

Highgate School Mallinson Sports Centre 4-Phase Scheme Drainage and SuDS Statement



Highgate School Bishopswood Road London, N6 4AY

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Executive Summary

The SuDS strategy addressed 3 components required under local and national planning guidance:

- Sustainable Urban Drainage Systems (SuDS) components to be implemented
- Method of controlling discharge rate
- Method of controlling discharge volume

The Highgate School Mallinson Sports Centre 4-Phase Scheme is large and complex with significant falls in multiple directions. Further complication stems from presence of retained buildings on site, which are subject to some minimal changes, do not form part of the works and are excluded from the calculations.

The 6th revision of this document has been updated to address the comments provided by the Lead Local Flood Authority. This includes revisions in hydrological input datasets used to undertake hydraulic calculations.

Proposed SuDS

This report looks in detail at all potential SuDS components listed in technical and non-technical recommendations. The site is resting on extensive clay layer which stretches from the surface down to at least 50m thus infiltration is not viable. With poor infiltration and limited space the site is poorly suited to implements extensive SuDS. As the site is a low pollution risk with discharge to surface water sewer, extensive treatment is not required. The following are the proposed SuDS:

- Green Roofs
- Trees
- Attenuation Tank

Proposed Runoff Rate

The report established existing Brownfield and Greenfield discharge rate for each major event (1-in-1 / 30 / 100 year). Given the site is located within Haringey critical drainage area, the report focused on minimising flood risk and achieving discharge as close as possible to the Greenfield Rate.

With complex site and following detailed technical review of the practical and appropriate flow rate to achieve the target greenfield rate, it was found that both 1-in-1year flows were too low and not practical for the development.

The proposal is to limit the site to 8.0 l/s up to 1-in-30-year + 35% Climate Change storm (greenfield rate) and increase this to 12.0 l/s for rainfall up to 1-in-100-year + 40% Climate Change (greenfield rate), thus delivering as close as possible to greenfield runoff rate during higher intensity and more critical rainfall events. Attenuation structures will be designed to capture and store all storms up to 1-in-100-year +40% Climate Change event.

1 Project Introduction

The proposed Highgate School Mallinson Sports Centre 4-Phase Scheme is located within an existing school which has a number of existing and newly proposed buildings and extensions of various heights.

The site area within the application red-line boundary is 16,720 m² and is approximately L-shaped. The section of the site where all the buildings are is approximately 115 m long and 40 m to 50 m wide. The remaining site is approximately 80m by 60m in size and contain new Orchard Sportsground. The site has significant fall across: At the high end, on both Southern and Eastern corners, the site level is approximately 110.0 m, however in between the level drops down as low as 107.5 m. Longitudinally the level drops down to 106.0 m at the Northern corner.

Not all buildings within the red-line boundary are part of the demolition and re-development; Two large buildings will be subject to refurbishment and some alternations to join them together with proposed buildings, however otherwise they will remain in place and drainage will remain mostly unaltered. Discussion was held with Haringey Council regarding drainage strategy for existing buildings and new buildings and the agreement was that retained buildings can be excluded from drainage calculations. The overall roof area of retaining buildings is 1,456 m², resulting in overall reduced drainage area to 15,264 m².

The site is currently at risk from surface water flood and is located within critical drainage zone. A separate report has been prepared by Edenvale Young showing in detail how flooding will be mitigated and contained within an upstream dam, located between the buildings and the Orchard Sportsground. Based on proposed mitigation measures flooding will be controlled and won't impact the buildings.

The proposal is for various facilities such as new sports hall, four courts, new teaching office, changing room, new entrance foyer and others. For full details of proposed works please refer to Design and Access Statement submitted under separate cover. The overall impermeable area of the site, including all hardstanding external surfaces, will increase from the existing 3,890 m² (23.3% impermeable) to 5,312 m² (31.8% impermeable).

The development will discharge surface water in line with the requirements of the local planning authority and statutory undertakers and utilize Sustainable Urban Drainage System. Surface water will discharge to existing Thames Water surface water sewer/swale.

Foul water will discharge to Thames Water sewer. Discharge of foul water is outside the scope of this report.

2 Sustainable Drainage Systems (SuDS) Background

This section looks in detail at the drainage and SuDS provision for the development.

2.1 Planning and Technical Considerations

Haringey Council Local Plan

- Haringey's Local Plan: Strategic Policies was adopted by the council in 2013 to replace the Unitary Development Plan, with subsequent alterations adopted on 24 July 2017.
- Strategic Policy SP5: Water Management and Flooding, sets out the council's requirements for developments to implement Sustainable Drainage Systems (SuDS) in all locations and all major planning applications must demonstrate the use of sustainable drainage as part of their development.

London Plan

- Policy 5.13 and the new London Plan Policy SI 13: A development should utilise Sustainable Urban Drainage Systems (SuDS) unless there are practical reasons for not doing so and should aim to achieve greenfield runoff rates and ensure that surface water runoff is managed as close to its source as possible.

The National SuDS Standards (2025):

- In June 2025, the UK government released the first major update to the National Standards for Sustainable Drainage Systems (SuDS) in over a decade. As climate pressures mount and housing demand intensifies, this guidance sets a new direction, redefining SuDS not just as flood mitigation tools but as key elements of healthy, resilient, and green communities.
- Key updates include:
 1. Standard 2: Managing everyday rainfall to reduce pressure on traditional sewers.
 2. Standard 3: Ensuring resilience against extreme rainfall events.
- Section 3.18 states *'The peak allowable discharge rate from the development to surface waters or sewers for the 50% AEP event shall be limited to the equivalent 50% AEP greenfield runoff rate, or 3 l/s/ha, whichever is the greater'*.
- It is noted however, that these rates cannot be achieved in some instances for previously developed sites. Section 3.21 states *'For previously developed sites a 'relaxation factor' shall be applied to the target 50% and 1% AEP greenfield runoff rates where evidence is provided that demonstrates why greenfield runoff or 3l/s/ha rates cannot be achieved and this is agreed with the approving body. This relaxation factor shall be no greater than 5 times the greenfield runoff rate'*.

2.2 Sustainable Drainage Principles

The most appropriate means of surface water control and discharge has been determined based on the hierarchy as set out in the National standards for sustainable drainage systems¹.

Methods for Controlling Storm Water

The aim of Sustainable Drainage Systems (SuDS) is to emulate natural processes with the result that watercourses and storage areas receive the hydrological profiles under which they evolved, and that water quality in local ecosystems is protected or improved. Table 1 summarises the hierarchy of SuDS components which can be incorporated into development. SuDS elements that are proposed to manage surface water for the development will be discussed, in section 3.1, in relation to this hierarchy.

Storing water for later use

Rainwater harvesting is the collection of rainwater runoff for use and is the most common method of storing water for later use. Other options include storing water in ponds for irrigation. Runoff can be collected from traditional roofs and other impermeable areas, stored, treated (where required) and used as a supply for water for domestic, commercial, industrial and/or institutional properties. Such systems are not intended to control peak runoff rate during critical events and are mainly useful during medium and small events, to capture runoff and thus reduce the over volume entering the drainage system.

¹ Available at: <https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems> Accessed 02.06.26

Infiltration Techniques

Infiltration is a key planning, building regulations and public water company requirement. Almost all SuDS components could be designed permeable: soakaways, infiltration trenches, filter strips, basins, bio-retention and paving systems. Infiltration contributes to reducing runoff rates and volumes while supporting base flow and groundwater recharge. The four key criteria have to be satisfied before infiltration into the soil can be considered:

- Ground must be suitable for infiltration
- Groundwater generally needs to be 1.0m below base of infiltrating feature
- Ground must be not contaminated, or SuDS designed so that infiltration will not activate pollution
- Soakaways generally should not be placed closer than 5m to a building (15m for boreholes)

Attenuate rainwater in open water features for gradual release

The most commonly known features are detention basins, ponds and wetlands. All of the features are used to control peak runoff rate, while open ponds or detention basins can reduce volume of runoff through retransformation or infiltration (see above).

Attenuate rainwater in tanks (sealed) systems for gradual release

The most common method of controlling runoff on developed sites is through storage in attenuation tanks. The purpose is to collect the water and slowly release it into the drainage network. The attenuation systems, such as geo-cellular tanks below ground provide no volume reduction benefit.

Table 1: SuDS Hierarchy

	SuDS Techniques	Flood Reduction	Pollution Reduction	Landscape & Wildlife
Most Sustainable	Green and blue roofs	✓	✓	✓
	Basins and ponds 1. Constructed wetlands 2. Balancing ponds 3. Detention Basins 4. Retention Ponds	✓	✓	✓
	Filter strips and swales	✓	✓	✓
	Infiltration Devices 1. Soakaways 2. Infiltration trenches and basins	✓	✓	✓
	Permeable surface and filter drains 1. Gravelled areas 2. Solid paving blocks 3. Porous pavements	✓	✓	
Least Sustainable	Tanked systems 1. Over-sized pipes/tanks 2. Box storage systems	✓		

Methods for Discharging Storm Water

Methods for discharging storm water:

- Discharge rainwater direct to a watercourse
- Discharge rainwater to a surface water sewer/drain
- Discharge rainwater to the combined sewer

Methods for discharging storm water, if infiltration is not viable, is site dependent.

Discharge rainwater direct to a watercourse

Discharge to a watercourse is preferred as this reduces the need to provide a drainage network, allows recharge to rivers and groundwater, and reduces sewer flooding. Discharge to a tidal river can be unattenuated, whilst in other cases Greenfield rates and volumes are appropriate.

Discharge rainwater to a surface water sewer/drain

British standards require that sewers must be kept separate on-site and discharge storm water to storm water sewer if infiltration is not viable and a watercourse discharge is not possible. The key purpose of separate systems is to minimise storm surcharge to foul treatment stations and improve water quality of receiving water courses.

Discharge rainwater to the combined sewer.

Older parts of the country, especially London, do not have separate sewer systems, and in such instances the only viable option is to connect to combined water sewer or foul water sewer.

3 Proposed SuDS Elements

3.1 Proposed SuDS

CIRIA The SuDS Manual C753 provides a good guide on all possible SuDS systems, their use and constraints. The below table summarises all proposed SuDS elements with reference given to the SuDS hierarchy and their suitability to the development site.

The site has significant open space and thus offers significant SuDS potential. The overall scheme is to implement higher up elements of the SuDS management train, including swale, detention basin, trees and including other elements such as bioretention if they are practical. Some elements lower down the SuDS management train have been excluded. Discussion regarding discharge rate and volume is covered under a separate section.

Table 2: Summary of Proposed SuDS with Reference to SuDS Hierarchy

SuDS Technique	Practicable	Proposed	Comments
Rainwater Harvesting	X	X	It is not practical to implement harvesting on this site as the area is on clay and suffers from water logging. External garden areas are minimal.
Green and blue roofs	✓	✓	Green roofs underlain with blue roof attenuation cells are proposed for suitable roofs.
Basin and ponds	X	X	Not proposed – insufficient space where ground levels are level or lower than ground levels around impermeable surfaces to provide such a feature
Filter strips and swales	X	X	Not proposed – insufficient space where ground levels are level or lower than ground levels around impermeable surfaces to provide such a feature
Infiltration Devices	X	X	Not proposed – unsuitable ground conditions
Permeable surface and filter drains	✓	X	The majority of pavements are small and thus would shed the water to neighbouring grass areas.
Tanked Systems	✓	✓	Below ground attenuation will be provided to meet peak storage requirements.

3.2 Pollution Mitigation

The proposals for the site have been assessed against the CIRIA SuDS Manual C753 to determine the requirements for the treatment of surface water prior to its discharge from the site to the sewer network. The SuDS features incorporated within the site should be designed to have a total pollution mitigation index that is equal to or greater than the pollution hazard index. Owing to the proposed use of the site and scale of development, the pollution hazard level is considered within.

Table 3: Pollution hazard indices for different land uses

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons (HCs)
Other Roofs (commercial/industrial)	Low	0.3	0.2 (up to 0.8)	0.05
non-residential car parking with infrequent change	Medium	0.7	0.6	0.7

The SuDS features required to mitigate against these index scores have been considered. Given the restrictions noted in the SuDS hierarchy.

As mentioned in *Table 2*, the capability to incorporate SuDS components which can deliver pollution mitigation is limited given the site's constraints. Therefore, a pollutant vortex separator system will be included within the proposed surface water drainage network, directly upstream of the connections to the public sewer.

The SuDS pollution mitigation indices for proprietary treatment systems is greater than the pollution hazard index for the non-residential roof or car parking.

3.3 Proposed Discharge Method

Table 4 shows the Discharge Hierarchy in order along with comments specific to the development site and their suitability

New direct connections are needed to ensure that the proposed site is not combined with existing unrestricted sewer outfall for existing buildings.

Table 4: Discharge Hierarchy

Method of discharge	Viable	Proposed	Comments
Rainwater as a resource (i.e. Rainwater Harvesting)	X	X	It is not practical to implement harvesting on this site as the area is on clay and suffers from water logging. External garden areas are minimal.
Rainwater infiltration to ground at or close to source	X	X	Not viable - unsuitable ground conditions for infiltration due to its poor soakage potential.
Rainwater discharge direct to a watercourse	X	X	No watercourse is located within the immediate vicinity of the site to discharge to.
Controlled rainwater discharge to a surface water sewer or drain.	✓	✓	There is a Thames Water surface water sewer/swale within the immediate vicinity of the site which will be discharged to, subject to Thames Water S106 approval.
Controlled rainwater discharge to a combined sewer	✓	X	A more preferable method of discharge is viable.

4 Runoff Rates

4.1 Background

The site is not suitable for infiltration; ground investigation has confirmed that the site is clay or various densities from the surface until at least 50m below.

Given limited external space and no infiltration, the only viable means of storing surface water is via attenuation tanks within the site boundary, which would be located around the proposed buildings.

PJCE are also examined alternative arrangements to store attenuation volume behind the new dam and within Orchard Sports Ground flood zone (refer to Flood Risk Assessment to better understand the function of the facility), which is being constructed to protect the development from flooding. However, to achieve this, a hydro-brake would need to be installed within Thames Water sewer upstream to mimic greenfield rate reduction at the site. Given the number of practical, technical and legal challenges which would be needed to be addressed to enable this solution, this solution was not explored further.

The site will achieve a discharge rate, as outlined below, as close to Greenfield runoff rate as possible, by either directly controlling runoff or mimicking greenfield run-off off-site.

4.2 Greenfield Runoff Rates

The Greenfield mean annual flood runoff rate (QBar) for the entire site has been calculated, using the FEH statistical (2025) method, as 5.20 l/s. A copy of the HR Wallingford Greenfield runoff rate estimation tool calculation sheet is provided in the Appendix G.

The table below summarises Greenfield discharge rates for given return periods. The Greenfield rate has been calculated for the entire site area (16,720 m²), excluding the overall roof area of buildings which are to be retained (1,456 m²).

Greenfield runoff rates				
Return Period	1-in-1 year	1-in-30 year	1-in-100 year	QBar
Greenfield runoff rate (l/s)	4.40	12.00	16.70	5.20

4.3 Existing Runoff Rates

An assessment has been undertaken to model the existing runoff rate from the site using InfoDrainage. The most up to date FEH hydrological data was used in determining the existing discharge rates. FEH datasets concentrate on rainfall event durations of one hour and above and returns for the 1-in-2 year event and above.

The existing runoff rates for the site have been exclusively based on the existing hardstanding area of the site (3,890 m²). Certain impermeable areas, such as pathways, typically drain to grass and is therefore ignored in the calculations. A volumetric runoff coefficient (Cv) of 1.0 has therefore been applied to all contributing areas within the hydraulic model.

The results for the 1 in 2 year, 1 in 30 year and 1 in 100 year storm intensities are presented in Table 2 below, with a copy of the calculations included in Appendix E.

Peak discharge rates – Pre Development			
Return Period	1-in-2 year	1-in-30 year	1-in-100 year
Discharge rate (l/s)	83.90	216.10	283.20

4.4 Climate Change

Climate change must be allowed for over the lifetime of the development, and the Environment Agency guidance is published on the GOV.UK website. The peak rainfall allowances map shows anticipated changes in peak rainfall intensity and should be used in drainage design.

The site is located in the London Management Catchment. The climate change allowances for this area are shown in Table 2 and Table 3 for 3.3% and 1% annual exceedance rainfall event respectively. The intended lifetime for the proposed development is assumed to be 100 years, in accordance with the PPG for Flood Risk and Coastal Change.

Peak rainfall intensity allowances in small and urban catchments apply across all of England and range between 20% and 40% total potential increase for the 100-year design life of the development. It is necessary to consider both the "Central" and the "Upper End" allowances, to ensure no increase in discharge rates from the site following development. Flood protection measures should be incorporated where the 40% climate change allowance would result in onsite flooding to buildings or access routes.

The 'Upper End' allowance will be used for design, to be retained within the site. Climate change allowances of 35% and 40% have been applied to the 3.3% and 1% AEP events respectively in the design calculations, which is considered to be a precautionary approach.

Table 5: London Management Catchment climate change allowances – 3.3% AEP

Management Catchment	Allowance Category	Total potential change anticipated for the '2050s'	Total potential change anticipated for the '2070s'
London	Central Allowance	20%	20%
	Upper End Allowance	35%	35%

Table 6: London Management Catchment climate change allowances – 1.0 % AEP

Management Catchment	Allowance Category	Total potential change anticipated for the '2050s'	Total potential change anticipated for the '2070s'
London	Central Allowance	20%	25%
	Upper End Allowance	40%	40%

4.5 Proposed Runoff Rates

As the site is in a Haringey Critical Drainage Area. The 3 x Greenfield rate, typically applicable to brownfield sites, is not suitable given site location and flood risk downstream, the development will target Greenfield runoff rate.

The development has limited green space and is challenged by heavy fall between different portions of the site. Finally, the development is physically split by retained buildings. This all means that single discharge rate point for the entire development is unlikely and at least 3 separate connections will be required.

Each connection could be restricted hydro-brake, however the lowest recommended limit to avoid blockages is 2.0l/s, thus minimum discharge rate that site can achieve is 6.0 l/s.

Attenuation volume restrictions resulting from high invert levels of discharge connection points have further limited the capability of reducing the discharge rate from the site, as seen in the sustainable drainage strategy layout in Appendix D. As a result, the following discharge rates are proposed.

Table 7 - Proposed vs existing discharge rate comparison

	1-in-2 year	1-in-30year	1-in-100year	1-in-100year + 40% CC
Proposed Discharge Rate	8.00 l/s	8.00 l/s	12.00 l/s	12.00 l/s
Greenfield Discharge Rate	4.40 l/s	12.00 l/s	16.70 l/s	NA

Thames Water Pre-Planning enquiry has been consulted on 10th of September 2019 and confirmed provided Haringey accept Greenfield Rate proposed above, then sufficient capacity exists within existing surface water network to accept the flows; letter with reference number DS6059960 has been issued and can be seen on the Appendix K.

5 Runoff Volumes Proposed Sustainable Drainage System

To meet the proposed discharge rate during the design storm event of 1 in 100 year plus 40% climate change factor, surface water attenuation devices will be required.

The proposed Sustainable Drainage System has been designed to attenuate surface water runoff generated from the entire post-development impermeable area (5,312m²), excluding the existing roof area which is to be retained (1,456m²).

Given the variations in topography across the site and the shallowness of the swale/public surface water which is proposed to discharge to, separate sustainable drainage networks are proposed at different areas of the site.

The sunken courtyard, covered Eton five court roof area and external hard standing surfaces surrounding the existing sports hall totals an impermeable catchment area of 1,140m², will drain to a geocellular storage tank (SW.AT.01 on drawing L2384-PJC-XX-00-DR-C-0700), located to the east of the sunken courtyard. The surface water runoff associated with the sunken courtyard and courts roof (600m²) will be pumped at a rate of 3.00 l/s. It is proposed for the discharge rate for SW.AT.01 to be restricted to 3.00 l/s, which equates to a required storage volume of 38.89m³ during the design storm event. A new headwall will be installed along the swale to the north east of the Mallinson sports hall.

The proposed studio/function room, gallery hallway, lobby area and associated hard standing external areas, along with half of the proposed green roof above the new sports hall will drain to a geocellular storage tank (SW.AT.02 on drawing L2384-PJC-XX-00-DR-C-0700) which will be located below the new slab for the studio

area. The impermeable catchment area draining to SW.AT.02 totals 1,680m², a storage volume of 138.10m³. During the 1 in 30 year plus 35% uptake for climate change, the discharge rate will be restricted to 2.00 l/s. The peak water depth in tank SW.AT.02 for all events up to 1 in 30 year +35% CC is expected to be 0.74m AOD. A secondary flow control device is to be installed in the downstream chamber with an invert level 0.74m above the chamber invert/base flow control device. The high-level flow control device will have a discharge rate of 4.00 l/s, to allow for a discharge rate of 6.00 l/s during the 1 in 100 year + 40% CC event. An existing outfall to the onsite swale will be utilised for discharging the attenuated flows.

Finally, the second half of the sports hall green roof, cycle storage and externally paved areas will drain to a third geocellular storage tank west of the sports hall. The contributing catchment area equates to 1,040m², with 57.00m³ of storage provided. Surface Water discharge will be limited to 3.00 l/s.

Table 8 below provides a summary of storage volumes provided for each attenuation feature, the limited discharge rate and the contributing area which surface water runoff is attributed to. The copy of the proposed Sustainable Drainage Strategy Layout is provided in Appendix D.

Table 8 - Attenuation requirements and associated discharge rates

Tank Reference	Contributing Catchment Area (m ²)	Storage Volume (m ³)	Discharge Rate during 1-in-2 Yr (l/s)	Discharge Rate during 1-in-30 Yr +35% CC (l/s)	Discharge Rate during 1-in-100 Yr + 40% CC (l/s)
SW.AT.01	1,140	38.89	3.00	3.00	3.00
SW.AT.02	1,680	138.10	2.00	2.00	6.00
SW.AT.03	1,040	33.51	3.00	3.00	3.00
Total	3,860	210.50	8.00	8.00	12.00

The surface water runoff rate relating to the existing roof area (1,456m²) which is to be retained and has been excluded from the Sustainable Drainage Network has also been modelled to determine the post-development runoff from the site.

Table 9: Peak runoff rates associated with retained roof area

Peak discharge rates – Retained Roof Area			
Return Period	1-in-2 Yr	1-in-30 Yr +35% CC	1-in-100 Yr + 40% CC
Discharge rate (l/s)	31.50	109.60	148.9

The comparison of the pre-development surface water runoff rates associated with the existing impermeable area on site (3,890 m²) to the post-development surface water runoff rates associated with the proposed impermeable area on site (5,312 m²) is presented in XXX.

Table 10: Existing vs proposed surface water discharge rates

Storm Intensity	Existing Flow Rate (l/s)	Proposed Flow Rate (l/s)	Percentage Betterment
1-year	83.90	39.50	52.90%
30-year + 35% CC	216.10	117.60	45.60%
100-year + 40% CC	283.20	160.90	43.20%

6 Other Considerations

6.1 Exceedance Events

Any overland flows which cannot be attenuated during storm events greater than the of design storm event (1% AEP +40% CC) will follow natural topography of the site, which falls in an westerly direction. The lowest localised ground level on site can be found adjacent to the proposed cycle storage and plant room area, as indicated in long section B-B in appendix A. The site boundary threshold along the western border is naturally raised above this location. During an exceedance storm event, surface water will likely be conveyed along the swale, located within the site boundary, entering the public surface water sewer at an unrestricted rate. An overland flow exceedance plan is provided in Appendix H

Any rainfall west of the Swale outfall will likely pond at the local depression between the site boundary and proposed cycle storage and plant room area. Building entrances are slightly raised above the surrounding external land to convey surface water away from internal areas and reduce flood risk during exceedance events

6.2 Adoption and Management

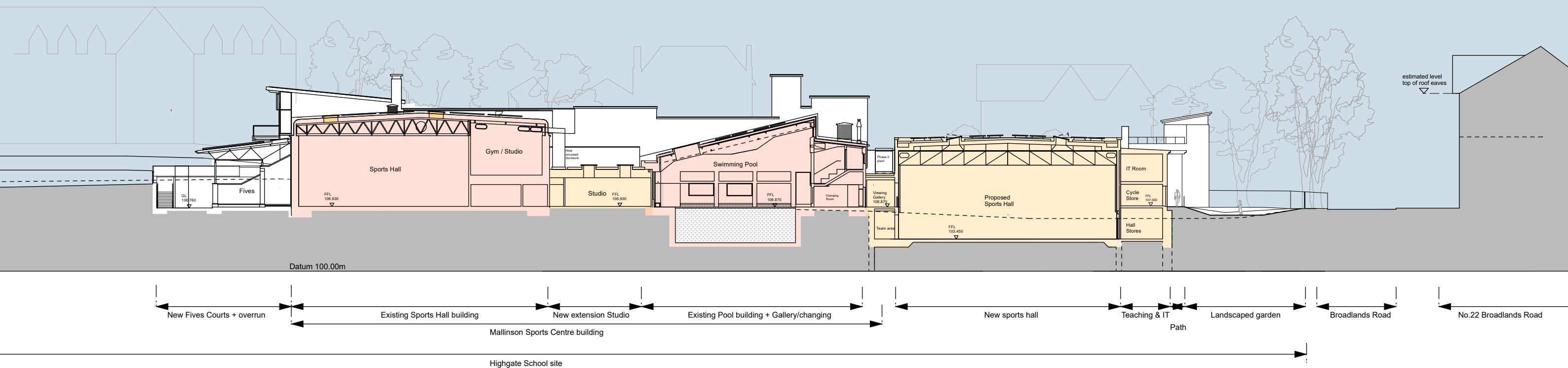
Due to the nature of the site, it is unlikely that any SuDS features would be adopted. The ongoing management and maintenance of the proposed surface water management systems will be expected to fall under the responsibility of the school.

The long-term management of surface water drainage assets including any SuDS components, is essential to ensure they continue to function to their design standard. As such, a management and maintenance plan will need to be developed in order to ensure the systems continue to work effectively.

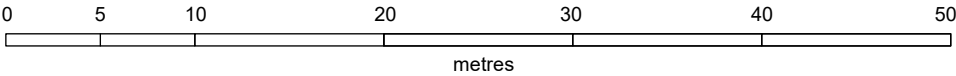
The site will include maintainable elements such as attenuation tanks, green roofs and hydro-brake flow control. A maintenance plan for these elements is provided in Appendix J.

Other elements such as trees are unlikely to require maintenance as these will be planted within natural ground.

Appendix A – Proposed Site Plans



Section BB proposed



ed toovey architects

studio 401 royle building
31 wenlock road
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Revisions:

PLANNING ISSUE

Rev A: July 2023 - Key plan added; ground tone added

- Always take site measurements to verify dimensions
- Refer to M&E Engineers drawings for all services

Highgate School MSC 4-Phase Scheme

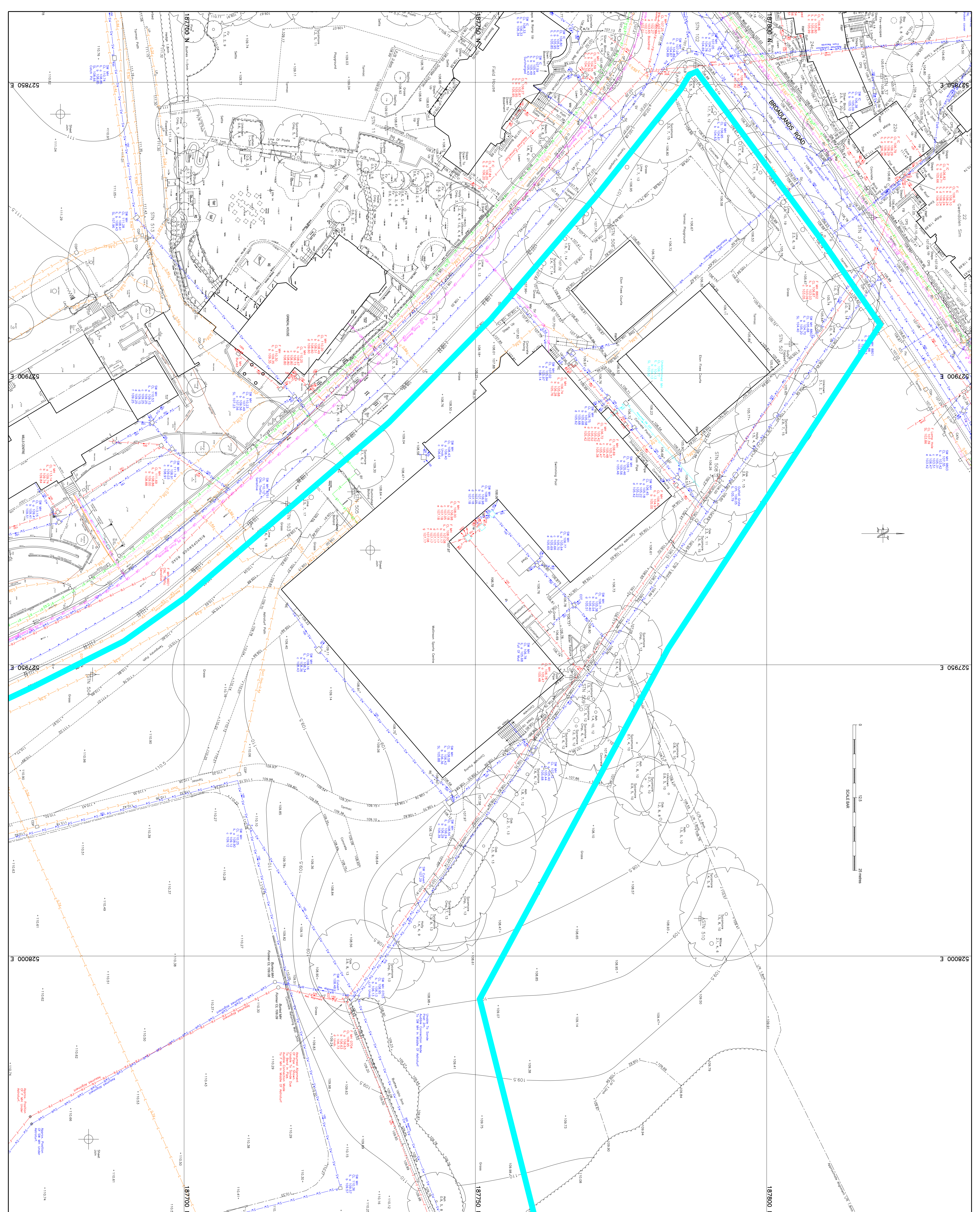
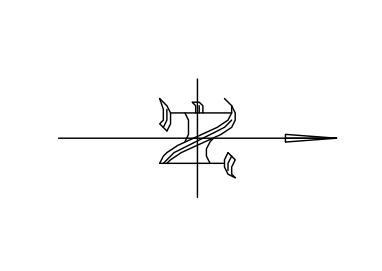
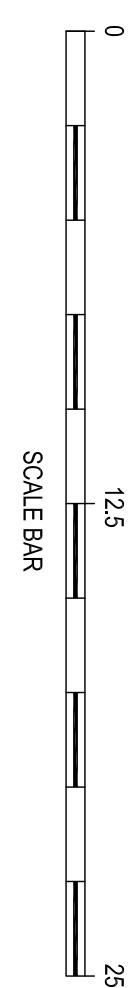
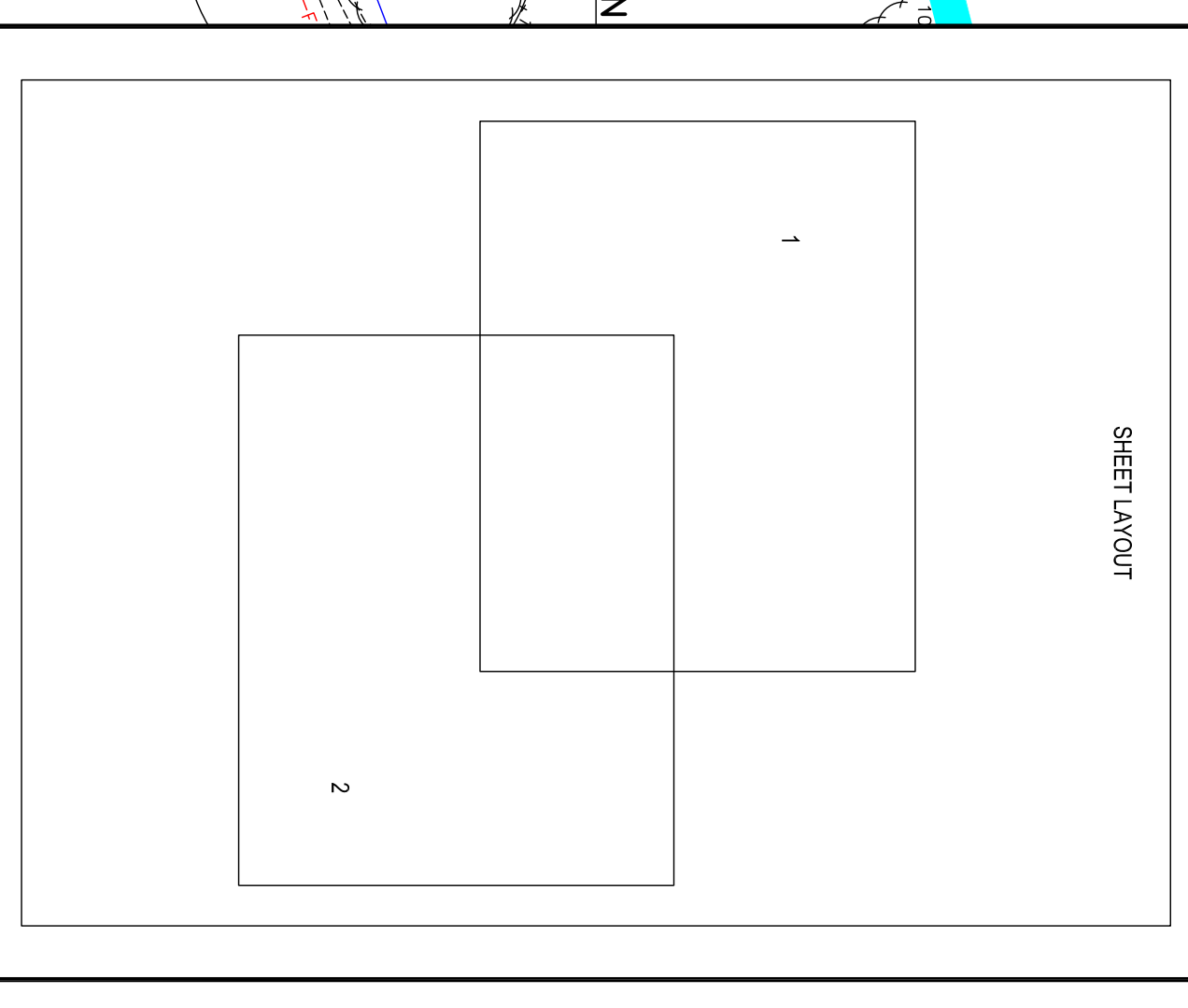
Section BB proposed

October 2018

Drwg No. 1182 / GS / 012-C

Scale 1:400 @ A3 ; 1:200 @ A1

Appendix B – Topographical Survey

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Architectural Building Surveys
Underground Services Location

		
THE SURVEY ASSOCIATION	QMS QUANTITY SURVEYORS	RICS ROYAL INSTITUTE OF CHARTEDED SURVEYORS
PROJECT NAME	HIGHGATE SCHOOL - SPORTS CENTRE	

DRAWING TITLE	
EXISTING SITE & SERVICES LAYOUT	

SCALE	1/200	DRAWN	JLV	PAPER SIZE	A0
DATE	January 2016	CHECKED	DRO	REVISION	
Dwg No. 13849/JV/1					

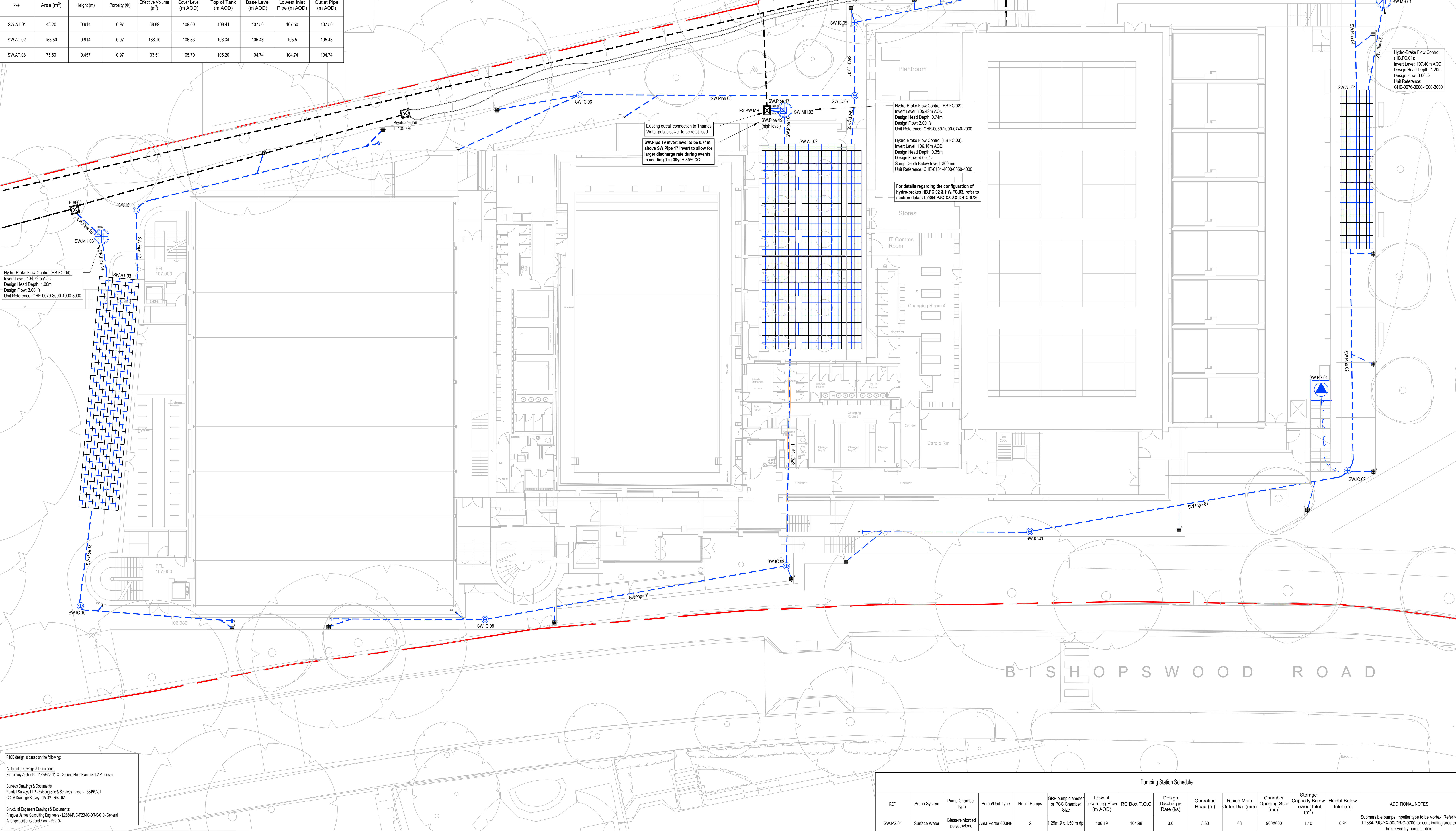
Appendix C – Thames Water Sewer Records



Appendix D – Sustainable Drainage Strategy Layout

Surface Water Manhole/Inspection Chamber Schedule							Surface Water Pipe Schedule			
REF	Cover Level (m AOD)	Invert Level (m AOD)	Depth to Invert (m)	Chamber Diameter (Ømm)	Chamber Material	Opening Size (Ømm)	ADDITIONAL NOTES	REF	Internal Pipe Dia. (Ømm)	Pipe Length (m)
SW.IC.01	109.50	106.35	1.15	600	Polypropylene	580	-	SW.Pipe 01	225	40.90
SW.IC.02	110.10	107.90	2.20	600	Polypropylene	350	-	SW.Pipe 02	225	20.30
SW.IC.03	108.60	107.80	0.80	600	Polypropylene	580	-	SW.Pipe 03	150	18.90
SW.IC.04	108.60	107.70	0.90	600	Polypropylene	580	-	SW.Pipe 04	225	9.80
SW.IC.05	106.80	106.15	0.65	450	Polypropylene	430	-	SW.Pipe 05	225	8.30
SW.IC.06	106.60	106.00	0.60	600	Polypropylene	580	-	SW.Pipe 06	150	12.20
SW.IC.07	106.60	105.70	0.90	450	Polypropylene	430	-	SW.Pipe 07	150	6.60
SW.IC.08	108.10	106.40	1.70	600	Polypropylene	350	-	SW.Pipe 08	225	25.00
SW.IC.09	108.60	106.00	2.60	600	Polypropylene	350	-	SW.Pipe 09	225	4.30
SW.IC.10	106.70	105.90	0.80	450	Polypropylene	430	-	SW.Pipe 10	225	28.10
SW.IC.11	105.60	104.80	0.80	450	Polypropylene	430	-	SW.Pipe 11	225	41.00
SW.MH.01	108.65	107.40	1.25	1200	Precast Reinforced Concrete	600 x 600	Manhole to be fitted with Hydro Brake flow control. 300mm sump below invert level.	SW.Pipe 12	225	7.10
SW.MH.02	106.73	105.42	1.31	1200	Precast Reinforced Concrete	600 x 600	Manhole to be fitted with two Hydro Brake flow controls. Invert level of HB.FC.02: 105.42m. Invert level of HB.FC.03: 106.16m. 300mm sump below invert level.	SW.Pipe 13	225	7.30
SW.MH.03	105.69	104.72	0.97	1200	Precast Reinforced Concrete	600 x 600	Manhole to be fitted with Hydro Brake flow control. 300mm sump below invert level.	SW.Pipe 14	225	4.80
EX.SW.MH	106.71	105.38	1.33	Unknown	Unknown	Unknown	Existing inlet (B on survey) to be up-sized to suit proposed pipe dia. from SW.MH.02.	SW.Pipe 15	150	3.30
TW.8803	105.68	104.70	0.98	Unknown	Unknown	Unknown	New inlet to be formed at manhole base for connection from SW.MH.03.	SW.Pipe 16	225	5.10
								SW.Pipe 17	150	2.25
								SW.Pipe 18	150	4.50

Attenuation Tank Schedule								
REF	Area (m²)	Height (m)	Porosity (Ø)	Effective Volume (m³)	Cover Level (m AOD)	Top of Tank (m AOD)	Base Level (m AOD)	Outlet Pipe (m AOD)
SW.AT.01	43.20	0.914	0.97	38.89	109.00	108.41	107.50	107.50
SW.AT.02	155.50	0.914	0.97	138.10	106.83	106.34	105.43	105.43
SW.AT.03	75.60	0.457	0.97	33.51	105.70	105.20	104.74	104.74



Notes:

- Do not scale from this drawing.
- All dimensions are in millimetres unless otherwise stated.
- All levels are in metres to Ordnance Datum unless otherwise stated.
- This drawing should be read in conjunction with all relevant architectural, structural, engineering and MEP drawings and specification.
- For setting out of rainwater, foul water drain points and gullies refer to architects and MEP drawings.
- All above ground pipework to MFP specification and design. Refer to MEP package for information. When transitioning materials between above and below ground, use flexible drain coupling or other suitable coupling.

LEGEND:

- Boundary Line
- Surface Water Pipe
- Foul Water Pipe
- Surface Water Pipe Below Slab
- Foul Water Pipe Below Slab
- Existing Combined Water Pipe
- Surface Water Rising Main
- FW.IC.XX Foul Water Inspection Chamber
- SW.IC.XX Surface Water Inspection Chamber
- SW.MH.XX Surface Water Manhole Chamber
- EX.MH.XX Existing Manhole Chamber
- Rodding Eye
- Geocellular Storage Crate (1000mmx500mmx400mm)
- Hydro Brake Flow Control
- Sol Vent Pipe/Stub Stack
- Rainwater Pipe
- Existing Gully
- Channel Drain
- Gully
- SW.PS.XX Surface Water Pump Station
- EX.MH.XX Existing Manhole Chamber

NOT For Construction

Issue Date / Time: 29/07/25 14:00

This is not a formal drawing issue and as such may contain un-coordinated or incomplete information. Full drawing issue to follow.

P01	29/07/25	EA	SPJ	For Information
Rev.	Date	Drawn/Chk	Annotation	

PJCE

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HIGHGATE SCHOOL

HIGHGATE MALLISON SPORTS CENTRE
PHASE 2

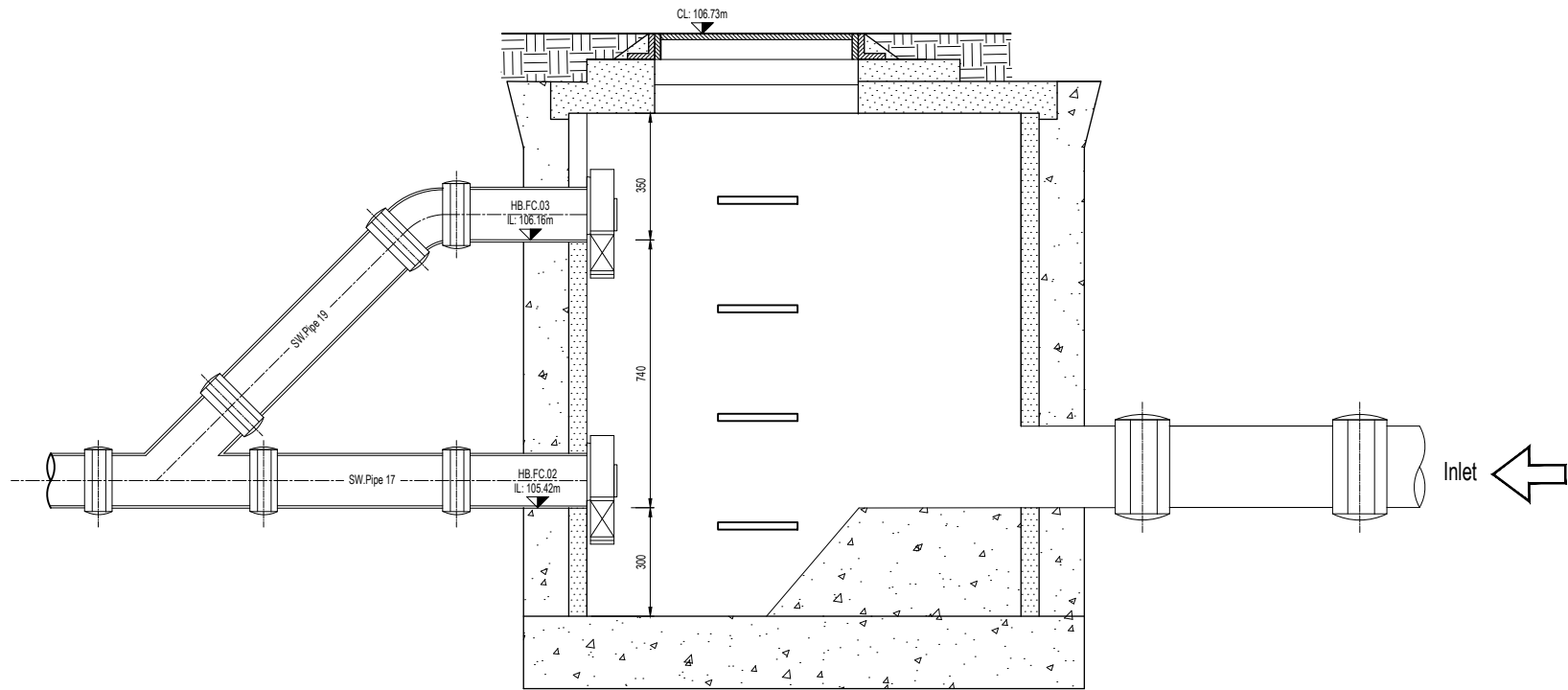
SUSTAINABLE DRAINAGE
STRATEGY LAYOUT -

Pumping Station Schedule												ADDITIONAL NOTES		
REF	Pump System	Pump Chamber Type	Pump/Unit Type	No. of Pumps	GRP pump diameter or PCC Chamber Size	Lowest Incoming Pipe (m AOD)	RC Box T.O.C	Design Discharge Rate (l/s)	Operating Head (m)	Rising Main Outer Dia. (mm)	Chamber Opening Size (mm)	Storage Capacity Below Lowest Inlet (m³)	Height Below Inlet (m)	
SW.PS.01	Surface Water	Glass-reinforced polyethylene	Ama-Porter 603NE	2	1.25m Ø x 1.50 m dp	106.19	104.98	3.0	3.60	63	900X600	1.10	0.91	Submersible pumps impeller type to be verified. Refer to L2384-PJC-XX-00-DR-C-0700 for contributing area to be served by pump station.

FOR INFORMATION				
Scale:	1:125 @ A0	Date:	JUL 26	
Drawn:	EA	Engineer:	EA	Checked: SPJ
Drawing No:				Revision

L2384-PJC-XX-00-DR-C-0700

P01



HYDROBRAKE DETAIL FOR SW.MH.02

Scale 1:10

HB.FC.02 Specification

Hydrobrake Range	- Optimum
Outfall pipe (SW.Pipe 17) size	- 150Ø
Outfall IL	- 105.42m
Hydrobrake Discharge Rate	- 2.00 l/s
Hydrobrake Design Head	- 0.74m
Model Reference - SHE-0069-2000-0740-2000	

HB.FC.03 Specification

Hydrobrake Range	- Optimum
Outfall pipe (SW.Pipe 19) size	- 150Ø
Outfall IL	- 106.16m
Hydrobrake Discharge Rate	- 4.00 l/s
Hydrobrake Design Head	- 0.35m
Model Reference - CHE-0101-4000-0350-4000	

Notes:

1. Refer to drawings L2384-PJC-XX-00-DR-C-700 for the drainage layout.
2. All dimensions are in millimetres unless otherwise stated. All levels are in metres unless otherwise stated.
3. This drawing should be read in conjunction with all relevant architects, structural engineers and m&e engineers drawings and specification.
4. For setting out of rainwater and foul water drain points refer to architects and MEP drawings.
5. All concrete and concrete products will satisfy sulphate classification 2 of the 'BRE Digest 363' and consist of O.P.C minimum cement content 330Kg/m³ or S.P.R.C minimum cement control of 280 Kg/m³.
6. Flexible joints outside manholes structures etc. for pipes up to and including 450 dia. first flexible joints 150 from outside face of substructure. Second joint 600 from first joint.
7. manhole construction to be watertight.
8. Where pipes enter a manhole at an angle, a slow radius bend is to be used. The bend should be built inside the manhole.
9. High strength (granolithic) concrete topping to be brought up to a dense smooth finish to all branch connections (Min. thickness 20). Benching slope to be 1:10 to 1:30.
10. manhole covers and frames to comply to BS.EN.124 and be D400 type unless otherwise noted on schedule.
11. All precast manhole units are to conform to BS.EB.5911 PT 200.
12. All precast concrete slabs and rings shall be bedded or jointed using a mortar, proprietary bitumen resin mastic sealant.
13. Levelling of cover to be achieved using engineering brickwork (4 courses max. 2 courses min.)
14. All gully connections are to be 100Ø and to have class A bed and surround.
15. All drains are to be laid at a constant gradient between manhole inspection chambers.
16. Where Class A bedding is used for protection of pipework, each flexible joint in the concrete surround shall be interrupted over its full cross-section with a shaped compressible filler.
17. Where pipes are surrounded in concrete, pipe joints are to be protected from the ingress of concrete fats by wrapping them in polythene sheet or building paper.
18. Step irons to be in accordance with BS.EN.1247

P01	29.07.26	EA	SPJ	For Information
Rev.	Date	Drawn	CHK	Amendment

PJCE

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HIGHGATE SCHOOL

HIGHGATE MALLISON SPORTS CENTRE
PHASE 2

HYDROBRAKE FLOW CONTROL
CONFIGURATION

Status: FOR INFORMATION

Scales: 1:10 @ A1 Date: JUL 26

Drawn: EA Engineer: EA Checked: SPJ

Drawing No. Revision:

L2384-PJC-XX-XX-DR-C-0730

P01

Appendix E – InfoDrainage Calculations – Pre-Development

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development	Date: 02/06/2026			
Report Details: Type: Inflows Storm Phase: Phase	Designed by: EA	Checked by: SPJ	Approved By: SPJ	
	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Total Hardstanding Area

Type : Catchment Area

Area (ha)	0.389
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development		Date: 02/06/2026			
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Junctions Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
Outfall	Manhole	492.564	162.434	107.500	1.200	106.300	Circular	1.200

Name	Lock
Outfall	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
Outfall	Inlet	Total Hardstanding Area	(None)	No Restriction

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development				Date: 02/06/2026				
Report Details: Type: Inflow Summary Storm Phase: Phase				Designed by:	Checked by:	Approved By:		
				EA	SPJ	SPJ		
				Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London				

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Total Hardstanding Area	Outfall		Time of Concentration	0.389	100	0	100	0.389
TOTAL		0.0		0.389				0.389

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development		Date: 02/06/2026		PJCE	
Report Details: Type: Network Design Criteria Storm Phase: Phase		Designed by: EA	Checked by: SPJ		Approved By: SPJ
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Manhole Options

Apply Offset	☐
--------------	--------------------------

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development	Date: 02/06/2026			PJCE
Report Title: Rainfall Analysis Criteria	Designed by: EA	Checked by: SPJ	Approved By: SPJ	
	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH	Type: FEH
Site Location	GB 527893 187767 TQ 27893 87767
Rainfall Version	2022
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	0.000
100.0	0.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880
2160	4320
2880	5760
4320	8640
5760	11520
7200	14400
8640	17280
10080	20160

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development		Date: 02/06/2026		PJCE	
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Inflows Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Total Hardstanding Area	FEH: 2 years: +0 %: 15 mins: Summer	0.39	83.9	36.420

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development		Date: 02/06/2026		PJCE	
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Inflows Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Total Hardstanding Area	FEH: 30 years: +0 %: 15 mins: Summer	0.39	216.0	93.819

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development		Date: 02/06/2026		PJCE	
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Inflows Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



FEH: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Total Hardstanding Area	FEH: 100 years: +0 %: 15 mins: Summer	0.39	283.1	122.964

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development		Date: 02/06/2026			
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Junctions Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Outfall	FEH: 2 years: +0 %: 15 mins: Summer	107.500	106.300	106.300	0.000	83.9	0.000	0.000	83.9	36.420	OK

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development	Date: 02/06/2026		
	Designed by: EA	Checked by: SPJ	Approved By: SPJ
	Report Details: Type: Junctions Summary Storm Phase: Phase		
Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Freeboard (m)
1.200

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development		Date: 02/06/2026			
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Junctions Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Outfall	FEH: 30 years: +0 %: 15 mins: Summer	107.500	106.300	106.300	0.000	216.0	0.000	0.000	216.1	93.819	OK

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development	Date: 02/06/2026			
Report Details: Type: Junctions Summary Storm Phase: Phase	Designed by: EA	Checked by: SPJ	Approved By: SPJ	
	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Freeboard (m)
1.200

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development		Date: 02/06/2026			
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Junctions Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



FEH: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Outfall	FEH: 100 years: +0 %: 15 mins: Summer	107.500	106.300	106.300	0.000	283.1	0.000	0.000	283.2	122.964	OK

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development	Date: 02/06/2026		
	Designed by: EA	Checked by: SPJ	Approved By: SPJ
	Report Details: Type: Junctions Summary Storm Phase: Phase		
Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Freeboard (m)
1.200

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development		Date: 02/06/2026			
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Phase Management Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



Phase
FEH: 2 years: Increase Rainfall (%): +0: 15 mins: Summer

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Outfall			83.9	36.420
TOTAL	83.9	36.420	83.9	36.420

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development		Date: 02/06/2026			
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Phase Management Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



Phase
FEH: 30 years: Increase Rainfall (%): +0: 15 mins: Summer

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Outfall			216.1	93.819
TOTAL	216.1	93.819	216.1	93.819

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Pre-Development		Date: 02/06/2026			
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Phase Management Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



Phase
FEH: 100 years: Increase Rainfall (%): +0: 15 mins: Summer

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Outfall			283.2	122.964
TOTAL	283.2	122.964	283.2	122.964

Appendix F – InfoDrainage Calculations – Post-Development

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development	Date: 02/06/2026			
Report Details: Type: Inflows Storm Phase: Phase	Designed by: EA	Checked by: SPJ	Approved By: SPJ	
Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London				



Ex.A.05

Type : Catchment Area

Area (ha)	0.011
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Ex.A.02

Type : Catchment Area

Area (ha)	0.028
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Ex.A.04

Type : Catchment Area

Area (ha)	0.008
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



R1

Type : Catchment Area

Area (ha)	0.005
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development	Date: 02/06/2026			PJCE
Report Details: Type: Inflows Storm Phase: Phase	Designed by: EA	Checked by: SPJ	Approved By: SPJ	
	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



GR3

Type : Catchment Area

Area (ha)	0.063
-----------	-------

Dynamic Sizing

Runoff Method	Green Roof
Summer Volumetric Runoff Coefficient	1.000
Winter Volumetric Runoff Coefficient	1.000
Depression Storage (mm)	0
Evapotranspiration (mm/day)	3.0
Decay Coefficiency	0.050
Time Delay (mins)	120



Ex.A.06

Type : Catchment Area

Area (ha)	0.025
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



R2

Type : Catchment Area

Area (ha)	0.022
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development	Date: 02/06/2026			PJCE
Report Details: Type: Inflows Storm Phase: Phase	Designed by: EA	Checked by: SPJ	Approved By: SPJ	
	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



Ex.A.07

Type : Catchment Area

Area (ha)	0.014
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Ex.A.08

Type : Catchment Area

Area (ha)	0.027
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



GR1

Type : Catchment Area

Area (ha)	0.031
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Dynamic Sizing

Runoff Method	Green Roof
Summer Volumetric Runoff Coefficient	1.000
Winter Volumetric Runoff Coefficient	1.000
Depression Storage (mm)	0
Evapotranspiration (mm/day)	3.0
Decay Coefficiency	0.050
Time Delay (mins)	120

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development	Date: 02/06/2026			PJCE
Report Details: Type: Inflows Storm Phase: Phase	Designed by: EA	Checked by: SPJ	Approved By: SPJ	
	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



GR2

Type : Catchment Area

Area (ha)	0.024
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Dynamic Sizing

Runoff Method	Green Roof
Summer Volumetric Runoff Coefficient	1.000
Winter Volumetric Runoff Coefficient	1.000
Depression Storage (mm)	0
Evapotranspiration (mm/day)	3.0
Decay Coefficiency	0.050
Time Delay (mins)	120



Sunk Court

Type : Catchment Area

Area (ha)	0.029
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



R3

Type : Catchment Area

Area (ha)	0.014
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development	Date: 02/06/2026		
	Designed by: EA	Checked by: SPJ	Approved By: SPJ
Report Details: Type: Inflows Storm Phase: Phase	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



GR4

Type : Catchment Area

Area (ha)	0.024
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Dynamic Sizing

Runoff Method	Green Roof
Summer Volumetric Runoff Coefficient	1.000
Winter Volumetric Runoff Coefficient	1.000
Depression Storage (mm)	0
Evapotranspiration (mm/day)	3.0
Decay Coefficiency	0.050
Time Delay (mins)	120



Ex.A.03

Type : Catchment Area

Area (ha)	0.007
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Ex.A.01

Type : Catchment Area

Area (ha)	0.019
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development	Date: 02/06/2026			PJCE
Report Details: Type: Inflows Storm Phase: Phase	Designed by: EA	Checked by: SPJ	Approved By: SPJ	
	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



GR5

Type : Catchment Area

Area (ha)	0.027
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Dynamic Sizing

Runoff Method	Green Roof
Summer Volumetric Runoff Coefficient	1.000
Winter Volumetric Runoff Coefficient	1.000
Depression Storage (mm)	0
Evapotranspiration (mm/day)	3.0
Decay Coefficiency	0.050
Time Delay (mins)	120



R4

Type : Catchment Area

Area (ha)	0.007
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Existing Roof Area

Type : Catchment Area

Area (ha)	0.146
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026			
Report Details: Type: Junctions Storm Phase: Phase		Designed by: EA	Checked by: SPJ		Approved By: SPJ
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
SW.IC.03	Manhole	556.480	215.840	108.600	0.800	107.800	Circular	0.600
Culvert Headwall	Manhole	572.330	224.258	107.900	0.600	107.300	Circular	1.200
SW.IC.02	Manhole	576.899	171.214	110.100	2.200	107.900	Circular	0.600
SW.IC.04	Manhole	575.364	215.351	108.600	0.900	107.700	Circular	0.600
SW.IC.05	Manhole	530.286	211.685	106.800	0.650	106.150	Circular	0.450
SW.IC.01	Manhole	546.207	165.502	109.500	1.150	108.350	Circular	0.600
SW.HB.01	Manhole	578.318	213.656	108.650	1.250	107.400	Circular	1.200
SW.PS.01	Manhole	570.742	178.009	106.780	1.500	105.280	Circular	1.250
SW.IC.06	Manhole	505.375	205.127	106.600	0.600	106.000	Circular	0.600
SW.IC.09	Manhole	523.914	164.734	108.600	2.600	106.000	Circular	0.600
SW.IC.08	Manhole	496.758	157.527	108.100	1.700	106.400	Circular	0.600
SW.IC.07	Manhole	530.321	205.050	106.601	0.899	105.702	Circular	0.450
SW.IC.10	Manhole	459.667	159.099	106.700	0.800	105.900	Circular	0.450
SW.IC.11	Manhole	465.090	195.224	105.600	0.800	104.800	Circular	0.450
TE.8803	Manhole	459.531	194.515	105.680	0.980	104.700	Circular	1.200
SW.HB.03	Manhole	461.957	192.268	105.691	0.968	104.723	Circular	1.200
EX.SW.MH	Manhole	522.342	203.719	106.710	1.330	105.380	Rectangular	
SW.HB.02	Manhole	522.598	201.491	106.730	1.310	105.420	Circular	1.200
MH for Ex. Roof Area	Manhole	488.411	237.788	106.100	0.800	105.300	Circular	1.200

Name	Diameter (m)	Width (m)	Lock
SW.IC.03			None
Culvert Headwall			None
SW.IC.02			None
SW.IC.04			None
SW.IC.05			None
SW.IC.01			None
SW.HB.01			None
SW.PS.01			None
SW.IC.06			None
SW.IC.09			None
SW.IC.08			None
SW.IC.07			None
SW.IC.10			None
SW.IC.11			None
TE.8803			None
SW.HB.03			None
EX.SW.MH	0.700	0.500	None
SW.HB.02			None
MH for Ex. Roof Area			None

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026			
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Junctions Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
SW.IC.03	Inlet	Ex.A.03	(None)	No Restriction
Culvert Headwall	Inlet	P6	(None)	No Restriction
SW.IC.02	Inlet 1	Ex.A.02 P1	(None)	No Restriction
	Inlet 2	RM	(None)	No Restriction
SW.IC.04	Inlet	P3	(None)	No Restriction
SW.IC.05	Inlet	Ex.A.04	(None)	No Restriction
SW.IC.01	Inlet	Ex.A.01	(None)	No Restriction
SW.HB.01	Inlet	P5	(None)	No Restriction
SW.PS.01	Inlet 1	Sunk Court	(None)	No Restriction
	Inlet 2	GR1	(None)	No Restriction
SW.IC.06	Inlet 1	R4	(None)	No Restriction
	Inlet 2	GR4	(None)	No Restriction
SW.IC.09	Inlet 1	P10 Ex.A.06	(None)	No Restriction
	Inlet 2	R2	(None)	No Restriction
SW.IC.08	Inlet 1	GR5	(None)	No Restriction
	Inlet 2	R3	(None)	No Restriction
SW.IC.07	Inlet	Ex.A.05	(None)	No Restriction
	Inlet 1	P7	(None)	No Restriction
	Inlet 2	P8	(None)	No Restriction
	Inlet 3	R1	(None)	No Restriction
SW.IC.10	Inlet	Ex.A.08	(None)	No Restriction
SW.IC.11	Inlet	Ex.A.07	(None)	No Restriction
TE.8803	Inlet	P15	(None)	No Restriction
SW.HB.03	Inlet	P14	(None)	No Restriction
EX.SW.MH	Inlet	P17	(None)	No Restriction
	Inlet (1)	P19 (high level)	(None)	No Restriction
SW.HB.02	Inlet	P16	(None)	No Restriction
MH for Ex. Roof Area	Inlet	Existing Roof Area	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SW.IC.03	Outlet	P3	Free Discharge
SW.IC.02	Outlet	P2	Free Discharge
SW.IC.04	Outlet	P4	Free Discharge
SW.IC.05	Outlet	P7	Free Discharge
SW.IC.01	Outlet	P1	Free Discharge
	Outlet	P6	Hydro-Brake®

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		PJCE	
Report Details: Type: Junctions Storm Phase: Phase		Designed by: EA	Checked by: SPJ		Approved By: SPJ
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

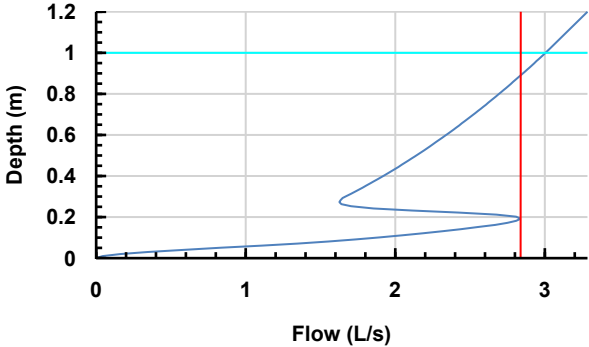
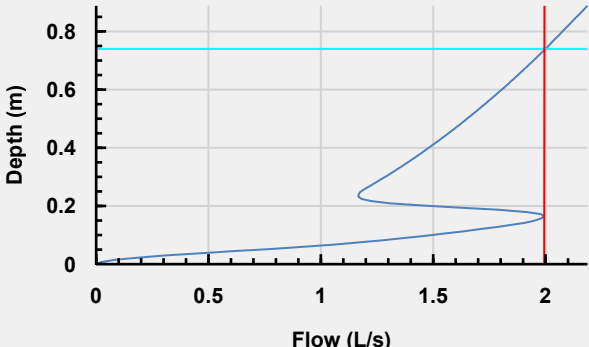
SW.HB.01	Junction	Outlet Name	Outgoing Connection	Outlet Type
		Invert Level (m)	107.400	
		Design Depth (m)	1.200	
		Design Flow (L/s)	3.0	
		Objective	Minimise Upstream Storage Requirements	
		Application	Surface Water Only	
		Sump Available	☐	
		Unit Reference	CHE-0076-3000-1200-3000	

	Outlet	RM	Pump
	Invert Level (m)	105.280	
	Depth (m)	Outflow (L/s)	
	0.100	3.0	
	0.200	3.0	
	0.300	3.0	
	0.400	3.0	
	0.500	3.0	
	0.600	3.0	
	0.700	3.0	
	0.800	3.0	
	0.900	3.0	
	1.000	3.0	
	1.100	3.0	
	1.200	3.0	
	1.300	3.0	
	1.400	3.0	
	1.500	3.0	
	1.600	3.0	
	1.700	3.0	
	1.800	3.0	
	1.900	3.0	
	2.000	3.0	
	2.100	3.0	
	2.200	3.0	
	2.300	3.0	
	2.400	3.0	
	2.500	3.0	
	2.600	3.0	
	2.700	3.0	
	2.800	3.0	
	2.900	3.0	
	3.000	3.0	
	3.100	3.0	
	3.200	3.0	
	3.300	3.0	
	3.400	3.0	
	3.500	3.0	
	3.600	3.0	
	3.700	3.0	
	3.800	3.0	

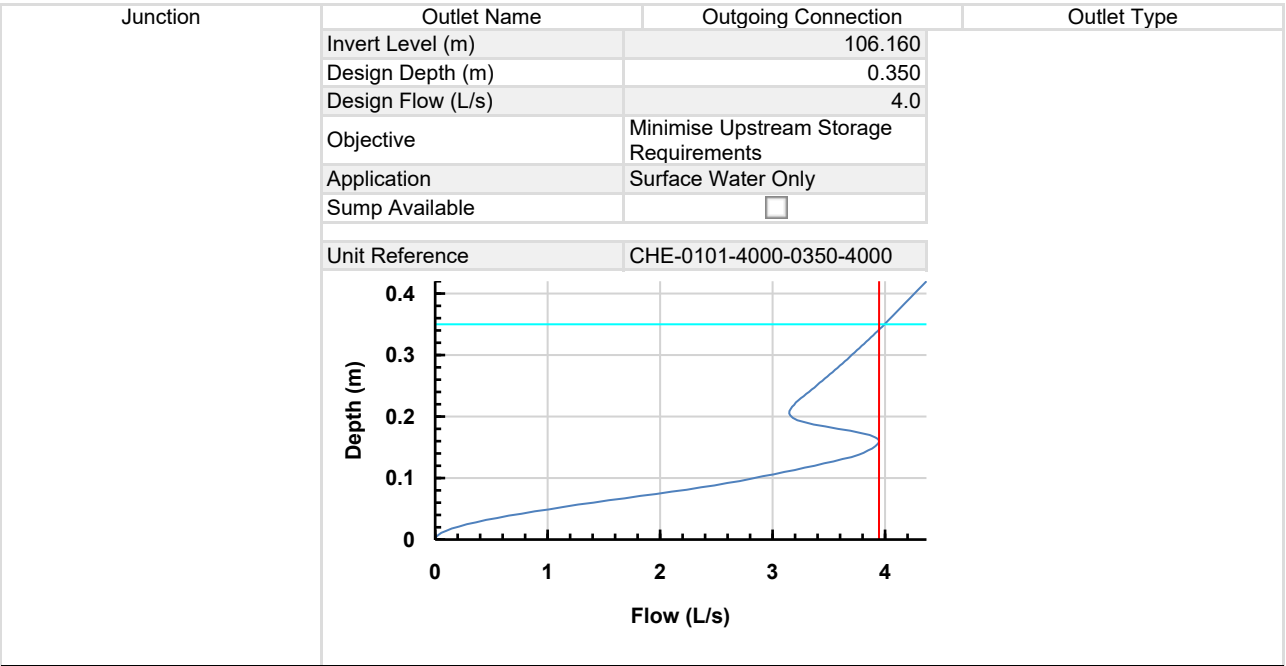
Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026			
Report Details: Type: Junctions Storm Phase: Phase		Designed by: EA	Checked by: SPJ		Approved By: SPJ
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Junction	Outlet Name	Outgoing Connection	Outlet Type
SW.PS.01	3.900	3.0	
	4.000	3.0	
	4.100	3.0	
	4.200	3.0	
	4.300	3.0	
	4.400	3.0	
	4.500	3.0	
	4.600	3.0	
	4.700	3.0	
	4.800	3.0	
	4.900	3.0	
	5.000	3.0	
	5.100	3.0	
	5.200	3.0	
	5.300	3.0	
	5.400	3.0	
	5.500	3.0	
	5.600	3.0	
	5.700	3.0	
	5.800	3.0	
	5.900	3.0	
	6.000	3.0	
	6.100	3.0	
	6.200	3.0	
	6.300	3.0	
	6.400	3.0	
	6.500	3.0	
	6.600	3.0	
	6.700	3.0	
	6.800	3.0	
	6.900	3.0	
	7.000	3.0	
	7.100	3.0	
	7.200	3.0	
	7.300	3.0	
	7.400	3.0	
	7.500	3.0	
	7.600	3.0	
	7.700	3.0	
	7.800	3.0	
	7.900	3.0	
	8.000	3.0	
	8.100	3.0	
	8.200	3.0	
	8.300	3.0	
	8.400	3.0	
	8.500	3.0	
	8.600	3.0	
	8.700	3.0	
	8.800	3.0	
	8.900	3.0	
	9.000	3.0	
	9.100	3.0	
	9.200	3.0	
	9.300	3.0	
	9.400	3.0	
	9.500	3.0	
	9.600	3.0	
	9.700	3.0	
	9.800	3.0	
	9.900	3.0	
	10.000	3.0	
SW.IC.06	Outlet	P8	Free Discharge
SW.IC.09	Outlet	P11	Free Discharge
SW.IC.08	Outlet	P10	Free Discharge
SW.IC.07	Outlet	P9	Free Discharge
SW.IC.10	Outlet	P13	Free Discharge
SW.IC.11	Outlet	P12	Free Discharge

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026			
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Junctions Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Junction	Outlet Name	Outgoing Connection	Outlet Type
SW.HB.03	Outlet	P15	Hydro-Brake®
	Invert Level (m)	104.723	
	Design Depth (m)	1.000	
	Design Flow (L/s)	3.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0079-3000-1000-3000	
			
SW.HB.02	Outlet	P17	Hydro-Brake®
	Invert Level (m)	105.420	
	Design Depth (m)	0.740	
	Design Flow (L/s)	2.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0069-2000-0740-2000	
			
	Outlet 2	P19 (high level)	Hydro-Brake®

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		PJCE	
Report Details: Type: Junctions Storm Phase: Phase		Designed by: EA	Checked by: SPJ		Approved By: SPJ
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development	Date: 02/06/2026			
Report Details: Type: Stormwater Controls Storm Phase: Phase	Designed by: EA	Checked by: SPJ	Approved By: SPJ	
Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London				



SW.AT.01

Type : Cellular Storage

Dimensions

Exceedance Level (m)	109.000
Depth (m)	0.914
Base Level (m)	107.500
Number of Crates Long	12
Number of Crates Wide	5
Number of Crates High	1
Porosity (%)	97
Crate Length (m)	1.2
Crate Width (m)	0.6
Crate Height (m)	0.914
Total Volume (m³)	38.886

Inlets

Inlet 1

Inlet Type	Point Inflow
Incoming Item(s)	P2
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet 2

Inlet Type	Point Inflow
Incoming Item(s)	P4
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	P5
Outlet Type	Free Discharge

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development	Date: 02/06/2026		
	Designed by: EA	Checked by: SPJ	Approved By: SPJ
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



SW.AT.02

Type : Cellular Storage

Dimensions

Exceedance Level (m)	106.550
Depth (m)	0.914
Base Level (m)	105.436
Number of Crates Long	24
Number of Crates Wide	9
Number of Crates High	1
Porosity (%)	97
Crate Length (m)	1.2
Crate Width (m)	0.6
Crate Height (m)	0.914
Total Volume (m³)	138.081

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	GR2
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	P9
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	P11
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	P16
Outlet Type	Free Discharge

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development	Date: 02/06/2026		
	Designed by: EA	Checked by: SPJ	Approved By: SPJ
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



SW.AT.03

Type : Cellular Storage

Dimensions

Exceedance Level (m)	105.700
Depth (m)	0.457
Base Level (m)	104.743
Number of Crates Long	3
Number of Crates Wide	35
Number of Crates High	1
Porosity (%)	97
Crate Length (m)	1.2
Crate Width (m)	0.6
Crate Height (m)	0.457
Total Volume (m³)	34.013

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	P12
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	P13
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	GR3
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	P14
Outlet Type	Free Discharge

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026			
Report Details: Type: Connections Storm Phase: Phase		Designed by: EA	Checked by: SPJ		Approved By: SPJ
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Name	To	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
P7	SW.IC.07	6.635	Pipe	14.807		0.6	150	106.800
P6	Culvert Headwall	12.176	Pipe	121.760		0.6	150	108.650
P11	SW.AT.02	41.063	Pipe	72.806		0.6	225	108.600
P3	SW.IC.04	18.890	Pipe	188.901		0.6	150	108.600
P5	SW.HB.01	8.509	Pipe	85.091		0.6	225	109.000
RM	SW.IC.02	9.170	Pipe	-3.500		0.6	150	106.780
P1	SW.IC.02	40.869	Pipe	90.819		0.6	225	109.500
P4	SW.AT.01	23.888	Pipe	119.440		0.6	225	108.600
P2	SW.AT.01	20.298	Pipe	50.744		0.6	225	110.100
P9	SW.AT.02	4.335	Pipe	16.302		0.6	225	106.601
P8	SW.IC.07	24.946	Pipe	83.690		0.6	225	106.600
P10	SW.IC.09	28.096	Pipe	70.239		0.6	225	108.100
P12	SW.AT.03	7.059	Pipe	123.847		0.6	225	105.600
P13	SW.AT.03	7.281	Pipe	6.293		0.6	225	106.700
P14	SW.HB.03	4.801	Pipe	236.125		0.6	225	105.700
P15	TE.8803	3.306	Pipe	145.857		0.6	225	105.691
P16	SW.HB.02	5.089	Pipe	318.038		0.6	225	106.550
P17	EX.SW.MH	2.242	Pipe	56.045		0.6	150	106.730
P19 (high level)	EX.SW.MH	2.242	Pipe	2.874		0.6	150	106.730

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Part Family	Lock	Flow Restriction (L/s)	Culvert Type	Culvert Entrance
P7	106.150	106.601	105.702		None		(None)	(None)
P6	107.400	107.900	107.300		None	3.06	(None)	(None)
P11	106.000	106.550	105.436		None		(None)	(None)
P3	107.800	108.600	107.700		None		(None)	(None)
P5	107.500	108.650	107.400		None		(None)	(None)
RM	105.280	110.100	107.900		None	3.00	(None)	(None)
P1	108.350	110.100	107.900		None		(None)	(None)
P4	107.700	109.000	107.500		None		(None)	(None)
P2	107.900	109.000	107.500		None		(None)	(None)
P9	105.702	106.550	105.436		None		(None)	(None)
P8	106.000	106.601	105.702		None		(None)	(None)
P10	106.400	108.600	106.000		None		(None)	(None)
P12	104.800	105.700	104.743		None		(None)	(None)
P13	105.900	105.700	104.743		None		(None)	(None)
P14	104.743	105.691	104.723		None		(None)	(None)
P15	104.723	105.680	104.700		None	2.96	(None)	(None)
P16	105.436	106.730	105.420		None		(None)	(None)
P17	105.420	106.710	105.380		None	2.19	(None)	(None)
P19 (high level)	106.160	106.710	105.380		Levels	4.37	(None)	(None)

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026			
Report Details: Type: Connections Storm Phase: Phase		Designed by: EA	Checked by: SPJ		Approved By: SPJ
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Name	Wall Thickness (mm)	Material	Trench Width (mm)	Bedding Material	Surrounding Material
P7	0		0		
P6	0		0		
P11	0		0		
P3	0		0		
P5	0		0		
RM	0		0		
P1	0		0		
P4	0		0		
P2	0		0		
P9	0		0		
P8	0		0		
P10	0		0		
P12	0		0		
P13	0		0		
P14	0		0		
P15	0		0		
P16	0		0		
P17	0		0		
P19 (high level)	0		0		

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026			
Report Details: Type: Inflow Summary Storm Phase: Phase		Designed by: EA	Checked by: SPJ		Approved By: SPJ
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Ex.A.01	SW.IC.01		Time of Concentration	0.019	100	0	100	0.019
Ex.A.02	SW.IC.02		Time of Concentration	0.028	100	0	100	0.028
Ex.A.03	SW.IC.03		Time of Concentration	0.007	100	0	100	0.007
Ex.A.04	SW.IC.05		Time of Concentration	0.008	100	0	100	0.008
Ex.A.05	SW.IC.07		Time of Concentration	0.011	100	0	100	0.011
Ex.A.06	SW.IC.09		Time of Concentration	0.025	100	0	100	0.025
Ex.A.07	SW.IC.11		Time of Concentration	0.014	100	0	100	0.014
Ex.A.08	SW.IC.10		Time of Concentration	0.027	100	0	100	0.027
Existing Roof Area	MH for Ex. Roof Area		Time of Concentration	0.146	100	0	100	0.146
GR1	SW.PS.01		Green Roof	0.031		0		0.031
GR2	SW.AT.02		Green Roof	0.024		0		0.024
GR3	SW.AT.03		Green Roof	0.063		0		0.063
GR4	SW.IC.06		Green Roof	0.024		0		0.024
GR5	SW.IC.08		Green Roof	0.027		0		0.027
R1	SW.IC.07		Time of Concentration	0.005	100	0	100	0.005
R2	SW.IC.09		Time of Concentration	0.022	100	0	100	0.022
R3	SW.IC.08		Time of Concentration	0.014	100	0	100	0.014
R4	SW.IC.06		Time of Concentration	0.007	100	0	100	0.007
Sunk Court	SW.PS.01		Time of Concentration	0.029	100	0	100	0.029
TOTAL		0.0		0.532				0.532

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		PJCE	
Report Details: Type: Network Design Criteria Storm Phase: Phase		Designed by: EA	Checked by: SPJ		Approved By: SPJ
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Manhole Options

Apply Offset	☐
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Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development	Date: 02/06/2026			PJCE
Report Title: Rainfall Analysis Criteria	Designed by: EA	Checked by: SPJ	Approved By: SPJ	
	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH	Type: FEH
Site Location	GB 527893 187767 TQ 27893 87767
Rainfall Version	2022
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	35.000
100.0	40.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880
2160	4320
2880	5760
4320	8640
5760	11520
7200	14400
8640	17280
10080	20160

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026			
Report Details: Type: Inflows Summary Storm Phase: Phase		Designed by: EA	Checked by: SPJ		Approved By: SPJ
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Ex.A.05	FEH: 2 years: +0 %: 15 mins: Summer	0.01	2.3	0.993
Ex.A.02	FEH: 2 years: +0 %: 15 mins: Summer	0.03	6.1	2.637
Ex.A.04	FEH: 2 years: +0 %: 15 mins: Summer	0.01	1.7	0.759
R1	FEH: 2 years: +0 %: 15 mins: Summer	0.01	1.1	0.468
GR3	FEH: 2 years: +0 %: 30 mins: Summer	0.06	3.8	6.600
Ex.A.06	FEH: 2 years: +0 %: 15 mins: Summer	0.03	5.4	2.343
R2	FEH: 2 years: +0 %: 15 mins: Summer	0.02	4.7	2.064
Ex.A.07	FEH: 2 years: +0 %: 15 mins: Summer	0.01	3.0	1.284
Ex.A.08	FEH: 2 years: +0 %: 15 mins: Summer	0.03	5.8	2.517
GR1	FEH: 2 years: +0 %: 30 mins: Summer	0.03	1.9	3.282
GR2	FEH: 2 years: +0 %: 30 mins: Summer	0.02	1.5	2.562
Sunk Court	FEH: 2 years: +0 %: 15 mins: Summer	0.03	6.4	2.766
R3	FEH: 2 years: +0 %: 15 mins: Summer	0.01	3.0	1.311
GR4	FEH: 2 years: +0 %: 30 mins: Summer	0.02	1.4	2.487
Ex.A.03	FEH: 2 years: +0 %: 15 mins: Summer	0.01	1.5	0.639
Ex.A.01	FEH: 2 years: +0 %: 15 mins: Summer	0.02	4.1	1.779
GR5	FEH: 2 years: +0 %: 30 mins: Summer	0.03	1.7	2.874
R4	FEH: 2 years: +0 %: 15 mins: Summer	0.01	1.6	0.687
Existing Roof Area	FEH: 2 years: +0 %: 15 mins: Summer	0.15	31.5	13.680

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		PJCE
Report Details: Type: Inflows Summary Storm Phase: Phase		Designed by: EA	Checked by: SPJ	
		Approved By: SPJ		
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



FEH: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Ex.A.05	FEH: 30 years: +35 %: 15 mins: Summer	0.01	7.9	3.453
Ex.A.02	FEH: 30 years: +35 %: 15 mins: Summer	0.03	21.1	9.177
Ex.A.04	FEH: 30 years: +35 %: 15 mins: Summer	0.01	6.1	2.631
R1	FEH: 30 years: +35 %: 15 mins: Summer	0.01	3.8	1.626
GR3	FEH: 30 years: +35 %: 30 mins: Summer	0.06	13.5	23.225
Ex.A.06	FEH: 30 years: +35 %: 15 mins: Summer	0.03	18.8	8.145
R2	FEH: 30 years: +35 %: 15 mins: Summer	0.02	16.5	7.167
Ex.A.07	FEH: 30 years: +35 %: 15 mins: Summer	0.01	10.3	4.464
Ex.A.08	FEH: 30 years: +35 %: 15 mins: Summer	0.03	20.2	8.760
GR1	FEH: 30 years: +35 %: 30 mins: Summer	0.03	6.7	11.545
GR2	FEH: 30 years: +35 %: 30 mins: Summer	0.02	5.2	8.995
Sunk Court	FEH: 30 years: +35 %: 15 mins: Summer	0.03	22.1	9.606
R3	FEH: 30 years: +35 %: 15 mins: Summer	0.01	10.5	4.563
GR4	FEH: 30 years: +35 %: 30 mins: Summer	0.02	5.1	8.748

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026			
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Inflows Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Ex.A.03	FEH: 30 years: +35 %: 15 mins: Summer	0.01	5.1	2.220
Ex.A.01	FEH: 30 years: +35 %: 15 mins: Summer	0.02	14.3	6.189
GR5	FEH: 30 years: +35 %: 30 mins: Summer	0.03	5.9	10.109
R4	FEH: 30 years: +35 %: 15 mins: Summer	0.01	5.5	2.397
Existing Roof Area	FEH: 30 years: +35 %: 15 mins: Summer	0.15	109.5	47.568

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026			
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Inflows Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Ex.A.05	FEH: 100 years: +40 %: 15 mins: Summer	0.01	10.8	4.692
Ex.A.02	FEH: 100 years: +40 %: 15 mins: Summer	0.03	28.7	12.477
Ex.A.04	FEH: 100 years: +40 %: 15 mins: Summer	0.01	8.2	3.576
R1	FEH: 100 years: +40 %: 15 mins: Summer	0.01	5.1	2.211
GR3	FEH: 100 years: +40 %: 30 mins: Summer	0.06	18.5	31.818
Ex.A.06	FEH: 100 years: +40 %: 15 mins: Summer	0.03	25.5	11.070
R2	FEH: 100 years: +40 %: 15 mins: Summer	0.02	22.4	9.741
Ex.A.07	FEH: 100 years: +40 %: 15 mins: Summer	0.01	14.0	6.066
Ex.A.08	FEH: 100 years: +40 %: 15 mins: Summer	0.03	27.4	11.904
GR1	FEH: 100 years: +40 %: 30 mins: Summer	0.03	9.2	15.808
GR2	FEH: 100 years: +40 %: 30 mins: Summer	0.02	7.2	12.313
Sunk Court	FEH: 100 years: +40 %: 15 mins: Summer	0.03	30.1	13.059
R3	FEH: 100 years: +40 %: 15 mins: Summer	0.01	14.3	6.201
GR4	FEH: 100 years: +40 %: 30 mins: Summer	0.02	7.0	11.981

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026			
		Designed by: EA	Checked by: SPJ		Approved By: SPJ
Report Details: Type: Inflows Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Ex.A.03	FEH: 100 years: +40 %: 15 mins: Summer	0.01	7.0	3.021
Ex.A.01	FEH: 100 years: +40 %: 15 mins: Summer	0.02	19.4	8.415
GR5	FEH: 100 years: +40 %: 30 mins: Summer	0.03	8.0	13.849
R4	FEH: 100 years: +40 %: 15 mins: Summer	0.01	7.5	3.258
Existing Roof Area	FEH: 100 years: +40 %: 15 mins: Summer	0.15	148.9	64.658

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		PJCE	
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: EA	Checked by: SPJ		Approved By: SPJ
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW.IC.03	FEH: 2 years: +0 %: 15 mins: Summer	108.6 00	107.8 00	107.83 5	0.035	1.5	0.010	0.000	1.4	0.637	OK
Culvert Headwall	FEH: 2 years: +0 %: 360 mins: Winter	107.9 00	107.3 00	107.34 0	0.040	2.5	0.000	0.000	2.5	34.397	OK
SW.IC.02	FEH: 2 years: +0 %: 15 mins: Summer	110.1 00	107.9 00	107.96 6	0.066	12.9	0.019	0.000	12.7	8.947	OK
SW.IC.04	FEH: 2 years: +0 %: 15 mins: Summer	108.6 00	107.7 00	107.72 5	0.025	1.4	0.007	0.000	1.3	0.644	OK
SW.IC.05	FEH: 2 years: +0 %: 15 mins: Summer	106.8 00	106.1 50	106.17 0	0.020	1.7	0.003	0.000	1.7	0.758	OK
SW.IC.01	FEH: 2 years: +0 %: 15 mins: Summer	109.5 00	108.3 50	108.39 0	0.040	4.1	0.011	0.000	3.9	1.780	OK
SW.HB.01	FEH: 2 years: +0 %: 180 mins: Summer	108.6 50	107.4 00	107.79 9	0.399	2.7	0.451	0.000	2.5	27.640	Surcharged
SW.PS.01	FEH: 2 years: +0 %: 15 mins: Summer	106.7 80	105.2 80	106.51 6	1.236	8.1	1.516	0.000	3.0	4.617	Flood Risk
SW.IC.06	FEH: 2 years: +0 %: 15 mins: Summer	106.6 00	106.0 00	106.03 4	0.034	2.9	0.010	0.000	2.8	2.146	OK
SW.IC.09	FEH: 2 years: +0 %: 15 mins: Summer	108.6 00	106.0 00	106.08 3	0.083	14.5	0.024	0.000	13.8	7.396	OK
SW.IC.08	FEH: 2 years: +0 %: 15 mins: Summer	108.1 00	106.4 00	106.44 0	0.040	4.6	0.011	0.000	4.4	3.000	OK
SW.IC.07	FEH: 2 years: +0 %: 15 mins: Summer	106.6 01	105.7 02	105.74 3	0.041	7.9	0.007	0.000	7.7	4.355	OK
SW.IC.10	FEH: 2 years: +0 %: 15 mins: Summer	106.7 00	105.9 00	105.92 5	0.025	5.8	0.004	0.000	5.8	2.516	OK
SW.IC.11	FEH: 2 years: +0 %: 15 mins: Summer	105.6 00	104.8 00	104.84 0	0.040	3.0	0.006	0.000	2.9	1.260	OK
TE.8803	FEH: 2 years: +0 %: 240 mins: Summer	105.6 80	104.7 00	104.73 6	0.036	2.5	0.000	0.000	2.5	27.083	OK
SW.HB.03	FEH: 2 years: +0 %: 240 mins: Summer	105.6 91	104.7 23	104.90 9	0.187	2.5	0.211	0.000	2.5	27.092	OK
EX.SW.MH	FEH: 2 years: +0 %: 600 mins: Summer	106.7 10	105.3 80	105.40 9	0.029	2.0	0.000	0.000	2.0	55.544	OK
SW.HB.02	FEH: 2 years: +0 %: 600 mins: Summer	106.7 30	105.4 20	105.61 9	0.199	2.0	0.225	0.000	2.0	55.551	Surcharged
MH for Ex. Roof Area	FEH: 2 years: +0 %: 15 mins: Summer	106.1 00	105.3 00	105.30 0	0.000	31.5	0.000	0.000	31.5	13.680	OK

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development	Date: 02/06/2026			
	Designed by: EA	Checked by: SPJ	Approved By: SPJ	
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Freeboard (m)
0.765
0.560
2.134
0.875
0.630
1.110
0.851
0.264
0.566
2.517
1.660
0.858
0.775
0.760
0.944
0.781
1.301
1.111
0.800

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		PJCE
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: EA	Checked by: SPJ	
		Approved By: SPJ		
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



FEH: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW.IC.03	FEH: 30 years: +35 %: 15 mins: Summer	108.600	107.800	107.931	0.131	5.1	0.037	0.000	4.9	2.072	OK
Culvert Headwall	FEH: 30 years: +35 %: 360 mins: Winter	107.900	107.300	107.343	0.043	2.9	0.000	0.000	2.9	92.973	OK
SW.IC.02	FEH: 30 years: +35 %: 15 mins: Summer	110.100	107.900	108.019	0.119	37.9	0.034	0.000	36.4	20.286	OK
SW.IC.04	FEH: 30 years: +35 %: 15 mins: Summer	108.600	107.700	107.931	0.231	4.9	0.065	0.000	4.7	1.523	Surcharged
SW.IC.05	FEH: 30 years: +35 %: 15 mins: Summer	106.800	106.150	106.186	0.036	6.1	0.006	0.000	6.0	2.630	OK
SW.IC.01	FEH: 30 years: +35 %: 15 mins: Summer	109.500	108.350	108.427	0.077	14.3	0.022	0.000	13.7	6.189	OK
SW.HB.01	FEH: 30 years: +35 %: 480 mins: Winter	108.650	107.400	108.602	1.202	3.2	1.360	0.000	2.9	102.137	Flood Risk
SW.PS.01	FEH: 30 years: +35 %: 15 mins: Summer	106.780	105.280	106.790	1.510	28.2	11.371	9.531	3.0	5.071	Flood
SW.IC.06	FEH: 30 years: +35 %: 15 mins: Summer	106.600	106.000	106.064	0.064	10.1	0.018	0.000	9.9	7.519	OK
SW.IC.09	FEH: 30 years: +35 %: 15 mins: Summer	108.600	106.000	106.168	0.168	50.7	0.048	0.000	48.5	25.719	OK
SW.IC.08	FEH: 30 years: +35 %: 15 mins: Summer	108.100	106.400	106.476	0.076	15.8	0.021	0.000	15.5	10.481	OK
SW.IC.07	FEH: 30 years: +35 %: 15 mins: Summer	106.601	105.702	105.783	0.081	27.6	0.013	0.000	27.0	15.182	OK
SW.IC.10	FEH: 30 years: +35 %: 15 mins: Summer	106.700	105.900	105.947	0.047	20.2	0.007	0.000	20.1	8.758	OK
SW.IC.11	FEH: 30 years: +35 %: 15 mins: Summer	105.600	104.800	105.064	0.264	10.3	0.042	0.000	10.1	4.210	Surcharged
TE.8803	FEH: 30 years: +35 %: 1440 mins: Summer	105.680	104.700	104.739	0.039	2.8	0.000	0.000	2.8	108.157	OK
SW.HB.03	FEH: 30 years: +35 %: 720 mins: Summer	105.691	104.723	105.605	0.882	3.9	0.998	0.000	2.8	98.154	Flood Risk
EX.SW.MH	FEH: 30 years: +35 %: 5760 mins: Summer	106.710	105.380	105.409	0.029	2.0	0.000	0.000	2.0	225.562	OK
SW.HB.02	FEH: 30 years: +35 %: 5760 mins: Summer	106.730	105.420	105.618	0.198	2.0	0.224	0.000	2.0	225.562	Surcharged
MH for Ex. Roof Area	FEH: 30 years: +35 %: 15 mins: Summer	106.100	105.300	105.300	0.000	109.5	0.000	0.000	109.6	47.568	OK

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development	Date: 02/06/2026			
	Designed by: EA	Checked by: SPJ	Approved By: SPJ	
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Freeboard (m)
0.669
0.557
2.081
0.669
0.614
1.073
0.048
-0.010
0.536
2.432
1.624
0.819
0.753
0.536
0.941
0.086
1.301
1.112
0.800

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		PJCE
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: EA	Checked by: SPJ	
		Approved By: SPJ		
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW.IC.03	FEH: 100 years: +40 %: 15 mins: Summer	108.600	107.800	108.050	0.250	7.0	0.071	0.000	6.7	2.737	Surcharged
Culvert Headwall	FEH: 100 years: +40 %: 600 mins: Winter	107.900	107.300	107.343	0.043	3.0	0.000	0.000	3.0	150.778	OK
SW.IC.02	FEH: 100 years: +40 %: 15 mins: Summer	110.100	107.900	108.051	0.151	50.5	0.043	0.000	50.3	25.186	OK
SW.IC.04	FEH: 100 years: +40 %: 15 mins: Summer	108.600	107.700	108.050	0.350	6.7	0.099	0.000	5.4	2.007	Surcharged
SW.IC.05	FEH: 100 years: +40 %: 15 mins: Summer	106.800	106.150	106.193	0.043	8.2	0.007	0.000	8.2	3.575	OK
SW.IC.01	FEH: 100 years: +40 %: 15 mins: Summer	109.500	108.350	108.441	0.091	19.4	0.026	0.000	18.7	8.438	OK
SW.HB.01	FEH: 100 years: +40 %: 600 mins: Winter	108.650	107.400	108.613	1.213	3.7	1.372	0.000	3.0	150.781	Flood Risk
SW.PS.01	FEH: 100 years: +40 %: 15 mins: Summer	106.780	105.280	106.795	1.515	38.4	17.210	15.370	3.0	5.134	Flood
SW.IC.06	FEH: 100 years: +40 %: 15 mins: Summer	106.600	106.000	106.075	0.075	13.8	0.021	0.000	13.5	10.241	OK
SW.IC.09	FEH: 100 years: +40 %: 15 mins: Winter	108.600	106.000	106.212	0.212	65.0	0.060	0.000	60.7	34.828	OK
SW.IC.08	FEH: 100 years: +40 %: 15 mins: Summer	108.100	106.400	106.489	0.089	21.5	0.025	0.000	21.2	14.251	OK
SW.IC.07	FEH: 100 years: +40 %: 15 mins: Summer	106.601	105.702	105.832	0.131	37.5	0.021	0.000	36.7	20.314	OK
SW.IC.10	FEH: 100 years: +40 %: 15 mins: Summer	106.700	105.900	105.955	0.055	27.4	0.009	0.000	27.3	11.902	OK
SW.IC.11	FEH: 100 years: +40 %: 15 mins: Summer	105.600	104.800	105.191	0.391	14.0	0.062	0.000	13.1	5.687	Surcharged
TE.8803	FEH: 100 years: +40 %: 960 mins: Winter	105.680	104.700	104.739	0.039	2.8	0.000	0.000	2.8	146.438	OK
SW.HB.03	FEH: 100 years: +40 %: 600 mins: Summer	105.691	104.723	105.636	0.913	6.4	1.033	0.000	2.8	135.336	Flood Risk
EX.SW.MH	FEH: 100 years: +40 %: 360 mins: Winter	106.710	105.380	105.409	0.029	6.1	0.000	0.000	6.1	112.323	OK
SW.HB.02	FEH: 100 years: +40 %: 360 mins: Winter	106.730	105.420	106.344	0.924	6.1	1.045	0.000	6.1	112.359	Surcharged
MH for Ex. Roof Area	FEH: 100 years: +40 %: 15 mins: Summer	106.100	105.300	105.300	0.000	148.9	0.000	0.000	148.9	64.658	OK

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development	Date: 02/06/2026			
	Designed by: EA	Checked by: SPJ	Approved By: SPJ	
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

Freeboard (m)
0.550
0.557
2.049
0.550
0.607
1.059
0.037
-0.015
0.525
2.388
1.611
0.769
0.745
0.409
0.941
0.055
1.301
0.386
0.800

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		
		Designed by: EA	Checked by: SPJ	Approved By: SPJ
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
SW.AT.01	FEH: 2 years: +0 %: 180 mins: Summer	107.799	107.799	0.299	0.299	7.4	12.516	0.000	0.000	2.7	27.759	67.813	OK
SW.AT.02	FEH: 2 years: +0 %: 360 mins: Summer	105.632	105.632	0.196	0.196	8.0	29.512	0.000	0.000	2.0	46.311	78.627	OK
SW.AT.03	FEH: 2 years: +0 %: 240 mins: Summer	104.910	104.910	0.167	0.167	5.8	12.242	0.000	0.000	2.5	27.122	64.007	OK

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		
		Designed by: EA	Checked by: SPJ	Approved By: SPJ
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



FEH: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
SW.AT.01	FEH: 30 years: +35 %: 480 mins: Winter	108.603	108.603	1.103	1.103	6.8	38.499	0.000	0.000	3.2	105.226	0.997	OK
SW.AT.02	FEH: 30 years: +35 %: 360 mins: Winter	106.153	106.153	0.717	0.717	15.4	108.130	0.000	0.000	2.1	68.177	21.691	OK
SW.AT.03	FEH: 30 years: +35 %: 120 mins: Winter	105.619	105.619	0.876	0.876	18.1	33.946	0.000	0.000	2.9	44.515	0.197	OK

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		
		Designed by: EA	Checked by: SPJ	Approved By: SPJ
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By:
 Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
SW.AT.01	FEH: 100 years: +40 %: 600 mins: Winter	108.613	108.613	1.113	1.113	7.9	38.509	0.000	0.000	3.7	174.285	0.970	OK
SW.AT.02	FEH: 100 years: +40 %: 360 mins: Winter	106.345	106.345	0.909	0.909	21.8	137.160	0.000	0.000	6.1	113.126	0.667	OK
SW.AT.03	FEH: 100 years: +40 %: 240 mins: Winter	105.643	105.643	0.900	0.900	16.5	33.969	0.000	0.000	3.0	106.783	0.128	OK

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		PJCE
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: EA	Checked by: SPJ	
		Approved By: SPJ		
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P7	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.IC.05	SW.IC.07	106.800	106.170	0.031	0.758	0.7	0.04	1.7	OK
P6	FEH: 2 years: +0 %: 360 mins: Winter	Pipe	SW.HB.01	Culvert Headwall	108.650	107.714	0.041	34.397	0.7	0.16	2.5	Surcharged
P11	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.IC.09	SW.AT.02	108.600	106.083	0.056	7.396	1.8	0.23	13.8	OK
P3	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.IC.03	SW.IC.04	108.600	107.835	0.030	0.637	0.6	0.11	1.4	OK
P5	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.AT.01	SW.HB.01	109.000	107.642	0.192	3.629	0.4	0.05	2.9	OK
RM	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.PS.01	SW.IC.02	106.780	106.516	0.018	4.614	0.0	0.23	3.0	Flood Risk
P1	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.IC.01	SW.IC.02	109.500	108.390	0.053	1.780	0.5	0.07	3.9	OK
P4	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.IC.04	SW.AT.01	108.600	107.725	0.073	0.644	0.3	0.03	1.3	OK
P2	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.IC.02	SW.AT.01	110.100	107.966	0.086	8.947	1.5	0.17	12.7	OK
P9	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.IC.07	SW.AT.02	106.601	105.743	0.045	4.355	1.9	0.06	7.7	OK
P8	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.IC.06	SW.IC.07	106.600	106.034	0.038	2.146	0.7	0.05	2.8	OK
P10	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.IC.08	SW.IC.09	108.100	106.440	0.062	3.000	0.6	0.07	4.4	OK
P12	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.IC.11	SW.AT.03	105.600	104.840	0.055	1.260	0.7	0.06	2.9	OK
P13	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.IC.10	SW.AT.03	106.700	105.925	0.042	2.516	2.1	0.03	5.8	OK
P14	FEH: 2 years: +0 %: 240 mins: Summer	Pipe	SW.AT.03	SW.HB.03	105.700	104.910	0.177	27.122	0.2	0.07	2.5	OK
P15	FEH: 2 years: +0 %: 240 mins: Summer	Pipe	SW.HB.03	TE.8803	105.691	104.909	0.038	27.083	0.6	0.06	2.5	OK
P16	FEH: 2 years: +0 %: 240 mins: Summer	Pipe	SW.AT.02	SW.HB.02	106.550	105.629	0.201	36.678	0.1	0.07	2.0	OK
P17	FEH: 2 years: +0 %: 600 mins: Summer	Pipe	SW.HB.02	EX.SW.MH	106.730	105.619	0.031	55.544	0.8	0.08	2.0	Surcharged
P19 (high level)	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW.HB.02	EX.SW.MH	106.730	105.515	0.011	0.000	0.0	0	0.0	OK

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		PJCE
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: EA	Checked by: SPJ	
		Approved By: SPJ		
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



FEH: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P7	FEH: 30 years: +35 %: 15 mins: Summer	Pipe	SW.IC.05	SW.IC.07	106.800	106.186	0.059	2.630	0.9	0.13	6.0	OK
P6	FEH: 30 years: +35 %: 360 mins: Winter	Pipe	SW.HB.01	Culvert Headwall	108.650	108.602	0.044	92.973	0.7	0.18	2.9	Flood Risk
P11	FEH: 30 years: +35 %: 15 mins: Summer	Pipe	SW.IC.09	SW.AT.02	108.600	106.168	0.161	25.719	1.9	0.79	48.5	OK
P3	FEH: 30 years: +35 %: 15 mins: Summer	Pipe	SW.IC.03	SW.IC.04	108.600	107.931	0.150	2.062	0.8	0.38	4.9	OK
P5	FEH: 30 years: +35 %: 240 mins: Winter	Pipe	SW.AT.01	SW.HB.01	109.000	108.601	0.225	67.902	0.3	0.06	3.6	Surcharged
RM	FEH: 30 years: +35 %: 15 mins: Summer	Pipe	SW.PS.01	SW.IC.02	106.780	106.790	0.018	5.068	0.0	0.23	3.0	Flood
P1	FEH: 30 years: +35 %: 15 mins: Summer	Pipe	SW.IC.01	SW.IC.02	109.500	108.427	0.098	6.189	0.8	0.25	13.7	OK
P4	FEH: 30 years: +35 %: 15 mins: Summer	Pipe	SW.IC.04	SW.AT.01	108.600	107.931	0.225	1.428	0.3	0.1	4.7	Surcharged
P2	FEH: 30 years: +35 %: 15 mins: Summer	Pipe	SW.IC.02	SW.AT.01	110.100	108.019	0.225	20.286	1.7	0.5	36.4	OK
P9	FEH: 30 years: +35 %: 15 mins: Summer	Pipe	SW.IC.07	SW.AT.02	106.601	105.783	0.159	15.182	2.3	0.21	27.0	OK
P8	FEH: 30 years: +35 %: 15 mins: Summer	Pipe	SW.IC.06	SW.IC.07	106.600	106.064	0.072	7.519	1.0	0.17	9.9	OK
P10	FEH: 30 years: +35 %: 15 mins: Summer	Pipe	SW.IC.08	SW.IC.09	108.100	106.476	0.122	10.481	0.8	0.25	15.5	OK
P12	FEH: 30 years: +35 %: 15 mins: Summer	Pipe	SW.IC.11	SW.AT.03	105.600	105.064	0.225	4.209	0.8	0.22	10.1	Surcharged
P13	FEH: 30 years: +35 %: 15 mins: Summer	Pipe	SW.IC.10	SW.AT.03	106.700	105.947	0.161	8.758	2.4	0.1	20.1	OK

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026			
		Designed by: EA	Checked by: SPJ	Approved By: SPJ	
Report Details: Type: Connections Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			

P14	FEH: 30 years: +35 %: 360 mins: Summer	Pipe	SW.AT.0 3	SW.HB.0 3	105.700	105.614	0.225	83.912	0.2	0.18	6.0	Surcharged
P15	FEH: 30 years: +35 %: 1440 mins: Summer	Pipe	SW.HB. 03	TE.8803	105.691	105.136	0.040	108.157	0.6	0.07	2.8	Surcharged
P16	FEH: 30 years: +35 %: 30 mins: Winter	Pipe	SW.AT.0 2	SW.HB.0 2	106.550	105.838	0.225	4.708	0.2	0.08	2.4	Surcharged
P17	FEH: 30 years: +35 %: 5760 mins: Summer	Pipe	SW.HB. 02	EX.SW. MH	106.730	105.618	0.031	225.562	0.8	0.08	2.0	Surcharged
P19 (high level)	FEH: 30 years: +35 %: 15 mins: Summer	Pipe	SW.HB. 02	EX.SW. MH	106.730	105.727	0.012	0.000	0.0	0	0.0	Surcharged

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		PJCE
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: EA	Checked by: SPJ	
		Approved By: SPJ		
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P7	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW.IC.05	SW.IC.07	106.800	106.193	0.071	3.575	1.0	0.18	8.2	OK
P6	FEH: 100 years: +40 %: 600 mins: Winter	Pipe	SW.HB.01	Culvert Headwall	108.650	108.613	0.044	150.778	0.7	0.18	3.0	Flood Risk
P11	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	SW.IC.09	SW.AT.02	108.600	106.212	0.216	34.828	2.0	0.99	60.7	OK
P3	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW.IC.03	SW.IC.04	108.600	108.050	0.150	2.720	0.9	0.52	6.7	Surcharged
P5	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	SW.AT.01	SW.HB.01	109.000	108.050	0.225	4.088	0.4	0.09	5.2	Surcharged
RM	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW.PS.01	SW.IC.02	106.780	106.795	0.018	5.131	0.0	0.23	3.0	Flood
P1	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW.IC.01	SW.IC.02	109.500	108.441	0.117	8.438	0.9	0.34	18.7	OK
P4	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW.IC.04	SW.AT.01	108.600	108.050	0.225	1.944	0.4	0.11	5.4	Surcharged
P2	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW.IC.02	SW.AT.01	110.100	108.051	0.225	25.186	1.7	0.69	50.3	OK
P9	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW.IC.07	SW.AT.02	106.601	105.832	0.225	20.314	2.3	0.28	36.7	OK
P8	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW.IC.06	SW.IC.07	106.600	106.075	0.088	10.241	1.1	0.24	13.5	OK
P10	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW.IC.08	SW.IC.09	108.100	106.489	0.169	14.251	0.9	0.34	21.2	OK
P12	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW.IC.11	SW.AT.03	105.600	105.191	0.225	5.686	0.9	0.28	13.1	Surcharged
P13	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW.IC.10	SW.AT.03	106.700	105.955	0.224	11.902	2.4	0.13	27.3	OK

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		
		Designed by: EA	Checked by: SPJ	Approved By: SPJ
Report Details: Type: Connections Summary Storm Phase: Phase		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



P14	FEH: 100 years: +40 %: Summer	Pipe	SW.AT.03	SW.HB.03	105.700	105.641	0.225	52.916	0.4	0.45	15.0	Surcharged
P15	FEH: 100 years: +40 %: 960 mins: Winter	Pipe	SW.HB.03	TE.8803	105.691	105.620	0.040	146.438	0.6	0.07	2.8	Flood Risk
P16	FEH: 100 years: +40 %: 360 mins: Winter	Pipe	SW.AT.02	SW.HB.02	106.550	106.345	0.225	113.126	0.2	0.21	6.1	Surcharged
P17	FEH: 100 years: +40 %: 360 mins: Winter	Pipe	SW.HB.02	EX.SW.MH	106.730	106.344	0.031	74.581	0.9	0.09	2.2	Surcharged
P19 (high level)	FEH: 100 years: +40 %: 480 mins: Winter	Pipe	SW.HB.02	EX.SW.MH	106.730	106.339	0.022	41.944	2.4	0.04	3.9	Surcharged

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026			
Report Details: Type: Phase Management Storm Phase: Phase		Designed by: EA	Checked by: SPJ		Approved By: SPJ
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			



Phase
FEH: 2 years: Increase Rainfall (%): +0: 15 mins: Summer

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Culvert			2.5	3.124
Headwall				
TE.8803			1.4	1.421
EX.SW.MH			1.1	1.123
MH for Ex.				
Roof Area			31.5	13.680
TOTAL	87.7	44.584	34.0	19.348

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		PJCE
Report Details: Type: Phase Management Storm Phase: Phase		Designed by: EA	Checked by: SPJ	
		Approved By: SPJ		
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London		



Phase
FEH: 30 years: Increase Rainfall (%): +35: 15 mins: Summer

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Culvert			1.9	2.787
Headwall			2.8	2.585
TE.8803			1.4	1.761
EX.SW.MH			109.6	47.568
MH for Ex. Roof Area				
TOTAL	304.8	155.033	114.3	54.701

Project: L2384-PJC-XX-XX-CA-C-001 Highgate School Mallinson Sports Centre Post-Development		Date: 02/06/2026		PJCE	
Report Details: Type: Phase Management Storm Phase: Phase		Designed by: EA	Checked by: SPJ		Approved By: SPJ
		Company Address: Pringuer-James Consulting Engineers Overseas House, Elm Grove Wimbledon, London			


Phase
FEH: 100 years: Increase Rainfall (%): +40: 15 mins: Summer

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Culvert			2.2	3.075
Headwall				
TE.8803			2.3	2.659
EX.SW.MH			1.7	1.911
MH for Ex.				
Roof Area			148.9	64.658
TOTAL	414.4	210.725	154.5	72.304

Appendix G – HR Wallingford Greenfield Runoff Estimation

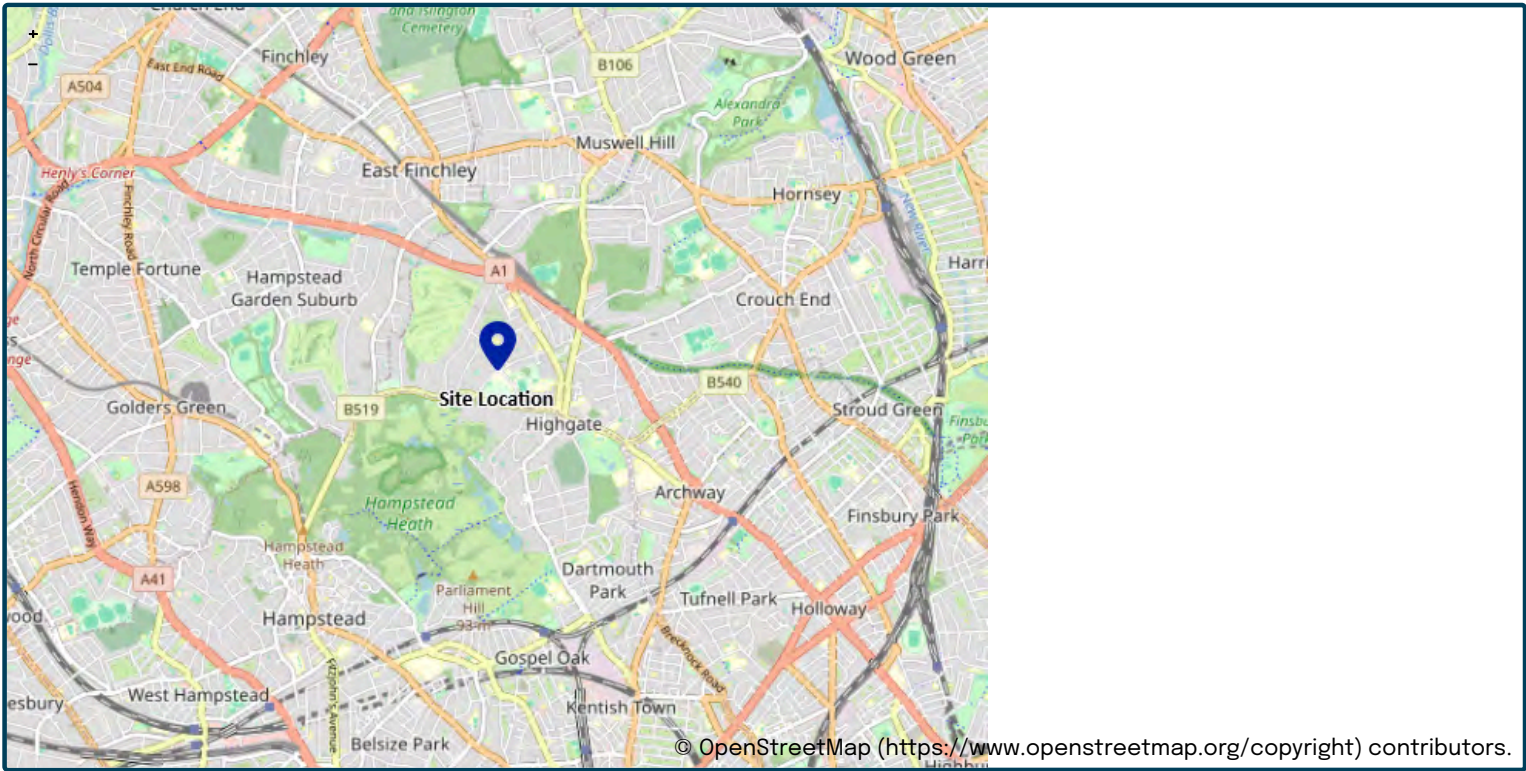
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	02/06/2026
Calculated by	Ewan Andrew
Reference	L2384
Model version	2.2.3

Location

Site name	Highgate School
Site location	Highgate, Haringey



Site easting (British National Grid)	527817
Site northing (British National Grid)	187618

Site details

Total site area (ha)	1.2168	ha
----------------------	-------------------------------------	----

Greenfield runoff

Method

Method	FEH statistical (2025)
--------	------------------------

FEH statistical (2025)

	<u>My value</u>	<u>Map value</u>
SAAR9120 (mm)	745	mm
BFIHOST19scaled	.445	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	4.6	l/s
QBar (FEH statistical 2025) (l/s)	5.2	l/s

Growth curve factors

	<u>My value</u>	<u>Map value</u>
Hydrological region	6	6
1 year growth factor	0.85	
2 year growth factor	0.88	
10 year growth factor	1.62	
30 year growth factor	2.3	
100 year growth factor	3.19	
200 year growth factor	3.74	

Results

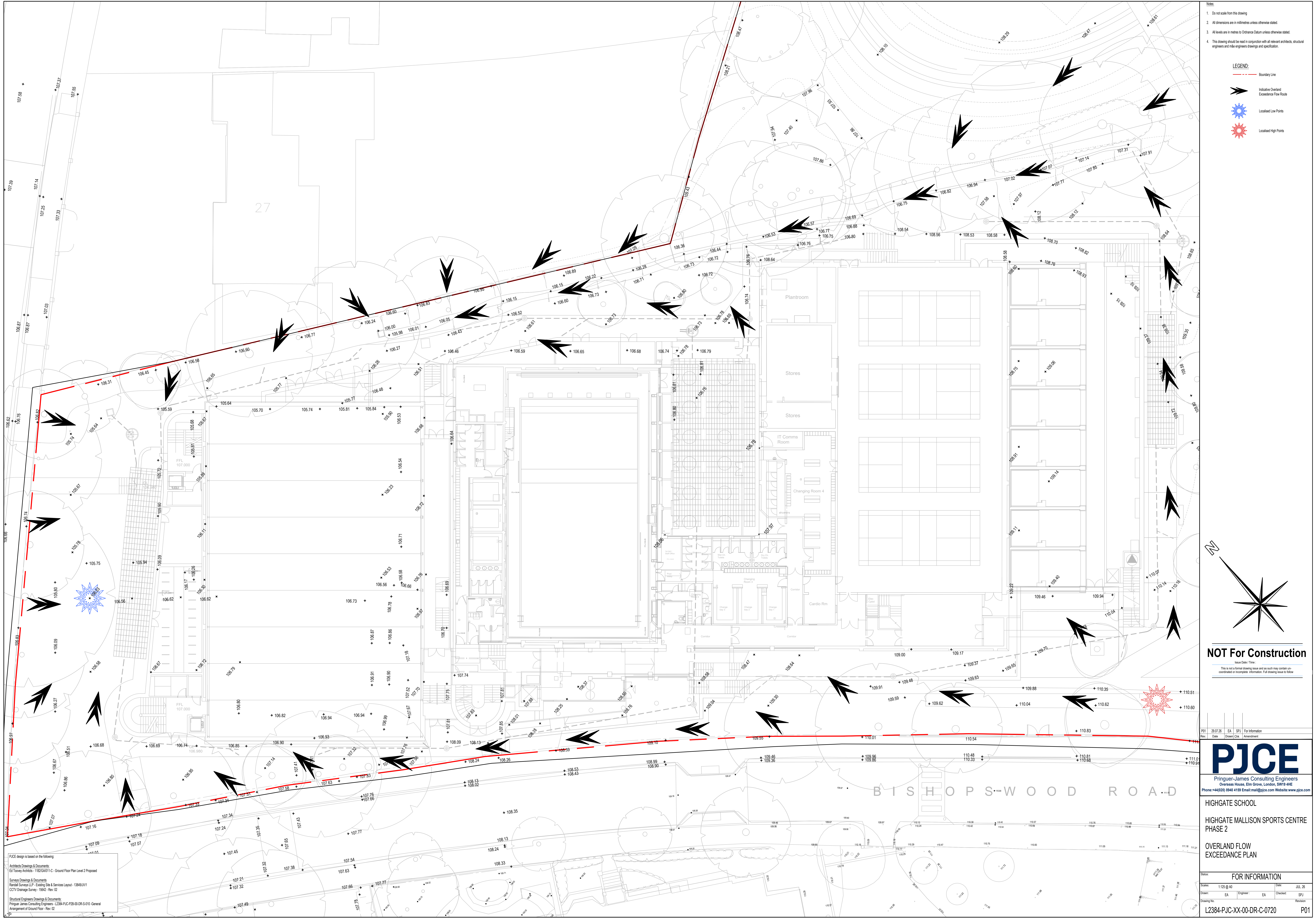
Method	FEH statistical (2025)
Flow rate 1 year (l/s)	4.4
Flow rate 2 year (l/s)	4.6
Flow rate 10 years (l/s)	8.5
Flow rate 30 years (l/s)	12.0
Flow rate 100 years (l/s)	16.7
Flow rate 200 years (l/s)	19.5

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Appendix H – Overland Flow Exceedance Plan



- Notes:
1. Do not scale from this drawing
 2. All dimensions are in millimetres unless otherwise stated.
 3. All levels are in metres to Ordnance Datum unless otherwise stated.
 4. This drawing should be read in conjunction with all relevant architects, structural engineers and m/e engineers drawings and specification

LEGEND:

- Boundary Line
- Indicative Overland Exceedance Flow Route
- Localised Low Points
- Localised High Points

NOT For Construction

This is not a formal drawing issue and as such may contain un-coordinated or incomplete information. Full drawing issue to follow.

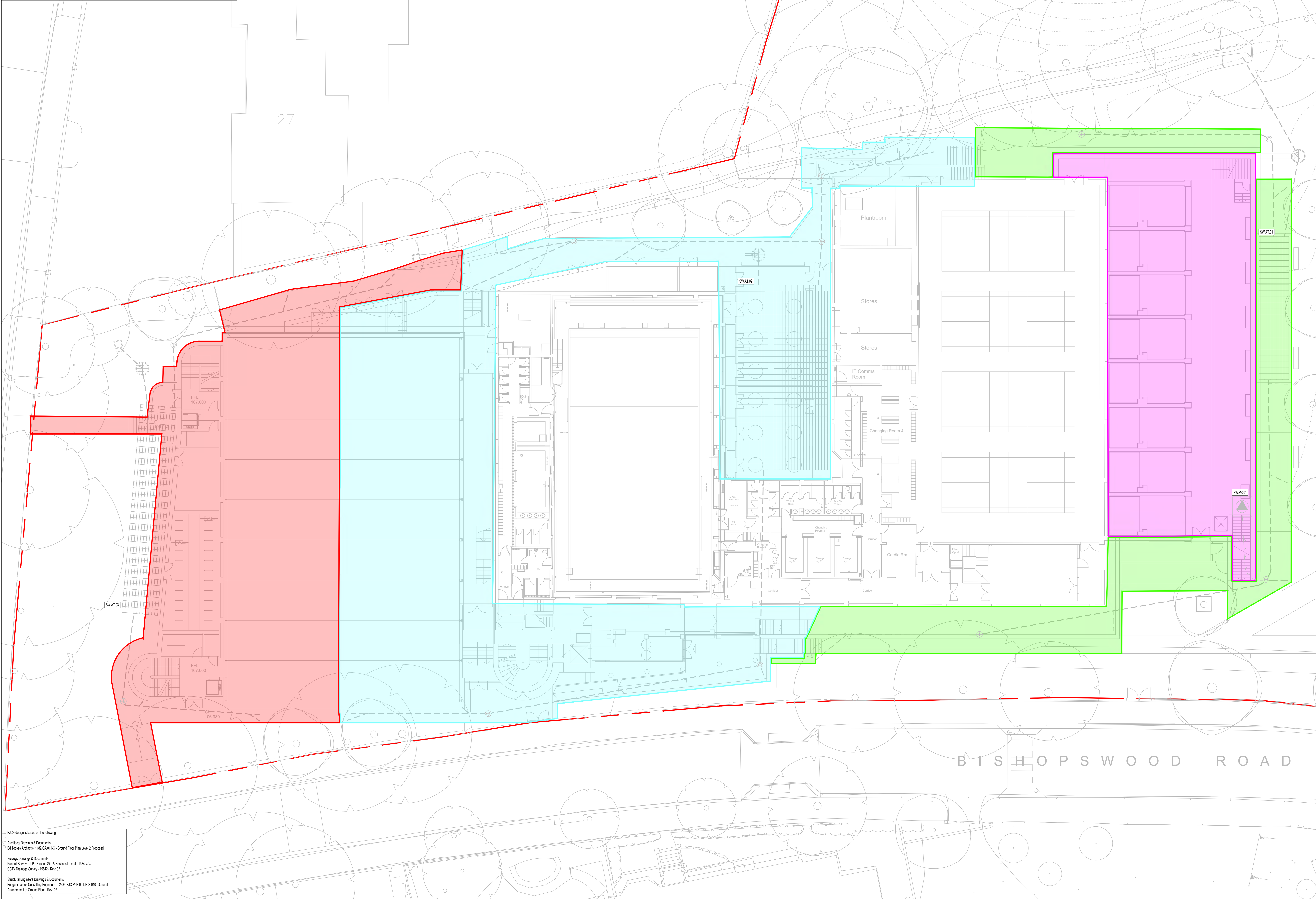
PJCE
Pringuer-James Consulting Engineers
Overseas House, Elm Grove, London, SW19 4HE
Phone: +44(020) 8940 4159 Email: mail@pjce.com Website: www.pjce.com

HIGHGATE SCHOOL
HIGHGATE MALLISON SPORTS CENTRE
PHASE 2
OVERLAND FLOW
EXCEEDANCE PLAN

FOR INFORMATION			
Scale:	1:125 @ A0	Date:	JUL 26
Drawn:	EA	Engineer:	EA
Checked:	SPJ	Revised:	
Drawing No:	L2384-PJC-XX-00-DR-C-0720	P01	

Appendix I – Impermeable Area Plan

Contributing Catchment Areas to Attenuation Devices			
REF	Contributing Impermeable Area (m²)	Contributing Green Roof Area (m²)	Total Contributing Area (m²)
SW.PS.01	290	310	600 (to drain to SW.AT.01)
SW.AT.01	540	-	540 (plus pumped discharge from SW.PS.01)
SW.AT.02	930	750	1,680
SW.AT.03	410	630	1,040
Total	2,170	1,690	3,860



PJCE design is based on the following:

Architects Drawings & Documents:
Ed Toovey Architects - 1162/GA/011-C - Ground Floor Plan Level 2 Proposed

Survey Drawings & Documents:
Pondall Surveys LLP - Existing Site & Services Layout - 13849/0/1
CCTV Drainage Survey - 15642 - Rev 02

Structural Engineers Drawings & Documents:
Pringuer-James Consulting Engineers - L2384-PJC-P28-00-DR-S-010 - General Arrangement of Ground Floor - Rev 02

Notes:

- Do not scale from this drawing
- All dimensions are in millimetres unless otherwise stated.
- All levels are in metres to Ordnance Datum unless otherwise stated.
- This drawing should be read in conjunction with all relevant architects, structural engineers and m/e engineers drawings and specification

LEGEND:

- Boundary Line
- Impermeable catchment area draining to Pump Station SW.PS.01
- Impermeable catchment area draining to Pump Station SW.AT.01
- Impermeable catchment area draining to Pump Station SW.PS.02
- Impermeable catchment area draining to Pump Station SW.AT.03

NOT For Construction

Issue Date / Time:
This is not a formal drawing issue and as such may contain un-coordinated or incomplete information. Full drawing issue to follow

Rev.	Date	Drawn	Chk	EA	SPJ	For Information
P01	29.07.26					

PJCE

Pringuer-James Consulting Engineers
Overseas House, Elm Grove, London, SW19 4HE
Phone: +44(020) 8940 4159 Email: mail@pjce.com Website: www.pjce.com

HIGHGATE SCHOOL

HIGHGATE MALLISON SPORTS CENTRE
PHASE 2

CONTRIBUTING IMPERMEABLE
AREA PLAN

Status: FOR INFORMATION

Scales:	1:125 @ A0	Date:	JUL 26
Drawn:	EA	Engineer:	EA
Checked:	SPJ	Revision:	

Drawing No: L2384-PJC-XX-00-DR-C-0710 P01

APPENDIX J – Maintenance Plan

Maintenance Plan for the following design elements has been provided below:

- Green roofs
- Attenuation Tank
- Hydro-brake
- Trees

Green Roofs – Operations and Maintenance Schedule

	Required Action	Typical Frequency
Regular inspections	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural stability.	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify any sediment source.	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from drainage layer to the conveyance or roof drain system.	Annually and after severe storms
	Inspect underside of roof for evidence of leaking.	Annually and after severe storms
Regular maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth.	Six monthly or as required
	During establishment (i.e. year one), replace dead plants as required.	Monthly (but usually the responsibility of the manufacturer)
	Post establishment, replace dead plants as required (where >5% of coverage).	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage.	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds.	Six monthly or as required
	Mow grass, prune and manage other planting (if appropriate) as required – clipping should be removed and not allowed to accumulate.	Six monthly or as required
Remedial action	If erosion channels are evident, these should be stabilized with extra soil substrate similar to the original material, and sources of erosion damage should be identified and controlled.	As required
	If drain inlet has settled, cracked, or moved, investigate and repair as appropriate.	As required.

Attenuation tank – Operations and Maintenance Schedule

	Required Action	Typical Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance).	Monthly
	For systems where rainfall intensities into the tank from above, check surface of filter for blockage by sediment, algae, or other matter: remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays.	Annually, or as required
Occasional maintenance	Repair/rehabilitate inlets, outlets, overflows, and vents.	As required
Monitoring	Inspect/check all inlets, outlets, vents, and overflows to ensure that they are in good condition and operating as designed.	Annually
	Survey inside of tank for sediment build-up and remove if necessary.	Every 5 years or as required.

Hydro-brake – Operations and Maintenance Schedule

	Required Action	Typical Frequency
Regular maintenance	Check and empty sump pit. Check orifice plate for any blockages. If fault is identified during routine inspection/monitoring, undertake remedial action.	Every 6 months
Remedial action	Repair and/or replace orifice plate.	As required
Monitoring	Inspection to check orifice performance, condition of the system and to identify any faults.	Every 6 months

Trees – Operations and Maintenance Schedule

	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris.	Monthly (or as required)
	Manage other vegetation and remove nuisance plants.	Monthly (at start, then as required)
	Inspect inlets and outlets.	Inspect monthly
Occasional maintenance	Check tree health and manage tree appropriately.	Annually
	Remove silt build-up from inlets and surface and replace mulch as necessary.	Annually, or as required
	Water.	As required (in periods of drought)
Monitoring	Inspect silt accumulation rates and establish appropriate removal frequencies.	Half yearly

APPENDIX K – Communication

- Thames Water Capacity check.
- Haringey Council email



Mr Vlad Myrsikov

PJCE

Overseas House,
Elm Grove,
London,
SW19 4HE



10 September 2019

Pre-planning enquiry: Capacity Confirmation (Foul flows only)

Dear Vlad,

Thank you for providing information on your development.

Site: Mallison Sports Centre, Bishopswood Road, Highgate, London – N6 4NY

Existing site: Secondary School (1,400 pupils).

Existing surface water discharge at 16.33 l/s for 1:1yr, 46.08 l/s for 1:30yr & 61.93 l/s for 1:100yr.

Proposed site: Secondary School (1,400 pupils), increase in floor area in comparison to the existing building.

Proposed foul water discharge by gravity between manholes TQ27878802-TQ28870704.

Proposed surface water discharge at 5.0 l/s for 1:1yr, 8.0 l/s for 1:30yr & 12.0 l/s for 1:100yr+40%CC between manholes TQ27878801-TQ28870703.

Site Area – 1.268 ha (Impermeable Area = 0.2158ha & Green Space = 0.9983ha (overland flows to sewer via swale))

Foul Water

From the information you have provided, we can confirm that the existing foul sewer network does have sufficient capacity to accommodate the proposed foul and surface water flows from the site.

This confirmation for capacity is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.

Surface Water

Please note that discharging surface water to the public sewer network should only be considered after all other methods of disposal have been investigated and proven to not be viable. In accordance with the Building Act 2000 Clause H3.3, positive connection to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable.

The disposal hierarchy being: 1st Soakaways; 2nd Watercourses; 3rd Sewers.

If they are consulted as part of any planning application, Thames Water Planning team would ask to see why it is not practicable to attenuate the flows to Greenfield run-off rates i.e. 5l/s/hectare of the total site area.

Please refer to the attached document titled “Planning your wastewater” attached to this letter, specifically to notes relating to surface water. Also, I would advise you to liaise with the Local Authority (LA) / Lead Local Flood Authority (LLFA) and discuss their criteria regarding surface water discharges in that area and adhere to their stipulation. If you agree & adhere to a LA/LLFA stipulation, then Thames Water will be able to accommodate that agreed discharge.

If you've any further questions, please contact me on 020 3577 7608.

Yours sincerely

Zaid Kazi

Development Engineer
Developer Services – Sewer Adoptions Team
Thames Water Sewer

From: Matthews Ray <Ray.Matthews@haringey.gov.uk>
Sent: 15 March 2019 10:50
To: Vlad Myrsikov <vlad@pjce.com>
Subject: RE: Highgate School

Hi Vlad,

We (LLFA) have now reviewed the proposed development at Highgate school.

With regards to the temporary class room that is being placed on the artificial surface that already has storage beneath it, if you could initially provide us with a brief description and drawing of the proposal that should be enough for us at this stage to determine if further control needs to be put in place.

Regarding the main site, we believe it's not unreasonable for the retained buildings to be excluded as per your request, so the focus will be on the new build. The LLFA can confirm that we are satisfied to exclude the 2 retained buildings this will allow you to concentrate on the new build only. We would ask you to sensitivity test for a 40% CC as we are on the understanding 30% CC is no longer current. We will require a run-off rate as close as possible to greenfield rate for this site.

Please let me know if you require anything else from me at this stage.

Kind regards

Ray Matthews

SuDS Officer

Haringey Council

Level 1 River Park House

225 High Road

Wood Green

London. N22 8HQ

E: ray.matthews@haringey.gov.uk