Drainage Assessment Form

We require applicants to complete this Drainage Assessment Form (DAF) and submit it to the Local Planning Authority, referencing from where the information in the submission document is taken. The form is supported by the Defra/EA guidance on Rainfall Runoff Management document (www.evidence.environment-agency.gov.uk/FCERM/Libraries/FCERM_Project_Documents/Rainfall_Runoff_Management_for_Developments_-_Revision_E.sflb.ashx) and aligns to the tools on www.UKsuds.com.

1. Site Details

SITE DETAILS		NOTES FOR APPLICANTS & LOCAL AUTHORITIES
Site Name	NISHKAM SCHOOL HOUNSLOW	
LPA reference (if applicable)		
Address & post code	152 STAG LANE, HOUNSLOW TW7 5PN	
Grid reference	515550, 177660	Centre point of the site in eastings, northings (XXXXXX, YYYYYY) format.
Brief description of proposed work	CONSTRUCTION OF NEW 1500 PUPIL SECONDARY SCHOOL	For example, type of development, number of units etc.
Is the existing site Brownfield or Greenfield?	GREENFIELD	Brownfield = developed. Greenfield = undeveloped.
Total site Area (Ha)	4.17 Ha	The area, in hectares, of the whole development site including any large parkland areas and public open space.
Significant public open space (Ha)	0	The area, in hectares, of any large parkland areas or public open space situated within the site which remains largely unchanged and is not provided with positive drainage
Area Positively Drained (Ha)*	1.97 HECTARES	This is the total development area that is served by the drainage system. It is the difference between the total site area and the significant public open space.
Is the site currently known to be at risk of flooding from any sources? If so, please state and provide evidence.	NO. FLOOD ZONE 1	Please attach surface water and fluvial flood risk maps (as shown on the Environment Agency's website) and any records of known historic flooding at the site.

* The Greenfield runoff rate from the development which is to be used for assessing the requirements for limiting discharge flow rates and attenuation storage from a site should be calculated for the area that forms the drainage network for the site whatever size of site and type of drainage technique. Please refer to the Rainfall Runoff Management document or CIRIA SuDS Manual for details.

2. Impermeable Area

	Existing	Proposed	Difference (Proposed-Existing)	Notes for applicants & Local Authorities
Impermeable area (Ha) Surfaces which do not permit infiltration of water into the ground.	0	1.97 HA	1.97 HA	If proposed > existing, then runoff rates and volumes will be increasing.
Drainage Method Rainwater harvesting/infiltration/SuDS/ watercourse/sewer	—	SEWER		See the London Plan Policy 5.1.3 Drainage Hierarchy. If the existing drainage was via infiltration and the proposed is not, section 3 should provide evidence as to why.

3. Is infiltration on-site suitable? Storage is required for the additional volume from site but also for holding back water to slow down the rate of discharge from the site. This is known as attenuation storage and long term storage. The idea is that the additional volume is not permitted to flow rapidly overland, into watercourses or into the sewer system and hence potentially increasing flood risk on site and downstream of the site. You can either infiltrate the stored water back into the ground, or if this isn't possible hold it back with on-site storage, allowing gradual discharge at a controlled rate. Please fill in the table to show the extent of your investigations as to whether infiltration is a possible route for runoff to be discharged to.

			Notes for applicants & Local Authorities
Infiltration	**State the site's geology (including superficial deposits where known).**	UNDERLAIN BY LONGLET SILT & TAPLOW GRAVEL	Infiltration rates are highly variable and infiltrating into made (i.e. unnatural) ground should be avoided.
	State the site's known Source Protection Zones (SPZ).	FLOOD ZONE 1	Please refer to the Environment Agency's website to identify any source protection zones (SPZ).
	What is the development site's infiltration rate?	0 m/sec – 5.7×10^{-5} m/sec	Infiltration rates should be worked out in accordance with BRE 365. If infiltration is the preferred method of drainage, then rates should be no lower than 1×10^{-6} m/s.
	Were infiltration rates obtained via a desktop study or from infiltration tests?	TESTED TO BRE DIGEST 365	If it is not feasible to access the site to carry out infiltration tests before planning approval is granted, a desktop study could be undertaken looking at the underlying geology of the area and assuming a worst-case infiltration rate.
	At what depth below ground is the water table (groundwater level)?	APPROX 3.0 METRES	Where known, please use borehole test results and state the time of year these were carried out.
	State the distance between the proposed infiltration device base and the water table.	N/A NO INFILTRATION	Need a minimum of 1m between the base of the infiltration device and the water table to protect groundwater quality and ensure groundwater does not enter infiltration devices. Avoid infiltration where this is not possible.
	Is the site contaminated? If yes, consider advice from others on whether infiltration can happen.	NO	Water should not be infiltrated through land that is contaminated. The Environment Agency may provide bespoke advice in planning consultations for contaminated sites that should be considered.

In light of the above information, is infiltration feasible?	~~Yes~~ / No	If infiltration is not feasible the applicant should consider the options in section 4. If infiltration is feasible, then it can be combined with the methods in section 4.

4. Method Proposed to Discharge Surface Water via *(in line with London Plan Policy 5.13 drainage hierarchy).* Please select numerous options if this is the case.

	Yes	No	Evidence that this is or is not possible	Notes for Applicants & Local Authorities
Rainwater harvesting		✓	RAINWATER HARVESTING IS NOT PROPOSED FOR THIS DEVELOPMENT	Rainwater harvesting is where rainwater is stored on site for reuse. For example, water for gardening, domestic use etc.
Infiltration		✓	REFER TO INFILTRATION TEST RESULTS WITHIN THE BELOW GROUND DRAINAGE STATEMENT, DESCRIPTION & CALCULATION	Allowing space for rainwater to soak into the ground, as per natural methods.
Attenuation of rain water in ponds and open water features	✓		PROPOSED TO CONTROL DISCHARGE TO SEWER & ATTENUATE WATER AT SURFACE LEVEL ON FOOTBALL PITCH	Please see the CIRIA SuDS Manual for further details about above ground attenuation techniques.
Attenuation of rain water through tanks or sealed water features	✓		YES. RAINWATER FROM CAR PARKING, ROOFS & MUGA. POROUS SURFACE WITH GRANULAR SUB BASE BELOW	Underground storage features which gradually release water. Please note that these are less sustainable than above ground methods and are usually more complex to maintain.
To watercourse		✓	NO KNOWN WATER COURSES ADJACENT TO THE SITE	Is there a watercourse nearby? If so please name, stating approximate distance from site.
To surface water sewer	✓		CURRENTLY SEEKING PERMISSION FOR DISCHARGE TO THAMES WATER STORM SEWER	The confirmation from sewer provider that sufficient capacity exists for this connection will be required.
To combined sewer		✓	THAMES WATER ASSET RECORDS DETAIL SEPARATE FOUL & STORM WATER SEWERS IN THIS AREA	This would only be acceptable in worst case scenarios and certainly not where separate sewer systems currently exist.

5. Supporting Calculations – in order to check that the proposed development is designed to conform to standards, please complete the following three tables showing your calculations.

A. Peak Discharge Rates – This is the maximum flow rate at which storm water runoff leaves the site during a particular storm event.

Please circle which method was used to calculate the Greenfield Runoff Estimation for Sites:	IH124 method / ~~FEH method~~

***London Plan policy 5.13**: developers should aim for a Greenfield runoff rate from their developments.*

***London Plan Sustainable Design and Construction SPG section 3.4.10:** All developments on Greenfield sites must maintain Greenfield runoff rates. On previously developed sites, runoff rates should not be more than three times the calculated Greenfield rate.*

	Greenfield Rates (l/s) (A)	Proposed Rates (l/s) (B)	Difference (l/s) (Proposed-Greenfield)	Notes for Applicants & Local Authorities
QBAR	6.41			QBAR is approximately the 1 in 2 year storm event.
1 in 1 year	5.45	9.5	4.05	Proposed discharge rates (with mitigation) should be no greater than the Greenfield rates for all corresponding storm events. Please note that discharging all flow, regardless of the corresponding storm event intensity, from site at the existing 1 in 100 year event rate would increase flood risk during smaller events and therefore would not be permitted.
1 in 30 year	14.74	9.5	-5.24	
1 in 100 year	20.44	9.5	-10.94	
1 in 100 year plus climate change		9.5		To mitigate for climate change the proposed 1 in 100 year +CC runoff rate must be no greater than the Greenfield 1 in 100 year event runoff rate. 30% should be added to the peak rainfall intensity to represent increases due to climate change.

Instructions: **To fill in the required 'Difference' boxes, if the site is Greenfield, calculate B-A. If the site is Brownfield prior to development, calculate B-(3xA).**

B. Discharge Volumes Post Development (without mitigation)

The Non-Statutory Technical Guidance for SuDS: *Where reasonably practicable, for Greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the Greenfield runoff volume for the same event. Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the Greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event.*

	Existing Volume		Post-development Volume (m^3) (without mitigation) (C)	Difference (m^3)		Notes for applicants & Local Authorities
	Greenfield Volume (m^3) (A)	Brownfield Volume (m^3) (B)		Post-development to Greenfield (C-A)	Post-development to Brownfield (if applicable) (C-B)	
1 in 100 year, 6 hour event	250		977	727		These calculations provide an indication of how much storage will be required on site.

Instructions: If the site was Greenfield prior to development, only fill in boxes the green boxes. If the site was Brownfield prior to development, complete all of the boxes.

C. Storage Methods – Attenuation storage is provided to enable the rate of runoff from the site into the receiving watercourse or sewer to be limited to an acceptable rate to protect against erosion and flooding downstream. The attenuation storage volume is a function of the degree of development relative to the Greenfield discharge rate. Long term storage is similar to attenuation storage, but aims to specifically address the additional volume of runoff caused by the development compared to pre-development runoff. A combination of SuDS features can account for both types of storage.

Type of SuDS Feature	Volume (m^3)	Notes for applicants & Local Authorities
1 FLOODED FOOTBALL FIELD	210 m^3	SuDS can be adapted for most situations even where infiltration isn't feasible e.g. impermeable liners beneath some SuDS devices allows treatment but not infiltration. See the CIRIA SuDS Manual C697. If no storage features have been proposed please explain why this is the case and provide evidence to back up this reasoning in the box below.
2 GRAVEL 30% VOID RATIO MUGA	200 m^3	
3 GRAVEL 30% VOID RATIO PARKING	750 m^3	
4 INFILTRATION TRENCH	30 m^3	
5		
6		
7		

8		
9		
10		
TOTAL	1190 m^3	This value should be equal to or greater than the 'Difference' value in section 5B. If the site was previously Greenfield, this total should be equal to or greater than the (C-A) value. If the site was previously Brownfield, then this total value should be greater than the (C-B) value, but as close to the (C-A) value as possible.

IF NO STORAGE FEATURES HAVE BEEN PROPOSED IN THE SECTION ABOVE, PLEASE EXPLAIN WHY THIS IS THE CASE AND PROVIDE EVIDENCE TO BACK UP THIS REASONING IN THIS BOX.

6. Please confirm...

	EVIDENCE (PLEASE NAME RELEVANT EVIDENCE DOCUMENT(S))	NOTES FOR APPLICANTS & LOCAL AUTHORITIES
That the drainage system can contain the 1 in 30 storm event without flooding.	YES	The Non-Statutory Technical Standards for SuDS states that no part of the site should flood during a 1 in 30 year event (unless that area is designated to hold and/or convey water as part of the design). This is also a requirement for Sewers for Adoption and is good practice.
That any flooding between the 1 in 30 & 1 in 100 plus climate change storm events will be safely contained on site.	YES	Safely: not causing property flooding or posing a hazard to site users i.e. no deeper than 300mm on roads/footpaths. Flood waters must drain away at section 5A rates.

How runoff flows from storm events in excess of 1 in 100 years will be managed on site.	CALCULATION BASED 100YR +30% LEVELS WILL CONTAIN WATER ON FOOTBALL PITCH	As per the Non-Statutory Technical Standards for SuDS, proposed methods for managing excess flows should be demonstrated so as to minimise the risks to people and property, e.g. through evidence of exceedance routes.
How are rates being restricted (hydrobrake etc.)?	VORTEX FLOW CONTROL AS HYDROBRAKE OR ACO	Hydrobrakes to be used where rates are between 2l/s to 5l/s. Orifices not to be used below 5l/s as the pipes may block. Pipes with flows < 2l/s are prone to blockage.

7. Adoption and Maintenance – please provide the following information

	ADOPTION AND MAINTENANCE INFORMATION	NOTES FOR APPLICANTS & LOCAL AUTHORITIES
Please confirm the proposed owners/adopters of the entire drainage systems throughout the life of the development. Please list all the owners and contact details.	NISHKAM SCHOOL TRUST C/O NISHKAM CENTRE 6 SOLO ROAD, HANDSWORTH BIRMINGHAM. B21 9BN	If there are multiple owners then a drawing illustrating exactly what features will be within each owner's remit must be submitted with this Drainage Assessment Form.
How is the entire drainage system to be maintained?	POROUS SURFACES TO BE PRESSURE WASHED CLEANED ON ANNUAL BASIS. REFER TO ATTACHED MAINTENANCE DOCUMENT	Clear details of the maintenance proposals of all elements of the proposed drainage system over the lifetime of the development must be provided. Poorly maintained drainage can lead to increased flooding problems in the future. If the space provided is not big enough, please attach a separate document containing all relevant information.

8. Evidence. Please identify where the details quoted in the sections above were taken from. i.e. plans, reports etc. Please also provide relevant drawings that need to accompany your DAF, in particular exceedance routes and ownership and location of SuDS (maintenance access strips etc).

Form Section	Document reference where details quoted above are taken from	Page Number
Section 2	AREAS TOKEN FROM DRAWING NWL-BMD-XX-ZO-DR-D HP 00491	ALL
Section 3	FLOOD RISK ASSESSMENT LBH WEMBLEY LBH 4337/FRA BOM DRAINAGE STATEMENT	"
Section 4	BOM DESIGN CALCULATIONS	"
Section 5A	MICRO DRAINAGE FOR SUDS TOOLS	"
Section 5B	" " "	"
Section 5C	MICRODRAINAGE	

The above form should be completed using evidence from the documents submitted with this application, including site plans and, if necessary for the site, a Flood Risk Assessment. It should serve as a summary sheet of the drainage proposals and should clearly show that the proposed runoff rate and volume as a result of development will not be increased. If there is an increase in rate and/or volume, the rate and volume sections should be completed to set out how the additional rate/volume is being dealt with.

This form is completed using factual information from the documents submitted with this application to the LPA, including Site Plans and, if necessary, a Flood Risk Assessment, and can be used as a summary of the surface water drainage strategy on this site.

Form Completed By STEVEN BLISS

Qualification of person responsible for signing off this Drainage Assessment Form LTER PUBLIC HEALTH ENGINEERING

Company BOM DESIGN

On behalf of (Client's details) NISHKAM SCHOOL TRUST

Date: 8/6/2015