Appendix 9

Supplementary Guidance
Water & Drainage

Shetland
Local Development Plan 2012

LOCAL DEVELOPMENT PLAN

Shetland Islands Council

CONTENTS

1 INTRODUCTION

The Shetland Local Development Plan (the Plan), together with any Supplementary Guidance, sets out the policies and criteria against which planning applications submitted in Shetland will be considered.

This Supplementary Guidance sets out detailed policy advice to help you meet the requirements of the Plan. It is therefore recommended that it is read in conjunction with the policies in the Plan and any other Supplementary Guidance relevant to the type of development proposed.

The purpose of this Supplementary Guidance (SG) is to set out policies and further guidance for water and drainage issues related to proposed developments.

This SG provides advice on the assessment of flood risk from all sources on all sizes of development sites.

It also sets out a proportionate approach to the level of detail to be provided on surface and foul water drainage and the requirement for larger scale developments to submit a Drainage Impact Assessment.

1.1 Planning and Advice - Scottish Planning Policy

The following national policies are relevant to this SG Topic:

Scottish Planning Policy
Planning etc. (Scotland) Act 2006
Town and Country Planning (Scotland) Act 1997
Flood Risk Management (Scotland) Act 2009

This Supplementary Guidance accompanies the following Shetland Local Development Plan Policies **NH 6, WD1, WD 2, WD 3** listed below which seek to avoid new built development in areas at risk of flooding, and to protect areas across Shetland for natural flood management.

Policy NH 6 Water Environment
Development will only be permitted where appropriate measures are taken to protect the marine and freshwater environments to an extent that is relevant and proportionate to the scale of development.

Development adjacent to a watercourse or water body must be accompanied by sufficient information to enable a full assessment of the likely effects.

Where there is potential for the development to have an adverse impact the applicant/developer must demonstrate that

- There will be no deterioration in the ecological status of the watercourse or water body;

- It does not encroach on any existing buffer strips and that access to these buffer strips has been maintained; and
- Both during the construction phase and after completion it would not significantly affect:
    - Water quality flows in adjacent watercourses or areas downstream
    - Natural flow patterns and sediment transport processes in all water bodies or watercourses.

Justification
The Council has a duty to protect and, where possible improve, Shetland's water environment in its role as a responsible authority under the Water Framework Directive.

It is a key objective of the Scottish River Basin Management Plan and the Shetland Area Management Plan that water bodies and watercourses achieve good ecological status and that there is no deterioration in the current ecological status.

The water environment includes burns, rivers, ponds, lochs, wetlands, standing, tidal or coastal waters as well as ground water. A water body is generally defined as still water e.g. lochs and ponds and a watercourse as moving water e.g. burns and rivers.

The creation and maintenance of buffer strips can help reduce flooding in the surrounding landscape, allow for the maintenance of watercourses, reduce pollution from nearby developments and allow for a wildlife corridor to be maintained or established.

WD1 Flooding Avoidance
Proposals to build below the 5 metre contour (5 metres above Ordnance Datum, Newlyn) or in other areas shown to be at risk of flooding or coastal erosion, will not be permitted unless a suitable Flood risk assessment is provided that demonstrates the following:

- The development does not create a flood risk to existing or proposed properties and/ or surrounding land.
- Appropriate acceptable mitigation measures can be undertaken to ensure no significant adverse impact on the natural and built environment as well as cultural heritage.

If there is any doubt the precautionary principle will apply.

Further policy and guidance on undertaking a Flood Risk Assessment can be found in Supplementary Guidance Flooding and Drainage.

Justification

It is widely accepted that sea levels are on the rise and that storms will become more frequent and more severe. Around Shetland a relative sea level rise between 0.4 and 0.6 metres is predicted by the end of the 21st century which may result in serious consequences for established coastal settlements.

The Council will not approve new development at low ground levels near to the coast where there is a significant risk of future inundation or erosion.

The Planning Service has continued to administer the analysis of the reported incidents of flooding which illustrates that the most common source of flooding was historically inundation by the sea. Analysis of the reported incidents illustrates that coastal inundation is still an issue but increasingly incidents are the result of heavy rainfall.

Coastal flooding events occur when an unusually high tide affects low lying property and the worst effects result when the high tide coincides with a severe weather incident. Again, climate change predictions state that such events will occur more often and become more severe.

Analysis of available data including 1 in 200 year coastal flood levels, SEPA flood maps, UK climate projections and historical storm surge levels have led to the use of the 5m contour for the purpose of determining when a flood risk assessment should be required.

A study undertaken in 2009, which predicts the scenario for Shetland in the future, forms important background research on which Development Plan policies relating to flooding and climate change are based. Practical application of these findings vindicates the requirement for the submission of a Flood Risk Assessment (including an additional allowance for climate change), in support of any planning application for proposed development, or in areas shown to be at risk from flooding.

The results of the Flood Risk Assessment will be used to determine whether the development is acceptable on flood risk grounds.

Policy WD 2 Waste Water

New developments which require waste water disposal and are located within or adjacent to settlements are expected to connect to the public sewer .

Where a connection to the public sewer is not achievable and a wastewater system such as a private septic tank is proposed the developer should demonstrate that:

- There should be no detrimental effect, including cumulative effect, on the surrounding uses, natural, built environment and cultural heritage.

Further policy guidance can be found in Supplementary Guidance Flooding and Drainage

Justification

The water environment has a finite capacity to receive pollutants. The provision of sustainable drainage infrastructure is essential in protecting, maintaining and improving the water environment. This policy seeks to protect watercourses and water bodies by limiting the potential adverse impacts of foul drainage.

Policy WD 3 SuDS

All development proposals that will give rise to surface water run-off should incorporate Sustainable Drainage Systems (SuDS). Further policy and guidance on the design and implementation of SuDS can be found in Supplementary Guidance Flooding and Drainage.

Justification

The aim of SuDS is to attenuate the flow of surface water off the development site as well as provide treatment to minimise the pollutants reaching existing waterbodies, thereby protecting, maintaining or enhancing the water environment.

SuDS are a sequence of water management practices and facilities designed to drain surface water in a manner that will provide a more sustainable approach to surface water management than the conventional practice of routing run-off through a pipe to a watercourse.

For drainage issues associated with public roads and roads drainage issues please refer to Shetland Islands Councils Roads Access Design Guide.

2 SITE SELECTION AND DESIGN

In relation to flooding and drainage a number of factors must be considered prior to submission of a Planning Application, including

• is the development site at risk of flooding from any source ?
• would development of the site lead to increased flood risk elsewhere?
• would safe access and egress to and from the development be possible during flood events?
• can the development be design to avoid impacts direct on the water environment?
is the development likely to prevent safe access to and maintenance of bodies of water and/or flood defence measures?
• is the development design employing SuDS?
• how is natural water emanating from the site being dealt with and managed, for example surface or ground water that will not be part of the storm water treatment?
• how is extraneous water (uphill surface or ground water) being dealt with?
• what is to be done during construction phases to control water contamination and limit flow rates?

3 FLOODING AVOIDANCE

3.1 Types of Flooding

There are a number of potential sources of flooding within Shetland which include the following primary sources.

River (fluvial) flooding - this occurs when the water draining from the surrounding land exceeds the capacity of the watercourse, burn or river.

Coastal flooding – a combination of high tides and stormy conditions can result in overtopping. If low atmospheric pressure coincides with a high tide, a tidal surge may cause serious flooding.

Surface water (pluvial) flooding – is caused when rainfall water (or snowmelt) ponds or flows over the ground before it enters a watercourse, drainage system or public sewer, or when it cannot enter the drainage system because the system is already full to capacity.

Sewer flooding - this occurs when combined sewers are overwhelmed by heavy rainfall.

Sewer flooding is often closely linked to surface water flooding, and may contain untreated foul water.

Groundwater flooding - this occurs when water levels below the surface of the ground and in direct contact with the ground or subsoil rise above surface levels.

Reservoir flooding and flooding from other infrastructure – Although unlikely, failure of infrastructure such as dams, could result in a large volume of water being released very quickly. SEPA are responsible under the Reservoirs (Scotland) Act 2011 to monitor, inspect and maintain accordingly. The actual monitoring and inspections will be conducted by qualified engineers employed by the reservoir manager.

3.2 Flood Hazard and Risk: Roles & Responsibilities

The Flood Risk Management (Scotland) Act 2009 aims to reduce the adverse consequences of flooding on communities, the environment, cultural heritage and economic activity.
We are all responsible for protecting ourselves and our property from flooding. This means taking action to ensure we do all we can to help minimise flood damage to our land or property.
Public bodies will do what they can to reduce the overall impacts of floods and ensure that, where possible, the risks are minimised.
Responsibilities for implementing the new approach to flood risk management are shared by

Local Authority
Shetland Islands Council plays a central role in managing flood risk within Shetland with a view to reducing overall flood risk.
The 2009 act sets out responsibilities for a number of departments within the Local Authority

Planning Authority - As Planning Authority the Council will steer development away from areas of known flood risk and ensure that any development which is (exceptionally)

necessary in flood-prone areas is carried out responsibly and with least adverse external effects. Planning policy supports SuDS on all development sites.

Building Standards Authority - As Building Standards Authority, the Council is responsible for enforcing technical construction standards designed to minimise harmful effects upon buildings and their users caused by ground water and floodwater, and for approving site drainage installations.

Roads Authority - As Roads Authority the Council deals with flooding on public roads, and maintains public bridges and culverts.

Emergency Planning liaises with the other emergency services in dealing with protection of people and property during and in the aftermath of flood events.

Public and communities
Individual members of the public are the first line of defence against flooding and are responsible for protecting themselves, their family, property and business.

Developers
Applicants for planning permission and developers should ascertain whether there is a likelihood of flooding, assess the risk in consultation with the appropriate bodies, and design accordingly; they must adopt sustainable drainage principles for site drainage.

Scottish Water
Scottish Water will be responsible for assessing the risk of flooding from surface water and combined (surface water and foul) sewers. Once risks are identified, Scottish Water, working with local authorities and SEPA, will look for opportunities to reduce those risks.

SEPA
SEPA's role is the delivery of information and co-ordination of flood risk management in Scotland. SEPA also provide a flood forecasting and warning service.

Scottish Government
Scottish Ministers are responsible for setting the policy framework for Flood Risk Management and Flood Warning, setting Scottish Planning Policy and providing resources to enable authorities to address flood risk

3.3 Identification of areas at risk from flooding

The following sources of information may be applicable

- SEPA’s Indicative River and Coastal Flood Map (Scotland) - shows indicative fluvial and coastal flood risk areas.
  http://www.sepa.org.uk/flooding/flood_extent_maps.aspx

- Current Shetland Island Council Planning Policy considers that Proposals to build below the 5m contour (5 meters above Ordnance Datum, Newlyn) may be at risk of coastal flooding.

- Investigation of historical flooding events.

- Shetland Islands Councils Strategic Flood Risk Assessment

3.4 Development in areas at risk of flooding

Avoidance is the most sustainable form of mitigation in areas at risk of flooding.

If a development proposal is submitted within an area thought to be at risk of flooding then a detailed flood risk assessment (FRA) is required in order to establish the extent of the functional floodplain, to inform which areas need to be avoided, which areas can be developed and the type of development that would be appropriate.

Development in areas at risk of flooding will not be permitted unless

- a location is essential for operational reasons, such as for navigation and water based recreation uses, agriculture, transport or some utilities infrastructure, and
- an alternative lower risk location is not achievable, and
- It does not create additional flood risk.

Some essential civil infrastructure however, such as hospitals, fire stations and schools would need additional consideration in terms of flood risk.

4 SURFACE WATER DRAINAGE

When your site was undeveloped, rain fell there and was disposed of by natural processes. After construction starts these natural processes will be adversely affected. You need to address the issue of surface water within your site.

As part of your Planning Submission you must provide a description of how the site will be drained and where the water will go when it leaves the site.

These plans for the site drainage should identify where the system could fail, and in the event of a failure, how the risk of flooding property (buildings, roads or non agricultural ground) will be prevented. This may be by rainwater harvesting, additional drainage features, or landscaping works designed to steer any floodwater flows away from the property at risk.

There are also requirements to control the speed and quality of water running off the site through the use of Sustainable Drainage System (SuDS) devices, and good site planning will fit those in more easily.

Further details are available from the CIRIA publication The SuDS Manual (C697)

In general applications for one or two houses will need to address the issues below (4.1 to 4.7) at the in principle stage, with larger proposals, or developments in areas with particular problems requiring a formal Drainage Impact Assessment (Section 7).

Drainage design can be a complex process so it is important that all drainage matters are considered at an early stage in the design process. As a result the surface water drainage proposals should be submitted with the first planning application, whether in principle or full, for any development which requires foul or surface water to be drained.

4.1 Providing suitable treatment and attenuation

Water will drain quicker from your roofs and roads than it did from the undeveloped grass site and SuDS are a way of evening out the flows, back to the natural level. Water draining across the hard areas may pick up pollution that needs to be removed and SuDS is also a method of achieving this.

From an attenuation perspective the SuDS on your site should be designed to take at least 10 year return period rainfall events and have enough attenuation volume for the extra peak run off flows that will come from the new areas of hard surfaces – roofs, decks, pavements, access roads and turning areas.

Small housing developments will typically need a total of 1.5m^3 of water attenuation storage per house. These requirements will usually also provide adequate water treatment for small scale development however larger developments and industrial developments will require more detailed calculations and design.

Sites vary in their suitability for particular types of SuDS drainage, according to soil permeability, gradients, the potential presence of contamination, etc.
The size of the site and the scale of the development may also constrain the options, but beneficial devices can be designed to work in almost all circumstances if they are considered as part of the overall design process.

Some SuDS devices which could be used include:

Soakaways

Soakaways drain water directly into the ground; they can be used at source or, as is more commonly used in domestic developments the water is conveyed to the soakaway by means of a pipe. Soakaways are completely below ground level and can be easily integrated into landscaped areas, such as gardens.

Infiltration devices (soakaways, filter drains) should not be built within 5m of a building, under a road or on a soil which might dissolve or be washed away. The use of suitable membranes can extend the life of the device as it acts as a filter screening out the debris.

Attenuation volumes and storage tanks

Drains connect to an attenuation volume which can store a certain volume of water and discharge it more slowly through a throttled outfall. The storage volume can take the form of a solid pit or tank or of voids in a permeable material such as clean rock fill or gravel. It should be noted that these types of systems do not provide SuDS treatment.

Permeable Surface on hard surfaced areas e.g. car parks, paths, patios etc.

Permeable surfaces slow the flow of water by infiltration, water simply filters through the surface layer into a permeable sub-base which both slows the flow of water and filters out some of the pollutants.

Swale

A swale is a wide, shallow, grassed ditch with a gentle fall that filters slow flowing water and can retain a volume of water in high rainfall conditions which will then drain away more slowly.

Filter Strips

These are vegetated strips of land designed to accept surface water run off as sheet flows from upstream developments. They lie between a hard surfaced area and a receiving drainage feature and treat run off by vegetative filtering, promotion of settlement of particulates and infiltration.

Filter Drains

These are constructed to have a large area of permeable material below ground level which temporarily stores the water. Surface-water flows to this storage area via a permeable surface. The permeable surface base traps sediment and can provide some treatment for pollutants such as oil.

Ponds

Ponds which act as a holding device or reservoir for surface water, slowing down the flow before it continues offsite to an existing watercourse.

Wetland Areas

This is an area comprising shallow ponds and marshland where water constantly flows through, aquatic vegetation in this area treats and retains the water and so slow down the rate of flow into the existing watercourse.

4.2 Water Quality

Water from roofs and from roads and turning areas for 1 to 2 houses draining through some form of SuDS will not normally need extra treatment to remove pollution.

Roads shared between more houses and industrial developments may need some additional filtering and there are various SuDS devices which are suitable.

You are advised to contact SEPA at an early stage to find out if they think there are any water quality issues with your proposals.

4.3 Drainage check for extreme rainfall events

In extreme rainfall events the volume of water running off the ground might be more than the ditches, culverts and SuDS features are able to carry.

You need to see if there would be any damage caused by those excess flows, and try to design your site to reduce the problems as much as possible.

You should write a description of how the site will be drained and where the water will go when it leaves the site.

The statement will tell us where the system could fail, and if a failure there might flood property (buildings, roads or non-agricultural ground). You will then need to say how you will design your site to stop that happening, such as carrying out extra drainage or landscaping works to steer any floodwater flows away from any property at risk.

4.4 Cut off drainage

Most houses have a ditch on their uphill side to stop water running onto the site. When this ditch is outside the site the responsibility for maintaining this ditch may not be agreed and/or clear, and in the long term that could mean that it leaves the house vulnerable to flooding.

Where areas of land drain towards your site, and a cut-off ditch or other drainage feature is in place outside the site to prevent this water reaching the site, you will need to consider the likely effects during an extreme rainfall event and include these in the drainage statement.

Again you should consider the risks of flooding to your own and other properties from a failure of this drainage and where there might be problems from flooding, try to achieve a site layout where levels, landscaping or on-site drainage prevents flood water from effecting buildings or other vulnerable areas.

Cut off ditches carrying only flows from undeveloped land generally do not require attenuation before discharging to watercourses or roads ditches, as long as they do not alter the existing drainage patterns, or concentrate flows more than they would previously have been. Attenuation may still be helpful in coming up with a design that does not create a flood risk.

4.5 Future Maintenance of Drainage

The planned site drainage might do all that’s needed when it’s new, but you also have to consider how the drainage system will perform over time. A vital aspect of any sustainable design is that it can be easily maintained over a long period.

While your site may be drained solely by ditches, drains and soakaways that are within the site itself there may also be drainage features out with your site curtilage. Where your site drainage relies on features out with your site curtilage you need to ensure that you have a suitable maintenance access agreement in place with the landowner

When considering and designing for water management on development sites, the possibility of erosion should be assessed and allowed for. Soil erosion will reduce the capacity of SuDS features. Cut and fill operations to create level plots for building, or the creation of mounds and embankments to support roads, footpaths, etc., or as new

landscape features can create artificially steep slopes that are potentially unstable when waterlogged and so prone to slumping and gully erosion.

4.6 Surface water connections to sewers

You may wish to connect to an existing public surface water sewer. Public sewers are controlled by Scottish Water, and you will require written permission from them, to confirm that your proposals are acceptable and that the sewer has sufficient capacity that the extra flows will not create a flood risk.

Surface water drains which carry only water from roads gullies and drains are controlled by the SIC as Roads Authority, and private connections are not usually allowed.

4.7 Roads drainage

Most developments will interact with existing roads drainage in some way.

The Roads Authority have their own design requirements for works affecting the existing roads drainage,
For drainage issues associated with public roads and roads drainage please refer to Shetland Islands Councils Roads Access Design Guide. More information is available from Shetland Islands Council Roads Service.

Site water may drain into roadside drainage, and this is generally only accepted by the Roads Authority if the site drainage is attenuated to 1 in 10 year levels at least. A further check is required to ensure that the affected roadside ditches and cross drains have sufficient capacity for the attenuated flows, and also that no flood risk is created during extreme rainfall events.

Surface water from cut off ditches is generally accepted into roadside drainage as long as it does not change the drainage pattern of the area. – see 4.4 for details

Where the proposed site is lower than the existing roads drainage, there may be a flood risk from heavy flows from existing drainage features or cross drains, or if the existing drainage features become blocked or are overtopped by flows. These risks should be addressed as part of the application - see 4.3 for details.

5 WATER ENVIRONMENT

5.1 Riparian Buffer Strips - Access and egress

Shetland Island Council will seek a buffer strip between the top of the bank of any body of water within an application site and any proposed new development. This strip should be kept free from any development, whether proposed as part of the application or in the future, in order to allow access to the watercourse for the purposes of watercourse assessment and maintenance, to aid water and ecological quality and to ensure bank stability. Riparian buffer strips may be secured by a planning condition.

For the avoidance of doubt a buffer strip is required on both banks of a watercourse and boundary fences/walls should only be erected outwith these riparian buffer strips. SEPAs

recommended minimum width of buffer strip is 6m however larger buffer strips may be required depending on the physical characteristics of the adjacent watercourse.

5.2 Culverted watercourses

The culverting and canalisation of watercourses should normally be avoided and existing culverted or canalised watercourses in redevelopment and land rehabilitation schemes should be restored where appropriate.

Flood risk associated with watercourses and culverts must be addressed in the Drainage impact assessment and/or the Flood Risk Assessment.

6 WASTE WATER DRAINAGE

6.1 Connection to public sewers

Where there is a public sewerage system, foul drainage from development within and close to the settlement envelope should be directed to that system.

Large scale developments in rural locations should also seek connection to the public sewer. It is SEPA's preference that single developments of greater than 25 houses and large scale business and industrial units in all locations should connect to the public sewer

Public sewers are controlled by Scottish Water. As part of the Planning Application process Development Management will consult with them to confirm that your proposals are acceptable and that the sewer has sufficient capacity and will inform you if this is not the case. If you are planning a large scale development it is advisable that you make contact with Scottish Water in the early stages of planning your development in order to confirm that a connection to Scottish Water is possible. In some instances Scottish Water might expect you to make developer pro-rata contributions in order to remove constraints to connection.

Building Standards require that every wastewater drainage system serving a building must be designed and constructed in such a way as to ensure the removal of wastewater from the building without threatening the health and safety of the people in and around the building.
For further guidance refer to the Building Standards Technical Handbooks or contact Shetland Islands Council Building Control.

In some locations there may be a suitable surface water sewer system which can accept surface water drainage from your site. If your drainage design connects to a surface water sewer then, as part of the approval of that design, you will require written confirmation from Scottish Water that your drainage proposals are acceptable to them, and that their system has the capacity to accept the flows from your proposal without creating a flood risk.
SuDS attenuation and/or water quality treatment may still be required as a part of your design and you will still be required to consider the flood risk within your site during extreme rainfall events.

6.2 Connection to private waste water systems

Wastewater treatment system such as septic tanks consists of 2 main components, a watertight underground tank into which raw sewage is fed and a system designed to discharge the wastewater safely to the environment without pollution.

Discharges from private wastewater systems require a CAR license from SEPA.

SEPA has indentified areas where a proliferation of private waste water arrangements is thought to be causing environmental problems and this information is available from their website. Additional consultation with SEPA will be required for all developments proposing private waste water arrangements in these areas to enable assessment of any significant potential environmental and health impacts.

Planning permission for any development involving the installation of a private wastewater treatment plant or septic tank will only normally be granted where the proposal complies with the Shetland Islands Council's Policy WD2.
Details of the location of the private wastewater treatment plant or septic tank and its associated filter and infiltration system should be submitted at the planning application stage and included within the red line of your development.

Building Standards require that every private wastewater treatment plant or septic tank serving a building must be designed and constructed in such a way that it will ensure the safe temporary storage and treatment of wastewater prior to discharge.
For further guidance refer to the Building Standards Technical Handbooks or contact Shetland Islands Council Building Control.

7 DRAINAGE IMPACT ASSESSMENT

All new development needs to be free from unacceptable flood risk for all flood events up to the 1 in 200 year return period (including a 20% allowance for increase in rainfall intensities from climate change).
The detail and technical complexity of a DIA will reflect the scale and potential significance of the proposed development.

A DIA must consider flood risks from all existing and proposed surface water drainage and demonstrate how the risks will be managed. The DIA will be required to certify that any flood risk associated with the development can be managed now and for the lifetime of the development, taking into account the potential effects of climate change. It should also demonstrate that the development will not increase the risk of flooding elsewhere.

It is important to note that flood mitigation measures would only be acceptable in some circumstances and that Shetland Islands Council will insist on the avoidance of flood risk as the first principle.

Your site layout plan should be to scale and show existing over-ground surface water flow and watercourse flow directions, provide location and sizing information for any existing culverts, bridges or other unusual drainage features and include clear size and flow information on all drainage proposed for the development, including cut off ditches and the existing ditches and water courses which site drainage will discharge into.

All developments are required to include SuDS devices capable of attenuation flows to pre-development levels for 10 year rainfall events. There are a range of standard SuDS devices which can be used, with suitable options for different types of site.

Larger scale developments and commercial and industrial sites will need additional SuDS treatment. Each of these different SuDS devises outlined in sections 4.1 and 4.2 above represents a level of SuDS treatment. One level of SuDS treatment is required for most housing developments but two or three different SuDS treatment levels are required for larger scale commercial and industrial sites. Further details, including design guidance, are available in the CIRIA publication The SuDS Manual (C697).

Larger developments, or proposals that include alternative types of drainage proposals will require calculations to show the proposed drainage is suitable, including pre- and post- development peak rainfall run off rates and attenuation volumes required for a 10 year rainfall event.

Calculations should be self-explanatory and include details of methods used, any assumptions made and also give sources for any external information or co-efficient used.

All hard areas will require attenuation of some kind, but it may be preferred to apply different solutions to different situations e.g. attenuation volume for piped drainage including roof water, and a filter strip along the edge of the access road.

Infiltration devices
Where it is proposed to use SuDS devices that act through infiltration the results of a subsoil porosity test and details of the subsoil classifications and level of the water table must be included.

Assessment of the drainage system under extreme rainfall events
The drainage system and the route of flow from it downstream should be examined to determine if there will be any damage caused by the excess flow, and to outline actions to be taken to reduce potential problems as much as possible.

Where watercourses draining the site are outwith the site itself, the issue of future maintenance and its possible effects on flows during extreme rainfall should be given particular attention.

In general drainage design which “fails safe” is preferred, so that flood risks can be avoided, rather than just reduced.
For example, a building may have a door at the back with the natural slope of the land falling towards it, which could present a flood risk if surface water flowed and accumulated there.
A cut off ditch to divert surface water flows on the site boundary and a gully or channel drain to intercept water gathering near the doorway would be usual and sensible drainage features to include, but there are risks or either or both failing, blocking or being overtopped during extreme rainfall events.
A “fail safe” design in that case would be to design the ground levels near the doorway so that water would not collect there, or to design ground landscaping works uphill of the building so that surface water flows would always run around and clear of the building and so prevent flooding of the building, even in the event of a failure of all or part of the drainage system.

Where calculations are required as a part of this assessment a 200 year return period rainfall event should be used.

Maintenance responsibilities
SuDS and other drainage features will require on-going maintenance to ensure they continue to operate correctly. The person(s) responsible for maintaining the drainage features should be stated, together with any formal agreement in place to guarantee them right of access where they are not the landowner.

8 Flood Risk Assessment (FRA)

Where the Planning Authority, in consultation with both our own flood specialists and SEPA considers that there might be a risk of flooding to a proposed development, or as a result of the development, it will request that a FRA is submitted in support of any planning application.

A FRA must consider all sources of flooding and demonstrate how flood mitigation methods will be managed. The FRA will be required to certify that any flood risk associated with the development can be managed now and for the lifetime of the development, taking into account the potential effects of climate change. It should also demonstrate that the development will not increase the risk of flooding elsewhere.

It is important to note that adoption of flood mitigation measures would only be suitable in some circumstances and that Shetland Islands Council will insist on the avoidance of flood risk as the first principle.

All new development needs to be free from unacceptable flood risk for all flood events up to the 1 in 200 year return period (including allowances for climate change, storm surge, freeboard, etc).
The detail and technical complexity of a FRA will reflect the scale and potential significance of the proposed development and the level of flood risk.

A FRA should provide the following information.

a) National Grid Reference

b) Site location plan at a scale of 1:2500 showing contours and a clearly distinguishable line demarcating the site in question. The plan must also highlight all watercourses within the catchment area or other bodies of water in the vicinity that may have an influence on the site;

c) Site layout plan showing ground level in relation to a specified Datum[1] both pre and post development;

d) Proposed finished floor level in relation to a specified Datum[1];

e) Provide details and specifications of any pre-existing flood alleviation measures, their state of maintenance and their performance;

f) If applicable, lowest level of access road in relation to a specified Datum[1] to ensure that safe dry access and egress can be provided [2];

g) If available, any anecdotal or photographic information on historic flood events;

h) Detailed topographical site plan showing ground levels over the area of the site in relation to a specified Datum[1] along with the positioning of all buildings within the site.

i) The estimated peak flood level (fluvial, coastal, or a combination of both whichever produces the worst case scenario) that reflects the 1 in 200 year return period event

j) The mapped extent of this event in relation to the sites, with the development layout superimposed;

k) Outline, if applicable, of the proposed works required to mitigate flood risk and also show that these works will have a neutral (or better) effect on the probability of flooding elsewhere, including existing properties;

Further information is available within SEPA's Technical Flood Risk Guidance, available from http://www.sepa.org.uk/planning/flood_risk.aspx

Reference Notes:

[1] It is acceptable to provide levels referenced to – Ordinance Datum (Local Lerwick), Chart Datum or Ordinance Datum (Newlyn).
The type of Datum used must be marked clearly on every drawing submitted.

[2] Developers and Planning Authorities have to take into account the effects of a flood on access, including by Emergency Services.
Please note that a pedestrian route is currently acceptable.

The following additional factors should be taken into consideration whilst producing a FRA. The requirements are outlined in detail within Shetland Islands Council Strategic Flood Risk Assessment.

- Projected sea level rise from Climate Change Impacts
- Storm Surges
- Freeboard
- Wave action

9 LICENSING

9.1 Works License

Sea outfalls will also require a Works Licence under the Zetland County Council Act 1974. Any queries regarding Works Licences or requests for application forms should be directed to Shetland Islands Council Marine Planning, Development Services.

9.2 Marine License

Under the Marine (Scotland) Act 2010 the Scottish Government is responsible for the new marine licensing system for activities carried out in the Scottish inshore region of UK waters from 0-12 nautical miles (nm).

A licence is required for any sea outfall and enquiries should be directed to Scottish Executive Marine Laboratory, Aberdeen.

9.3 Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR)

Realignment, culverting and other works within a watercourse channel will generally require a SEPA license to be in place before works commence.
These requirements are covered under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR).

To register or license a new septic tank or sewage discharge for any scale of development you are advised to refer to the CAR section on SEPA's website.

For further details on best practice, general binding rules and licensing requirements refer to SEPA's website http://www.sepa.org.uk

10 CERTIFICATION AND CHECKLISTS

10.1 Building Standards

The results of a ground assessment, trial hole and percolation test are required to be submitted with applications for building warrants where it is proposed to drain the foul drainage from the development to a septic tank and infiltration system.
In order to ensure that your proposal complies with building warrant requirements you should contact the Building Control Service.

Building Control Service can be contacted at the Infrastructure Services Department, Grantfield, Lerwick, ZE1 0NT (Tel: 01595 744800).

10.2 Adoption of SuDS

Some SuDS features, draining adopted roads,
are potentially adoptable by the Roads Authority and other SuDS features are potentially adoptable by Scottish Water.
Design requirements for adoption are site specific and may exceed the basic planning requirements outlined in this document. Advice should be sought from the relevant authority at an early stage.

10.3 Adoption of Foul Drainage

Some foul drainage systems are potentially adoptable by Scottish Water.
Design requirements for adoption are site specific and advice should be sought at an early stage.

11 Contacts

Shetland Island Council

Development Planning & Heritage
Development Services
Grantfield
Lerwick
Shetland

Tel: 01595 744800
Email: development.plans@shetland.gov.uk

Roads Service
Gremista
LERWICK
ZE1 0PX

Tel: 01595 744866
Email: roads@sic.shetland.gov.uk

Building Standards
Development Services
Grantfield
Lerwick
ZE1 0NT

Tel: 01595 744800
Email: building.standards@shetland.gov.uk

Marine Planning
Development Services
Grantfield
Lerwick
Shetland
ZE1 0NT

Tel: 01595 744800
Email: marine.planning@shetland.gov.uk

Emergency Planning and Resilience Service
Governance and Law
20 Commercial Road
Lerwick
Shetland
ZE1 0LX

Tel: 01595 744740
Email: emergency.planning@shetland.gov.uk

SEPA

Regulatory advice

Lerwick Office
The Esplanade
Lerwick
Shetland
ZE1 0LL

Tel: 01595 696926

Pre-application planning advice

Planning Service
Graesser House
Fodderty Way
Dingwall
IV15 9XB

Tel: 01349 862021
Email: planning.dingwall@sepa.org.uk

Scottish Water
Duncan House
Sandy Loch
Upper Sound
Lerwick
Shetland
ZE1 0SU

Tel: 0845 6018855
Email: customer.service@scottishwater.co.uk

Scottish Government
Marine Scotland
Licensing Operations Team
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

Tel: 01224 295579