Scottish Environment Protection Agency

Buidheann Dìon Àrainneachd na h-Alba

SEPA Flood Risk Standing Advice for Planning Authorities and Developers

November 2020

Every day SEPA works to protect and enhance Scotland's environment, helping communities and businesses thrive within the resources of our planet.

We call this **One Planet Prosperity**

INTRODUCTION

This is standing advice from the Scottish Environment Protection Agency (SEPA) on **flood risk.** Although this advice is principally aimed at planning authorities, developers will also find it useful. All other standing advice can be found in our 'Standing Advice for Development Management Consultations'.

This document provides advice on a number of categories of development. Planning Authorities should not consult us on proposals for these types of development, but instead follow the advice provided. In some cases, local authority flood risk management staff may require some aspect of flood risk to be investigated in a Flood Risk Assessment (FRA). Provided that our standing advice is followed, SEPA should not be consulted.

Any type of development that involves landraising in the functional floodplain is not covered by this standing advice, and SEPA should therefore still be consulted on such proposals. Landraising is the process of raising ground levels in order to remove or partially remove a site from an area of flood risk. Doing so reduces the ability of the functional floodplain to store or convey water and can increase flood risk elsewhere.

This guidance excludes development consented under The Roads Scotland Act, or other Acts of Parliament, Environmental Impact Assessment Regulations or developments identified in the current National Planning Framework: SEPA should be consulted on such development and will provide a bespoke response.

We may need to be consulted on some of these developments for reasons other than flood risk (e.g. engineering works in the water environment). In such instances, this standing advice still applies to the flood risk aspects affecting the development. More than one category of standing advice may be applicable depending on the nature of the development in question.

Developers should be aware that we regulate a number of matters that may be applicable to development covered by this standing advice. To ensure proposals will meet all relevant regulatory requirements, please refer to the authorisations and permits page of our website. Best practice advice in relation to pollution prevention is available on the Net Regs website.

Scottish Planning Policy (SPP) (2014) states that the planning system should promote flood avoidance by locating development away from functional floodplains. Planning authorities

and developers should therefore be aware in their decision-making of the risks involved in placing additional people and property at risk of flooding. The consequences of flooding can be both temporary and long-lasting, tangible and intangible, and can include the following (in no particular order of impact or severity), all, some, or none of which may be applicable to the development types covered by this standing advice:

- Loss of human life.
- Impact on health, including mental health due to loss, disruption and concern over future flooding events.
- Depreciation in property value and inability to gain future insurance cover.
- The need to relocate on a temporary basis (albeit this can be for several months or years).
- Loss of, or damage to, personal possessions and property, including irreplaceable items.
- Loss of, or damage to, utility supplies and transportation infrastructure.
- Loss of earnings.
- Loss of life to pets and livestock, and damage to crops.

STANDING ADVICE FOR PLANNING AUTHORITIES

For the categories of development listed overleaf, SEPA has no site-specific flood risk advice. You should consult with your flood risk management colleagues for their flood risk advice if required. Their advice should be taken into consideration when determining the application. This standing advice should not be considered to constitute a formal response from SEPA (i.e. an objection, non-objection etc.).

Any type of development that involves landraising in the functional floodplain is not covered by this standing advice, and we should therefore still be consulted on such proposals.

- Developments where the only source of flood risk is from surface water

- Changes of use within a vulnerability category or to a lower category of vulnerability (this includes developments in areas protected by a flood protection scheme), where there is no change to the overall footprint of the development and the overall flood risk has not increased
- Extensions of all sizes to single residential dwellings, including the provision of new overnight accommodation/bedrooms but excluding the formation of an entirely new dwelling
- The formation of new (or alterations and extensions to existing) garages, sheds, conservatories, greenhouses and other buildings that are incidental to the enjoyment of a main residential dwelling house
- Essential infrastructure or water compatible uses
- Cemeteries
- Small-scale street furniture (flagpoles, signage, benches, street-lights etc.)
- Walls, fences and other means of property enclosure/demarcation, including erection of new and raising of existing structures. This does not include embankments if they are not formally constituted under flood prevention legislation.
- Like-for-like replacement of watercourse crossings, culverts and bridges
- Hydro schemes
- Footpaths, access tracks, private roads, car parks and other landscaping proposals (includes replacements and extensions)
- Open-sided agricultural buildings and structures (including poly-tunnels)
- Septic tanks and soakaways
- Temporary construction accommodation
- Reverse vending machines required to deliver Scotland's Deposit Return Scheme

ADDITIONAL INFORMATION FOR LOCAL AUTHORITY FLOOD RISK MANAGEMENT STAFF

The quick links below give additional information for local authority flood risk management staff, which they **may** wish to refer to when providing advice on flood risk. If the local authority requires an FRA to be carried out to assess any aspect of the proposal, SEPA's Technical Flood Risk Guidance may be useful to assist with obtaining or interpreting any such

assessment. **Do not consult us for flood risk advice on proposals for these types of development:**

1. Developments where the only source of flood risk is from surface water
2. Changes of use within a vulnerability category or to a lower category of vulnerability (this includes developments in areas protected by a flood protection scheme), where there is no change to the overall footprint of the development and the overall flood risk has not increased
3. Extensions of all sizes to single residential dwellings, including the provision of new overnight accommodation/bedrooms but excluding the formation of an entirely new dwelling
4. The formation of new (or alterations and extensions to existing) garages, sheds, conservatories, greenhouses and other buildings that are incidental to the enjoyment of a main residential dwelling house
5. Essential infrastructure or water compatible uses
6. Cemeteries
7. Small-scale street furniture (flagpoles, signage, benches, street-lights etc.)
8. Walls, fences and other means of property enclosure/demarcation, including erection of new and raising of existing structures. This does not include embankments if they are not formally constituted under flood prevention legislation.
9. Like-for-like replacement of watercourse crossings, culverts and bridges
10. Hydro schemes
11. Footpaths, access tracks, private roads, car parks and other landscaping proposals (includes replacements and extensions)
12. Open-sided agricultural buildings and structures (including poly-tunnels)
13. Septic tanks and soakaways
14. Temporary construction accommodation
15. Reverse vending machines required to deliver Scotland's Deposit Return Scheme
16. Glossary

1. **Developments where the only source of flood risk is from surface water**

- All developments should consider how they will manage rain and surface water run-off to avoid the risk of flooding to the new development, to adjacent developments and to any watercourses where surface water is discharged. The CIRIA SUDS Manual (C753) sets out how SUDS should be designed and constructed to meet all requirements in relation to:
    - Managing water quantity and flood risk (up to the 1:200 year event)
    - Managing water quality
    - Providing benefits for people and place by being integrated into and enhancing the landscape quality and considered part of the wider green infrastructure network
    - Providing benefits for biodiversity

- **The following points relate to the management of pre-existing surface water flood risk only.**
- Proposed developments with complex surface water hazards should ensure that the surface water flood risk is adequately assessed and managed within the site boundary (more strategic solutions are also acceptable provided they are able to be secured via the land use planning process).
- SPP states that infrastructure and buildings should generally be designed to be free from surface water flooding in rainfall events where the annual probability of occurrence is greater than 0.5% (1:200 year). Local authorities are best placed to assess and manage the different components of surface water flooding in relation to new development, either directly as part of their existing responsibilities in relation to roads and flood risk management, or collaboratively with Scottish Water where Scottish Water intends to adopt any surface water management infrastructure.
- SEPA's Flood Maps have a surface water flooding layer. It has been delivered to planning authorities to support the consideration of such matters within the land use planning system and they are publically available on our website. The map combines pluvial sources and sewer model outputs to provide a strategic assessment of surface water flood risk.
- Development should not take place within a flow path (i.e. natural, modified or SUDs exceedance flow path), as this could increase flood risk to existing as well as new

development required. Note also that any landraising in areas where surface water flows and ponds may only serve to increase flood risk to existing receptors by deflecting water towards them.

- Residential development in lower ground/basement floors should be avoided where surface water flood risk is significant and cannot be mitigated, as it can pose a risk to life. This is due to potential rapid inundation where water could pour in from above head height.
- Safe and flood free access and egress should be provided. This means the provision of a safe and flood free route during the relevant flood probability event that enables the free movement of people of all abilities (on foot or with assistance) both to and from a secure place that is connected to ground above the design flood level and/or wider area.
- We recommend that finished floor levels should be set 600mm above the design flood level where appropriate and practicable in order to provide an allowance for freeboard.
- Developers should accept that buildings and other structures could be damaged during a surface water flood event if they are located in or near to an area that floods. They should therefore be designed to be flood resistant and resilient, as this will mitigate the level of risk. Flood resilient buildings are designed to reduce the impact of flood water entering the building so that damage is minimised. In comparison, flood resistant buildings are designed to prevent or minimise the entry of water into the building in the first place. The appropriate resilience and resistance measures will depend on the characteristics of the design flood; this includes the estimated flow velocity, inundation rate, depth that flood water will reach in the building and the duration of the flood event. Specific guidance on flood resilient and resistant construction techniques can be found in the CIRIA 2019 code of practice and guidance for property flood resilience, and you may wish to consult with the local authority building standards team regarding this issue.
- Where development is a replacement for existing development of the same type, opportunities for flood risk betterment should be explored.

2. **Changes of use within a vulnerability category[1] or to a lower category of vulnerability[2] (this includes developments in areas protected by a flood protection scheme[3]), where there is no change to the overall footprint of the development and the overall flood risk has not increased**

- Safe and flood free access and egress should be provided where possible. This means the provision of a safe and flood free route during the relevant flood probability event that enables the free movement of people of all abilities (on foot or with assistance) both to and from a secure place that is connected to ground above the design flood level and/or wider area.
- A reduction in flood risk can be achieved through the incorporation of flood resistant and resilient materials and design, and the raising of finished floor levels where practicable. The CIRIA 2019 code of practice and guidance for property flood resilience is a useful source of information and you may wish to consult with the local authority building standards team.
- We recommend that finished floor levels should be set 600mm above the design flood level where appropriate and practicable in order to provide an allowance for freeboard. We recommend that an allowance for climate change should be included when calculating the design flood level, independently of an allowance for freeboard, as per our Guidance on Climate Change Allowances for Flood Risk Assessment in Land Use Planning.
- Developers should accept the risk that their structures could be damaged during a flood event if proposing to build in or near an area that could flood, and should therefore design them to be flood resistant and resilient. Flood resilient buildings are designed to reduce the impact of flood water entering the building so that damage is minimised. In comparison, flood resistant buildings are designed to prevent or minimise the entry of water into the building in the first place. The appropriate resilience and resistance measures will depend on the characteristics of the design flood; this includes the estimated flow velocity, inundation rate, depth that flood water will reach in the building and the duration of the flood event. Specific guidance on flood

[1] Use our Land Use Vulnerability Guidance to establish the vulnerability of the existing and proposed land uses to flood risk.
[2] Excludes changes to any residential/overnight use for (i) changes within a vulnerability category and (ii) lower categories of vulnerability.
[3] As defined in SEPA's Position on Development Protected by a Flood Protection Scheme.

resilient and resistant construction techniques can be found in the CIRIA 2019 code of practice and guidance for property flood resilience, and you may wish to consult with the local authority building standards team.

3. **Extensions of all sizes to single residential dwellings, including the provision of new overnight accommodation/bedrooms but excluding the formation of an entirely new dwelling**

- Extensions, even very small ones, have the potential to impact on local flood risk. They can introduce more people to an area of flood risk, particularly during the night time, and therefore increase the risk to life. They may also deflect water to other nearby receptors. We recommend that these issues be carefully considered in the design and decision-making process.
- A reduction in flood risk can be achieved through the incorporation of flood resistant and resilient materials and design, and the raising of finished floor levels where practicable. The CIRIA 2019 code of practice and guidance for property flood resilience is a useful source of information and you may wish to consult with the local authority building standards team.
- Safe and flood free access and egress should be provided where possible. This means the provision of a safe and flood free route during the relevant flood probability event that enables the free movement of people of all abilities (on foot or with assistance) both to and from a secure place that is connected to ground above the design flood level and/or wider area.
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- Developers should accept the risk that their structures could be damaged during a flood event if proposing to build in or near an area that could flood, and should therefore design them to be flood resistant and resilient. Flood resilient buildings are designed to reduce the impact of flood water entering the building so that damage is minimised. In comparison, flood resistant buildings are designed to prevent or

minimise the entry of water into the building in the first place. The appropriate resilience and resistance measures will depend on the characteristics of the design flood; this includes the estimated flow velocity, inundation rate, depth that flood water will reach in the building and the duration of the flood event. Specific guidance on flood resilient and resistant construction techniques can be found in the CIRIA 2019 code of practice and guidance for property flood resilience, and you may wish to consult with the local authority building standards team.

- Where development is a replacement for existing development of the same type, opportunities for flood risk betterment should be explored.
- We recommend that a 6m minimum (for channels less than 1m in width and increasing proportionally to channel width) undeveloped buffer strip is provided in perpetuity between all development types and watercourses, allowing space for natural fluvial processes to occur (as well as other attendant environmental benefits, not limited to but including biodiversity, open space, channel maintenance, pollution reduction and river restoration). It is important to highlight that buffer strips do not mitigate any identified flood risk that may exist at a site. Our guidance on the Water Environment provides more information on buffer strips.

4. **The formation of new (or alterations and extensions to existing) garages, sheds, conservatories, greenhouses and other buildings that are incidental to the enjoyment of a main residential dwelling house[4]**

- Even small structures have the potential to impact upon flood risk elsewhere. We recommend that these issues be carefully considered in the design and decision-making process.
- Some structures can cause channel blockage elsewhere if washed out, exacerbating local flooding. Structures should be installed securely to avoid potential wash-out in a flood event. A reduction in flood risk can be achieved through the incorporation of flood resistant and resilient materials and design, and the raising of finished floor levels where practicable. The CIRIA 2019 code of practice and guidance for property flood resilience is a useful source of information and you may wish to consult with the local authority building standards team.

[4] Includes extensions of all sizes that are not covered by Permitted Development Rights, but excludes the provision of new overnight accommodation/bedrooms and the creation of an entirely new dwelling.

- Safe and flood free access and egress should be provided where possible. This means the provision of a safe and flood free route during the relevant flood probability event that enables the free movement of people of all abilities (on foot or with assistance) both to and from a secure place that is connected to ground above the design flood level and/or wider area. We recommend that finished floor levels should be set 600mm above the design flood level where appropriate and practicable in order to provide an allowance for freeboard. We recommend that an allowance for climate change should be included when calculating the design flood level, independently of an allowance for freeboard, as per our Guidance on Climate Change Allowances for Flood Risk Assessment in Land Use Planning.
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- Where development is a replacement for existing development of the same type, opportunities for flood risk betterment should be explored.
- We recommend that a 6m minimum (for channels less than 1m in width and increasing proportionally to channel width) undeveloped buffer strip is provided in perpetuity between all development types and watercourses, allowing space for natural fluvial processes to occur (as well as other attendant environmental benefits, not limited to but including biodiversity, open space, channel maintenance, pollution reduction and river restoration). It is important to highlight that buffer strips do not mitigate any identified flood risk that may exist at a site. Our guidance on the Water Environment provides more information on buffer strips.

5. **Essential infrastructure and water compatible uses**[5]

- Such development should be designed and constructed to remain operational during floods and not impede water flow.
- Consideration should be given to site layout and access, and alternative lower risk locations sought for the most sensitive aspects of the development
- Safe and flood free access and egress should be provided where possible. This means the provision of a safe and flood free route during the relevant flood probability event that enables the free movement of people of all abilities (on foot or with assistance) both to and from a secure place that is connected to ground above the design flood level and/or wider area.
- We recommend that finished floor levels should be set 600mm above the design flood level where appropriate and practicable in order to provide an allowance for freeboard.
- We recommend that an allowance for climate change should be included when calculating the design flood level, independently of an allowance for freeboard, as per our Guidance on Climate Change Allowances for Flood Risk Assessment in Land Use Planning.
- Developers should accept the risk that their structures could be damaged during a flood event if proposing to build in or near an area that could flood, and should therefore design them to be flood resistant and resilient. Flood resilient buildings are designed to reduce the impact of flood water entering the building so that damage is minimised. In comparison, flood resistant buildings are designed to prevent or minimise the entry of water into the building in the first place. The appropriate resilience and resistance measures will depend on the characteristics of the design flood; this includes the estimated flow velocity, inundation rate, depth that flood water will reach in the building and the duration of the flood event. Specific guidance on flood resilient and resistant construction techniques can be found in the CIRIA 2019 code of practice and guidance for property flood resilience, and you may wish to consult with the local authority building standards team.
- Developers and planning authorities should be aware that development at flood risk may also increase the risk of flooding to nearby development and receptors.

[5] Use our Land Use Vulnerability Guidance to establish the vulnerability of the existing and proposed land uses to flood risk. Essential infrastructure includes development consented under the Town and Country Planning (Scotland) Act 1997 only.

- Where development is a replacement for existing development of the same type, opportunities for flood risk betterment should be explored.
- Where relevant, structures should be installed securely to avoid potential wash-out during flood events.
- We recommend that a 6m minimum (for channels less than 1m in width and increasing proportionally to channel width) undeveloped buffer strip is provided in perpetuity between all development types and watercourses, allowing space for natural fluvial processes to occur (as well as other attendant environmental benefits, not limited to but including biodiversity, open space, channel maintenance, pollution reduction and river restoration). It is important to highlight that buffer strips do not mitigate any identified flood risk that may exist at a site. Our guidance on the Water Environment provides more information on buffer strips.

6. **Cemeteries**

- Due to the sensitive nature of this development, consideration should be given to the impact were the development to flood. Flooding could be from small watercourses and/or groundwater, as well as larger fluvial and coastal sources. The long term impacts of wave action and coastal erosion should also be considered for sites in exposed coastal locations. Further information on coastal erosion can be found in Scotland's National Coastal Change Assessment.
- SEPA has published guidance on assessing the impacts of cemeteries on groundwater. Groundwater is often the most significant constraint when considering options for cemetery extension and assessing new sites.
- We recommend that an allowance for climate change should be included when calculating the design flood level, independently of an allowance for freeboard, as per our Guidance on Climate Change Allowances for Flood Risk Assessment in Land Use Planning.
- Safe and flood free access and egress should be provided where possible. This means the provision of a safe and flood free route during the relevant flood probability event that enables the free movement of people of all abilities (on foot or with assistance) both to and from a secure place that is connected to ground above the design flood level and/or wider area.

- Developers should accept the risk that their structures could be damaged during a flood event if proposing to build in or near an area that could flood, and should therefore design them to be flood resistant and resilient.
- We recommend that a 6m minimum (for channels less than 1m in width and increasing proportionally to channel width) undeveloped buffer strip is provided in perpetuity between all development types and watercourses, allowing space for natural fluvial processes to occur (as well as other attendant environmental benefits, not limited to but including biodiversity, open space, channel maintenance, pollution reduction and river restoration). It is important to highlight that buffer strips do not mitigate any identified flood risk that may exist at a site. Our guidance on the Water Environment provides more information on buffer strips.
- See also Section 8 below in relation to walls, which are a common feature of cemeteries.

7. **Small-scale street furniture (flagpoles, signage, benches, street-lights etc.)**

- Such structures can cause channel blockage elsewhere if washed out, exacerbating local flooding. Structures should be installed securely to avoid potential wash-out in a flood event.
- Developers should accept the risk that their structures could be damaged during a flood event if proposing to build in or near an area that could flood, and should therefore design them to be flood resistant and resilient.
- Where development is a replacement for existing development of the same type, opportunities for flood risk betterment should be explored.
- We recommend that a 6m minimum (for channels less than 1m in width and increasing proportionally to channel width) undeveloped buffer strip is provided in perpetuity between all development types and watercourses, allowing space for natural fluvial processes to occur (as well as other attendant environmental benefits, not limited to but including biodiversity, open space, channel maintenance, pollution reduction and river restoration). It is important to highlight that buffer strips do not mitigate any identified flood risk that may exist at a site. Our guidance on the Water Environment provides more information on buffer strips.

8. **Walls, fences and other means of property enclosure/demarcation**

- These structures can create an obstruction to flood flows and exacerbate local flood risk. Where property enclosure/demarcation is required in areas at risk of flooding

then consideration should be given to alternative approaches to minimise the effect on flooding, for example using open-structure fences instead of walls. Structures should be installed securely to avoid potential wash-out in a flood event.

- Property walls should not be constructed with the sole intention of flood protection, because they are unlikely to withstand the hydro-static pressure created during a flood event. Furthermore, the sudden failure of a wall during a flood event can lead to rapid and therefore more dangerous inundation. Instead, a more holistic and sustainable approach should be adopted by identifying measures that can be incorporated without increasing flood risk elsewhere, reducing the likelihood of failure of any one flood protection measure. Property-specific protections should be the first step and include: seeking insurance provision, signing up to Floodline to receive flood alerts, preparing a flood plan, identifying an evacuation route (if possible), and property-level flood protection products that could help to reduce the impact of flooding on property such as airbricks and door guards. The Scottish Flood Forum can provide additional information on preparing for flooding. The CIRIA 2019 code of practice and guidance for property flood resilience is a useful source of information and you may wish to consult with the local authority building standards team.
- Developers should accept the risk that their structures could be damaged during a flood event if proposing to build in or near an area that could flood, and should therefore design them to be flood resistant and resilient.
- Developers and planning authorities should be aware that development at flood risk may also increase the risk of flooding to nearby development and receptors.

  We recommend that a 6m minimum (for channels less than 1m in width and increasing proportionally to channel width) undeveloped buffer strip is provided in perpetuity between all development types and watercourses, allowing space for natural fluvial processes to occur (as well as other attendant environmental benefits, not limited to but including biodiversity, open space, channel maintenance, pollution reduction and river restoration). It is important to highlight that buffer strips do not mitigate any identified flood risk that may exist at a site. Our guidance on the Water Environment provides more information on buffer strips.

9. **Like-for-like replacement of watercourse crossings, culverts and bridges**

- Proposals for replacement culverts and bridges with structures that have identical dimensions and gradient will not result in a change to local flood risk either upstream or downstream.
- A good practice guide for river crossings can be found on the SEPA website.

10. **Hydro schemes**

- Powerhouses should be located as far back from the water corridor as is practicable, and designed to be operational in times of flooding. We advise against the use of protective flooding/landscaping bunds to achieve this.
- The construction of weirs to facilitate off-take mechanisms or the transfer of water from one catchment to another may increase the risk of flooding locally if a nearby receptor exists. We recommend that the developer demonstrates adequate mitigation of any flood impacts. We also advise consultation with the local authority flood risk management staff. Further advice is provided in SEPA's Controlled Activities Regulations (CAR) Flood Risk Standing Advice under 'Discharge Alterations'.

11. **Footpaths, access tracks, private roads, car parks and other landscaping proposals – includes replacements and extensions.**

- Developers should accept the risk that their structures could be damaged during a flood event if proposing to build in or near an area that could flood, and should therefore design them to be flood resilient.
- Where development is a replacement for existing development of the same type, opportunities for betterment should be explored.
- We recommend that a 6m minimum (for channels less than 1m in width and increasing proportionally to channel width) undeveloped buffer strip is provided in perpetuity between all development types and watercourses, allowing space for natural fluvial processes to occur (as well as other attendant environmental benefits, not limited to but including biodiversity, open space, channel maintenance, pollution reduction and river restoration). It is important to highlight that buffer strips do not mitigate any identified flood risk that may exist at a site. There is potential for siting footpaths within buffer strips to maximise their potential for leisure/nature access, whilst maintaining their primary purpose. Our guidance on the Water Environment provides more information on buffer strips.

12. **Open-sided agricultural buildings and structures (including poly-tunnels)**

- Where it is deemed that a flood risk exists, local authority flood risk management staff should be consulted and review any supporting information such as an FRA, where necessary. Our guidance on carrying out an FRA will be helpful.
- These structures can cause channel blockage downstream if they are washed out, exacerbating local flooding. They should be installed securely to avoid potential wash-out in a flood event.
- Significant coverage of land by polytunnels may create localised flooding impacts in the form of soil erosion and the runoff of water/ sediment onto rural roads. Impacts of this type have been observed in recent times in a number of locations in Scotland, particularly during summer months following intense rainfall events. Careful consideration should be given to providing mitigation against such impacts, particularly on sloping land.
- We recommend that a 6m minimum (for channels less than 1m in width and increasing proportionally to channel width) undeveloped buffer strip is provided in perpetuity between all development types and watercourses, allowing space for natural fluvial processes to occur (as well as other attendant environmental benefits, not limited to but including biodiversity, open space, channel maintenance, pollution reduction and river restoration). It is important to highlight that buffer strips do not mitigate any identified flood risk that may exist at a site. Our guidance on the Water Environment provides more information on buffer strips.

13. **Septic tanks and soakaways**

- For pollution prevention purposes, we recommend that such development should follow current Scottish Water guidance.
- Such structures should be installed securely to avoid potential wash-out in a flood event.
- SEPA regulatory information on septic tanks and private sewage treatment systems should be consulted.

14. **Temporary construction accommodation**[6]

- We recommend that an allowance for climate change should be included when calculating the design flood level, independently of an allowance for freeboard, as per our Guidance on Climate Change Allowances for Flood Risk Assessment in Land Use Planning.
- Safe and flood free access and egress should be provided. This means the provision of a safe and flood free route during the relevant flood probability event that enables the free movement of people of all abilities (on foot or with assistance) both to and from a secure place that is connected to ground above the design flood level and/or wider area.
- Such structures should be installed securely to avoid potential wash-out in a flood event.
- Developers should accept the risk that their structures could be damaged during a flood event, and should therefore design them to be flood resistant and resilient.

15. **Reverse vending machines required to deliver Scotland's Deposit Return Scheme**

- Such structures should be installed securely to avoid potential wash-out in a flood event.
- Developers should accept the risk that their structures could be damaged during a flood event, and should therefore design them to be flood resistant and resilient.

TECHNICAL GLOSSARY

Betterment: Relates to achieving an overall flood risk reduction either via modification and/or design (including use of flood resistant/ resilient materials) of a development. This can be in relation to a new development or re-development of an existing building already at flood risk.

Catchment: The upstream area contributing to flow or runoff to a particular point on a watercourse, i.e. all the land drained by a river and its tributaries.

[6] Excludes the provision of overnight accommodation/bedrooms.

Channel blockage: The full or partial physical blockage of a river channel (watercourse), canal, flood diversion channel etc. from fallen trees, other woody debris, collapsed banks, collapsed structures or other man-made detritus, including caravans, sheds and cars carried off in a flood. Can often result in the backing up of water in the channel, leading to out-of-bank flooding. Blockage often occurs on the upstream side of bridges and culverts, where material gets lodged. Note that covered channels such as culverts, pipes and sewers can also collapse or surcharge due to internal blockages.

Design flood level: The flood level (water level) associated with the specific magnitude of flood adopted for the design of a development site, or flood protection scheme. It is usually defined in relation to the flood severity or rarity, in terms of its return period or annual probability. The SPP 2014 risk framework (para 263) suggests the most appropriate annual flood risk probabilities for different land uses. For the majority of developments this will be above the 0.5% annual probability flood extent or 200-year event (i.e. medium to high risk areas). For the most vulnerable land use types this will be above the 0.1% annual probability flood extent or 1000-year event (i.e. low to medium risk areas).

Duration (of flood event): Although self-explanatory, i.e. 'the total amount of time an area is affected by flood water', it is important to understand that the longer the flood duration, the greater the damage costs are. Damage costs similarly also increase with greater depth of flooding. Increased duration also has a negative impact on the effectiveness of Property Level flood Protection measures (PLP), such as air brick covers and door guards.

Evacuation: Involves the movement of people, either through their own efforts or with the assistance of others, to a 'place of safety' without the need for specialist trained and equipped rescuers. These activities take place before an area is inundated by flood water. Such egress routes should be dry and free from flooding.

Flow path: The route(s) that flood water will take across natural or developed land (including along roads or through buildings) generally following the path of least resistance, including where water is deflected due to the presence of a notable feature/ structure. It also relates to where water will go when a hydraulic structure fails or is exceeded, such as a SUDS pond, detention basin or reservoir.

Flow velocity: Flow (or discharge) is the volume of water that passes through a channel cross-section in a given unit of time, normally expressed as cubic metres per second (m^3/s). A flow velocity is the speed and direction of this discharge in meters per second (m/s). It can also relate to overland flow from out-of-channel flooding, sewer surcharge or pluvial runoff.

Fluvial flood risk: the probability of a flood originating from a river (or other watercourse) and of the potential adverse consequences, associated with it, for human health, the environment, cultural heritage and economic activity.

Freeboard: A height added to the predicted level of a flood to take account of the height of waves or turbulence and uncertainty in estimating the probability of the flooding. Industry standard allowance is 600 mm. In a planning context, it can be the difference between the design flood level and the finished floor levels of a development, or soffit /deck levels of a

bridge or culvert. Freeboard is a common design element of formal flood defences, over and above the required design flow and any additional allowance for climate change.

Functional floodplain: The floodplain is defined in SPP as the generally flat areas adjacent to a watercourse or the sea where water flows in time of flood or would flow but for the presence of flood prevention measures. The Functional floodplain refers to the role of floodplains as areas of storage and conveyance for flood water. For planning purposes the functional floodplain is defined in SPP as generally having a greater than 0.5% probability of flooding in any year.

Hydrostatic pressure: Refers to the pressure exerted by any fluid in a confined space, due to the force of gravity. Hydrostatic pressure increases with depth due to the increasing weight of the fluid. Water is heavy and the increasing pressure of this water against a wall or foundation, for example, can lead to water entering through the weakest point in the structure, which can result in collapse. This potentially can apply to flood defence walls, culverts, dams and buildings where, due to water depth, pressure can build up underneath the floor and water can enter the property from below.

Inundation rate: This pertains to how quickly an area is being flooded, and how it may change over time, e.g. the sudden collapse of a wall along a river, will result in more rapid flooding/ inundation of the land behind the wall, than if the wall was not present. The rate of flooding also depends on the discharge or magnitude of the flood source, whether it be from a river, the sea, heavy rainfall or water behind a man-made structure, such as a flood defence or a dam, which is somehow released.

Landraising: the process of raising ground levels in order to remove or partially remove a site from an area of flood risk. Doing so reduces the ability of the functional floodplain to store or convey water and can increase flood risk elsewhere.

Natural fluvial processes: The physical interaction of flowing water with the natural channels of rivers and streams. Fluvial processes include the motion of sediment (transportation), erosion, and deposition, leading to changes in river beds and banks. Fluvial processes create a wide range of river forms, including meanders, pools, riffles and bars, which provide a variety of habitats. Such natural processes can be interrupted or perturbed by man-made structures in or on the banks of a river system.

Off-take mechanisms: Normally hydraulic structures sited to divert water from a river for a specific purpose, such as hydro-power generation or water supply. They are very often associated with a weir, e.g. lades, pipes, culverts, diversion channels, filter beds.

Open space: Space within and on the edge of settlements comprising green infrastructure and/or civic areas such as squares, market places and other paved or hard landscaped areas with a civic function. Detailed typologies of open space are included in Planning Advice Note 65.

Overland flow: The movement of water over the land, downslope toward a surface water body (e.g. river or loch) or a low point in the land surface where it will pond. Overland flow is a very important aspect of the water cycle and can be generated by different natural

mechanisms, e.g. rainfall, snowmelt and soil saturation. Surcharge of man-made systems can also generate overland flow.

Pluvial sources and sewer model outputs: These are the two elements that combine to make up the Surface Water Hazard maps displayed on SEPA's website, i.e. areas where water will 'pond' from heavy rainfall (pluvial sources) and/or sewer surcharge, when the sewer system is full and starts to spill. SEPA is responsible for modelling the pluvial flood hazard from rainfall, whilst Scottish Water model the sewer risk. See also **'Pluvial flooding'**.

Pluvial flooding: Flooding as a result of notable rainfall, flowing over or ponding above the ground before it enters a natural (e.g. watercourse) or artificial (e.g. sewer) drainage system, or when it cannot enter a drainage system (e.g. because the system is already full to capacity or the drainage inlets have a limited capacity).

Receptors: Categories of animate and inanimate objects (e.g. people or built development) that can be adversely affected by a flood, e.g. under the Flood Risk Management (Scotland) Act 2009, four key risk receptors are highlighted for which flood risk should be reduced, i.e. Human Health, the Economy, the Environment and Cultural Heritage. Assets that fall under Essential and Civil Infrastructure (as defined in SPP) would be important 'receptors' that may be affected by flooding. For example, the National Flood Risk Assessment (NFRA) produced by SEPA considers seven broad receptor categories – (1) Agriculture (land & buildings), (2) Buildings (businesses, services and residential), (3) Community facilities, (4) Cultural Heritage, (5) Environment, (6) Transport and (7) Utilities.

Surface Water Flooding: Same as **'Pluvial flooding'** but also includes any surcharge/ spillage from a man-made sewer or water supply system, which causes water to flow overland or pond above ground, in either urban or rural settings, creating a flood hazard.

Wash out (washed out): Refers to dislodgement of structures in or adjacent to a river channel (or other flood source) during a flood event. Most commonly this term can be used in relation to the destruction of roads and bridges during a flood, where they are said to have been 'washed out' from their normal location.

Watercourse(s): All means of conveying water except a water main or sewer.

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Version 1	New document to replace Appendix 2 of LUPS-GU8 - SEPA standing advice for planning authorities.

Notes

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