SuDS Flows and Volumes – LLFA Technical Assessment Proforma

This form identifies the information required by the LLFA to enable technical assessment of flows and volumes determined as part of drainage / SuDS calculations.

*Note : * means delete as appropriate; Numbers in brackets refer to accompanying notes.*

SITE DETAILS

1.1	Planning application reference	**1331/APP/2017/1883**
1.2	Site name	**Former Nestle Factory Hayes – SEGRO Commercial Development**
1.3	Total application site area (1)	**51,750 m² / 5.175 ha**
1.4	Is the site located in a CDA or LFRZ	**No**
1.5	Is the site located in a SPZ	**No**

VOLUME AND FLOW DESIGN INPUTS

2.1	Site area which is positively drained by SuDS (2)	**41,260 m²**
2.2	Impermeable area drained pre development (3)	**49,162 m²**
2.3	Impermeable area drained post development (3)	**41,260 m²**
2.4	Additional impermeable area (2.3 minus 2.2)	**– 7902 m² (i.e. reduction of 7902 m²)**
2.5	Predevelopment use (4)	~~Greenfield~~ / **Brownfield** / ~~Mixed~~ *
2.6	Method of discharge (5)	~~Infiltration~~ / ~~waterbody~~ / **storm sewer** / ~~combined sewer~~*
2.7	Infiltration rate (where applicable)	**Soil infiltration rate testing has been undertaken and determined negligible infiltration rates. Details are in Capita's June 2016 ground investigation report.**
2.8	Influencing factors on infiltration	**A shallow groundwater table and low permeability near-surface soils have been found to preclude the use of infiltration drainage.**
2.9	Depth to highest known ground water table	**The groundwater level ranges between about 28.0 and 29.5 mAOD.**
2.10	Coefficient of runoff (Cv) (6)	**0.75 summer and 0.84 winter. Our design has used the worst case winter storm therefore Cv = 0.84 is the basis of the Capita strategy.**
2.11	Justification for Cv used	**These values are considered to accurately reflect the characteristics of the type of impervious surfaces proposed at this site.**
2.12	FEH rainfall data used (Note that FSR is no longer the preferred rainfall calculation method)	**No**

SuDS Flows and Volumes – LLFA Technical Assessment Proforma

2.13 Will storage be subject to surcharge by elevated water levels in watercourse / sewer **No**

2.14 Invert level at outlet (invert level of final flow control) **27.280 mAOD**

2.15 Design level used for surcharge water level at point of discharge(14) **None used**

CALCULATION OUTPUTS

Sections 3 and 4 refer to site where storage is provided by attenuation and / or partial infiltration. Where all flows are infiltrated to ground omit Sections 3 -5 and complete Section 6.

3.0 Defining rate of runoff from the site

3.2 Max. discharge for 1 in 1 year rainfall **7.3 l/s/ha, 38.3 l/s for the site**

3.2 Max. discharge for Q_{med} rainfall **7.7 l/s/ha, 40 l/s for the site**

3.3 Max. discharge for 1 in 30 year rainfall **9.3 l/s/ha, 48.1 l/s for the site**

3.4 Max. discharge for 1 in 100 year rainfall **19.2 l/s/ha, 99.2 l/s for the site**

3.5 Max. discharge for 1 in 100 year plus 30%CC **21.4 l/s/ha, 110.6 l/s for the site**

4.0 Attenuation storage to manage peak runoff rates from the site

4.1 Storage - 1 in 1 year **404 m^3** **0.010 m^3/m^2 (of developed impermeable area)**

4.2 Storage - 1in 30 year (7) **1090 m^3** **0.026 m^3/m^2**

4.3 Storage - 1in 100 year (8) **1357 m^3** **0.033 m^3/m^2**

4.4 Storage - 1 in 100 year plus 20%CC (9) **1541 m^3** **0.037 m^3/m^2**

5.0 Controlling volume of runoff from the site

5.1 Pre development runoff volume(10) **2559 m^3 for the site**

5.2 Post development runoff volume (unmitigated) (10) **1802 m^3 for the site**

5.3 Volume to be controlled/does not leave site (5.2 - 5.1) **– 757 m^3 for the site**

5.4 Volume control provided by
- Interception losses(11) **0 m^3**
- Rain harvesting(12) **0 m^3**
- Infiltration (even at very low rates) **0 m^3**
- Separate area designated as long term storage(13) **0 m^3**

5.5 Total volume control (sum of inputs for 5.4) **0 m^3** (15)

6.0 Site storage volumes (full infiltration only)

SuDS Flows and Volumes – LLFA Technical Assessment Proforma

6.1 Storage - 1in 30 year (7) **Not applicable** m^3 m^3/m^2 (of developed impermeable area)

6.2 Storage - 1 in 100 year plus CC (9) **Not applicable** m^3 m^3/m^2

Notes

1. All area with the proposed application site boundary to be included.
2. The site area which is positively drained includes all green areas which drain to the SuDS system and area of surface SuDS features. It excludes large open green spaces which do not drain to the SuDS system.
3. Impermeable area should be measured pre and post development. Impermeable surfaces includes, roofs, pavements, driveways and paths where runoff is conveyed to the drainage system.
4. Predevelopment use may impact on the allowable discharge rate. The LLFA will seek for reduction in flow rates to GF status in all instances. The design statement and drawings explain / demonstrate how flows will be managed from the site.
5. Runoff may be discharge via one or a number of means.
6. Sewers for Adoption 6th Edition recommends a Cv of 100% when designing drainage for impermeable area (assumes no loss of runoff from impermeable surfaces) and 0% for permeable areas. Where lower Cv's are used the application should justify the selection of Cv.
7. Storage for the 1 in 30 year must be fully contained within the SuDS components. Note that standing water within SuDS components such as ponds, basins and swales is not classified as flooding. Storage should be calculated for the critical duration rainfall event.
8. Runoff generated from rainfall events up to the 1 in 100 year will not be allowed to leave the site in an uncontrolled way. Temporary flooding of specified areas to shallow depths (150-300mm) may be permitted in agreement with the LLFA.
9. Climate change is specified as 30% increase to rainfall intensity, unless otherwise agreed with the LLFA / EA.
10. To be determined using the 100 year return period 6 hour duration rainfall event.
11. Where Source Control is provided Interception losses will occur. An allowance of 5mm rainfall depth can be subtracted from the net inflow to the storage calculation where interception losses are demonstrated. The Applicant should demonstrate use of subcatchments and source control techniques.
12. Please refer to Rain harvesting BS for guidance on available storage.
13. Flow diverted to Long term storage areas should be infiltrated to the ground, or where this is not possible, discharged to the receiving water at slow flow rates (maximum 2 l/s/ha). LT storage would not be allowed to empty directly back into attenuation storage and would be expected to drain away over 5-10 days. Typically LT storage may be provided on multi-functional open space or sacrificial car parking areas.
14. Careful consideration should be used for calculations where flow control / storage is likely to be influenced by surcharged sewer or peak levels within a watercourse. Storm sewers are designed for pipe full capacity for 1 in 1 to 1 in 5year return period. Beyond this, the pipe network will usually be in conditions of surcharge. Where information cannot be gathered from Thames Water, engineering judgement should be used to evaluate potential impact (using sensitivity analysis for example).
15. In controlling the volume of runoff the total volume from mitigation measures should be greater than or equal to the additional volume generated.