Developers’ Guide for Surface Water Management
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Introduction

As a Lead Local Flood Authority (LLFA), Southwark Council is responsible for managing flood risk from surface water, groundwater and ordinary watercourses throughout the borough. In order to effectively reduce flood risk, Southwark is committed to reducing surface water runoff flowing into both separate and combined sewers throughout the borough by requiring the use of sustainable drainage systems (SuDS) in all developments, in line with policy 5.13 of the London Plan (2011). This is further supported by section 9.3 of Southwark’s Sustainable Design Supplementary Planning Document.

In our roles as the local Planning Authority and the LLFA, we will review both Flood Risk Assessments and Drainage Strategies as part of the appraisal of planning applications. This guidance has been developed to inform developers on the requirements for planning submissions, including guidance on how this information should be prepared and to what criteria the documentation should be developed.

Should there be any queries on the information provided in this document, or any other queries regarding flood risk and drainage with respect to developments, Southwark’s Flood Risk Management Team may be contacted via floodriskmanagement@southwark.gov.uk.
Requirements for Flood Risk Assessments and Drainage Strategies

This section highlights the requirements with regard to flood risk and drainage submissions for planning permission for developments in Southwark. The level of detail required will need to be tailored for the actual development. If the developer is in any doubt about the information required or the level of detail to be provided, it is strongly recommended that the developer seeks clarification from Southwark’s Flood and Drainage Team.

It is highly recommended that pre-application discussions take place before submitting an application to the local planning authority. The more issues that can be resolved at pre-application stage, the greater the benefits to both Southwark Council and the applicant.

The participation of other consentory bodies (particularly statutory consultees) in pre-application discussions should also be undertaken whenever possible to enable early consideration of all fundamental issues, even when further discussions will be required at a later stage. These agencies or bodies may include (but not be limited to):

- Environment Agency
- Canal and River Trust
- Highway Authority
- Thames Water (sewage undertaker)

2.1 Planning Applications

Planning applications may be submitted either as outline applications with one or more matters reserved for later determination, or as full applications. The level of information that needs to be submitted for each type of application will vary depending on the size of the development, flood risk and complexity of proposed drainage systems. The following table should be used as a guide only for the documentation required for each stage of applications. The requirements may vary depending on the size of the development and local conditions.

<table>
<thead>
<tr>
<th>Document</th>
<th>Pre-Application</th>
<th>Outline Application</th>
<th>Full Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Specific Flood Risk Assessment</td>
<td>Recommended</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Drainage Strategy</td>
<td>Recommended</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Preliminary Layout Drawings</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Preliminary Hydraulic Calculations</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Ground Investigation Report (where infiltration is proposed)</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Evidence of Third Party Agreement for Discharge to their System</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Detailed Development Layout Drawings</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Detailed Hydraulic Calculations</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Geotechnical Factual and Interpretive Reports (including infiltration results)</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Discharge Agreements (Temporary and Permanent)</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

Additional information may be required depending on the type and size of development, and for specific site conditions. For larger developments, consideration should also be given to phasing; this should be reflected in the documentation.
Further details on what is required for Flood Risk Assessments (FRAs) and Drainage Strategies are provided in the next sections.

2.2 Flood Risk Assessments

For the majority of developments, site specific FRAs are required in line with the National Planning Policy Framework (NPPF). This is to ensure that inappropriate development in areas of flood risk are avoided by directing developments away from areas at high risk, or where development is necessary, ensuring that flood risks are adequately considered. Site specific FRAs should be appropriate to the scale, nature and location of the development, and are required for developments:

- In flood zone 2 or 3, including minor developments and change of use.
- More than 1 hectare in size within flood zone 1.
- Less than 1 hectare in size within flood zone 1, including a change of use in development type to a more vulnerable class (e.g. from commercial to residential), where they could be affected by sources of flooding other than rivers and the sea.
- In an area within flood zone 1 with known drainage issues.

In preparing the site specific FRA, the applicant should collect all available information pertaining to the site to accurately determine flood risks and for consideration in the development of a drainage strategy. Relevant information available from Southwark Council includes:

- Strategic Flood Risk Assessment
- Local Flood Risk Management Strategy
- Surface Water Management Plan (SWMP) and Flood Risk Maps
- Preliminary Flood Risk Assessment (PRFA)

The Environment Agency’s standing advice should be followed if the FRA is being undertaken for:

- A minor extension (household extensions or non-domestic extensions less than 250m² in area) in flood zone 2 or 3.
- More vulnerable uses in flood zone 2 (except for landfill or waste facility sites, caravan or camping sites).
- Less vulnerable uses in flood zone 2 (except for agriculture and forestry, waste treatment, and water and sewage treatment).
- Water compatible uses in flood zone 2.

This includes developments involving a change of use into one of these vulnerability categories or into the water compatibility category.

There are 5 No. Critical Drainage Areas (CDAs) within Southwark. Southwark Council expects FRAs to be undertaken for all developments within the CDAs. FRAs will also be required for development proposals near CDAs that could potentially impact on flooding in a CDA Southwark would however expect that opportunities for reducing surface water run-off should be explored in all cases. Further details on the locations of the CDAs are available in Southwark’s SWMP.

Detailed flood maps and boundaries of our CDAs are available from the EA’s website and the council’s SWMP.
2.3 Drainage Strategy

Where the existing site drainage is to be modified in any way, or new surface water drainage is to be provided, a Drainage Strategy should be submitted, either as a part of the site specific FRA or as a separate document. As a general rule, the following information should be submitted as part of the Drainage Strategy, as a minimum:

- Description of the existing and proposed drainage arrangements for the site.
- Calculation of the existing surface water runoff for the site. This should consider the existing permeable area for brownfield sites.
- Calculation of the proposed runoff from this site. This should consider any proposed impermeable areas for the site and how this compares to any existing impermeable areas.
- Assessment of the suitability for Sustainable Drainage Systems (SuDS) to be used for surface water management, including recommendations and indicative sizing for chosen SuDS measures.
- Site drainage layout; this should include a site plan showing locations of SuDS measures, pipelines and flow control devices.
- Explanation of who will maintain the site drainage system, including SuDS measures, and how the maintenance will be funded.
- Evidence that the site has an agreed point of discharge; this may be in the form of a written agreement of discharge (section 106 or similar), or evidence of discussions held with the relevant undertaker / authority, e.g. Thames Water for discharge to combined sewers.
- Any required phasing arrangements that must be considered; this should document how drainage is considered during all stages of the development. This will likely only be required for larger developments.

Further details on the requirements for hydraulic design are provided in section 3 of this guidance.

In general, drainage strategies are not required for any development where no changes are to be made to the external layout of the site (primarily change of use applications). However, Southwark Council expects all developments to take advantage of any suitable opportunities to reduce surface water runoff, e.g. installation of water butts.

Southwark Council understand that the required information may not be available to produce all of this documentation, though we expect to see every effort made to provide a suitable level of detail. Should certain information not be available, we will likely recommend that a condition be imposed on the planning application to ensure that sufficient details are provided prior to the commencement of construction.

We recommend that any hydraulic calculations undertaken are appended to the drainage strategy document.

2.
Hydraulic Design

As detailed in section 2.2, Southwark expect the existing brownfield / greenfield runoff rates for development sites to be calculated as part of the drainage strategy. This section details the requirements for calculating the runoff rates and selecting a suitable proposed runoff rate for the design. Southwark now expects every effort to be made to reduce surface runoff for all developments to the equivalent greenfield rate as detailed below.

3.1 Calculation of Existing Site Runoff Rates

An assessment of the both the existing and equivalent greenfield rates of discharge from the site should be calculated using the annual exceedance probability (AEP) in the table below.

<table>
<thead>
<tr>
<th>Site Characteristic</th>
<th>Annual Exceedance Probability (AEP)</th>
<th>Equivalent Return Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average site ground slope greater than 1%</td>
<td>100%</td>
<td>1 in 1 year</td>
</tr>
<tr>
<td>Average site ground slope 1% or less</td>
<td>50%</td>
<td>1 in 2 year</td>
</tr>
</tbody>
</table>

The methods used for calculating the runoff rates should be confirmed in the Drainage Strategy, e.g. modified rational method, as well as details of any computer software packages used (e.g.) Microdrainage.

3.2 Calculation of Proposed Site Runoff Rates

The rate of surface water discharge for the 1% AEP design event (1 in 100 year return period) from the proposed development site, including an allowance for climate change (20% allowance for non-residential developments and 30% allowance for residential developments), should be limited to the calculated greenfield rate (in line with the methodology described in 3.1 above). This is in line with policy 5.13 of the London Plan (2011), see section 4 for details.

For some developments, site constraints or other mitigating factors may mean that achieving the greenfield runoff rates is not possible or prohibitively expensive. For such sites, Southwark expect that the flow is reduced as far as possible, with the goal of reducing the flow by no less than 50% of the existing brownfield site runoff rate as a minimum.

Where reduction of the flow to greenfield rates is not possible, Southwark expect the developer to agree a discharge rate with the Flood Risk Management team prior to submission of the planning application. In such situations, the developer will be required to demonstrate that it is not feasible to achieve a better outcome. If the application is submitted without an agreed runoff rate, the Flood Risk Management Team may not recommend the proposal for approval.
3.3 **Critical Storm Durations**

The critical storm duration for each element of the drainage network should be determined by considering a range of summer and winter storm durations from 15 minutes up to the 1080 minute (7 day) duration. FSR (Flood Studies Report) rainfall data should only be used for critical storm durations less than 1 hour and FEH (Flood Estimation Handbook) rainfall data should be used for storm durations greater than 1 hour.

If computer modeling software has been used, e.g. Microdrainage, full printouts of model inputs and results should be provided, to allow for an assessment of the modelled information.
SuDS Assessment and Selection

In line with policy 5.13 of the London Plan (2011), developers should utilise SuDS on all developments, unless there are practical reasons for not doing so. Therefore, Southwark expect to see suitable consideration given to using sustainable measures in line with the following drainage hierarchy:

- Store rainwater for later use
- Use infiltration techniques, such as porous surfaces in non-clay areas
- Attenuate rainwater in ponds or open water features for gradual release
- Attenuate rainwater by storing in tanks or sealed water features for gradual release
- Discharge rainwater direct to a watercourse
- Discharge rainwater to a surface water sewer / drain
- Discharge rainwater to the combined sewer

The use of SuDS should be considered early in the design, to ensure that a suitable drainage system is developed. SuDS options may require a significant land area, or may be difficult to incorporate once detailed design is underway. It can be difficult to incorporate some options once the detailed design is underway, and therefore early consideration is vital.

Further information on the use of SuDS is available from the following sources:

- CIRIA 523 SuDS Best Practice Manual
- CIRIA 609 SuDS – Hydraulic, Structural and Water Quality Advice
- CIRIA 697 SuDS Manual
- CIRIA C687 Planning for SuDS
- CIRIA W12 Sustainable Water Management in Schools
- CIRIA R156 Infiltration Drainage – Manual of Good Practice
- CIRIA C698 SuDS Construction Guide
- CIRIA C635 Designing for Exceedance in Urban Drainage
- Local Authority SuDS Officer Organisation (LASOO) – Non Statutory Technical Standards for Sustainable Drainage – Best Practice Guidance
Common Issues

There are a number of items that are commonly seen in FRAs and Drainage Strategies, which Southwark consider to be undesirable. This section provides details of these elements.

5.1 Common Issues with Flood Risk Assessments

The following issues are commonly encountered in FRA submissions:

- Inadequate breach assessment – SFRA or EA breach assessment information is commonly used to identify tidal flood risk to sites. In reality, both should be used as there are areas in the north of the borough where it is believed the EA information does not sufficiently cover. Note: The SFRA is currently being updated. Until this update is complete, EA breach modeling information should be used.
- Breach assessment conclusions – it is common to see FRAs which identify residual tidal flood risk, but later discount the risk as insignificant due to the low probability of a breach occurring. This is not an acceptable approach and suitable mitigation, resistance or resilience measures should be identified in the FRA.
- Inadequate resilience measures – where residual risk has been identified, developers commonly fail to recommend adequate resilience measures in line with the requirements for exception tests provided within Southwark’s SFRA.
- Lack of reference to Surface Water Flood Mapping – this information is provided within Southwark’s SWMP and should be referenced in all FRAs.
- Poor or no assessment of the impact of basements on surface water and groundwater flow / flooding – an assessment should always be undertaken of the effect of the basement on groundwater levels, infiltration and surface water flows on site. Particular attention should be given to cases where the depth of the basement extends into known groundwater levels.

5.2 Common Issues with Drainage Strategies

The following issues are commonly encountered in Drainage Strategy submissions:

- Daisy chained surface water connections – this refers to instances where a new drainage connection is made to existing highway drainage. This should be avoided at all costs as this can cause capacity issues. The preferred solution is to discharge directly into the Thames Water combined sewer.
- Connection (misconnection or otherwise) of foul discharges to a surface water system – this is never acceptable, but does occur without consent.
- Combined manholes – in some parts of London, manholes containing foul and surface water sewer pipes have been historically installed. This can lead to contamination of surface water discharges and should be avoided.
- Pumped surface water mains – although there are some scenarios (e.g. very flat sites combined with shallow combined sewers) where pumped mains are necessary, they are not a preferred solution. Evidence will be required to demonstrate why a gravity system cannot be used.
- Permeable paving in the public highway – this has the potential to cause settlement issues in the highway, and should therefore generally be avoided. Permeable paving can be permitted in the highway in parking bays and in small cul-de-sacs where minimal vehicle traffic is expected.
Linear drainage channels are not a preferred method of surface water collection. In general, the developer will need to provide sufficient details to demonstrate why conventional drainage systems are not suitable.

This list is not exhaustive but comprises some of the main drainage issues noted in the course of reviewing planning applications. Further guidance on acceptable drainage provisions in highways can be sought from the Southwark Streetworks Design Manual (SSDM).