



North Ayrshire Council  
Comhairle Siorrachd Àir a Tuath

# North Ayrshire Supplementary Street Design Guide

## Appendix G –Construction Standards and Materials

Version 1: 2023



## Version Control

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



## Contents

1.1	Introduction .....	2
1.2	Geotechnical Considerations.....	2
1.3	Subgrade Drainage .....	2
1.4	Carriageway Construction.....	2
1.5	Materials .....	3
1.6	Cycle Paths.....	5
1.7	Footway and Service Strip Crossing.....	5
1.8	Street Nameplates.....	5
1.9	Signing and Road Marking.....	6

## Tables

Table 1 – Pavement Construction Mainland and Cumbrae .....	3
Table 2 – Pavement Construction in Arran .....	3

## Figures

Figure 1 – Section Through Road Indicating Sub Grade Drainage .....	2
Figure 2 – Filter Drain.....	2
Figure 3 – Capping Layer Requirements (Subject to Frost Susceptibility) .....	2
Figure 4 – Concrete Block Paving.....	4
Figure 5 – Asphalt with Decorative Aggregates.....	4
Figure 6 – Natural flags – Designing Streets.....	5

## 1.1 Introduction

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

## 1.2 Geotechnical Considerations

### Soil Report

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

## 1.3 Subgrade Drainage

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

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

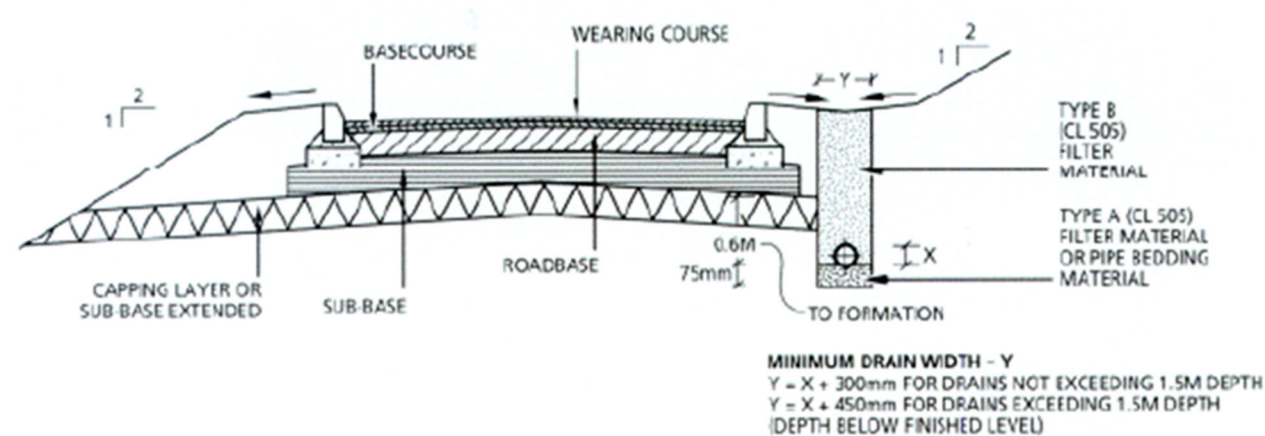


Figure 1 – Section Through Road Indicating Sub Grade Drainage



Figure 2 – Filter Drain

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

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

## 1.4 Carriageway Construction

### CBR (California Bearing Ratio)

Carriageways should be designed as flexible pavements in accordance with TRRL Report LR1132 for bituminous roads and BS7533 for block paving. CBR testing is only relevant in natural soils and cannot be used for pavement design in fill materials. By their nature fills are random and highly variable in density and CBR testing in them only assesses the quality of the material at the locus of the test. Therefore, for pavement construction on fill materials, unless the fill material is equivalent to or better than the specified capping material, a full capping layer is required.

### Capping Layer

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

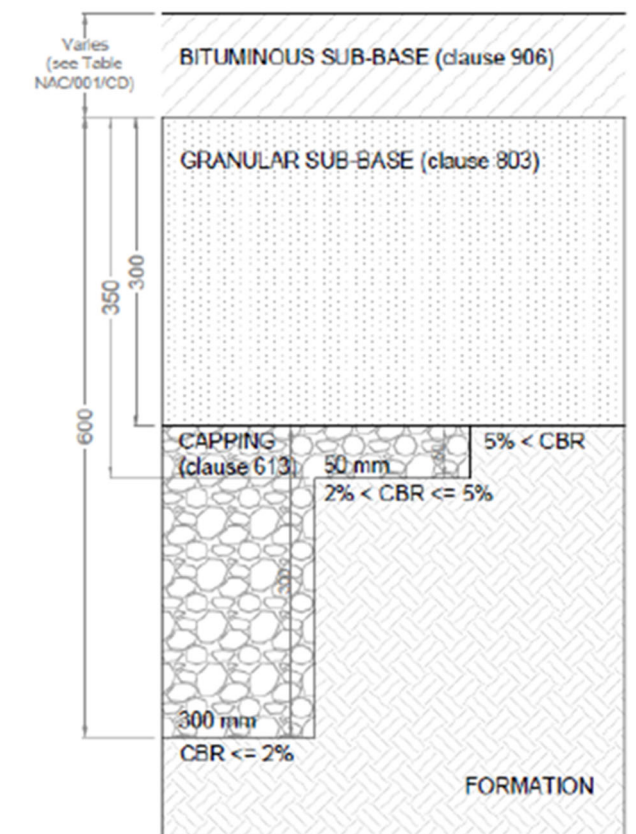


Figure 3 – Capping Layer Requirements (Subject to Frost Susceptibility)

## Pavement Construction Table

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

Table 1 – Pavement Construction Mainland and Cumbrae

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

Table 2 – Pavement Construction in Arran

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

## 1.5 Materials

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

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

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

### Adopted Materials

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

## Adoption of other Materials

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

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

## Carriageway Materials

### Blacktop

This falls into three main types:

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

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

### Block Paving

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

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

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



Figure 4 – Concrete Block Paving

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

## Alternatives

Other options exist such as:

- Natural stone setts

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

## Unsuitable Materials

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

## Footways and Other Paved Areas

### Blacktop

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

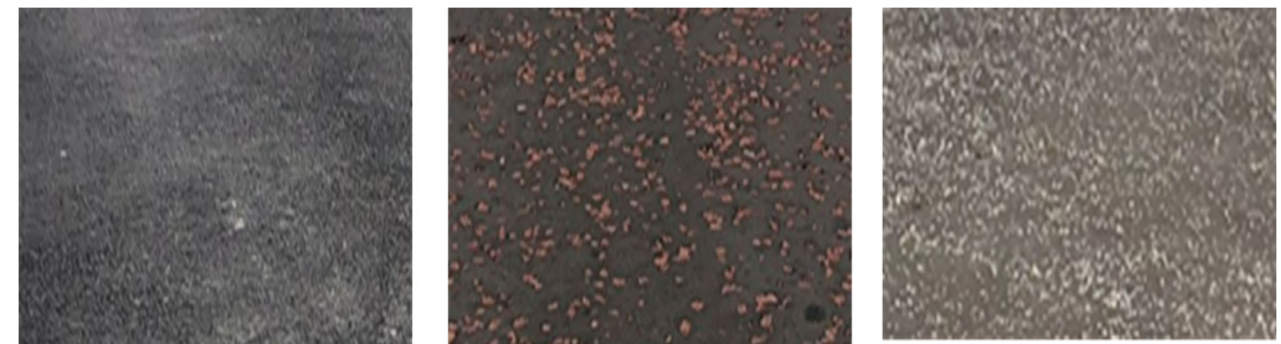


Figure 5 – Asphalt with Decorative Aggregates

## Concrete Flags

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

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

## Natural Stone Flags/Setts

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



Figure 6 – Natural flags – Designing Streets

## Tactile Paving

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

## Unsuitable Materials

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

## Kerbs, Channel Blocks and Edgings

### Concrete

- Standard precast kerbs (grey, pressed)

### Natural

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

## Parking Bays

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

## 1.6 Cycle Paths

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

## 1.7 Footway and Service Strip Crossing

### Vehicular

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

### Pedestrian

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

## 1.8 Street Nameplates

### Wall Mounted Street Nameplate

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

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

### Free Standing Street Nameplates with Poles

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

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

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

## 1.9 Signing and Road Marking

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

### Signpost Specification.

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

- Posts shall be manufactured using structural hollow sections to BS4848 part 2.
- Posts shall be galvanised and have a self-coloured grey P.V.C. or E.V.A. plastic coating of thickness not less than 0.3mm applied externally, over the full length of the post, using the

fluidised bed process.

- In the case of large base posts, the post shall be welded to the top of the base housing by continuous weld round the entire circumference of the post and by welding the bottom of the post to an internally fitted reinforcing ring.
- All posts shall have a coating of bituminous paint complying with BS 3416 applied internally over the full length of the post.
- In the case of large base posts an 18mm conduit hole shall be provided 75mm from the top of the post as indicated in the enclosed drawing. A base plate (as specified in BS 873 part 7) shall also be provided.
- To prevent the ingress of water all open-ended posts shall be provided with post caps conforming to BS 873-part 7 section 5.4.
- Manufacturers shall state clearly the plastic material to be used to coat the posts.