TORBAY COUNCIL

Level 1 Strategic Flood Risk Assessment

June 2026

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1.1 What is a Strategic Flood Risk Assessment

A Strategic Flood Risk Assessment (SFRA) is an overview of flood risk within a specific area. It aims to provide general guidance to planning officers, developers and other interested people about areas where flood risk is an issue. This is important because flooding of properties causes disruption, large and expensive damages, distress, and can result in loss of life.

It is a government requirement that flood risk is considered in the process of allocating land for development and recommends that sites should be allocated for development in descending order of flood risk. This is documented in National Planning Policy Framework (NPPF).

This SFRA covers the Torbay area, and its main objectives are as follows:

- To provide a reference and policy document that will be part of the evidence base to inform the Local Development Framework and any subsequent plans.
- To ensure that Torbay Council meets its obligations under the latest planning guidance.
- To provide a reference and policy document for use by the general public and developers to advise and provide information on their obligations under NPPF.
- To use as a tool to inform the development control process about the potential risk of flooding associated with future planning applications and the basis for requesting specific Flood Risk Assessments, if necessary.
- Emergency planning process

1.2 Flood Risk in Torbay

Torbay suffers flooding from different sources which include the following:

- Fluvial
- Coastal
- Sewer

- Highway
- Surface Water
- Groundwater

Within Torbay there are 17 watercourses of which 8 have been classified as main rivers due to the significant history of flooding.

Torbay also has an extensive coastline extending from the boundary with Teignbridge to the boundary with South Hams.

Much of the study area is urban, comprising the three main towns of Torquay, Paignton and Brixham. Because people have settled near watercourses and the coast, this means that there is a risk of flooding to these towns within Torbay.

The risk is mostly from watercourse flooding in the middle and lower reaches of the main catchments, from the sea in coastal areas, from surface water runoff, and from combined sewer flooding in various catchments throughout Torbay. In localised areas there is a risk of flooding on low lying land where ground water is becoming an increasing concern.

All areas are potentially at risk from flooding or have the potential to make flood risk worse elsewhere. Some areas are at a higher risk of flooding than others; many areas are at little or no risk. It is the combination of a number of factors that contribute to making an area at risk from flooding. These are settlement location, including proximity to a watercourse or the coast, climate, geology and topography. The risk of flooding can become greater when there are extreme storms or when taking into account the predicted effects of climate change.

Flood risk within Torbay may arise from the interaction of multiple flood sources, including fluvial, tidal, surface water, sewer and drainage mechanisms. In some locations, flood behaviour may be influenced by interactions between these sources, as well as culverted systems, drainage infrastructure and exceedance flow routes. These interactions should be recognised where relevant when considering development suitability and flood risk management.

Significant areas within Torbay are at risk from flooding including parts of Higher Brixham, Paignton Town Centre, Kings Ash Road, Totnes Road, Occombe Valley, Torquay Town Centre, together with the coastal areas around Torquay, Paignton and Brixham.
Some areas at risk of flooding within Torbay have either natural or man made defences, which can act to decrease flood risk in specific areas.

Climate change will increase the risk of flooding. However, this may be mitigated through planning new developments in a way, which avoids building in high risk areas, and by improving existing or creating new flood defences.

It is essential that Local Development Framework planning and development control policies address the risk of flooding, building on those already identified within the Adopted Torbay Local Plan. This SFRA is the start of this process. It provides guidance on how to identify which areas lie within a flood risk area and the implications for plan making and planning applications in taking this flood risk into account.

In addition the SFRA will identify the different policies for the various flood risk areas within Torbay and provide strategies for managing the flood risk. These strategies include, making space for water, sustainable drainage, improving habitat for wildlife, opening culverts, nature based solutions/natural flood management, urban creep, together with considering access and egress to properties.

1.3 Flooding History in Torbay

There have been flooding incidents in places within Torbay over many years. For example in 1999 major flooding occurred in Torquay town centre, Paignton town centre, Higher Brixham, Churston and Galmpton. In October 2004 a high tide combined with strong easterly winds caused coastal flooding from the sea in the seafront areas of Paignton, Torquay and Goodrington. In March 2018 a named storm, Storm Emma, in which a high tide combined with strong easterly winds caused extensive coastal flooding across the bay affecting Oddicombe/Babbacombe, Meadfoot, Torre Abbey, Livermead, Preston, Paignton, Goodrington and Brixham

Some areas of Torbay have had or are having flood defences built in order to reduce the risk of flooding happening again. It should be noted however that many areas of Torbay that suffer flooding have had no flood defences constructed.

Where defences are in place it is important not to be complacent about the risk of flooding. Flood defences are constructed to protect areas from a flood of a certain size (standard of protection). There is always a risk that a storm will occur which is larger than the standard of protection, or that the defence will fail. This is why the Flood Zones produced by the Environment Agency do not take into account flood defences and they provide a precautionary extent of the predicted flooding by assuming the defences are not in place.

It is also important to note that due to climate change the defences that were constructed in the past may not now have the standard of protection, which is thought necessary.
Flood and Water Management Act Section 19 reports for flooding dating back to 2012 can be found on Torbay Council's website **Reports, Information and legislation - Torbay Council**.

1.4 Data

The SFRA uses the best available data at the time of writing, collected from the Environment Agency and Torbay Council. The SFRA is a live document. It retains value by being kept up to date with latest information, for example by incorporating the Environment Agency Flood Zones information that is regularly updated. In addition, all records of new flooding events from all sources will be incorporated into the updates of the SFRA.

The quality of the data collected and produced varies and where less reliable information or assumptions have been made a precautionary approach is used to identify the need to get more detailed information.

The main point to remember is that the advice given in this document is a guide to help identify the level of flood risk and whether further information is needed. It is essential to be aware of the potential risk to life and property, in order to make informed decisions about the need for further information and action if necessary.

In most cases before a decision is made about the suitability of a site for development in terms of flood risk, more detailed investigations will have to be made by the developer in the form of a site specific flood risk assessment. In addition, when considering the suitability of land for developments the sequential risk based approach as identified within the NPPF must be followed.

1.5 Definition of Important Terms

Floods are not regular, evenly spaced or similar events. They are independent, randomly spaced throughout time and they vary in size. This means that when stating the size of a flood, averages have to be used. The following terms are particularly useful when describing the size of a flood.

- Return Period: When we speak of a 1 in 100 year flood we mean that the peak flood flow on average will be exceeded only once in a 100 year period. It does not mean that you will only get one storm of this magnitude every 100 years, it could happen at any time and more often than once in 100 years.
- Probability: The probability that an event of a particular magnitude will occur in any one year can be found by dividing 1 by the return period of the flood in question. For example, the probability of a 1 in 50 year flood occurring in 2007 is 0.02 or 2%.

The return periods 1 in 1000 years and 1 in 100 years are used by the Environment Agency to estimate the flood extents from rivers and 1 in 200 years for the sea. These flood extents are represented on the Flood Map as Flood Zones 2 and 3 respectively. The NPPF uses these Flood Zones for categorising flood risk, as shown below, in order to guide planning decisions.

- Flood Zone 3 has a high probability of flooding (1 in 100 years or greater for fluvial and 1 in 200 years or greater for tidal flooding).
- Flood Zone 2 has a medium probability of flooding (between 1 in 1000 years and 1 in 100 years for fluvial and 1 in 1000 years and 1 in 200 years for tidal flooding))
- Flood Zone 1 has a low probability of flooding (less than 1 in 1000 years)

NPPF advises that a sequential approach to land use in terms of flood risk is applied. This means that development will be allowed in high risk areas only if there are no reasonably available sites in the area of lower risk; the development is suitable and appropriate measures to mitigate against the risk of flooding are already present or will be employed.

1.6 Study Outputs

The main outputs from the study are the level 1 and level 2 SFRA reports and a series of maps covering the whole of Torbay. They have been produced to indicate areas where there is a risk of flooding and where proposed developments should be avoided because of the flood risk. The maps together with this report and Environment Agency maps will enable consistent and suitable planning policy and development control decisions to be made with

respect to flood risk using the latest information. The evidence will inform decisions on land allocations in the Local Plan as well as at a site specific level for individual planning applications.

The Environment Agency Flood risk modelling data for rivers, the sea and reservoirs is available online at:

- **Environment Agency Flood map for planning**
- **Environment Agency Check long term flood risk**

The flood maps for planning do not include the defences and have recently included a layer for climate change. The long term flood risk maps include defences.
The flood maps show three different kinds of areas as identified below:

- Environment Agency Flood Zone 3 is the area that could be affected by flooding either from rivers, watercourses or the sea, if there were no flood defences. This area could be flooded from the sea by a flood that has a 0.5% (1 in 200 years) or greater chance of happening each year, or from a river or watercourse by a flood that has a 1% (1 in 100 years) or greater chance of happening each year. This is described as a high risk area.

- Environment Agency Flood Zone 2 shows the additional extent of an extreme flood from rivers, watercourses and the sea. These areas are likely to be affected by a major flood with up to a 0.1% (1 in 1000 years) chance of happening each year. This is described as a low to medium risk area.

- Land not identified in Zones 2 and 3 lies within the Environment Agency Flood Zone 1 which has little or no risk.

It must be made clear that these zones show the extents of the natural floodplain if there were no flood defences or other manmade structures and channel improvements.

Functional floodplain maps have been produced as part of the SFRA Level 2. This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The functional floodplain has been based on the following:

- land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or
- land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).

1.7 Technical Guidance

As part of the SFRA, technical guidance has been produced for planning officers and interested parties that should be used when considering, at a strategic level, the suitability of a site for development in terms of flood risk. By following the guidance within this report, it will be possible to assess the suitability of a site for development and what is required from a developer in order to support a planning application.

In addition, some specific details about flood risk and sources of flooding, which apply in Torbay, have been documented as a guide for planners. Details are provided about:

- Residual flood risk
- Coastal flooding
- Groundwater
- Defences
- Surface water runoff
- Managed Coastal Retreat and Coastal Change Management Areas
- Flood Warnings and Evacuation Procedures

1.8 Recommendations

The SFRA makes a number of recommendations:

- It is the developer's responsibility to provide site specific flood risk assessments with any planning application. The developer should recognise that the strategic flood mapping may not capture all local flood mechanisms. Any development should protect flood storage, flood conveyance routes, exceedance pathways and resilience to residual flood risk.

- Every application for development should have a flood risk assessment in accordance with the Torbay Critical Drainage Area.
- All site specific flood risk assessments must be considered by Torbay Council and or the Environment Agency as part of the planning consultation process.
- Land which is found to be unsuitable for one type of development due to flood risk may still be suitable for other types of use. The NPPF guidance can be used to suggest suitable alternative land uses.
- The data contained within this SFRA constitutes the best available data at the time of writing.
- The SFRA should be used to steer strategic growth and site specific allocations in the Local Development Framework to reasonably available site at lowest flood risk. This includes investigating the impact of proposals for new development in the vicinity of and particularly upstream of areas sensitive to flooding.
- The Local Development Framework policies controlling development should reflect the guidance in the SFRA. They may in future require amendments if the SFRA is updated.

1.9 Conclusions

Flooding is an important issue, which must not be ignored. In the future, it is likely that flooding will occur more frequently and more severely due to climate change.

By using the SFRA in combination with site specific flood risk assessments, it is possible for Torbay Council to meet its obligations under NPPF applying the risk based sequential approach to all stages of planning, steering new developments to areas at the lowest risk of flooding. This means that land for development can be allocated in a sustainable way.

2 Introduction

2.1 Study Objectives

This work has been undertaken to provide a detailed assessment of the extent and nature of the risk of flooding within Torbay together with its implications for land use planning. The Strategic Flood Risk Assessment will enable the risk based sequential approach to be applied at all stages of the planning process. It will inform the LDF and development control decisions.

Data used in this study has been collected on the basis of best available within the available timescale. It is inevitable that the outputs from a study of this nature will require updating as additional and more accurate data becomes available.

2.2 Torbay Council

Torbay consists of the three towns of Torquay, Paignton and Brixham. Ground levels vary across the district from approximately 120m AOD inland to approximately 2m AOD at the coast.

Within the Torbay catchment area there are 17 watercourses of which 13 discharge directly to the English Channel, 2 discharge to the River Dart, 1 discharges to the River Teign and 1 discharges to the public combined sewer system. The names, locations and catchment areas for these watercourses are highlighted on drawing numbers TC/9/7/15 –3/2, 4/2, 5/2, and 6/2 in Appendix A.

Eight watercourses that have historically suffered major flooding were categorised as critical ordinary watercourses. In April 2006 these critical ordinary watercourses were enmained and re-categorised as main rivers. Although the remaining nine watercourses have a history of flooding, this flooding is of only a minor nature and therefore the watercourses are categorised as ordinary watercourses. These watercourses are listed in Section 4.2 and their characteristics outlined in Section 5.

The responsibility for the main rivers, watercourses and flood defences that are located along the lengths of the watercourses lie with different organisations e.g. Torbay Council as land drainage authority, the Environment Agency, riparian owners.

The responsibility of each organisation is outlined below:

Under the Land Drainage Act 1991 local authorities are classified as the land drainage authority and they are responsible for managing the flood risk from ordinary watercourses. Additionally, if the local authority is a coastal authority they are responsible for the risk provided by coastal erosion and coastal flooding. Local authorities have permissive powers to carry out improvement works to flood defences, and they provide an emergency response during major incidents.

Highway authorities are responsible for ensuring that the public highway is free from surface water flooding. Also, where watercourses pass either under the public highway or within the boundary of the public highway the highway authority becomes a riparian owner of the watercourse and as such are responsible for the maintenance of the watercourse. The Environment Agency is responsible for flood risk management arising from main rivers as well as flooding from the sea. They maintain, operate and improve flood defences and provide a 24 hour flood warning service and emergency response. Although they are not responsible for ordinary watercourses, they have to consent any works being undertaken on a watercourse. The Environment Agency is responsible for reporting to DEFRA on government targets.

The water companies are only responsible for managing the flood risk from the public sewerage system in accordance with the guidelines set by the water regulator OFWAT. Riparian owners are identified as the landowner adjacent to a main river or ordinary watercourse. Riparian landowners have certain rights and responsibilities in relation to the watercourses flowing through or adjacent to their property. These “riparian rights” are based on common law and have been defined as a result of legal cases over many years. As a riparian owner they are responsible for the maintenance of the watercourse through their property, and they are not allowed to impede the flow of water along the length of the watercourse.

In addition to flooding from watercourses, Torbay has a history of coastal flooding and in certain locations flooding from the public sewer network is also a problem. The responsibility for managing coastal flooding lies with the Environment Agency and Torbay Council and the responsibilities for flooding from the public sewer network lies with South West Water.

The whole of Torbay has been designated as a Critical Drainage Area (CDA) by the Environment Agency in 2026, more details are included with the level 2 SFRA. This means

there is a requirement for all planning applications to undertake a site specific flood risk assessment in support of planning applications.

The area within Torbay is under pressure for more development, as there is a need to provide more space for housing as well as business growth. The Strategic Flood Risk Assessment will help steer development to areas at the lowest probability of flooding, which will not increase the risk elsewhere.

2.3 Definition of Flood Risk

Floods are not regular, evenly spaced or similar events. They are independent, randomly spaced throughout time and they vary in size. This means that when stating the size of a flood, averages have to be used. The following terms are particularly useful when describing the size of a flood.

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NPPF advises that a sequential approach to land use in terms of flood risk is applied. This means that development will be allowed in high risk areas only if there are no reasonably

available sites in the area of lower risk; the development is suitable and appropriate measures to mitigate against the risk of flooding are already present or will be employed. Flood risk includes not only the probability of flooding from identified sources, but also residual mechanisms including culvert blockage, surcharge, drainage exceedance, infrastructure failure, overtopping and interaction between multiple flood sources.

2.4 Interface with other Flood Risk Maps

The Environment Agency provide flood risk maps for coastal and fluvial flooding. These can be found on the government website **https://flood-map-for-planning.service.gov.uk/**. The Level 2 Strategic Flood Risk Assessment provides more details on flood risk. Strategic flood mapping provides an important evidence base for understanding flood risk at a strategic scale. However, local flood mechanisms and site-specific constraints may not always be fully represented. Local evidence, professional judgement and site-specific assessment may therefore be required where local hydraulic conditions, culverted systems, exceedance flow routes or residual flood risks are relevant.

2.5 Climate Change

As the Strategic Flood Risk Assessment is a long term planning document it is necessary to consider the potential impacts of climate change in terms of risk of flooding from rivers, watercourses, surface water and the sea. This meets the requirements of NPPF. Predicting the effects of climate change on river, watercourse and surface water flows is uncertain however sea level rise has already been recorded. In the future it is predicted that in the south west there will be increases in the amount of winter rainfall and the intensity of summer storms. It is predicted that sea levels may rise due to global warming. Updated guidance on how to consider climate change has been published within NPPF Guidance **Flood risk assessments: climate change allowances - GOV.UK**. It is important to remember that NPPF requires individual planning applications for development and strategic allocations in the Local Development Framework to consider the long term flood risk for the lifetime of new buildings.

3 Project Outputs

3.1 Mapping

The principal project output is the mapping of Torbay showing land classified to NPPF Zones as set out in Figure 1 - Flood Risk Zones in NPPF below:

Flood Zone	Level of Risk	Definition
1	Low Probability	This zone comprises land assessed as having a less than 1 in 1000 (0.1%) annual probability of river or sea flooding in any year.
2	Medium Probability	This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% -0.1%) in any year,
3a	High Probability	This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (1%) or a 1 in 200 or greater annual probability of flooding from the sea (0.5%) in any year.
3b	The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: • land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).

Figure 1 - Flood Risk Zones in NPPF

For full details of the above table see Table 1 of technical guidance to the NPPF.

In addition to the flood zones any new developments should be classified for flood risk vulnerability in accordance with Table 2 of technical guidance to the NPPF. This classification is based on: the risk to human life posed by flooding, closely followed by the implications for human stress, health and well being.

Based on the flood zones and flood risk vulnerability Figure 2 - Flood Risk Vulnerability and Flood Zone Compatibility below has been reproduced from Table 3 of the technical guidance to the NPPF identifying whether certain development is appropriate, should not be permitted or the use of the exception test is required for each flood zone. It should be noted that, even when the exception test is identified as being required within Figure 2 - Flood Risk Vulnerability and Flood Zone Compatibility, prior to carrying out the exception test a sequential test for the site must be carried out.

Flood Risk Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	Yes	Yes	Yes	Yes	Yes
Zone 2	Yes	Yes	Exception Test Required	Yes	Yes
Zone 3a	Exception Test Required	Yes	No	Exception Test Required	Yes
Zone 3b	Exception Test Required	Yes	No	No	No

Figure 2 - Flood Risk Vulnerability and Flood Zone Compatibility

Key:

Yes = Development is appropriate

No = Development should not be permitted

The flood zone maps to be used in conjunction with the tables can be found on the government website **https://flood-map-for-planning.service.gov.uk/**. The functional floodplain maps 3b can be found in the Level 2 SFRA.

The mapping presented within this SFRA should be regarded as a strategic planning tool. Whilst it provides a valuable indication of flood risk, it may not identify all local flood mechanisms or site-specific constraints further assessment may be required.

4 Source of Risk

4.1 General Criteria

It is required that flood risk zones are defined in accordance with the criteria set out in NPPF. For land at risk from fluvial flooding, these criteria require differentiation according to the sequential characterisation of flood risk as shown in Figure 1 - Flood Risk Zones in NPPF.

In addition, rapid inundation zones are identified. For the purpose of this study rapid inundation is defined as the filling of an area of land to a depth of 0.3m within 30 minutes of the failure or overtopping of the defence.

4.2 Source of Risk

4.2.1 Fluvial Flooding

With respect to strategic flood risk within Torbay, the watercourses that have been appraised can be divided into two distinct types. These are as follows:

- Main Rivers – Aller Brook, Occombe Valley Watercourse, Victoria Stream, Clennon Valley Watercourse, Yalberton Watercourse, Galmpton, Churston Watercourse and Higher Brixham Watercourse. As a result of regular flooding to properties and major infrastructure over the past ten years the above seven watercourses have been classified as main rivers. The catchment area serving all of these watercourses is complex with many surface water sewers and highway drains discharging directly to the watercourse. Specific information relating to each watercourse can be found later within this report.

- Ordinary Watercourses – Maidencombe Watercourse, Watcombe Watercourse, River Fleet, Ilsham Valley Watercourse, Torre Valley Watercourse, Cockington Stream, Hollicombe Watercourse, Broadsands Watercourse, Lupton Watercourse. Over the

past twenty five years there is a history of flooding from the majority of these watercourses however, the level of flooding has been only minor.

4.2.2 Coastal Flooding

As Torbay is a coastal authority many sections of the sea wall act as flood defences. During high tides, which coincide with easterly winds, these flood defences can be overtopped. This overtopping results in significant flooding around the bay, with properties and infrastructure being at risk. The main locations at risk from coastal flooding are:

- Torre Abbey Fields, Torquay
- Livermead, Torquay
- Paignton and Preston Greens, Paignton
- Goodrington Park, Paignton
- Broadsands
- Brixham Town Centre
- Torquay Harbour Area

In the majority of cases coastal flooding only affects the public highway and open space resulting in the temporary closure of the sea front roads. However, during severe storms in 2004 and 2018 numerous properties in the vicinity of Paignton and Preston Green suffered flooding. The areas at risk from coastal flooding are identified on the flood zone maps.

4.2.3 Sewer Flooding

The responsibility for the public sewer network within Torbay lies with South West Water. In the majority of sewer catchments with Torbay the sewers are combined i.e. they receive both foul and surface water runoff. Where recent developments have been constructed the sewer system comprises separate foul and surface water sewers. In addition, within the low-lying area of Paignton town centre there are separate combined and surface water sewers.

As the combined sewer system within Torbay is only designed for between the 10% and 3.3% storm events it is difficult to predict the level of flooding that would be expected from the sewer system for the 1% and 0.1% events.

4.2.4 Surface Water Flooding

Surface water flooding happens usually from very heavy rainfall when the water cannot soak away into the ground or find its way into drains. This type of flooding can happen away from rivers, such as water flowing off fields and along roads. It can be a particular problem in urban areas where there is little grass and lots of roads, pavements and driveways.
Flood risk from surface water flooding is of concern within the study area. A number of flood incidents have occurred within the area caused by surface water alone, or in combination with watercourse flooding. The Environment Agency flood maps do not identify flood risk due to surface water flooding.
Surface water flood risk should be considered alongside other sources of flooding where interactions may occur. Intense rainfall events may generate exceedance flows, surcharge drainage systems and influence flood behaviour associated with watercourses, sewer systems and tidally constrained drainage networks.

4.2.5 Highway Flooding

The responsibility for the public highway and highway drainage lies with Torbay Council as the highway authority. In the majority of catchments highway drainage drains to the public combined or surface water sewer systems however, in certain locations there are separate highway drains discharging to watercourses or coastal waters. Where ground conditions are suitable or in rural locations where there is not an available drainage system, road gullies would discharge to soakaways.
During severe storm events flooding to the highway can occur. As a result of the hydraulic design of the gullies being exceeded. Flooding can also occur due to the hydraulic design of the system that serves the gully (e.g. the public sewer) being exceeded. A further cause of highway flooding can be defective gullies or broken pipework or as a result of blockages to the gully grating from fallen leaves or debris, not allowing surface runoff to enter the gullies and hence flooding occurring. Highways may act as temporary exceedance flow routes during severe rainfall events. Development proposals should avoid obstructing these pathways or creating unsafe access arrangements.

4.2.6 Groundwater Flooding

Overall ground water flooding within Torbay is not a major problem. However, it is known that it could be a problem in low lying coastal areas such as the Torquay harbour area, Paignton Town Centre, and Brixham. With predicted sea level rise this will increase ground water flooding. British Geological Survey produce Susceptibility to groundwater flooding data **Susceptibility to Groundwater Flooding | British Geological Survey (BGS)** which should be used as part of flood risk assessments.

4.2.7 Flood Zone Maps

The flood zone maps to be used in conjunction with the tables can be found on the government website **https://flood-map-for-planning.service.gov.uk/**. The functional floodplain maps 3b can be found in the Level 2 SFRA.

Flood Zone mapping provides a strategic indication of fluvial and tidal flood risk and should form an important part of the evidence base for planning decisions. However, development suitability may also be influenced by other flood mechanisms, including surface water flooding, ordinary watercourses, culverted systems, exceedance flow routes and residual flood risk. These factors should be considered where relevant to the proposed development.

4.2.8 Rapid Inundation Zones (See Figure 4)

Rapid inundation has been taken as the development of 30cm depth of floodwater within 30 minutes of overtopping or breaching of flood defences. Rapid inundation zones have been identified as appropriate behind all raised defences having a standard of protection greater than 1%. The width of the zone is defined in relation to the potential head of water contained by the defence and to local barriers to the spread of water away from the defence, such as road embankments.

5 Specific Flood Data

5.1 Introduction

The Environment Agency flood extents for main rivers and ordinary watercourses have been made with the assumption that all flooding has resulted due to the studied watercourse alone, rather than the flooding being due to overland flow, sewer flooding or any other source.

All watercourses within Torbay are inspected on an annual basis and the results of these surveys are reproduced as a watercourse asset survey. The results of the latest watercourse asset surveys have been reviewed as part of this study.

5.2 Main Rivers

5.2.1 Aller Brook

The Aller Brook is located to the North West of Torbay and the watercourse flows out of Torquay, through Teignbridge along the Aller Valley before discharging into the River Teign. The section of watercourse, which passes through Torbay is approximately 3km in length.

The head of this watercourse lies within the Barton Lands development area; however, tributaries are also located within the development around Torbay Hospital. From Barton Lands the watercourse is mainly open however virtually all of the tributaries around Torbay Hospital have been culverted.

In order to allow the surface water runoff from the Barton Lands Development to discharge to the Aller Brook the developer had to construct a storage lagoon to the rear of the Sainsbury's supermarket. This storage lagoon has been designed to contain the 0.5% event. The discharge from the lagoon is controlled by means of a hydrobrake.
It should be noted that the Aller Brook between Torbay boundary and the upstream connections to the storage lagoon became main river on 1st April 2006. The remaining sections of the watercourse together with its tributaries will remain as ordinary watercourses.

5.2.2 Occombe Valley Watercourse

The Occombe Valley Watercourse rises near the ring road and flows in an easterly, then south-easterly direction before discharging to coastal waters at Preston Sands. The overall length of this watercourse is approximately 6.4km.

The outfall for this watercourse is via a culvert, which discharges onto the beach below mean high water springs. As a result, during high tides the hydraulic capacity of the outfall is restricted.

The initial 3km of this watercourse is open as it passes through farm fields and open space. However, once the watercourse reaches Occombe Valley Road the majority of its length to the outfall is culverted. Downstream of Washington Close the culvert bifurcates however, the two culverts merge again under Paignton Green immediately prior to discharging to coastal waters.

In the initial stages the watercourse only receives surface runoff from farm fields and open space however, as the watercourse enters the urban areas of the catchment it receives discharges from surface water sewers and highway drains. These discharges are unrestricted and result in the risk of flooding downstream being exacerbated.
It should be noted that the Occombe Valley watercourse between Occombe Valley Road and the discharge location on Preston Sands became main river on 1st April 2006. The remaining section of the watercourse will remain an ordinary watercourse.

5.2.3 Victoria Stream

The Victoria Stream lies within the low-lying area of Paignton town centre and discharges to coastal waters at two locations. The first discharge location is below Paignton Sands near Paignton pier, and the second discharge location is through the wall within Paignton Harbour. At both of these locations the outfall is affected by tidal conditions restricting the hydraulic performance of the outfalls. The overall length of the watercourse is 1.8km and for the majority of its length the watercourse is culverted.

The catchment serving this watercourse is totally urban with surface water sewers, highway drains, and land drainage discharging directly to the culverted watercourse. This watercourse has a pumping station under Paignton green that allows flows to discharge into Paignton Harbour for all tidal conditions.

It should be noted that the Victoria Stream became main river on 1st April 2006.

5.2.4 Clennon Valley Watercourse

This watercourse initially flows southerly and the easterly discharging to coastal waters at Goodrington Sands. The overall length of the watercourse is approximately 4.1km.
The outfall for this watercourse comprises a culvert laid along the beach and discharging below mean high water springs. As a result, the hydraulic capacity of the outfall is severely restricted during high tide levels. This has during heavy rainfall resulted in deep flooding and closure of Dartmouth Road, which is one of the two main roads linking Paignton and Brixham.

The initial section of the watercourse is rural however a flood storage pond was constructed during the late 1990's in Great Parks in order to allow surface water from the new housing development to discharge to the watercourse.

Downstream of this new development, between Kings Ash Road and Totnes Road there are numerous other housing developments that have been constructed over the years where surface water runoff has been connected directly to the watercourse. From Totnes Road the watercourse passes through the grounds of Paignton Zoo and then through Clennon Valley nature reserve and sports pitches. Within the zoo grounds and the nature reserve numerous ponds have been constructed on the watercourse.

Historically this watercourse has suffered flooding on a regular basis to properties and major highways including Kings Ash Road, Totnes Road and Dartmouth Road. As a result of this flooding on more than one occasion both the main roads linking Paignton to Brixham, Kings Ash Road and Dartmouth Road have had to be closed to traffic.

It should be noted that the Clennon Valley watercourse between Great Parks storage pond and the discharge location on Goodrington Sands became main river on 1st April 2006. The remaining section of the watercourse upstream of Great Parks storage pond remains an ordinary watercourse.

5.2.5 Yalberton Watercourse

The Yalberton Watercourse is the longest watercourse within Torbay having an approximate length of 9.5km however, the overall length of the watercourse is 12km. The final 2.5km from where it departs from Torbay until its outfall to the River Dart at Stoke Gabriel lies within the South Hams. Although this watercourse discharges into a tidal river the tides have very little effect on the performance of the watercourse and certainly no effect on the performance of the watercourse as it passes through the Torbay area.

Over the majority of the watercourse the catchment is rural with runoff from farm fields being the main contribution to flows. However, there are a number of areas of development where the surface water runoff discharges to the watercourse. These areas include properties in Totnes Road/Stoke Road, Yalberton Industrial Estate and the Long Road Industrial Estate.

In order to allow surface water runoff from the Yalberton Industrial Estate to discharge to the watercourse an above ground storage area in farm fields above Stoke Road was constructed. Should this storage volume be exceeded, flows will overtop the storage bund and discharge to the downstream watercourse increasing the risk of flooding downstream.

Historically flooding has occurred from this watercourse upstream of the storage pond at Totnes Road. In addition, on a number of occasions when the storage pond has been exceeded flooding to roads and properties downstream has been reported.

It should be noted that the Yalberton watercourse between Totnes Road and the discharge location to the River Dart at Stoke Gabriel became main river on 1st April 2006. The

remaining section of the watercourse upstream of Totnes Road remain an ordinary watercourse.

5.2.6 Churston Watercourse

This watercourse flows north easterly from Alston Farm through farm fields to the rear of Churston village from where the watercourse sinks and becomes subterranean before discharging at Elberry Cove. The length of the above ground watercourse is approximately 0.83km and for the majority of its length it is open. The only sections of the watercourse that are culverted are under Alston Lane, Dartmouth Road and a section under the garden of Hayes Court, Elberry Lane.

The catchment is predominantly made up of farm fields however, surface water run off from roads and Churston village discharge into the watercourse.
Historically flooding has been a major problem from this watercourse with internal flooding to numerous properties in Churston Village.
Due to the historical flooding this watercourse was identified as a critical ordinary watercourse and as a result from 1st April 2006 it became a main river.

5.2.7 Higher Brixham Watercourse

The Higher Brixham Watercourse flows north easterly from Kennels Road and discharges to coastal waters at Brixham Outer Harbour. The overall length of this watercourse is approximately 2.9km. Although the discharge location is tidal the tides have very little effect on the hydraulic performance of the watercourse.

The upstream section of this watercourse is rural and is fed by surface water runoff from fields. However, downstream of Rowan Way the catchment becomes urban and is fed by surface water runoff from housing developments. In this downstream section the watercourse has been culverted for approximately 60% of its length.

Due to the historical flooding this watercourse was identified as a critical ordinary watercourse and as a result from 1st April 2006 it became a main river.

5.3 Galmpton Watercourse

This watercourse flows North/westerly from the high ground at Kennels Road through the village of Galmpton before discharging to the River Dart at Galmpton Creek. The overall length of the watercourse is approximately 1.5km.

Although the watercourse discharge location is affected by tidal conditions, the tides have very little effect on the hydraulic performance of the watercourse.

The catchment area serving this watercourse can be divided into two distinct areas separated by the Paignton to Kingswear Steam Railway. Upstream of the railway the watercourse is predominantly open, and the watercourse is fed by surface water runoff from the farm fields. Downstream of the railway the catchment becomes more urban, and the watercourse comprises a combination of open and culverted sections. The catchment area for this section of watercourse comprises the majority of the housing area where surface water sewers and highway drains have been connected to the watercourse allowing surface water runoff from buildings and roads to discharge to the watercourse increasing the risk of flooding.

The Environment Agency recategorised the watercourse to main river in order to carry out a flood alleviation scheme. The flood alleviation scheme was completed in 2003 and involved the hydraulic upsizing of culverts, duplication of culverts and the provision of an overland collection system in the low-lying area of Galmpton Glade.

5.3.1 Ordinary Watercourses

Ordinary watercourses, including culverted or modified systems, can make a significant contribution to local flood risk. Flood mechanisms associated with these systems may not be fully represented in strategic mapping and should be carefully considered in planning decisions. The impacts of these systems should be considered as part of the Flood Risk Assessment.

5.3.2 Maidencombe Watercourse

This watercourse is approximately 0.4km long and flows through Maidencombe in a north-easterly direction before discharging into the English Channel. For the majority of the watercourse's length, it is open however, where it passes under roads the watercourse has been culverted.

5.3.3 Watcombe Watercourse

This watercourse is only 0.3km in length and flows from Teignmouth Road discharging to the English Channel at Watcombe Beach. The watercourse has very little historical flooding and there are no properties at risk from flooding along this watercourse.

5.3.4 River Fleet

Originally the River Fleet flowed from the Watcombe area of Torquay in a southerly direction, through Torquay town centre eventually discharging into Torquay harbour. However, during the late 1890's, as the town developed the lower reaches of the watercourse were converted to a public combined sewer.

As a result, the River Fleet now only exists as a watercourse between Watcombe and Hele Cross roads where the watercourse discharges into South West Water's combined sewers. The overall length of remaining watercourse is just over 2km of which the majority has been culverted as development has taken place.

5.3.5 Ilsham Valley Watercourse

The watercourse in Ilsham Valley is approximately 0.66km in length and discharges to the English Channel at Meadfoot Beach. For the majority of the length the watercourse is open however, the downstream section as it passes South West Water's pumping station and under Meadfoot Sea Road is culverted.

As part of South West Water's works to construct the pumping station a wetland area has been constructed along the line of the watercourse.

5.3.6 Torre Valley Watercourse

The Torre Valley watercourse flows southerly from Lawes Bridge to the Torquay Recreation Ground and eventually discharges to the English Channel on Torre Abbey Beach. A tributary of the watercourse drains from Sherwell Valley and joins the main watercourse at the Torquay recreation Ground. The watercourse has a length of approximately 2km and for the majority of its length it is culverted.

As the watercourse discharges directly to coastal waters at times of high tides the discharge through the downstream sections of the watercourse is restricted as the water level within the watercourse matches the tide level. As a result, the Torquay Recreation Ground is susceptible to flooding from both the watercourse and coastal waters.

The upper sections of the watercourse receive flows from a large catchment area as a result of surface water sewers and highway drains discharging directly to the watercourse.

5.3.7 Cockington Stream

The Cockington Stream flows south-easterly through Cockington Village before discharging to coastal waters at Livermead beach. Although the stream discharges directly to coastal waters the outfall is at a level which means that its hydraulic capacity is not affected by high tides.

The overall length of the watercourse is 1.5km and for the vast majority of its length the watercourse is open with the only culverts being under roads and the railway. Downstream of Cockington village the watercourse passes through Cockington nature reserve where the watercourse has been widened to form lakes. Some developments near the watercourse have surface water sewers discharging directly to the watercourse however, the majority of the surface water runoff discharging to the watercourse is from fields.

5.3.8 Hollicombe Stream

The Hollicombe stream rises near the ring road and flows south easterly discharging to the English Channel at Hollicombe Beach. Although the stream discharges directly to coastal waters the capacity of the outfall is not affected by tidal conditions.

The overall length of the watercourse is approximately 2.5km and for the majority of its length it is open. However, from Old Paignton Road and under Hollicombe Park the watercourse has been culverted with the exception of approximately 30m of open watercourse.

The catchment serving this watercourse is predominantly fields however, in the downstream sections there is surface water from a housing development, which discharges directly to the watercourse.

5.3.9 Broadsands Watercourse

This watercourse is approximately 0.3km long and discharges to coastal waters at Broadsands beach. For the majority of its length the watercourse is open however, it is culverted as it passes through the sea wall and to where it outfalls onto the beach.
As the outfall for this watercourse is below high water spring tide levels, during high tides the outfall becomes tide locked resulting in an increased risk of flooding should a storm event occur simultaneously with a high tide.

The upstream catchment serving the watercourse comprises surface water sewers from the housing developments in Brunel Road and Broadsands Road. In the lower catchment the

open sections of the watercourse are served by runoff from farm fields together with the paved car park.

Historically, where flooding has been reported only the low-lying fields and car park have been affected.

5.3.10 Lupton Watercourse

The Lupton watercourse flows north easterly from Kennels Road, through Brixham town centre before discharging to Brixham inner harbour near the Prince of Orange statue. The overall length of this watercourse is approximately 2.7km. The catchment serving this watercourse can be divided into two distinct areas. Firstly, a rural area from Kennels Road to Monksbridge Road where the watercourse is fed by surface water runoff from fields. Secondly, the urban area from Monksbridge Road to the outfall where the watercourse is fed by surface water sewers and highway drainage. Within the first area the watercourse is predominantly open and within the second area the majority of the watercourse is culverted.

As the watercourse discharges to Brixham inner harbour through the harbour wall, at the outfall there is a tidal flap valve to stop flooding from seawater within the town centre. At times of high tides, the capacity of this outfall is severely restricted increasing the risk of flooding to Brixham town centre should a storm event occur.

5.4 Coastal Flooding

Torbay is a coastal authority, many sections of the sea wall around the bay act as flood defences. During high tides, which coincide with easterly winds, these flood defences can be overtopped. This overtopping results in significant flooding around the bay, with properties and infrastructure being at risk. There are 8 main locations at risk from coastal flooding and further details regarding the location and the number of properties at risk are provided below.

5.4.1 Torquay Harbour Area

The harbour wall around Torquay inner harbour acts as a flood defence. At various locations around the harbour wall surface water drains discharge directly to the harbour. These outfalls are fitted with tidal flap valves to in order stop tidal waters entering the drainage system. However, as a result of high tides coinciding with easterly winds the harbour walls have been overtopped on occasions resulting in flooding. In addition, during very high tides, the surface water outfalls become tide locked and should a major storm

occur at the same time as a high tide the risk of flooding in the low-lying areas around Torquay harbour is increased.

5.4.2 Torre Abbey Beach

The sea wall from Torquay outer harbour to Corbyn Head acts as a flood defence and protects the low-lying areas of Torre Abbey meadow and Torquay recreation ground from coastal flooding during high tides. However, should a high tide occur with an easterly wind there is a severe risk of coastal flooding.

When coastal flooding occurs the main coast road has to be closed, causing major traffic disruption. In addition, flooding is reported on both Torre Abbey meadow and Torquay recreation ground. In the recent past flooding of this nature has resulted in severe damage to the sea wall, pavements, roads, cars and services.

5.4.3 Livermead

The sea wall from Corbyn Head to Livermead Cliffs acts as a flood defence and protects the low-lying areas around Livermead from coastal flooding. However, should a high tide occur with strong easterly winds there is a severe risk of coastal flooding.
When coastal flooding occurs the main coast road between Torquay and Paignton has to be closed resulting in major traffic disruptions.

5.4.4 Preston Sea Front

The sea wall from Hollicombe Gardens to the Redcliff Hotel acts as a flood defence and protects the low-lying areas around Preston Green from coastal flooding during high tides. However, should a high tide occur with a strong easterly wind there is a risk of overtopping of the sea wall resulting in flooding to Preston Green and Marine Parade.

5.4.5 Paignton Sea Front

The sea wall from Redcliffe Hotel to Paignton Harbour acts as a flood defence and protects the low-lying areas of Paignton Town Centre, stretching from the Eastern Esplanade to the railway line, during high tides. However, at times of high tides and strong easterly winds there is a risk that the sea wall will be overtopped resulting in extensive flooding to Paignton Green, public highways, internal and external properties and public open spaces.

In addition to the coastal flooding problem in this area, flooding also occurs during high tides that coincide with storm events due to the hydraulic overload of Victoria Stream. As a

result, it is sometimes very difficult to differentiate from which source the flooding has occurred.

As ground levels in the low-lying area of Paignton are predominantly below highest astronomical tide levels it can be seen that once the flood defence has been overtopped the area suffering flooding is extensive, as can be seen on the flood risk maps.

5.4.6 Goodrington Beach

The sea wall from Roundham Head to Cliff Park Road acts as a sea defence protecting the low-lying area of Goodrington Park during high tides. However, at times of high tides and strong easterly winds there is a risk that the sea wall will be overtopped resulting in extensive flooding to Goodrington Park, buildings, Quay West, the railway, Dartmouth Road, Youngs Park Road and Tanners Road.

5.4.7 Broadsands Beach

The sea wall at Broadsands beach acts as a flood defence protecting the low-lying car park and public open space during high tides. However, at times of high tides and strong easterly winds there is a risk that the sea wall will be overtopped resulting in coastal flooding.

5.4.8 Brixham Harbour

The sea wall around Brixham inner harbour acts as a flood defence protecting the low-lying area of Brixham town centre. However, at times of high tides and strong easterly winds there is a risk that the harbour wall will be overtopped. This overtopping will result in flooding to highways and properties around the quayside and through Bank Lane up to Brixham Town Hall.

5.5 Sewer Flooding

The public sewer system within Torbay is the responsibility of South West water and as mentioned previously the system consists of predominantly a combined sewer system. In certain areas such as Paignton Town Centre, Cockington and the newer developments, separate foul and surface water sewers exist. The combined and surface water systems have been designed to accommodate between the 10% and 3.33% storm events. However, it is known that in certain areas properties have been flooded during storm events greater than 10%.

During storm events, where the sewer system is beaten significant flooding occurs to properties and infrastructure. In addition, flooding can result from blockages, collapses or pumping station failures within the sewer system.

Within Torbay there are seven sewer catchment areas. South West Water produce Drainage and Wastewater Management Plans, and these contain a lot of detail around the operation and future plans for the wastewater system. For information regarding the current performance of the sewer system, it is recommended that you contact South West Water.

5.5.1 Torquay – Babbacombe Catchment

The majority of this catchment is served by combined sewers, which drain, from St Marychurch by gravity to Ilsham Valley pumping station from where flows are pumped for treatment.

5.5.2 Torquay – Upton/Town Centre Catchment

This is the largest catchment within Torquay and is served predominantly by combined sewers, which drain, by gravity from the Watcombe area, through the town centre to Ilsham Valley pumping station from where flows are pumped for treatment. In addition to the surface water runoff from highways and buildings being connected to the surface water system, the River Fleet discharges at a controlled flow rate to the combined sewer system at Hele.

5.5.3 Torquay – Torre Valley Catchment

This catchment is served by a mixture of combined sewers, together with separate foul and surface water sewers especially within the Barton Lands, Edginswell, Sherwell Valley and Cockington areas of the catchment. The combined sewers discharge by gravity from Newton Road to Fleet Street pumping station, from where flows are lifted and discharge into the Upton/Town Centre catchment.

5.5.4 Paignton – Catchment Area A

This catchment serves the low lying areas of Paignton from Hollicombe to Clennon Valley and is served totally by a combined sewer system with the exception of the area around the town centre between Station Lane, Sands Road and Garfield Road where a separate surface water system exists. The combined sewer serving this catchment drains by gravity to Clennon Valley pumping station from where flows are lifted to the head end of the Grange Court to Brokenbury treatment works tunnel.

5.5.5 Paignton – Catchment Area B

This catchment serves the higher areas of Paignton such as Foxholes, Great Parks and Collaton St Mary. With the exception of new developments, which are served by separate foul and surface water systems, the catchment is served by a combined sewer system. The combined sewers drain by gravity directly to the head end of the Grange Court to Brokenbury tunnel.

5.5.6 Broadsands, Brunel, Hookhills, Galmpton and Churston Catchments

These catchments are served mainly by separate systems and the foul system discharges either directly to the Grange Court to Brokenbury tunnel or as at Churston and Galmpton flows are pumped directly to the inlet works of the sewage treatment works.

5.5.7 Brixham Catchment

Brixham is served by one sewer catchment area with sewers draining by gravity along the natural valley to the town centre where they are transferred via a tunnel to Oxen Cove pumping station. At Oxen Cove pumping station flows are pumped to the inlet works of Brokenbury sewage treatment works.

5.6 Highway Flooding

During severe storm events flooding to the highway can occur. As a result of the hydraulic design of the gullies being exceeded. Flooding can also occur due to the hydraulic design of the system that serves the gully (e.g. the public sewer) being exceeded. A further cause of highway flooding can be defective gullies or broken pipework or as a result of blockages to the gully grating from fallen leaves or debris, not allowing surface runoff to enter the gullies and hence flooding occurring.

6 Risk Based Approach to Flood Risk Assessment

Where developments are proposed in flood risk areas the developers must employ a risk based approach as outlined in NPPF in order to show that the risk of flooding has been carefully considered for its lifetime, without increasing flood risk elsewhere and where necessary mitigation has been proposed.

All plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate

change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:

a) applying the sequential test and then, if necessary, the exception test as set out below;

b) safeguarding land from development that is required, or likely to be required, for current or future flood management;

c) using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management); and

d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.

For all developments in flood risk areas together with those developments in catchment areas draining into the flood risk areas a flood risk assessment must be submitted with any planning application. The approach taken for the flood risk assessment is outlined below:

- Flood risk assessments should be carried out to the appropriate degree at all levels of the planning process to assess the risks of all forms of flooding to and from development taking climate change into account and to inform the application of the sequential approach.
- This strategic flood risk assessment has been carried out to identify the catchment wide flooding issues which affect Torbay. The information contained within this report will provide the information required to apply the sequential approach outlined below. Policies in local development documents should set out site specific requirements for flood risk assessments to be submitted with planning applications in areas of flood risk identified in the SFRA.

Requirements for all levels of flood risk assessment are given on the government website **Flood risk assessment: Flood Zones 1, 2, 3 and 3b - GOV.UK**.

Whilst Flood Zones remain the primary basis for application of the Sequential Test, site suitability should also be informed by other sources of flood risk and local flood evidence where these represent a material constraint to development. This may include surface water flooding, ordinary watercourses, culverted systems, exceedance flow routes, rapid inundation, residual flood risk and interactions between multiple sources of flooding. Where uncertainty exists regarding local flood behaviour or flood mechanisms, a precautionary approach should be adopted.

NPPF provides clear guidance on application of the sequential approach in relation to flood risk. This approach is a simple decision-making tool designed to ensure that sites at little or no risk of flooding are developed in preference to areas at higher risk. It can be applied at all levels and scales of the planning process.

6.1 The Sequential Test

The risk based Sequential Test should be applied at all stages of planning. Its aim is to steer new development to areas at the lowest probability of flooding.

The Flood Zones are the starting point for the sequential approach; however, all sources of flooding should be considered. Flood zones and surface water flooding are shown on the EA flood risk maps for planning **https://flood-map-for-planning.service.gov.uk/**. The flood zones refer to the possibility of sea and river flooding only, ignoring the presence of existing defences.

The overall aim of the decision maker should be to steer new developments to Flood Zone 1. Where there are no reasonably available sites in Flood Zone 1, decision makers identifying broad locations for development and infrastructure, allocating land in spatial plans or determining applications for development at any particular location should take into account the flood risk vulnerability of the land uses and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required. Only where there are no reasonably available sites in Flood Zones 1 or 2 should decision makers consider the suitability of sites in Flood Zone 3, taking into account the flood risk vulnerability of land and applying the Exception Test if required.

Within each Flood Zone, new development should be directed first to sites at the lowest probability of flooding and the flood vulnerability of the intended use matched to the flood risk of the site, e.g. higher vulnerability uses located on parts of the site at the lowest probability of flooding.

An LPA must demonstrate that it has considered a range of possible sites in conjunction with the Flood Zone information from the SFRA and applied the Sequential Test, and where necessary, the Exception Test, in the site allocation process. In cases where development cannot be fully met through the provision of site allocations, LPA's are expected to make a realistic allowance for windfall development, based on past trends.

Where sites have not undertaken the above process as part the development plan, applicants would be required to include information within their application to demonstrate how they have satisfied the Sequential and Exceptions Tests.

6.2 The Exception Test

Application of the Sequential Test should ensure that more vulnerable property types, such as residential housing (see **https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification**), will not be allocated to areas at high risk of flooding. In exceptional circumstances, there may be valid reasons for a development type which is not entirely compatible with the level of flood risk at a particular site to nevertheless be considered. In these circumstances, it will be necessary for the LPA or developer to demonstrate that the site qualifies for development in the manner proposed by passing all elements of the Exception Test.

The Exception Test should only be applied following application of the Sequential Test.

The Exception Test requires two additional elements to be satisfied (as set out in paragraph 164 of the National Planning Policy Framework (December 2024)) before allowing development to be allocated or permitted in situations where suitable sites at lower risk of flooding are not available following application of the sequential test.

It should be demonstrated that:

- development that has to be in a flood risk area will provide wider sustainability benefits to the community that outweigh flood risk; and
- the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

With regards to part 1 of the test, if a planning application fails to score positively against the aims and objectives of the Sustainability Appraisal (SA), the LPA should consider whether the use of planning conditions and/or Section 106 Agreements of the Town and Country Planning Act 1990, could make it do so. Where this is not possible the Exception Test has not been satisfied and planning permission should be refused.

In the absence of the site being specifically identified within the Local Plan SA, the developer will have to review the SA and provide a reasoned justification detailing how the planning application provides wider sustainability benefits to the community that outweigh flood risk. LPA's may consider the use of a sustainability checklist for this purpose.

6.3 Windfall Sites

Proposed developments for "windfall" sites will by definition not derive from an allocation in a development plan that has been sequentially tested. Such sites will, therefore, need to be subject to the Sequential and, if necessary, the Exception Tests at the planning application stage. Planning applications that are submitted as windfall sites where the Sequential Test has already been applied satisfactorily will also be subject to the Exception Test. The Exception Test should only be applied after the Sequential Test has been satisfied. When applying the Exception Test for planning applications, the developer is expected to demonstrate to the LPA that the application delivers wider sustainability benefits that outweigh the flood risk implications of developing a site. To help assist the application of the Exception Test to these sites, LPA's are advised to create a series of locally targeted sustainability checklists based on the aims and objectives of the SA framework. In the absence of a Sustainability Appraisal, the checklist should reflect the Government's sustainability strategy.

6.4 Flood Risk Vulnerability Classifications

The principal driver for the classification of flood risk vulnerability in **National Planning Policy Framework - Annex 3: Flood risk vulnerability classification - Guidance - GOV.UK** is the risk to human life posed by flooding, closely followed by the implications for human stress, health and well being. The extensive loss of life, which occurred in the 1935 floods, along the east coast of England, are a reminder of the devastating effect that floods can have on communities.

New developments should be categorised according to **National Planning Policy Framework - Annex 3: Flood risk vulnerability classification - Guidance - GOV.UK**, where land uses are different from those included in the table, a risk based approach should be adopted to ensure that any increase in risk to life is kept to an absolute minimum. Ultimately, it is the responsibility of the planning authorities to decide what level of risk is acceptable.

7 Strategies for Managing Flood Risk

7.1 General

Where developments are proposed within a catchment area discharging into a flood risk area, whether it be from rivers, watercourses, coastal or sewer flooding the developer must submit a flood risk assessment with the planning application. The catchment areas and flood risk areas are highlighted within this report. The flood risk assessment must follow the risk-based approach outlined in section 6 of this report. In addition, the developer must identify how he proposes to deal with surface water runoff from his site and how he will mitigate the risk of flooding for the lifetime of the development.

7.2 Torbay Council Strategies for Managing Flood Risk

The following strategies have been developed by Torbay Council for managing flood risk and these strategies must be considered for all proposed developments. The strategies are as follows:

- Making Space for Water
- Managing Surface Water
- Sustainable Drainage
- Climate Change
- Improving Habitat for Wildlife
- Considering Access/Egress to Properties
- Opening Culverts
- Natural Flood Management (NFM)/Nature based solutions (NBS)
- Urban Creep

- Cumulative Effect

Details of each strategy are identified below.

7.3 Strategy 1 Making Space for Water

At the planning application stage, an appropriate Flood Risk assessment will be required to demonstrate how flood risk from all sources of flooding to the development and flood risk to others will be managed now and taking climate change into account.

The Flood Risk Assessment should identify and assess the risks of all forms of flooding to and from the development and demonstrate how the flood risks will be managed, taking climate change into account. For all developments, the Flood Risk Assessment should identify opportunities to reduce probability and consequence of flooding.

As part of this strategy the developer is encouraged to deal with excessive flood risk by allowing areas of the development such as open space to flood. The developer should also utilise other areas of the development such as highways to act as carriers of floodwater to the open space designed for dealing with the excessive flood risk. When designing flood storage and carriers of this nature the developer must ensure that there is no risk of flooding to properties or that the flooding is not to a depth that will result in a risk to the public.

7.4 Strategy 2: Managing Surface Water

Flooding results both from sources external to the development site and rain falling onto and around the site. The sustainable management of the rainfall, described as surface water, is an essential element of reducing future flood risk to both the site and its surroundings. Assessment of surface water and drainage will be required as part of the Flood Risk Assessment.

Undeveloped sites generally rely on natural drainage to convey or absorb rainfall, the water either soaking into the ground or flowing across the surface into watercourses, providing a natural flow of environmental and ecological benefit.

The effect of development is generally to reduce the permeability of at least part of the site. This markedly changes the site response to rainfall. Without specific measures, the volume of water that runs off the site at peak runoff rate is likely to increase. Inadequate surface

water drainage arrangements in new developments can threaten the development itself and increase the risk of flooding to others.

The effective disposal of surface water from the development is a material planning consideration in determining proposals for the development and use of land. It will always be much more effective to manage surface water flooding at and from new developments early in land acquisitions and design process rather than resolve problems after development. Site layout should be influenced by topography. The location of buildings where surface water may flow naturally, or as a result of development, under extreme circumstances must be avoided if possible.

Surface water arising from a development site should as far as practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account. This must be demonstrated as part of the Flood Risk Assessment. Surface water management should preserve existing exceedance pathways and avoid development layouts that obstruct or redirect overland flood flows in a way that increases risk elsewhere.

The runoff destination hierarchy as stated in the National Standards for Sustainable Drainage Systems **National standards for sustainable drainage systems (SuDS) - GOV.UK** should be applied and is detailed below:

- priority 1: collected for non-potable use
- priority 2: infiltrated to ground
- priority 3: discharged to an above ground surface water body
- priority 4: discharged to a surface water sewer, or another piped surface water drainage system
- priority 5: discharged to a combined sewer

Note 1: priority 1 is the highest priority and priority 5 is the lowest.

Note 2: for the purposes of this standard, a combined sewer is a sewer intended to receive both foul sewage and surface runoff and does not include a sewer intended to receive only

foul sewage, even if it has the capacity to accommodate additional flows or has an element of surface water in it already.

7.5 Strategy 3: Sustainable Drainage

The term sustainable drainage systems (SUDS) is frequently used to cover the whole range of sustainable approaches to surface water drainage management including:

- Source control measures including rainwater recycling and drainage.
- Infiltration devices to allow water to soak into the ground, that can include individual soakaways and communal facilities.
- Filter strips and swales, which are vegetated features that hold and drain water downhill mimicking natural drainage patterns.
- Filter drains and porous pavements to allow rainwater and runoff to infiltrate into permeable material below ground and provide storage if needed.
- Basins and ponds to hold excess water after rains and allow controlled discharge that avoids flooding.

Torbay Council promotes the use of SUDS for the management of surface water runoff. All SUDS schemes should comply with Building Regulations, Part H on sustainable rainwater drainage.

Site layout and surface water drainage system should cope with events that exceed the design capacity of the system; the excess water can be safely stored on or conveyed from the site without adverse impacts.

The surface water drainage arrangements for any development site should be such that the volumes and peak flow rates of surface water leaving a development site are no greater than the rates prior to the proposed development, unless specific off-site arrangements are made and result in the same net effect.

For new development it may be necessary to provide surface water storage and infiltration to limit and reduce both the peak rate of discharge from the site and the total volume discharged from the site. There may be circumstances where it is appropriate for infiltration

attenuation storage to be provided outside the development site, if necessary, through the use of a Section 106 agreement.

Torbay Council's SUDS guide **suds-design-guide-version-20_sept22.pdf** should be used along with the National Standards for Sustainable Drainage Systems **National standards for sustainable drainage systems (SuDS) - GOV.UK** and the most up to date CIRIA Suds Manual.

7.6 Strategy 4: Climate Change

There is an increasing body of scientific evidence that global climate is changing as a result of human activity. Past, present and future emissions of greenhouse gases are expected to cause significant global climate change during this century. The nature of climate change at a regional level will vary however for the UK projections indicate that more frequent short duration high intensity rainfall and more frequent periods of long duration rainfall will be expected together with sea level rise. These kinds of changes will have implications for river and watercourse flooding together with local flash flooding.

In order to assist with the assessment of vulnerability to climate change the Government established the UK Climate Impacts Programme (UKCIP). Scenarios of future climate change in the UK were produced for the UKCIP in 2002 and published by DEFRA. Since the publication of this document the scenario information has been revised, expanded and developed and the latest guidance was published by DEFRA in 2018, UKCP18.

Global sea level will continue to rise, depending on greenhouse gas emissions and the sensitivity of the climate system. The relative sea level rise in England also depends on the local vertical movement of the land, which is generally falling in the south-east and rising in the north and west. Allowances for the regional rates of relative sea level rise shown below should be used as a starting point for considering flooding from the sea, along with the sensitivity ranges for wave height and wind speed in preparing flood risk assessments.

The rise in sea level will change the frequency of occurrence of high water levels relative to today's sea levels, assuming no change in storminess. There may also be secondary impacts such as changes in wave heights due to increased depths, as well as possible changes in the frequency, duration and severity of storm events.

Extensive, low-lying coastal lands are particularly susceptible to flooding. Changes to the drivers associated with coastal erosion (surges, waves, coastal sediment supply and morphology, and relative sea level rise) will affect probability of flooding to new developments.

The climate changes already seen in the UK suggests that winters will become wetter by as much as 50% by the 2070's. A shift in seasonal pattern of rainfall is also expected, with summers and autumns becoming much drier than at present.

The Environment Agency provide an online mapping tool that identify the climate change allowances that should be used (**Climate change allowances for peak rainfall**). Knowledge and understanding of climate change is continuing to grow. The most up-to-date guidance on climate change and flooding from the EA, DEFRA and UKCIP should be considered in the preparation of site specific flood risk assessments.

7.7 Strategy 5: Improving Habitat for Wildlife

As part of the detailed design for flood alleviation measures the developer should consider whether it is possible to improve the habitat for wildlife by using buffer strips or wildlife corridors. This would be implemented where considering the use of filter strips, swales or basins and ponds. All of these will provide ideal habitat for various different species of birds and other wildlife. In addition, the developer should consider the type and nature of planting at these features and at areas where flooding may occur.

7.8 Strategy 6: Consider Access/Egress to Buildings

As part of the Flood Risk Assessment the developer must demonstrate that the finished floor level of buildings is above the 1 in 100 year flood level. Development proposals should consider the potential impact of flooding on access and egress routes for the lifetime of the development. Consideration should be given to flood depth, velocity, hazard, duration, residual flood risk and the potential for routes to be affected by surface water flooding, rapid inundation or other local flood mechanisms.

7.9 Strategy 7: Opening Culverts

Where an existing main river, watercourse of ditch has been culverted and crosses a development site the developer should investigate the possibility of opening the culvert pipes. (i.e. removing the culvert and returning the main river, watercourse or ditch to its open condition.) Prior to carrying out this work the developer must demonstrate that the

design of the naturalisation will not result in an increased risk of flooding to the site and elsewhere. Culverted watercourses may present significant residual flood risk where blockage, surcharge or failure occurs. Development must avoid increasing these risks and opportunities to restore or better manage culverted systems should be supported where feasible. The Environment Agency for main rivers and Torbay Council as Lead Local Flood Authority for ordinary watercourse must approve all works of this nature.

7.10 Strategy 8: Natural Flood Management

Natural Flood Management (NFM), also referred to as Working with Natural Processes (WwNP), uses natural catchment processes to slow, store and filter water, helping to reduce flood risk whilst delivering wider environmental benefits. NFM measures may include floodplain restoration, woodland creation, wetland creation, river restoration, soil and land management, runoff reduction and exceedance flow management.

NFM can provide multiple benefits including flood risk reduction, climate resilience, biodiversity enhancement, water quality improvements and support for Biodiversity Net Gain (BNG). Opportunities to incorporate NFM and wider nature-based solutions should be considered early in site specific FRAs and integrated where proportionate and feasible as part of a catchment-based approach to managing flood risk. NFM measures should not be used as means to offset loss of functional flood storage, justify development in a flood zone or replace compensatory storage requirements.

The effectiveness of NFM is dependent upon the type, location and scale of measures implemented. A key factor in whether NFM proposals will be impactful is whether the scale of intervention is proportionate to the scale of flood risk experienced by communities and infrastructure downstream. To provide meaningful flood risk benefits, measures should be delivered at an appropriate scale and in locations that address the sources and pathways contributing to downstream flood risk.

Where flood risk reduction benefits from NFM are relied upon, these should be supported by evidence and assessment proportionate to the scale of the proposal. Applicants and decision makers should have regard to the latest Environment Agency Working with Natural Processes evidence and guidance when considering NFM proposals.

7.11 Strategy 9: Urban Creep

Urban creep which is the gradual increase in impermeable surfaces within existing developed areas can significantly increase surface water flood risk by reducing natural infiltration and increasing runoff rates. The cumulative effect of household extensions, paving of gardens, and loss of permeable green space can exceed the capacity of local drainage systems, contributing to more frequent surface water exceedance and increased pressure on both public and private drainage infrastructure.

It is important to retain permeable surfaces in any designs. FRA's should consider the additional runoff generated by urban creep in their surface water designs, this is particularly important in areas with known drainage constraints or historic surface water flooding.

7.12 Strategy 10: Cumulative Impacts

The cumulative effects of development should be considered where relevant, particularly where multiple developments may influence flood storage, flood conveyance, runoff generation, drainage system performance or residual flood risk. Incremental changes may contribute to increased flood risk over time even where the impact of individual developments is limited.

Developers should work with Torbay Council's Lead Local Flood Authority, the Environment Agency and LPA to deliver flood risk improvements at an early stage of the development. The Critical Drainage Area is established to mitigate downstream flooding by managing the cumulative effects of surface water runoff from multiple development sites within sensitive catchment areas. More information on this can be found in the level 2 SFRA.

8 Technical Guidance for Planning Officers and Developers

8.1 General Guidance

The government aims to reduce the risks to people and the developed and natural environment from flooding by discouraging further built development within flood risk areas. Government guidance has been produced for local planning authorities to help them when allocating land for development in order to meet this aim. This is contained in a document called National Planning Policy Framework (NPPF).

In undertaking the SFRA this has been examined and used to provide a robust and consistent system for assessing flood risk anywhere within the local planning authority area.

Site specific flood risk assessments should consider all relevant local flood mechanisms, including those not fully represented within strategic mapping, where evidence indicates material risk. Development proposals should demonstrate that they will not reduce flood storage, obstruct flood conveyance, worsen residual flood risk, compromise exceedance routes, increase flood hazard elsewhere or create unsafe access arrangements. Torbay Council flood policies can require that development does not result in the intensification of an existing use, including within the same vulnerability classification, where this would increase occupancy or otherwise worsen the potential risk to life.

In order to assist with the process, we draw attention to the following issues within the Torbay Council area.

8.2 Residual Flood Risk

Residual flood risk may arise from mechanisms that are not fully represented within strategic flood mapping, including infrastructure blockage, structural failure, culvert surcharge, exceedance flow routes, overtopping, defence failure and interactions between multiple sources of flooding. These mechanisms should be recognised where relevant when considering flood risk, development suitability and flood resilience.

8.2.1 Areas Sensitive to Flooding

Due to past flooding incidents certain areas have been highlighted by Torbay Council drainage engineers as sensitive to flooding. Any development in the vicinity of these areas, especially upstream, should be investigated regarding the potential impact of new development on these areas. Figure 3 below shows the areas which are particularly sensitive to flooding within Torbay.

8.2.2 Rapid Inundation Zones

Fast flowing water or deep flooding that occurs quickly can create a risk of loss of life. This can happen if flood defences fail or is overtopped, or in steep catchments through flash flooding. This type of flooding for the purpose of the SFRA is referred to as Rapid Inundation.

Rapid inundation zones are characterised for this SFRA as a flood of 30cm depth of floodwater within 30 minutes of overtopping or breaching of flood defences. It is prudent to consider that where raised defences are designed with a standard of protection of greater than 1 in 100 years, the area designated within Flood Zone 3 should be regarded as a rapid inundation zone. This is because water behind the raised defence can build up to a level higher than the surrounding land. If the raised defence collapsed, or water spills over the top of the defence, a large amount of floodwater could very quickly flood nearby land.

Figure 4 identifies areas in Torbay where there is a potential for rapid inundation.

Location	Source of flooding	Reason
Torquay Town Centre	Combined Sewers	High flows can exceed capacity of sewer systems causing flooding.
Torquay Harbour	Tidal	High tides and easterly winds can result in flooding. In addition surface water outlets to harbour can become tide locked.
Torre Abbey/ Torquay Sea Front	Tidal	High tides and easterly winds can result in flooding.
Torquay Recreation Ground	Torre Abbey Watercourse	High tides causes tide locking meaning Torre Abbey stream cannot discharge leading to backing up and causing flooding.
Livermead Sea Front	Tidal	High tides and easterly winds can result in flooding.
Cockington	Cockington Watercourse	High flows exceeding capacity of watercourse causing flooding.

Location	Source of flooding	Reason
Torbay Road, Hollicombe	Hollicombe Watercourse	High flows exceeding capacity of watercourse causing flooding.
Shorton Valley/Occombe Valley	Occombe Valley Main River	High flows exceeding capacity of culverts causing flooding.
Paignton Town Centre	Victoria Stream Main River/Tidal	Tide locking means the main river cannot discharge leading to backing up and flooding during heavy rainfall. In addition high tides and easterly winds can result in severe flooding.
Paignton and Preston Sea fronts	Tidal	High tides and easterly winds can result in severe flooding.
Kings Ash Road, Totnes Road and Dartmouth Road	Clennon Valley Main River	High flows exceeding capacity of culverts causing flooding. In the lower reaches tide locking reduces the capacity of the outlet leading to backing up and flooding.
Goodrington	Tidal	High tides and easterly winds can result in flooding.
Totnes Road, Stoke Road	Yalberton Main River	High flows exceeding capacity of culverts causing flooding.

Location	Source of flooding	Reason
Churston Village	Churston Main River	High flows exceeding capacity of culverts causing flooding.
Galmpton	Galmpton Main River	High flows exceeding capacity of culverts causing flooding.
Higher Brixham	Higher Brixham Main River	High flows exceeding capacity of culverts causing flooding.
Brixham Town Centre	Tidal	High tide levels can lead to flooding
Torbay	Surface water	Due to the steep urbanised area surface water flooding can occur in a short space of time

Figure 3 - Areas Particularly Sensitive to Flooding

At Risk Location	Reason
Downstream of Stoke Road Flood Storage Area	The dam located on the Yalberton main river, has an area behind it to store a certain amount of water. Should the capacity of the storage area be exceeded water will overtop the dam resulting in severe flooding downstream.

At Risk Location	Reason
Downstream of the storage lagoon at The Willows	The storage lagoon, located on the Aller Valley main river, can store a certain amount of water behind the controlling raised embankment. If this capacity be exceeded or the embankment fail significant flooding would occur to the existing developments within the Aller Valley.
Downstream of Great Parks storage lagoon	The storage lagoon, located on the Clennon Valley main river, can store a certain amount of water behind the controlling raised embankment. If this capacity be exceeded or the embankment fail significant flooding would occur to the existing downstream developments.
Downstream of Coombe Park storage pond	The storage pond, located on the Occombe Valley main river, can store a certain amount of water behind the controlling raised embankment. If this capacity be exceeded or the embankment fail significant flooding would occur to the existing downstream developments.
Downstream of Laywell Reservoir	The underground storage tank at Laywell reservoir, located on the Higher Brixham main river, can store a certain volume of water. Should this volume be exceeded excess flows will overtop the weir and discharge downstream. These excess flows would result in significant flooding to the existing properties downstream.

Figure 4 - Areas where there is potential for Rapid Inundation

Where development is proposed within or adjacent to a rapid inundation zone, consideration should be given to the potential implications for flood hazard, development safety, access and egress, emergency response and evacuation. Site-specific assessments should demonstrate that these factors have been appropriately considered where relevant.

8.3 Coastal Flooding

If high tides combine with strong easterly winds, then the winds can create waves, which can crash against sea defences causing spray. In severe storms waves can crash over defences leading to flooding in nearby low-lying land. This is called coastal flooding. It can also cause damage to structures through the force of the waves and the material and debris being carried by the waves. Areas at risk from coastal flooding include Torre Abbey, Livermead, Paignton town centre, Preston sea front, Goodrington, Broadsands, Meadfoot, Torquay Harbour and Brixham Harbour.

8.4 Ground Water

Ground water flooding occurs when water stored below ground reaches the surface. It does not have to occur near a river, or even when it is raining, and is often associated with porous ground such as sands, gravels, limestone and chalk.

Overall ground water flooding within Torbay has not been a major problem. However, it is known that it can be a problem in low-lying coastal areas such as the Torquay Harbour area, Paignton town centre and Brixham.

It is a NPPF requirement that the potential effects of ground water flooding must be assessed in any FRA.

8.5 Defences

Proposed development in or near areas where there is an existing flood defence must be closely examined in order to ensure that future development does not reduce the standard of protection provided by those defences for existing developments. Furthermore, it should not be assumed that the standard of protection provided by the defence is still as quoted when the defences where designed. Changes in flood estimation procedures and allowances for climate change can mean that the standard of protection may have been decreased. It is very important that this is investigated during a flood risk assessment to ensure that existing and new development has the appropriate level of protection; for the 1% probability flood for protection from watercourse and river flooding and the 0.5% probability flood for protection from coastal flooding.

8.6 Surface Water Runoff

Surface water flooding happens usually from very heavy rainfall when the water cannot soak away into the ground or find its way into drains. This type of flooding can happen away from rivers, such as water flowing off fields and along roads. It can be a particular problem in urban areas where there is little permeable area (soil, grass, woodland, etc.) and mainly impermeable areas (roads, pavements, driveways, etc.).

Flood risk from surface water flooding is of concern within the study area. A number of flood incidents have occurred within the area caused by surface water alone, or in combination with watercourse flooding.

Any change in land use will result in a change to the surface water runoff, which is generated from the site. In order to meet NPPF considerations, the effect of this change in runoff must be quantified and investigated in order to gauge any potential effect on flood risk from surface water within the development site itself and in the off site vicinity. Where surface water runoff may be increased, this must be dealt with using Sustainable Urban Drainage Systems (SUDS) and must comply with the requirements of the Torbay Critical Drainage Area.

8.7 Managed Coastal Retreat and Coastal Change Management Areas

The idea of managed coastal retreat is about planning for the threat of rising sea levels by looking at the options available to protect the coastline. In some areas it may not be suitable to build bigger flood defences to protect against flood risk. It may even be necessary to remove some defences, especially on eroding cliffs, which could provide extra material such as sand and silt for the sea to deposit elsewhere. Managed coastal retreat may also mean setting back sea walls so that beaches, salt marshes and other natural features can help in defending from the sea.

As part of the study area is adjacent to the coast, in the future, managed coastal retreat may become a relevant planning issue for the area. Under the NPPF, coastal areas are treated as high-risk environments where planning decisions must account for both current and future hazards, including erosion, sea-level rise, storm surges and coastal flooding. Much of the coastline in Torbay consists of cliffs and where beaches exist, they are backed by concrete or masonry sea walls. At present there are no known plans for managed coastal retreat within Torbay, and it is unlikely this will be an option in the foreseeable future due to the nature of the area.

More information on the risk of cliff erosion can be found on the Shoreline Management Plan Explorer, available on the government website **Home | Shoreline Management Plans**.

Ongoing coastal erosion and the increasing flood risks driven by climate change may result in some existing development and infrastructure becoming unsustainable in the long term. This includes areas that are, or are expected to become, affected by coastal erosion identified through Coastal Change Management Areas; places likely to be permanently inundated by the sea or tidal estuaries/rivers; or locations that may experience flooding so frequently that they effectively become intertidal. In such cases, where there is little or no realistic prospect of adequately reducing these risks through new or upgraded flood and coastal erosion risk management infrastructure or through property-level resilience measures continued occupation or use may not be viable.
Further details on CCMA and coastal change is provided within the relevant sections of the Local Plan

9 Flood Warnings and Evacuation Procedures

Within the study area, as for the rest of England and Wales, the responsibility for flood warning rests with the Environment Agency. The Environment Agency provides flood alerts and flood warnings for designated areas. Within the study area the designated areas are as follows:

Flood alerts

- South Devon Coast from Start Point to Dawlish Warren
- River Dart area
- River Teign area

Flood Warnings

- South Devon Coast between Beesands and Dawlish
- South Devon Coast at Torbay
- South Devon Coast at Paignton

The direct warning service requires people in at risk properties to sign up with the Environment Agency on the government website **Get flood warnings by text, phone or email - GOV.UK**. They can then receive automatic warning messages if a flood is likely.

The Environment Agency provide an online service for flood alerts and flood warnings which is on the government website **Flood alerts and warnings - GOV.UK**.

Flood evacuation planning is a function of the Torbay Council Emergency Planning Department, with input from the Environment Agency and other relevant organisations. Evacuation planning exists for certain urban centres at risk from flooding from the sea. Within the study area the low-lying area around Paignton town centre has a Major Incident Plan in place.

Safety and evacuation procedures should be addressed for developments within Environment Agency flood zone 3 and flood zone 2. Provisions such as refuges and safe exit routes out of the site which are above flood levels should be incorporated into the design of such sites. Access for emergency vehicles will also need to be considered.
Any major development within the urban areas with an existing Major Incident Plan should consider the impact of new development on the existing plan. It should be ensured that the procedures can be applied to the new development or modified if necessary, in conjunction with Torbay Council and the Environment Agency.