The Highland Council
Comhairle na Gàidhealtachd

Roads and Transport Guidelines for New Developments
Stiùiridhean Rathaidean is Còmhdhalach airson Leasachaidhean Ùra

Section 2 – Standards and Guidelines
Earrann 2 – Inbhean is Stiùiridhean

Chapter 7
Caibideil 7
Construction materials standards
Inbhean stuthan togail

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Section 2 – Standards and guidelines / Earrann 2 – Inbhean is stiùiridhean

Section 2 of the Roads and Transport Guidelines for New Development document sets out the Council's current standards and guidance to assist the design of new road layouts, together with their associated services and facilities, to the standards required by the Council, if the road is to be adopted as public.
The section starts with establishing an appropriate layout, in terms of the intended road type, then provides guidance and requirements on various aspects of detailed design, including parking levels. Guidance on construction details and material standards is also provided.

For lightly trafficked residential streets, reference must be made to the Scottish Government's Designing Streets document, providing design parameters and guidance, which must be taken into account in the design of new or improved streets that serve residential areas.

Section 2 includes the following:

Chapter 4 Road Network

Chapter 5 Design Objectives and Requirements

Chapter 6 Parking

Chapter 7 Construction Materials Standards

Chapter 7 – Construction materials standards / Caibideil 7 – Inbhean stuthan togail

7.1 General / Coitcheann

7.1.1 The Council's objective, with regard to construction materials standards, is to achieve finished works at reasonable cost using durable materials requiring minimal and easy future maintenance. The specifications for construction works shall be in accordance with the Manual of Contract Documents for Highway Works Volume 1: Specification for Highway Works (referred to as the Specification), published by TSO (The Stationary Office), and any supplements or revisions as issued and as amended by these guidelines. Clause references mentioned within this document relate to the Specification. Adherence to the Specification, as amended by these guidelines, will be an important consideration in recommending any new road for adoption. Where a Specification clause refers to an associated Appendix for further information then clarification should be sought from the Council.

7.1.2 The Specification is closely linked with the DMRB that provides a comprehensive manual system (now in CD format) accommodating all current standards, advice notes and other published documents relating to the design, assessment and operation of trunk roads. However, a lot of guidance provided in the DMRB is also relevant to the design of local roads.

7.1.3 The use of re-cycled or newly developed materials, together with non-standard design details, is not precluded, but such proposals must be discussed and approved by the Council before their inclusion in any proposals subsequently submitted for formal approval. A developer should note acceptance of such materials for Road Construction Consent and subsequent adoption will be at the discretion of the Council and normally only works of a limited extent will be accepted on an experimental basis until techniques and materials have been tested through time.

7.1.4 Earlier Chapters have already stressed the importance of early and full consultation in relation to geometric design and layout. This advice applies equally to construction standards and the developer should discuss standards with the Council. This is especially important for those sites with drainage problems, soils with low CBR or soils susceptible to frost heave.

7.1.5 Taking account of the above points, proposed schemes should be designed from the outset with the final construction phase in mind, with the objective of seeking to minimise disruption to existing infrastructure and the local community. Consideration should be given to the phasing of permanent and temporary works. A Construction Method Statement will normally be required to be submitted as part of the Road Construction Consent Application.

7.2 Geotechnical requirements / Riatanasan geoteicneolais

7.2.1 The extent and type of ground investigation requirements, with associated detailed documentation, will be dictated by the nature of the proposed development, the site's previous land use(s) and local ground conditions.

7.2.2 All ground investigation reports should comply with BS 5930: Code of Practice for Site Investigation. The Factual Ground Investigation Report should include the following information, as a minimum:

- exploratory borehole/trial pit logs;
- aboratory test data, being relevant to the proposed form of road construction;
- site plan, at 1/500 scale, showing the proposed road layout and all borehole/trial pit locations.

7.2.3 The spacing of the boreholes/trial pits will depend upon the nature of ground conditions and the proposed development. Sufficient and appropriate locations shall be chosen to ensure the condition of the site can be fully identified.

7.2.4 Where it is proposed to construct a new road on land previously used for industrial purposes or waste disposal, chemical analysis data and gas monitoring information must be submitted, in addition to standard test data. Further relevant information is contained within BS 10175: Investigation of Potentially Contaminated Sites – Code of Practice.

7.2.5 The Ground Investigation Interpretive Report must be submitted with the Road Construction Consent application.

7.2.6 California Bearing Ratio (CBR) – the CBR value of the soil shall be determined by the laboratory CBR test in accordance with BS 1377: Part 4 Methods of Test for Soils for Civil Engineering Purposes. Test results shall be

incorporated in the Factual Ground Investigation Report.

7.3 Road drainage / Drèanadh rathaid

7.3.1 **Road Gullies** - road gullies must be constructed in accordance with Clause 508 of the Specification and fitted with external traps. Gully pots should be either 450mm inside diameter (I.D.) precast concrete or 450/510mm I.D. in-situ concrete with plastic former. Gratings shall be set to level and grade on two courses of engineering brick. Gully gratings and frames shall be Class D400 complying with BS EN 124 Gully Tops and Manhole Tops for Vehicular and Pedestrian Areas and be of a size compatible with the gully pot. The gully frame is to be 100mm deep and the grating is to be set 6mm below the road surface. Dished gullies should not be used. In non-contiguous car parks, Class C250 gratings and frames will be an acceptable alternative.

7.3.2 **Connections** - gully connections shall be constructed in accordance with Clause 508 of the Specification.

7.3.3 Where gullies are to be connected to a surface water drain, this shall be by means of 150mm diameter jointed fire-clay or plastic pipes, surrounded with 150mm of Class ST1 concrete where the cover is less than 0.9 metres.

7.3.4 Where a land drain is to be connected to the surface water drain, it must be via a silt trap.

7.3.5 **Chambers** - chambers should be constructed in accordance with Clause 507 of the Specification.

7.3.6 Manhole covers and frames shall be non-rock types and comply with BS EN 124 and be Class D400 (minimum clear opening 600mm diameter or equivalent, minimum depth of frame 100mm) except in non contiguous car parks or verges where the use of Class C250 (minimum clear opening 600mm diameter or equivalent, minimum depth of frame 100mm) will be permissible. Class B125 will only be permissible where no vehicle overrun is possible, for example where it is prevented by bollards.

7.3.7 All manhole covers should be positioned so they open in a manner that allows a person unobscured views of oncoming traffic when entering or exiting the manholes.

7.3.8 **Pipework** - all pipework combinations for road drainage must be in accordance with Volume 4, Section 2, Part 5, HA 40 of the DMRB and

constructed in accordance with the Specification.

7.3.9 **Down Pipes** - in redevelopment areas, there may be existing down pipes that may have previously discharged over the footway or through a footway channel. These must now be connected either directly into a gully pot or its connection with 100mm jointed pvc or fire-clay pipes. Permission will be required from Scottish Water and SEPA for this form of surface water treatment.

7.4 Pavement construction / Togail chabhsairean

7.4.1 Carriageways

7.4.1.1 Specification - carriageway pavements for Strategic Route Roads and Main Distributor Roads shall be designed in accordance with Volume 7 of the DMRB. All other types of road shall be designed in accordance with the principles set out in Table 7.1, unless agreed otherwise with the Council.

7.4.1.2 Rigid pavement construction will not normally be accepted, except for individual accesses to industrial or commercial buildings.

7.4.1.3 Design Life – carriageway pavements for all prospectively adoptable roads other than a road classed as a Strategic Route or Main Distributor shall be designed for a 40-year life and a minimum construction required to carry 1.0 million standard axles for any road, unless agreed otherwise with the Council.

7.4.1.4 Frost susceptible material – in general, most soils in the Highlands region are frost susceptible and, as a result, a minimum construction depth of 450mm of non-frost susceptible materials should be used in the road construction, unless agreed otherwise with the Council. **If necessary, the thickness of sub-base should be increased (or used in place of capping) to ensure the minimum depth of non-frost susceptible material.**

7.4.1.5 **Formation/Sub-grade** – a sub-base thickness of 200mm is generally acceptable, based on a CBR of 15% or higher. Where the CBR is less than 15%, then the sub-base thickness needs to be increased or a capping layer provided underneath. As a guide, the following should be adopted for different sub-grade CBR values, unless agreed otherwise:

CBR =10%	180mm sub-base + separate capping layer of 180mm
CBR = 5%	240mm sub-base + separate capping layer of 210mm

CBR =2.5% 350mm sub-base + separate capping layer of 250mm

7.4.1.6 For an increased sub-base thickness, the minimum permitted CBR for the sub-grade is 2.5%. Where a sub-grade has a lower CBR, the increased sub-base is considered unsuitable support for a pavement foundation since it would tend to deform under construction traffic. It must, therefore, be improved using one of the following options:

- The material at the surface can be removed and replaced by a more suitable material. If the depth of relatively soft material is small, all can be replaced but it may only be necessary to replace the top layer. The thickness removed will typically be between 0.5 - 1.0 metres.
- Use of an appropriate geotextile membrane system.
- If the soil is cohesive, a lime treatment may be appropriate, subject to soil suitability being demonstrated.
- If the soil is permeable, a deeper than normal drainage system may be considered, together with a system of monitoring the improvement expected.

7.4.1.7 Soft clays, saturated silts and running sand should normally be removed from below the pavement if practical. If not, measures as described above should be used to improve the subgrade. Peat should also be removed, unless alternative construction methods are agreed with the Council. The presence of ground and surface water will not allow an economic foundation to be formed and, therefore, the sub-grade must be adequately protected and drained before construction commences to prevent ingress of water. The inverts of side ditches or filter drains must be at least 600mm below formation level or sub-formation level as appropriate. Replacement of unsuitable materials is best effected by free-draining sands and gravel or crushed rock. If sub-grade drainage is not possible then replacement should be with rock fill. On soft sub-grades, the foundation materials may penetrate the subsoil leading to uneconomic construction and a separation layer, using a geotextile fabric membrane, suitable for the soil type is advisable. The Council may also consider the use of recycled materials such as crushed concrete as capping material.

7.4.1.8 For new or extended roads totalling a length of less than 100m, it is unlikely that varying the capping layer thicknesses to suit different CBR values would be economical.

7.4.1.9 **Formation on rock** - where the formation is on rock, the granular sub-base can act as a 150mm deep regulating layer.

7.4.1.10 **Sub-base -** the sub-base is provided as a stable lower layer within the pavement construction. Sub-bases shall comply with Clause 803 of the Specification. Sub-base thicknesses are determined by the strength of the sub- grade, which is determined by the CBR Test. There are variants on the CBR Test - laboratory, field, with surcharge, saturated etc. In the context of this document, the laboratory CBR with a surcharge to simulate the appropriate vertical overburden stress of the case being considered should be taken as the standard method, unless another method of testing is agreed with the Council.

7.4.1.11 **Base** – dense base and binder course asphalt concrete shall comply with Clause 906 or 929 of the Specification.

7.4.1.12 **Binder** – dense binder course asphalt concrete shall comply with Clause 906 or 929 of the Specification and shall have a minimum thickness of 55mm.

7.4.1.13 **Surfacing** - surface course shall comply with Clause 910, 911 or 942, with a minimum thickness of 35mm. Actual thickness depends on the type of material selected.

7.4.1.14 Construction thickness for different types of road is indicated in Table 7.1. The foundation thickness (combined capping and sub-base layer) is based on an assumed minimum sub-grade CBR of 3% and would need to be revised for CBR values lower or higher than this value. DMRB CD 225, for foundation design and DMRB CD 226 for asphalt design should be consulted before the final selection of a pavement design for other than a small scheme where the economics are not significant.

7.4.1.15 Recycled materials - recycling of existing pavement material is an alternative way to construct roads and use of such materials in carriageway and footway construction will be considered favourably by the Council. The cold recycling of material is now a major construction activity. Cold recycling can contribute to a reduction in energy, fuel and material consumption. Where its use is agreed with the Council, a cold recycling pavement should be designed according to the TRL Report TRL611.

7.4.1.16 Two stage construction - two stage construction shall be adopted to avoid construction damage to the surface course and the developer should bear this in mind when programming the works. Any settlement that may occur

shall be taken up with regulating course before the laying of the next layer(s). Early reinstatement of openings or failed areas is essential. Before the regulating course or surface course is laid, the top of the previous course shall be well cleaned and tack coat (refer to Clause 920) applied at the rate of 0.6 litre per square metre.

7.4.1.17 Temporary drainage - consideration should be given to the temporary drainage of the first stage, i.e. base course, to minimise ponding caused by the projection of gully gratings above the temporary surface, either by adjustment of gully frames or another approved method. This applies particularly in large projects where the construction period may be long and the wearing course not laid before a winter work period.

7.4.1.18 Tie in points - special attention should be paid to the area where the new construction ties into the existing road network, as this location is prone to failure due to poor compaction and the ingress of water. Each layer should be stepped back by a minimum of 300mm.

Table 7.1 Carriageway pavement construction

Road type	Sub-base	Base	Binder course	Surface course
Strategic route or main distributor		Designed in accordance with Vol 7 DMRB		
Local distributor or industrial access road	350mm type 1 to Cl 803	130mm dense base to Cl 906 or 929	55mm binder course to Cl 906 or 929	45mm hot rolled asphalt to Cl 910 or 911 or such other material as approved by The Council (Note 4)
Main residential street	350mm type 1 to Cl 803	80mm dense base to Cl 906 or 929	55mm binder course to Cl 906 or 929	
Minor residential street or car park	300mm Type 1 to Cl 803	65mm dense base to Cl 906 or 929	55mm binder course to Cl 906 or 929	
Home zone, courtyard or cul-de-sac		Construction to be agreed with The Council		
Rural road		Construction to be agreed with The Council		

Notes:

1. Table 7.1 is for guidance only and is based on a 3% CBR, with a combined sub-base and capping layer. The site-specific actual design requirements are to be based on actual CBR test results.

2. The first 450mm depth, from the finished road surface, shall be non frost

susceptible materials.

3. The penetration value of binder and the polished stone value of chippings shall be approved by the Council.

4. The Council will consider the use of Stone Mastic Asphalt and proprietary thin surface materials in certain circumstances. However, such materials might not be deemed suitable on a heavily trafficked road; where there are heavy turning movements; on roundabouts or at busy bus stops.

7.4.1.19 Rural roads – in many rural locations, levels of traffic are significantly lower than those experienced in urban situations. As a result, carriageway pavement construction thicknesses can sometimes be relaxed, depending on the scale and type of development. It is recommended, therefore, that early discussions are held with the Council to agree possible construction relaxations from the requirements of Table 7.1.

7.4.1.20 Appropriately designed surface dressing will be an acceptable material for a minor residential road in a rural location, with the rest of the construction make-up to be agreed with the Council.

7.4.1.21 Concrete block paving – concrete block paving is considered to be acceptable for carriageway pavement construction in the following locations:

(a) pedestrian/vehicle shared surfaces, such as Home Zones;
(b) bus terminals and other locations susceptible to diesel spills; and
(c) commercial or industrial accesses.

7.4.1.22 Block paving carriageways shall have the same design life as bituminous carriageways, with the block paving (200x100x80 to Cl 1107) and bedding layer replacing the binder course and wearing course. Materials and the method of construction shall be in accordance with BS EN1338: Concrete Paving Blocks and BS 7533-102: Code of Practice. The colours of the paving blocks must be agreed with the Council, in advance of construction.

7.4.1.23 It is very important that block paving carriageways incorporate adequate provision for the drainage of the unbound materials, especially where the road has a low longitudinal gradient. Where the blocks are laid on concrete, cement or bituminous base, appropriate drainage of the bedding layer must be provided.

7.4.1.24 Slip/skid resistance for block paving is described in BS 7533-101.

7.4.1.25 Where a permeable block paving surface is to be used as part of a

sustainable drainage system, the design of the underlying drainage layers shall be compatible with the proprietary system used. Geotextiles shall be employed as considered appropriate. A typical design of drainage layers is given in Table 7-2 with the final design to be agreed with the Council. In some circumstances, the Council may require the provision of a secondary drainage system as back up.

7.4.1.26 If acceptable to the Council, natural blocks may be used and should be in accordance with the SCOTS Natural Stone Surfacing – Good Practice Guide.

Table 7.2 Block paving carriageways

Type	Sub-base	Base	Bedding course	Surface course
Urban locations				
Precast concrete blocks				
Pedestrian/vehicle shared surfaces (such as home zones, car Parking)	320mm type 1 to Cl 803	None	Min 30mm bed 6:1 sand/cement or 50mm sand	200x100x80 to Cl 1107
	270mm type to Cl 803	Impermeable surface 70mm dense base to Cl 906 or 929	30mm sand	
Bus terminals and other locations susceptible to diesel spills or commercial or industrial accesses	300mm type 1 to Cl 803	150mm concrete C32/40	Min 30mm bed 6:1 sand/cement	200x100x80 to Cl 1107
Permeable block paving				
pedestrian/vehicle shared surfaces (such as home zones, car parking)	200mm lower base - (20/40) BS EN 13242 recommended grading tolerance Gc 80/20. GTnr, f4	200mm upper base – (10/20) BS EN 13242 recommended grading tolerance Gc 80/20. GTc 20/15	Laying course – (2/6.3) BS EN 13242 recommended grading tolerance Gc 80/20. GTc 20/15	200x100x80 permeable block pavior to BS EN 1338

7.4.2 Footways, footpaths and cycle tracks

7.4.2.1 Footway, footpath and cycle track pavement construction shall be in accordance with Table 7.3, unless an alternative design is agreed with the Council.

7.4.2.2 Where an existing footway/footpath is to be extended, say, into a new residential development, there may be environmental reasons and advantages for constructing the new section with materials that match the existing ones and this should be discussed with the Council.

7.4.2.3 Cycle tracks and shared pedestrian/cycle facilities should only have flexible construction, unless agreed otherwise with the Council.

Table 7-3 Footway/footpath/cycle track construction

Type	Sub-base	Binder course	Surface course [1]
Urban locations			
Flexible construction	100mm [2] type 1 to Cl 803	40mm binder or course to Cl 906 or 929 or	30mm Hot rolled asphalt to Cl 910 or 25mm close graded asphalt concrete surface course or to Cl 912 or
		Single course 60mm close graded asphalt concrete surface course to Cl 912	
Small element slabs (not suitable for cyclists)	150mm type 1 to Cl 803	25mm bed medium course sand	400x400x60mm to Cl 1104S
Block paving construction (pedestrian areas only)	150mm type 1 to Cl 803	min 50mm sharp sand	200x100x65mm thick rectangular block paving to Cl 1107
Other	Other types, such as granolithic concrete, setts and natural stone slabs, are only suitable where specified by planning requirements, with construction make-up to be agreed.		
Rural locations			
Flexible construction for footways, footpaths and	200mm Type 1 to Cl 803 or suitable recycled material	40mm dense binder course to Cl 906 or 929 or	25mm hot rolled asphalt to Cl 910 or 25mm close graded asphalt concrete surface course to Cl 912 or

cycle tracks		Single course 50mm close graded asphalt concrete surface course to Cl 912

Notes to Table 7.3:

1. Where Hot Rolled Asphalt is used as the surface course, prior to rolling 6mm or 10mm limestone or other approved chippings shall be applied at an approximate rate of 1kg per square metre.
2. The sub-base shall be increased to 150mm if the Council considers locations may be liable to overrun by vehicles.
3. The first 450mm depth, from the finished surface, shall be non frost susceptible materials and this may require the depth of sub-base material to be increased, unless agreed otherwise with the Council.

7.4.3 Vehicular footway crossings

7.4.3.1 For lightly trafficked small developments, it may be acceptable for vehicles to traverse the footway/footpath, as long as the pavement construction of the crossing point is strengthened. Vehicular footway crossings can have either flexible or rigid construction, in accordance with Table 7.4, but should match the adjacent footway/footpath type. Precast concrete slab construction will not be permitted for such crossings.

Table 7.4 Vehicular footway crossing construction

Type	Sub-base	Binder course	Surface course [1]
Residential driveway flexible construction	200mm Type 1 to Cl 803	50mm binder course to Cl 906 or 929 Or	30mm hot rolled asphalt to Cl 910 or 25mm close graded asphalt concrete surface course to Cl 912 or
		Single course 60mm asphalt concrete surface course to Cl 912	
Residential driveway rigid construction to match existing footway	Construction to be approved by The Council		
Commercial access flexible construction	350mm Type 1 to Cl 803	60mm binder course to Cl 906	40mm hot rolled asphalt to Cl 910 or Cl 911 or 35mm asphalt concrete close graded surface course to Cl 912

Commercial access rigid construction	210mm Type 1 to Cl 803	200mm 30/20 concrete to Cl 1704	40mm granolithic concrete to Cl 1106A

Notes to Table 7.4:

1. Where Hot Rolled Asphalt is used as the surface course, prior to rolling 6mm or 10mm limestone or other approved chippings shall be applied at an approximate rate of 1kg per square metre.

2. The first 450mm depth, from the finished surface, shall be non frost susceptible materials and this may require the depth of sub-base material to be increased unless agreed otherwise with the Council.

7.4.3.2 Emergency access – where a footway/footpath/cycle track is also intended to act as an emergency access route, then it needs to be designed to accommodate commercial vehicles and constructed to commercial access standards, as set out in Table 7.4.

7.5 Kerbing and edging / Cabhsairean is oirean

7.5.1 All carriageways, footways, footpaths and cycle tracks shall be provided with a kerb or edging, as detailed in Figures 7.1 and 7.2, unless agreed otherwise with the Council. Usually, the kerb shall be precast concrete or plastic but where, for reasons of conformity with existing development or as a planning requirement, kerbs of a different material are required, this shall be agreed with the Council.

7.5.2 Kerbs – Kerbs shall conform to BS EN 1340 Concrete Kerb Units and may be manufactured from precast concrete, although the Council does encourage the use of recycled material as an alternative. Recycled plastic kerbs have health and safety advantages, reducing the need for mechanical handling which is a requirement for precast concrete kerbs.

7.5.3 Kerbs shall be set on a 25mm thick Class 1 mortar bed, sitting on a Class ST2 concrete foundation, with foundation dimensions as shown in Figures 7.1 and 7.2 and dependent on road type. Kerbs shall also be haunched with Class ST1 or ST2 concrete.

7.5.4 On conventionally constructed roads, kerbs shall be set with an upstand of 125mm, unless approved otherwise with the Council, except at pedestrian and vehicular crossing points, where the upstand shall be reduced to a maximum of 6mm (ideally flush) and 20mm, respectively.

7.5.5 On shared surfaces, where kerbs are laid and pedestrians are able to

generally walk on either side of the kerb, its upstand should be a maximum of 6mm.

7.5.6 Where the development road joins an existing road, agreement must be obtained from the Council to determine the type of transition kerb to be used, together with the extent of any existing kerbing that may need to be replaced.

7.5.7 Special kerbs – At bus-stops, high upstand bus access kerbs shall be provided in accordance with the guidelines given in Roads for All – Good Practice Guide for Roads.

7.5.8 Edging – edging for footpaths and cycle tracks shall be flush with the walking/running surface. In remote areas and with the approval of the Council, footpaths and cycle tracks may be constructed without edging kerbs, as long as the sub-base is laid 500mm wider than the surfacing layers on both sides.

7.5.9 Service strips - where a shared surface has a service strip, edging kerb should be laid at the rear of the service strip, to highlight the limits of the prospectively adoptable road, unless some other form of delineation is agreed.

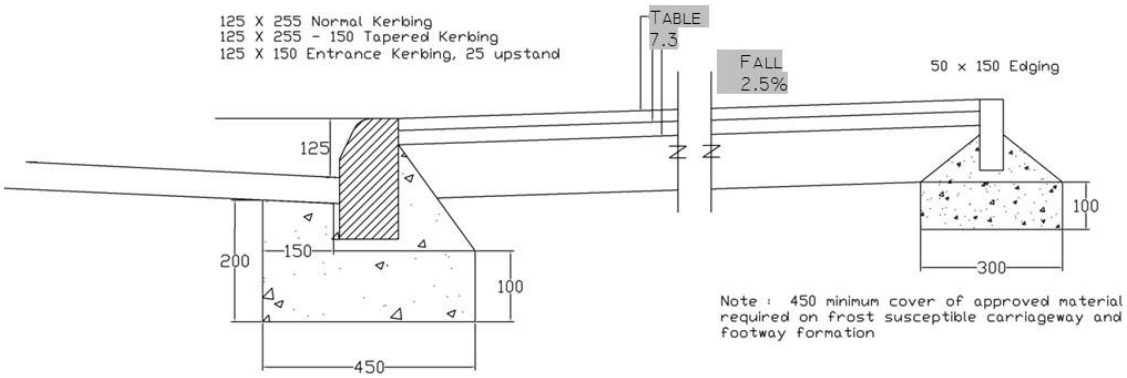


Figure 7.1 Kerbing for Access Roads and Bus Routes

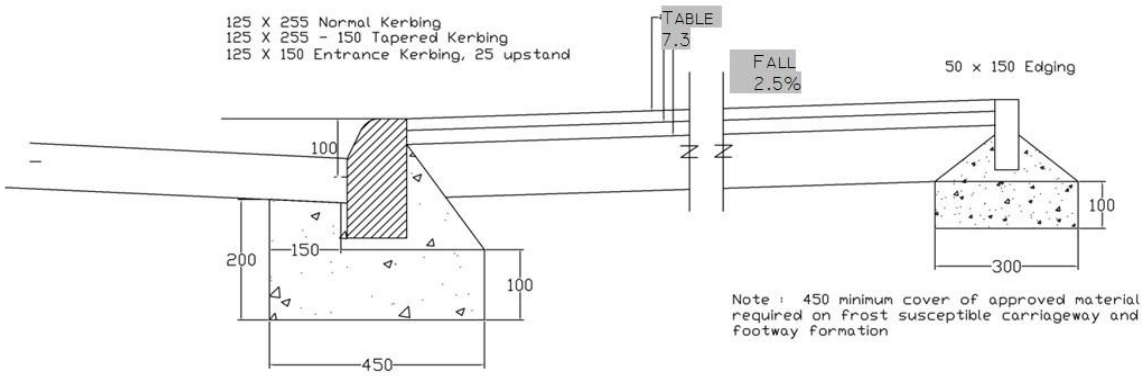


Figure 7.2 Kerbing for residential areas and car parks

Landscaping and verges / Deilbh-tìre agus fàil rathaid

7.5.1 Landscaping has an important role in creating attractive places, including streets, and planting, especially trees, helps to soften the street scene whilst also generating visual interest, improving the local microclimate and providing valuable habitats for wildlife. However, landscaping proposals within the prospectively adoptable road boundaries or on adjacent land that might impact on visibility splays must be discussed with the Council at an early stage, to agree verge widths, planting type and limitations.

7.5.2 **Appropriate planting** - whilst planting is to be encouraged, its design needs careful consideration, in order to ensure that (a) appropriate plants are used and (b) future maintenance requirements are minimised, especially in those areas that will subsequently be adopted by the Council. Plants can include trees, shrubs, flowers, ground cover, climbers, bulbs and grass and, in general, the planting of native species will be encouraged in rural areas but

can be more relaxed in urban areas.

7.5.3 **Trees** – trees should be sited to permit full branch growth and spread. Trees that are too close to the kerb may come into regular contact with high vehicles, affecting their growth. Where this could happen, trees should be sited such that their branches will not be within 450mm of the kerbline for their first 5.3m height.

7.5.4 Trees and shrubs should not be sited where they could cause damage to adjacent footways, buildings or services, unless their roots are contained. Whilst the best conditions for planting trees are in free draining, unconstrained tree pits, this is not always possible, especially within the urban environment. Where tree roots need to be contained, a tree pit of minimum volume of $3m^3$ should be provided and prepared to allow adequate drainage. In urban locations, trees may require guards to protect them from vandalism or impact damage.

7.5.5 **Soft verges** – soft verges shall be grassed, unless agreed otherwise with the Council, in consultation with Statutory Undertakers, where appropriate. A permanent demarcation must be provided to highlight the boundary between the rear of the verge and adjacent private property (usually in the form of fencing or wall or of edge kerbing, which can be provided as single kerbs at 3m centres along the boundary).

7.5.6 **Topsoil** – topsoil is to be spread to a uniform thickness of 150mm on all areas to be seeded and/or planted unless agreed otherwise by the Council. Prior to placing the topsoil, the top 200mm of underlying ground shall be broken up to facilitate free drainage, with all stones exceeding 100mm in size, together with any building waste, removed.

7.5.7 **Grass seed** – grass seed shall be sown during appropriate times of the year. The developer shall be responsible for resowing, in the following season, those areas where the initial seeding was not successful. The grass seed mixture for urban locations shall be agreed with the Council, prior to sowing. For rural locations, the following mixture shall be acceptable:

	Rate of Spread $12g/m^2$
Sheep fescue Bonito "Fescue Ovina"	30%
Red fescue Dawson "Festuca rubra subsp rubra"	45%
Brown top Highland "Agrostis castallana"	25%

although the Council may agree other mixtures, where deemed appropriate.

7.5.8 **Planting maintenance** – regular maintenance of newly planted trees and shrubs is essential during their first three years, in order to ensure that they grow and flourish properly. The developer will be required to prepare a maintenance schedule to cover this period and include regular inspections, weed control and replacement planting of failing trees or shrubs. Unless the landscaping is located with prospectively adoptable areas, it will remain private and the developer will be required to arrange on-going maintenance, which shall be to the satisfaction of the Council.

7.5.9 **Hard verges** – the form of any hard landscaping must be agreed with the Council during early stages in the design process and it must also take account of any planning requirements. Where hard verges are provided on Distributor Roads, there may be a requirement to surface all or part of the hard verge with pedestrian deterrent paving.

7.5.10 **Home zones** – the design of homes zones recommends the use of planting to create attractive streets and also act as traffic calming features. In such circumstances, the planting should be semi-mature when provided, to ensure these objectives are achieved from opening of the development