



North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

North Ayrshire Supplementary Street Design Guide

Appendix H – SuDS and Drainage

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 Design 2**
 - Footpaths 3
 - Access Strips 3
- 1.3 Approvals 4**
 - Approvals/Certificates 4
- 1.4 Responsibility Schedule..... 4**
- 1.5 Drainage Assessments 4**
 - 1:200 Flood Event..... 5
 - Land Drainage Strategy 5
- 1.6 SuDS Management Plan 5**
- 1.7 Gullies and Chambers 5**
 - Chambers and Gully Specification 5
 - Location 5
 - Gully Spacing 6
- 1.8 Maintenance and Adoption 6**
 - On-going Maintenance..... 6
 - Planning Approvals Process 6

Tables

- Table 1 – Gully Spacing..... 6

Figures

- Figure 1 – SuDS Ownership..... 2
- Figure 2 – Filter Trench for Rainwater Management..... 3
- Figure 3 – Swale adjacent to street..... 4
- Figure 4 – Responsibility Plan Extract..... 4
- Figure 5 – Drainage Development Planning Flowchart 7

1.1 Introduction

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

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

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

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

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

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

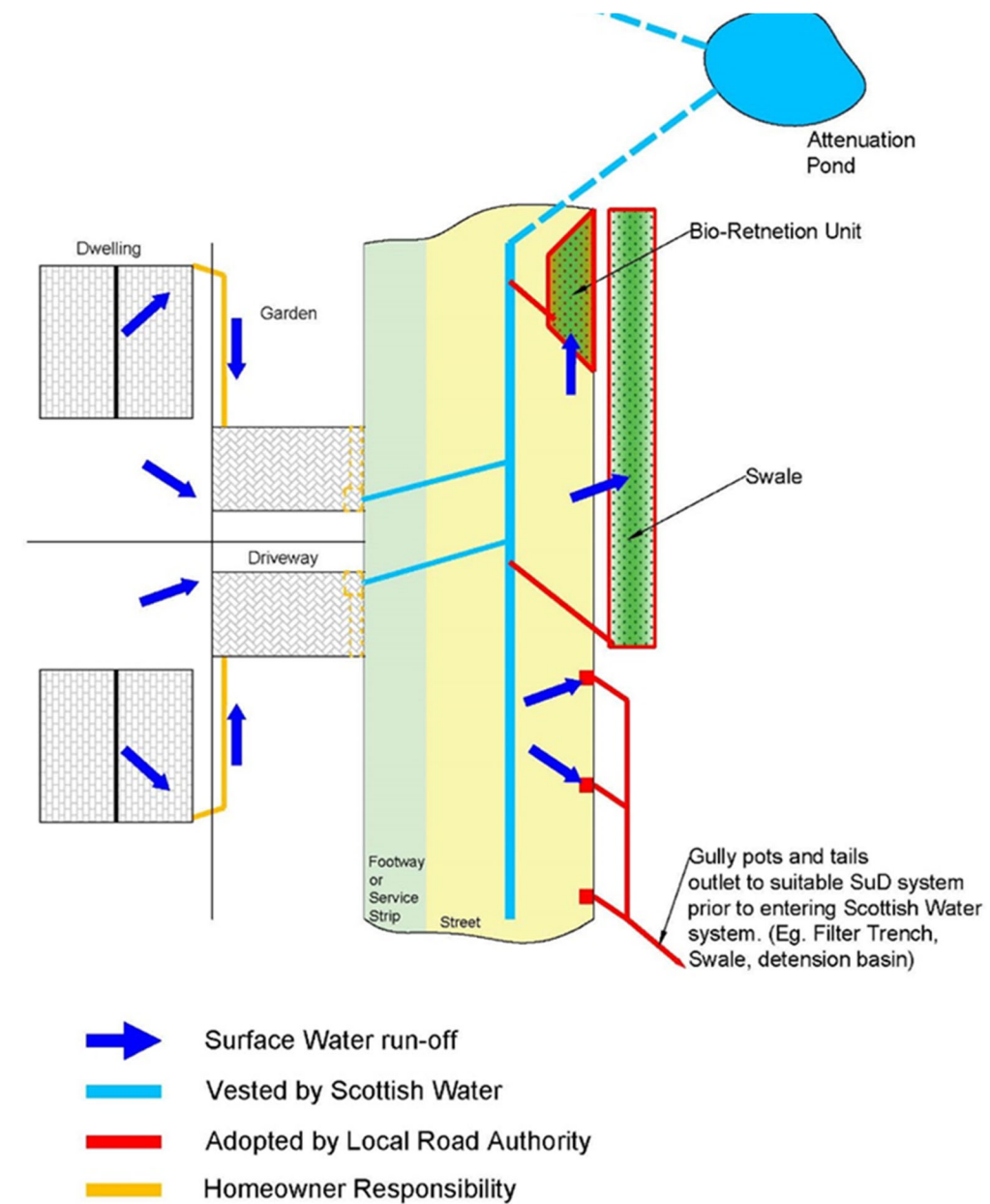


Figure 1 – SuDS Ownership

1.2 Design

Streets should be designed to include Sustainable Drainage Systems (SuDS) which are promoted by the Government as the preferred solution for managing surface water and minimizing environmental impacts. They should be applied wherever practical and technically feasible. Sustainable drainage solutions adoptable by both local authorities and Scottish Water are set out in The SuDS Manual (CIRIA 2007). Not implementing SuDS could breach Controlled Activities Regulations. In limited circumstances where the discharge location is to

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

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

- PAN 61: Planning and Sustainable Urban Drainage.
- Scottish Planning Policy NPF4.
- The Water Environment and Water Services (Scotland) Act 2003 (WEWS Act 2003).
- SuDS for Roads (Working Party SUDS 2009).
- The SuDS Manual (CIRIA 2007).
- North Ayrshire Drainage Policy/ Advice Notes.

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

Proposals will be expected to make appropriate allowance for both urban creep and climate change. There is an expectation that drainage proposals will also take account of climate change allowances. Climate change will have ramifications for 'additional' attenuation storage (i.e., over and above that required by Scottish Water, flood flow-paths, the design of access/egress routes and freeboard allowances / finished floor levels).

SuDS can be designed for:

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

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

- Filter strips.
- Filter drains.
- Swales.
- Bioretention Systems.

- Trees.
- Porous Paving.
- Detention Basins.
- Ponds and Wetlands.



Figure 2 – Filter Trench for Rainwater Management

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

Footpaths

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

Access Strips

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



Figure 3 – Swale adjacent to street

1.3 Approvals

Approvals/Certificates

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

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

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

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







1.4 Responsibility Schedule

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

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

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

LEGEND

- SURFACE WATER DRAINAGE INFRASTRUCTURE UNDER SCOTTISH WATER MAINTENANCE, DENOTED THUS: 
- FOUL WATER DRAINAGE INFRASTRUCTURE UNDER SCOTTISH WATER MAINTENANCE, DENOTED THUS: 
- FOUL & SURFACE WATER DISCONNECT CHAMBERS CONNECTION TO SEWER UNDER SCOTTISH WATER MAINTENANCE, DENOTED THUS: 
- FOUL & SURFACE WATER DISCONNECT CHAMBERS PRIVATE DRAINAGE INFRASTRUCTURE DENOTED THUS: 
- DRAINAGE INFRASTRUCTURE UNDER NORTH AYRSHIRE COUNCIL MAINTENANCE DENOTED THUS: 
- SUDS BASIN INFRASTRUCTURE UNDER NORTH AYRSHIRE COUNCIL MAINTENANCE DENOTED THUS: 

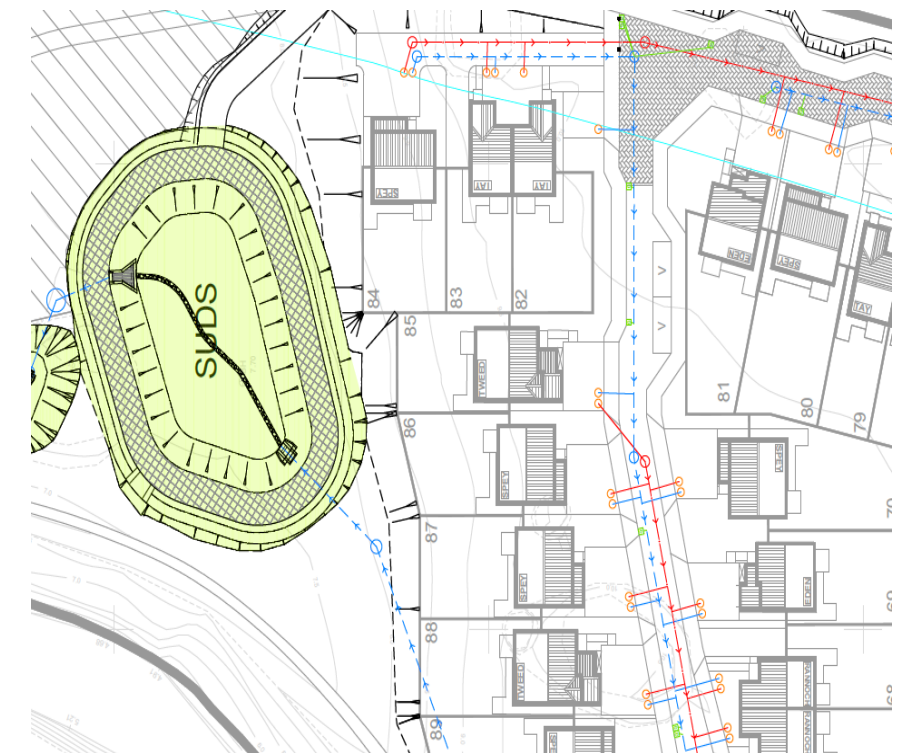


Figure 4 – Responsibility Plan Extract

1.5 Drainage Assessments

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

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

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

1:200 Flood Event

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

Land Drainage Strategy

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

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

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

1.6 SuDS Management Plan

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

- SuDS overview
- “Management Statement” to describe the SuDS scheme and set out the management aims and responsibilities for the site.
- “Maintenance Schedule” describing what work is to be done and when it is to be done

using frequency and performance requirements as appropriate, including:

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

1.7 Gullies and Chambers

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

Chambers and Gully Specification

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

Location

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

Gully Spacing

Table 1 – Gully Spacing

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

1.8 Maintenance and Adoption

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

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

On-going Maintenance

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

See section 1.6 SuDs Management Plan.

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

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

Planning Approvals Process

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

Pre-application Discussion Stage (Non-Statutory):

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

Planning Application in Principle Stage:

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

Full Planning Application Stage

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

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

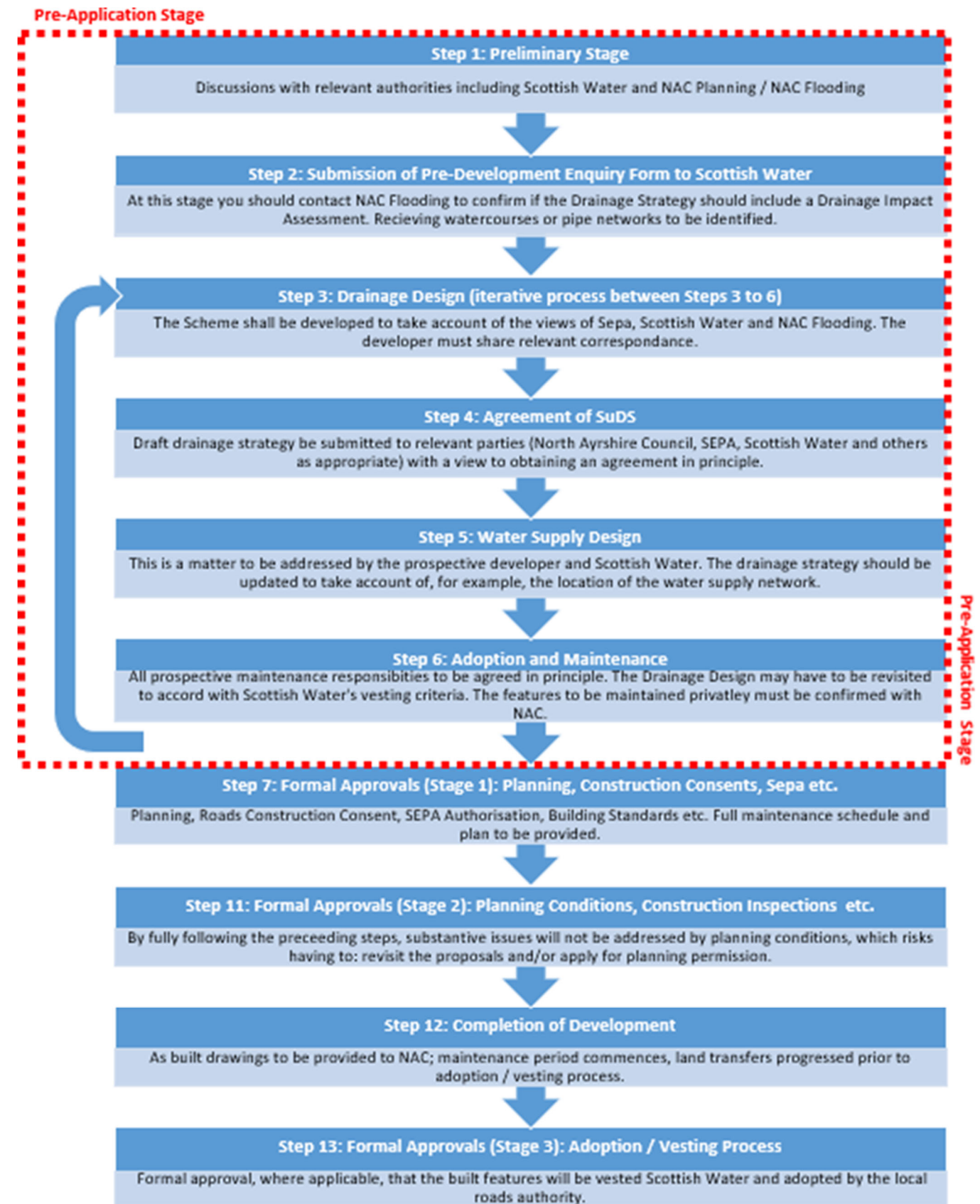


Figure 5 – Drainage Development Planning Flowchart