



UPPER TEAN REFERENCE: SMD/2022/0667 – DRAINAGE POSITION

This note has been produced to establish the drainage position for the Upper Tean application ref: SMD/2022/0667. This application was first validated in January 2023 and has undergone several rounds of consultation, with various drainage responses received. Please see below.

Date	Consultee	Consultee Comment	Applicant Actions/Comments
25/01/2023	LLFA	We would like to have sight of the Environment Agency consultation response on the suitability of the fluvial modelling produced before we can make an informed assessment of the drainage strategy presented.	No response required.
02/02/2023	Environment Agency	Based upon the Flood Map for Planning a small part of the site outlined in red falls within Flood Zone 2 and 3 of the River Tean, designated main river, and is therefore considered at high risk of fluvial flooding. The wider area outlined blue on the proposed site plan sits entirely within flood zone 2 and 3. This is based upon JFLOW data (a national generalised flood mapping technique that is used in the absence of hydraulic modelling), with no other flood models present for this location.	
		Finished Floor Levels: raising floor levels above the design flood level is the most effective way to ensure the development will not be subject to internal flooding. Given the proximity of flood zone 2/3 and in the interests of ensuring a sustainable development it is advised that Finished Floor Levels (FFL) should be set no lower than 600mm (freeboard) above the 1% plus climate change flood level, with flood proofing techniques considered (where appropriate).	As per the submitted flood risk assessment, it can be confirmed that FFL are proposed to be over 600mm higher than the 1% plus climate change flood level.
02/02/2023	Severn Trent Water	I can confirm that we have no objections to the proposals subject	



		to the inclusion of the following condition	
		Severn Trent Water advise that there is a public 150mm combined sewer, a public 150mm foul sewer which connect into a public 150mm combined sewer (and later connects to a nearby public 1050mm combined sewer), a public 225mm surface water sewer that upsizes to a public 300mm surface water sewer, and a 18inch clean water asset located within this site.	A comprehensive re-design has been complete to ensure that appropriate easements are included to safeguard the existing Severn Trent Water infrastructure.
09/05/2023	LLFA	Staffordshire County Council Flood Risk Management position We have reviewed the submitted information require further information in relation to site drainage proposals. We would therefore recommend that planning permission is not granted until this has been resolved.	
		While the EA have been consulted on and have provided a response to the FRA, we request that they are also asked to provide comment on the Drainage Strategy document. The EA will need to approve: • The 3 proposed connection points. • The discharge rates into the River Tean from the outlet of the swales.	
		Have you considered the use of above ground SuDS before defaulting to oversized pipes and underground crates?	
		Has any source control e.g. rainwater harvesting been considered?	
		Have you considered the use of permeable paving on site on individual driveways and other private roads?	
		We would not accept underground storage crates that span multiple property curtilages due to the issue of maintenance.	
		We will need to see STW approval for all pipe diversions at this stage to ensure your drainage strategy is viable, including a comment on the	

		suitability of the swales crossing the STW pipe shown in the blue line area.	
		Provide an acceptable management and maintenance plan for surface water drainage to ensure that surface water drainage systems shall be maintained and managed for the lifetime of the development. Including names and contact details for those responsible for ongoing maintenance.	
		Provide supporting information to demonstrate that sufficient water quality measures have been incorporated into the design. This should be in accordance with the CIRIA SuDS Manual Simple Index Approach and SuDS treatment design criteria	
		We do not accept the calculation of greenfield runoff rates based on including the blue line site boundary, please provide greenfield calculations for the red line boundary only and amend the runoff values according to this.	
		Please provide storage calculations for the requirements of the site.	
		We need to see detailed designs of the swales.	
		We need to understand the risk to the site if the swales are flooded (which is likely given that they are located within a flood zone) on the operation of the drainage network). This should be modelled in micro drainage.	
		Can the swales be included within the micro drainage model so a discharge rate into the watercourse can be provided.	
		Please use FEH rainfall in any micro-drainage modelling.	
19/05/2023	EA	"We would not seek to control surface water run-off rates, however, to aid with your	



		assessment of such we attach our latest West Midlands Climate Change Guidance which includes a section on Surface Water and Peak Rainfall Allowances."	
		"Consideration should be given as to whether the proposed system can still operate effectively during a flood event or after a flood event/ multiple events when the scheme could be at capacity."	
		"Environment Agency Permit: Notwithstanding the above, any works within, alteration to the dimensions of the watercourse and any storage of facilities or materials within its floodplain or within 8m of the top of the bank will require a Flood Risk Activity Permit issued by the Environment Agency. We recommend the applicant contact the Partnerships & Strategic Overview Team (Shropshire, Herefordshire, Worcestershire & Gloucestershire) at psa.midswest@environment.agency.gov.uk to consult on this further."	
March 2024 – Updated Design Submitted			
21/05/2024	LLFA	Have you considered the use of above ground SuDS before defaulting to oversized pipes?	A swale has been provided from the drainage outfall to the main river which will offer ecological and biodiversity benefit. Since the ecological and drainage value has been appropriately achieved by the proposed swale, SuDS are not considered appropriate or viable due to the need to deliver residential development within the space available. In addition, it is considered that the edge-of-town and cul-de-sac nature of this development, which is proposed to serve family homes, will mean that ponds and other open water storage features located in such close proximity to the proposed dwellings will create an unacceptable water hazard risk with children expected to be playing and traversing through the area.
		Has any source control e.g. rainwater harvesting been considered?	Source control has been considered and appropriately implemented within the layout of these proposals, i.e. the use of permeable paving on the proposed domestic driveways

			circa 20% of the site drained area, refer to para 3.2.2 of the Drainage Strategy Report Rev D.
	We will need to see STW approval for all pipe diversions at this stage to ensure your drainage strategy is viable, including a comment on the suitability of the swale crossing the STW pipe shown in the blue line area.		Please refer to STW comment confirming no objection to the proposals dated 02/02/2023.
	Provide supporting information to demonstrate that sufficient water quality measures have been incorporated into the design. This should be in accordance with the CIRIA SuDS Manual Simple Index Approach and SuDS treatment design criteria.		The proposed permeable paving to the domestic driveways and the swale across the blue line land which will transmit the water from the Hydrobrake control to the main river, this has been designed to accommodate for the drainage of the site and is sufficient to adequately clean the discharge water. See para 3.2.4 of the Drainage Strategy Report Rev D.
	Please provide storage calculations for the requirements of the site.		The drainage design calculations, giving maximum water levels in the storage system are detailed within Appendix C and para 3.2.2 confirms the required storage volume, in the Drainage Strategy Report Rev D.
	Demonstrate on the exceedance plan that all FFLs are at least 150mm above surrounding ground level OR at the level recommended in the FRA (whichever is higher).		Drawing J159/03 Rev C in the Drainage Strategy Report Rev D includes text outlining that "House FFL to be typically 150mm above adjacent external levels and ground levels around each plot have been confirmed to this effect.
	Demonstrate on the exceedance plan that all driveways will slope away from property entrances.		Drawing J159/04 Rev B confirms that all driveways adjacent to the properties fall away from the property entrances. The driveways adjacent to the properties are also confirmed to be 150mm lower than FFL on drawing J159/03 Rev C.
	Can you label ILs and lengths of pipes on the drainage plan so we can verify this against the modelling.		Surface water MH IL's have been added to drawing J159/03 Rev C (as per the Manhole Schedule).
	Unclear in the modelling why some of the pipes have no contributing area – can we have a supporting impermeable area plan to verify against the modelling.		Drawing J159/02 Rev A has been added into the Drainage Strategy Report Rev D together with the re-run design, (with no noticeable effect on the design due to the oversized 'flat; storage system).
	We need to see how the proposed swale interacts with the floodplain in the post-dev scenario in the 2D domain of the hydraulic modelling, so please update the hydraulic modelling post-dev scenario to		The pipe outflow (and all storage) is set above the 100 year + c.c. flood water level and it is also set above the 1,000 year flood water level meaning no backflow would occur during the design rainfall or even under extreme rainfall.



		include a representation of the swale, taking the top water levels from the outfall of microdrainage modelling to inform the swale inflows. We need to understand: 1. The impact of this swale on the drainage on the site (i.e. are you going to see any backflow) and 2. If the swale channelising water impacts the modelled flood zones (i.e. where you can build within the site AND any impacts on third party land as a result of the proposals).	
		The development layout has changed, and post-dev hydraulic modelling has not been rerun. Has the amendment to the embankment and changes to FFLs been updated in the post dev modelling?	Please refer to JBA letter ref: OGS\DED-JBAU-XX-XX-LT-Z-0001.docx.
		We ask that the FRA is updated with all the records (including photographic evidence) of flooding supplied to the LPA and how the site will mitigate against the fluvial risk and not cause an increase in the flood risk to third party land. The EA guidance provided to you also references floodplain consultation if this could be considered if necessary following updated to the hydraulic modelling	Please refer to JBA letter ref: OGS\DED-JBAU-XX-XX-LT-Z-0001.docx.
		Can the applicant comment on how they have considered and applied the EA guidance AND their considerations for whether the swale can operate during a flood event. The EA consult also states that a permit is required and requests contact with the PSO team be made with regards to this – if you could provide evidence that these discussions have taken place and their outcome.	Please refer to JBA letter ref: OGS\DED-JBAU-XX-XX-LT-Z-0001.docx.
05/09/2024	LLFA	Given the space constraint on the site, please consider incorporating MicroSuDS e.g. tree pits or	In conjunction with the Source Control feature of permeable paving to the private driveways it

	raingardens that can be easily incorporated with landscaping features to provide multi-benefits to both water quality and landscaping. Please can you also confirm if any of the road network is going to be private, if so please add permeable paving to these sections. As the development as proposed depends on the diversionary works being approved, we need to see this at this stage. The report states that: 'The swale would become redundant during the worst storms i.e. 100 year event with the outflow pipe (set above the 100 year flood water level) discharging directly to the flood water'. Please confirm how adequate water treatment will be provided in this case, for water not passing through permeable paving? While the cover letter from JBA concludes no additional risk to third party land as a result of the proposals, there is no evidence of this unless a post-dev scenario is modelled to understand the impacts of the development on the fluvial flood risk. Given the flooding observed in this area we would request that post-dev modelling is completed so this risk can be quantified. In addition, the proposed swale does travel through the modelled extent and therefore will need to be modelled. We need to understand if the swale channelising water impacts the modelled flood zones (i.e. where you can build within the site AND any impacts on third party land as a result of the proposals). Please note that in line with the advice from the EA, following post-dev modelling you may be required to consider floodplain compensation for the scheme.	is also proposed to provide 1 No. water butt to each property for garden use. The road network is proposed for adoption (S38). Therefore, the permeable paving is limited to the unadopted private domestic driveways. During meeting dated 07/11/2024, planning officer confirmed these details could be conditioned given the easements proposed in the updated design. Subject to sewer adoption (S104) agreement with Severn Trent Water and the Environment Agency, it is proposed to incorporate a Hydro International Downstream Defender prior to the control manhole to provide appropriate water cleaning to all site water before discharge to the swale, thus unaffected by flood water. Hydraulic modelling is not an alternative to common sense. There is not requirement to 'model' the impact of ground raising work if it is allocated outside of the floodplain. Comment sense you suffice to demonstrate that anything located outside of the floodplain does not interact (and thus detrimentally impact) the floodplain and/or flood risk elsewhere. Due to the above, all 'baseline' model results can be treated as representative of the 'post development' scenario too. With regards to the swale, these will involve relatively shallow and localised excavation work. If anything, these will 'slightly' increase the capacity of the floodplain and thus reduce (by a negligible amount) flood risk elsewhere. We do not intend to re-engage with the EA re post-development modelling for the reason explained above. As the ground raising is to be allocated outside of the floodplain, no floodplain compensation scheme is required either.
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Commented [OS1]: OK with permeable paving . The proposal will need to maintain the 3 surface water overland flow pathways.

It was confirmed during the meeting that:

- 1.The northern one is outside of site boundary
 - 2.No ground raising will occur along the southern one
- Re central one, if alterations are made to it (e.g. by raising ground levels and/or placing a building across the 0.1%AEP RoFSW SW overland flow route), then the LLFA will require the impact on flood risk to be quantified.

Commented [RB2R1]: OK with permeable paving AND water butts as referenced in the comments

Commented [RB3R1]: Re the central flow path, if it cannot be maintained the LLFA require you to demonstrate betterment on the existing flood risk situation to both the site and to third parties. An example of this would be a discussed in the meeting a swale feature or other similar blue green corridor

Commented [OS4]: Correspondence from STW is required to confirm they are OK with the proposed diversion (across Plot 8). No alteration along the other water main easement.

Commented [RB5R4]: We will need to have sight of the latest layout showing that there is no diversion required to the southern pipe.

Commented [OS6]: It was confirmed during the meeting that:

- 1.The proposed swales will not require any importing of materials on site to be built.
- 2.The proposed swale will not reduce the floodplain capacity.

Commented [OS7]: Comment no longer applicable as the swale does not reduce floodplain storage.

Commented [OS8]: Comment no longer applicable as the swale does not reduce floodplain storage.



09/10/2024	EA	We have now reviewed the submitted amended information relating to this application. I confirm that we have no additional comments to make at this time and refer you to the points raised in our original response letter dated 2 February 2023 (Our ref SV/2023/111584/01-L01).	The lowest proposed Finished Floor Level (FFL) is 130.100 whereas, due to the river gradient, the 1% flood level + climate change levels vary from 127.200 to 128.800. Therefore, the minimum site freeboard is 1300mm which is above the minimum requirement of 600mm.
28/10/2024	Severn Trent Water	Severn Trent Water advise that there is a public 150mm combined sewer, a public 150mm foul sewer which connect into a public 150mm combined sewer (and later connects to a nearby public 1050mm combined sewer), a public 225mm surface water sewer that upsizes to a public 300mm surface water sewer, and a 18inch clean water asset located within this site. Public sewers have statutory protection and may not be built close to, directly over or be diverted without consent. You are advised to contact Severn Trent Water to discuss the proposals. Severn Trent will seek to assist in obtaining a solution which protects both the public sewer and the building. Please note, when submitting a Building Regulations application, the building control officer is required to check the sewer maps supplied by Severn Trent and advise them of any proposals located over or within 3 meters of a public sewer. Under the provisions of Building Regulations 2000 Part H4, Severn Trent can direct the building control officer to refuse building regulations approval. Please note that there is no guarantee that you will be able to build over or close to any Severn Trent sewers, and where diversion is required there is no guarantee that you will be able to undertake those works on a self-lay basis. Every approach to build near to or	Updated design to account for the required easements. There were discussions surrounding the potential to condition the utility diversions during a meeting with the Case Officer dated 07/11/2024. The Case Officer has confirmed that this would not be conditioned but that there is a separate process to be followed.



		divert our assets has to be assessed on its own merit and the decision of what is or isn't permissible is taken based on the risk to the asset and the wider catchment it serves. It is vital therefore that you contact us at the earliest opportunity to discuss the implications of our assets crossing your site. Failure to do so could significantly affect the costs and timescales of your project if it transpires diversionary works need to be carried out by Severn Trent.	
		We have apparatus in the area of the planned development, the developer will need to contact Severn Trent Water, New Connections team as detailed below to assess their proposed plans for diversion requirements.	Updated proposals confirming appropriate easements are to be submitted to Severn Trent Water for comment.