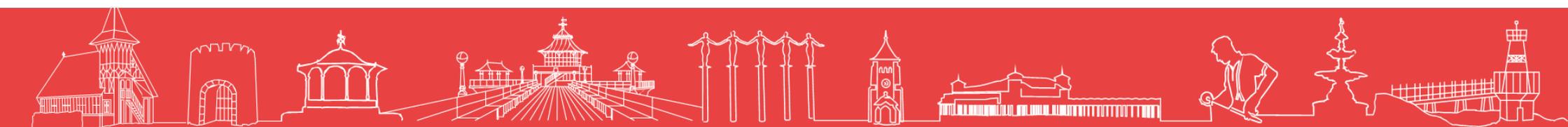
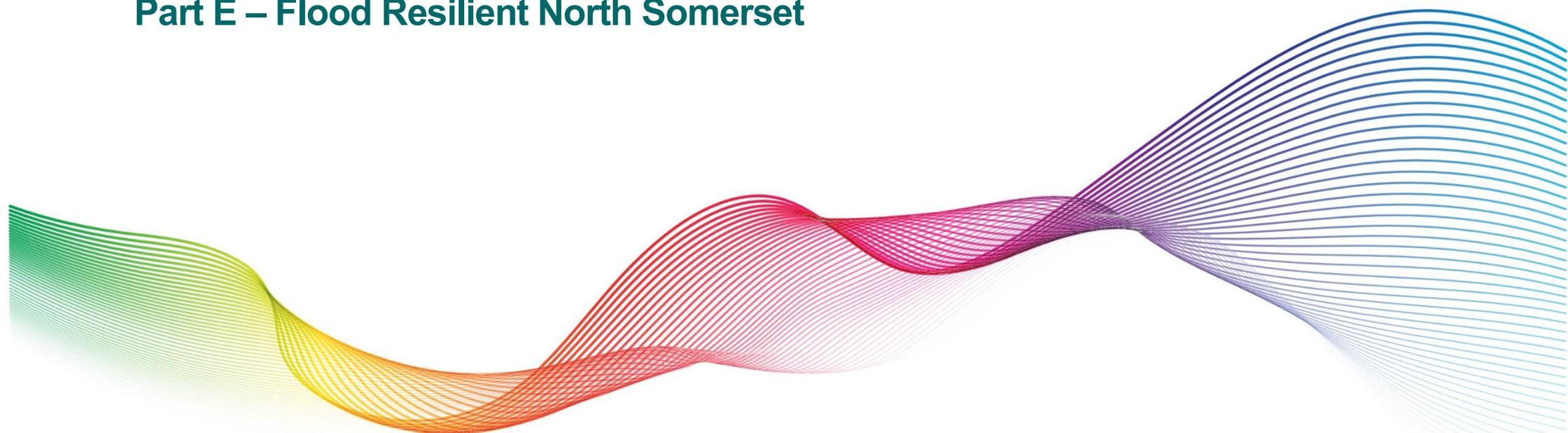


Local Flood Risk Management Strategy for North Somerset

Part E – Flood Resilient North Somerset



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1.0 Introduction

In the future, it may not be possible to fully protect everywhere in North Somerset from flooding.

Climate change will mean more extreme weather and storms, often resulting in more flooding. Sea levels will continue to rise, and the risk of waves overtopping flood defence will increase. In some places, extreme rainfall will overwhelm the drains, sewers and river flood defences that were built before the impacts of climate change were fully understood. It may be that some places will be at greater risk of flooding as the defences needed are too expensive, or for many reasons, it is not physically possible to build something to provide the protection needed.

But we can improve the resilience of communities, businesses, properties and people so that flooding has less impact and they can recover more quickly.

2.0 What is flood resilience?

The Environment Agency's National Flood and Coastal Erosion Risk Management Strategy for England defines resilience as "the capacity of people and places to plan for, better protect, respond to, and recover from flooding and coastal change.". This includes making the best land use and development choices, protecting people and places where possible, responding to and recovering from flooding and coastal change whilst all the time adapting to climate change.

3.0 Know your flood risk

This document assumes you know your risk of flooding and have read [Part A - Introduction and Local Flood Risk Reduction Actions in North Somerset](#), which explains how to determine if you are at risk and what that risk means.

Flood risk maps can be found here: <https://www.gov.uk/check-long-term-flood-risk>

If you are at risk of river flooding or coastal flooding, you can get warnings sent to your phone or by email.

Sign-up for Flood Warnings here: <https://www.gov.uk/sign-up-for-flood-warnings>

It is essential to understand that you may be at risk of flooding and not be in a flood warning area. Flood warnings are only for flooding from the sea and larger rivers. There is no warning service for other types of flooding, such as surface water flooding.

4.0 Flood resilient actions

Flood resilience can be applied at different levels:



At a **district level**. This means the whole of North Somerset.



At a **community level**. This means a town, a village, a block of flats or a development.



At a **building level**. This means your home or business property.



And at an **individual level**. This is you and your family.

For this guide, a flood has been broken down into four stages, which are:

- **Readiness** for a flood
- **Reducing** the impact of the flood
- **Responding** to the flood
- **Recovering** from a flood

Flood resilience is action or intervention at one or more stages of a flood. Some of the actions or interventions that can be taken are:

5.0 How do we get ready for a flood?



At a **district level**

- North Somerset Council and the Environment Agency will provide information and communications about flood risk in an easy-to-understand way that aims to reach all community members.
- Flood Risk Management Authorities (Environment Agency, North Somerset Council, Wessex Water and North Somerset Level Internal Drainage Board) working with communities to help them understand their risk and what they need to do and when. The Local Flood Risk Management Strategy, its promotion, implementation and talking with communities is an example of how to achieve this.



At a **community level**

- Understanding your communities flood risk.
- Knowing where the areas of highest risk are and knowing where the safe places to go if your community is flooded.

- Helping those that are vulnerable or cannot help themselves to understand their risk and helping them to prepare for a flood.
- Forming a Flood Action Group, what this is and how it can help is explained in more detail below.



At a **building level**

- Understand how a flood would impact your building, what areas are likely to be damaged, are there precious items stored where a flood may damage them? Can this be changed?
- Creating a flood plan for your building, business or home and implementing those actions before a flood.
- Preparing your building, business or home for a flood as set out in your flood plan.
- Consider the use of property level protection described further in this document.



At an **individual level**

- Know your flood risk.
- Prepare your own personal flood plan. List all the actions you would do in the event of a flood and whom you would get help and information from. North Somerset Council has produced a flood plan template that it recommends you use; this can be found in the appendix of this document.
- Have an idea of where to stay if you had to move out.



Figure 1 - © Grab bag - Police Scotland Control Rooms

- Have a bag ready with essential items such as medications and insurance documents if you need to leave your home. This should include the following:
 - A copy of your emergency action plan
 - A list of emergency contact numbers (utilities, insurance company, Environment Agency etc.)
 - Copies of essential documents such as your insurance documents, driving licences, passports etc
 - Spare house and car keys
 - Torch/headlamp and spare batteries
 - Portable form-check and batteries
 - Whistle
 - Essential medication and repeat prescription forms
 - First aid kit
 - Antibacterial hand gel
 - Wash kit and essential toiletries
 - Glasses and or contact lenses
 - A change of clothes
 - Cash (nearby bank machines may not work)
 - Phone chargers/external battery charger

- Spare sets of clothes if you have space
- Non-perishable food and bottled water
- Babies/small children - food, nappies, toiletries and comforters
- Pet leads
- And if you have time:
 - Credit/debit cards
 - Pets - pet food and comforters
 - iPad/laptop and chargers
 - Children's games or toys
- Mentally prepare yourself for a flood because it can be physically challenging and upsetting; reach out to family and friends who can help support you through a potentially difficult time.

6.0 How do we reduce the impact of a flood?



At a **district level**

- Flood Risk Management Authorities increasing their understanding of risk across North Somerset and providing that information in an easily understandable way to those that need it.
- Authorities, businesses and homeowners adequately maintaining flood defences, drains and sewers.
- Slowing, redirecting, and storing water away from communities, businesses, and homes.



At a **community level**

- Ensuring community buildings or land used for the well-being or social interest of the local community are maintained and adapted to be safe and not damaged in a flood. This can include making buildings flood resilient (discussed in more detail below).
- Ensuring that watercourses are maintained if the community is responsible for maintaining them. [Part F – Small Watercourse Maintenance Good Practice Guidance](#) explains how to do this.
- Slowing and redirecting water safely through and storing water away from communities using natural flood management. What this is and how to do this is explained in [Part D – North Somerset Natural Flood Management](#).



At a **building level**

- Making a building flood resilient (discussed in more detail below).



At an **individual level**

- Being prepared and knowing what to do if you are flooded. Have a plan of what you would do.

7.0 How do we respond to a flood?



At a **district level**

- Flood Risk Management Authorities and local responders, such as the emergency services, understanding their roles and responsibilities when responding to flooding. Flooded properties will be prioritised over land and road flooding, with the safety

of people, especially those most vulnerable, having the highest priority.

- Flood Risk Management Authorities and local responders, such as the emergency services working together to provide help and support to those most need it.



At a **community level**

- Community leaders (such as local councillors and flood wardens) understanding their roles and actions during a flood.
- Being able to provide accurate information and support to those that need it.
- Checking on the vulnerable and those unable to help themselves when it is safe to do so.



At a **building level**

- Installing, maintaining, and using property protection products such as flood doors and automatically closing air bricks.



At an **individual level**

- Moving vehicles to higher ground if it's safe to do so.
- Moving family and pets to safety.
- Moving essential items upstairs or to a safe place in your property, starting with cherished items and valuables, then furniture and furnishings.
- Turning off gas, electricity, and water supplies if it's safe to do so; never touch an electrical switch if you're standing in water.
- Alerting neighbours and offering help if it's safe to do so.
- Making sure you have an emergency kit including a torch, spare batteries, mobile phone and charger, warm clothes, essential numbers like your home insurance, water, food, first aid kit and any medicines and baby care items you may need.
- You should not rely on sandbags as they do not always work and are difficult to dispose of. North Somerset Council does not provide sandbags in a flood. Other more reliable products are available.

8.0 How do we recover from a flood?



At a **district level**

- Risk Management Authorities preparing and following their flood recovery plans to evacuate and drain water from the district as soon as it is reasonably practicable.



At a **community level**

- Supporting the vulnerable and those not able to help themselves in getting the help they need.
- Recording flood levels, depths, durations, and flow routes so that the cause of flooding can be understood to see if anything can be done to reduce the risk of it happening again.



At a **building level**

- Taking photographs of everything that has been damaged.

- Recording flood levels, depths, durations, and flow routes so that the cause of flooding can be understood to see if anything can be done to reduce the risk of it happening again.
- Not turning on electricity until it has been checked and is safe to do so.



At an **individual level**

- Seeking help from friends, family, and neighbours.
- Looking after your health, both physically and mentally.

9.0 Flood resilient North Somerset

9.1 What are the risk management authorities doing in North Somerset?

- North Somerset Council, as the Lead Local Flood Authority, is progressing with a program of property level resilience on individual homes that have been impacted by flooding where there is unlikely to be a large scheme built in that location. Natural Flood Management is being investigated in areas that would benefit from slowing the flow in upstream catchments. A study looking at where larger schemes may be

suitable will also be started. Looking at coastal flooding, fixing old defences. North Somerset Council is also ensuring that new developments are built away from areas that flood and that new drainage systems are built large enough to cope with future climate change impacts.

- North Somerset Council, as the Highway Authority, is investigating the future increase in flood risk in its Highways Asset Management Policy and Strategy 2022-2025.
- Wessex Water in North Somerset has prepared a drainage and wastewater management plan (DWMP) which sets out how we aim to deliver resilient drainage and wastewater infrastructure for the next 25 years.
- North Somerset Levels Internal Drainage Board is engaging with the local flood risk management strategy and working closely with North Somerset Council as the lead Local Flood Authority on improving targeted maintenance in urban areas and increased telemetry coverage.

10.0 Flood resilient communities

10.1 How can communities help themselves to become flood resilient?

Flood Action Groups

A Flood Action Group is a voluntary group of residents who work on behalf of the wider community alongside agencies and Flood Risk Management Authorities, to try and better manage the impact of future flood events and to help each other in the event of a flood.

North Somerset Council can provide materials to Flood Action Groups to enable them to understand their flood risk.

It is up to each group to decide how often they meet and the group's own roles, responsibilities, aims and objectives.

The National Flood Forum can help communities set up a Flood Action Group <https://nationalfloodforum.org.uk/working-together/communities/what-is-a-flood-action-group/>

What can a flood action group do?

A Flood Action Group can have a variety of different roles; some examples include:

Raise awareness of flood risk within the community

By spreading awareness of flood risk in the community, residents and business owners can plan and reduce the damage and impact a potential flood could cause.

Monitor local conditions to the best of your ability, e.g. community volunteers keeping an eye out for blocked watercourses and weed screens.

Many things can affect the risk of flooding; however, on a small/local scale, there are things that both community group

volunteers and residents can be aware of to reduce the risk and help to clear and report:

- Watercourse and weedscreen blockages, is there something causing the water to back up? Are water levels unusually high upstream? Report any blockages to the appropriate Flood Risk Management Authorities. These can be found in [Part B – A Guide to Risk Management Authorities](#).
- Fly-tipping and garden waste in a watercourse, report this to North Somerset Council <https://www.n-somerset.gov.uk/my-services/parking-travel-roads/street-cleaning/fly-tipping>
- Develop and review a community flood plan

A community-led emergency flood response plan is written and controlled by the community. It provides a structured and coordinated response by a group of residents or volunteers who wish to better prepare and support their community before, during and after flood events. These community volunteers and responders will likely be the first people on-site when a flood event occurs or is expected to occur. They may be required to provide a first response until Environment Agency/local authority support is available or emergency services can attend and take the lead on operations.

Look out for vulnerable members of the community

Flood action groups can help identify and support those in the community who may need extra help or assistance before,

during and after a flood. This may help reduce the impact it has on them.

Prepare for and act during a flood event

During a flood, a flood action group could help locate and deploy property flood resilience measures, help relay information about the flood to community members, and provide a handover and any further assistance to emergency services if requested.

Identify key flooding issues within the community

Flood action groups can highlight key flooding issues, indicators or hotspots in the community and report these to the correct risk management authority (RMA). They can also report these on behalf of residents or advise them on whom to report their issues to.

Build relationships and lines of communication with key agencies

Flood action groups can invite Risk Management Authorities to their meetings and positively engage with them. North Somerset Council, the Environment Agency, Wessex Water and North Somerset Levels Internal Drainage Board can help develop a community resilience plan for the area. They may also be able to provide details of the wider local authority emergency planning measures.

Building relationships with authorities will help Flood Action Groups understand the role of different agencies and organisations in responding to emergency events, highlight

key contacts, identify how your community plan can be integrated, and 'tie in' with the neighbouring community emergency response plan currently in place.

Funding and support

It may be possible for a flood action group to access funding from local organisations to assist with community resilience. To access funding, the group would need to become a constituted group. A constitution is the 'governing document' of your group, which sets out how you intend to run it and shows funders that the group is organised if you are going to apply for grant funding.

Community Resilience North Somerset through Voluntary Action North Somerset may assist the flood action group in becoming constituted and provide access to resources and information about running successful community groups.

<https://communityresilience-ns.org.uk/>

<https://www.vansweb.org.uk/>

11.0 Flood resilient buildings

11.1 What are flood resilient buildings?

When flood water enters a building, it can damage not only the contents but also the fabric of the building.

- Plaster will swell when it gets wet and can crack when drying out.

- Timber can also swell and deform during the wet-to-dry process of recovering from a flood.
- Some types of insulation can be permanently damaged and will no longer function if it gets wet.

Flood resilient buildings do two things:

1. flood water coming into the building is limited as much as possible and
2. the fabric of the building is changed so that it is not damaged when it becomes wet.

This approach is known by different names such as property level protection (PLP), property level resilience (PLR) or property level flood resilience (PLFR).

11.2 How do you make buildings resilient to flooding?

Water entry:

The first thing to understand is where water may enter your building. Some ways in will be obvious, such as doorways, other ways, such as through air bricks, holes made for pipes and cables, and back up through the toilet, are less obvious. For all the ways that water can come into a building, there are ways to reduce flow as much as possible. It may not be possible to completely stop all water from entering your building, but you can reduce the amount that comes in and give you more time to move precious items and furniture somewhere safe.

Barriers can be used at doorways; doors can be replaced with flood doors, and air bricks can have covers or be replaced with ones that automatically close. Toilets can be bunged, and drains can have a device that stops water flowing the wrong way, known as a non-return valve.



Images 1, 2 and 3. Flood barrier in a gateway by Flood Protection Solutions, self-closing airbrick and inflatable toilet bung by M3 Floodtec.

Water entry points to consider:

- Doors
- Windows at a low level
- Service holes, such as telephone, gas, electric, water etc
- Air bricks
- Drains, such as downstairs toilets, showers, washing machines, dishwashers etc.
- Pointing of walls
- Floor construction, if you have a suspended wooden floor, water may come up through the ground and find its way into your property that way

Surfaces and building fabric:

As well as preventing water from coming into your building, you should also consider what would happen if water did find its way in. Waterproof plaster, hard ceramic floors and skirting can all be washed down after flood water has receded, and instead of being out of your property for months, you could return in a matter of days.

Surface and building fabric items to consider that may be damaged by flood water.

- Wall construction, such as plaster and plasterboard
- Wall insulation

- Timber floors
- Timber skirting boards
- Electrical socket locations
- Fitted carpets
- Fitted kitchens

11.3 How can I protect my property? Where can I get advice?

North Somerset Council recommends that the publication: **Code of practice for property flood resilience (CIRIA C790)** is always followed.

https://www.ciria.org/CIRIA/Resources/Free_publications/CoP_for_PFR_resource.aspx

The good practice included in the code of practice breaks the process into several stages. These are set out below with a checklist of things you should consider during the process. North Somerset Council can guide and assist you with this process.

Hazard assessment

- Have you agreed on the level of detail and cost of the survey based on the amount of work you think you might need and your risk?
- Do you know the different kinds of flooding that might affect your property?

- Have sources of relevant flood information been collected?
- Has information on the chances of flooding from every type of flooding been obtained?
- Do you know how much warning time you might get before a flood of each type?
- Do you know the possible routes for water to reach your building from each source?

Property survey

- Have you agreed on the level of detail and cost of the survey based on the flood risk and the amount of work you think might be needed? Has the survey identified ways to minimise the damage that would work for you?
- Does the survey contain detailed information about the building, including their age, condition, type of construction and how they are used?
- Has the current level of property flood resilience been described, including ways water might enter through openings and the fabric of the building? Have your needs and preferences been discussed and recorded?
- Does the report cover how your building would be dried, decontaminated and repaired after a future flood?

- Has the survey noted the ground conditions at the site and described the ways in which water could enter your building from below or from a building next to yours?

Options development and design

- Have you discussed different options based on the surveys, including potential damage reduction, your needs and costs involved?
- Have you also discussed ongoing operation, repair and maintenance requirements?
- Have you been given information on recognised or certified products and, where they meet your needs? Have these been included?
- Have you agreed in writing on what your preferred option is?
- Has the design and specification been set out in drawings or text that describes the measures, their installation, and their purpose in detail?
- Does the design and specification give you all the information you need to appoint a contractor or develop an installation plan?

Construction

- Has your main contractor done all the work in the design and specification or documented any changes from the original design?

- Has your main contractor managed the subcontractors and taken responsibility for their work?
- Has all the necessary preparation been done, including drying out and, if needed, decontamination before construction of measures begins?
- Has the construction work been undertaken in accordance with good practice, including relevant standards, guidance, and legislation?
- Have the works been inspected during construction?

Commissioning and handover

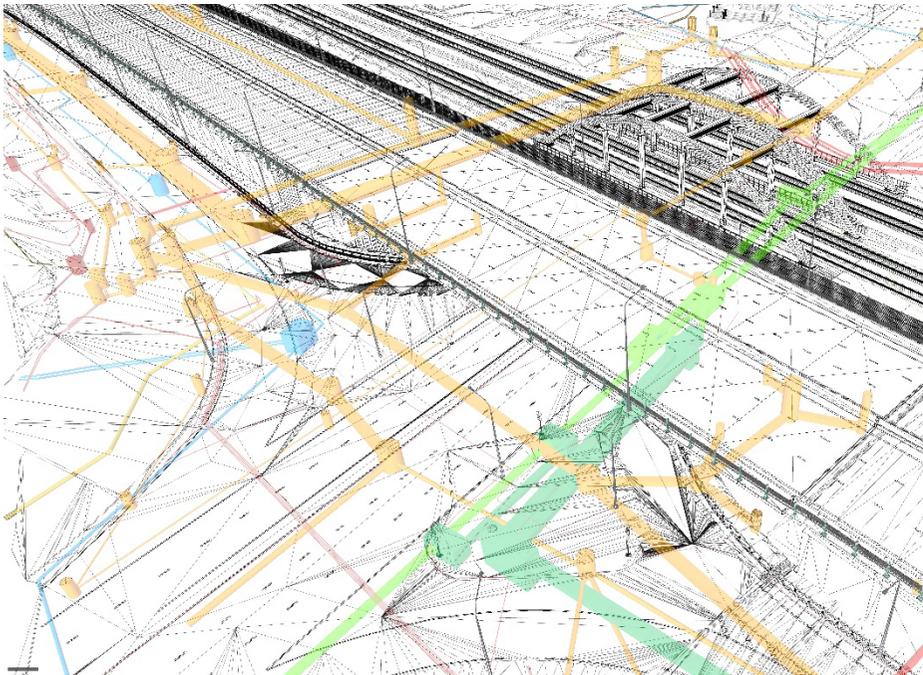
- Have the installed measures been inspected on competition impartially?
- Are there any recommended post-installation test procedures for your chosen measures? If so, have these been carried out?
- Have you received all the information you need in a handover pack and a point of contact for further information?
- Do you know if the measures need to be manually operated for each flood event, and if so, have you planned who will operate the measures in the event of a flood?
- Has any required manual operation been demonstrated to you and the people who will operate them?

Operation and maintenance

- Have you been given a plan for the operation and maintenance, or have you been shown how to prepare one? Does the plan make sense? Who will operate, check and maintain the measures?
- Have the nominated people agreed to the maintenance responsibilities, and are they able to do so or do you need to employ specialists where needed?
- Can the nominated people understand and perform the required operational tasks?
- Do the nominated people know they need to record any operation of the measures? Have you provided a way for them to do this?
- Do the nominated people know they need to record any maintenance or repair of the measures? Have you provided a way for them to do this?
- Do you know how often or under what conditions your plans may need to change? Have you identified how this can be done?
- Do you have information on special cleaning, checking, repairs and maintenance needed after the measures have been used in a flood? Have you a plan in place to make this happen?

12.0 Flood resilient infrastructure

12.1 How can we make infrastructure more resilient to flooding?



Infrastructure is all the basic physical and organisational structures and facilities needed for North Somerset to function. This can be:

- Bridges, roads and tunnels
- Railway lines and stations
- Telephone wires, cables and radio broadcasting systems

- The electrical power grid
- Gas pipelines
- Water supply to homes and businesses
- Drains, sewers, pumping stations, waste treatment facilities and septic tanks
- Waste storage and collection facilities
- Flood defences and storage ponds
- Public parks, historical sites and nature reserves
- Agricultural land and food processing facilities
- Health facilities such as doctors' surgeries and hospitals
- Schools and colleges

Infrastructure will be flooded more often in the future due to climate change and will need to be more resilient. It should be able to stand up to more frequent flooding and quickly recover and not impact the performance of the infrastructure.

Flood resilience measures should be adopted as part of any organisation or business's plans and strategies for now and in the future. If the infrastructure is important, owners need to understand the risk of flooding and develop long-term plans to ensure they will perform as intended in the future if they are flooded more often.

Examples of measures that can be taken are:

- Barriers and walls can be used to prevent or slow the flow of water into sensitive areas

- Infrastructure can be made from materials that are not damaged when they are underwater and can easily be washed down when the flood water has gone
- Electrical equipment can be located higher above where it might flood
- The use of technology, such as the future automation of water control structures and flood defences, linked through to increased coverage of remote water level monitoring.

When new infrastructure is planned, it should be designed, built, and operated to account for the climate changes that may occur over its lifetimes. Evidence tells us that natural infrastructure, such as wetlands and other nature-based solutions, can be as effective and less expensive than hard defences and other engineered solutions. Existing infrastructure may also need to be retrofitted or managed differently. Additional infrastructure, such as sea walls, will need to be constructed to address the physical impacts of climate change.