuDS Schedule
DETAILED DESIGN
DETAILED DESIGN AUDIT
Meeting GCC
Supporting Information Required:
Plans; Sections; Surveys; Detailed Design Audit; Stage 2 - Road Safety Audit
SUBMIT
PLANNING + RCC APPLICATIONS



STAGE 1

GETTING THE BASICS RIGHT

1.0 UNDERSTANDING THE CORE PRINCIPLES:

Placemaking
Design for Movement
Sustainable Urban Drainage Solutions
Flood Risk Assessment & Flood Management
Integrated Landscape and Open Space
Integrated Parking Strategy

1.0 UNDERSTANDING THE CORE PRINCIPLES

Objective: ***At this stage the developer is required to gain an understanding of Glasgow's Core Principles for the design of new residential developments. These should inform the concept of the design from its inception and form the basis of all the subsequent stages as identified in the***

PLACEMAKING

New developments should have a distinctive and positive identity. Buildings, streets and open spaces should be designed to generate an understandable layout by way of routes, informal spaces and key focal points that provide a sense of place and allow for informal interaction among people.

To achieve these aims, the design of new residential developments should:

- take full account of the physical characteristics of the site. The design should create a locally distinctive layout that takes account of the orientation of buildings in relation to both streets and amenity space. The layout should enhance views in and out of the site;
- create safe, welcoming spaces;
- consider built forms and key physical features which generate active street frontages and are arranged to reinforce the presence of gateways or to enhance features that create visual interest;
- provide a mix of housing types that respond to community needs and the desire of residents to remain in a local area as their needs change. Thus, new developments should be designed to allow for a degree of adaptability both within the curtilage of the property and within the open space;
- include integrated community facilities where these are deemed sustainable, with the aim of decreasing dependency on the car to access general facilities, and to foster a sense of community among residents;









DESIGN FOR MOVEMENT

The relationship between buildings, spaces and the routes that connect them plays a fundamental role in the creation of distinctive places and walkable neighbourhoods. The design of new residential developments should give place and movement equal consideration. Layouts should encourage walking and cycling and discourage car based trips; therefore they should:

- create an integrated permeable network of streets, footways, paths and spaces that are conveniently connected and offer choices of movement;
- provide pedestrian and cycle desire lines which link to the surrounding network; these should not be segregated from the road network;
- provide key links to any existing local communities, facilities, schools, shops, public transport, hospitals etc;
- identify carefully considered and potentially commercially viable public transport routes to, from and through the site; and
- ensure all dwellings are served by a potentially adoptable road.

The control of vehicle speeds and vehicle routing is crucial to the successful creation of a sense of place.

SUSTAINABLE URBAN DRAINAGE SOLUTIONS SYSTEMS (SUDS)

Climate-change and the need to consider the capacity of the existing sewer 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 to provide SUDS. 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 body. This will normally mean Scottish Water and/or the Council.
- 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, where possible.

Initial investigations on drainage and SUDS should establish the soil and hydrological conditions of the area and the site. The design principles should be agreed with the Council including future regime for maintenance, discharge location and methodology of calculating surface water discharge rates.

Developers should also note the following:

- The appropriate levels of SUDS treatment should be provided in new developments to meet the requirements of the *Water Environment and Water Service (Scotland) Act 2003*.
- Any in-curtilage SUDS (private) should have a strategy 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

Glasgow City Council and Scottish Water will enter into legal agreements to share the maintenance of surface water drainage systems



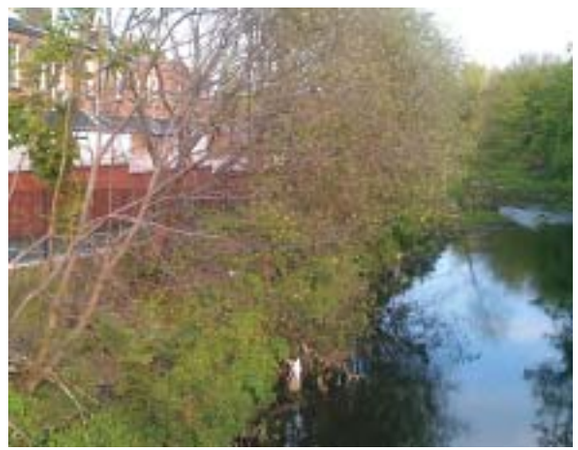
FLOOD RISK ASSESSMENTS AND FLOOD MANAGEMENT

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

If any of the aforementioned flooding sources are identified there will be a requirement to carry out a Flood Risk Assessment. The Council's Flood Management team should be consulted at the conceptual stage of all development to discuss these requirements. Details of the main requirements can be found in the Council's *Flood Risk Assessment and Drainage Impact Assessment: Planning Guidance for Developers*







INTEGRATED LANDSCAPE AND OPEN SPACE

Well designed landscapes and open spaces can add more value to high quality housing and provide a commercial advantage in a competitive marketplace. The design of new residential developments should:

- link key landscaped features, biodiversity elements and public open space to form an integrated green network within the site and the wider area. Where this is not possible, close and distance views should be established as a means of indirectly linking green areas, with green 'stepping stones' provided by planting and/or street trees;
- design landscape elements that are multi-purpose and connect to each other and allow for species movement through a green network;
- design landscape features to take full cognisance of existing movement patterns, the location of housing and site topography;
- clearly identify both formal and informal open spaces. These spaces should have a sense of purpose and be appropriately located to foster ownership and stewardship by local residents; and
- put in place a sustainable long-term maintenance strategy.





INTEGRATED PARKING

The way parking is handled is a major factor in determining the quality of a residential development. Parked vehicles can dominate the environment, affecting both how areas look and residents' and visitors' perception of safety.

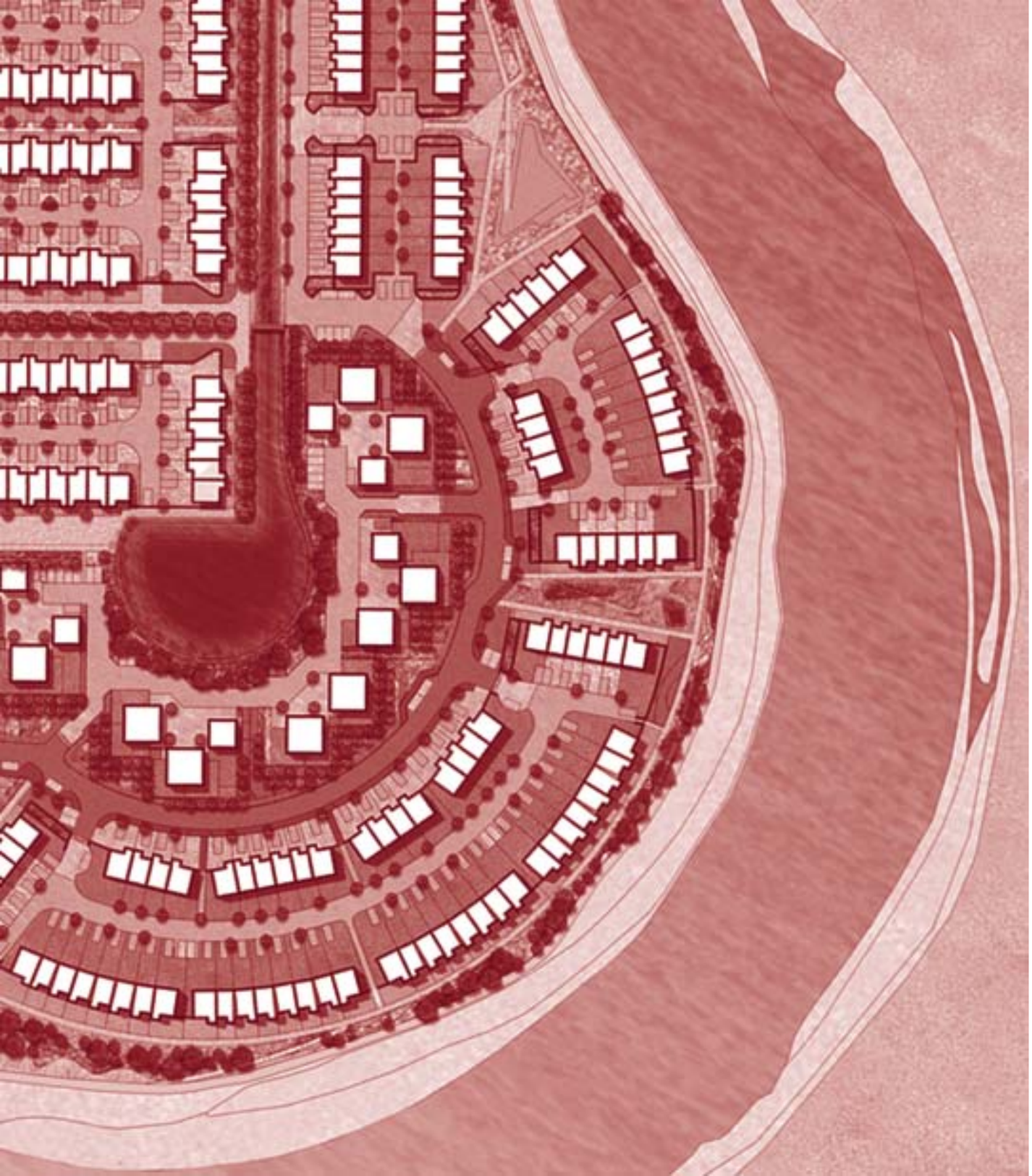
- Good design should accommodate the requirements of car users, while locating parking appropriately to minimise its visual and physical impact in the street.

The current parking standards are set out in City Plan Policy *TRANS 4 Vehicle Parking Standards*. See also Section 4 Detailed Design for detailed guidance.









STAGE 2

2.0 THE APPRAISAL

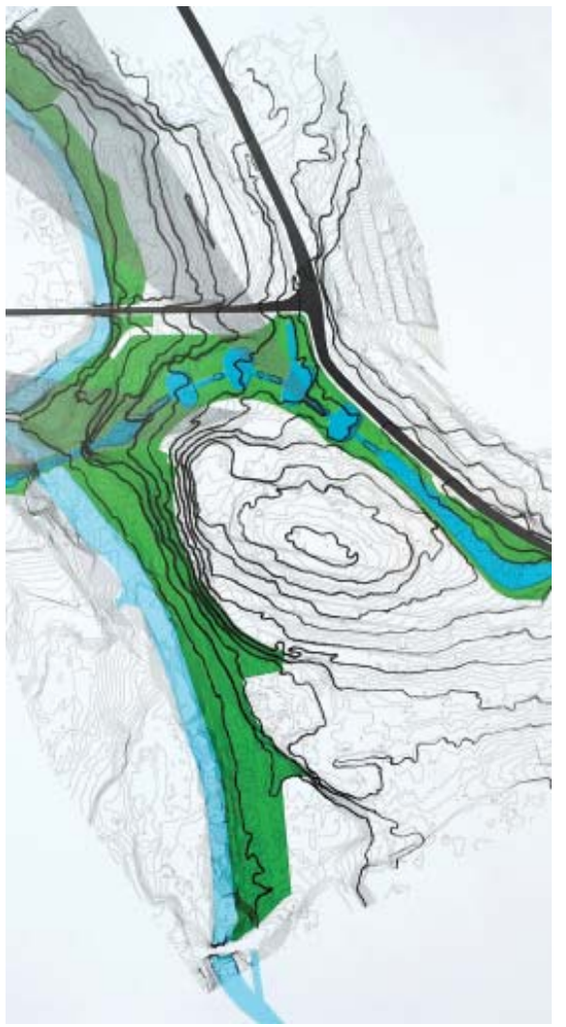
2.0 THE APPRAISAL

Objective: ***At this stage the developer is expected to gain a full understanding of the site and its wider context by carrying out a series of desktop studies. These will emphasise its physical characteristics, constraints and opportunities. The outcome of the Appraisal should be interpreted in light of the Core Principles as examined in Stage 1.***

The appraisal should be split into three phases:

1 - A desktop study. This should identify any key constraints and opportunities which will influence how the site is developed. (See **Table 1** below)

2 - Following the desk top study, the developer should contact the Council with the results, to agree the parameters of further surveys. (See **Table 2** below)



3 - The developer must also carry out an assessment addressing the Core Principles. In doing this, it will be necessary to look beyond the boundaries of the site. This will allow the potential development's connections with the surrounding area to be assessed. This assessment should take the form of a narrative, with schematic drawings where applicable. (See **Table 3** below)

TABLE 1

Desk top studies may include:

- Planning Policy History
- Site History
- Site Ownership
- Listed Buildings / TPOs / Conservation Areas
- Utilities (including sewer capacity)
- Geotechnical
- Contaminated Land
- Archaeology
- Landscape and Ecology
- Hydrology (watercourses, rights of discharge and flood risk)
- Publicly Adopted Roads (including Stopping Up)
- Public Rights of Way / Passage and Core Paths
- Parks and open space

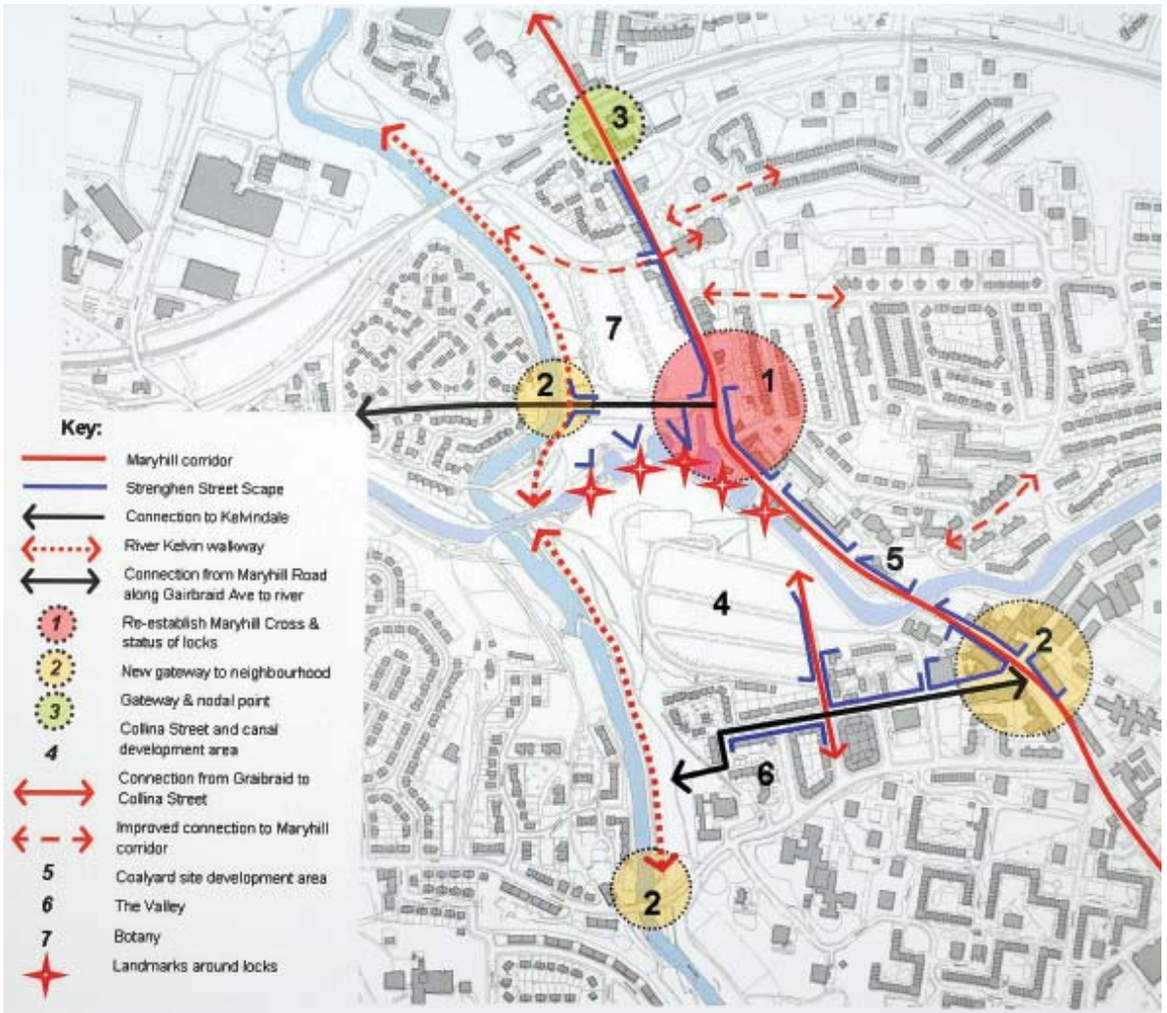


TABLE 2

Surveys will usually include:

a) **A topographic survey** of the site showing contours, spot heights at no less than 0.5 metre intervals, boundary features and watercourses. The topographic survey should not stop at the boundary of the site but include adjacent areas; the extent of the adjacent areas to be included should be discussed with the Council. Cross sections for key locations may also be required.

b) **A photographic survey** of the site and surrounding area accompanied by a location plan indicating the location of the images.

c) **Other surveys** such as Transport Assessments, Drainage Impact Analysis, Environmental Impact Assessments, Tree Surveys and Habitat Surveys, as considered necessary by the Council.

d) **Flood Risk Assessments** and Flood Management: this assessment will give consideration to the risk associated with the flooding source and how this may be mitigated. Any proposed mitigation measures will require to take account of impact upon functional flood plain, climate change, river levels etc and illustrate how the development will not increase flood risk elsewhere. Section 204 of the Scottish Planning Policy, Risk Framework provides guidance on the appropriate levels of protection. These standards have been clarified in City Plan 2.

Some of the surveys will also need to be submitted with the planning application (*see Appendix 1),* but for planning applications in principle, all these surveys may not be required.

TABLE 3

The appraisal should consider the following elements of the Core Principles:

Placemaking

- the activities generated by the use of the existing spaces;
- key nodes, focal point or gateways;
- the arrangement, size and shape of adjacent urban blocks;
- the densities, building heights and types in the area;
- the pattern of development i.e. is it formally informal/linear or enclosed and plot sizes;
- the scale, massing, materials and architectural style of the built form and any key physical features;
- the townscape and any existing landmarks;
- the site's development plan designation and or presence of listed buildings, and
- views in and out of the site (include photographs/sketches).





Design for Movement

- the nature and use of the existing surrounding streets including a clear understanding of existing movement patterns, and the volume of vehicular and pedestrian traffic;
- potential access points into the site for pedestrians, cars and cyclists;
- any existing rights of way paths (including rights of way, core paths, desire lines and designated cycleways) , public transport routes and bus stops including details of distances from the site to these existing facilities;
- the walking distances to principal destinations such as schools, shops and community facilities;
- Any barriers to access from the site to existing transport routes or local facilities.

SUDS

- drainage and water courses (including rights of discharge);
- existing SUDS such as ponds or swales. The potential to integrate these into the proposed development should be considered;
- current SUDS maintenance regimes;
- local environmental conditions including microclimate.

Flood Risk Assessments and Flood Management

- Flood risk from all sources

Integrated Landscape and Open Space

- topography;
- paths including rights of way, core paths, desire lines and designated cycle ways;
- open spaces, formal and informal and their existing use;
- location and type of existing trees and other vegetation;
- existing areas of biodiversity/ecological importance, including SSSIs and other natural environmental designations;
- existing maintenance responsibilities for identified open space and greenspace

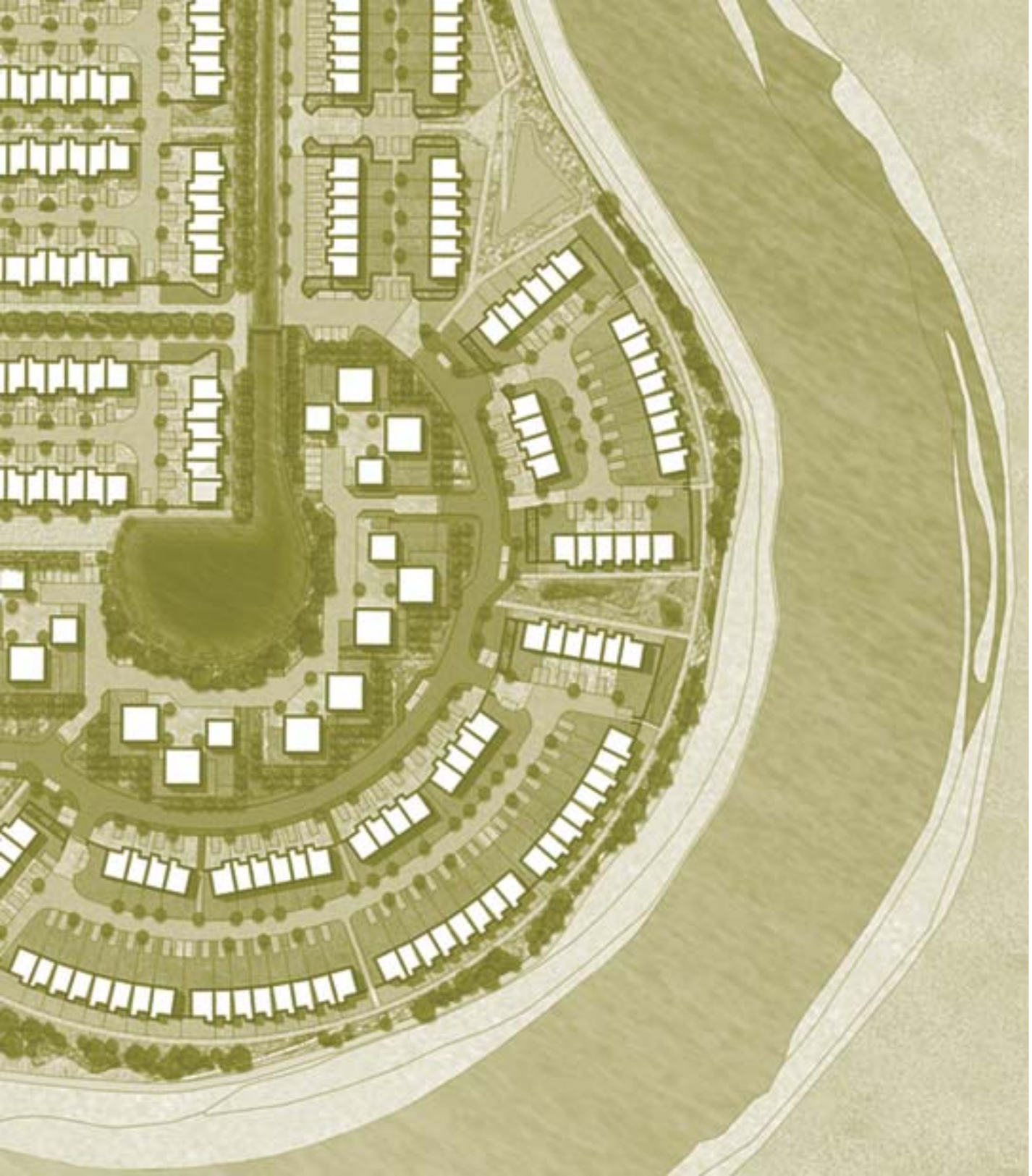
Parking Strategy

- existing parking provision in the area ; this should be surveyed both during the day and evening;
- parking location / type;
- constraints caused by existing parking in the area, e.g. obstructing footways or access for service emergency vehicles
- any large unused parking areas





The three parts of the appraisal will inform the next stage, the *Strategy for the site and Conceptual Layout*, and should be submitted to the Council as part of the pre-application discussions.



STAGE 3

3.0 STRATEGY FOR THE SITE & CONCEPTUAL LAYOUT

3.1 PRELIMINARY DESIGN AUDIT

3.0 STRATEGY FOR THE SITE AND CONCEPTUAL LAYOUT

Objective: *From the analysis carried out in the Appraisal, the developer will be required to formulate a strategy for the site informed by the findings of the previous stages (Understanding the Core Principles and The Appraisals). This will aim to demonstrate how the constraints and opportunities offered by the site will be addressed and enhanced. The strategy will then be translated into a conceptual layout that should aim to identify the basic spatial and functional relationships of all its components (the houses, the streets and the space between).*

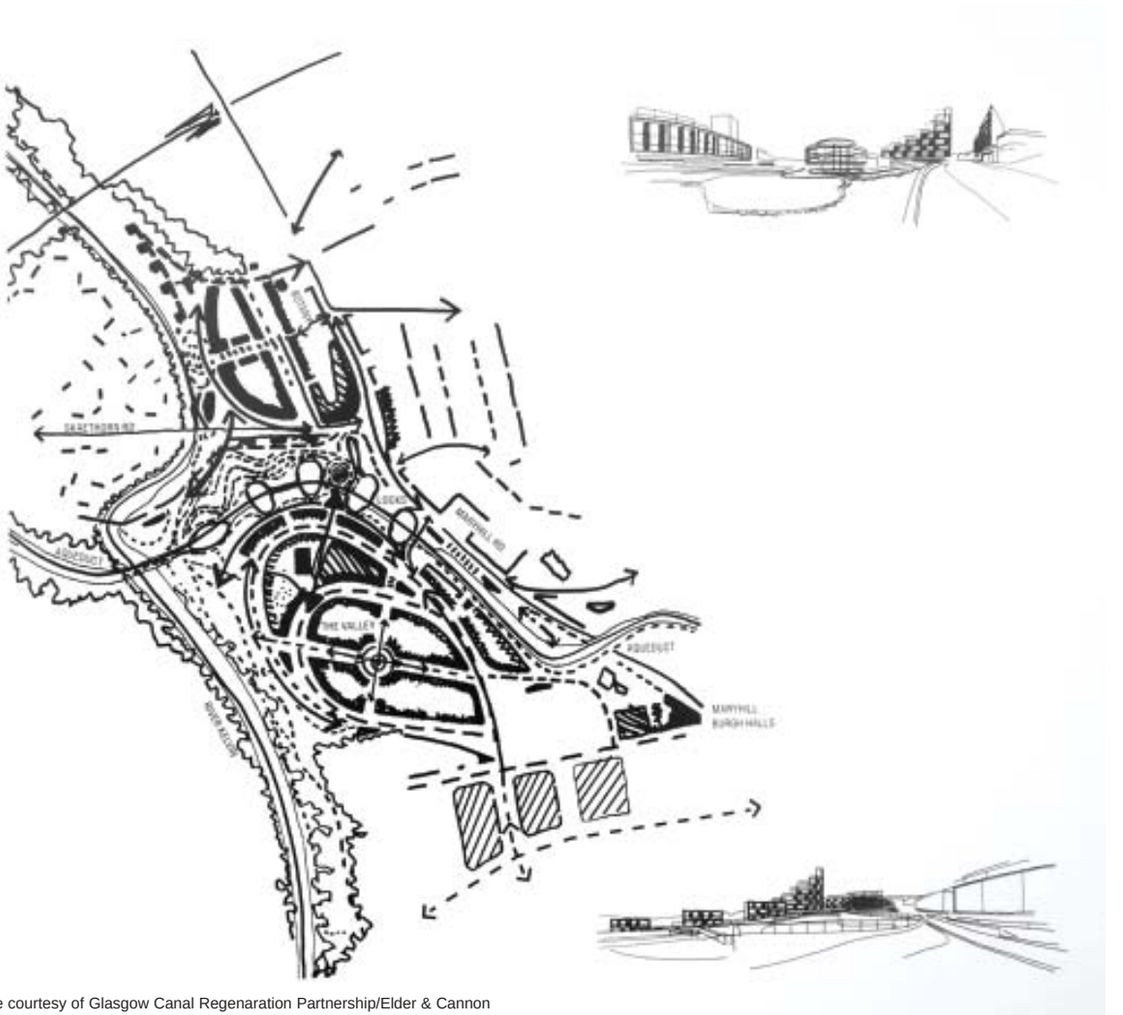


Image courtesy of Glasgow Canal Regenaration Partnership/Elder & Cannon

The **Strategy** should include a written narrative of how the site will be developed and demonstrate a clear understanding of the layout's main components: streets, buildings and greenspaces.

The **Conceptual Layout** should address the topography, highlighting how the key physical and environmental features of the site will be integrated on the site and to its surrounding area, and indicate the internal links and their associated wider connections. The conceptual layout should take the form of an indicative schematic layout rather than a detailed layout. The developer should, however, also consider the Construction Consent Guidance for New Residential Streets *(See Appendix 2).*

As part of this stage, the developer could submit a Bavarian B-Plan of the conceptual layout. This is a simple technique for evaluating and comparing layouts which highlights in different colours the key components of a layout.

Link to Bavarian B Plan info on the web

For further guidance see the examples below and the Scottish Government's Planning Advice Note *PAN 83 Masterplanning*




care home
energy centre
community centre
cycle routes

3.1 PRELIMINARY DESIGN AUDIT

Objective: ***At this stage the developer should review the proposed scheme to ensure that the core principles have been incorporated. Design Audits can be used to document how these core principles and any safety concerns have been successfully addressed.***

What is a Design Audit?

A Design Audit is a way of checking that a proposed scheme meets all the aims of the design guidance. A Design Audit should assess the design in terms of accessibility for pedestrians, cyclists, motorists, and public transport. Pedestrian accessibility should include all users of the street including those with visual or mobility impairment.

A Design Audit should also assess the quality of place and the visual apperarance of the street and could include an assessment of how the street will be used by the community. Community engagement can also be used to inform designers of local issues at pre-application stage, and this will be formal requirement if development is considered major in terms of planning legislation.

Design Audits should also take into account the Road Safety Audit process which is detailed in Stage 4.

The amount of detail required in an audit will depend on the scale and complexity of a site. For simpler sites, for example where only one street is proposed, a preliminary design audit may not be required. Requirements for individual schemes should be established at an early stage through discussion with the Council.

If required, a Preliminary Design Audit should be undertaken following Stage 3 of the design process. It will look over the stages of the design so far, and check that the Core Principles of the Design Guide have been met.

At this stage, the designers should check that the proposals take into account the principles of a road safety assessment and/or self check Road Safety Audit, depending on the scale and complexity of the scheme. For more details, refer to Appendix 2: Construction Consent Guidance for New Residential Streets.

A meeting with the Council should be arranged following this submission.

(see 'The Process Stages' - Page 10)



STAGE 4

APPLYING THE GUIDE

4.0 THE DETAILED DESIGN

The Layout
Parking Provision and Layout
SUDS and Flood Management
Landscape, Amenity Open space and Recreatlon
Walking, Cycling and Public Transport
Building Lines, Entrances and Privacy
Aspect, Orientation and Daylighting
Services, Utilities and Street Lighting
Street Materials and Street Furniture
Refuse Containment and Collection

4.1 DETAILED DESIGN AUDIT

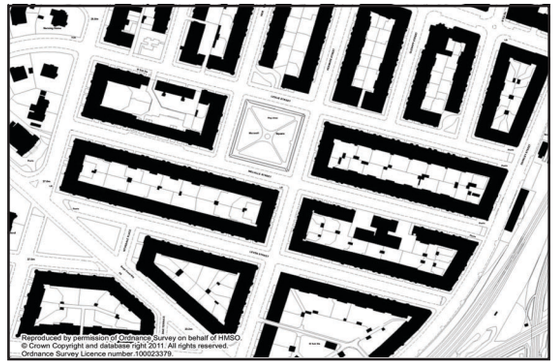


4.0 DETAILED DESIGN

Objective: ***From the outcome of the Preliminary Design Audit the developer is now required to develop the conceptual layout into a detailed plan that will comprise the detail of all aspects of the design. This will subsequently form the basis of the formal submission to Glasgow City Council for planning permission and Roads Construction Consent.***

The following section of the guidance will make reference to some housing typologies which have been identified as the main typologies in the design of new residential areas (High Density and Tenement, Terraced Housing, Detached and Semi-Detached). Further guidance on application procedures and requirements are provided in the *Appendices* in *Housing Typologies - Example Layouts.*





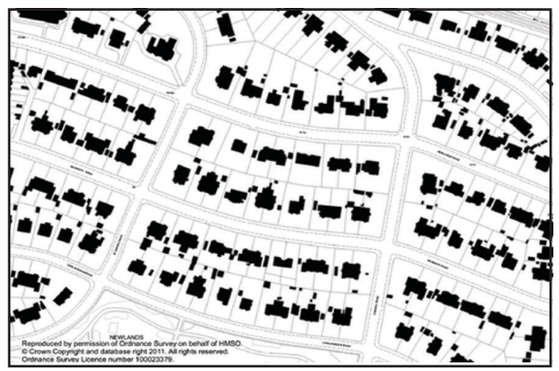
- High Density and Tenemental Housing





- Terraced Housing





- Detached and Semi-Detached





THE LAYOUT

Streets can fulfil a complex variety of functions. Their design requires a thoughtful approach that balances the needs of different users; it is therefore essential that a multi-disciplinary approach giving equal consideration to the following is adopted:

- The Layout
- Parking
- SUDS and Flood Management
- Landscape, Amenity Open space and Recreation
- Walking, Cycling and Public Transport
- Building Lines, Entrances and Privacy
- Aspect, Orientation and Daylighting
- Services, Utilities and Street Lighting
- Street Materials and Street Furniture
- Refuse Containment and Collection

Overview

Residential streets should be designed to ensure that vehicle speeds do not exceed 20mph. A traditional grid-pattern layout may help to control vehicle speeds and will provide maximum connectivity for pedestrians and cyclists.

Street Proportions

Street width and building height should be considered together in terms of the function of the street and its location. To provide a clear sense of enclosure building heights should be in proportion to the width of the street. Height to width ratios of 1:1.5 to 1:3 provide good spatial enclosure. Ratios less than 1:4 will usually require street trees to create an adequate sense of enclosure.

Higher ratios may be appropriate in central urban areas but, generally, where higher density housing over six storeys is proposed, streets should be wider to accommodate street trees to provide a human scale, visual amenity and mitigate on-street car parking.

Variation of building height can provide visual interest and break up the overall mass of a development and should respond to the type and location of the street. Generally, in tenemental neighbourhoods uniformity of eaves height is an important characteristic that should be respected by new residential development.



Image courtesy of Collective Architecture



Image courtesy of Collective Architecture

Block Structure

Within the network of streets, the block is the framework within which buildings are located and organised.

Block structure should provide a permeable network of interconnected streets and spaces for pedestrians, vehicles and cyclists that offer direct connections, choice and flexibility.

While block structure can vary in shape and size according to the pattern of streets, orientation, topography and building types, a fine urban grain, with small street blocks and frequent junctions, is generally preferred.

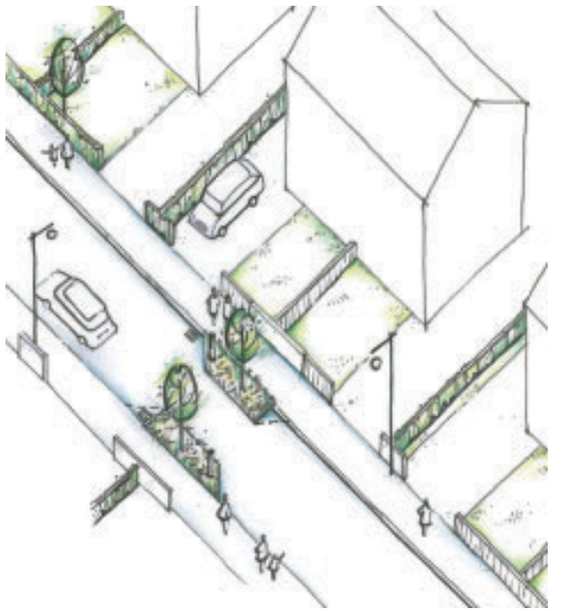
The perimeter block is an effective structure for residential neighbourhoods as it makes efficient use of land, offers opportunities for enclosed private or communal gardens and parking courts, and provides direct, convenient, overlooked routes.

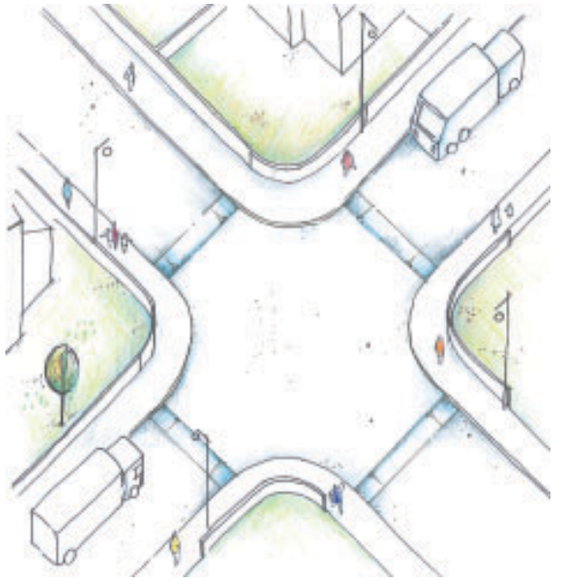
Blocks should be designed to ensure building frontages face and overlook streets, paths and public spaces. Frontages with few windows and backs facing onto streets should be avoided as these create unattractive, lifeless spaces that lack natural surveillance. Gable ends should include windows of habitable rooms, e.g. living rooms and kitchens, to enhance natural surveillance.

Housing Layout, Plot and Garden Size

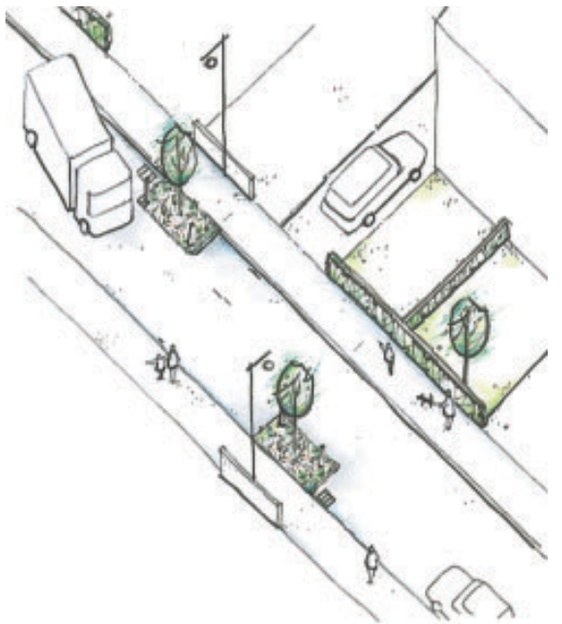
Within a layout, the size of a plot is important in defining the character of an area and this should be determined by the prevailing plot pattern as well as by the requirements of private amenities, parking, privacy zones and refuse storage. However, to provide visual interest and variety to the street design, variation in plot sizes is desirable. Housing layouts should have:

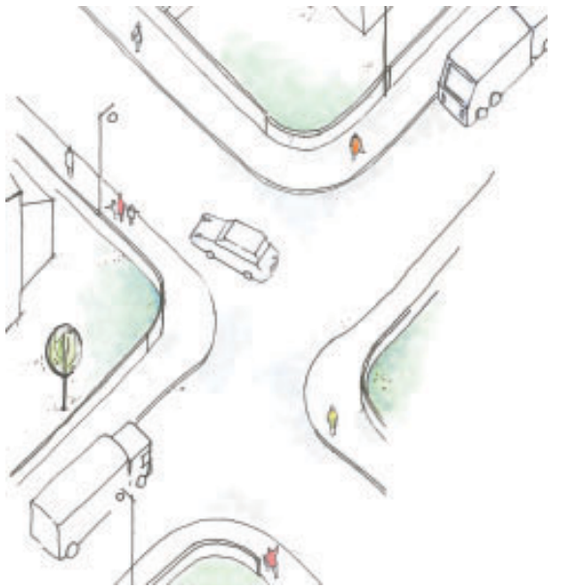
- side or back boundaries not located in prominent locations;
- car parking spaces located to the side or rear of the house or in a private rear parking court with no vehicle parking spaces immediately in front of habitable rooms;
- driveways with a minimum width of 3.5 metres. (In particular circumstances 3.2 metres may be considered.) Detached houses will also require at least one metre to the other side for maintenance purposes;
- front gardens generally between 2 and 4 metres in depth to discourage their use as car parking spaces and rear gardens of least 9 metres depth; and
- landscaping to help link the housing and street, enhance biodiversity and minimise the impact of parked vehicles.



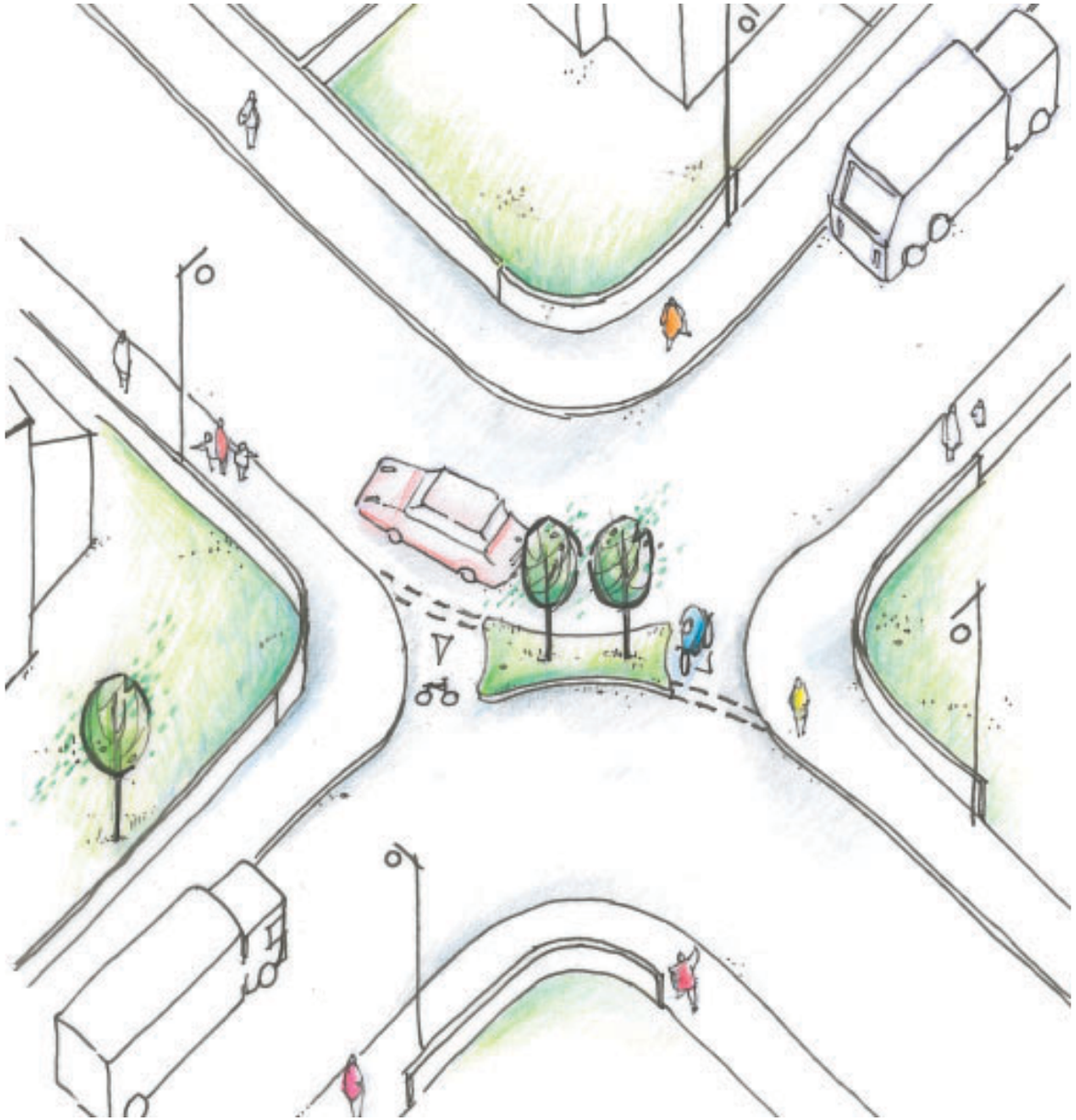


■ Crossroads with a raised junction





■ Staggered junctions



■ Diagonal Closure

Street Layout

The defining characteristic of the street is determined by the arrangement of plots and buildings facing on to public streets and the distinction between public areas and private space (to establish the location of SUDS, trees and public footway).

A good layout will have a number of connections onto the existing road network. In exceptional cases, where a single road connection is agreed, the number of dwellings should be restricted to 200; additional pedestrian and cycle connections should be provided. However, where a single access road is 7.3 metres wide, and the footway construction designed to take vehicle loading, up to 300 dwellings may be permitted.

Street block sizes should be guided by a maximum distance of 50 to 70 metres between junctions, to help control traffic speeds and promote finely grained development.

A variety of junction types may be considered and include:

- Crossroads with a raised junction; and
- Staggered junctions;
- Diagonal closures (except for pedestrians and cyclists);

If other mechanisms for controlling vehicle speeds are required, or if it is desirable to break a continuous length of road, a mixture of measures that complement the overall design could be applied. These include chicanes and / or pinch points, both of which could provide

landscaping and biodiversity areas. These latter may in addition act as part of the drainage system where appropriate measures are installed.

To determine whether a layout could accommodate typical service vehicles a Swept Path Assessment will be required to demonstrate that vehicle movements can be readily made. It is possible for service vehicles to use the full road width, providing there are no visibility issues, but large vehicles must not overrun the footway at any time.

Shared Surfaces

Shared surfaces in residential areas comprise a road without footways where the carriageway is shared by pedestrian and vehicles. Shared Surface Roads should only be considered where the volume of vehicular traffic is expected to be low and consist mainly of residents of that particular street. It is desirable that vehicle speed should not exceed 10 mph in Shared Surface Roads and the road layout should reflect this (refer to section 3.3 of Appendix 2 for further detail). A change in surfacing can assist with the desired speed reduction and concrete block paving or clay pavers may be appropriate for shared surfaces in locations where services are to be located in service strips outwith the shared surface footprint. Unless agreed otherwise, street lighting columns and Statutory Undertakers' services should be located in 2 metres wide service strips outwith the shared surface footprint to ensure that they are adequately protected and accessible.

Street Details

The following parameters will apply to all streets:

- Unobstructed footway widths must be no less than 2 metres.
- Carriageways should be 4.8 metres wide (unless shared services - 5.5 metres wide plus service strip) widening out to 7.3 metres where formalised visitor parking bays are provided. This on-street parking provision should alternate on each side of the street and it should be clear where on-street parking should and should not take place.
- To balance the overall landscaping in the street, swales and street trees can be used in the same manner as visitor parking bays.
- Carriageways that are bus routes must have a minimum width of 6 metres excluding any provision for on-street parking.
- Where bus shelters are proposed there should be localised widening of the footway to 4 metres to accommodate the shelter and leave 2 metres clear for pedestrians.
- Carriageway gradient should not exceed 5% with an absolute maximum of 8% with a typical crossfall of 3%.
- Minimum junction spacing should be 25 metres.
- Landscaping, including the location of street trees and street lighting should be detailed at this stage. (*See Appendix 4*).
- Streets with one-way operation should be avoided.
- Culs-de-sac should be avoided but, where agreed they should have an adequate turning area where vehicles can turn in a forward gear and, where possible, include direct cycle and pedestrian links.

Junction Visibility

Visibility at junctions and along the street should be checked against the relevant design speed for each street, and should be measured horizontally and vertically.

Forward Visibility

Stopping Sight Distance (SSD) is the distance within which drivers need to be able to see ahead and stop from a given speed

For further details on Junction Visibility, Forward Visibility and Driveway Pedestrian Inter-visibility requirements see Appendix 2 /section 3.1









CAR PARKING PROVISION

Mainstream Residential Housing

City Plan standards seek one allocated car parking space per dwelling. Allocated car parking should not be on the public street but be contained within the curtilage of the dwelling or in private parking areas. Visitor parking should be on-street and should be provided at a level of one space for every four dwellings.

Social Rented Housing

It is generally accepted that the level of Housing Association tenants' car ownership is lower than average. However, there is a concern that this base has the greatest potential for increase. Detailed evidence should, therefore, be submitted by Housing Associations of the predicted car ownership levels in each application if less than the minimum allocated car parking spaces are proposed. Social housing proposals should plan for an increase in car numbers up to one allocated space per dwelling, for example by providing landscaping which could be converted to car parking if required in the future. These areas should be identified at the outset.

On-Street Parking Restrictions

Outwith suburban areas, if a proposed scheme includes less than the minimum level of allocated parking, a Traffic Regulation Order may require to be promoted at the developer's expense. This could take the form of a Restricted Parking Zone (RPZ) where parking is restricted to marked bays, or a Controlled Parking Zone (CPZ) where no waiting and no loading restrictions are marked to prohibit parking. However, good design should not be dependant on a Traffic Regulation Order, as promotion is open to public consultation and successful promotion can not be guaranteed





CAR PARKING LAYOUTS

Parking, swales and landscaping will be the main elements in the street together with the footway and carriageway. The exact position and proportion will vary to allow the place and movement function to be balanced (Refer to section 3 of Appendix 2, *Construction Consent Guidance for New Residential Streets*).

The design of streets should not be necessarily applied uniformly, as long as all the necessary elements are included; thus, the street character should vary to provide visual interest and a sense of character and identity. Good street design should always make it clear where parking is allowed for residents and visitors alike.

1. Allocated Parking (Private)

Parked cars in front gardens form a visual barrier on the street which detracts from its quality as a place in which to live and visit. The wider streets required to fit parking into front gardens also tend to detract from the sense of place. For that reason, parking should as a general rule be located to the side or rear of the dwellings.

High Density and Tenemental Housing

Allocated parking will generally be provided in rear private parking courts.

In tenemental developments, the relevant level of allocated parking may be difficult to achieve.

Any solution requires to maintain residential amenity in the back courts as well as the quality of the street environment. In areas where there is an identified issue with commuter parking, controlled parking schemes should be proposed.

Any variation in parking provision above or below the standards set out in City Plan *Policy TRANS 4* must be justified in terms of the criteria set out in this policy.

Parking provision could include undercroft or basement parking, though the provision of car parking on the ground floor of the street frontage of flatted development is discouraged as this reduces natural surveillance and creates sterile environments. This should only be considered in mixed commercial/residential areas.

Terraced Housing

In town houses, if car parking is provided by integrated garages, living accommodation should also be provided on the ground floor to ensure natural surveillance. In this case car parking can be provided in front of the garage and the houses would be set back to allow this. However, this design should also take into account the overall effect on the visual amenity of the street.

Where this proves unsuitable, parking should be provided at the rear and not in the front garden. This could be in the form of rear parking courts or parking spaces within rear gardens accessed by rear lanes, private shared drives or by pend access to communal parking courts.

Where rear parking courts are proposed these should be small enough to allow for proximity to the residents who use it and also adequate surveillance from neighbouring houses. The ideal size for such courts would be 6-12 spaces.

Detached and Semi-Detached Housing

Car parking should be provided in-curtilage, to the side and/or the rear of the house and not in the front garden; for this reason the houses should be set back no more than 4 metres from the street to discourage front garden parking. The distance to the side boundary should be 3.5 metres to allow for a car to be parked and access to the house. Where garages are provided, they should be set back a minimum of 6 metres from the heel of the footway.

Driveway dimensions should be a minimum of 6 x 3.5 metres with garages at least 3 x 6 x 2.3 (H) metres.

In larger detached house plots, it may be possible to set back the house more than 4 metres from the street as long as the garage and driveway are to the side of the house. This ensures an adequate amount of landscaped space to the front of the house which can contribute positively to the streetscape.

2. Un-Allocated Parking (Public)

Where on-street parking is provided this should be designed to avoid confusion and indiscriminate parking by residents and/or visitors. Large areas of uninterrupted parking will not be acceptable. The street should be designed to encourage on-street parking to take place in designated areas only. This is particularly important on streets which are likely to be used as bus routes.





On-street parking can be provided as parallel parking (minimum of two bays to allow for dual use by larger service vehicles) or right angled parking at the edge of the carriageway. In all situations street trees and landscaping should be integrated to soften the visual impact of parked cars within the streetscape. The narrower street width of 4.8 metres widening out to 7.3 metres to accommodate on-street parking bays will encourage drivers to use the parking spaces

The location of on-street parking spaces will require more thought than in a traditional layout to minimise the psychological and physical barriers of parked vehicles. Although on-street parking bays should be visible from a habitable room they should not be directly in front of the main living room of a dwelling.

High Density and Tenemental Housing

On-street parking is likely to be parallel or end-on to the kerb. This should be broken up with street trees, which should be spaced alternately at each side of the street to provide a green avenue. Pinch points could be used as traffic calming measures as well as pedestrian crossing points to break up the parking.

The introduction of street trees and landscaping within parking bays together with integrated communal open space will contribute to create a better sense of place and overall quality of environment.

Terraced Housing and Detached and Semi-Detached Housing

On-street parking will be limited by the requirement to keep driveways clear and by swales within the street. Again it is likely that on-street parking will be parallel to the kerb and broken up by street trees. The juxtaposition of habitable rooms, driveways and landscaping should be carefully considered to maximise the placemaking opportunity. Pedestrian crossing points will generally be at street junctions i.e. approximately every 50 – 70 metres.

SUDS AND FLOOD MANAGEMENT

It is fundamentally important that the SUDS strategy (refer to Appendix 3) is developed at an early stage in the process and agreed in principle with the Local Authority before a housing layout is developed. The most effective solutions will take account of discharge location, site topography, street and housing layout.

The purpose of SUDS is to provide water quality treatment and attenuation of surface water. Surface water within a development can generally be split into two categories:

1) Curtilage water (private space) – roofs, driveway grounds and car parks
2) Roads, carriageway, footways and paths

While in-curtilage drainage is generally the responsibility of Scottish Water or the property owner the roads drainage will be generally the responsibility of the Council.

SUDS features such as ponds and basins should be overlooked and accessible to enable monitoring for maintenance purposes and integrated into the development's open space and movement requirements.







SUDS facilities should be designed to treat and convey a 1 in 30 year flood event. Any flows which exceed the design capacity of the SUDS will require to be routed in a controlled manner to an appropriate location (i.e. regional SUDS facility or designated area) prior to discharge. If a SUDS facility is to discharge to a watercourse it should provide sufficient attenuation to ensure no detriment to the flows within the watercourse.

Further guidance on permissible discharges to watercourses may be obtained from *Flood Risk Assessment and Drainage Impact Assessment: Planning Guidance for Developers*.

During the development of the SUDS strategy the developer will be required to engage with Scottish Water and the Council to ensure that the strategy meets the prescribed standards of Scottish Water and the Council.

In some instances, the Council and Scottish Water may choose to share ownership of the surface water drainage network. This arrangement is possible by the use of Section 7 of the *Sewerage (Scotland) Act 1968* Agreement. The agreement would be between the Council and Scottish Water.

The Section 7 Agreement is a high level agreement between The Roads Authority and Scottish Water, however each development will be reviewed on an individual basis and a bespoke Section 7 Schedule will be required to be prepared through joint discussion. This review will identify the combination of SUDS and drainage features which will be acceptable.

The developer will be required to provide a colour coded plan indicating what both Scottish Water and the council will be willing to vest / adopt once the works have been completed to the appropriate standard.

Appendix 3 gives typical layouts of possible shared surface water systems that would be acceptable to both Scottish Water and the Council. These layouts are not prescriptive but do give a starting point for discussion.

Guidance on the methodologies for calculating Water Quality Treatment Volume (V_t) is provided in *CIRIA C697: The SUDS Manual* .

In-curtilage SUDS

The developer is expected to provide one level of SUDS to treat surface water discharging from within the curtilage of each dwelling. These SUDS systems should be designed to cope with a 1 in 30 year flood event.

Although there are many ways of providing in-curtilage treatment and attenuation of surface water (for example, by permeable paving), there

is concern that the effectiveness of such solutions would diminish over time. Responsibility for maintenance would be placed on individual residents and this responsibility could not be enforced by statutory bodies. If such SUDS fail, an increased volume of untreated water could discharge onto the public road. This could damage the SUDS which are in place for the public road drainage, increase flood risk through overland flooding, and contaminate the receiving watercourse.

Private SUDS connecting to the public drainage system should have their ownership and maintenance responsibilities clearly established by the developer and discussed with Scottish Water prior to their acceptance of any part of the public drainage system for vesting.

The Council's preference, therefore, is for all SUDS to be maintained by an "in-perpetuity body". This could be, for example, the Council, Scottish Water, or their successors, but would not include private factors. Private in-curtilage SUDS maintained by a registered Housing Association may be considered providing that they connect to a Scottish Water outlet.

Where the above does not apply, other methods of SUDS outwith the curtilage must be provided. Scottish Water will normally vest a detention basin or pond to treat in-curtilage rainwater if it is designed to *Sewers of Scotland 2*.



SUDS for Publicly Adopted Roads

Residential streets will require to treat surface water in accordance with SEPA's *Regulatory Method (WAT-RM-08) Sustainable Urban Drainage Systems* prior to discharge to a watercourse or surface water sewer.

General guidance is:

- Less than 50 residential units require 1 level of treatment
- Between 50 and 1000 units require 2 levels of treatment
- Greater than 1000 units require a SEPA Licence

The above treatment levels are only provided for guidance purposes and it will be the Developers responsibility to ensure the SUDS proposals meet SEPA regulatory standards.

The maintenance of SUDS will also be considered as part of the Roads Construction Consent application and a draft maintenance schedule should be produced at this stage by the developer. A Whole Life Cost spreadsheet has also been developed *(see link)* which allows the capital and maintenance cost of SUDS to be considered together.

If an end-of-line treatment such as a SUDS pond or basin is provided (which could treat curtilage

and roads drainage) then one further level of treatment may still be required for the roads drainage. This could be provided by bio-retention areas, swales or second basin/pond for example. These can also provide landscaping and traffic calming within the street.

CIRIA C697: The SUDS Manual, SUDS for Roads and the Whole Life Cost spreadsheet, all provide details of how to select, construct and maintain SUDS facilities.

High Density Development and Tenemental Typologies

In such development areas it is likely that there will be numerous pedestrian desire lines for street crossings and a high level of on-street parking. SUDS features such as swales contiguous with the road are discouraged in favour of end-of-line treatment solutions and / or green roofs, which are considered as the most appropriate.

Detached, Semi-Detached and Lower Density Development

If an end of line system is not used, swales are/ will be the preferred SUDS solution in this typology, as a dry swale can provide two levels of treatment for roads drainage as well as providing landscaping features. Housing layout and driveway positions must be carefully considered to avoid frequent short lengths of swales between vehicle crossing points. When driveway positions have been approved then each swale should operate independently rather than providing a piped connection under each driveway.

SUDS Features for Road Construction Consent Adoption

The Council will give consideration to the use of the undernoted SUDS features, subject to integration with the overall development design and appropriate technical standards:

- Liner roads swales
- 2-stage swales
- End-of-line swales with appropriate maintenance access
- Basins with appropriate maintenance access
- Ponds with appropriate maintenance access
- Bio-retention areas integrated with traffic calming

Where considered appropriate self-cleansing oversized pipes may be utilised.







Flood Risk Assessment and Flood Management

Following on from the flood risk assessment, the design will also have to take cognisance of any design exceedance flows from within the development. Exceedance flows may be generated from combined sewers, surface water sewers or SUDS systems. Any flows of this nature will require to be routed safely through the development to a regional SUDS facility or a designated flood storage area.

The Council will adopt a risk based approach to the protection of existing roads network which is to be retained within a new build housing development. However the dwellings will be required to be protected to the aforementioned standards.

The following flood protection standards should be adopted for new residential development within the City:

Domestic dwelling (2 storeys or more)	1:200 Year
Domestic dwelling (single storey Bungalows, static caravans)	1:500 Year
Flatted development	1:500 Year

Within the required level of protection for development a 20% allowance should be made for Climate Change plus a suitable allowance for freeboard.

LANDSCAPE, AMENITY OPEN SPACE AND RECREATION

At conceptual layout stage, the developer will have produced a landscape strategy for the site. This should now be followed by a detailed landscape design that includes consideration of:

- how the green spaces can be linked together to form a green corridor to encourage biodiversity and pedestrian/recreational connectivity;
- the creation of spaces that people will naturally take ownership of and use for amenity and recreation, and will be easily accessible, attractive and safe. These can be multi-use spaces, e.g. amenity space combined with natural play space. (For further details see Appendix 4, *Guidance on Street Tree Details, Specifications and Standards*).
- soft landscaping which can contribute to sustainable drainage and reduce run-off by forming part of at-source SUDS (e.g. swales, bio-retention etc);
- provision of specific recreational spaces as required by *City Plan Policy ENV 2 Open Space and Public Realm Provision*;
- use of natural features such as watercourses, existing trees and shrubs, and topography in the site layout to maximise visual, recreational and drainage benefit;
- links to existing off-site recreational provision.

The developer must also, at an early stage, consider how the landscaping and recreational space will be maintained. SUDS features should be maintained by an in-perpetuity body such as the Council or Scottish Water, while landscaping features could be maintained by a factor. The strategy for maintenance must be presented with the landscape strategy and agreed with the Council.

SUDS and recreational spaces can/should overlap: SUDS features such as ponds and wetlands can provide habitats and visual amenity, while facilities such as sports pitches can provide locations for compensatory flood storage.



Image courtesy of Malcolm Cochrane and Grounds for Learning

Street Trees

Street trees are encouraged in all urban streets as a means of reinforcing the sense of place, providing visual enclosure, and forming green corridors and habitats through the site and its wider surroundings. They can also play a useful role in physical and psychological traffic calming.

- Tree planting (though not necessarily shrub planting) should be carried out away from services. An approved root management system must be used.
- Trees in streets should avoid blocking driveways and sightlines, allow for suitable levels of on-street car parking between the trees, and not interfere with the pedestrian routes. Traffic calming features are often suitable for tree planting.
- Private front gardens should not be used for the delivery of street trees.
- The most cost effective method may be to plant trees in planting beds with soil and gravel, with or without additional shrub planting. This may have the dual benefit of acting as a bio-retention system.
- The planting beds should be protected by raised kerbs or other measures, to prevent compaction which would severely curtail the lifespan and health of the trees. The canopy edge should not project beyond the carriageway kerb edge and on potential bus routes (i.e. any 6 metres wide carriageway) should be set back from the kerb by at least 450 mm.
- Trees must be designed together with a street lighting strategy to avoid leafed branches obscuring street lights and / or CCTV cameras.





For guidance on street tree details, specifications and standards see Appendix 4, *Guidance on Street Tree Details, Specifications and Standards*.

Recreational Space

City Plan Policy ENV 2 seeks the provision of recreational space on-site wherever possible. Developers are expected to provide the relevant level of facilities on-site unless they submit a clear justification for alternative arrangements based on site-specific factors. Provision of open space, both amenity and recreational should be built into the estimated costs of the development at the pre-planning stage.

Play space should not only include traditionally defined children's play parks with fixed equipment, but also the creation of "playable" spaces which meet the needs of different people at the same time. Support for playable spaces can extend the range of play opportunities available to children and can be cost effective, for example, providing playable spaces which can also function as amenity space and landscaping. Imaginative planting, ground mounding, boulders, seating and sculpture can all provide play for children of a wide range of ages as well as exercise and visual amenity for adults.

All communal or public open space should be accessible (by walking and cycling) and welcoming, and designed for natural surveillance to increase security and foster a sense of ownership in the community.

Boundary Treatments

Existing trees and shrubs, particularly on the perimeter of sites, should be retained where viable and enhanced by additional planting. Hedgerows can be used as boundary treatments in both urban and suburban development, at the front boundary of plots or to provide a green street edge to a tenemental or high density site. It is recommended that such boundaries are strengthened by a post and wire fence or similar while the planting establishes itself. Hedgerows should favour plant species that support biodiversity e.g. native, nectar rich and berry bearing. Boundary treatments should be designed to avoid creating unnecessary barriers to the movement of species.

Higher Density Flats

The open space associated with higher blocks of flats depends on whether the buildings are hard to the edge of the street. As the main entrance will be from the street, where there may be little opportunity for a garden area to the front, it may be possible to form a green zone in the street itself in the form of communal gardens or landscaping for amenity use.

Children's play space should generally be in a safe and overlooked area. Amenity open space could link separate blocks and provide a playable space as discussed above. There should be outside provision for clothes drying in areas screened from public view and not excessively overshadowed.

As it is less likely that private outdoor amenity space will be provided, communal amenity space assumes an even greater importance. However, shared roof gardens and useable balconies could contribute to the provision of private amenity space.

Front privacy zones, if provided, could include green edges in the form of hedge planting. Street trees should also be provided.



Tenemental Housing

It is most likely that in tenemental areas the landscaping and recreational space will comprise backcourts, with street trees and upgrading of urban parks providing further greenspace and recreational opportunities. As it is less likely that private outdoor amenity space will be provided, communal amenity space assumes an even greater importance.

Some form of backcourt area or communal garden is required to provide tenemental flats with space for sitting out and drying laundry. Front privacy zones/gardens, if provided, could include green edges in the form of hedge planting.

Terraced Housing

Here the building and plot form is most likely to give rise to front gardens and rear gardens for private use. Where the terrace is part of a suburban low density housing scheme, communal open space may be provided in the form of parkland and green corridors throughout the wider site. Where the terrace is accessed by a lane arrangement to the rear, there is an opportunity for combining private garden ground, rear access and parking with a communal green space.







It is likely that the street will contains swales for sustainable urban drainage, and these features can be combined with planting to provide a green edge to the street between the private plots and the carriageway.

Detached and Semi-Detached Housing

Generally suburban housing consists of two or three storey dwellings with front and rear private gardens. Greenspace could be part of a larger parkland area through the site with some small scale play parks throughout the housing. The individual play parks should be located close to housing and overlooked by and easily accessible from the housing which it serves. They should not be entirely to the rear of the housing if there are high rear boundary fences as these will prevent adequate overlooking. They should not directly border car parking areas as this can cause conflict with car owners and there is also a risk of children running out between manoeuvring cars. There should be clear views in and out of these open spaces.

Swales for sustainable urban drainage can be combined with planting to provide a green edge to the street between the private plots and the carriageway.

WALKING, CYCLING AND PUBLIC TRANSPORT

Walking

Pedestrians should have priority in new residential developments. Pedestrian movements should be made as convenient, safe and pleasant as possible by careful attention during the early design of the scheme. The pedestrian network should reflect natural desire lines, be overlooked for security and take account of existing informal networks. Paths that skirt the development at the back of dwellings should be avoided.

Walking distances to community infrastructure should be minimised. A maximum of a 10 minutes walk should be the target. Maximum walking distances to play areas are provided in City Plan Development Guide *DG/ENV 2 Open Space and Public Realm Provision*

Pedestrian routes should be designed to accommodate the needs of the disabled and should follow the guidelines outlined below (Refer to section 5.4 of Appendix 2, Construction Consent Guidance for New residential Streets, for further details):



- Footways and paths should have minimum unobstructed widths of 2 metres and be designed to take account of any permanent structures that are required in the footway e.g. bus shelters, utility cabinets. Simple structures such as lighting columns and traffic signal poles can be accommodated within the 2 metres width.
- Pedestrian routes should be designed without the need for steps with red tactile paving provided at all controlled crossing points.
- Gradients on paths should not exceed 5% with an absolute maximum of 8% and a maximum crossfall of 3%.
- Underpasses and bridges to separate pedestrian routes from traffic will not be normally acceptable.
- Dropped kerbs must be provided at all controlled crossing points. They should have an upstand of 6 mm.
- At uncontrolled junctions on core pedestrian routes, consideration should be given to the use of a raised junction with a buff coloured tactile paving provided to assist the visually impaired.
- Paths should be designed to accommodate cyclists and be signed accordingly.

Cycling

A cycle network should be established to serve the needs of the cyclists and should be direct, avoid steep gradients, barrier free and overlooked. The cycle network will overlap with and augment the pedestrian network.

Cycle routes should be designed using *Cycling by Design 2010* published by Transport Scotland. Details with particular relevance to residential streets include:

- within residential developments cyclists should be accommodated primarily on the carriageway as these will be designed for a maximum vehicle speed of 20mph;
- where horizontal speed control measures are used a cycle by-pass should be provided;
- access should also be provided onto path networks, which should be wide enough to accommodate pedestrians and cyclists (for appropriate widths see *Cycling by Design 2010*).

Cycle Parking

The design of cycle parking provision should:

- consider the level of provision for residents *(See Policy TRANS 6 of City Plan)*;
- include the provision in garages, bespoke cycle storage, communal areas in flats, on-street cycle racks;
- provide shared facilities to be secure, overlooked, convenient and sheltered;
- be suitable and available for use by both owners and visitors and be detectable by blind or partially sighted people by means of a tapping rail; and
- include cycle stands to be clear of pedestrian desire lines and closer to the carriageway than buildings.

For further details on cycle storage refer to *Cycling by Design 2010, Chapter 8.*





Public Transport

New residential areas should be designed so that no one is required to walk more than 400 metres from their home to access public transport.

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. A coordinated approach between different transport modes should be encouraged with pedestrian and cycle routes, and cycle parking, linked to all key transport nodes.

Where a new bus route or service diversion is promoted through the development this should be discussed with local transport operators and also with Strathclyde Partnership for Transport (SPT). Proposed bus routes should be commercially viable with bus stops, pedestrian routes etc clearly marked on the plans submitted for planning permission.

Designing for Bus Passengers

The need for bus stops will be identified at the appraisal stage. If at that stage there is a need highlighted, the position of such stops should be shown on the layout plans at detailed submission stage. The details of bus stop locations and spacings should be determined at Transport Assessment stage if relevant.

In general, bus stops should:

- not be located in front of residential properties. If this is unavoidable they should at least not be directly in front of ground floor windows;
- incorporate adjacent kerbs with heights of 180 mm above the carriageway to facilitate boarding, for a minimum length of 6 metres;
- provide a cage and clearway markings for bus services with a 30 minutes or less frequency. This should be highlighted with red screed around the cage's edge.
- be arranged to ensure buses stop on the main carriageway and not within lay-bys; and
- be provided with accessible routes with dropped kerbs.

For typical detail refer to *section 3.5 of Appendix 2, Construction Consent Guidance for New Residential Streets.*

Bus shelters should be generally provided at city-bound stops. Details for their provision will be agreed by the planning authority and implemented at the developer's expense. Proposals for the provision of shelter facilities should also be discussed in conjunction with SPT. Where bus shelters are provided, localised widening of the footway to 4 metres will be necessary to leave 2 metres clear for pedestrians. Where real-time information services can be made available, such facilities should also be considered.



BUILDING LINES, ENTRANCES AND PRIVACY

Building Lines and Enclosure

Building lines contribute to a sense of enclosure by providing a clearly defined edge to the street or public realm space.

To avoid visual fragmentation buildings should adhere to an established/ common building line and create a new one where none exists. Projections and set backs from the main building line can be used to add emphasis and variety to the streetscape at appropriate locations.

Where there is no established building line, development should be set back from the footway but set back distances should be minimised to aid enclosure of the street and increase the ability of buildings to interact with the public realm.

In suburban locations, garages should be located to the side of dwellinghouses and recessed behind the main building line.

Front boundary treatments can aid the sense of enclosure by providing clear separation of public and private space but should not act as a barrier to natural surveillance of the street from the building. Boundaries should be clearly defined with a boundary treatment appropriate to the location.

Entrances to Dwellings

The primary means of access for all dwellings should be from the main street. Entrances should be visible and frequent along the street to encourage natural surveillance and activity on to the streets, to make places feel safe and secure and contribute to a sense of place. Entrances should provide inclusive access for all people regardless of disability, age or gender.

Flatted developments should maximise front doors on to the street with ground floor flats having their own entrances. Separate entrances for ground floor flats also offer more flexibility. However, this may require the introduction of lay-by parking on heavily trafficked routes.

Privacy

While encouraging surveillance, consideration must be given to maintaining privacy for residents, both from the public street and between windows of habitable rooms. At site strategy stage, the developer must state how the layout will deal with this issue.





Front Building Line and Privacy Zones

High Density and Tenemental Housing

The building line will/should be designed with a 1-3 metres privacy zone between windows and the public footway. Habitable rooms should face the front street. Depending on the volume of pedestrian traffic, a solution should be found to protect privacy. For front facing rooms this can be achieved by raising the internal floor height so that external cill height is also raised to 1.5m above street level. Alternatively, some form of screening by boundary planting should be provided.

Terraced Housing

If terraced houses are designed to have integrated garages, then a public room should be located on the ground floor to provide overlooking to the street. If the building is set back less than 4 metres from the footway, privacy solutions such as above should be provided.

Detached and Semi-Detached Housing

Building lines should be established at no more than 4 metres from the footway. This allows for side garden parking while discouraging front garden parking. This buffer zone will serve as a front garden area and will also provide adequate privacy from the public areas of the street. If the area between the house and the public footway is reduced to 3 metres or less, privacy solutions should be sought.

Rear Privacy and Window to Window Distances

If there is a 45 degree angle or more between facing windows of habitable rooms, the distance between them could be reduced.

In flatted developments, there should be at least a 4 metres privacy zone between the ground floor flats and any communal path or open space/ backcourt. This could be an allocated private garden for the ground floor flat, or an area of planting to provide privacy.

ASPECT, ORIENTATION AND DAYLIGHTING

Streets and dwellings should be orientated to maximise solar gain and protection from the wind. Dwellings should have large areas of clear glazing, with main rooms facing south or west wherever possible. Blank gables to the south should be avoided.

While layouts should maximise daylight and sunlight to dwellings and gardens, this should not be to the exclusion of other considerations such as privacy or streetscape.

Dwellings should have dual aspect however, where proposed, single aspect units should have more generous internal space standards and aspects similar to or better than similar dual aspect units.

There should be no adverse impact on existing or proposed neighbours in terms of overlooking, loss of privacy, daylight, or sunlight.

The Building Research Establishment (BRE) document - *Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice*, 2nd edition, (P Littlefair 2011) should be used to assess impact on daylighting or sunlighting.

















SERVICES, UTILITIES AND STREET LIGHTING

Public and Private Services

The location and installation of utility apparatus should be considered early in the planning process. Individual utility providers should be consulted and an indication of proposed locations should be submitted to the Council as part of the Roads Construction Consent application (Refer to *section 3.6 of Appendix 2, Construction Consent Guidance for New Residential Streets*, for more details).

Utility apparatus should be laid in corridors throughout the site with minimal service connections across carriageways or under Sustainable Drainage Systems (SUDS). No utilities should be located under SUDS features with impermeable membranes, unless they are ducted and encased in concrete.

No underground 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.

Details of all underground apparatus associated with the development should be registered on the Scottish Community Apparatus Data VAULT system.

Further information / advice regarding the provision of facilities can be downloaded from the National Joint Utilities Group (NJUG) at *www.njug.org.uk*

Street Lighting

The *Roads (Scotland) Act 1984* empowers local authorities to light roads as they consider appropriate. Glasgow City Council consider high quality lighting to be fundamental to safety and the enhancement of sense of place and its design should be related to the function of the space being lit.

The developer is responsible for the provision and maintenance of street lighting on roads/ streets and public amenities until they are formally adopted by Glasgow City Council. Unless agreed otherwise, lighting of roads/streets and public amenities shall be in accordance with *BS5489: Part 1*.

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. The siting of street lighting should also take account of the street tree strategy. Both siting and direction of lighting should minimise disturbance to biodiversity, e.g. roosting birds and foraging bats.

Columns should be sited at the heel of the footway or service area. The distance between any two lighting columns in any direction shall not be less than 15 metres.

For further details see the road lighting approved products page of the Council's website at *http://www.glasgow.gov.uk/index.aspx?articleid=5483*.

STREET MATERIALS AND STREET FURNITURE

Street materials and street furniture can play an important role in creating character and enhancing the function and identity of a place (Refer to section 5 of Appendix 2, Construction Consent Guidance for New Residential Streets, for more details).

Future maintenance of all public open spaces, roads (carriageway, footway, verge), streets, paths associated with developments should be considered at an early stage in the planning process.

In terms of Section 16 of the *Roads (Scotland) Act 1984*, the Council as Local Roads Authority will, upon request, adopt and in perpetuity maintain any new road or street constructed in accordance with a Roads Construction Consent (RCC).

The following key principles should therefore be applied:

- Materials should be of high quality, durable, easy to maintain and readily procured.
- Clear responsibility for in perpetuity maintenance should be established and agreed at early stage.
- Designs should give careful consideration to the robustness, durability and future availability of the preferred materials for Public Realm, lighting, street furniture etc
- Materials should take into account the varied needs of the pedestrian users of the environment.
- Tonal contrast in materials is a useful source of information for visually impaired people. There should be a strong tonal or colour contrast between kerb and footway. Ideally any change in paving material, colour or texture should have a distinct purpose e.g. to denote car parking spaces.
- Ensure that clear physical delineation between private and publicly adoptable areas is provided.

Street Furniture

Street furniture should be placed to minimise obstruction and meet the following criteria:

- In main pedestrian routes, street furniture should be at least 1 metre high, should not obstruct any road junction sightline and should be coloured or tonally contrasted from their





surroundings or have a single colour contrasting band to be more legible to visually impaired people;

- be detectable at ground level with a long cane;
- outwith pedestrian routes, seating should be at regular intervals (around 50 metres) and should be 450 – 480 mm high; and
- guardrails should be avoided but if, following agreement with the Council, they are considered essential, they should be 1.2 metres high and extend down to 200 mm of ground level. They should contrast tonally with their surroundings; alternatively, the ends of the railings should be highlighted with two 150 mm deep tonally contrasting bands.

Road Pavement Construction

Unless agreed otherwise, the specification for construction and inspection procedures of paved areas and street lighting shall be in accordance with section *2.4 and 5 of Appendix 2, Construction Consent Guide for New Residential Streets*.

Kerbs should normally be provided alongside paved areas (carriageway, footway, shared surface, path, parking area, etc.) to provide edge restraint, delineation and facilitate the management of drainage flows. Drop kerbs should be used at pedestrian and vehicular crossing points with 6 mm and 20 mm upstands from the carriageway.

Carriageways should be designed as flexible pavements. Written approval of the Council will be required for materials other than Hot Rolled Asphalt (HRA) or Dense Bitumen Macadam (DBM). A Materials Strategy which outlines the cost, durability and maintainability of the proposed materials compared to HRA and DBM over a 40 year design life, should be submitted to the Council.

Each vehicular trafficked pavement for new residential streets should be designed based on the following inputs and specific circumstances of the site:

- Design Life,
- Design Traffic, and
- Stiffness and strength of the sub-grade / sub-formation soil, on which the vehicular trafficked pavement is to be constructed.

Pedestrian and Cycle Pavements

The design of pedestrian and cycle pavements should take account of ground conditions and the volume of pedestrian and cyclist activity.

All pedestrian and cycle pavements should be designed to accommodate the additional load imposed by frequent light vehicular over-run and very occasional heavy vehicle over-run. Required construction thicknesses are as shown in *HD39/01, Footway Design*, *Design Manual for Roads and Bridges: Volume 7.*

For further details see section 5.4 of Appendix 2, Construction Consent Guidance for New Residential Streets.

REFUSE CONTAINMENT AND COLLECTION

Refuse vehicles should be able to stop within 15-20 metres of communal bins. Collection points for smaller individual bins should be within 45 metres of the access point for the refuse vehicles. The developer should agree bin collection points at the detailed layout stage and areas should be provided on street for larger bins on collection day to avoid obstruction of pedestrian routes.

High Density Housing

Usually communal bins with 1280 litres capacity should be provided. Bin storage should be within the building with bins presented for collection on the street by the factor. On-street collection areas should be provided.

Tenemental Housing

Bin storage should be located in backcourts. Bins can be communal or individual (with 240 litres capacity) and should be presented for collection on the street by householders or the factor. On-street collection areas should be provided for communal bins.

Terraced Housing

Bin collection vehicles could come to the end of the rear lanes. Bin storage should be to the rear of the house

Detached and Semi-Detached Housing

Bin storage will be within individual house plots and the householder would be responsible for presenting the bins at the nearest bin collection point. Storage areas for four bins should be located within the rear or side garden. Layouts should make provision for residents to present bins on the street on the relevant day by the householders or the factors. Bin stores should be easily accessible for all residents but should not be located in front gardens.







4.1 DETAILED DESIGN AUDIT

Objective: ***At this last stage of the work, the developer will be required to review the details of the design to ensure that the Core Principles and advice set out in the Design Guide have been incorporated, and the findings of the appraisals and any safety concerns have been successfully addressed.***

Prior to submission of applications for Planning and Road Construction Consent, the developer will be required to meet with the Council and present the Detailed Design Audit along with plans, site sections and elevations. The detailed Design Audit could form part of the Design Statement which may be submitted with the planning application (see *Appendix 1*).

- A Detailed Design Audit shall include a Road Safety Audit. Road Safety Audits should be undertaken by a team with experience in roads design, road safety and traffic engineering, and investigation of roads traffic collisions and measures to eliminate or reduce risk. The Road Safety Audit team should always be independent of the scheme design, although it is acceptable for them to work for the same organisation as the design team.

- The requirement for Road Safety Audits for individual schemes should be established at an early stage through discussion with the Council.

Further guidance is available in *Appendix 2*, *Construction Consent for New Residential Streets*



Guidance on submitting planning applications is contained in Appendix 1. Guidance on procedure for Road Construction Consent and Section 56 approval is contained in section 2 of *Appendix 2, Construction Consent Guidance for New Residential Streets*.



REFERENCE MATERIAL

HOUSING TYPOLOGIES : EXAMPLE LAYOUTS

- High Density and Tenemental Housing
- Detached and Semi-Detached Housing
- Terraced Housing

REFERENCE DOCUMENTS

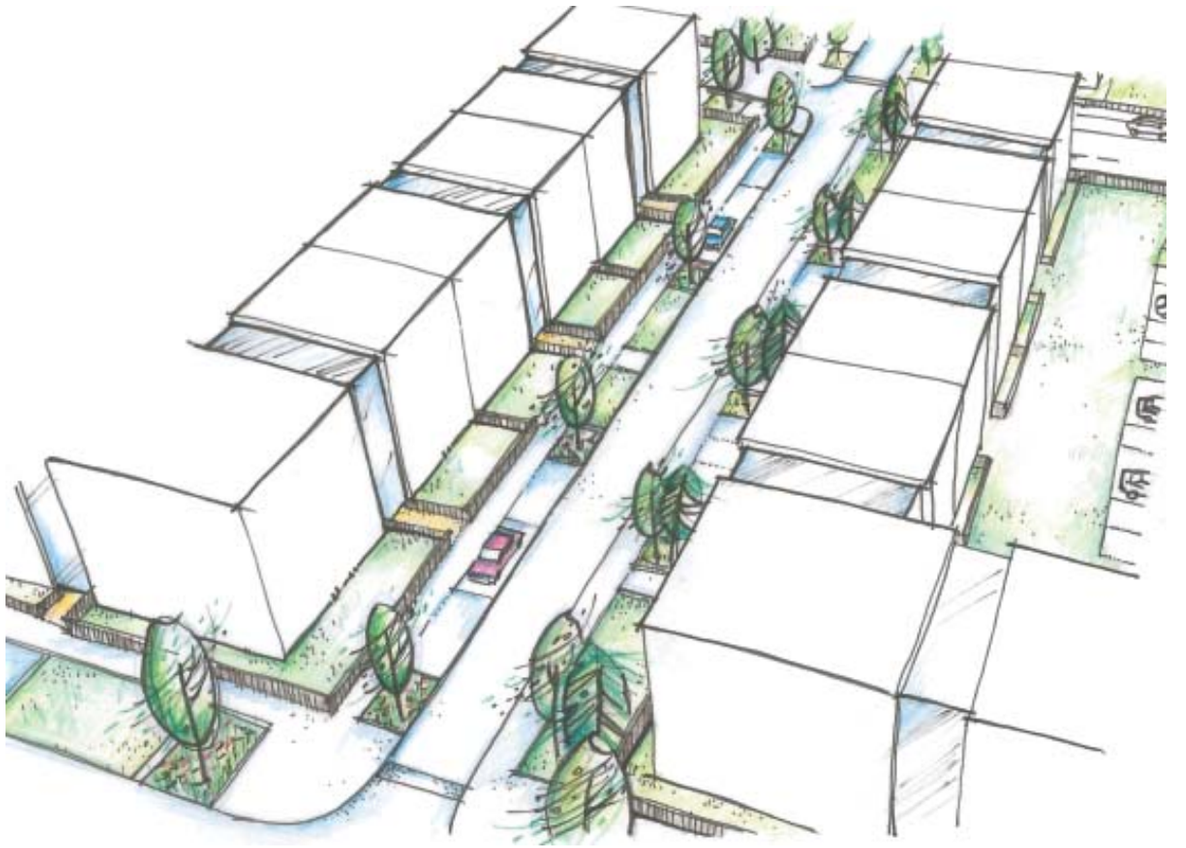
GLOSSARY

HOUSING TYPOLOGIES: EXAMPLE LAYOUTS

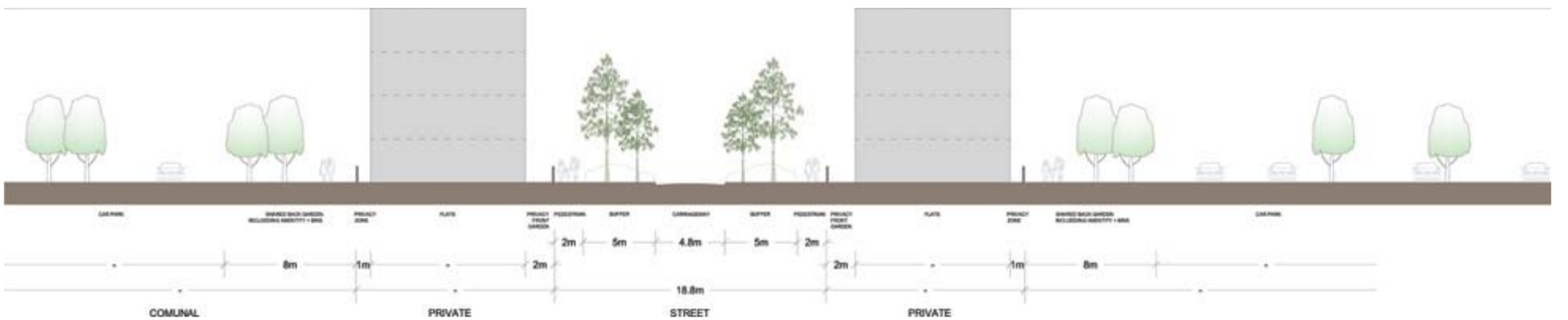
This section shows examples of layouts relative to the main housing typologies as identified in the Design Guide.

Such examples are not suggested as a prescriptive approach to the design but have the aim to illustrate how the various components that make up the street could be laid out in an integrated manner

HIGH DENSITY AND TENEMENTAL HOUSING

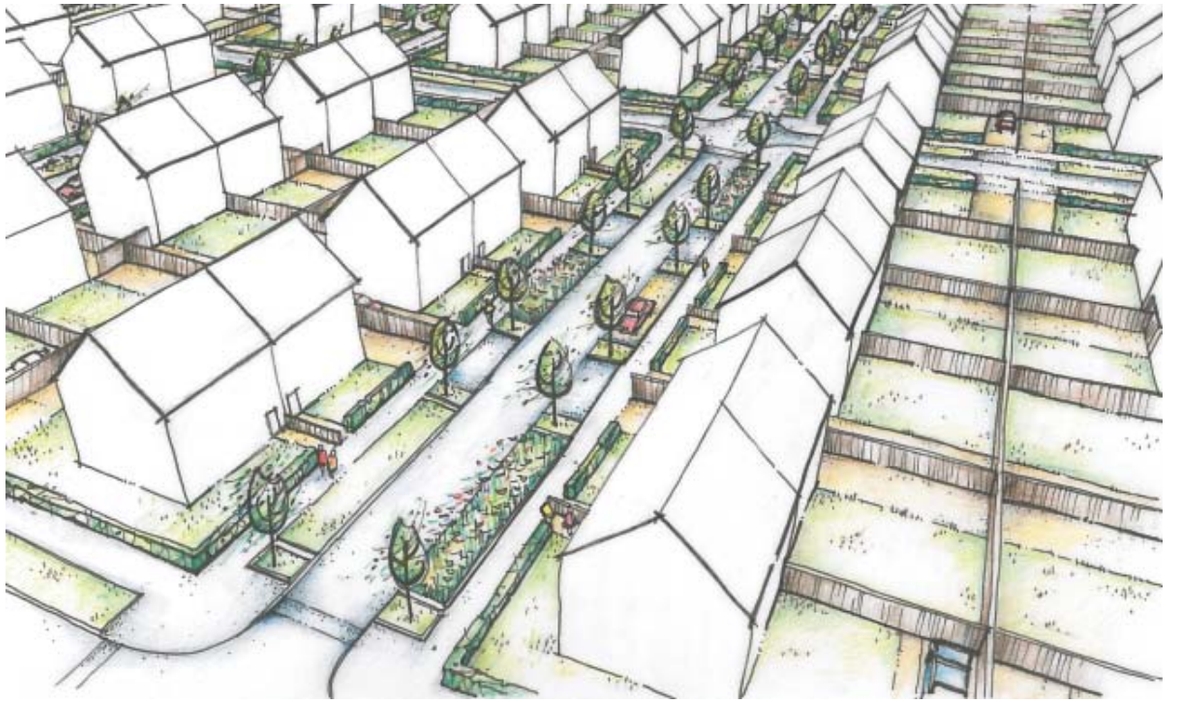


NB. Drawings are for reference only - not to scale



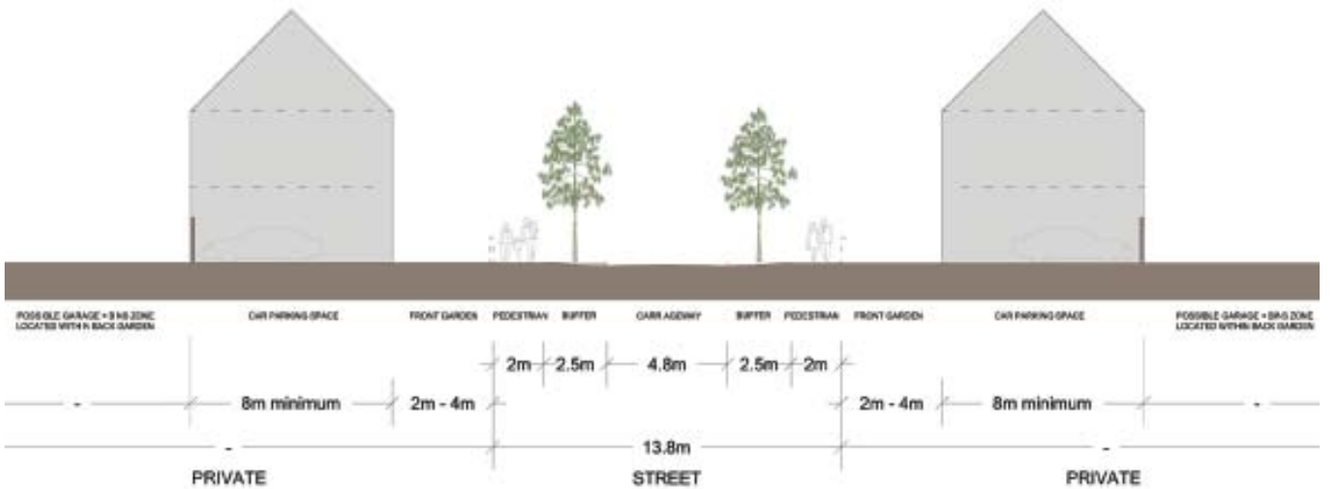

Private Amenities
Resident Parking
Footway
Landscape Strip
Public Open Space

HOUSING TYPOLOGIES: EXAMPLE LAYOUTS



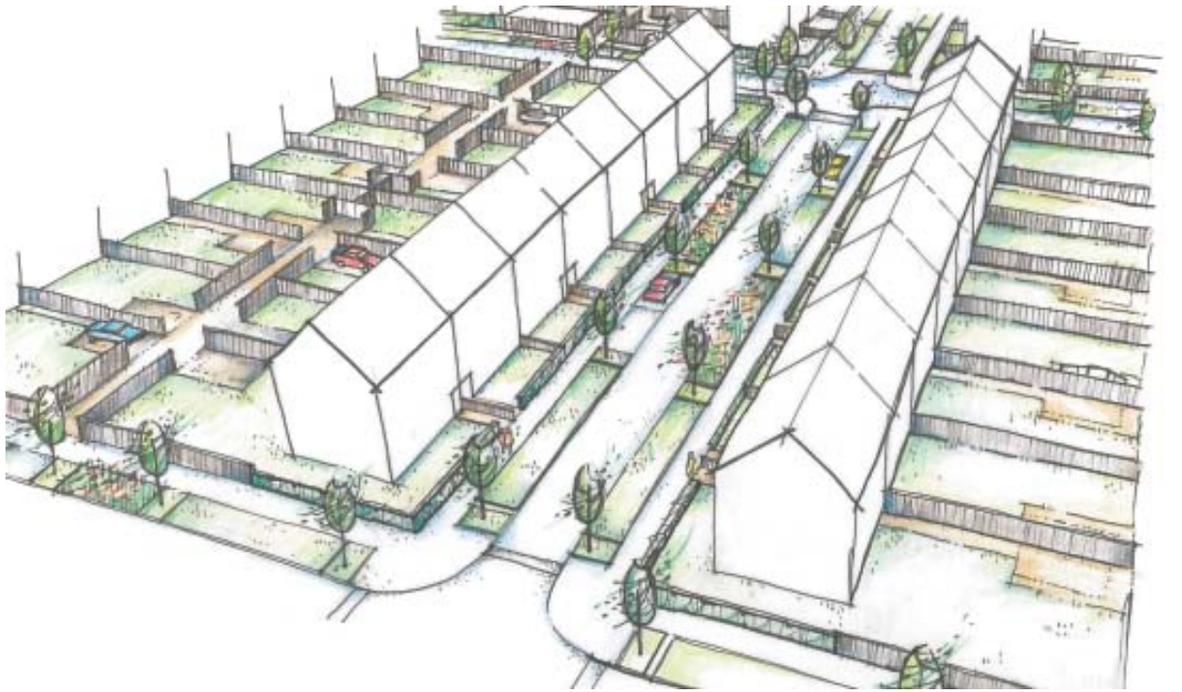
DETACHED AND SEMI-DETATCHED HOUSING

NB. Drawings are for reference only - not to scale



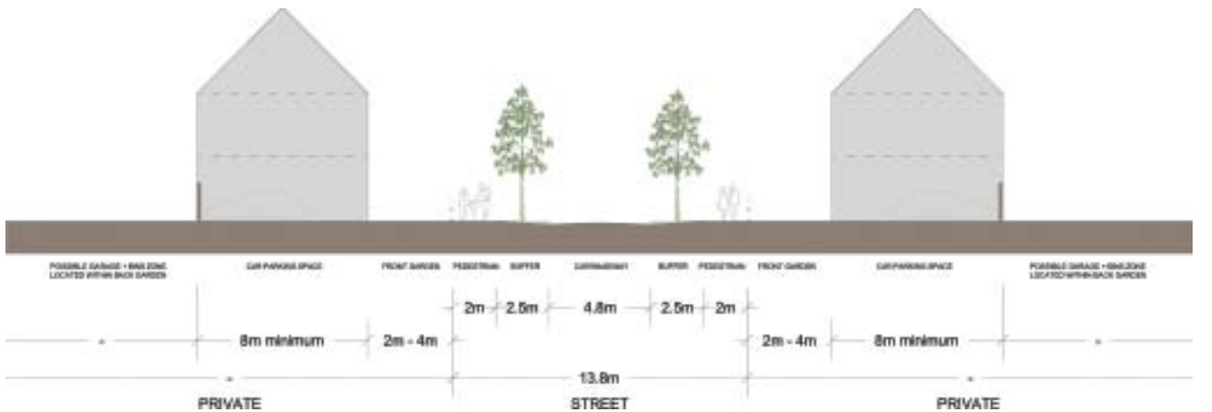

Visitor Parking
Public Open Space
Resident Parking
Footway
Landscape Strip
SUDS

HOUSING TYPOLOGIES: EXAMPLE LAYOUTS



TERRACED HOUSING

NB. Drawings are for reference only - not to scale




Resident Parking
Public Open Space
F
Footway
Private Access
Landscape Strip
SUDS

REFERENCE DOCUMENTS

Roads (Scotland) Act 1984

Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Highways Agency, Department of Transport

Manual of Contract Documents for Highway Works Notes for Guidance, Volume 2 Specification for Highway Works, Highways Agency, Department of Transport

Transport Research Laboratory TRL Report No. 332 Road *Layout Design Standards and Driver Behaviour*, G Maycock, PJ Brocklebank, RD Hall

Transport Research Laboratory TRL Report No. 661 *The Manual for Streets: Evidence and Research*, I York, A Bradbury, S Reid, T Ewings, R Paradise

Design Manual for Roads and Bridges: Volume 7, Highways Agency, Department of Transport

Cycling by Design

Scottish Road Works Register

Scottish Community Apparatus Data VAULT

National Joint Utilities Group (NJUG)

Scottish Planning Policy 1 (SPP1)

Designing Places

Designing Streets: A Policy Statement for Scotland (22nd March 2010)

The Glasgow and the Clyde Valley Strategic Development Plan

Glasgow City Plan 2

Sewerage (Scotland) Act 1967

Water Environment and Water Service (Scotland) Act 2003

PAN 61: Planning and Sustainable Urban Drainage
CIRIA C697: The SUDS Manual

SUDS for Roads

Whole Life Costs Model
Sewers for Scotland 2nd Edition

WAT-RM-08 Regulation of Sustainable Urban Drainage Systems

Building (Scotland) Amendment Regulations 2011, 2011 Technical Handbook, Section 3 - Environment

Please find below the link to the SUDS WLC and WLC Carbon tool on SCOTS website:

http://scotsnet.org.uk/best-practice.php

Available at this site are the following files for download:

- the SUDS for Roads WLC and WL Carbon Tool (recommend to save rather than open when downloading)
- the SUDS for Roads WLC and WL Carbon Guidelines
- an Excel file (with instructions) which users can use to compare different SUDS options
- a Feedback form (and email address to send feedback to).

Also available at this web location is a link to download the SUDS for Roads 2010 Guidelines Manual.

BS 3882 : 1994, Specification for Topsoil

BS 5837 : 2012, Trees in Relation to Design, Demolition and Construction

CIRIA: The benefits of large species trees in urban landscapes: a costing design and management guide. Draft 6 | September 2011

Trees in the Townscape: A Guide for Decision Makers, Trees and Design Action Group (www/tdag.org.uk)

GLOSSARY

Adopt	Add to the Local Roads Authority's list of public roads
Allocated Parking Spaces	Parking spaces or driveways which are for the exclusive use of the residents of the individual dwelling and their visitors.
Bavarian B Plan	A plan that uses colour to highlight the components of a development layout e.g. red for buildings, green for open spaces and yellow streets and paths.
Biodiversity	The existence of a wide variety of plant and animal species in their natural environments
Build Out	Narrowing of the carriageway constructed on only one side as an extension of or adjacent to the verge, footway or cycle track.
Carriageway	That part of a road constructed for use by vehicular traffic. Auxiliary traffic lanes, passing places lay-bys and bus bays are included.
Chicane	A series of built outs on alternate sides of the carriageway.
CIRIA	Construction Industry Research and Information Association
CPZ	Controlled Parking Zone.
Curtilage Water	Surface water draining from roofs, driveways, grounds and car parks within the enclosed area immediately surrounding a house of dwelling
Cycle Lane/ Cycleway	Part of the carriageway intended for use by cyclists only.Part of the road, but separate from the carriageway. Pedestrians and cyclists may share a cycleway or they may be segregated from each other.
Dense Bitumen Macadam DBM	A pre-mixed continuous grading bituminous material.
Dropped Kerb	A reduction in carriageway edge kerb height.

Urban Grain	Urban grain is the pattern of building plots, street blocks and streets in urban areas. A fine urban grain has small plots and street blocks with frequent junctions.
Flexible Pavements	Roads constructed from bituminous materials that yield elastically to traffic loading
Fluvial	Flooding from rivers and burns
Footway	That part of a road associated with a carriageway reserved exclusively for pedestrians.
Formation	Subgrade prepared for road construction.
Gateway	An object or structure constructed on the verge footway or cycle track of a road for the purpose of indicating the presence in a length or lengths or road or roads of traffic calming works of a description, prescribed by the Traffic Calming Regulations.
HRA	Hot Rolled Asphalt. A low stone content pre-mixed gap graded bituminous material
Impermeable Membranes	A waterproof material
In-curtilage	Within the ground surrounding or belonging to a building.
Lateral Shift	A change in the alignment of the carriageway.
Overland Flow	Water flowing over the ground surface toward a channel; upon reaching the channel, it is called surface runoff.
Path	A pedestrian route not associated with a carriageway, for use by pedestrians and pedal cycles only.
Pavement	Layers of the carriageway, footway, footpath or parking area structure above formation level, i.e. Surface Course, Binder Course, Base and Sub-Base.
Pinch point	Build outs constructed on both sides of a carriageway opposite one another.

Playable Space	Landscaped areas which have been designed to provide opportunities for informal children's play, including for example mounded land forms, imaginative planting and objects such as rocks, logs and paving.
Pluvial	Ponding of rainwater which has not entered a drainage network, normally occurring in low lying areas.
Road	Any way (other than a waterway) over which there is a public right of passage (by whatever means) and including the road's verge and any bridge (whether permanent or temporary) over which or any tunnel through which, the road passes.
Road Bond	A deposit lodged as a security with the local Roads Authority as a legal requirement, before work can commence on house construction within a housing development.
Road Construction Consent	The authority to construct a new road or an extension of an existing road irrespective of whether or not such roads are to be submitted for adoption as public granted by the Local Roads Authority under Section 21 of the Roads (Scotland) Act 1984.
RPZ	Restricted Parking Zone.
Safety Audit	A formal systematic procedure applied at various stages of a road scheme to ensure that they operate a safely as possible.
Service Strip	Reservation for Statutory Undertaker services (gas, water, (etc)) normally located within confines of footway or verge.
Shared Surface	Paved area for unsegregated use by both pedestrians and vehicles.
SSD	Stopping Sight Distance
SUDS	Sustainainable Urban Drainage System

Swales	Type of SUD (depressed grass verge) adjacent to carriageway
TPOs	Tree Protection Orders. Councils can designate certain trees or groups of trees as having special protection. Permission is required from the Council to fell or lop such trees.
Transport Assessment	A report which assessed the impact of a new development on the road and transportation network.
Unallocated Parking Spaces	Parking spaces which do not relate directly to any particular dwellings and are considered to be for the use of either residents or visitors on a “first come first served” basis.
Verge	The landscaped part of a road adjacent to the carriageway and generally at substantially the same level. It may abut footways, cycle tracks or ditches.
Vest	To be responsible for maintenance.
Visibility	The intervisibility between vehicles or between vehicles and pedestrians. Where this crosses land beside the road the area must be kept clear of obstructions and is called a “visibility splay” at a junction and “forward visibility” when travelling along a road.
WLC	Whole Life Costs
Traffic Regulation Order (T.R.O)	Legal order, which allows the Roads Authority to regulate the speed, movement and parking of vehicles.



APPENDICES

Appendix 1 - Planning Guidance

Appendix 2 - Construction Consent Guidance for New Residential Streets

Appendix 3 - SUDS and Flood Management

Appendix 4 - Guidance on street tree details, specifications and standards

APPENDIX 1 : PLANNING GUIDANCE

1

INTRODUCTION

Planning application forms can be obtained from the *Development Management: Application Forms* page of the Council's website, which includes information on the *Scale of Fees*.

Residential development of 50 or more dwellings or of a site area of 2 hectares or more is classified as major development and is subject to a pre-application process which requires prospective developers to consult local communities.

Information on the planning application process is available in *Circular 4 2009: Development Management Procedures.*
Development Plan policies are available on the *Planning Policies* page of the Council's website.
Planning applications can be submitted online through the *Scottish Planning Portal.*

Guidance on community engagement in planning is provided in the Scottish Government's Planning Advice Note *PAN 3/2010 Community Engagement*.

Applications for residential development for may also require the following:

DESIGN AND ACCESS STATEMENT

Design or design and access statements are required for:

- applications for planning permission for national and major developments;
- Applications for planning permission for local development within the categories listed below will require a **design statement** unless the development comprises the alteration or extension of an existing building :
  - a World Heritage Site;
  - a conservation area;
  - a historic garden or designed landscape;
  - a National Scenic Area;
  - the site of a scheduled monument; or
  - the curtilage of a category A listed building.

A design and access statement or design statement is **not** required for the following categories:

- an application for planning permission for development of land without complying with the conditions of a previous planning permission;
- a material change in the use of land or buildings; or
- an application for planning permission in principle.

Guidance on how to prepare and present design statements is provided in Planning Advice Note *PAN 61 Design Statements*.

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

A site of more than 0.5 hectare requires an application to the Council for a formal screening opinion, which will set out whether an EIA is required to accompany a planning application. In the event that an EIA is necessary, a formal scoping opinion should then be obtained from the Council (see below).

Some types of development automatically require EIA. These tend to be larger developments, or those with the most serious potential environmental effects, known as Schedule 1 Development.

For more information see *Schedule 1 of the EIA (Scotland) Regulations 2011*.
Other types of development, known as Schedule 2 development, *may* require assessment.

Generally, whether a proposal will require assessment or not depends on its scale, and the sensitivity of the site and surrounding area.
For more information see *Schedule 2 of the EIA (Scotland) Regulations 2011*.

Screening: Developers may ask the Council for a formal determination on whether or not a project requires EIA. This is called a Screening Opinion. The Screening Opinion will set out whether or not EIA is needed and the reasons for that decision. It will normally be issued within three weeks of the request.

Where the Council's opinion is that EIA *is* required and the developer disagrees, or where should the Council fail to adopt any opinion within thee weeks (or any agreed extension), the developer may ask the Scottish Ministers to make a screening direction.

Scoping: A developer intending to carry out EIA may formally ask the Council what should be covered. This is not essential, but is advisable as failure to include information in the EIA can lead to delays in processing the planning application. The Council will consult with the statutory bodies, and then provide a Scoping Opinion giving this information. Scoping Opinions will normally be issued within 5 weeks of the request being received.

Requests for Scoping Opinions should include a plan identifying the land and a description of the nature and purpose of the proposal and its possible effects on the environment. Any other relevant information such as proposed methodology of assessment may be included.

TRANSPORT ASSESSMENT

A Transport Assessment is required for a residential development of more than 100 dwellings, but may also be required for a smaller development (between 50 - 100 dwellings) located in a traffic sensitive area.

The scope of the Transport Assessment should always be agreed in advance with the appropriate Council officer and developers should always provide their consultant sufficient time to prepare the document, which can be constrained by the need to undertake traffic surveys outwith school holidays.

The requirements for a Transport Assessment are outlined in City Plan development guide D*G/ TRANS 1 Transport Assessments*.

The following Glasgow City Plan 2 policies and guidance may also be relevant:

DG/TRANS 3 Public Transport Accessibility Zones

TRANS 8 Developer Contributions - Transport Infrastructure

DG/TRANS 4 Clyde Fastlink - Developer Contributions

TRANS 5 Providing for Pedestrians and Cycling in New Residential Development

The following guidance is available from the Scottish Government: *PAN 75: Planning for Transport* and *Transport Assessment and Implementation: A Guide*.

SITE INVESTIGATION, NOISE, AIR QUALITY REPORTS

These are required where previous use of the site gives rise to ground contamination issues, where the site is subject to significant external noise sources or air quality issues, normally from traffic. The Public Health Unit within the Council's Land and Environmental Services (LES) provides advice on whether these reports are required. E-mail: publichealth@glasgow.gov.uk

See also Policy *TRANS 9 Air Quality* of Glasgow City Plan 2.

SUSTAINABLE URBAN DRAINAGE SYSTEM (SUDS), DRAINAGE IMPACT ASSESSMENT (DIA) AND FLOOD RISK ASSESSMENT.

Both SUDS and DIA are required for residential development of more than one unit and a Flood Risk Assessment is required where there is a material flood risk. See Appendix 3 SUDS and Flood Management for further guidance.

STOPPING UP ORDERS

Applicants should be aware of the importance, where required, of the need to formally Stop Up certain areas, roads and public paths, which due to their development layout, will no longer have a public right of passage.

Where this process is required because of related development, it is normally carried out under the Town & Country Planning (Scotland) Act (1997) following the grant of planning permission.

The simplest way of demonstrating the Stopping Up procedure is in the context of public right of passage, which is established by Road Construction Consent. A Stopping Up Order removes the road area(s) from the register of public road and consequently removes the public right of passage. The Stopped Up areas (carriageway, footway, footpath, etc.) must be physically grubbed up or closed off, with any associated street nameplates, lighting, etc. removed - i.e. the area no longer is and no longer appears to be a road.

After the Stopping Up Order has been made it is the responsibility of the developer to inform the Council at least a month in advance of the proposed date for physically Stopping Up each road area covered by the Order. This is to allow programming of works to remove public apparatus such as lighting columns, control pillars, barrier rail and bollards. All of the works associated with stopping up shall be at the developer's expense.

In addition, prior to the physical Stopping Up of a road area, the developer must provide a plan of the existing drainage / SuDS system, including all gullies. This plan will clearly demonstrate the proposed methodology of this removal, and that the removal will have no adverse effect on the surrounding Council and Scottish Water infrastructure, which will remain part of the publicly adopted road and drainage network.

APPENDIX 2 : CONSTRUCTION CONSENT GUIDANCE FOR NEW RESIDENTIAL STREETS

2

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CC5 Footpath Agreement
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CC8 Carriageway Design Certificate
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1 INTRODUCTION

1.1 PURPOSE AND STRUCTURE

Objective

The objective of this Appendix (Construction Consent Guidance for New Residential Streets) is to assist developers designing new residential roads, submitting applications for Roads Construction Consent and subsequent adoption. The Guide will also be used by Council officials assessing Road Construction Consent applications.

The guide aims to provide clear and consistent advice that builds on and interprets the principles, standards, and guidance contained in Glasgow's Design Guide for New Residential Areas, Design Manual for Roads and Bridges (DMRB) and the Manual of Contract Documents for Highway Works (MCHW). The granting of roads construction consent does not exempt the applicant from compliance with these principles, standards and guidance or obtaining any other permission which may be required.

Although economy of maintenance will be a major consideration in the assessment of applications for roads construction consent, developers will not be discouraged from attempts to use innovative and new design techniques.

Structure

The guidance covers the following subjects:

Section 1, Introduction

Introduces the document and its structure

Section 2, Construction Consent and Adoption

Outlines the policy, procedures and legal requirements for road design, consent and adoption.

Section 3, Design Standards

Contains details of the relevant roads design standards.

Section 4, Parking Design Standards

Contains parking design standards appropriate for both on and off street parking.

Section 5, Construction Design and Lighting Design

Details construction design standards.

Section 6, Road Safety

Outlines the policy, procedures and legal requirements for Road Safety Audit / Assessment

2 CONSTRUCTION CONSENT AND ADOPTION

2.1 APPLICATION FOR SECTION 56 APPROVAL

If a development requires planning permission and is wholly within the existing publicly adopted roads area, then an application for Section 56 approval would be required, under Section 56 of the Roads (Scotland) Act 1984.

Requirements for a valid application for Section 56 approval:

- covering Letter;
- location Plan (to 1:1,250 or 1:2,500 scale);
- detailed site plan;
- cross-section through each area of proposed change within the adopted area (including footway) gradients and cross falls);
- plan showing existing signing, lining, time plates and street furniture (i.e. prior to any works taking place);
- plan showing existing street lighting (including illuminated road signs);
- where any change to an existing TRO (Traffic Regulation Order) is necessary due to the proposed works (e.g. by an access relocation), or a new TRO is required by the proposed works, the applicant will supply an electronic plan of the changes and a rechargeable works order code;

2.2 APPLICATION FOR CONSTRUCTION CONSENT

If a development will extend the existing road in any way, or add new road to it, then an application for Road Construction Consent (RCC) would be required, under Section 21 of the Roads (Scotland) Act 1984.

Place and date of Application

Following pre-RCC application discussions as part of the overall design process, an application for Roads Construction Consent should be made on Form CC1. Completed application forms should be submitted three months prior to the commencement of construction to the Council unless an alternative timescale has been agreed.

Submission of Plans

Formal applications for Construction Consent should be in an electronic Portable Document Format (PDF) and consist of the following (**initially two paper copies will be required for preliminary checking of the proposals**):

(a) A location plan, to a scale of 1:1250 or 1:2500, showing the proposed road network and its relationship to existing development.

(b) A layout plan of the carriageways, footways, verges, footpaths, retaining walls, cycle tracks, buried structures, bridges and earthworks to a scale of 1:500 (1:200 where pedestrian / vehicle shared surfaces are proposed) showing:

(i) the proposed centre, building and kerb lines (and also the heel of the footway where this differs from the building line),

(ii) curve radii of the road alignment and junctions,

(iii) speed control measures,

(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,

(ix) details of Sustainable Drainage Systems that will potentially be offered form adoption,

(x) the location of the road drainage system and its discharge points (applicants can obtain information on discharge points from Scottish Water),

(xi) the location and type of lighting columns and lanterns, wall-mounted lighting units (if applicable), control pillars, underground cables and road crossing ducts,

(xii) the location of all underground services and ancillary apparatus,

(xiii) the full extent of all cut and fill slopes,

(xiv) the boundaries of any areas which it is intended will subsequently be offered for adoption (coloured red or hatched) or maintenance,

(xv) road signs and road markings etc.

(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 and gully connections.

(e) A **Design Audit which includes a Stage 2 Road Safety Audit** for the design shall also be included.

(f) A **Ground Investigation Report** and corresponding **Geotechnical Design Report** making specific recommendations on the design of the proposed road.

Structures Submission

The structures technical approval procedures outlined in the following paragraphs must be completed prior to submitting an application for Roads Construction Consent. This applies to all proposals (relating to both existing and proposed roads) requiring new road structures or proposals which affect existing road structures.

Technical Approval consists of a review of Structural Proposals made by Designers on behalf of a Developer by a Technical Approval Authority (TAA). The role of Structures TAA for Glasgow City Council is held by the Structures Section in Land and Environmental Services.

The following Technical Approval Procedures should be read in conjunction with the DMRB, 'Technical Approval of Highway Structures'.

Please note bridges, buried structures, subway underpasses, culverts and any other structure supporting the road with clear span or internal diameter 0.9m or greater requires TAA approval as well as earth retaining structures where the effective retained height is 1.5m or greater.

Structures Technical Approval - Procedures

Category of Proposals

Consultation with the TAA on proposals regarding structures should start when Planning Consent is being considered. The Designer shall then propose an appropriate Category: 0, 1, 2 or 3 according to the criteria set out in the DMRB for agreement with the TAA.

Technical Requirements

At initial consultations with the TAA, the Developer's Designer is to ascertain the required technical criteria for the design (or assessment) and construction of the structure. The design and construction requirements for all proposals shall generally comply with the relevant standards in the DMRB and the MCHW. Other supplementary standards or requirements etc. proposed by either the TAA or Designer shall be agreed through the Technical Approval Process. All the relevant standards should be listed in a Technical Approval Schedule.

Departures from Standard

Designers seeking to introduce alternative design principles or non-standard techniques may do so by proposing Departures from Standard where required. Reasons and justifications for Departures shall be submitted to the TAA with the application for a Departure from Standard. Applications for Departures shall be submitted to the TAA for approval prior to submitting the formal Technical Approval submissions.

Application for Approval in Principle

An application for Approval in Principle shall be submitted for TAA review in accordance with the template provided in the Structure Design Certificate (SD5 - Refer to Structures Design Certificate Proformas). The Approval in Principal is a record of all the agreed technical criteria which the design (or assessment) and construction is to be based. The submission shall comprise the completed SD5, a location plan, a general arrangement drawing, relevant parts of the Geotechnical Report, an agreed Technical Approval Schedule, documents relating to consultations and any other relevant information or reports. Calculations and detailed drawings are not required as part of the Application for Approval in Principle.

Endorsement of the Approval in Principle by the TAA is required before proceeding with any design. The completed design cannot be implemented until the Structures section of Land and Environmental Services is in receipt of certificates confirming that the implementation documents are accurate and fully in compliance with the requirements of the Approval in Principle. The Approval in Principle is valid for three years after the date of agreement.

Design and Checking Certification

The Design and Design Check Certificates (SD1 to SD4 - Refer to Structures Design Certificate Proformas) are signed confirmation that the design and design check has been satisfactorily completed in accordance with the technical criteria agreed with the TAA. The completed Design and Check certificates should be submitted to the TAA as part of the Application for Construction Consent.

Construction Compliance Certificate

Completion and acceptance inspections shall be in accordance with DMRB 'Inspection of Highway Structures'. Glasgow City Council requires a Construction Compliance Certificate (SD6 - Refer to Structures Design Certificate Proformas) to be completed for all structures proposed for adoption by the Council.

Summary of Construction Consent Submissions

Please note where a Category 0 and 1 structure requires a Departure from Standard the category of structure shall change to 2. Applications for Departures from Standard require to be approved before the Approval in Principle is submitted.

Construction Consent Submissions for structural proposals for the various categories shall include the following:

Category 0: - Confirmation from TAA of Category selection. Design and Check Certificate (SD1) - Accompanied with a General Arrangement Drawing and any other documentation to support the Category 0 classification.

Category 1: - Confirmation from TAA of Category selection. An endorsed Application for Approval in Principle (SD5) with Design and Check Certificate (SD2).

Category 2 & 3: - Confirmation from TAA of Category selection. An endorsed Application for Approval in Principle (SD5) with Design Certificate (SD3) & Design Check Certificate (SD4).

For structures to be adopted by Glasgow City Council the Design and Check certificates shall be submitted with a copy of the design calculations and construction drawings.

If the need for an additional or amended structure arises after the granting of Construction Consent, the developer should seek the approval of Glasgow City Council before commencing the associated construction.

Responsibility for Design

The granting of Construction Consent does not imply that Glasgow City Council accepts any responsibility for the accuracy and suitability of any elements of the design.

Docqueting of Plans

It is essential that the applicant or agent declares each plan, detailed drawing and specification submitted with the application to be 'the plan/drawing/specification referred to in the application' by signing and dating each plan, drawing and specification.

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.

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 Glasgow City Council. Any such representations will be considered before Construction Consent is determined.

Hearing of Objection

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

Right of Appeal

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

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 be not greater 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, Glasgow City Council may grant an extension with revised road bond (if appropriate). In the absence of such an extension a new application for Construction Consent must be made.

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, the approval of the Council must be gained. Major changes may require the submission of a new application for Construction Consent, which must be approved by the Council prior to construction. Construction Consent approvals cannot be transferred from one applicant to another and any change of applicant must result in a resubmission.

Footpath Agreement

In addition to obtaining Construction Consent, the developer should enter into an agreement with Glasgow City Council (using Form CC5) before constructing any footpaths which it is intended should subsequently be adopted.

Road Lighting and Signing

The developer will be responsible for the provision of all road, footpath and cycletrack lighting, temporary and permanent signing (whether illuminated or not) and alterations to existing lighting deemed necessary under Construction Consent.

Road Bonds

Where a developer is required to lodge a Road Bond or deposit, the completed Form CC7 should be submitted prior to any house building commencing.

Construction Consent Forms

All the relevant Construction Consent forms, as detailed below, are included at the end of this Appendix for the use of the applicant. Permission is hereby granted for these forms to be printed.

Form	Title
CC1	Application for Construction Consent to construct or extend a road
CC2	Notification of adjacent proprietors (Docquets of Service)
CC3	Notice of Service
CC4	Construction Consent
CC5	Footpath Agreement
CC6	Application for addition of roads (including footways/cycle tracks) to list of public roads
CC7	Road Bond
CC8	Carriageway Design Certificate
CC9	Construction Consent Checklist

Non Standard Materials

Carriageways should be designed as flexible pavements. Written approval of the Council will be required for materials other than Hot Rolled Asphalt (HRA) or Dense Bitumen Macadam (DBM). A Materials Strategy which outlines the cost, durability and maintainability of the proposed materials compared to HRA and DBM over a 40 year design life, should be submitted to the Council.

Where alternative materials are accepted in writing by the Council, the developer may be required to provide an additional supply of the alternative material/s, i.e. deposit a stock of 5% of these materials with Glasgow City Council prior to adoption.

Sustainable Drainage Systems, Pipes and Culverts under Roads

For Sustainable Urban Drainage Systems, 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. Grills should be designed to facilitate ease of maintenance and prevent flooding and, where possible, grills should allow for overflow during flood conditions or where the grill face is blocked with debris.

Drainage Outfall to Watercourse

The approval of Council's Development and Regeneration Services Flood Risk Management section is required where it is intended that treated surface water run-off will be discharged to an existing watercourse. Where connection of the treated road drainage to an existing watercourse is not possible, it may be possible to connect the treated road drainage to a public sewer if approved by Scottish Water. The hydraulic capacity of this outfall should be established in a manner as described in Section 5.7.

Where it is intended that the Council and Scottish Water will share ownership of the surface water drainage network, Roads Construction Consent will be conditional on Scottish Water approval.

Failure to Comply

Failure to comply with the procedures given in this document will result in refusal of Construction Consent. Developers are therefore encouraged to liaise with the relevant Council representative at all stages of a scheme.

2.3 INSPECTION PROCEDURES DURING CONSTRUCTION

Notice of Commencement

The Contractor must **contact** the Council's Land and Environmental Services **Roadworks Control Unit** at least **six weeks in advance of commencement of the works** to discuss traffic management issues and arrange relevant permits.

Two weeks notice must be given to the Council 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.
Prior to works commencing on site the Contractor should undertake a dilapidation survey on the adjacent public road network. In the absence of such a survey, the Contractor will be liable for any repairs required to the surrounding road network.

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 relevant Council 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 initiate and maintain dialogue with the relevant Council representative to examine the works being executed and the materials being used, but will remain responsible for ensuring that construction is in accordance with the Construction Consent. Failure to do so could result in rejection of the application for adoption.

Charges for Inspection and Testing

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

Notice of Operations

The developer or his contractor must give the relevant Council 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 steel fixing where reinforced concrete is used,

(d) Striking of formwork,

(e) Setting out of road lighting plant positions, backfilling of cable trenches and painting of lighting columns.

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

Completion Inspection

Towards completion of any development incorporating new roads, a request should be made to the Council to have a completion inspection carried out. As a result of this inspection, a list of any remedial work required to bring the road(s) up to Glasgow City Council's standards will be prepared. Following the satisfactory completion of any such remedial work, an application may be made for the addition of the road(s) to Glasgow City Council's list of public roads.

2.4 ADOPTION PROCEDURE

Policy Regarding Adoption and Maintenance

In terms of Section 16 of the Roads (Scotland) Act 1984, following satisfactory inspection, Glasgow City Council will, upon request, adopt, any new road, (including any associated footway or verge) constructed in accordance with a Construction Consent. However, where a shared surface water drainage system is incorporated (under a Section 7 agreement) adoption will be conditional on Scottish Water vesting their part of the drainage system.

Phased Adoption

To avoid delays between construction and adoption of roads, developers can programme construction to enable the adoption of roads to be phased as sections of work are completed, subject to the following conditions:

(a) Each phase should have a separate and independent Construction Consent.

(b) Carriageways, footways and verges will not be adopted separately.

(c) Only lengths of road between junctions or completed culs-de-sac will be adopted.

(d) All roads submitted for adoption should form a continuous system with existing adopted roads.

Adoption of Footpaths

In terms of Section 18 of the Roads (Scotland) Act 1984, Glasgow City Council will, upon request, adopt any footpath which is the subject of an Agreement (Form CC5). Furthermore, should a developer fail to complete a footpath to the Authority's satisfaction within the period specified in such an Agreement, Glasgow City Council may itself carry out the work and recover reasonably incurred expenses from the developer. The suitability of footpaths for adoption under Agreement will be judged against the following criteria:

(a) Footpaths should be constructed in accordance with a Construction Consent.

(b) Footpaths should form part of a general pedestrian network interconnecting houses, shops, schools, public transport, etc. and be available to pedestrians on an unrestricted basis.

(c) Footpaths should serve more than one dwelling.

(d) In the case of multi-storey buildings, the footpath may be adopted up to the point where it is deemed to enter the curtilage (i.e. garden, landscaped or forecourt area surrounding the building).

(e) Surfaced areas surrounding buildings and intended essentially for maintenance purposes will not be considered.

(f) Where numerous footpaths serve the same purpose, only one will be considered for adoption, e.g. parallel footpaths, front and rear footpaths, etc.

(g) At least one end of a footpath should be connected to a public road to facilitate access for maintenance purposes.

(h) Steps should be avoided.

Parking Areas Adoption and Maintenance

In new development, the developer will normally be required to provide parking spaces in accordance with Policy TRANS4 of the Glasgow City Plan 2.

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.

Off-road parking areas will not be adopted as public roads unless they are identified as meeting a general public parking need and have been constructed to the satisfaction of the Council.

Adoption of Road Lighting

Lighting installations on publicly maintainable roads, footpaths and parking areas may be taken over by the Roads Authority for operation and maintenance, in advance of the road adoption, provided that the following requirements are met;

(a) Acceptable Completion and Inspection Certificate (form CC10 or approved equivalent) is submitted

(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,

(c) Written assurance from the developer that all roads concerned will be offered for future adoption,

d) Where the development involves self build plots, all driveways and site lines are finalised.

Final acceptance will be withheld until all columns and control pillars etc. have been numbered.

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. Adoptable cycle tracks should:

(a) Form part of a general cycling network interconnecting houses, shops, schools, public transport, etc. and be available to cyclists or cyclists and pedestrians on an unrestricted basis.

(b) Be connected to a public road carriageway to facilitate access for maintenance purposes.

Where a cycle track is provided on land primarily intended for recreational or similar purposes to be managed by the Council, the cycle track will not be adopted and a Construction Consent is not required; Road (Scotland) Act 1984 Section 151(3).

Delineation Public/Private

Clear physical delineation will be required between all private areas and the public road.

Structural 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 Glasgow City Council. Other essential structures will also require an agreement to enable these structures and solums to vest in Glasgow City Council. However, where the bridge or other structure and solum have not been so acquired, Glasgow City Council will be responsible only for maintaining the road surface.

Drainage Agreements

The agreed Section 7 surface water drainage schedule should be prepared through joint discussion. This review will identify the combination of SUDS and drainage features that will be acceptable.

The developer will be required to provide a colour coded plan indicated what both Scottish Water and the Council will be willing to vest / adopt once the works have been completed to the appropriate standard.

Roads Bonds

In terms of Section 17 of the Roads (Scotland) Act 1984 and the Security for Private Roadworks (Scotland) Regulations 1998, private developers are required to make financial provision with Glasgow City Council in order to safeguard the completion of housing development roads and surface water drainage systems (including SUDS) which are the subject of a Construction Consent. Such provision as submitted under Form CC7, which may take the form of a Road Bond or deposit, protects prospective house purchasers from having to bring incomplete roads up to adoptable standards.

It should be noted that no building works can commence until such securities have been lodged. A security in favour of the Roads Authority will also require to be lodged in cases where substantial works affecting the existing road network are being undertaken by private bodies e.g. roundabout, underpass etc. (this by means of a Section 75 Agreement made under the Town and Country Planning Act 1997. The Regulations concerning Road Bonds do not, however, cover private accesses.

2.5 APPLICATION FOR ADOPTION OF DEVELOPMENT ROADS, FOOTPATHS & CYCLE TRACKS

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 Glasgow City Council's list of public roads) may be submitted to the Council by the person to whom such consent was granted

Footpaths

Only those footpaths which are the subject of an Agreement will be eligible for adoption.

Documents to Accompany Application

The submission should be in an electronic Portable Document Format (PDF) and consist of all plans associated with the application for Construction Consent and all relevant as built details (including street names). The roads offered for adoption should be shown in colour (See Figure 2.1), and the plans should clearly indicate the ownership of all areas so coloured. The application for adoption should include the Health and Safety File as required under the Construction Design and Management Regulations 2007.

Road Lighting

The submission should include two copies of a signed Lighting Completion and Inspection Certificate Form CC10 (or approved equivalent) together with as installed plans. These plans must show the positions and circuit, arrangements of all lighting apparatus and be in an electronic Portable Document Format (PDF).

Drainage / SUDS

The submission should include two copies of the agreed drainage schedule and colour coded plans indicating what both Scottish Water and the Council have agreed to vest / adopt.

Adoption Inspection

Following on from completion in accordance with a Construction Consent, the Council will within a period of twelve months from the date of application for adoption, undertake an inspection to ensure that the road has not deteriorated to a standard below that required for adoption.

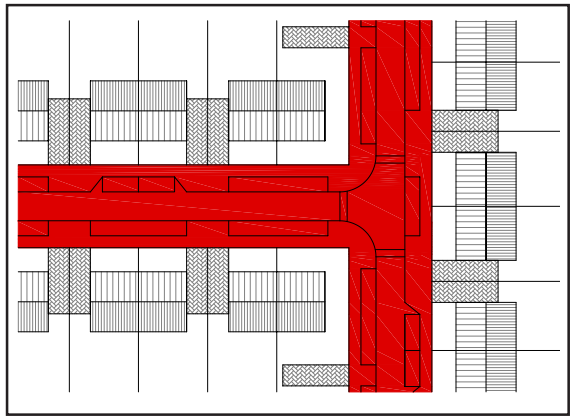
Addition to List of Public Roads

Following a satisfactory adoption inspection by the Councils representative and Scottish Water vesting of drainage, 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.

Release of Road Bond

Glasgow City Council may on request of the Developer release up to 80% of the Road Bond in respect of a section of road within a Construction Consent where;

Figure 2.1 - Plan indicating adoptable areas



(a) the construction of carriageways, footways, etc is complete to basecourse including street lighting over the whole of the section, and

(b) a turning facility up to basecourse level is provided at the 'end' of the section, and the section is not isolated within the development by other sections not yet up to the standard specified in paragraph (a)above, but connects to the public road network through sections at least up to that standard.

(c) The SUDS network has been completed to the satisfaction of the Council and Scottish Water (where appropriate).

Glasgow City Council will retain a minimum of 20% of the originalsecurity lodged until such time as the road has been added to the list of Public Roads.

3 DESIGN STANDARDS

Layout / Design Speed

The ability to achieve self enforcing vehicle speeds should not depend on traffic calming measures but should be brought about, by the road layout. As far as possible, geometry and natural features should be used to encourage speed reduction and provide the most environmentally friendly layout. Details of acceptable speed control measures are given in the Design Guide for New Residential Areas, which outlines design standards and method of application.

Pedestrian Consideration

Constraints introduced by the layout which might impede the free movement of pedestrians should be avoided

Speed	Kilometres per hour	16	20	24	25	30	32	40	45	48	50	60
	Miles per hour	10	12	15	16	19	20	25	28	30	31	37
	SSD (metres)	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 3.1 - Stopping Sight Distances

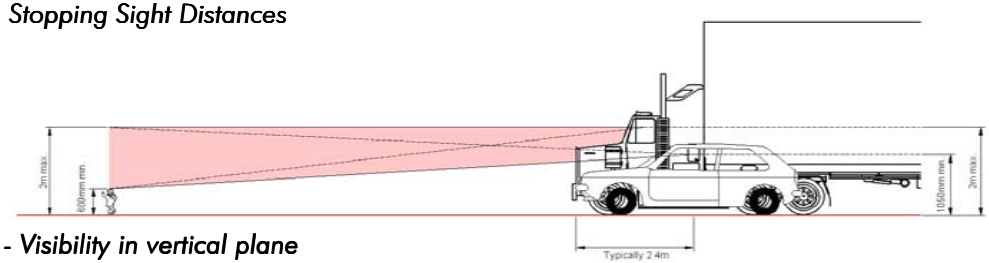


Figure 3.1 - Visibility in vertical plane

3.1 VISIBILITY

Stopping Sight Distance

The Stopping Sight Distance (SSD) is the distance within which drivers need to be able to see ahead and stop from a given speed.

The SSD values used in *Designing Streets* are based on research into deceleration rates, driver perception-reaction times and speed. These SSD values are appropriate for residential and lightly trafficked streets. The table below shows the effect of speed on SSD. These values are independent of traffic flow or type of road. It is recommended that they are used on all streets with 85th percentile wet weather speeds up to 60 kph.

Below around 20 mph, shorter SSDs themselves may not achieve low vehicle speeds: the design of the whole street and how this will influence speed needs to be considered at the start of the process; e.g. the positioning of buildings, the presence of on-street parking, landscaping and speed control measures.

Further information on SSDs, including details of the calculation formula, and also the relationship between visibility and speed is available in TRL Report No. 332 and TRL Report No. 661.

Visibility Requirements

Visibility should be checked at junctions and along the street. Visibility is measured horizontally and vertically. Using plan views of proposed layouts, checks for visibility in the horizontal plane ensure that views are not obstructed by vertical obstructions.

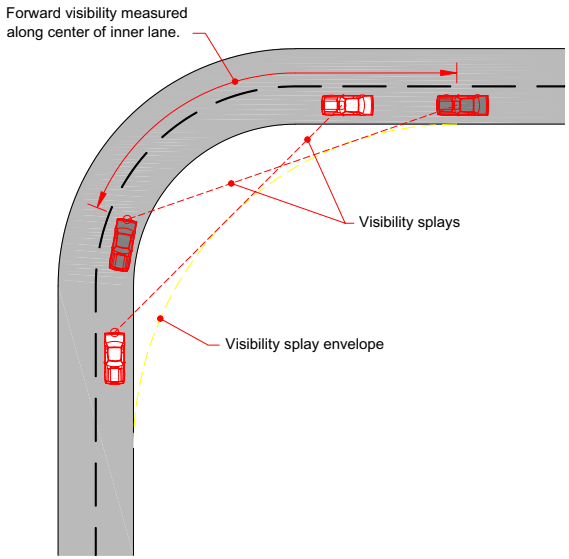
Checking visibility in the vertical plane is then carried out to ensure that views in the horizontal plane are not compromised by obstructions such as the crest of a hill, or a bridge at a dip in the road ahead. It also takes into account the variation in driver eye height and the height range of obstructions. Eye height is assumed to range from 1.05 metres (for car drivers) to 2 metres (for lorry drivers). Drivers need to be able to see obstructions 2 metres high down to a point 600 mm above the carriageway.

Forward Visibility

Forward visibility is the distance a driver needs to see ahead to stop safely for obstructions in the street. The minimum forward visibility required is equal to the minimum SSD. It is checked by measuring between points on a curve along the centreline of the inner traffic lane. Consideration should be given to vertical geometry and any other obstructions.

There will be situations where it is desirable to reduce forward visibility in conjunction with other methods to control traffic speeds.

Figure 3.2 - Measurement of forward visibility



Visibility Splays at Junctions

The distance back along the minor arm from which visibility is measured is known as the X distance. It is generally measured back from the 'give way' line (or an imaginary 'give way' line if no such markings are provided). This distance is normally measured along the centreline of the minor arm for simplicity, but in some circumstances (for example where there is a wide splitter island on the minor arm) it will be more appropriate to measure it from the actual position of the driver.

The Y distance represents the distance that a driver who is about to exit from the minor arm can see to his left and right along the main alignment. For simplicity, it is measured along the nearside kerb line of the main arm, although vehicles will normally be travelling a distance from the kerb line. The measurement is taken from the point where this line intersects the centreline of the minor arm (unless, as above there is a splitter island in the minor arm).
When the main alignment is curved and the minor arm joins on the outside of a bend, another check is necessary to make sure that an approaching vehicle on the main arm is visible over the whole of the Y distance. This is done by drawing an additional sight line which meets the nearest wheel track at a tangent.

Some circumstances make it unlikely that vehicles approaching from the left on the main arm will cross the centreline of the main arm - opposing flows may be physically segregated at that point, for example. If so, the visibility splay to the left can be measured to the centreline of the main arm.

Figure 3.3 - X and Y Distances

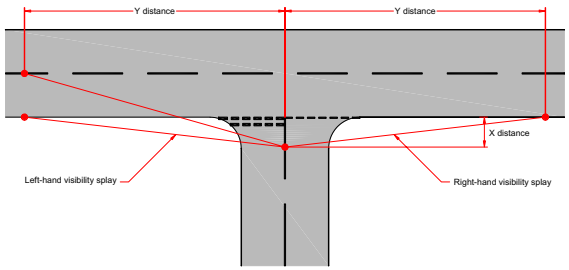
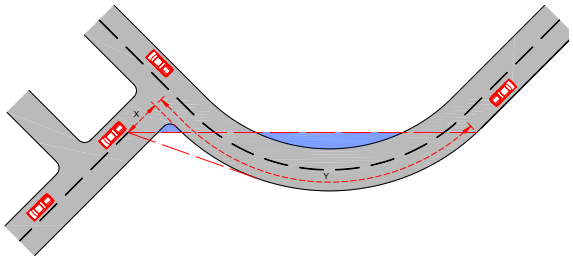


Figure 3.4 - Visibility Splay on Bends



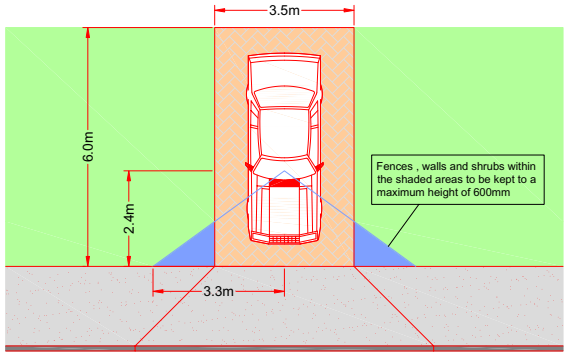
X and Y Distances

An X distance of 2.4 metres should normally be used in most built-up situations, as this represents a reasonable maximum distance between the front of the car and the driver's eye. A minimum figure of 2 metres may be considered in some very lightly trafficked and slow-speed situations, but using this value will mean that the front of some vehicles will protrude slightly into the running carriageway of the major arm. The ability of drivers and cyclists to see this overhang from a reasonable distance, and to manoeuvre around it without undue difficulty, should be considered. Using an X distance in excess of 2.4 metres is not generally required in built-up areas. The Y distance should be based on values for SSD.

Driveway Pedestrian Inter-visibility

To ensure adequate inter-visibility between vehicles in driveways and pedestrians on the adjacent footway, an X distance of 2.4m and Y distance of 3.3m should be provided as indicated in Figure 3.5. There should be no physical obstructions or planting within these areas, that are above 0.6m high

Figure 3.5 - Driveway pedestrian intervisibility



DRIVEWAY VISIBILITY SIGHTLINES

Obstacles to Visibility

The impact of obstacles, such as street trees and street lighting columns, should be assessed in terms of their impact on the overall splay. In general, occasional obstacles to visibility that are not large enough to fully obscure a whole vehicle or a pedestrian, including a child or wheelchair user, will not have a significant impact on road safety.

3.2 DESIGN PARAMETERS

Table 3.2 - Typical Residential Street Design Parameters

Feature	Standard	Comment
Design Speed	20mph (32kph)	
Minimum Carriageway Width	4.8m	Minimum 6m on bus route
Maximum Gradient	8%	Maximum 6.7% on bus route
Minimum Gradient	0.8%	
Minimum Vertical Curve Length	K x change of gradient	K = 3 Absolute minimum curve length 15m
Camber/Crossfall	2.5%	
Minimum Horizontal Curve Radius	25m	Except speed control bends. Superelevation not essentials
Corner Radii	4.5m	
Minimum Forward Sight Distance	25m	85th&ile speed = 20mph
	43m	85th%ile speed = 30mph
		Based on stopping sight distances in Designing Streets
Minimum Verge Width	2m	Grass or deterrant paving
Minimum Footway Width	2m	Desirable on both sides. Essential on at least one side of the road.

Note1: The minimum vertical curve length can be determined by multipying the K value by the algebraic change gradient expressed as a percentage i.e. 3% gradient to a -2% grade indicates a change of 5% and a curve length of 15m

VEHICLE DIMENSIONS

Apart from the 4.2 metres height restriction for 38 tonne lorries loaded in excess of 32.5 tonnes, there is no regulation governing maximum height but most vehicles are less than 4.5 metres high.

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 road, including access through pends where servicing is required.

Generally, 2.25 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 safely service the area without blocking the adjacent road.

Horizontal Clearance

A horizontal clearance of 0.45 metres should always be provided between the edge of the carriageway and any vertical objects such as signs.

3.3 SHARED SURFACES

Table 3.3 - Shared Surfaces Design Parameters

Feature	Standard	Comment
Design Speed	10mph (16kph)	
Minimum Vehicle Running Width	5.5m vehicle width	Overall minimum width excluding service stop
Maximum Gradient	7%	
Minimum Gradient	1.25%	
Crossfall	2.5%	
Minimum Vertical Curve Length	K x change of gradient	K = 2 Absolute minimum curve length = 10m
Minimum Horizontal Curve Radius	10m	
Corner Radii	4.5m	
Minimum Forward Sight Distance	11m	85th %ile speed = 10mph
		Based on stopping sight distances in Designing Streets
Verges		N/A

Note1: The minimum vertical curve length can be determined by multipying the K value by the algebraic change gradient expressed as a percentage i.e. +3% gradient to a -2% grade indicates a change of 5% and a curve length of 15m

Application

Shared surfaces in residential areas comprise a road without footways where the carriageway is shared by pedestrians and vehicles. Shared Surface Roads should only be considered where the volume of vehicular traffic is expected to be low and consist mainly of residents of that particular street. It is desirable that vehicle speed should not exceed 10 mph in Shared Surface roads and the road layout should reflect this. A change in surfacing can assist with the desired speed reduction and concrete block paving or clay pavers may be appropriate for shared surfaces in locations where services are to be located in service strips outwith the shared surface footprint.

Transition

Transitions from conventional to shared surface roads can assist with the desired speed reduction and should be located to draw the attention of drivers to the change in the nature of the road and the need for different driving techniques. Transition should be emphasised by the incorporation of features as detailed in the examples in Figure 3.6

Parking

Parking provision is crucial in the design of a Shared Surface Road as any parking on the running track will severely disrupt traffic flow if not completely block the passage of vehicles. Parking places can be provided within the total road space and located in such a manner that they are incorporated in the speed control measures. Reference should be made to Section 4.2 (Aisle Parking / Driveway Width) to ensure that vehicles can enter and leave the spaces with ease.

Service Strips

2 metres wide service strips (Section 3.6) must be provided to accommodate Statutory Undertakers' services.

Figure 3.6 - Example Arrangements at Transition to Shared Surface Road

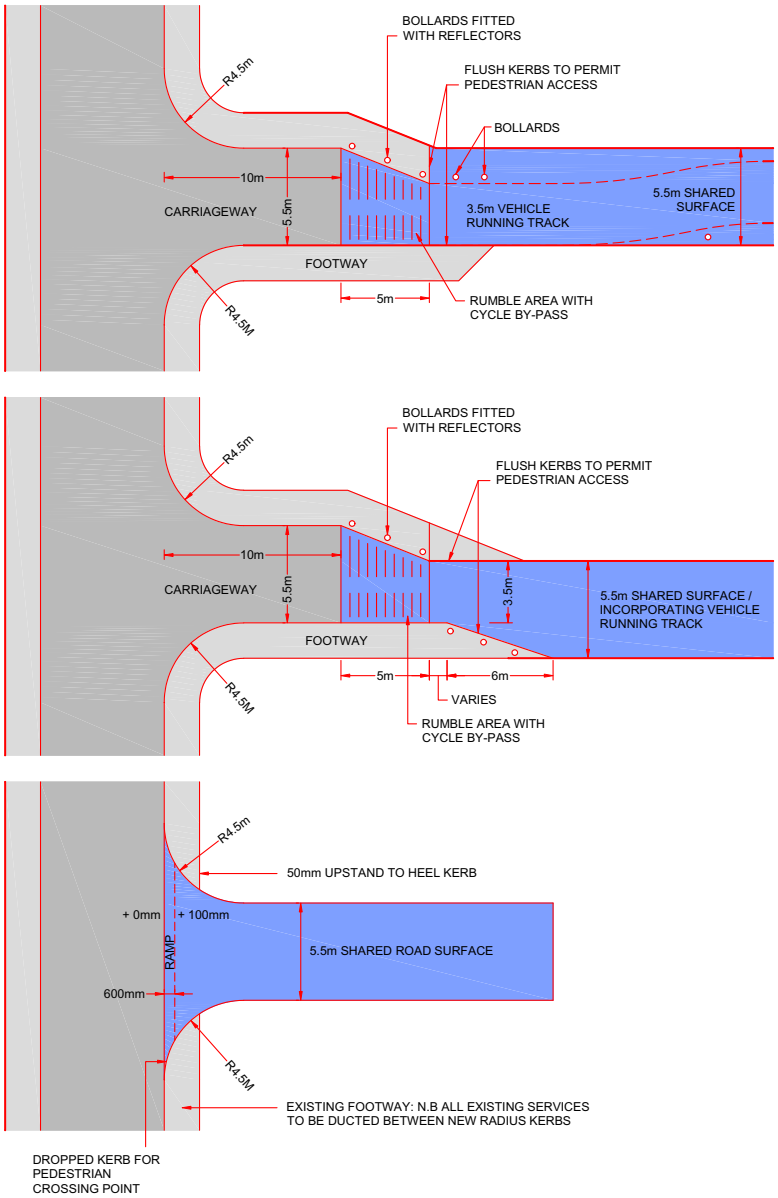
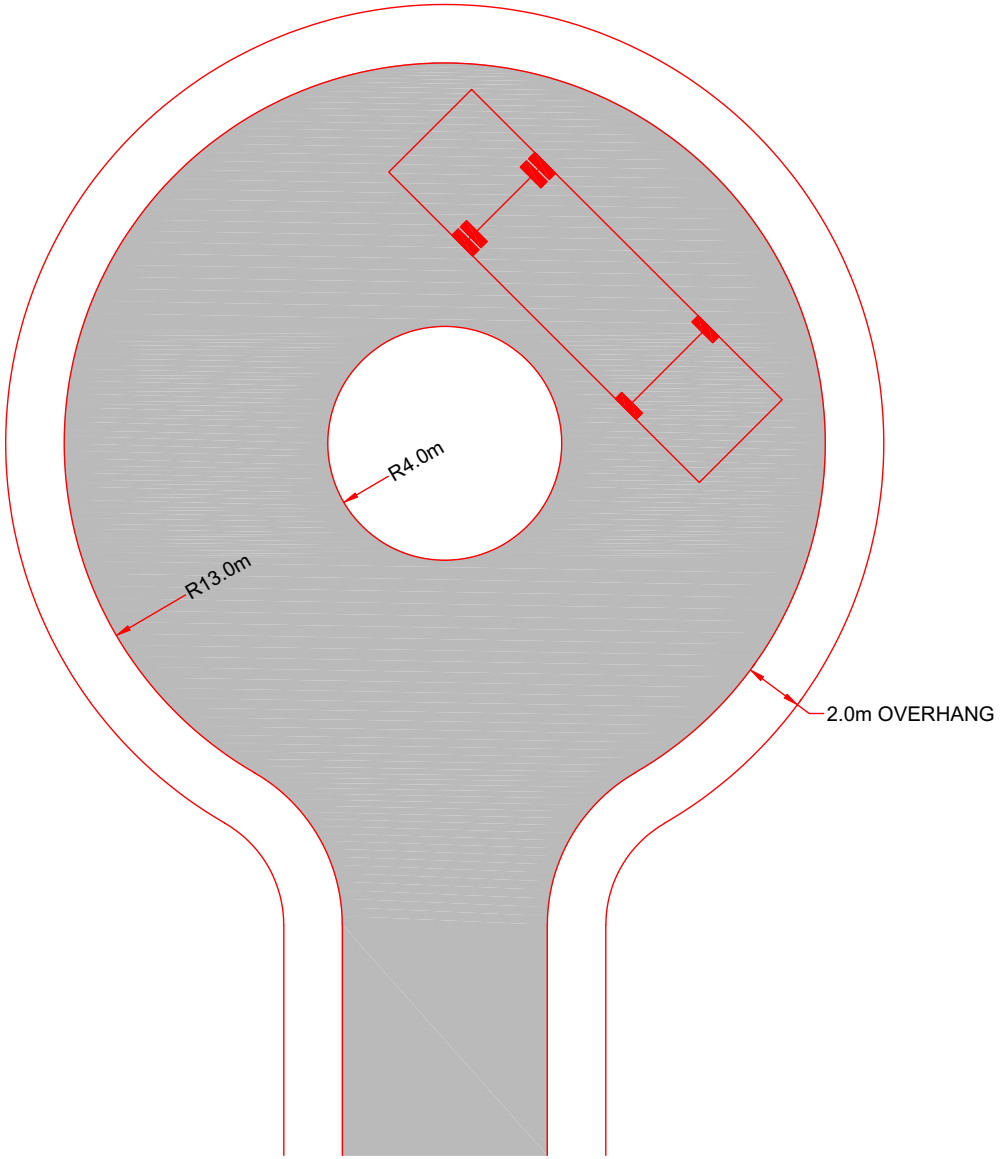


Figure 3.7 - Turning Area (all dimensions in metres)



3.4 SERVICING AND TURNING AREAS

Provision

In circumstances where a cul-de-sac is permitted, a turning area should be provided.

Dimensions

Swept path analysis should be undertaken to demonstrate that reversing will not be required by the largest vehicles to use the turning area regularly.

In the absence of acceptable swept path analysis, the turning space provided shall incorporate the dimension of the turning circle detailed in Figure 3.7

3.5 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 at an early stage.

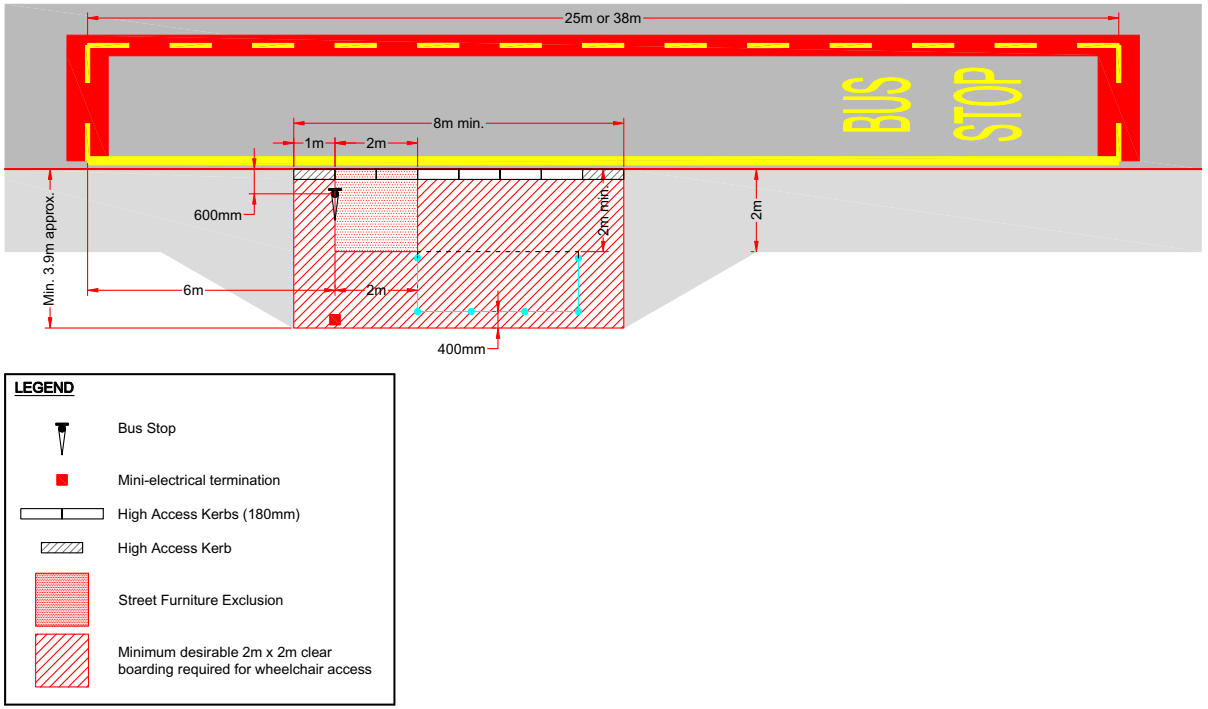
Designing for Bus Passengers

Bus shelter provision shall be agreed by the Planning Authority and implemented at the developer's expense. Proposals for provision of shelter facilities should also be discussed in conjunction with SPT.

Where bus shelters are provided, localised widening of the footway to 4 metres will be necessary to leave 2 metres clear for pedestrians. Where real-time information services can be made available, such facilities should also be considered.

A typical bus stop layout is shown Figure 3.8

Figure 3.8 - Typical bus stop detail



3.6 STATUTORY AND PRIVATE SERVICES

Consultation

The provision of statutory or other services laid underground constitutes a basic element of development design. The Statutory Undertakers, who provide such services, must therefore be consulted during preparation of design briefs, so that their requirements can be coordinated in the design and a balance struck between their needs and other objectives.

Services Located in Roads

In the interests of both the Statutory Undertakers 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.

Services in the carriageway

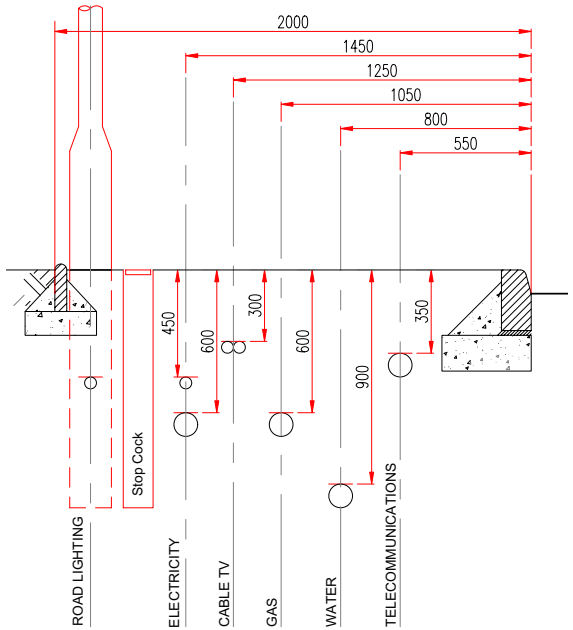
Foul and surface water sewers will normally be placed under the carriageway. The depth, clearance and relative position of sewers should be carefully considered and discussed with Scottish Water at an early stage in the design process and efforts made to minimise the need for future road closures during sewer inspections or maintenance.

Early consultation with Scottish Water regarding their provision, in accordance with the Sewerage (Scotland) Act 1968 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.

Services in Service Strips

The width of a service strip will depend on the number and type of premises served. For up to two hundred dwellings, all domestic services (gas, electricity, lighting, water and telephones) will normally be accommodated in a 2 metres wide reservation and Figure 3.9 shows typical positions. The minimum clearance between each

Figure 3.9 - Services under footway



service should be to the satisfaction of the Statutory Undertakers. This diagram is, however, only a guide and does not absolve the designer from negotiating with each Statutory Undertaker at the earliest possible stage. In any development, the depth, clearance and relative position of each service will require to be decided by the Statutory Undertakers and the method of laying cables and pipes left to their discretion.

Special arrangements will require to be made where a footway is less than 2 metres wide and local widening in excess of 2 metres may be necessary to accommodate access chambers or where roads have tight bends.

Street furniture and Lighting Columns

All street furniture should normally be located at the rear of footpaths/footways or recessed behind them and no furniture or structures should obstruct any road junction sight line. Conversely, no services other than road lighting cables should be located within 0.5 metre of the rear of the footway to allow for lighting columns and joint pillars or other street furniture. For detailed guidance regarding the provision of road lighting see link below:

http://www.glasgow.gov.uk/index.aspx?articleid=5483

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 [e.g. by a fence, wall or concrete edge kerbing).

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.

Hydrants

The position of all hydrants should be agreed with the Commander of Strathclyde Fire and Rescue and Scottish Water. Hydrants should not be located where vehicles are likely to park.

Services Crossing under Carriageway

Where service strips or branch connections cross the carriageway, cabled services should be individually ducted at increased depths in accordance with the requirements of the Statutory Undertakers as directed by the Council. Crossings of narrow residential roads should be located at passing places to minimise disruption to traffic flow during maintenance/repair works.

Services in Shared Surfaces and Housing Courts

In shared surface layouts, all services should continue to be located in land eligible for adoption by Glasgow City Council. Shared Surface roads should generally have a 2 metre contiguous service strip which is delineated by means of a flush kerb. 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 be located in the service strip but may also be located within parking areas or widened areas within the total road width, by agreement with the Statutory Undertakers. In Housing Courts the discipline of a service strip should be maintained although this will be in private control and therefore a wayleave agreement will be required.

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 Glasgow City Council. Service strips should be protected when there are risks from damage from occasional overriding by vehicles.

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. Advice should always be sought from the Statutory Undertakers when considering planting in the vicinity of services. Refer to Appendix 4 of the Design Guide for New Residential Areas for further details.

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 Council before any excavation is undertaken in a public road.

3.7 ADDITIONAL CONSIDERATIONS

Amendments to standards

The Council reserves the right to amend any of the standards contained within this document to suit local circumstances and changes to policy or good practice.

Traffic Management

The layout of a development may be influenced by existing or proposed traffic management measures and the Traffic Manager should be consulted about these at an early stage. Where Glasgow City Council 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.

Traffic Noise

The developer should consult with the Public Health Division of Land and Environmental Services 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) alterations to the road network listed in the Transport Policies and/or the Structure Plan.

Grit Bins

In all residential developments, and especially within culs-de sac or 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.

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 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.

4 PARKING DESIGN STANDARDS

4.1 TYPICAL DIMENSIONS AND MANOEUVRABILITY

Right-angled car parking bays should be 4.8 metres by 2.5 metres where a manoeuvring width of 6 metres is available. Narrower road or aisle widths will require the parking bay to be widened in accordance with Table 4.1. Parallel parking bays should be 2.4 metres wide and 5.5 metres long where the bays are internal or constrained by physical means. Free access to an end space will permit the bay length to be reduced to 5.0 metres.

Aisle Parking / Driveway Width

Table 4.1 details the layout and aisle width associated with the standard right angle parking layout. The necessary width of entry to a parking bay is related to the available width of carriageway of a road or aisle of a car park. Where this width is limited, alternatives can be developed by adjusting the width of the parking bay to suit the available carriageway or aisle width. The dimensions to be used for the parking bay widths and the parking lane widths are given in Table 5.1 which also gives the corresponding widths of driveways.

Table 4.1 - Aisle widths and driveway dimensions

Road/Aisle Width (m)	Bay Width (m)	Driveway Width (m)
6	2.5	3.5
5.5	2.6	3.5
4.8	2.9	3.5

4.2 ON ROAD PARKING

On Road Types

On road parking bays can be provided in any of the following forms;

(i) end on parking,

(ii) parallel parking

(iii) angled parking - on one way road only or central reserve.

Angled Parking

Table 4.2 details the angle and road / aisle widths associated with angled parking.

Table 4.2 - Road / Aisle widths with Angled Parking

Angle of Parking (°)	Aisle Width (m)
60°	4.0
75°	4.7
90°	6.0

Groups of Spaces

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. Groups of 4 to 6 are appropriate to keep pedestrians to the footway. No individual line marking is required to indicate individual spaces, only a channel demarcation and end markings are required.

4.3 OFF ROAD PARKING

Location

Off road parking occurs 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. Access to large groups of off road parking should be via a footway crossing as indicated in Figure 5.8

Screening / Security

Since parked vehicles can be visually intrusive, particularly in the residential environment, it is desirable to have an element of screening of the actual parking bays, either by the judicious use of landscaping or by setting them behind building lines. However, communal parking areas can be subject to anti-social behaviour where these areas are not overlooked. Off-road parking should, therefore, be located in such a manner that parking spaces are within sight of associated premises and, where spaces are allocated to individual dwellings; ideally they should be visible from the appropriate house.

5 CONSTRUCTION DESIGN

5.1 GEOTECHNICAL CONSIDERATIONS

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, local ground conditions and mining history.

The Ground Investigation and Geotechnical Design Reports which must be submitted with the application for Construction Consent will be examined against the engineering drawings submitted and the supporting factual information. Reports that do not specifically relate to the proposed road/s will not be considered and will be returned to the applicant for re-submission.

Supporting Technical Documentation

The Ground Investigation Reports 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,

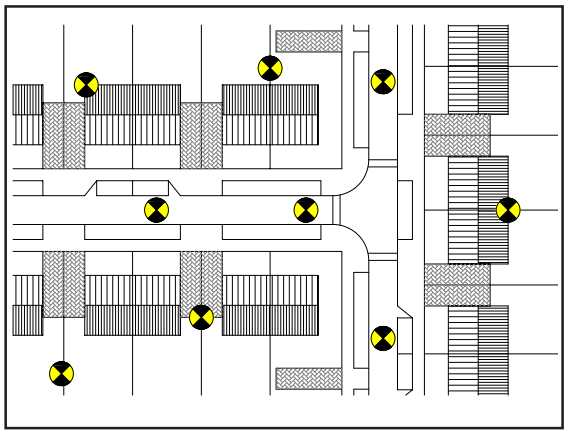
(c) a location plan of the site at 1/2500 scale with the proposed road superimposed,

(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 and depth of exploratory holes is dependent upon the ground conditions and nature of development. 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 appropriate chemical analysis and gas monitoring information is submitted in addition to standard laboratory testing to BS 5930:1999 and BS 1377:1990.

Figure 5.1 - Exploratory Borehole Survey



Interpretive Report

The Geotechnical Design Report must include a Mineral Report specifically dealing with the implication for the proposed road construction.

Mine Workings

Where a mineshaft lies within the site it is not acceptable to locate the road over the shaft irrespective of how it has been, or will be treated.

In the situation where a proposed road is underlain by shallow mine workings, the designer of that road must identify the risk of loss of

support to the road. Based on an evaluation of the method of mining, the current condition of the mine, the groundwater regime and condition of superincumbent strata, the applicant should identify whether precautions are necessary to ensure mineral stability. Specific guidance on the requirements for road structures is contained in the DMRB. Although the DMRB can be applied to all roads, whether major or minor, specific site conditions may require treatment even where there is more than 10 times the extraction thickness in terms of rock cover.

The Coal Authority

It will be necessary to consult The Coal Authority before any ground investigation is carried out where coal seams are likely to be encountered by drilling operations. The Coal Authority must also be consulted before any proposed treatment of coal seams or shafts and other mine entrances vested with them are undertaken. The Coal Authority may impose certain conditions under which drilling or treatment may be carried out; any such conditions must be complied with and are conditional upon Construction Consent being granted.

Brownfield Sites

Where a site has formerly been developed it will likely be covered in fill material i.e. 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 Geotechnical Design Report should assess any contamination and its implications for both road construction and maintenance of the completed road and its drainage system.

Peat

Where peat is present in the vicinity of a proposed road, it should be excavated and replaced.

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.

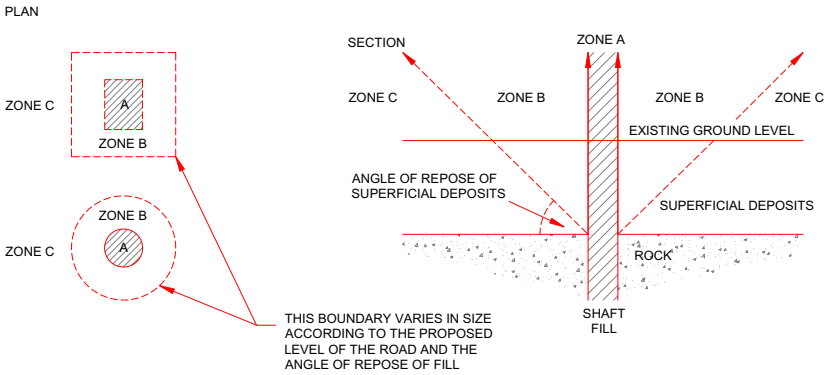
Geotextiles or polymer geogrids may not be used as a substitute for a capping layer or as a means of reducing subbase thickness in normal road construction. They may be used in addition to a capping layer or normal pavement construction to resolve a particular problem. The decision to use geotextiles 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.

Geogrids or geotextiles should not be used below roads and footways/cycle tracks as an alternative to grouting in an area where shallow mine workings are present. If the workings are at a depth where the normal criteria as applied to development roads would require treatment by grouting or excavation and replacement then such treatment should be carried out.

CBR

The California Bearing Ratio (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 Ground Investigation Report.

Figure 5.2 - Ground Treatment A



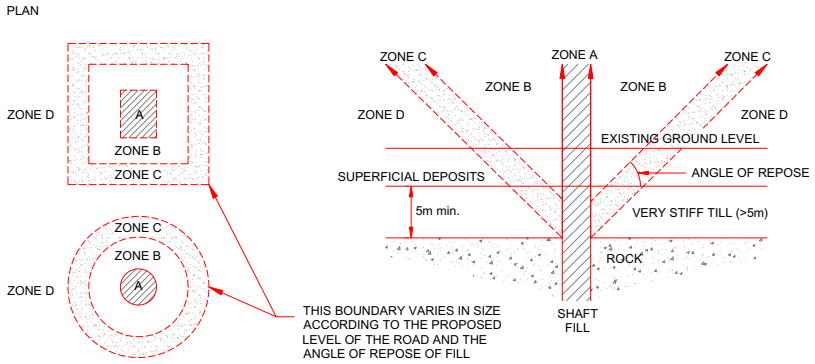
ZONE A - NO ROAD CONSTRUCTION PERMITTED UNDER ANY CIRCUMSTANCES.

ZONE B - ROAD CONSTRUCTION POSSIBLE WITHIN ZONE B BUT APPROPRIATE TREATMENT OF SHAFT IS REQUIRED.

ZONE C - ROAD CONSTRUCTION POSSIBLE WITHOUT TREATMENT OF SHAFT

NB: ZONES DEFINE LEVELS OF TREATMENT REQUIRED AND NOT A FAILURE MECHANISM.

Figure 5.2 - Ground Treatment B



ZONE A - NO ROAD CONSTRUCTION PERMITTED UNDER ANY CIRCUMSTANCES.

ZONE B - ROAD CONSTRUCTION POSSIBLE BUT APPROPRIATE TREATMENT OF SHAFT IS REQUIRED.

ZONE C - ROAD CONSTRUCTION POSSIBLE BUT SOME TREATMENT SOME SHAFT IS REQUIRED

ZONE C - ROAD CONSTRUCTION POSSIBLE WITHOUT TREATMENT OF SHAFT

NB: ZONES DEFINE LEVELS OF TREATMENT REQUIRED AND NOT A FAILURE MECHANISM.

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:

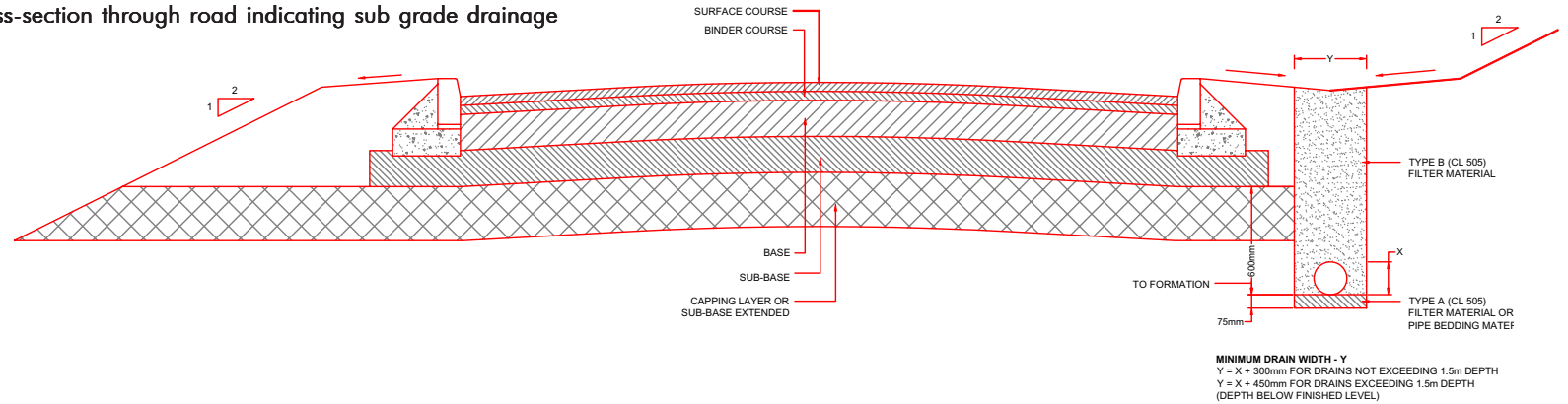
(a) In cuttings, filter drains which will be required to cater for surface water run off from slopes will also provide a sub grade drainage function by being located deep enough to prevent the water table from rising to within 0.6 metre of the formation level.

(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 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 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.

Figure 5.3 - Cross-section through road indicating sub grade drainage



5.2 CARRIAGEWAY CONSTRUCTION

Flexible Pavements

Rigid pavement construction will not normally be accepted. Carriageways should be designed as flexible pavements in accordance with Volume 7 of the DMRB.

Capping Layer

It will be permissible for developers constructing short lengths of roads to adopt the construction thicknesses detailed in Table 5.2 where the California Bearing Ratio (CBR) is greater than 5%. However where the CBR value is less than or equal to 5%, a capping layer is required as follows:

Table 5.1 - Capping Layer Requirements: Subject to frost susceptibility (See paragraph below)

Capping Layer Requirements

CBR (%)	Depth of Capping (mm)	Depth of Sub base (mm)
CBR < 2	600	150
2 < CBR < 5	350	150

NB. 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.

Frost Susceptibility

It is possible for roads to be designed to have a total bituminous thickness of 170 mm and, with a CBR value less than or equal to 2%, a 150 mm sub-base and 600 capping layer. In such circumstances 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 CBR value greater than 2% (but less than 5%) where the total bituminous thickness and sub-base thickness together are less than 450 mm the same principle applies (i.e. 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 5.1 prescribes 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 600 mm of capping layer. The developer should consult the Council 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 circum-stance it will be necessary to complete and return Form CC8 “Carriageway Design Certificate”

Two Stage Construction

Where the road is continuously used by construction traffic, two stage construction will be necessary to avoid damage to the surface course. Table 5.2 indicates acceptable two stage construction pavement layer thicknesses for 0.5, 1.5 and 3.5MSA.

Stage One

The first stage for carriageway construction shall be the top of the specified bituminous binder. 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 surface course not laid before a winter work period. Any settlement which may occur in the binder course of bituminous roads shall be made up with regulating course before the laying of the surface course, and early reinstatement of openings or failed areas is essential

Stage Two

Before the regulating course and the surface course - where it is bituminous - are laid, the top surface of the binder 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 basecourse 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 thick-ness is regular and within tolerance.

Figure 5.4 - Carriageway and Footway Cross Section

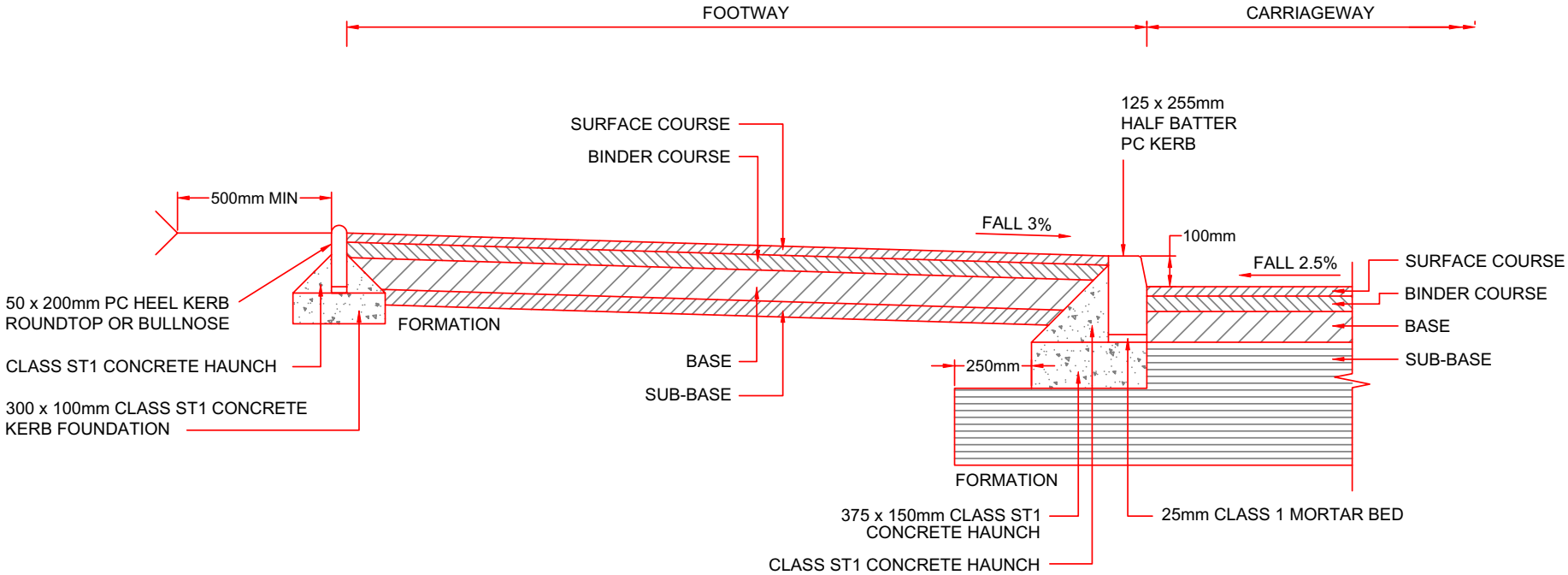


Table 5.2 - Pavement Design Examples (bituminous layers)

Road Traffic (MSA)	Sub-base	Base	Binder	Surface Course
3.5 MSA	225mm (cl 803)	215mm Dense Macadam Combined Base and Binder (cl 903) **for two stage construction** 155mm Dense Macadam Base (cl 903)	60mm Dense Macadam Binder (cl 903)	40mm Rolled Asphalt (cl 903)
1.5 MSA	300mm (cl 803)	185mm Dense Macadam Combined Base and Binder (cl 903) **for two stage construction** 125mm Dense Macadam Base (cl 906)	60mm Dense Macadam Binder (cl 903)	40mm Rolled Asphalt (cl 910)
0.5 MSA	300mm (cl 803)	170mm Dense Macadam Combined Base and Binder (cl 903) **for two stage construction** 120mm Dense Macadam Base (cl 903)	50mm Dense Macadam Binder (cl 906)	40mm Rolled Asphalt (cl 910) (see note 1)

*MSA = Million Standard Axles

Note1: 40mm rolled asphalt surface course may be replaced with 40mm close graded macadam surface course (clause 912), at the discretion of the Roads Asset Manager. Also, in island locations with the agreement of the Roads Asset Manager, deferred set material may be permitted.

Note 2: This table is for guidance only, however it is based on a design life of 40 years, which must be used for all carriageway pavement designs.

Note3: Clause and Appendix numbers in brackets refer to the Specification.

Note 4: A typical cross section of the carriageway and footpath construction is shown in Figure 5.4

5.3 ISLANDS AND BUILD OUTS

Construction

Speed control measures can involve the build out of the footway to create such features as pinch points, nibs or chicanes. Where these are to be constructed, the normal kerb construction detailed in Figure 5.4 should be used. The infill to the footway build outs can be normal footway construction as detailed in Figure 5.4 or soft landscaping can be incorporated, subject to visibility conditions.

Pedestrian Provision

Where speed control measures involve the provision of islands in the carriageway, the normal kerb construction should again be used. Where pedestrians are likely to cross, drop kerbs should be used or breaks should be provided. In normal conditions short lengths of island in the carriageway should be constructed as footway construction. Such islands within the carriageway will require bollards or lights with appropriate signing to ensure visibility and heighten awareness.

Table 5.3 - Footway, Footpath and Cycletrack Construction in Urban Areas

Type	Sub-base	Base	Binder	Surface Course
Flexible Surfacing	50mm Granular Sub-base Type 1 (cl 803)	100mm Type 1 Granular Material (cl 803)	50mm Dense Macadam (cl 906)	30mm Rolled Asphalt (cl 903) (see note 1)

Note1: Prior to compaction 6mm or 10mm limestone or other approved chippings shall be applied to the surface at a nominal rate of 1kg/m^2.

Note 2: In rural areas or in lightly trafficked locations, the alternative shown in Table 6.4 may be permitted at the discretion of the Roads Asset Manager.

Note3: Footway and footpath thicknesses will require to be increased where, in the opinion of the Roads Asset Manager they are liable to be subject to overrun..

NB: Clause numbers in brackets refer to the Specification.

Table 5.4 - Footways, Footpaths and Cycletracks in Rural Areas

Type	Sub-base	Base	Binder	Surface Course
Flexible Surfacing	200mm Type 1 or recycled suitable material (e.g. Planings)		40mm Dense Macadam (cl 906)	25mm Rolled Asphalt (cl 910) or 25mm Close Graded Macadam (cl 912)
				Combined 50mm Close Graded Macadam (cl 912)

5.4 FOOTWAY, FOOTPATH AND CYCLE TRACK CONSTRUCTION

Flexible Pavement

Rigid pavement construction will not normally be accepted. Developers should adopt the footway, footpath or cycle track construction thicknesses detailed in Table 5.3 and 5.4 and Figures 5.4 and 5.5 unless an alternative design in accordance with Volume 7 of the DMRB is agreed with the Council.

5.5 KERBS AND EDGING

Materials/Construction

All carriageways, footways and footpaths should be provided with precast concrete kerb or edging as detailed in Figures 5.4 and 5.5. On conventional roads, kerbs should be set 100mm above finished carriageway channel level, except at pedestrian and vehicular crossings where this dimension is reduced to 6mm and 20mm respectively. Edging at the heel of footways should have an upstand of 50mm, whereas on footpaths it should be set flush with the walking surface. On shared surfaces an upstand of 50mm should normally be provided, except at junctions with footpaths (both private and public) where kerbs should be set 6mm above the shared surface. Approval for any departure from these standard details should be sought from the Council prior to construction commencing.

Figure 5.5 - Typical Footpath/Cycle Path Construction

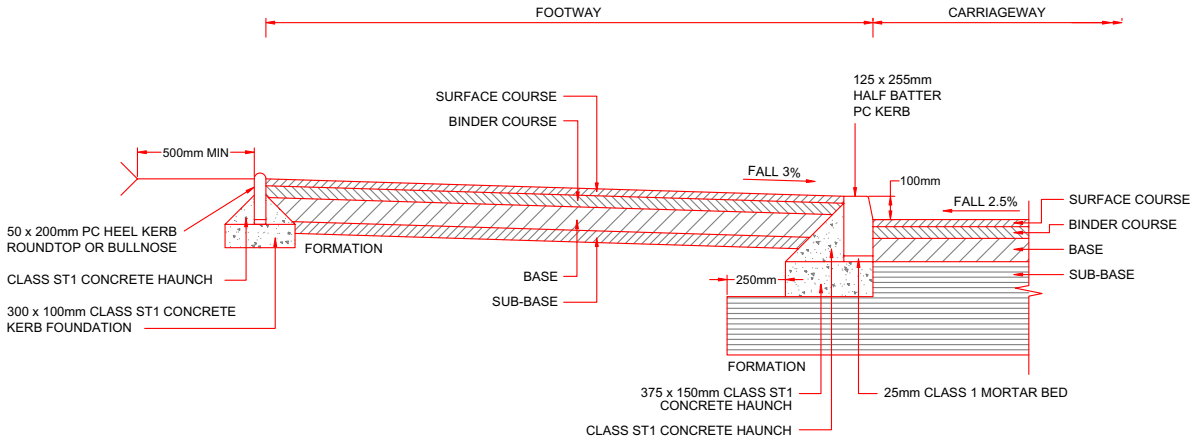
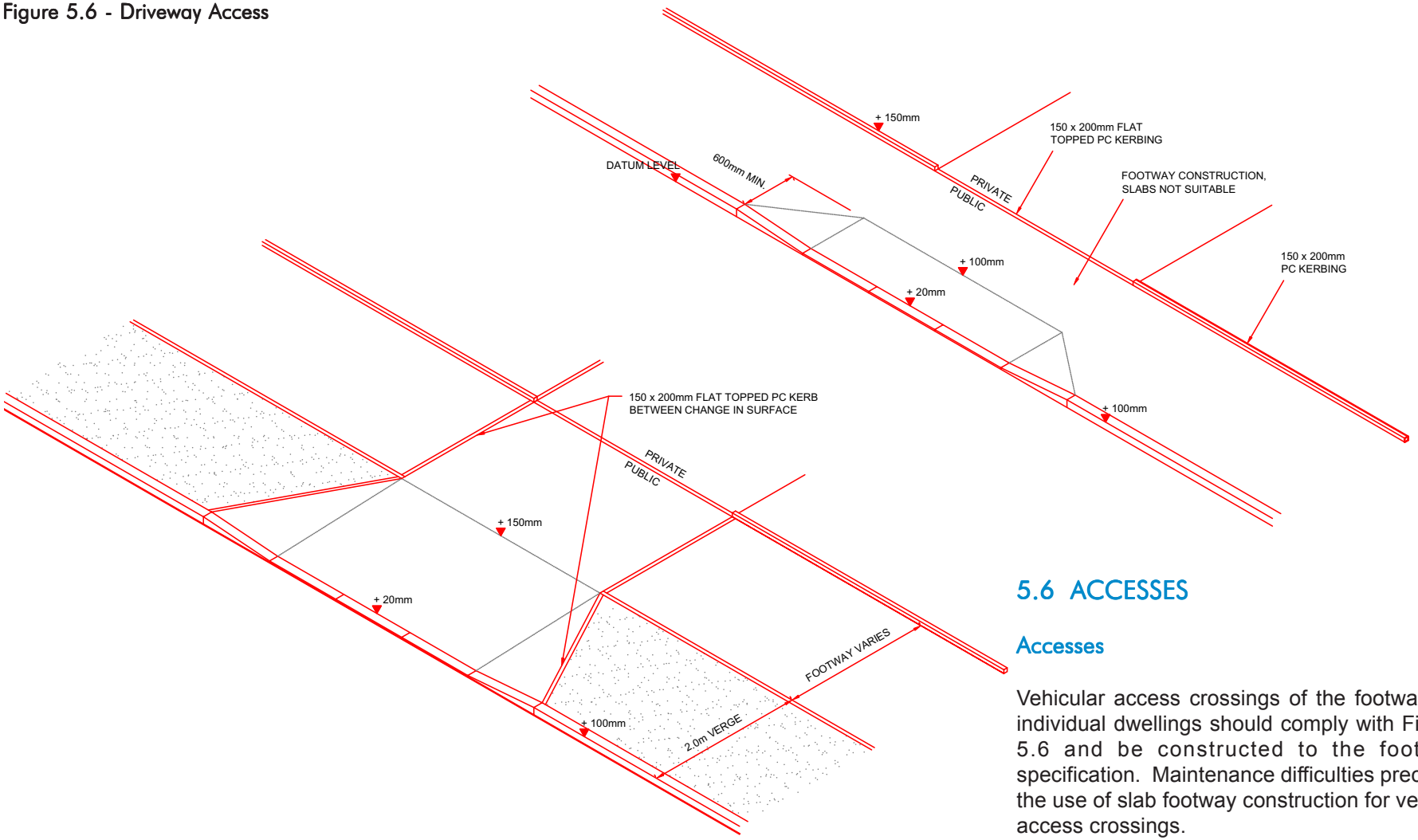


Figure 5.6 - Driveway Access



5.6 ACCESSES

Accesses

Vehicular access crossings of the footway for individual dwellings should comply with Figure 5.6 and be constructed to the footway specification. Maintenance difficulties preclude the use of slab footway construction for vehicle access crossings.

Figure 5.7 - Kerb Detail along the Footpath

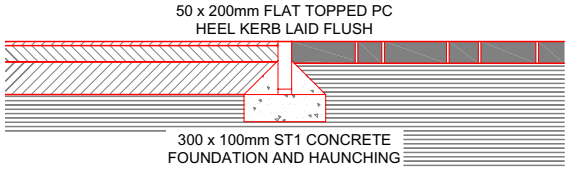
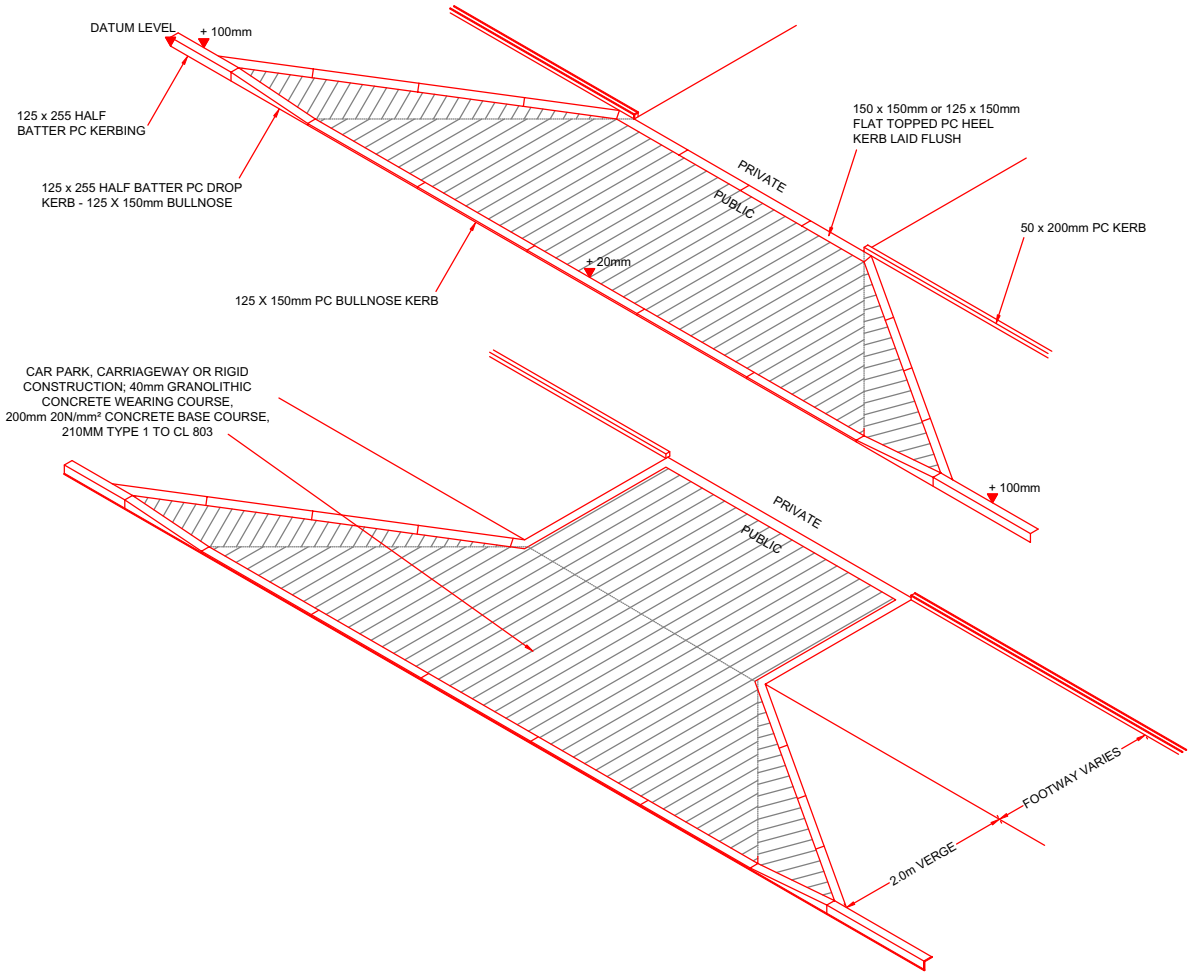


Figure 5.8 - Minor Access for Car Park of up to 50 Spaces



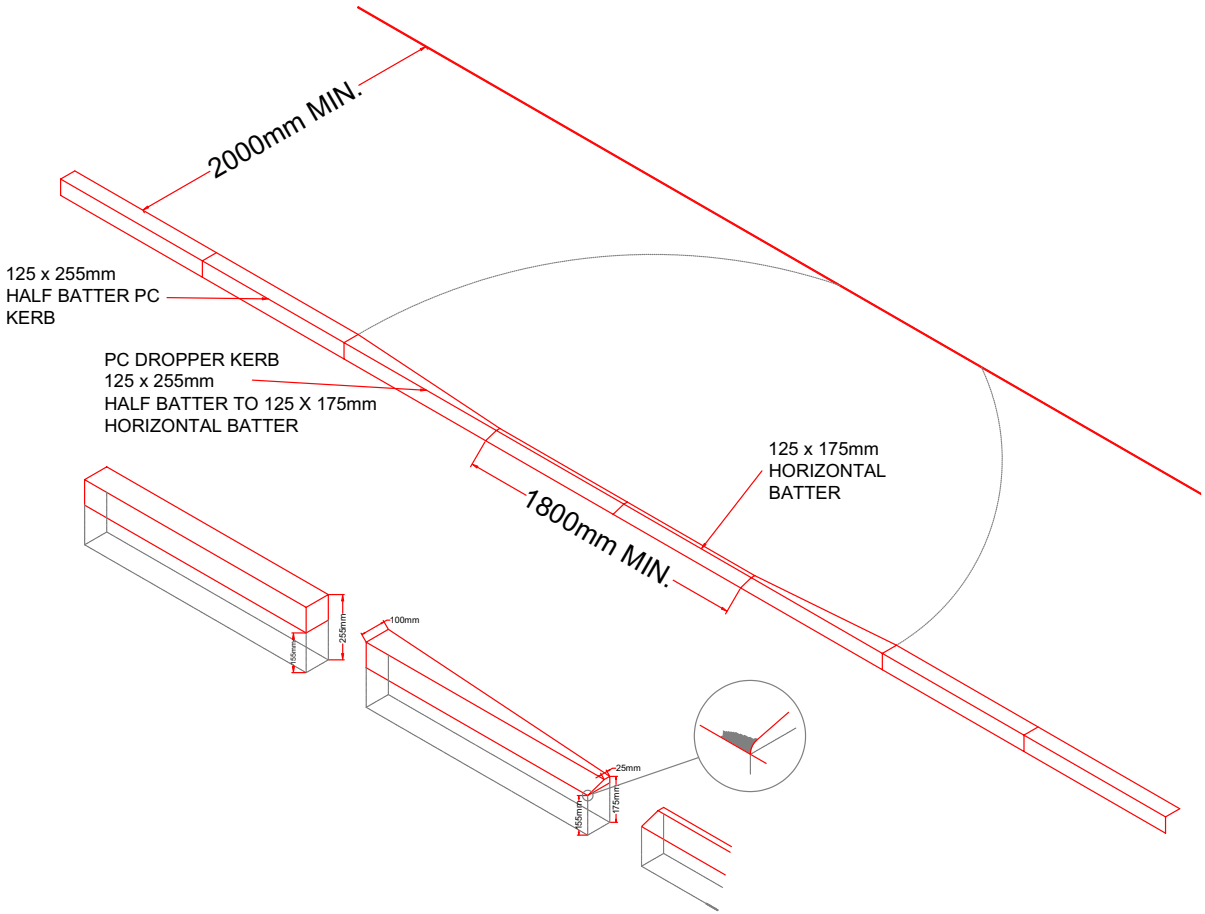
Other Access Details

Where vehicular access, other than to individual dwellings, is taken over a footway, a crossing, as detailed in Figure 5.8 should be constructed.

Pedestrian Access/ Crossings

Figure 5.9 details the requirement for dropped kerbs where pedestrian routes cross the carriageway from adjacent footways e.g. at T-junctions and pelican crossings. Note the large dished area which is to minimise footway gradients (7.5 per cent maximum) and avoid abrupt changes of slope. Pedestrian crossings of a carriageway with an adjacent grass verge should comply with Figure 5.8 except that the dropped kerb should be a 6mm up stand from the carriageway and extend for a minimum length of 1.8 metres.

Figure 5.9 - Dropped kerb detail at designated pedestrian crossing



5.7 ROAD DRAINAGE

Specification

The specification for the construction of road drainage shall be the Specification for Highway Works, Volume 1 of the MCHW. 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 DMRB 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.

Sustainable Drainage Systems

The use of Sustainable Urban Drainage Systems is an integral part of road drainage design and must be discussed with the Council, Scottish Water and SEPA at an early stage in the design process to agree the appropriate levels of treatment required and the form of Sustainable Urban Drainage Systems that will be acceptable for adoption. All components should be designed in accordance with Ciria C697 The SUDS Manual and to the satisfaction of the adopting authority.

Gully Spacing

Table 5.5 details the acceptable channel distance between gullies for a road comprising carriageway with two number 2 metres wide footways, based on criteria adapted from the DMRB (Table 5.5 is based on rainfall intensity of 50 mm/hour and width of channel flow of 600 mm). The spacing may require to be altered according to the road layout (e.g. at junctions) and special measures will be required where the grade is necessarily flatter than 0.8 per cent (sags, crests, etc). Advice on these matters should already have been received from the Council who should be consulted at an early stage by any developer wishing to carry out a full drainage design. Irrespective of design spacings, a gully should be positioned:

(a) just upstream of the tangent point at road junctions,

(b) short of the point where adverse camber is removed when applying super-elevation,

(c) at any local low point,

(d) at speed control measures, where necessary.

They should not be positioned;

(e) at pedestrian crossing points,

(f) at driveways.

(g) at extended channel line of parallel layby parking.

Drop Kerb Inlets to Swales

Where drop kerbs are applied to promote runoff from the road surface to swales, the introduction of a paving slab 10mm below road channel level, will facilitate the flow to the swale whilst reducing erosion and accumulation of silt at this location.

Irregular Areas

Lay-bys should normally drain to the road channel; it should not, therefore, be necessary to provide gullies at the rear of lay-by parking areas.

Lay-by Drainage

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.

Footpath Drainage

Remote footpaths should be constructed with flush edging as detailed in Figure 5.5. Only in exceptional circumstances, and where there is appropriate access for gully cleaning vehicles as agreed with the Council, should direct drainage into gullies be considered.

Gullies

Road gullies should be 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 450mm, minimum area of waterway 900cm^2 and minimum depth of frame 100mm). The use of Class B125 (minimum nominal width 325mm, minimum area of waterway 650cm^2 and minimum depth of frame 100mm) may be permissible in non contiguous car parks at the discretion of the Council.

Table 5.5 - Gully Spacing for Carriageways

Gradient		1/150* 0.66%	1/100 1.00%	1/80 1.25%	1/60 1.66%	1/40 2.50%	1/30 3.33%	1/20 5.00%
Cross Section	**Carriageway Width**	**Gully Spacing (metres)**						
1 in 40 (2.5%) Camber	5.5m	7.0	8.5	9.5	11.0	13.0	15.0	18.0
	6.0m	6.5	8.0	9.0	10.5	12.5	14.5	17.0
	7.3m	6.0	7.0	8.0	9.0	11.0	12.5	15.0
1 in 40 (2.5%) Crossfall	5.5m	3.5	4.5	5.0	5.5	6.5	7.5	9.0
	6.0m	3.0	4.0	4.5	5.0	6.0	7.0	8.5
	7.3m	3.0	3.5	4.0	4.5	5.5	6.5	7.5

Connections

Connections should be constructed in accordance with Clause 508 of the Specification. They must be formed with junction pipes unless the Council has specifically approved the use of saddles.

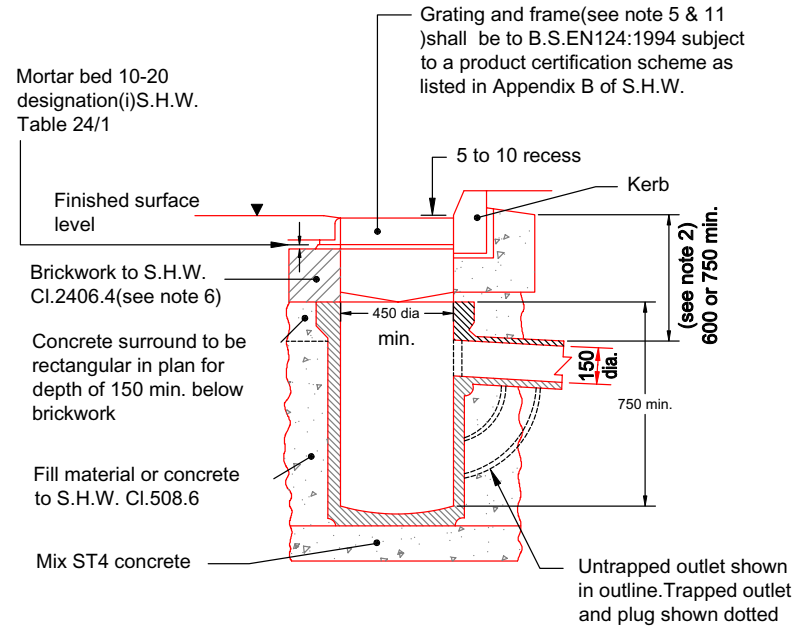
Chambers

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 in all adopted and adoptable areas, (minimum clear opening 600mm dia or equivalent, minimum depth of frame 100mm). The use of Class B125 (minimum clear opening 600mm dia or equivalent, minimum depth of frame 100mm) may be permissible in non contiguous car parks at the discretion of the Council.

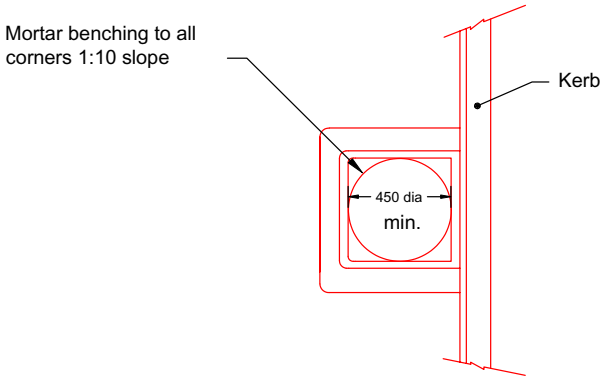
Outfall Connection

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 Development and Regeneration Services Flood Risk Management team.

Figure 5.10 - Road Gullies



PRECAST GULLY



PLAN
(WITHOUT GRATING)

5.8 LIGHTING DESIGN

Glasgow City Council operates a white light strategy which recommends the use of white light sources for road lighting purposes. The link below provides guidance on street lighting design.

http://www.glasgow.gov.uk/index.aspx?articleid=5483

6 ROAD SAFETY

Road Safety Audit / Assessment requirements for individual schemes should be established at an early stage through discussion with the Council.

6.1 INTRODUCTION

The 1988 Road Traffic Act requires Local Roads Authorities constructing new roads to "…*take measures as appear to the authority to be appropriate to reduce the possibility of accidents when the roads come in to use*".

The Council considers a Road Safety Audit as described in HD19/03, Volume 5 of the DMRB, to be a suitable procedure for ensuring this requirement is met.

However, sufficient information to undertake conventional Road Safety Audits may not be available prior to detailed design and the Council therefore considers Road Safety (Impact) Assessment and / or Stage 1 (Preliminary Design) Self Check Road Safety Audit to be appropriate during the preliminary design stage.

6.2 PRELIMINARY DESIGN

If required by the Planning Authority, a Preliminary Design Audit should be undertaken as part of the design process.

The Preliminary Design Audit will look over the initial stages of the design, and check that the Core Principles of the Design Guide for New Residential Areas have been met.

At this stage, the designers should undertake a Road Safety (Impact) Assessment and / or Stage 1 (Preliminary Design) Self Check Road Safety Audit (depending on the scale and complexity of the scheme) which can then be incorporated into the Preliminary Design Audit.

Road Safety (Impact) Assessment

Road Safety (Impact) Assessment, as described in the Institution of Highways and Transportation Road Safety Audit Guidelines 2008, would allow comparisons of safety to be made for fundamental options within the design. In addition, comparisons of safety implications for different road users could be made.

Another advantage of Road Safety (Impact) Assessment at this stage is the scope for the use of risk assessment.

Stage 1 (Preliminary Design) Self Check Road Safety Audit

Stage 1 (Preliminary Design) Self Check Road Safety Audits should follow the procedure set out in HD19/03, Volume 5 of the DMRB, with the exception that they will normally be undertaken by the designer.

6.3 DETAILED DESIGN

A Detailed Design Audit should be undertaken as part of the design process.

The Detailed Design Audit will review the details of the design to ensure that the Core Principles and advice set out in the Design Guide for New Residential Areas have been incorporated, and the findings of the appraisals and any safety concerns have been successfully addressed.

At this stage, an experienced, independent Road Safety Audit Team shall undertake a Stage 2

(Detailed Design) Road Safety Audit which can then be incorporated into the Detailed Design Audit.

Stage 2 (Detailed Design) Road Safety Audit

Stage 2 (Detailed Design) Road Safety Audits should follow the procedure set out in HD19/03, Volume 5 of the DMRB.

Stage 2 audits should be undertaken by a team with the experience and competencies described in HD19/03, Volume 5 of the DMRB.

However this experience and competence requirement could, at the discretion of the Council, be relaxed where the predicted increase in vehicle movements is less than 500 per day.

Regardless of the predicted increase in vehicle movements, the Audit Team must have experience in roads design, road safety and traffic engineering. The team will also have experience in investigation of road traffic collisions and measures to eliminate or reduce risks.

The Road Safety Audit Team should always be independent of the scheme design, although it is acceptable for them to work for the same organisation as the Design Team.

Stage 3 (Completion of Construction) Road Safety Audit

Stage 3 (Completion of Construction) Road Safety Audits should follow the procedure set out in HD19/03, Volume 5 of the DMRB.

Stage 3 audits should be undertaken by a team with the experience and competencies described in HD19/03, Volume 5 of the DMRB. However this requirement could, at the discretion of the Council, be relaxed.

Again, the Audit Team must have experience in roads design, road safety and traffic engineering. The team will also have experience in investigation of road traffic collisions and measures to eliminate or reduce risks.

The Stage 3 audit shall take place prior to the opening of the scheme and an appropriate representative from the Council and the Traffic Police will be invited.

Since it takes place after the granting of Construction Consent, the Stage 3 audit will be a condition of the Road Construction Consent.

Further information regarding Road Safety Assessment and Road Safety Audit can be found in the Institution of Highways and Transportation Road Safety Audit Guidelines 2008 and HD19/03, Volume 5 of the DMRB.

APPENDIX 2 : CONSTRUCTION CONSENT GUIDANCE FOR NEW RESIDENTIAL STREETS

STRUCTURAL DESIGN PROFORMAS

2

Structure Design Certificate

SD1

FORM OF CERTIFICATE FOR THE DESIGN AND CHECK OF CATEGORY 0 STRUCTURES.
(APPLICATION FOR APPROVAL IN PRINCIPLE NOT REQUIRED)

Name of Project/Scheme

Name of Structure

Designer

1 We certify that reasonable professional skill and care has been used in the preparation of the design and check of *(name of structure)* [1]

with a view to securing that:

a. it has been designed in accordance with the following standards:[2]

or[3]

b. it has been checked for compliance with the relevant standards in **1a** *(above)*

c. it has been accurately translated into Construction Drawings and Bar Bending Schedules (all of which have also been checked). The unique numbers of these Drawings and Schedules are:

Signed

Name

Position Held — Design & Check Team Leader

Engineering Qualifications[4]

Structure Design Certificate

SD1

FORM OF CERTIFICATE FOR THE DESIGN AND CHECK OF CATEGORY 0 STRUCTURES.
(APPLICATION FOR APPROVAL IN PRINCIPLE NOT REQUIRED)

continued

Name of Project/Scheme

Name of Structure

Designer

1 c.

Signed

Name

Position Held[5]

Name of Organisation

Date

2 The certificate is accepted by the Technical Approval Authority (TAA)

Signed

Name

Position Held

Engineering Qualifications[6]

For TAA

Date

Notes

1 *Where several Category 0 structures occur in a project they may be listed on one certificate.*
2 *Insert relevant current standards including amendments to date. This certificate shall be accompanied by a General Arrangement drawing.*
3 *List of additional methods or criteria. Departures not accepted for Category 0 structures.*
4 *CEng, MICE, MIStructE or equivalent.*
5 *A Principal of the organisation responsible for the design.*
6 *Engineer with appropriate qualification and experience for Category 0 structures.*

Structure Design Certificate SD2

FORM OF CERTIFICATE FOR THE DESIGN AND CHECK OF CATEGORY 1 STRUCTURES.
(APPLICATION FOR APPROVAL IN PRINCIPLE IS REQUIRED)

Name of Project/Scheme

Name of Structure

Designer

1 We certify that reasonable professional skill and care has been used in the preparation of the design and check of *(name of structure)* [1]

with a view to securing that:

a. it has been designed in accordance with the Approval in Principle dated:[2]

(date) including the following[3]:

b. it has been checked for compliance with the relevant standards in **1a**; *or*

c. it has been accurately translated into Construction Drawings and Bar Bending Schedules (all of which have also been checked). The unique numbers of these Drawings and Schedules are:

Signed

Name

Position Held: Design & Check Team Leader

Engineering Qualifications[4]

Structure Design Certificate SD2

FORM OF CERTIFICATE FOR THE DESIGN AND CHECK OF CATEGORY 1 STRUCTURES. **continued**
(APPLICATION FOR APPROVAL IN PRINCIPLE IS REQUIRED)

Name of Project/Scheme

Name of Structure

Designer

1 c.

Signed

Name

Position Held[5]

Name of Organisation

Date

2 The certificate is accepted by the Technical Approval Authority (TAA)

Signed

Name

Position Held

Engineering Qualifications[6]

For TAA

Date

Notes

1 *Where several Category 1 structures occur in a project, they may be listed on one certificate.*
2 *Insert date of agreement of the AIP by the TAA including the dates of any addenda. Note the AIP is valid for three years after the date of agreement by the TAA. If the construction has not yet commenced within this period, the AIP should be re-submitted to the TAA for review.*
3 *List of additional methods or criteria. Departures not accepted for Category 1 structures.*
4 *CEng, MICE, MIStructE or equivalent.*
5 *A Principal of the organisation responsible for the design.*
6 *Engineer with appropriate qualification and experience for Category 1 structures.*

Structure Design Certificate

SD3

FORM OF CERTIFICATE FOR THE DESIGN OF CATEGORY 2 AND 3 STRUCTURES.
(APPLICATION FOR APPROVAL IN PRINCIPLE IS REQUIRED)

Name of Project/Scheme	
Name of Structure	
Designer	

1 We certify that reasonable professional skill and care has been used in the preparation of the design of *(name of structure)*

with a view to securing that:

a. it has been designed in accordance with the Approval in Principle dated:[1]

(date) including the following[2]:

b. it has been accurately translated into Construction Drawings and Bar Bending Schedules. The unique numbers of these Drawings and Schedules are:

Signed	
Name	
Position Held	Design & Check Team Leader
Engineering Qualifications[3]	

Structure Design Certificate

SD3

FORM OF CERTIFICATE FOR THE DESIGN OF CATEGORY 2 AND 3 STRUCTURES.
(APPLICATION FOR APPROVAL IN PRINCIPLE IS REQUIRED)

continued

Name of Project/Scheme	
Name of Structure	
Designer	

1 c.

Signed	
Name	
Position Held[5]	
Name of Organisation	
Date	

2 The Departure from Standards and additional criteria given in Paragraph 1 are agreed[5].

3 The certificate is accepted by the Technical Approval Authority (TAA)

Signed	
Name	
Position Held	
Engineering Qualifications[6]	
For TAA	
Date	

Notes

1 *Insert date of agreement of the AIP by the TAA including the dates of any addenda. Note the AIP is valid for three years after the date of agreement by the TAA. If the construction has not yet commenced within this period, the AIP should be re-submitted to the TAA for review.*

2 *List any depatures from standard and any additional methods or criteria.*

3 *CEng, MICE, MIStructE or equivalent.*

4 *A Principal of the organisation responsible for the design.*

5 *Delete if not required.*

6 *Engineer with CEng, MICE, MIStructE or equivalent*

Structure Design Certificate

SD4

FORM OF CERTIFICATE FOR THE DESIGN CHECK OF CATEGORY 2 AND 3 STRUCTURES.
(APPLICATION FOR APPROVAL IN PRINCIPLE IS REQUIRED)

Name of Project/Scheme

Name of Structure

Designer

1 We certify that reasonable professional skill and care has been used in the checking of the design of *(name of structure)*

with a view to securing that:

a it complies with the Approval in Principle dated:[1]

(date) including the following[2]:

c it has been accurately translated into Construction Drawings and Bar Bending Schedules, all of which have also been checked. The unique numbers of these Drawings and Schedules are:

Signed

Name

Position Held: Design & Check Team Leader

Engineering Qualifications[3]

Structure Design Certificate

SD4

FORM OF CERTIFICATE FOR THE DESIGN CHECK OF CATEGORY 2 AND 3 STRUCTURES.
(APPLICATION FOR APPROVAL IN PRINCIPLE IS REQUIRED)

continued

Name of Project/Scheme

Name of Structure

Designer

1 c

Signed

Name

Position Held[5]

Name of Organisation

Date

2 The Departure from Standards and additional criteria given in Paragraph 1 are agreed.[5]

3 The certificate is accepted by the Technical Approval Authority (TAA)

Signed

Name

Position Held

Engineering Qualifications[6]

For TAA

Date

Notes

1 *Insert date of agreement of the AIP by the TAA including the dates of any addenda. Note the AIP is valid for three years after the date of agreement by the TAA. If the construction has not yet commenced within this period, the AIP should be re-submitted to the TAA for review.*
2 *List any depatures from standard and any additional methods or criteria.*
3 *CEng, MICE, MIStructE or equivalent.*
4 *A Principal of the organisation responsible for the design check.*
5 *Delete if not required.*
6 *Engineer with CEng, MICE, MIStructE or equivalent*

Structure Design Certificate

SD5

APPLICATION FOR APPROVAL IN PRINCIPLE

Name of Project/Scheme	
Name of Structure	
Designer	

1 Road Details

a.	Type of road:	
b.	Permitted traffic speed[2]:	
c.	Existing restrictions[3]:	

2 Site Details

a.	Obstacles crossed:	

3 Proposed Structure

a.	Description of structure and working life[4]:	
b.	Structural type:	
c.	Foundation type:	
d.	Span arrangements:	

Structure Design Certificate

SD5

continued

APPLICATION FOR APPROVAL IN PRINCIPLE

Name of Project/Scheme	
Name of Structure	
Designer	

3 e.	Articulation arrangements:	
f.	Proposed classes/levels[5]	
	(i) Consequence class:	
	(ii) Reliability class:	
	(iii) Inspection level:	
g.	Road restraint system type:	
h.	Proposed arrangements for maintenance and inspection/ inspection for assessment[1]:	
	(i) Traffic management:	
	(ii) Arrangements for future maintenance and inspection of structure. Access arrangments to structure:	

Structure Design Certificate SD5

continued

APPLICATION FOR APPROVAL IN PRINCIPLE

Name of Project/Scheme	
Name of Structure	
Designer	

3 i. Environment and Sustainability:

j. Durability, Materials and Finishes[6]:

k. Risks and hazards considered for design, construction, maintenance and demolition. Consultation with CDM Co-ordinator[7]:

l. Estimated cost of proposed structure together with other structural forms considered (including where appropriate proprietary manufactured structure), and the reasons for their rejection (including compative whole life costs with dates of estimates):

m. Proposed arrangements for construction:

(i) Construction of Structure:

(ii) Traffic management:

Structure Design Certificate SD5

continued

APPLICATION FOR APPROVAL IN PRINCIPLE

Name of Project/Scheme

Name of Structure

Designer

3 m. **(iii)** Service diversions:

(iv) Interface with existing structures:

4 Design Criteria

a. Actions:

(i) Permanent actions:

(ii) Snow, wind and thermal actions:

(iii) Persistent actions relating to normal traffic under AW regulations and C&U regulations[8]:

(iv) Persistent actions relating to General Order Traffic under STGO regulations[9]:

(v) Footway or footbridge variable actions:

Structure Design Certificate SD5

continued

APPLICATION FOR APPROVAL IN PRINCIPLE

Name of Project/Scheme	
Name of Structure	
Designer	

4 a. **(vi)** Actions relating to Special Order Traffic, provision for exceptional abnormal indivisible loads including location of vehicle track on deck cross-section[10,11]:

(vii) Accidental actions:

(viii) Actions during construction:

(ix) Special rules for combination of actions:

(x) Any special actions not covered above[12]:

b. Heavy or high route requirements and arrangements being made to preserve the route, including any provision for future heavier loads or future widening:

c. Minimum headroom provided: ____ m (including allowance for vertical sag compensation and maximum deflection of structure)

d. Authorities consulted and any special conditions required:

Structure Design Certificate SD5

continued

APPLICATION FOR APPROVAL IN PRINCIPLE

Name of Project/Scheme	
Name of Structure	
Designer	

4 e. Standards and documents

(i) List of relevant documents from the TAS:

(ii) Additional relevant Standards and publications:

f. Proposed Departures, relating to departures from standards given in **4e**:

g. Proposed Departures, relating to methods for dealing with aspects not covered by standards in **4e**:

5 Structural Analysis

a. Methods of analysis proposed for superstructure, substructure and foundations[13]:

Structure Design Certificate SD5

continued

APPLICATION FOR APPROVAL IN PRINCIPLE

Name of Project/Scheme	
Name of Structure	
Designer	

5 a. **(i)** Method of analysis for ultimate limit state (excluding fatigue):

(ii) Method of analysis for fatigue:

(iii) Method of analysis for serviceability limit state:

b. Description and diagram of idealised structure to be used for analysis:

Structure Design Certificate SD5

continued

APPLICATION FOR APPROVAL IN PRINCIPLE

Name of Project/Scheme

Name of Structure

Designer

5 c. Assumptions intended for calculation of structural element stiffness:

d. Proposed range of soil parameters to be used in the design of earth retaining elements:

6 Geotechnical Conditions

a. Acceptance of recommendations of the Geotechnical Design Report to be used in the design and reasons for any proposed changes:

Structure Design Certificate

SD5

continued

APPLICATION FOR APPROVAL IN PRINCIPLE

Name of Project/Scheme

Name of Structure

Designer

6 **b.** Geotechnical Design Report Summary Information

* delete as appropriate

Structure Name	**Chainage and OS Grid Reference**	**Reference / Comments**
Structure Type	**AIP Ref No.**	See HD22/08 cl 3.2 & 3.3 and BS EN 1997-1 cl 2.1 (10) - (21)
Designer's Geotechnical Advisor	**Design Life** 120 years / other*	
Geotechnical Category 1 or 2 or 3*	**Qualative or Quantitative Geotechnical Investigations**	
Soils / Geology	**Relevant Trial Holes**	
Strata	**Typical Depths**	
Previous Ground History	**Contaminated Ground Risk Assessment Required**	
Ground Water	**Protection of Structure against Chemical Attack**	
Earth Pressure Value - Range of angle of shearing resistance ('):	**Differential Settlement**	
Geotechnical Supervision / Monitoring		

Spread Foundations

Structure Element	Founding Stratum	Founding Level (m AOD)	Footing Size	Bearing Resistance (KN/m^2)	**Reference / Comments**
					…. ULS Comb 1 …. ULS Comb 2 …. SLS

Pile Design

Structure Element	Founding Stratum	Toe Level (m AOD)	Pile Dia (m)	Pile Length (m)	Pile Resistance (KN)	**Reference / Comments**
						…. ULS Comb 1 …. ULS Comb 2 …. SLS

Pile type:

Criteria for selecting pile toe level:

Allowance for negative skin friction within design:

Structure Design Certificate SD5

continued

APPLICATION FOR APPROVAL IN PRINCIPLE

Name of Project/Scheme	
Name of Structure	
Designer	

6 c. Differential settlement to be allowed for in the design of the structure:

d. If the Geotechnical Design Report is not yet available, state when the results are expected and list the source of information used to justify the preliminary choice of foundations[14]:

7 Checking

a. Proposed Category of Checking and Design Supervision Level:

b. If Category 3, name of proposed Independent Checker:

c. Erection proposals or temporary works for which Type S & P Proposals will be required, listing structural parts of the permanent structure affected with reasons:

8 Drawings and Documents

a. List of drawings (including numbers) and documents accompanying the submission[15]:

Structure Design Certificate SD5

continued

APPLICATION FOR APPROVAL IN PRINCIPLE

Name of Project/Scheme	
Name of Structure	
Designer	

9 The above is submitted for acceptance

We confirm that details of the temporary works design will be / have been pass to the Permanent Works Designer for review[16].

Signed	
Name	
Position Held	Design & Check Team Leader
Engineering Qualifications[17]	
Name of Organisation	
Date	

10 The above is rejected/agreed [1] subject to the amendments and conditions shown overleaf[18]

Signed	
Name	
Position Held	
Engineering Qualifications[17]	
For TAA	
Date	

Structure Design Certificate

SD5

continued

APPLICATION FOR APPROVAL IN PRINCIPLE

Name of Project/Scheme	
Name of Structure	
Designer	

10 Conditions

Structure Design Certificate

SD5

continued

APPLICATION FOR APPROVAL IN PRINCIPLE

Name of Project/Scheme	
Name of Structure	
Designer	

Notes

1 *Delete as appropriate*

2 *For a bridge, give over and/or under*

3 *Include weight, width and any environmental restrictions at or adjacent to the bridge*

4 *The design working life of the structure, including temporary structure, and replacement structural parts should be given. They should be expressed as a number of years rather than a range of years.*

5 *State the classes and levels for the whole structure, as well as those for the individual structural elements if higher or lower.*

6 *For concrete structures, give applicable exposure classes for particular structural elements. For all material strengths given, list the relevant codes/standards.*

7 *Designers should name the CDM co-ordinator and confirm that the CDM co-ordinator has reviewed the risks and hazards identified in the AIP and is satisified. Also see Clause 2.12(i), (ii) and (iii) of BD2.*

8 *e.g. Load Models 1 and 2, BS EN 1991-2*

9 *e.g. SV model vehicle in Load Model 3, BS EN 1991-2*

10 *e.g. SOV model vehicle in Load Model 3, BS EN 1991-2 and/or individual vehicle which includes the following information as applicable:*

a) Gross weight of the vehicle in tonnes and vehicle type and number.

b) Axle load and spacing (longitudinally and transversely)

c) Air cushion in tonnes over area applied (in metres, longitudinally and transversely)

d) Single or twin tyres and wheel contact areas

11 *If in doubt, the heavy or high load route requirements should be confirmed by the TAA.*

12 *e.g seismic action, atmospheic icing, floating debris, etc.*

13 *List the main structural elements for superstructure, substructure and foundation. If the designs of the superstructure, substructure and/or foundation are carried out by different teams, refer to cl.2.22 and 2.42 of BD2.*

14 *When the Geotechnical Design Report becomes available, an addendum to the AIP, covering section 6, must be submitted to the TAA. The addendum must have its own sections 8, 9 and 10 to provide a list of drawings, documents and signatures.*

15 *Include, without limitation:*

a) Technical Approval Schedule (TAS).

b) General Arrangement Drawing.

c) Relevant extracts from the Geotechnical Design Report.

d) Departures.

e) Relevant correspondence and documents from consultations.

16 *This statement is applicable to temporary works design AIP only.*

17 *CEng, MICE, MIStructE or equivalent.*

18 *AIP is valid for three years after the date of agreement by the TAA. If the construction has not yet commenced within this period, the AIP shall be re-submitted to the TAA for review.*

Structure Design Certificate

SD6

FORM OF CERTIFICATE FOR CONSTRUCTION COMPLIANCE.
(REQUIRED WHEN STRUCTURE TO BE ADOPTED BY GLASGOW CITY COUNCIL)

Name of Project/Scheme

Name of Structure

Designer

Approval in Principle[1] dated: *(date)* and addenda[1] dated: *(date)*

Construction drawings (permanent and temporary works[1,2]) and bar bending schedules listed with the Design and Check Certificate/Certificates[1] dated: *(date)*

As Constructed drawings[3] and Bar Bending Schedules[3], the unique numbers of these drawings and schdules are:

The Specification for Highway Works (edition, date):

including additional and subtitued clauses recorder in certificates for specification variations[1,3]:

1 We certify that

(name of structure and its equipment)[4]

a. Have been constructed, commissioned and tested in accordance with :

(i). The construction drawings and bar bending schedules listed within the above Design and Check Certificate/Certificates[1], with any modifications in accordance with the technical approval procedures given in BD2/*(date)*[1], except (*list exception(s) and give appropriate information and reason for non-compliance*[5]).

Structure Design Certificate

SD6

continued

FORM OF CERTIFICATE FOR CONSTRUCTION COMPLIANCE.
(REQUIRED WHEN STRUCTURE TO BE ADOPTED BY GLASGOW CITY COUNCIL)

Name of Project/Scheme

Name of Structure

Designer

1 a. **(ii).** The above Specification for Highway Works and specification variations, [1] except (*list exception(s) and give appropriate information and reason for non-compliance*[5]).

b. The execution of these works has been accurately translated into As Constructed drawings and bar bending schedules as listed above.

Signed

Name

Position Held[7] Contractor's Representative

Engineering Qualifications[6]

Signed

Name

Position Held[7]

Name of Organisation

Date

Structure Design Certificate

SD6

FORM OF CERTIFICATE FOR CONSTRUCTION COMPLIANCE.
(REQUIRED WHEN STRUCTURE TO BE ADOPTED BY GLASGOW CITY COUNCIL)

continued

Name of Project/Scheme	
Name of Structure	
Designer	

2 We certify reasonable professional skill and care has been used, relating to the execution of:

_____ *(name of structure),*

in the task described below *(choose either a, b or c)* :

a. [1]Examining the execution and that it has been constructed, commissioned and tested in accordance with:

(i) The above Approval in Principle, Design and Check Certificate1, with any modifications in accordance with the technical approval procedures given in BD2, dated: _____ *(date)*

except *(list of exception(s) and give appropriate information and reason for non compliance[7])* :

(ii) The construction drawings and bar bending schedules listed within the Design and Check Certificate/Certificates[1], dated: _____ *(date)*

as modfied by authorised variations accepted by the TAA, [1] except *(list exception(s) and give appropriate information and reason for non-compliance[5])* :

b. [1] Hands off audit role assessment to ensure that the correct quality control procedures have been followed.

c. [1] *(State task/role required under the contract's work specification or if different, the actual task/role performed and give appropriate information and reason for non-compliance[5])* :

Structure Design Certificate

SD6

FORM OF CERTIFICATE FOR CONSTRUCTION COMPLIANCE.
(REQUIRED WHEN STRUCTURE TO BE ADOPTED BY GLASGOW CITY COUNCIL)

continued

Name of Project/Scheme	
Name of Structure	
Designer	

2

Signed	
Name	
Engineering Qualifications[6]	
Position Held[2]	Works Examiner's Representative
Name of Organisation	
Date	

3 The certificate is accepted by the Technical Approval Authority (TAA)

Signed	
Name	
Position Held[7]	
Engineering Qualifications[6]	
For TAA	
Date	

Structure Design Certificate

SD6

FORM OF CERTIFICATE FOR CONSTRUCTION COMPLIANCE.
(REQUIRED WHEN STRUCTURE TO BE ADOPTED BY GLASGOW CITY COUNCIL)

continued

Name of Project/Scheme	
Name of Structure	
Designer	

Notes

1. *Delete as appropriate.*
2. *Temporary works are required where they may have significant effect on the permanent works.*
3. *A full list to be given including any addenda.*
4. *Certification for mechanical and electrical installations are not required as they are covered in Section 6 of BD2. However all the maintenance and operation manuals, including guarantees, should be provided to the TAA.*
5. *Consider appropriate measure if required and advise the TAA if it needs to be recorded in GCC's management system for structures.*
6. *Competent engineer with appropriate qualification and experience e.g. for Categories 0 and 1, and with Ceng, MICE, MIStructE or equivalent for Categories 2 and 3. The acceptance of competency criteria may be varied subject to TAA agreement.*
7. *A Principal of the Contractor or organisation responsible for the execution.*

Construction Consent Application

CC1

APPLICATION TO ROADS AUTHORITY FOR CONSTRUCTION CONSENT TO CONSTRUCT OR EXTEND A ROAD

To be completed in accordance with the provisions of the Council's (as Local Roads Authority) standards by any person wishing to construct or extend a road irrespective of whether or not it is to be subsequently maintained by the Roads Authority

1 I/We (*insert full name and address of applicant*)

apply under Section 21 of the Roads (Scotland) Act 1984 for Construction Consent for the (*state nature of operation, e.g. new construction or extension of existing road*)

at (*insert address of site*)

of which I am/we* are (*state interest in land, e.g. owner, tenant*)

all in conformity with the plans, detailed drawings and specification submitted herewith and doqueted and signed as relative herto.

2 I/we* hereby declare that no other party has an interest in the land. The attached form CC2 details all other parties having an interest in the land*

Signed (*Applicant*)

Name

Date

** delete as appropriate*

For Office Use Only

Reference Number		Work Commenced	
Received		Work Completed	
Objections		Start of Maintenance	
Objections Cleared		Adopted as Public	
CC Granted			

Docquets of Service

CC2

Reference Number:

For office use only

1 I/We certify that on (*insert date*)

day of 20

a notice of the lodging of this application has been served by the applicant upon the undernoted proprietors being the owners of all lands or heritages fronting, abutting or comprehended in the proposed new road or extension of the existing road and further certify that such notice contained an intimation that plans and other relevant particulars could be examined at the office of the Roads Authority located at

and that objections to the application should be lodged with the Roads Authority within Twenty-eight days from the date of the notice.

Signed (*Applicant or Agent*)

Name

Address

Date

List of proprietors referred to

Name	Address

Notice of Service

CC3

Reference Number: _____

For office use only

1 Notice for service on owner of land fronting, abutting or comprehending in new road or extension of existing road

Roads (Scotland) Act 1984 Notice under Section 21 *(2)* of application for Construction Consent

Proposed Road Construction at [a]

Take notice that application is being made to [b]

by [c]

for construction consent by [d]

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

to the Roads Authority office [f]

Signed _____

On behalf of _____

Date _____

Notes

a *Insert address or location of proposed road construction*
b *Insert name of authority*
c *Insert name of applicant*
d *Insert description of proposed road construction*
e *Insert date 28 days later than the date on which the notice is served*
f *Insert address of Roads Authority office at which the application is being lodged*

Page 1 of 1

Construction Consent Application

CC4

Reference Number: _____

For office use only

CONSTRUCTION CONSENT TO CONSTRUCT OR EXTEND A ROAD

Construction Consent by _____

(insert name of authority) (herinafter referred to as the "the Council")

as to the construction/extension of roads in connection with the _____

The Council, acting under and by virtue of Section 21 of the Roads (Scotland) Act 1984 hereby grant construction consent as follows

The Council Grant authority to _____

(insert name and address of the aplicant)

for roadworks in connection with _____

(insert name and address of the site)

In accordance with

a the plans submitted to and approved by the Council which plans are docqueted and signed by the Roads Authority as relative hereto
b the particulars set forth in the schedule annexed and signed as relative hereto and
c the relative provisions of the said Roads (Scotland) Act 1984, on the following condition(s):

i) All works are to be completed within a period of …….. years …..... months from the date of this consent.

ii) _____

iii) _____

iv) _____

Signed *(Roads Authority)* _____

Date _____

Schedule referred to:

Road Description (*this may be done by reference to plan*) _____ Length _____

Page 1 of 1

Footpath Agreement

CC5

Reference Number: _____

For office use only

AGREEMENT TO TAKE OVER FOOTPATH(S) ASSOCIATED WITH DEVELOPMENT

(to be completed only in respect to footpath(s) which will subsequently be maintained by the Roads Authority)

Agreement in terms of Section 18 of the Roads (Scotland) Act 1984 between [1]

_____ *(hereinafter referred to as "the Council")* and [2]

_____

of [3] _____

(hereinafter referred to as "the developer")

Whereby the footpath(s) constructed by the Developer in accordance with

Construction Number: _____

granted by the Council on [4] _____

as set forth in the Schedule annexed and signed as relative hereto will, following their satisfactory completion, be added to the Council's list of public roads.

Provided that, should the developer fail to complete the said footpath(s) to the satisfaction of the Council within a period of [5]

_____

from the date of this Agreement, the Council may itself complete the footpath(s) and recover from the Developer such expenses as are reasonably incurred in so doing.

Signed *(Roads Authority)* _____

Date _____

Signed *(Developer)* _____

Date _____

Schedule referred to:

Footpath Description (*this may be done by reference to plan*)	Length

Notes

1. *Insert name of authority*
2. *Insert name of applicant*
3. *Insert address of applicant*
4. *Insert date construction consent granted*
5. *Insert period for completion*

Adoption Certificate

CC6

APPLICATION BY A DEVELOPER FOR THE ADDITION OF ROAD(S) AND/OR FOOTPATH(S) TO THE ROADS AUTHORITY'S LIST OF PUBLIC ROADS

I/We (*insert name of applicant*)

_____

of (*insert address of applicant*)

_____

apply

1* under section 16(2) of the Roads (Scotland) Act 1984, in respect of the road(s) listed in Schedule A annexed and constructed in accordance with

Construction Number: _____

granted to me/us* on _____

and/or

2* under section 18(1) of the Roads (Scotland) Act 1984, in respect of the footpath(s) listed in Schedule B and the Agreement annexed and constructed in accordance with

Agreement Number: _____

dated _____

for the addition to the Roads Authority's list of public roads of the said road(s)* and/or footpath*(s)** all as shown in colour on the plan*(s)** submitted herewith and docqueted and signed as relative hereto

Signed (*Applicant*) _____

Date _____

* *delete as appropriate*

Schedule A referred to:

Road Description (*this may be done in reference to a plan*)	Length

Schedule B referred to:

Footpath Description (*this may be done in reference to a plan*)	Length

For Office Use Only

Reference Number Received		Adoption Inspection Added to list	

Road Bond

CC7

Reference Number: _____

For office use only

We, _____ *Name of Bank etc. Guarantee Finance*

CONSIDERING THAT

Developer _____

has been granted Construction Consent Ref _____

No. Dated _____

by the _____

(enter Council Name) (hereinafter referred to as the Council)

as local Roads Authority in terms of Section 21 of the Roads (Scotland) Act, 1984 for the construction of a private road(s) or part thereof in connection with

Development _____

all as is more fully detailed in the said Construction Consent and the plans and Schedule relative thereto, considering further that the estimated cost of constructing the said private road(s) or part thereof in accordance with the said Construction Consent and others is

Sum of Money _____

and that the said *(Developer)* _____

has requested us to grant security for such sum to the said Council by means of a bond in terms of the Security for Private Works *(Scotland)* Regulations 1985, do hereby as cautioners and sureties bind and oblige ourselves and our successors to pay to the said Council and its successors or assignees, on receiving from the said Council a demand in writing, such sum not exceeding

Sum of Money _____

which the said Council states in the said demand to be the costs incurred by it in construction, or rectifying defects, in the said private road(s) or part thereof in accordance with Regulatuion 13 of the said 1985 Regulations: and we consent to the registration hereof for preservation and execution: **IN WITNESS WHEREOF**

_____

Road Bond

CC7

Instructions;

Construction of private road(s) shall not commence until you have provided the Council with financial security for an amount of

£ _____

Being sufficient to meet the cost of construction/completing the construction of the road*(s)* in accordance with the Construction Consent, in terms of the *"Security for Private Roadworks (Scotland) Amendment Regulations 1998"*.

The Road Bond should be signed by an authorised signatory on behalf of the guarantor *(who is normally the bank, building society or insurance society)* and the signature should be witnessed by two witnesses. Please note that you should advise me of the date that the bond was signed.

To enable you to lodge your security I enclose the following documents.

a. One copy of form CC7 to be completed and returned to this office with your security.

b. One copy of the "Cautionary Obligation" in favour of

_____

(enter Council name)

If you intend to lodge your security in the form of a bond you may use this document.

c. One copy of *"Directions for Signing Deeds"* incorporation a signing schedule which you are required to complete and return with the bond.

d. One copy of guidance note for developers.

Road Bond

CC7

Roads (Scotland) Act 1984
Security for Private Road Works (Scotland) Amendment Regulations 1998
Guidance notes for developers

In terms of Section 17 of the Roads (Scotland) Act, 1984 and the Security for Private Roadworks (Scotland) Amendment Regulations 1998 you, as a developer, are required to make financial provision with the Council, as Local Roads Authority in order to safeguard the completion of housing development roads which are the subject of a Construction Consent. Such provision, as required by the Regulations, may take the form of a Road Bond or deposit and this will serve to protect prospective house purchasers from having to bring incomplete roads up to adoptable standards.

You are unable to commence building works adjacent to any road permitted by a Construction Consent until you have met the requirements of the above regulations which came into effect on 1st April 1986.

In terms of Regulation 6, the security shall be an amount sufficient to meet the cost of constructing or completing the construction of the said roads. Also to calculate the amount of that security by objective estimating and negotiation.

In terms of Regulation 5, that security shall be either a bond in favour of this Council or a cash deposit of a sum equating to that security. Such bond or deposit shall be lodged with the Council at the office where your construction consent was issued.

In terms of Regulation 16, any person who carries out building works in contravention of these regulations shall be guilty of an offence. It would, therefore, be in your interests to make early contact with the Local Roads Authority, who will be able to advise you fully on these procedures. Copies of form CC7 should be completed and returned with the security. Copies of the regulations are also available for inspection at the office of the Local Roads Authority.

Road Bond

CC7

DIRECTIONS FOR SIGNING DEEDS

Before signing, please read carefully

Every Party to the deed must sign on the *(insert page)* …….. including the inventory and plan, if any, with his or her usual signature where his or her initial are marked in pencil.

Each Witness to the execution of the deed requires to sign on the *(insert page)* ..... at the pencil mark X, adding after his or her signature the word “Witness”. Two witnesses are required to the signature of each party, but provided parties sign at the same time, the same persons may witness all the signatures and only require to sign once.

The witnesses must be above fourteen years of age. They should know the parties whose signatures they are witnessing personally or at least have credible information as to their identity. No person interested in the deed should act as a witness, and one spouse should not be a witness to signature the other.

The parties must not insert any blanks in the Deed.

When the Deed is signed the subjoined Schedule should be filled up in BLOCK LETTERS and returned along with the Deed. The schedule may be filled up by anyone. A female witness should state in the Schedule whether she should be styled Mrs, Ms or Miss.

SCHEDULE to be filled up and returned

Name of Party Signing	Place where Signed	Date of Signing	Full Name (*including middle Names, if any*). Occupation, and Address of First Witness	Full Name (*including middle Names, if any*). Occupation, and Address of Second Witness

Carriageway Design Certificate — CC8

Reference Number: _____
For office use only

Project

Description of roads

Location and other details

Soils - CBR _____ % Chainage Limits _____ to _____

Source document(s) _____ date _____

Traffic Information - ADT _____ at opening year _____ % commercial _____

Source document(s) _____ date _____

Design 1 - way AADT commercial _____ initial _____ final _____

Life _____ years Damage Factor _____ n/2 MSA _____ *(Cum total)*

Technical reference(s)

Thickness of layers in possible construction - (Clause no) mm

Surface course				
Binder course				
Base				
Sub-base				
Capping layer				
Total				

Designed by _____ Date _____

Checked by _____ Date _____

Page 1 of 1

Construction Consent Process Checklist — CC9

Reference Number: _____
For office use only

Developer

Scheme

Submitted Drawings

Page 1 of 2

Construction Consent Process Checklist CC9

Reference Number:

For office use only

	Yes	No
Design Audit (including Stage 2 Road Safety Audit) supplied?		
Ground Investigation and Geotechnical Design Reports supplied?		
Do reports specifically relate to the proposed roads?		
Have the Strutures Technical Approvals Procedure being completed?		
Street lighting and signing proposals supplied?		
Drainage / SUDS schedule supplied?		
Construction Consent Application (CC1) Form submitted?		
Docquets of Service (CC2) Form supplied?		
List of individual drawings submitted?		
Location Plan supplied?		
Layout Plan supplied?		
Longitundinal Section supplied?		
Cross Section supplied?		
Road Bond (CC7) Form supplied?		
Carriageway Design Certificate (CC8) Form submitted?		

APPENDIX 3 : SUDS & FLOOD MANAGEMENT

3

INTRODUCTION

SUDS and a Drainage Impact Assessment (DIA) are required for residential development consisting of more than one unit; a Flood Risk Assessment is required where there is a material flood risk. Developers are advised to view the following Council policies and guidance:

ENV 4 Sustainable Drainage Systems (SUDS)

ENV 5 Flood Prevention and Land Drainage

Flood Risk Assessment and Drainage Impact Assessment: Planning Guidance for Developers

Glasgow City Council and Scottish Water (*not yet signed*) legal agreements for shared surface water drainage systems.

SUDS DETAILS

The following SUDS details show typical Section 7 layouts of shared surface water systems that would be acceptable to both Scottish Water and the Council. These layouts are not prescriptive but give a starting point for discussion.

Details of SUDS features with an impervious lining which should be registered on the Symology system. Where impervious membranes are utilised care must be taken to ensure that subsequent introduction of other infrastructure does not puncture the membrane, i.e. service connections, trees, lighting columns etc.

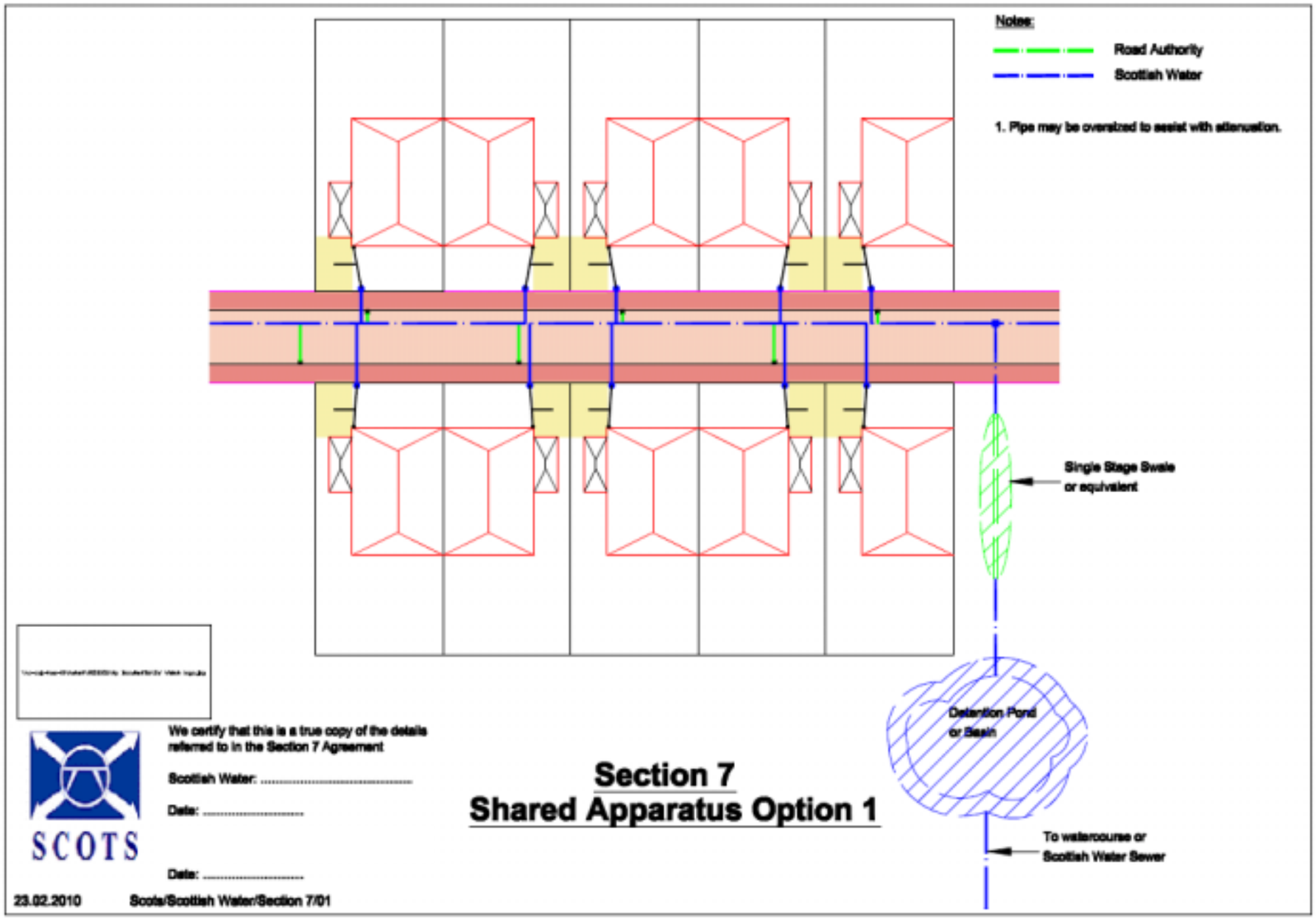
Due to the clay soils that predominate in Glasgow, it is anticipated that infiltration to the ground will be unlikely and an impervious membrane will be necessary.

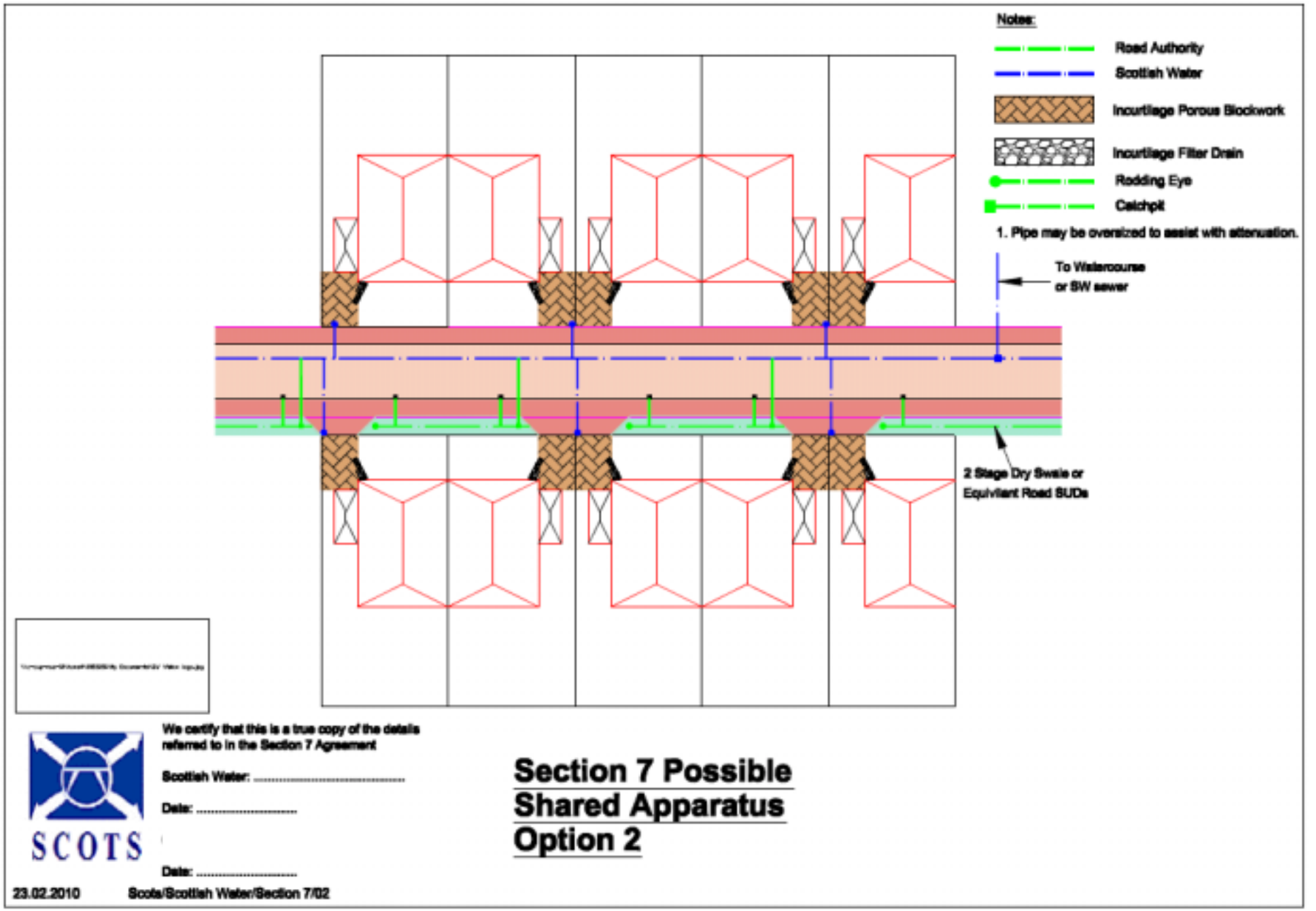
Bio-retention details per *CIRIA C697 The SUDS Manual* will be considered. Proprietary bio retention systems will be considered if SEPA confirm that they provide a level of treatment. Any such schemes will need to be considered alongside the landscape design.

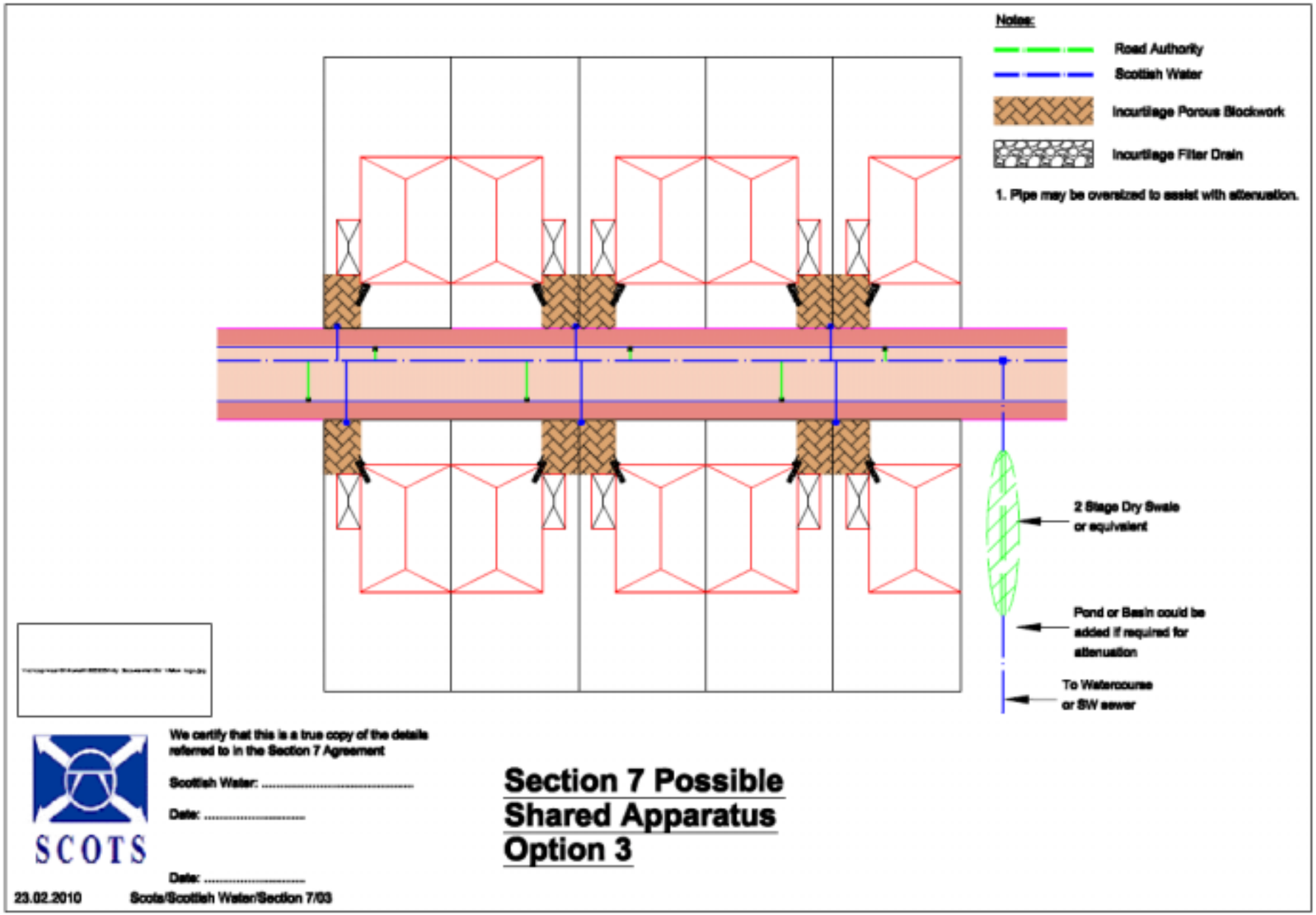
Supporting capacity calculations will be required for all SUDS to demonstrate that both appropriate treatment and attenuation are provided.

The three options shown in the following layouts indicate possible methods for the Council to share a surface water drainage system with Scottish Water through a Section 7 agreement under the *Sewerage (Scotland) Act 1968*.

For private new build development option 1 is the preferred solution as it removes Local Authority concern of lack of maintenance and subsequent consequences of privately maintained in-curtilage SUDS features.


Notes:
Road Authority
Scottish Water
1. Pipe may be oversized to assist with attenuation.
Single Stage Swale
or equivalent
Detention Pond
or Basin
To watercourse or
Scottish Water Sewer
We certify that this is a true copy of the details
referred to in the Section 7 Agreement
Scottish Water: .....
Date: .....
Date: .....
SCOTS
Section 7
Shared Apparatus Option 1
23.02.2010
Scots/Scottish Water/Section 7/01


Notes:
Road Authority
Scottish Water
Incurtilage Porous Blockwork
Incurtilage Filter Drain
Rodding Eye
Catchpit
1. Pipe may be oversized to assist with attenuation.
To Watercourse
or SW sewer
2 Stage Dry Swale or
Equivilant Road SUDs
We certify that this is a true copy of the details referred to in the Section 7 Agreement
Scottish Water: .....
Date: .....
Date: .....
SCOTS
Section 7 Possible
Shared Apparatus
Option 2
23.02.2010
Scots/Scottish Water/Section 7/02


Notes:
Road Authority
Scottish Water
Incurtilage Porous Blockwork
Incurtilage Filter Drain
1. Pipe may be oversized to assist with attenuation.
2 Stage Dry Swale
or equivalent
Pond or Basin could be
added if required for
attenuation
To Watercourse
or SW sewer
We certify that this is a true copy of the details
referred to in the Section 7 Agreement
Scottish Water: .....
Date: .....
Date: .....
SCOTS
Section 7 Possible
Shared Apparatus
Option 3
23.02.2010
Scots/Scottish Water/Section 7/03

APPENDIX 4 : GUIDANCE ON STREET TREE DETAILS, SPECIFICATIONS & STANDARDS

4

1 INTRODUCTION

It is the aim of this appendix to guide and advise on the planting of street trees in new residential developments. It covers aspects of tree selection, planting systems and onward maintenance deemed appropriate for a variety of settings.

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. In locations where this could compromise the integrity of the street infrastructure (including utilities), it will be necessary to restrict root growth through containing the root zone. In such locations, it is vital that the container provides an adequate volume for root growth. It is noted that root growth is rarely symmetrical and an irregular shape of container can still provide healthy growing conditions.

2 TREES IN PAVED AREAS AND ALONG ROADSIDES

2.1 TREE PIT AND PLANTING SYSTEMS

This guide is aiming to take tree planting in the direction of a tree planting specification that moves away from or avoids the using root restricting measures that have traditionally been employed when planting trees in urban areas; adjacent to roads and footways or within expansive areas of hard standing. It is many of these established practices of root growth restriction that lead directly shortening the life expectancy of a tree.

Therefore, to increase and extend the life expectancy of a street tree it is crucial that the volume of potential root growth is maximised. The aim should be to provide as much rooting area as possible: proprietary 'cell' systems are available that can assist in achieving this in urban areas.

This desire to provide ample volume for tree development can be seen in that larger growing tree species should ideally be provided with $20m^3$ growing media capable of supporting a tree however, compacted subsoil below the surrounding paved areas, road pavements or footways is not deemed as an exploitable growing media.

It is recognised that providing this volume of exploitable growing material may be difficult to achieve in the confines of the urban and road side environment unless the trees roots can naturally grow to or are encouraged to grow into open areas of adjacent soft landscape.

The exploitable rooting, grow-zone beyond the initial tree pit does not have to be geometrically formed, it is acceptable for this zone to be designed to fit into the development and the conditions created. Increasing the depth of the pit can be advantageous but beyond 900mm of growing media the benefit is reduced and therefore of little use beyond pit drainage installation or natural filtration.

Where possible the construction of planting trenches, rather than a single tree pit is advantageous particularly when the length and width of road side verge is incorporated along with the use of root barriers to prevent undesirable root growth under the carriageway or footway. However, where this is not achievable then negotiation on specific site constraints would be required and may produce an acceptable solution to allow for the planting of trees and particularly if there are utilities or other elements present.

The use of proprietary root support systems to construct the exploitable rooting zone or utilised to form the pit structure (along with root management systems such as barriers) is to be encouraged for trees adjacent to roads or those located in areas of hardstanding e.g. expanses of paving or car parks.

Trees immediately adjacent to Sustainable Urban Drainage (SUDS) features such as swales, ponds or basins will require root containment.

Small: $10m^3$ minimum

Medium: $15m^3$

Large: $20m^3$ upwards

2.2 UTILITIES AND HOW TO ACCOMMODATE THEM

Tree locations, service runs and proprietary systems should enable services to be accommodated and accessed.

2.3 GROWING MEDIA / SOIL

Due to previous experience and a high mortality rate soil types should be 70% soil and 30% sand to alleviate the use of Amsterdam soil. Reference should be made to **BS 3882: 1994** for quality of top soil and pit soil if required.

2.4 IRRIGATION AND AERATION

Irrigation is essential in paved areas particularly in a sealed system that does not allow for natural surface filtration or peculation of ground water or were a planting system utilising a 'cell' construction and root barriers are employed. Therefore, any proposed planting system must allow for a water inlet and subterranean either perforated pipe.

Although it may be desirable to allow surface water runoff to be directed into the planting pit / planting area as part of a none formal SUDS \ storm water management system the recognised damage that road salts have on tree growth can not go unchecked and therefore consideration for how these salts will be leached through the growing medium need to be considered.

Aeration is often overlooked as being essential for healthy tree establishment and growth but the need for gaseous exchange in the growing media and at surface level is crucial. It is at this point that consideration should given to providing an air space between the soil and the surrounding hardstanding and therefore the use of traditional grates and proprietary surface treatments that do not inhibit gaseous exchange are the preferred option.

2.5 DRAINAGE

Pit drainage is important to prevent water logging and assist the removal of salts and hydrocarbons that may wash into any root zone through surface runoff or peculation and also for the removal of VOCs (volatile organic compounds) that may naturally build up.

2.6 TREE SUPPORT

Underground support systems, proprietary and accepted industry standard methods: The selected method should be submitted and always obtain approval before commencing final specification.

2.7 SURFACE TREATMENTS (GRATES / RESIN BONDED GRAVELS/ PAVING)

The surface treatment to the immediate surround of the tree: Over the rootball zone should always be accessible and a wide range of proprietary systems are available however, bespoke designed should be avoided unless agreed with the Council.

The proposed system must allow for an ample void between the surface of the growing media and the base of the cover or grate etc to allow for gaseous exchange to occur. It should also be noted that a similar void should be provided for the canopy area at time of planting.

3 TREES IN SOFT LANDSCAPE AREAS AND OPEN SPACE

3.1 TREE PIT AND PLANTING SYSTEMS

Standard planting details in relation to BS 3882: 1994 and industry standard practices or 1.5 times larger than the tree roots, particularly with bare root specimens.

3.2 SOIL, GROWING MEDIA

Essential soil tests done on existing and imported soils to ensure they are conducive to tree establishment and growth, the use of soil ameliorants, proprietary planting additives, composts and fertilisers are to be utilised if tests results indicate deficiencies. Refer to **BS 3882: 1994** for quality of top soil and pit soil if required.

3.3 DRAINAGE

Surrounding soil conditions will have a baring on drainage as a compacted soil may lead to the tree pit becoming a sump for surface and ground water increasing the mortality rate of the trees. Therefore, avoid planting trees in low lying areas that may prove prone to water logging.

3.4 TREE SUPPORT

Industry standard and best practise techniques for tree support (BS 3882: 1994) i.e. short single or short double stakes with cross bar. Ties are subject to preference by contractors.

4 TREE SELECTIONS

4.1 TREE GENERA AND SPECIES UNSUITABLE FOR URBAN AREAS

Tree species that are considered undesirable and the reason for their exclusion within a built, urban environment are listed below.

Populus spp (all) (surface rooting and suckering habit)

Salix spp (surface rooting)

Prunus spp and cultivars in certain locations such as hard standing (surface rooting and suckering habit)

Tilia spp and cultivars (ensure species/ hybrids/ cultivars are not subject to aphid infestation and therefore prone to honey dew production are selected in urban areas, car parks or pavements).

Acer pseudoplatanus and cultivars (as per **Tilia** are prone to aphid infestation and therefore to honey dew can is an issue)

Aesculus hippocastanum (not adjacent to roads due to large dense crown, prone to shedding branches when under stress, conkers in built up areas and roads, although sterile varieties are available)

Malus spp/ cultivars (larger fruit forming varieties to be avoided in paved areas)

Where restrictions exist in relation to the amount of space available in terms of the breadth of the tree canopy, there would be a preference for the selection of columnar or fastigiate forms, and a presumption against the selection of trees requiring formative pruning in order to maintain a box or pleached character.

The selection of species exhibiting a comparatively open pattern of canopy growth may be of assistance where street trees might otherwise shade properties or gardens.

4.2 SELECTING SPECIES TO UTILISE

When selecting a palette of species to incorporate in any proposed schemes then a bias in the favour of native species or selected forms of native species are deemed more suitable, particularly in low rise residential developments. The use of non-native species is not to be discounted as many species have attributes that favour their use in the harsher urban environment where planting in hardstanding areas may be required.

4.3 TREE GROW POTENTIAL AND STATURE

In most situations there should be a presumption for taller growing species as these provide the most benefit to the wider environment.

4.4 MEETING BIODIVERSITY CRITERIA

The use of native species will promote local natural biodiversity however; the principal of diversification can also be used to increase age and species diversification to steer away from monoclonal planting which will reduce pests and disease issues

5 THE DESIGN, INSPECTION AND FUTURE MAINTENANCE

5.1 MAINTENANCE AND MANAGEMENT PROPOSAL

The following requirements would apply for any street trees submitted for adoption by Glasgow City Council.

The developer is to provide a management plan for the life cycle of any tree species and a maintenance regime supporting the first 5 years of establishment/ replacement, during which time the trees would remain the responsibility of the developer.

All information on technical detailing should be submitted based on an individual, site specific basis before any commitments from the Council can be made in relation to the formal adoption of trees.

5.2 INSPECTION

An agreement should be made between relevant parties to undertake site inspection visits at the following milestones, by providing 24 hours notice to the Council:

- On developments where 50 or more trees are proposed for adoption, the selection of the planting stock at the nursery would form the first inspection
- The excavation/construction of planting pits and rooting zones
- Installation of underground equipment
- The planting of trees
- The completion of any surrounding hardscape works to ensure works do not have a detrimental affect on pervious tree planting or the future establishment of the trees
- The conclusion of the developers 5 year maintenance and defects liability period for the trees, at which point records of each maintenance visit undertake by the contractor are to be provided