

NEW GYM & DINING HUB, HURSTPIERPOINT COLLEGE

FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY

NOVEMBER 2025



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Client : Hurstpierpoint College
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1.0 INTRODUCTION

- 1.1 HOP Consulting (HOP) has been instructed by Building Solutions Consultants Ltd., on behalf of Hurstpierpoint College (HPPC), to undertake a Flood Risk Assessment and Drainage Strategy (FRADS) report for the new gym and dining hub development adjacent to the existing swimming pool and sports building at the school site.
- 1.2 The proposals are to demolish the former swimming pool building and construct a new gym and dining hub, access, landscaping and extension of the existing access road for delivery vehicles.
- 1.3 The flood risk element of this report has been prepared in accordance with the principles of the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance (PPG) for Development and Flood Risk. The storm water drainage strategy has been considered in accordance with the National Standards for Sustainable Drainage Systems (NSSuDS). The purpose of this report is to demonstrate the risk of flooding from all sources, and foul and surface water discharge from the proposed development, can be managed effectively and in accordance with the statutory authorities' requirements.
- 1.4 The site is located within Mid Sussex District Council (MSDC) and reference has been made to the Strategic Flood Risk Assessment (SFRA) and local policies on flood risk management, in addition to online data available from the Environment Agency (EA) and the guidance from West Sussex County Council acting as the Local Lead Flood Authority (LLFA) for the district.
- 1.5 Details of the development proposals have been provided by Hurstpierpoint College and their agents to show the extent of the development and confirm the existing site layout. Information in this report has been received from a number of external parties and HOP does not accept liability for the accuracy of this information. Should there be material change in the development proposals, this report will need to be revised accordingly.



Fig 1.1 Site location map

2.0 SITE DESCRIPTION AND LOCATION

LOCATION & TQ GRID

- 2.1 The proposed development site is located just north of the village of Hurstpierpoint, West Sussex, within the southern grounds of Hurstpierpoint College as can be seen in the Site Location map and plan shown in Figures 1.1 and 2.1, respectively.

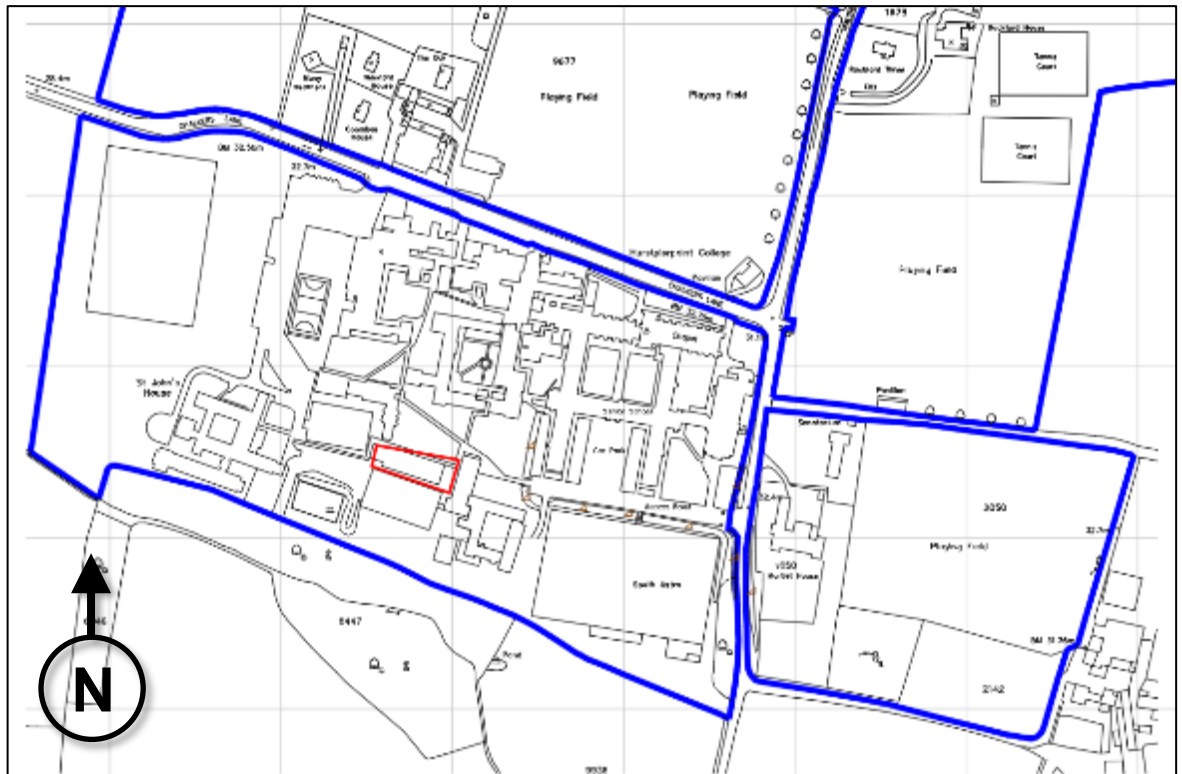


Figure. 2.1 Site location plan

- 2.2 The site is currently bordered by an existing Performing Arts Centre to the west, sports building to the south, a swimming pool building to the east and a pedestrian walkway to the north side.
- 2.3 TQ Grid Reference: TQ 28880 17543.

BRIEF DESCRIPTION & PRIOR USE

- 2.4 The pre-existing swimming pool building, now demolished, has become redundant following the completion of a newer, modernised swimming facility located to the east of the original structure.

SURROUNDING AREA

- 2.5 The development site is currently bordered by an existing Performing Arts Centre to the west, sports building to the south, a swimming pool building to the east and a pedestrian walkway to the north side.
- 2.6 The area directly surrounding the college is farmland and semi-natural habitats with patches of mixed deciduous woodland.

LEVELS & TOPOGRAPHY

- 2.7 The surrounding land falls gently away to the west and south of the development site. Based on topographical survey data, the maximum elevation to the north of the proposed building is approximately 29.5mAOD (above Ordnance Datum), falling to approximately 27.5mAOD at the southern boundary.
- 2.8 The southern boundary of the college site is delineated by a watercourse that runs from east to west and eventually flows to the Herring Stream, a tributary of the River Adur, some 3km to the north west.
- 2.9 As part of the development proposals, the ground levels on the northern side will be raised to enable level access to the building's ground floor. This adjustment will eliminate the existing slope from north to south that currently directs surface water towards the building. Instead, the revised levels will introduce a gentle gradient sloping eastward, directing runoff towards the existing footpath and improving overall site drainage.

GEOLOGY

- 2.10 The online BGS Geology Viewer indicates that bedrock geology of the site is Weald Clay Formation and that there are no superficial deposits noted at the development location.

HYDROGEOLOGY

- 2.11 Underlying geology and reference to the SFRA indicates that infiltration SuDS are not likely to be feasible at the development site and an attenuation SuDS scheme is proposed to manage surface water runoff at source through a limited discharge to a local watercourse.
- 2.12 Additionally, the presence of ponds and nearby watercourses in the vicinity of Hurstpierpoint College further suggests that infiltration-based SuDS are not appropriate for this location.

SPZ/AQUIFER

- 2.13 Environment Agency (EA) online mapping, accessed via the Magic Map application, shows the site is not located within a groundwater Source Protection Zone (SPZ).

3.0 DEVELOPMENT PROPOSALS

- 3.1 Development proposals are detailed in the architectural layouts produced by Building Solutions Consultants Ltd. (see Appendix B), with an extract of the proposed ground floor and site plan layout illustrated in Figure 4.1.
- 3.2 The proposals involve constructing a new gym and dining hub, along with associated access improvements, landscaping works, and the extension of the current access road to accommodate delivery vehicles.

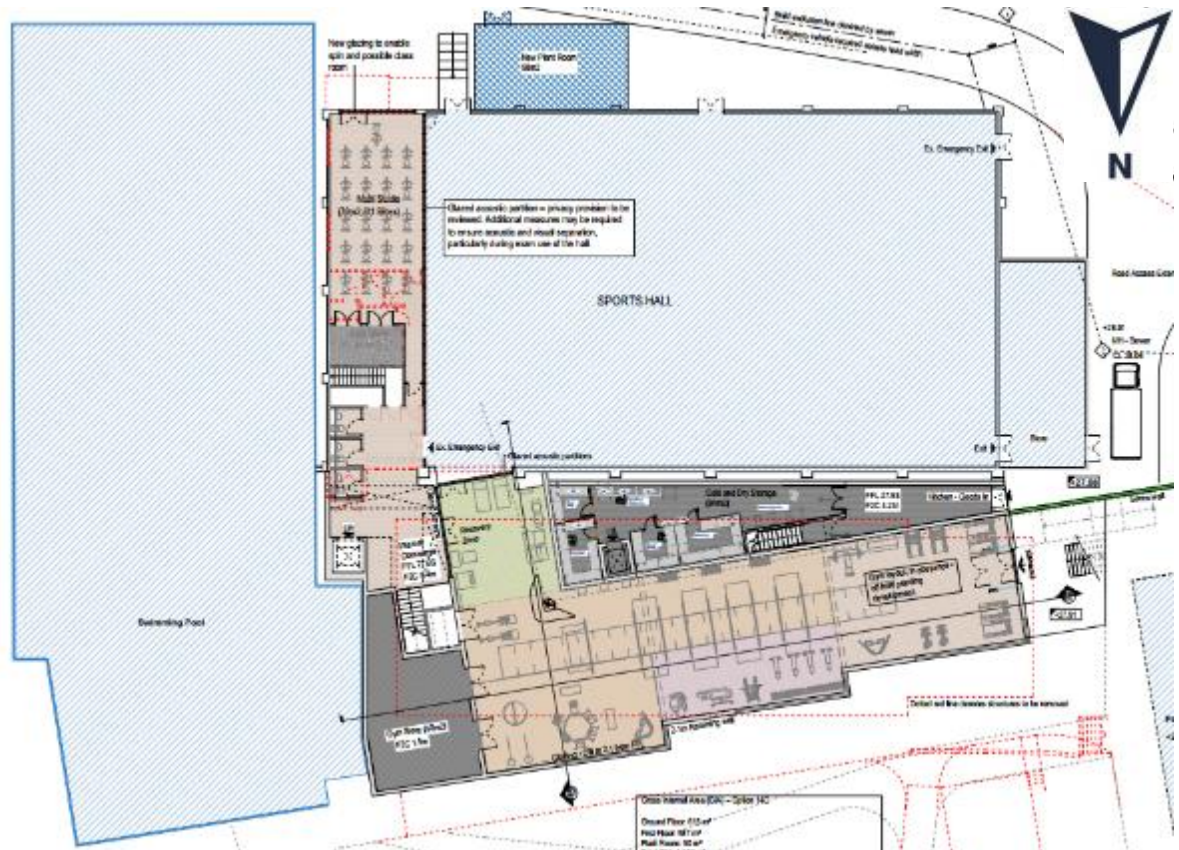


Fig 3.1 Site plan extract

BUILDINGS

- 3.3 The proposed two-storey building includes a gym, dining/café area, cold and dry storage, and toilet facilities on the lower ground floor. The ground floor features an additional entrance on the northern side of the building. The first floor accommodates the main dining/café area, a kitchen, and additional toilet facilities.

EXTERNAL AREAS

- 3.4 External works will include new pedestrian pathways and landscaping located to the north of the building along with a new extension of the existing access road to the south used by delivery vehicles.

4.0 FLOOD HAZARD AND PROBABILITY

Flooding from River and Sea

- 4.1 Flood risk data for the site has been obtained from the online EA Flood Map, an extract of which is shown in Figure 5.1. The mapping shows the site to be located entirely within Flood Zone 1. The PPG to the NPPF defines Flood Zone 1 as having less than 1:1000 annual probability of river or sea flooding (less than 0.1%).

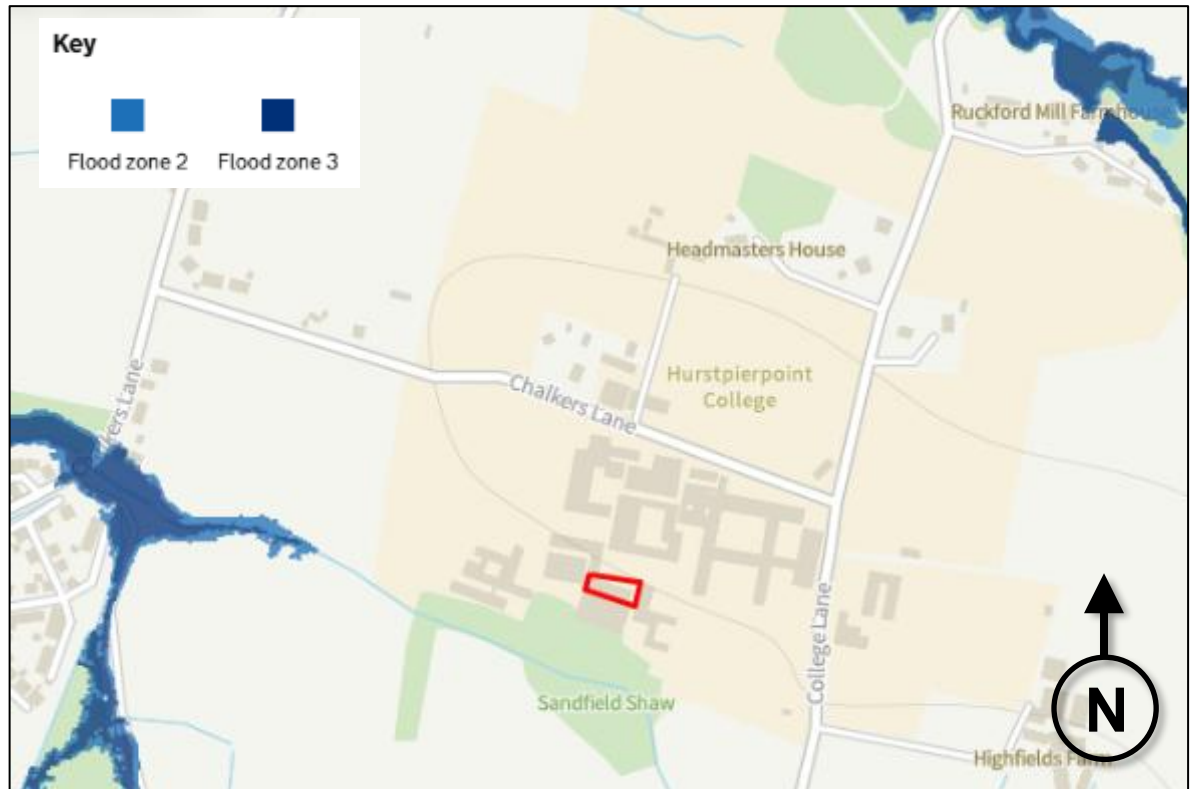


Fig 4.1 Planning Flood Risk Map

- 4.2 Table 2 of the NPPF classifies all forms of development to be appropriate for Flood Zone 1.

Surface Water Flooding

- 4.3 The Environment Agency (EA) has produced surface water flood maps indicating some localised areas of surface water accumulation within the site boundary, as shown in Figure 4.2.
- 4.4 This flood risk appears to be contained within the footprint of the existing building and is not considered to accurately reflect the 'real-world' conditions at the site. There are no flow routes through the site and surface water runoff is managed through roof interception and discharge to the below ground drainage system. No evidence of surface water flooding has been highlighted by the school management as occurring in this area.

- 4.5 As part of the proposed development, ground levels on the northern side of the site will be raised to provide level access to the building's ground floor. This proposed regrading will further reduce the risk of surface water flooding by reshaping the existing north-to-south slope that could potentially provide a pathway for surface water to flow toward the building.
- 4.6 The final levels design will incorporate engineered exceedance flow routes, directing runoff away from the northern façade and westward toward the existing footpath. From there, the site's grading will direct exceedance runoff southward into the existing ditch. An exceedance flow path plan is provided in Appendix C.



Fig 4.2 Extract from EA Surface Water Flood Map (100 year event)

- 4.7 It is therefore considered that the risk of surface water flooding is low and that the new development will introduce measures to manage runoff at source through an attenuated SuDS scheme, with exceedance flow routes incorporated into the levels design.

Groundwater Flooding

- 4.8 Flooding due to groundwater is considered unlikely, due to the underlying Weald Clay Formation geology. The low permeability of the Weald Clay means groundwater is unable to flow rapidly or with substantial volume, so creates only a very low risk of groundwater flooding on the site.
- 4.9 Online mapping of groundwater vulnerability shows the site is located in the 'Unproductive' zone, as shown in Figure 4.3. This classification results in a very low risk of contaminant infiltration into groundwater source protection zones.

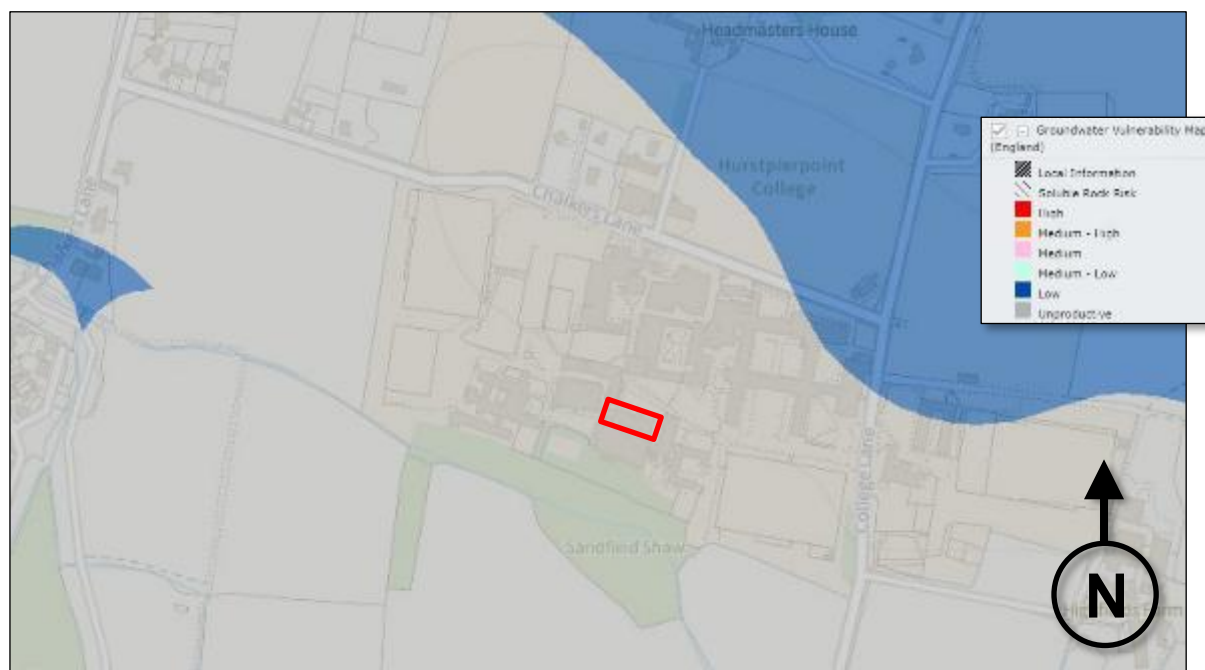


Figure 4.3 - Extract from Magic Map: Groundwater Vulnerability

Reservoir Flooding

The risk from reservoir flooding is considered to be very low, as the site is located outside of the area considered by the EA to be at risk of flooding from reservoirs and artificial bodies of water.

Sewer Flooding

- 4.10 Within the Mid Sussex District Council (MSDC) Strategic Flood Risk Assessment (SFRA), there are no historical records of known highway or sewer flooding affecting the site. The existing public foul water sewer shown south of the site (Figure 6.1) is situated at a lower elevation than the proposed buildings with ground levels falling to the south, directing overland flow away from the college buildings, should a flood event occur from this location. Risk of sewer flooding affecting the site is considered to be low.

Climate Change

- 4.11 Increased rainfall intensity, longer storm durations and rising sea levels are all attributed to global climate change. An allowance for an additional 45% rainfall intensity is taken into account in the design of surface water management for the college development. This reflects the stated Upper End Allowance for the 1% annual exceedance rainfall event, as shown on the DEFRA online data map service for the Adur and Ouse Management Catchment. The new surface water drainage infrastructure should be designed to manage the 1 in 100 year storm event, plus a 45% allowance for climate change, in accordance with the SFRA and the NSS.

Residual Risk

- 4.12 Residual risks are primarily associated with exceedance events that surpass the design criteria and/or potential blockages within the local drainage network. In the event of flooding caused by excessive rainfall or infrastructure failure, the surrounding topography and the proposed hardstanding levels suggest that overland flow would be directed away from the site. These flows would naturally follow the engineered gradients, discharging beyond the site boundary into the existing watercourse to the south.

5.0 SURFACE WATER DRAINAGE STRATEGY

Existing

- 5.1 No public surface water sewers are shown within the area covered by the sewer records. A CCTV drainage survey has confirmed that the existing surface water from the site is conveyed via private drainage infrastructure to the south, where it discharges into an existing watercourse. There does not appear to be any flow control associated with the discharge, which flows unmanaged to the downstream watercourse network.
- 5.2 Pre-development peak surface water runoff rates for the existing 687 m² brownfield site have been calculated for the 1, 2, 30, and 100-year return periods. The results are presented in Table 5.1. Rainfall data from the Flood Estimation Handbook (FEH, 2022) was used to inform the runoff calculations, complying with the LLFA hydraulic modelling standards.

Table 5.1 – Summary of pre-development surface water peak rates of runoff.

Design storm return period (years)	Pre-development surface water peak rate of runoff (l/s)
1	8.4
2	12.7
30	31.7
100	39.8

- 5.3 The existing mean annual flood flow rate (QBar) for the developed site has been calculated at 0.7 litres/second as shown in Figure 5.1.

Greenfield runoff

Method

Method

FEH statistical (2025)

FEH statistical (2025)

SAAR9120 (mm)

My value

872

Map value

mm

BFIHOST19scaled

0.236

QMed-QBar conversion

1.136

1.136

QMed (l/s)

0.6

l/s

QBar (FEH statistical 2025) (l/s)

0.7

l/s

Fig 5.1 QBAR runoff rates/Brownfield runoff rates

Discharge Hierarchy

Re-use for Non-Potable Purposes

- 5.4 The architectural proposals for the gym and hub building development do not include rainwater harvesting. Rainwater harvesting on its own is not considered to be a viable or practical method for managing surface water runoff from the development as any tank system could potentially be offline during an extreme rainfall event when it has reached capacity or is out of use for servicing and maintenance purposes.
- 5.5 Rainwater harvesting is considered to be more critical to the reduction of the use of the mains water resource where some rainfall can be captured for re-use for non-potable means, therefore reducing the load on the clean water supply network. This may be considered by other consultants, as part of the wider sustainability options for the development, outside of the context of flood risk

Infiltrated to the Ground

- 5.6 The Strategic Flood Risk Assessment (SFRA) for the district indicates that for the majority of the southern half of Hurstpierpoint (and land to the south of the village) the ground conditions mainly consist of sandy clays overlying Weald Clay.
- 5.7 Historic development throughout the HPPC has revealed typically very poor infiltration potential, particularly towards the southern part of the college campus, where the application site is located. Infiltration SuDS are therefore not considered to be favourable in this area. It is therefore considered that attenuation systems are considered likely to be the most appropriate form of SuDS in this area.

Discharged to a Surface Water Body

- 5.8 A CCTV drainage survey has confirmed that the existing surface water from the site is conveyed via private drainage infrastructure to the south, where it discharges into an existing ditch. This existing outfall represents the most favourable and sustainable option for managing surface water runoff from the site, aligning with current drainage infrastructure.

Discharged to a Surface Water Sewer

N/A

Discharged to a Combined Sewer

N/A

Proposed

- 5.11 The route of a local watercourse has been identified to the south of the adjacent sports building. This is formed of a pond at this location. It is proposed to discharge surface water to this pond via gravity, utilising the existing on-site drainage infrastructure. This arrangement is illustrated on the HOP Drainage Layout drawing provided in Appendix D.
- 5.12 The mean annual flood flow rate (QBar) for the developed site has been calculated as 0.70 litres/second. In accordance with the NSSuDS, the proposed discharge rate for all storm events, up to and including the 1 in 100 year return period with a 45% allowance for climate change, should be restricted to the existing QBar. However, NSSuDS also states that for previously developed sites a 'relaxation factor' shall be applied to the target 50% and 1% annual exceedance probability (AEP) greenfield runoff rates where evidence is provided that demonstrates why the greenfield runoff rate cannot be achieved. This relaxation factor shall be no greater than 5 times the greenfield runoff rate.

- 5.13 Where the peak allowable discharge rate requires flow controls with orifices (or equivalent) with a diameter of less than 50mm, the flow control shall be robustly protected from blockage risks. To further reduce this risk, the post-development runoff rate is proposed to be limited to 3.0 litres/second. This is below the relaxation threshold of five times QBAR, which equates to 3.5 litres/second, thereby enhancing system resilience and operational reliability. The reduction in runoff to a limit of 3.0 litres/second is considered to represent a significant betterment over the existing surface water drainage arrangement.

Interception of Rainfall

- 5.14 In accordance with the National Standards for SuDS, the surface water drainage system should be designed so that flooding does not occur on any part of the site for a 1 in 30 (3.3% AEP) year rainfall event; and so that flooding does not occur during a 1 in 100 (1% AEP) year event in any part of a building or in any utility plant susceptible to water.

Extreme Rainfall

- 5.15 Drainage calculations have utilised the current Flood Estimation Handbook (FEH) rainfall data for the site with the volumetric runoff coefficient (Cv) for both summer and winter storms set at a value of 1.0. Climate change allowances for an increase of 45% have been included in the model for the 1 in 30 and 1 in 100 return period storms respectively, in line with current EA guidance for the 687m² catchment.

Surface Water Flood Risk

- 5.16 Surface water attenuation will be provided via an underground tank located upstream of a Hydrobrake (or equivalent) flow control device. Storage requirements have been calculated using Causeway Flow software, with outputs included in Appendix E.
- 5.17 The analysis indicates that an attenuation tank measuring 12m (length) x 3.5m (width) x 0.8m (depth) will provide approximately 33.6m³ of storage, which is sufficient to accommodate runoff from the 1 in 100 year storm event plus 45% allowance for climate change.
- 5.18 Post-development prior mitigation peak surface water runoff flows for the 1, 2, 30 and 100 year return period and the proposed 687m² new building footprint have been calculated using an additional 45% increase in rainfall intensity to allow for climate change. Results are shown in Table 5.2.

Table 5.2 – Summary of post-development surface water peak rates of runoff.

Design storm return period (years)	Post-development surface water peak rate of runoff (l/s) (prior to mitigation)
1	12.2
2	18.4
30	46.0
100	57.8

- 5.19 The proposed infrastructure will collect surface water runoff from roofs and impermeable external areas using downpipes, gullies, channel drains, and below ground pipework connected to an attenuation system with limited outfall flow rate of 3.0 litres/second. This represents a significant improvement over the existing unmanaged arrangement, enhancing both water management and site resilience.

- 5.20 The existing vehicle permeable access road located to the south of the development is being extended to facilitate deliveries to the building. To accommodate this, the current soft landscaped area will be replaced with a permeable surface, ensuring that the existing drainage conditions are maintained.
- 5.21 Full details of the proposed surface water drainage strategy can be seen on the proposed drainage drawing included in Appendix D.

Water Quality

- 5.22 Guidance on water quality management for surface water runoff is provided in Chapter 26 of the SuDS Manual (CIRIA C753). This indicates that the Simple Index Approach to water quality should be utilised for the Gym & Dining Hub development. This method establishes Pollution Hazard Indices based on land use classifications that are then compared with the Mitigation Indices provided by SuDS components.
- 5.23 Further reference to Table 26.2 of the SuDS Manual shows that the proposed land use at the gym and dining hub development represents a low risk of pollution hazard level. The guidance for this level of risk is to use the simple index approach to pollution control requirements for discharging to ground water through infiltration techniques.
- 5.24 The notes to Table 26.2 state that extra measures may be required for discharges to protected resources, the guidance clarifies that in England and Wales, protected groundwater resources are represented by the catchment of a SPZ 1 classification. The development site lies outside of any SPZ and therefore no additional pollution control measures are required in this regard.

Table 5.3 Extract of Table 26.2 from the SuDS Manual.

Pollution hazard indices for different land use classifications				
Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7

- 5.25 The simple index approach is outlined in the SuDS Manual and provides pollution hazard indices for different land use classifications. An extract applicable to the development site is provided in Table 5.3. This shows total pollution hazard indices of total suspended solids (TSS) 0.3; Metals 0.2-0.8; and Hydrocarbons 0.05. The proposed roof is not expected to contribute significantly to contamination. Accordingly, a low to medium pollution index value of 0.5 has been assigned for the roof.
- 5.26 The small area of extended delivery access is expected to present a medium level of pollution hazard risk with TSS 0.7; Metals 0.6; and Hydrocarbons 0.7.
- 5.27 These hazard indices are to be compared against mitigation indices for individual SuDS components, as provided in Table 26.3 of the SuDS Manual, an extract of which showing the mitigation indices of SuDS features is provided in Table 5.4.

Table 5.4 Extract of Table 26.3 from the SuDS Manual.

Indicative SuDS mitigation indices for discharges to surface waters			
Type of SuDS component	Mitigation indices ¹		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4 ²	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond ⁴	0.7 ³	0.7	0.5
Wetland	0.8 ³	0.8	0.8
Proprietary treatment systems ^{5,6}	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

- 5.28 With surface water from the delivery area being managed through a permeable pavement and the roof runoff discharging into the pond, it can be seen that the total mitigation indices are greater or equal to the hazard indices for the different runoff catchments for the development. It is therefore considered that the SuDS proposals include an appropriate level of treatment to the surface water discharge.
- For the roof runoff these mitigation indices are TSS 0.7; Metals 0.7; and Hydrocarbons 0.5.
- For the delivery area these mitigation indices are TSS 0.7; Metals 0.6; and Hydrocarbons 0.7.
- 5.29 The SuDS Manual also allows for proprietary systems such as oil interceptors, smart filters, membranes and silt/debris traps to be utilised to minimise the risk of watercourse pollution, however, these are not proposed as part of the treatment train for the development.

SuDS Maintenance and Management Plan

- 5.30 Details of SuDS operation and maintenance activities are provided within Chapter 32 of the SuDS Manual. A summary of typical key SuDS components is given in Table 4.3.
- 5.31 As can be seen, all SuDS components require regular inspection and for the first year the guidance states that monthly inspections are carried out and documented to inform the ongoing maintenance regime of the site drainage. SuDS components at the site are not to be adopted and will be maintained for their lifetime by Hurstpierpoint College.
- 5.32 Further operational activities for the SuDS components described for the site include regular litter and debris removal; and weed and invasive plant control to ensure the drainage systems function without their design infiltration characteristics being compromised.

Table 6.5 Extract of Table 32.1 of the SuDS Manual

Typical key SuDS components operation and maintenance activities (for full specifications, see Chapters 11–23)													
Operation and maintenance activity	SuDS component												
	Pond	Wetland	Detention basin	Infiltration basin	Soakaway	Infiltration trench	Filter drain	Modular storage	Pervious pavement	Swale/bioretention/trees	Filter strip	Green roofs	Proprietary treatment systems
Regular maintenance													
Inspection	■	■	■	■	■	■	■	■	■	■	■	■	■
Litter and debris removal	■	■	■	■	□	■	■	□	■	■	■		□
Grass cutting	■	■	■	■	□	■	■	□	□	■	■		
Weed and invasive plant control	□	□	□	□		□	□		□		□	■	
Shrub management (including pruning)	□	□	□	□					□	□	□		
Shoreline vegetation management	■	■	□										
Aquatic vegetation management	■	■	□										
Occasional maintenance													
Sediment management ¹	■	■	■	■	■	■	■	■	■	■	■		■
Vegetation replacement	□	□	□	□						□	□	■	
Vacuum sweeping and brushing									■				
Remedial maintenance													
Structure rehabilitation /repair	□	□	□	□	□	□	□	□	□	□	□	□	
Infiltration surface reconditioning				□	□	□	□		□	□	□		

Key

- will be required
□ may be required

Notes

- ¹ Sediment should be collected and managed in pre-treatment systems, upstream of the main device.

- 5.33 Contractors should protect SuDS components from adverse sediment runoff during the construction phase and an initial pre-handover inspection as required to ensure that the drainage system has been constructed as designed. A SuDS Maintenance and Management Plan is included as Appendix F.

6.0 FOUL WATER DRAINAGE STRATEGY

Existing

- 6.1 An extract of Southern Water sewer records is depicted in Figure 7.1. As can be seen, public foul water sewers are shown to be located adjacent the southern boundary of the college grounds.

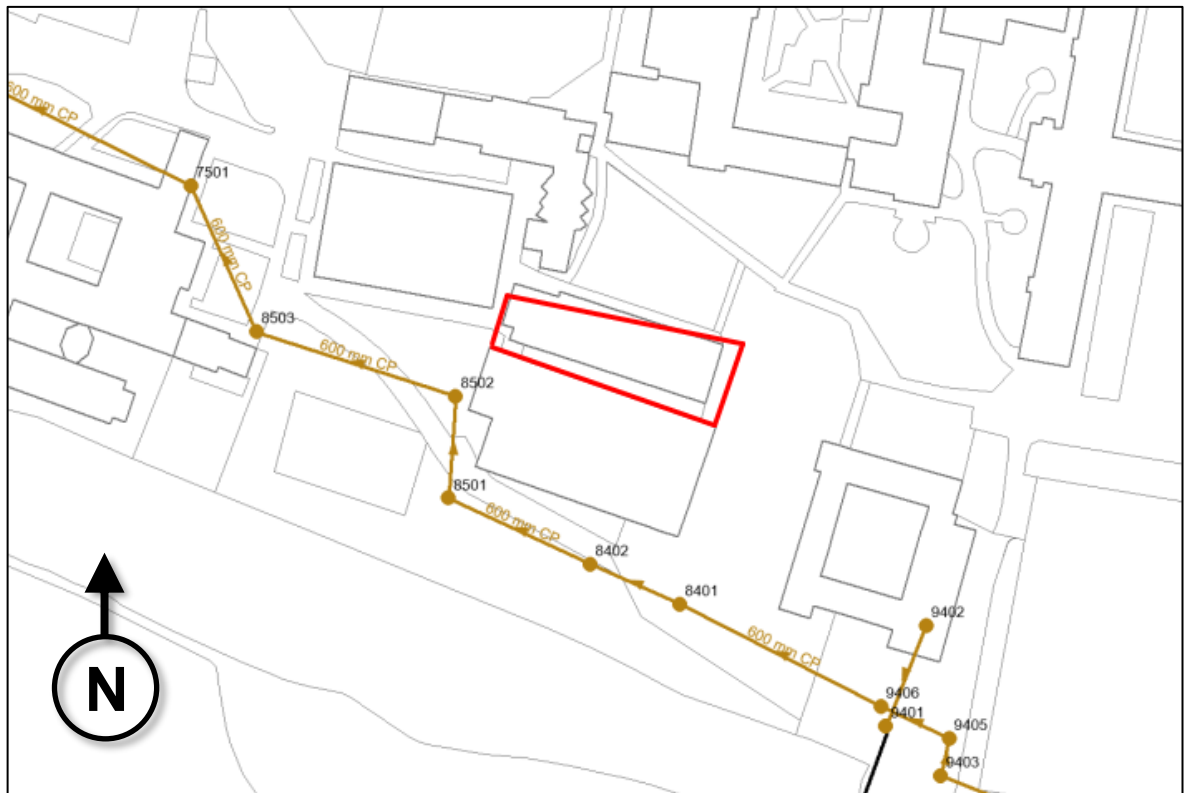


Figure 7.1 Southern Water Sewer Records

- 6.2 A CCTV drainage survey has shown that the existing foul water discharge from the site is directed via private drains to the south to connect to the public foul sewer.
- 6.3 Due to the backwash requirements for the filtration system of the former swimming pool at the site, the estimated existing peak foul water flow rate is 5.0 litres/second. This allows for a filter flush utilising 300 litres per minute.

Proposed

6.4 Foul water drainage is intended to connect into the existing sewer currently used by the former swimming pool building which is proposed to be demolished. A CCTV drainage survey has been undertaken and shows downstream connectivity to the wider college foul sewerage network which ultimately connects to the existing 600mm diameter Southern Water Sewer on the southern end of the site.

6.5 Following guidance in the Design and Construction Guidance for sewers, a foul water peak flow rate of 0.1 litres/second is expected from the gym and dining hub facilities. Utilising the calculation according to this extract;

2. Design flows for industrial and commercial developments can contain two elements: domestic flows (flows from toilets and kitchens, etc.) and trade effluent flow (wastewater from industrial processes¹). The total peak design flow is the sum of the domestic design flow and the trade effluent design flow.

- a) The domestic design flow should be calculated in accordance with BS EN 12056-2 System II (see also BS EN 16933-2) or, in the absence of appropriate information, 0.6 litres per second per hectare of developable land;
- b) The trade effluent design flow should be based on a metered discharge from premises similar to that proposed, or assumed as 0.5 litres per second per hectare for normal industry and 1 litre per second per hectare for wet industry. Where the proportion of wet industry is unknown, an average flow of 0.7 litres per second per hectare should be used.

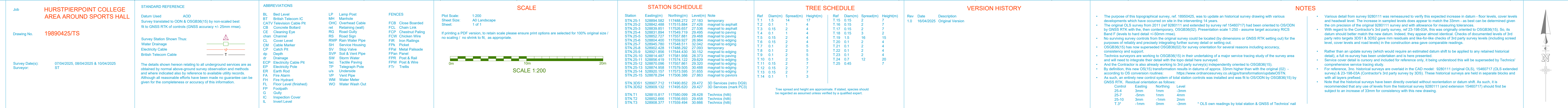
Where the site area is taken as 0.069ha.

6.6 This is considered a significant reduction in the foul water discharge rate from the new facilities and it is assumed that the downstream public foul water network has sufficient capacity to accept this discharge without the need for a capacity check to be undertaken. A S106 sewer connection application should be made in due course.

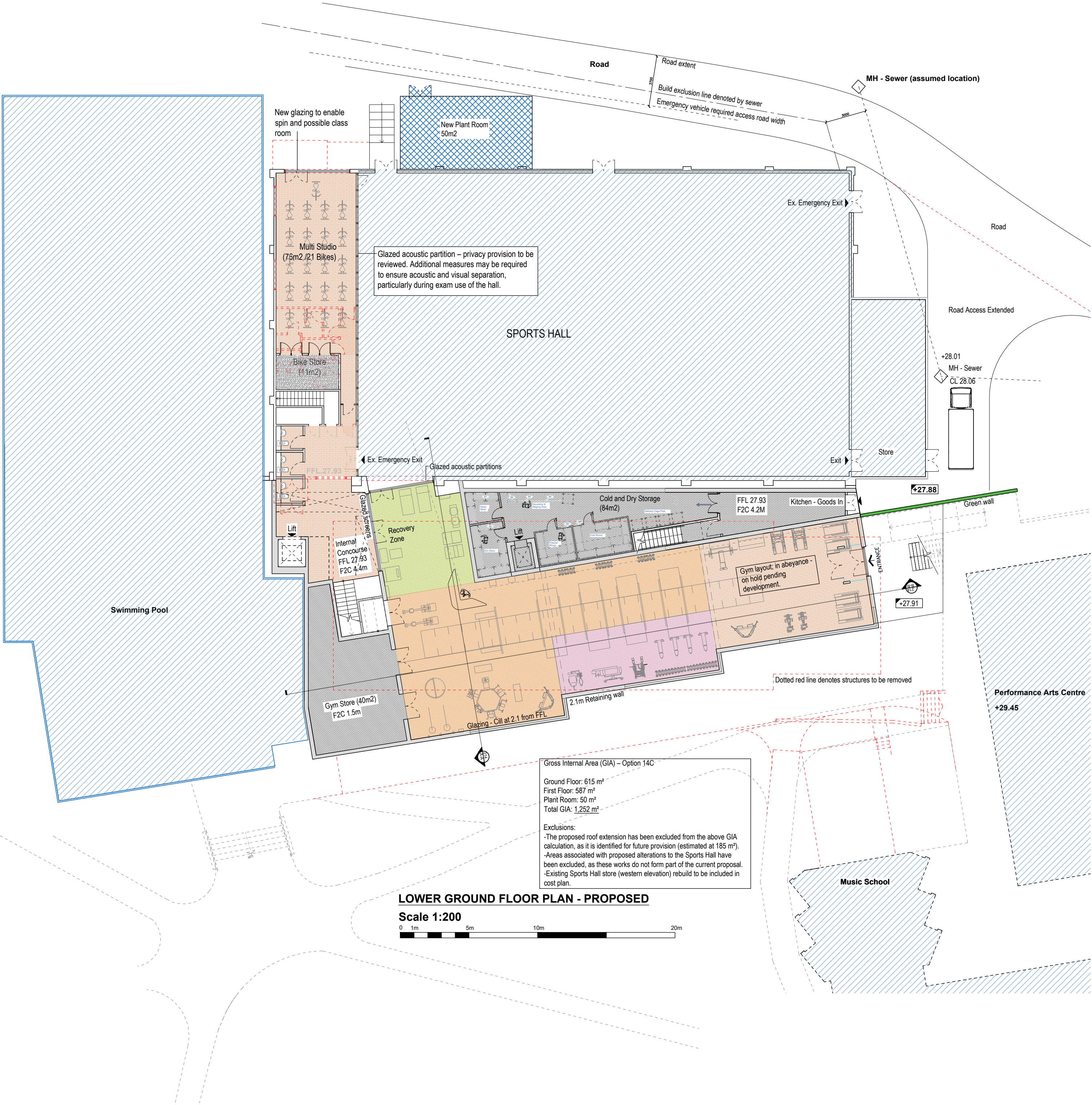
7.0 CONCLUSIONS

- 7.1 The site is located wholly within Flood Zone 1 and the flood risk from all sources is considered to be low or very low. The proposals for the redevelopment of the site for educational sports and dining facilities are deemed appropriate according to the principles set out in the NPPF.
- 7.2 Site data indicates that surface water runoff is currently managed at the site via gullies and rainwater pipes with surface water discharging unrestricted to the existing ditch to the south of the site.
- 7.3 Underlying geology and reference to the SFRA indicates that infiltration SuDS are not likely to be feasible at the development site and an attenuation SuDS scheme is proposed to manage surface water runoff at source through a limited discharge to a local watercourse. The limiting flow rate is set at 3.0 litres/second. This is a significant reduction to the existing discharge rate where surface water is currently unrestricted prior to connecting to the downstream watercourse network.
- 7.4 Foul water discharge from the proposed development is to connect to the public foul water sewer on the southern boundary via a connection through the existing private college drainage system. Connection to the existing public sewer is subject to the necessary Section 106 approval from the sewerage undertaker.
- 7.5 A reduction in foul water flow is anticipated, as the previous use was for a swimming pool and changing facilities, which would place a high load on the downstream public foul sewer network, estimated at 5 litres/second, compared to the 0.1 litre/second discharge estimated for the new gym and dining hub facilities.
- 7.6 The use of SuDS to manage surface water runoff from the site, as described in this report is considered compliant with EA guidance and the SuDS manual in terms of water quantity and quality. The site is not located within SPZ1, and no additional pollution control measures are required in this regard.
- 7.7 Maintenance requirements of SuDS elements during construction and operation phases have been identified in this report and should be included in the Operation and Maintenance and Health and Safety Manuals provided to the Client upon completion of the project.
- 7.8 This report has identified measures that reduce the level of flooding risk to the development and ensures the increase in the peak rate of surface water runoff and runoff volume are mitigated through the use of attenuation SuDS. This report shows that the proposals for the development of the gym and dining hub facilities at the Hurstpierpoint College site can be successfully implemented and managed and that there should be no increase in terms of flood risk to future users and neighbouring properties for the design lifetime of the development.

APPENDIX A - TOPOGRAPHIC SURVEY



APPENDIX B - ARCHITECTURAL PROPOSALS



Rev	DATE	NAME	NOTES
A	18/04/2025	DB	Dry store added
B	01/05/2025	DB	Update in accordance with client feedback
C	27/07/2025	DB	Update in accordance with client feedback
D	08/09/2025	DB	Update in accordance with client feedback
E	02/11/2025	DB	Client requested additional glazing

Notes:

Do not scale this drawing.

All levels and dimensions are to be checked on site.

This drawing is to be read in conjunction with all relevant consultants drawings and specifications, together with safety plan requirements.

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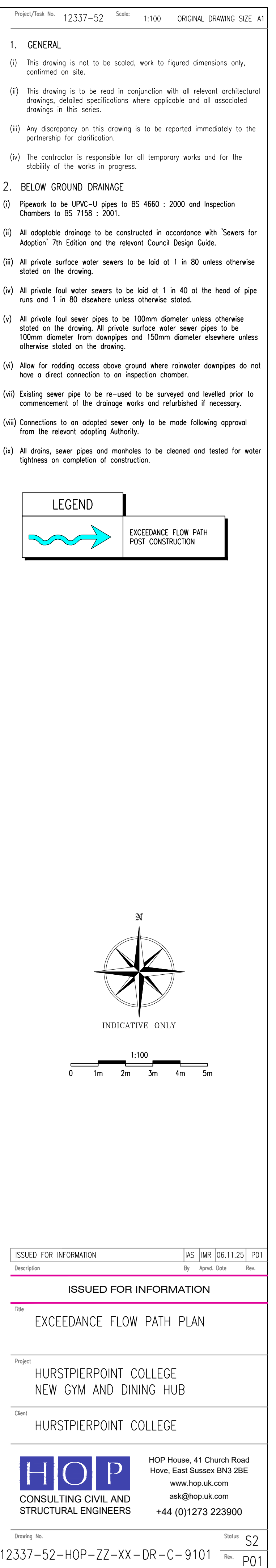
BUILDING SOLUTIONS CONSULTANTS LTD.

23 Titian road, Hove, BN3 5QR. Tel: 07834611763



PROJECT Phase 2, Hurstpierpoint College			
DRAWING LOWER GROUND FLOOR PLAN - PROPOSED			
STAGE Stage 2 - Output			JOB NO. : 712
			DATE : 07/04/2025
DWG NO. AL-211	SCALE 1:200 @A2	REVISION : E	DRAWN : DB
Do not scale: use figured dimensions only: check dimensions on site: notify BSC of any discrepancies: copyright BSC Ltd.			

APPENDIX C – FLOW EXCEEDANCE PATH PLAN



APPENDIX D - PROPOSED DRAINAGE PLAN

APPENDIX E - DRAINAGE CALCULATIONS

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	1	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	400.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1			28.300	1200	16.554	69.053	1.600
2		5.00	28.300		13.733	69.096	1.500
3			28.300		0.908	69.117	1.500
4	0.069	5.00	28.300	1200	-3.217	69.042	1.100

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	4	3	4.126	0.600	27.200	26.800	0.400	10.3	225	5.02	37.2
2.000	2	1	2.822	0.600	26.800	26.700	0.100	28.2	225	5.02	37.2

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	4.097	162.9	9.3	0.875	1.275	0.069	0.0	36	2.253
2.000	2.472	98.3	0.0	1.275	1.375	0.000	0.0	0	0.000

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	4.126	10.3	225	Circular	28.300	27.200	0.875	28.300	26.800	1.275
2.000	2.822	28.2	225	Circular	28.300	26.800	1.275	28.300	26.700	1.375

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	4	1200	Manhole	Adoptable	3		Junction	
2.000	2		Junction		1	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	16.554	69.053	28.300	1.600	1200	1 	2.000	26.700	225
2	13.733	69.096	28.300	1.500		0 	2.000	26.800	225
3	0.908	69.117	28.300	1.500		1 	1.000	26.800	225
4	-3.217	69.042	28.300	1.100	1200	0 	1.000	27.200	225

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	✓
Summer CV	1.000	Drain Down Time (mins)	240	2 year (l/s)	0.6
Winter CV	1.000	Additional Storage (m³/ha)	0.0	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160
30	120	240	480	720	1440	2880

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	45	0	0
10	45	0	0
30	45	0	0
100	45	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	FEH	Growth Factor 100 year	2.48
Positively Drained Area (ha)	0.069	Betterment (%)	0
SAAR (mm)	839	QMed	0.6
Host	1	QBar	0.7
BFIHost	0.233	Q 1 year (l/s)	
Region	7	Q 30 year (l/s)	
QBar/QMed conversion factor	1.136	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Node 1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	26.700	Product Number	CTL-SHE-0084-3000-0914-3000
Design Depth (m)	0.914	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.0	Min Node Diameter (mm)	1200

Node 2 Tank Storage Structure

Invert Level (m) 26.800 | Time to half empty (mins) 106 | Analyse flow through structure x

Inlets

3

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	42.0	0.800	42.0

Results for 2 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	1	22	26.980	0.280	17.7	0.3162	0.0000	OK
120 minute summer	2	80	26.965	0.165	19.9	6.9443	0.0000	OK
120 minute summer	3	78	26.974	0.174	9.4	0.0000	0.0000	OK
15 minute summer	4	9	27.252	0.052	18.6	0.0585	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	1	Hydro-Brake®		3.0				10.5
15 minute winter	2	2.000	1	21.7	0.703	0.221	0.0914	
15 minute summer	4	1.000	3	18.6	2.475	0.114	0.0599	

Results for 10 year +45% CC Critical Storm Duration. Lowest mass balance: 99.92%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	1	90	27.200	0.500	16.0	0.5655	0.0000	OK
120 minute summer	2	90	27.200	0.400	21.9	16.6124	0.0000	SURCHARGED
120 minute summer	3	90	27.210	0.410	16.5	0.0000	0.0000	OK
15 minute summer	4	10	27.274	0.074	35.6	0.0836	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	Hydro-Brake®		3.0				15.4
15 minute summer	2	2.000	1	23.0	0.677	0.234	0.1122	
15 minute summer	4	1.000	3	35.5	2.601	0.218	0.1027	

Results for 30 year +45% CC Critical Storm Duration. Lowest mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	1	60	27.380	0.680	21.3	0.7688	0.0000	OK
60 minute winter	2	60	27.380	0.580	23.1	24.0011	0.0000	SURCHARGED
60 minute winter	3	60	27.390	0.590	23.1	0.0000	0.0000	OK
60 minute winter	4	60	27.390	0.190	23.1	0.2152	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	Hydro-Brake®		3.0				20.0
120 minute winter	2	2.000	1	22.2	0.682	0.226	0.1122	
15 minute summer	4	1.000	3	46.1	2.756	0.283	0.1138	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	1	61	27.583	0.883	18.7	0.9986	0.0000	OK
60 minute winter	2	61	27.583	0.783	24.0	32.3583	0.0000	SURCHARGED
60 minute winter	3	60	27.595	0.795	29.3	0.0000	0.0000	OK
60 minute winter	4	60	27.595	0.395	29.5	0.4468	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	Hydro-Brake®		3.0				25.1
30 minute winter	2	2.000	1	23.3	0.699	0.238	0.1122	
15 minute summer	4	1.000	3	57.7	2.882	0.354	0.1345	

APPENDIX F - SuDS MAINTENANCE SCHEDULE

HURSTPIERPOINT COLLEGE – GYM AND DINING HUB

PROPOSED MAINTENANCE & INSPECTION SCHEDULE FOR BELOW GROUND DRAINAGE

(FOUL WATER AND SURFACE WATER) INCLUDING SUSTAINABLE DRAINAGE SYSTEMS (SuDS)

Item	Required Maintenance/Monitoring	Suggested Frequency	Responsibility
Foul Water Drainage	Check inspection chambers and manholes for damage, condition and function.	Every six months	Facilities Management
	Undertake a CCTV drainage survey of the drainage network to establish condition.	Every ten years	Specialist
	Replace or repair malfunctioning parts or structures	As required	Specialist
Surface Water Drainage	Check inspection chambers and manholes for damage, condition and function.	Every six months	Facilities Management
	Undertake a CCTV drainage survey of the drainage network to establish condition.	Every ten years	Specialist
	Replace or repair malfunctioning parts or structures.	As required	Specialist
Gullies and Channel Drains	Check gullies and channel drains for damage, condition and function.	Every six months	Facilities Management
	Remove sediment, oil/grease, litter and debris.	As necessary	Facilities Management
	Replace or repair malfunctioning parts or structures.	As required	Specialist
Permeable Surfacing	Sweep clean of debris and plant growth and inspect integrity of bedding grit. Replace bedding grit locally if required.	Every three months and after periods of heavy rainfall	Facilities Management
	Lift blocks and remove bedding grit and replace and re-bed paving.	Full bedding replacement currently recommended by manufacturers every 20 years	Specialist
Surface Water Catch Pits	Check silt traps and inspection chambers and note the rate of sediment accumulation. Remove sediment if present.	Every month for the first year and then annually, or as conditions require	Facilities Management
Surface Water Attenuation Tank	Check silt traps and inspection chambers, and note the rate of sediment accumulation.	Every month for the first year and then annually, or as conditions require	Facilities Management
	Undertake a CCTV drainage survey of tanks and associated inspection chambers. Note sediment build up and remove sediment/debris if present.	Every five years, or as conditions require	Specialist
Surface Water Outfall and Ditch	Check for blockages and damage. Remediate as necessary.	Every six months	Facilities Management
	Cut back vegetation and remove silt from ditch bed – to be placed on banks.	Annually	Facilities Management
General	Remove sediment, litter, debris and vegetation from the surface of pathways areas	As necessary and after heavy rainfall	Facilities Management
Flood Flow Routes	Ensure flood flow routes are not obstructed (i.e. lower lying portions of the land that will direct surface water runoff away from vulnerable assets in the event of drainage failure).	Every six months and during periods of heavy rainfall	Facilities Management

NOTES

The facilities management team of Hurstpierpoint College will be responsible for the implementation of the maintenance schedule for below ground drainage, by appointing appropriate persons and/or sub-consultants that are qualified to undertake these operations.

Maintenance is to be carried out by the facilities management or by a specialist contractor, as noted in Responsibility column above.

This maintenance schedule has been produced with reference to the guidelines outlined in 'The SuDS Manual' (CIRIA C753: 2015). The suggested frequency of maintenance is considered a guide, and should not replace the guidance from manufacturers of proprietary systems.

Refer to Engineering drawings for location and details of below ground drainage assets and SuDS features.