

APPENDIX C - Surface Water Management: Interim Guidance for Developers

Note: This document forms an appendix to the Surface Water Management: Interim Guidance for Developers, which can be viewed on Shropshire Council's website. For details of submission requirements, refer to Section 7 of this document.

SURFACE WATER MANAGEMENT PLAN

A Surface Water Management Plan is required to accompany applications for all development within a medium or high risk surface water area and all major development proposals (10 or more dwellings or 0.5 hectares or more for residential development and 1,000m² or more for non residential)

1. Provide evidence of your investigations into the existing sources of flooding on the proposed development site?

e.g.: consultation with the Environment Agency, Shropshire Council Flood and Water Management Team and relevant water company

A Flood Risk Assessment has been prepared by Eastwood Consulting Engineers (48842-ECE-XX-XX-RP-C-0003) which reviews various data sets and highlights any existing sources of flooding. A Drainage Assessment report has also been prepared by Eastwood Consulting Engineers (48842-ECE-XX-XX-RP-C-0004). A summary of the investigations is provided below.

Environment Agency

The Environment Agency's Flood Map for Planning and Long Term Flood Risk Maps have been reviewed to assess any existing sources of flooding (fluvial, tidal, surface water, reservoir).

Fluvial and tidal:

The site is recorded to lie within Flood Zone 1 (low risk).

Surface water:

There is a low risk and a low to high risk surface water flow route in the west and east of Zone A respectively. The western flow route leads towards an unnamed watercourse originating south of the site with an area of low to high risk ponding on the southern boundary of the site. The eastern flow route corresponds with the route (and surrounding area) of the unnamed watercourse in this part of the site.

There are two areas at low to high risk of surface water ponding in Zone B which are the result of localised topographic depressions in proximity to existing field ditches. There is an additional smaller area at low to medium risk of surface water ponding in Zone B corresponding with the location of an

existing pond feature with an outfall.

Reservoir:

The whole site is recorded to lie outside of the maximum extent of flooding from reservoirs, even when there is flooding from rivers.

Consultation:

The Environment Agency have been contacted to determine any restrictions or requirements for developing the site and to discharge surface water to an unnamed watercourse. A response is pending.

South Staffordshire Council (LLFA)

The South Staffordshire Council SFRA has been reviewed to investigate any existing sources of flooding. It is noted that the SFRA is based on the Environment Agency flood map and records the site to be within Flood Zone 1.

Consultation:

South Staffordshire Council were contacted to determine any restrictions and requirements for developing the site and discharging surface water to the unnamed watercourses around the site. A response received on 19th March 2024 states the following:

- Please see the Staffordshire SuDS handbook for policies and general guidance relating to SuDS.
- Land drainage consent may be required depending on the nature of the work. If no physical impoundment, bunding or damming of the watercourse flow is planned and no structural changes are being made, then land drainage consent is unlikely to be required.
- Discharge to an ordinary watercourse will require consent from the Environment Agency.

No information of existing flood risk to the site was provided.

Severn Trent Water

Pre-planning advice has been received from Severn Trent Water; their reference 1109468, dated 5th March 2024. The following points were noted regarding existing sources of flooding:

- Due to surcharge levels within the foul sewer, historic flooding in the wider catchment area and capacity issues within the receiving treatment works, additional investigations/ modelling will be

required to better understand the impact of the additional properties on the public sewer network.

- Given that planning approval has not yet been granted, the site will be added to the Severn Trent Water modelling tracker and reviewed regularly until the site can be progressed for sewer modelling.
- Severn Trent Water expects all surface water from the development to be drained in a sustainable way to the nearest watercourse or land drainage channel, including highway drainage, subject to the developer discussing all aspects of the surface water drainage proposals with the Lead Local Flood Authority. The discharge rate to a watercourse or drainage ditch will be determined by the LLFA/ EA.

2. Is the development site classed as:

Greenfield

☒

Brownfield

☐

3. What is the total area of the development site?

470,000

m²

4. What is the area of hardstanding (impermeable surface) that currently exists on the development site?

0

m²

5. What is the area of additional hardstanding will be added to the site as part of the development?

234,330

m²

6. How has the site layout been designed to manage the surface water flood risk?

e.g.: Habitable parts of the development are located in the areas of the site at lowest risk of flooding and highways act as exceedance flow paths channelling excess water toward an attenuation pond.

Any existing surface water flood risk to the site will be managed as part of the development and the layout ensures that any residual surface water flooding is routed along highways towards the attenuation location within public open space. An exceedance routing plan is included in Appendix 6 of the Drainage Assessment (see 48842-ECE-XX-XX-RP-C-0004).

Managing pre-development surface water flood risk (see 48842-ECE-XX-XX-RP-C-0003- FRA)

The western flow route in Zone A should be maintained or routed around proposed buildings towards the existing watercourse south of the site. The eastern flow route in Zone A of the site should be maintained as it corresponds with the location of an existing watercourse and surrounding area. Layout adjustments and re-profiling of the ground may be required to ensure that the flow route is preserved. Open space should be developed around the watercourse to ensure that existing flow capacity is not impeded.

Ground levels will need to be raised if development is proposed where topographic depressions and surface water ponding is present (Zone B). Layout adjustments and ground reprofiling will therefore be needed to ensure that flood storage is available to accommodate any existing surface water ponding on site that may occur from the nearby field ditches and ensure that flood water is not pushed onto third party land. The reprofiling of site levels and presence of the site's surface water drainage infrastructure will remove any surface water ponding within the development area and will lower the modelled flood depth. The existing pond feature with an outfall in the centre of Zone B will need to be maintained.

Managing post-development surface water flood risk (see 48842-ECE-XX-XX-RP-C-0003- FRA and 48842-ECE-XX-XX-RP-C-0004)

The proposed surface water drainage system is designed to current best practice and to the standards laid out in the publication 'Design and Construction Guidance for foul and surface water sewers' and Building Regulations Part H 2015.

The presence of the proposed surface water drainage system will remove manage surface water runoff on site for the 1 in 100 year plus 40% climate change event.

In the event of surface water exceedance during extreme rainfall events the site is laid out so that surface water runoff is directed away from houses, including those on neighbouring streets, via the proposed roads. Building FFLs will be raised above external levels and the site should be laid out so that vulnerable development is not located within areas at risk of surface water flooding.

7. What is the means of discharge for surface water from the development site? Justification should be provided if infiltration methods are not being proposed.

	Infiltration	
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	Watercourse	Surface water from the site is proposed to discharge to watercourse, subject to approval.
	Provide justification for not proposing to use infiltration methods	Surface water from Zone A (west) will discharge via a pumped system to the unnamed watercourse within its eastern boundary. Surface water disposal in Zone B (east) will be to the unnamed watercourse located 230 m south-east of the site (potentially via a pumped system subject to confirmation of watercourse levels). Infiltration type SuDS such as soakaways are not viable on the site due to the expected presence of impermeable ground (mudstone). This is corroborated with the SuDS Applicability map (Appendix B of the Shropshire Council Surface Water Management: Interim Guidance for Developers), which shows that the site lies within a zone suitable only for attenuation (and not infiltration).
	Sewer	N/A
	Provide justification for not proposing to discharge to a watercourse (provide further justification, above, for not proposing to use infiltration methods)	

8. What Sustainable Drainage Systems (SuDS) will be used on the development site? Your response should include, as a minimum:
- the type and dimensions of the SuDS that are to be implemented on the development site;
 - design assumptions including details of how they accord with the design criteria contained in the Interim Guidance;
 - calculations showing how the SuDS proposed will be adequate, and;
 - drawings, providing visual aid to the above, including layout, exceedance flow routes (contours) and construction details

Additional sheets should be attached, where necessary, and referenced in the table below. Reference should be made to the SuDS Management Train in Section 7

Type of SuDS feature		Design features- in accordance with design criteria
Source Systems	Permeable paving (Type C)	Potential for permeable paving (Type C) and rain gardens to be included within the site.
	Rain gardens	This is subject to the final site layout and detailed design to determine the suitability of the site conditions and public open space for the development of these SuDS features. Source control SuDS features will enhance the SuDS Management Train.
Site Systems	Swales	Potential for swales to be included within the wider site. This is subject to the final site layout and detailed design to determine the suitability of the site conditions and layout for the development of this SuDS feature. Site systems will enhance the SuDS Management Train.
Regional Systems	Subsurface storage	An attenuation tank is proposed for Drainage Parcel East-3 due to the nature of the proposed development and lack of suitable public open space for a basin (school and associated parking areas).
	Detention basins	Detention basins are proposed for the remaining 7 parcels of the site. It is assumed that the basin will have a maximum water depth of 1m and 1 in 3 side slopes. Access tracks and cut/fill to tie into ground levels will also

Regional Systems		be required, and the final plan area of the proposed basins will be confirmed at detailed design. A typical cross section of the proposed basins is included in Appendix 6 of the Drainage Assessment report (Ref: 48842-ECE-XX-XX-RP-C-0004). Site specific details and dimensions will be provided at detailed design. Attenuation calculations are included in Appendix 6 of the Drainage Assessment report (Ref: 48842-ECE-XX-XX-RP-C-0004) demonstrating that the proposed features will be adequate to attenuate for the 1 in 100 year + 40% climate change event with 10% urban creep. The whole site has been split into 8 smaller parcels, with attenuation features proposed at the low point of each parcel. This ensures that the surface water runoff is attenuated as close to the source as possible and not in one large basin for Zone A and B. Surface water is proposed to discharge at 1.4 l/s/ha for the developable site area as a generic standard greenfield runoff rate, or 3.5 l/s as a minimum practical rate if the rate is lower than this. An exceedance flow route plan is included in Appendix 6 of the Drainage Assessment report (Ref: 48842-ECE-XX-XX-RP-C-0004) showing that in the event of blockages, runoff will be directed away from properties towards the site low point.
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- 9. What consideration has been given to the multifunctional benefits of the chosen SuDS features? Additional sheets should be attached, where necessary, and referenced in the table below.**

Benefit	Please tick whether this benefit will be achieved	Comment on how the benefit will be achieved
Biodiversity	✓	Basins generally consist of different features including; dry-level bench, gentle slopes, wet shallow safety bench, shallow and deeper water zones, which will encourage biodiverse habitats by enabling a variety of wildlife to be present. Variations in topography will be used to protect ecologically valuable features from insensitive mowing by providing a physical constraint.
Recreation	✓	The surface water management system will be designed to help create a useable and enjoyable environment. The proposed basins will provide a focus for footpaths which will provide attractive areas for users to enjoy a walk and to spot wildlife.
Water Quality	✓	No runoff will be discharged from the site to receiving surface waters or sewers for the majority of small (eg < 5 mm) rainfall events. A detention basin will enable a settling effect of suspended solids and interception of contaminants. Permeable paving (Type C) would also provide initial treatment of surface water runoff at source. These features will ensure that runoff will be adequately treated to protect the receiving water body from short-term acute pollution (first flush).
Visual Amenity	✓	The design of surface SuDS features such as basins will enhance the experience of travelling through the development (by foot or vehicle) and make the development a more pleasant place to live and visit.

10. What are the secure, agreed maintenance processes that have been put in place for the each of the SuDS features described in Question 8?

e.g.: householder responsibility, management committee, local authority or water company

Maintenance of the potential SuDS systems for this site will be in accordance with the recommendations within The SuDS Manual (CIRIA C753, 2015) as stipulated in Table 1 below, along with any recommendations provided by suppliers and

product specifications.

Table 1 summarises maintenance actions and frequency for each component (surface and sub surface) of the drainage system. Maintenance access requirements such as vehicle and machinery access (where applicable) will also need consideration.

Features adopted by authorities, such as drainage authorities, will be maintained under their normal regime of inspection and maintenance.

The maintenance schedules below should be followed to ensure flood risk on site does not increase through system blockages or poor maintenance. Following the maintenance schedule is essential to ensure the drainage features remain functional for the lifetime of the development.

<u>SuDS System</u>	<u>ACTION</u>	<u>FREQUENCY</u>
Permeable Paving (Type C)	Initial inspection of porous pavement	Monthly for three months after installation
	General removal of litter and debris. Brush regularly.	Monthly (or more frequently if required)
	Inspect porous pavements for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 hours after large storms for first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Brushing and vacuuming of porous pavements (standard cosmetic sweep over whole surface)	Annually, after autumn leaf fall
	Removal of weeds from porous pavements or management using glyphosate applied direction into the weeds by an applicator rather than spraying	Annually (or more frequently if necessary)
	Remedial work to any depressions, rutting and cracks of the permeable pavement considered detrimental to the structural performance or a	As required

	hazard to users, and replace lost jointing material	
	Rehabilitation of surface and upper substructure of the permeable pavement by remedial sweeping	Every 15 years or as required
Rain garden	Ornamental tree and shrub planting. – Remove stakes and ties from trees when no longer needed for support and within 3 years of planting.	As required
	Protect from trimmer damage and remove competitive growth until well established.	As required
	Replace trees and shrubs which fail within the first 5 years after planting. Carry out tree surgery as necessary.	As required
Sub-surface storage	Remove debris from catchment surface where it may affect performance	Monthly
	If the system allows rainfall infiltration from above, check filter surface for blockages. Remove and replace infiltration material if deemed necessary.	Annually
	Remove sediment from pre-treatment structures	Annually or as required
	Inspect inlets, outlets, vents and overflows to ensure they are operating as designed	Annually
	Remedial work to repair inlets, outlets, overflows and vents	As required
	Survey inside of storage area for sediment build up. Remove sediment if required.	As required
Silt trap manholes	Inspect surface structures of inlets and outlets removing obstructions and silt as necessary. Check there is no physical damage.	Monthly
	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually (or more frequently if necessary)

Silt trap manholes	Remove cover and inspect ensuring water is flowing freely and that the exist route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn.	Annually
	Where there is a build-up of silt, remove and spread on site. Undertake when ground is damp in autumn or early spring and transplant turf and overseed to original design level.	As required As required
Basin	Inspect surface inlet/ outlet structures removing obstructions and silt as necessary. Check there is no physical damage.	Monthly
	Mow grass access paths and verges surrounding basins at 35 to 50 mm minimum and 75 mm or as specified to provide a cared for appearance and allow pedestrian access.	Monthly or as required.
	Confirm whether a liner is present to hold water or prevent pollution of groundwater to protect.	Annually or every 3 years as required
	Where silt accumulated on apron or around inlet/ outlet, then remove.	Annually or every 3 years as required
	Retain as much existing vegetation as possible to ensure rapid re-colonisation of open areas.	Annually or every 3 years as required
	Undertake silt removal during September-October to minimise damage to protected wildlife and ensure re-growth of aquatic vegetation before winter.	Annually or every 3 years as required
Swales	Mow amenity grass access paths and verges around swales at 35 – 50 mm minimum and 75 mm maximum.	Monthly or as required
	Mow swales at 100 mm with 150 mm maximum to filter and control runoff in normal grass swales.	Monthly or as required
	Where marsh or wetland develops in the swale due to wet conditions, cut annually, or as required at 100 mm.	Annually or as required

Swales	Where there is a build-up of silt, remove and spread on site. Undertake when ground is damp in autumn or early spring and transplant turf and overseed to original design levels.	As required
	Spread excavated material (silt) on site above the SuDS design profile, in accordance with EA Waste Exemption Guidance.	As required
	All damage to be returned to design profile unless there is a design flaw.	As required
Guttering, gullies and piped drainage system	General removal of litter and debris.	6 monthly, after autumn leaf fall (or as required)
	Cleaning of gullies, drainage channel and drainage channel sump units to remove debris and silt.	6 monthly, after autumn leaf fall (or more frequently if necessary)
	Cleaning of manholes to remove debris and silt.	Annually, after autumn leaf fall (or more frequently if necessary)
	If the system allows rainfall infiltration from above, check filter surface for blockages. Remove and replace infiltration material if deemed necessary.	Annually
	Remove sediment from pre-treatment structures.	Annually or as required
	Inspection of all access chambers, inspection chambers, manholes and proprietary storage units to identify and make good any defects as necessary.	Annually
	Inspect inlets, outlets, vents and overflows to ensure they are operating as designed.	Annually

Vortex flow control	Remove Litter and Debris	Monthly
	Cleaning of flow control to remove debris and silt	Annually (or more frequently if necessary)
	Inspect inlets and outlets for blockages and clear if required	Monthly
	Repair any damages to flow control device and manhole	As required
	Repair any damage to manhole cover	As required
	Repair any damage to inlet/outlet	As required
Inlets	Inspection for debris and sediment build up.	Annually (and following poor performance)
	Inspect inlets for blockages and clear if required.	Monthly
	Inspect inlet pipework for blockages, clogging, standing water and structural damage.	Monthly
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate.	As required

Table 1