

Technical Note

Project name	St. Illtyds 3G Pitch		
Design note title	Drainage Statement for Planning		
Document reference	C3G-HYD-XX-XX-R-C-102		
Author	Richard Baker		
Revision	P01		
Date	23 February 2024	Approved	✓

Drainage Statement for Planning - St Illtyd's Catholic High School

1. Introduction and Purpose of Report

The construction of a new 3G pitch is proposed at St Illtyd's Catholic High School, Cardiff

The design and construction of that pitch will require surface water drainage works that will need to comply with the requirements of Schedule 3 of the Flood and Water Management Act 2010, to secure a SuDS approval body consent ("SAB approval") before construction commence. It must also comply with local drainage policies and overcome specific constraints of this site relating to drainage.

This report has been produced to support a planning application for the proposed pitch.

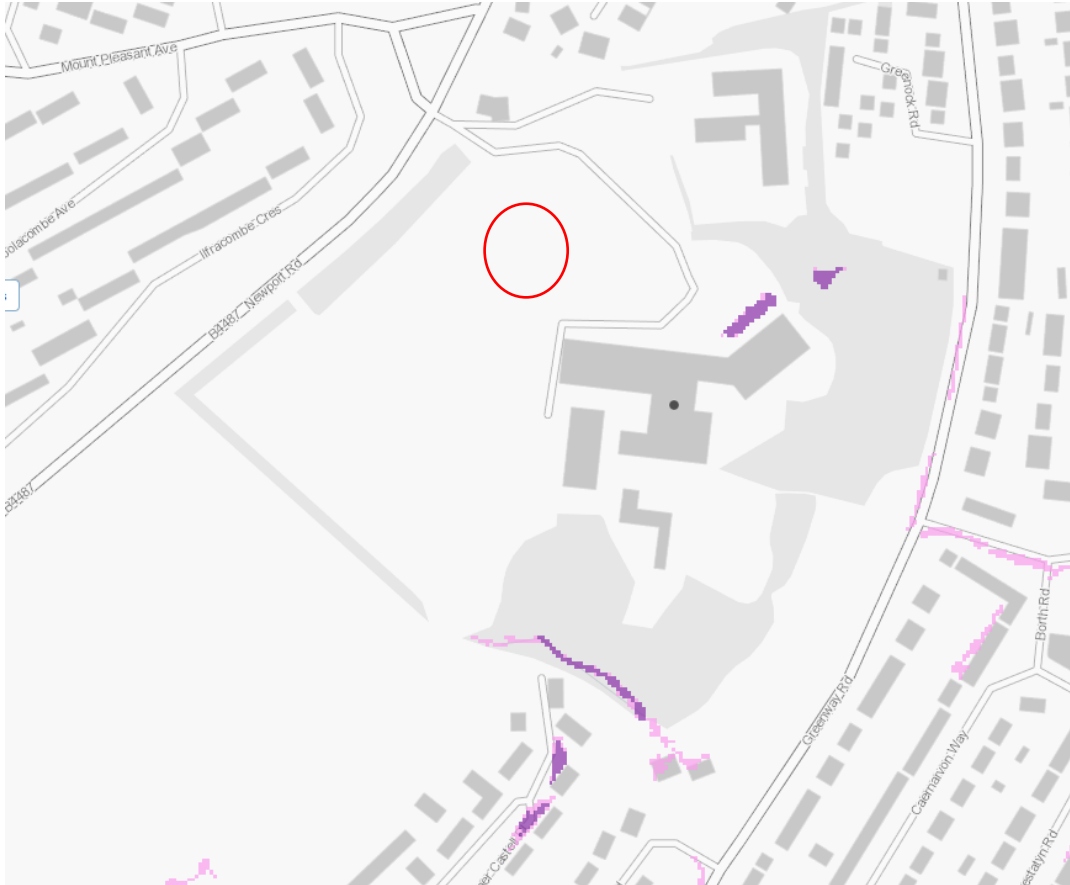
While planning is a separate process to SAB approval, this note summarises the work completed to date relating to surface water drainage and will also serve as a guide for the next stage of design and approval by the appointed pitch design and build contractor.

2. Proposed Works

In the place of the existing "redgra" gravel sports court and part of a grass sports pitch, a 126m x 70m artificial grass "3G" pitch is proposed. The proposed pitch surface is permeable, but requires draining under the surface, with the collected water being discharged to a suitable drainage discharge point at reduced rate, while complying with the SuDS standards listed in Section 5.

3. Flood Risk

The site is not in a flood risk zone.



Flood map for planning : No flood zone 2 or 3. No surface water flooding in the pitch area.

4. Status of Design and Approval

Following investigations into the existing drainage regime at the existing pitch site, a proposed surface water drainage strategy and design has been completed that complies with the requirements of the SuDs standards.

Consultation with Cardiff SAB has taken place, design and drawing undertaken and a SAB pre-application submission has been made, with a formal response received from Cardiff SAB.

The SAB pre-app response sets out the requirements of the next stage full SAB application, which must be considered in the detailed design by the appointed design and build contractor ahead of their full SAB application to Cardiff SAB once the final design is complete.

The contractor's detailed design and supporting SAB application documents will reference the principles and points made in the SAB pre-app design and satisfy the points raised by the SAB in their pre-app response. Any deviation from the proposed strategy will need to be fully justified, with evidence of compliance completed and submitted by the contractor, as part of their full SAB application.

The supporting information attached to this technical note presents the drainage proposals and hydraulic design.

5. Drainage Overview and SAB Compliance

5.1 Existing Drainage

The existing redgra sports court area is drained via an existing drainage channel and connected to the school's surface water drainage system. The existing grass pitch area is positively drained via a network of traditional pipe and stone trench land drains (herringbone style land drains), which also drains to the school's surface water drainage system

5.2 Amendments to Existing Drainage

The footprint of the proposed 3G pitch passes over the existing grass pitch drainage and existing redgra channel drainage. The existing drainage channel and its associated pipes and manholes, plus the existing land drains under the pitch will be removed. Any land drains serving other land outside the pitch will need to be diverted around and re-connected to the system they drain to now.

The existing surface water drainage system will remain as existing, but maintained through cleaning through to the outfall off-site after the works are complete.

5.3 Proposed Drainage Overview

The proposed drainage strategy is present on the Hydrock drawing " C3G-HYD-XX-XX-DR-C-1010 St Illtyds 3G - SW Drainage Strategy".

The main components of the proposed 3G pitch drainage are:

- » Permeable sub-base stone under the 3G pitch acting as a reservoir for a reduced discharge rate
- » Perforated collector drain to the edge of the permeable sub-base layer
- » New flow control chamber and device
- » Cleaning the existing downstream drainage
- » Compensatory planting areas for SAB biodiversity compliance

6. SAB Overview

6.1 Consultation and Pre-App

Consultation with SAB was undertaken as part of the SAB pre-app stage, in order to put the current strategy together. The pre-app response is included in this report and summarises the information that will be required within the full SAB application when the detailed design is completed by the design and build contractor.

Please note that any comments in the SAB response relating to a porous asphalt play area can be ignored as that piece of work is now no longer part of the proposals.

6.2 Discharge Destination

The discharge destination has been agreed to be the existing surface water drainage system within the school. Some cleaning works are required to this drainage, through to its outfall off-site following construction of the pitch.

6.3 Water Quantity

The existing pre-development greenfield runoff rate has been calculated and attached to this report. This is considered to be the maximum allowable discharge rate from the site, even though the existing is likely to be greater than this value.

The under-pitch storage within the permeable sub-base and a new flow control unit, will reduce the onward flow to that of the greenfield runoff rate, during all storm events up to the worst-case duration 1 in 100-year event, plus a 40% climate change factor. **This level of downstream protection and flow rate reduction is an improvement on the existing grass pitch state.**

6.4 Water Quality

Surface water runoff landing on the 3G pitch will pass through the top play surface layers, through the porous asphalt base and into the permeable sub-base stone below. This will then be collected by the perforated collector drain and passed through a catchpit to capture remaining debris or sediment.

6.5 Biodiversity

The 3G pitch does not provide any means of biodiversity benefit on its own. An area of compensatory planting is proposed and shown on the drainage strategy drawing.

6.6 Amenity

The 3G pitch is essentially an amenity feature. It is also its own drainage infrastructure (within its construction); therefore, the development is considered to provide an amenity benefit overall.

6.7 Construction

The aspects of the proposed 3G pitch relating to drainage are considered relatively standard and simple to construct without added complexity.

6.8 Ownership & Maintenance

The pitch and its drainage will be under the ownership of the school and maintained by an appointed pitch maintenance company. The downstream drainage remains the responsibility of the school and Cardiff Council to maintain.

7. Next Stage Approvals and Design and Build Contractor Responsibilities

Full SAB approval must be obtained before works start on site.

Post-planning, the remainder of the detailed design for construction and the submission of that design (plus supporting information) for full SAB approval will be the responsibility of the design and build pitch contractor.

If it is decided to deviate from the general principles and scope of the drainage scheme shown in the SAB pre-application stage work, the design will need to ensure that the alternative design is SAB compliant and make a full application based on that.

It should be noted that the SAB pre-app schemes each have an area of compensatory landscape planting to meet the biodiversity standard of the SuDS Legislation and SAB approval. This area is flexible, but must be covered by the landscape designer's work.

Appendices

- » Drawing : C3G-HYD-XX-XX-DR-C-1010 St Illtyds 3G - SW Drainage Strategy
- » Calculation - St Illtyds 3G - greenfield rate
- » Calculation - St Illtyds 3G
- » SAB Pre-App Response - St Illtyds



ALL EXISTING DOWNSTREAM SURFACE WATER DRAINAGE BEING RETAINED MUST BE JET CLEANED AND CAMERA SURVEYED THROUGH TO THE SCHOOL SITE BOUNDARY AFTER PITCH WORKS COMPLETION, TO ENSURE GOOD CLEANLINESS AND PERFORMANCE.

EXISTING MANHOLE IN THE ROUNDABOUT AREA IS SILTED AND NEEDS CLEARING OUT TO ENABLE CLEANING AND SURVEY TO CONTINUE TO THE BOUNDARY.

TO ENSURE THE REQUIRED STORAGE VOLUME IS ACHIEVED, THE MAXIMUM PERMISSIBLE GRADIENT OF THE PERMEABLE SUB-BASE LAYER IS 1:100 ALONG ITS WIDTH

1.2mØ CONCRETE FLOW CONTROL MANHOLE WITH HYDROBRAKE FLOW CONTROL DEVICE. SEE TEXT.

1.2mØ CATCHPIT MANHOLE WITH 300mm SUMP

EXTENT OF 450mm DEEP TYPE 3 PERMEABLE SUB-BASE COVERS THE WHOLE PITCH AND RUNOFF AREA. THIS ACTS AS THE STORAGE RESERVOIR FOR SURFACE WATER BEHIND THE FLOW CONTROL

EXISTING SURFACE WATER DRAINAGE TO BE REMOVED.

INTERIM MAINTENANCE ACCESS POINT FOR CARRIER DRAIN

INDICATIVE EXTENT OF EXISTING PITCH DRAINAGE TAKEN FROM AERIAL PHOTOGRAPHS. ALL EXISTING DRAINAGE UNDER THE PROPOSED PITCH AREA SHALL BE REMOVED

Adult Rugby Pitch (w/ C18 Football)
126 x 80m

2250 PERFORATED CARRIER DRAIN IN 500mm WIDE STONE FILLED TRENCH. DEPTH VARIES TO SUIT PIPE INVERT LEVEL.

PIPE SIZE UPSTREAM OF THE FLOW CONTROL IS SET AT 2250 FOR STORAGE AND BLOCKAGE REDUCTION PURPOSES.

TO ENSURE THE REQUIRED STORAGE VOLUME IS ACHIEVED, THE MAXIMUM PERMISSIBLE GRADIENT OF THE PERMEABLE SUB-BASE LAYER IS 1:100 ALONG ITS WIDTH

6000 INSPECTION CHAMBER AS HEAD OF RUN ACCESS POINT FOR CARRIER DRAIN

INDICATION OF COMPENSATORY LANDSCAPE PLANTING FOR SAB COMPLIANCE (BIODIVERSITY CRITERIA)

TO ENSURE THE REQUIRED STORAGE VOLUME IS ACHIEVED, THE SUB-BASE LEVEL OF THE LENGTH OF THE PITCH MUST REMAIN FLAT, WITHOUT FALL.

GENERAL DRAWING NOTES:

- This drawing is for tender purposes only and presents the surface water drainage strategy from the proposed pitch and associated hardstandings.
- This drawing does not present the civil engineering strategy or solutions for: earthworks, levels, boundary conditions, retaining walls or utilities. These are not part of the Hydrock scope.
- This drawing should not be used for construction and is subject to detailed design by the Contractor, including the confirmation of surface water attenuation storage provision.
- No construction works should commence until SAB approval is obtained.
- No construction should commence until all key existing and connection point drainage items are checked and confirmed on site in terms of position, level and condition.
- The contractor should allow for all surface reinstatement for all required trenching works outside of the proposed works areas.
- Any material, excavation and depth quantities relating to drainage and attenuation storage given in the tender documentation are indicative only and the information on this drawing takes precedent.

EXISTING PITCH DRAINAGE NOTES:

- An existing pitched pitch drainage system is in place in form of a lateral and carrier drain arrangement, installed to drain the existing grass pitch. This drainage system is shallow and the construction of the new 3G pitch will encounter these pipes, therefore they must be removed in the location of the pitch.
- The removal of the existing pitch drainage and the installation of the new permeable sub-base and collector drain will isolate the surface water flow, so that it can be passed through the hydrobrake flow control and discharged to the proposed outlet at no greater than the equivalent greenfield runoff rate.
- The existing pitch drainage system is not mapped, but its outline can be seen on a series of historic aerial photographs that show the general locations of the lateral and main pipes.
- An estimate of the lengths that needs removal is given in this drawing for information, but the contractor should allow for the removal of all existing pitch drainage below the proposed pitch.

PITCH SURFACE WATER ATTENUATION STORAGE NOTES:

- Minimum area of permeable (type 3) sub-base area required to meet the under-pitch storage volume requirement is 120m x 74m at 450mm deep
- The maximum gradient of the pitch (and permeable sub-base under the pitch) along its length is flat. Any fall will reduce the available storage volume in the sub-base and will not comply.
- Maximum gradient of the pitch (and permeable sub-base under the pitch) along its width is 1:100. If this can be laid flatter then the depth of sub-base (as storage) can potentially be reduced
- Hydrobrake flow control in the final manhole. Specification reference: MD-SHE-0119-5700-0530-5700, for a maximum greenfield QBAR discharge of 5.7l/s for storms up to 1:100+40%
- The storage volume required under the pitch, within the sub-base layer is 607m³. Other design options presented by the contractor to achieve this storage volume will be considered, which can involve varying depths of sub-base across the pitch area.

DRAINAGE STRATEGY OVERVIEW NOTES:

- The surface water drainage strategy for the proposed pitch is to let rainfall falling on the pitch infiltrate through the pitch construction layers and into a layer of permeable sub-base stone below.
- That layer acts as a storage reservoir for the water, which is then collected by a 225mm diameter perforated carrier drain and the flow is conveyed to a flow control manhole before discharging to the existing drainage system.
- The maximum discharge rate from the hydrobrake flow control manhole is set to be equivalent to the greenfield runoff rate for the drained area, during all storm events up to the critical duration 1 in 100 year storm event, plus a 40% climate change allowance factor.
- The discharge point is to the existing surface water drainage system that already receives flows from the positively drained grass pitch area.
- The on and off-site flood risk is reduced compared to the existing grass pitch situation due to the provision of attenuation storage and flow control. Within the drainage design and strategy there is no consideration for infiltration drainage, from the permeable sub-base layer and into the underlying ground. The pitch is not lined, so there will be some marginal water volume losses to the underlying ground, but infiltration is not relied upon to drain the pitch or to achieve compliance. The pitch and any other porous surfaces areas provide their own interception area.
- The pitch drainage work is subject to detailed design for compliance with the SuDS legislation and must achieve SAB approval before construction commences.
- In terms of the SuDS standards for SAB compliance the general strategy is as follows:
 - Discharge Destination:** To existing private surface water drainage system, as per the existing grass pitch drainage.
 - Discharge Quantity:** Outflow limited to QBAR greenfield runoff rate for all storms up to 1:100+40%
 - Water Quality:** Very low water quality risk. Some treatment occurs within the permeable sub-base layer. Catchpits provided for silt and debris collection.
 - Amenity:** As a sports facility the proposals is fundamentally and amenity development
 - Biodiversity:** No biodiversity provision within a 3G pitch development. Contractor to allow for compensatory landscape planting elsewhere on the site to satisfy SAB requirements equivalent to 10% of the proposed pitch area.
 - Ownership:** Owned and operated by the school / Cardiff Council
 - Maintenance:** By the school / Cardiff Council. Catchpits and rodding eyes are provided on key drainage lines to aid future cleaning and maintenance

REVISIONS				
Rev	Date	Description	By	App
P04	13/02/24	Architect Layout Updated	CC	RB
P03	30/05/23	Lateral pitch drains shown	RB	RB
P02	28/04/23	Note added, hard informal play area works omitted from tender	RB	RB
P01	19/04/23	Tender Issue	RB	RB

Hydrock

CLIENT
MACE
FOR CARDIFF COUNTY COUNCIL

PROJECT
CCC22 3G PITCHES
ST. ILLTYDS

CLICK TEXT AND SELECT
REQUIRED ADDRESS FROM
DROP DOWN MENU

TITLE SUSTAINABLE SURFACE WATER DRAINAGE STRATEGY	
HYDROCK PROJECT NO. C-20700	SCALE @ A1 Custom Scale
STATUS DESCRIPTION FOR STAGE APPROVAL	STATUS S4
DRAWING NO. (PROJECT-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) C3G-HYD-XX-XX-DR-C-1010	REVISION P03

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File St Illtyds 3G.SRCX

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Source Control 2018.1.1

ICP SUDS Mean Annual Flood

Input

Return Period (years) 100 SAAR (mm) 1038 Urban 0.214
Area (ha) 1.018 Soil 0.350 Region Number Region 9

Results 1/s

QBAR Rural 4.1
QBAR Urban 5.7

Q100 years 11.1

Q1 year 5.0
Q30 years 9.5
Q100 years 11.1



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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 939 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m ³)	Status
15 min Summer	52.674	0.244	0.0	5.7	5.7	112.8	O K
30 min Summer	52.750	0.320	0.0	5.7	5.7	193.3	O K
60 min Summer	52.817	0.387	0.0	5.7	5.7	282.7	O K
120 min Summer	52.875	0.445	0.0	5.7	5.7	374.6	O K
180 min Summer	52.904	0.474	0.0	5.7	5.7	423.9	O K
240 min Summer	52.920	0.490	0.0	5.7	5.7	453.2	O K
360 min Summer	52.939	0.509	0.0	5.7	5.7	488.8	O K
480 min Summer	52.948	0.518	0.0	5.7	5.7	507.2	O K
600 min Summer	52.952	0.522	0.0	5.7	5.7	515.7	O K
720 min Summer	52.953	0.523	0.0	5.7	5.7	517.6	O K
960 min Summer	52.952	0.522	0.0	5.7	5.7	515.5	O K
1440 min Summer	52.945	0.515	0.0	5.7	5.7	501.9	O K
2160 min Summer	52.929	0.499	0.0	5.7	5.7	469.7	O K
2880 min Summer	52.908	0.478	0.0	5.7	5.7	432.6	O K
4320 min Summer	52.866	0.436	0.0	5.7	5.7	358.5	O K
5760 min Summer	52.818	0.388	0.0	5.7	5.7	285.0	O K
7200 min Summer	52.767	0.337	0.0	5.7	5.7	214.6	O K
8640 min Summer	52.720	0.290	0.0	5.7	5.7	158.6	O K
10080 min Summer	52.676	0.246	0.0	5.7	5.7	114.4	O K
15 min Winter	52.703	0.273	0.0	5.7	5.7	140.7	O K
30 min Winter	52.780	0.350	0.0	5.7	5.7	231.7	O K
60 min Winter	52.849	0.419	0.0	5.7	5.7	332.1	O K
120 min Winter	52.909	0.479	0.0	5.7	5.7	434.3	O K
180 min Winter	52.939	0.509	0.0	5.7	5.7	489.9	O K
240 min Winter	52.956	0.526	0.0	5.7	5.7	523.6	O K
360 min Winter	52.978	0.548	0.0	5.8	5.8	566.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Summer	127.517	0.0	137.0	77
30 min Summer	85.701	0.0	220.4	92
60 min Summer	54.957	0.0	312.1	116
120 min Summer	34.010	0.0	410.1	160
180 min Summer	25.295	0.0	468.1	206
240 min Summer	20.351	0.0	508.2	260
360 min Summer	14.971	0.0	568.1	372
480 min Summer	12.028	0.0	612.5	486
600 min Summer	10.141	0.0	647.5	602
720 min Summer	8.817	0.0	676.4	710
960 min Summer	7.063	0.0	722.2	818
1440 min Summer	5.157	0.0	777.3	1068
2160 min Summer	3.757	0.0	845.7	1476
2880 min Summer	2.997	0.0	883.3	1888
4320 min Summer	2.176	0.0	924.9	2700
5760 min Summer	1.731	0.0	942.1	3488
7200 min Summer	1.449	0.0	945.7	4192
8640 min Summer	1.255	0.0	942.3	4864
10080 min Summer	1.111	0.0	933.1	5552
15 min Winter	127.517	0.0	166.1	80
30 min Winter	85.701	0.0	259.6	94
60 min Winter	54.957	0.0	362.4	118
120 min Winter	34.010	0.0	472.3	160
180 min Winter	25.295	0.0	537.6	208
240 min Winter	20.351	0.0	582.7	260
360 min Winter	14.971	0.0	650.4	368



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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m ³)	Status
480 min Winter	52.989	0.559	0.0	5.8	5.8	589.3	O K
600 min Winter	52.995	0.565	0.0	5.9	5.9	601.6	Flood Risk
720 min Winter	52.998	0.568	0.0	5.9	5.9	606.7	Flood Risk
960 min Winter	52.996	0.566	0.0	5.9	5.9	603.9	Flood Risk
1440 min Winter	52.986	0.556	0.0	5.8	5.8	582.6	O K
2160 min Winter	52.963	0.533	0.0	5.7	5.7	536.9	O K
2880 min Winter	52.935	0.505	0.0	5.7	5.7	481.9	O K
4320 min Winter	52.872	0.442	0.0	5.7	5.7	368.9	O K
5760 min Winter	52.795	0.365	0.0	5.7	5.7	251.2	O K
7200 min Winter	52.712	0.282	0.0	5.7	5.7	150.4	O K
8640 min Winter	52.635	0.205	0.0	5.7	5.7	79.5	O K
10080 min Winter	52.575	0.145	0.0	5.6	5.6	39.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
480 min Winter	12.028	0.0	700.7	480
600 min Winter	10.141	0.0	740.6	594
720 min Winter	8.817	0.0	773.6	704
960 min Winter	7.063	0.0	824.2	912
1440 min Winter	5.157	0.0	810.4	1140
2160 min Winter	3.757	0.0	970.4	1600
2880 min Winter	2.997	0.0	1016.1	2052
4320 min Winter	2.176	0.0	1069.8	2916
5760 min Winter	1.731	0.0	1096.2	3696
7200 min Winter	1.449	0.0	1107.6	4336
8640 min Winter	1.255	0.0	1111.2	4928
10080 min Winter	1.111	0.0	1108.2	5376



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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.400	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Green Roof

Area (m ³)	10176	Evaporation (mm/day)	3
Depression Storage (mm)	5	Decay Coefficient	0.050

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:	From:	To:	From:	To:
0	4 0.184918	24	28 0.055696	48	52 0.016775	72	76 0.005053	96	100 0.001522
4	8 0.151398	28	32 0.045600	52	56 0.013735	76	80 0.004137	100	104 0.001246
8	12 0.123954	32	36 0.037334	56	60 0.011245	80	84 0.003387	104	108 0.001020
12	16 0.101485	36	40 0.030567	60	64 0.009207	84	88 0.002773	108	112 0.000835
16	20 0.083089	40	44 0.025026	64	68 0.007538	88	92 0.002270	112	116 0.000684
20	24 0.068028	44	48 0.020489	68	72 0.006171	92	96 0.001859	116	120 0.000560

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From:	To:
0	4 0.000



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Model Details

Storage is Online Cover Level (m) 53.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	126.0
Membrane Percolation (mm/hr)	1000	Length (m)	80.0
Max Percolation (l/s)	2800.0	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	52.430	Cap Volume Depth (m)	0.530

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0119-5700-0530-5700
Design Head (m)	0.530
Design Flow (l/s)	5.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	119
Invert Level (m)	52.430
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.530	5.7	Kick-Flo®	0.393	5.0
Flush-Flo™	0.189	5.7	Mean Flow over Head Range	-	4.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.2	0.800	6.9	2.000	10.6	4.000	14.8	7.000	19.3
0.200	5.7	1.000	7.7	2.200	11.1	4.500	15.6	7.500	20.0
0.300	5.5	1.200	8.3	2.400	11.6	5.000	16.4	8.000	20.7
0.400	5.0	1.400	9.0	2.600	12.0	5.500	17.1	8.500	21.3
0.500	5.5	1.600	9.6	3.000	12.9	6.000	17.9	9.000	22.0
0.600	6.0	1.800	10.1	3.500	13.9	6.500	18.6	9.500	22.6



Neuadd y Sir
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CF10 4UW
Tel: (029) 2087 2087
www.cardiff.gov.uk

Reference: SAB/PRE/0203

DATE: 17 July 2023

Mr Richard Baker
Hydrock
Third Floor Wharton place
Wharton Street
Cardiff
CF101GS

Dear Sir / Madam,

LOCATION: St Illtyd's Catholic High School, Newport Road, Rumney, Cardiff CF3 1XQ
PROPOSAL New 3G pitch construction and tarmac play area

Further to your Sustainable Drainage Approval Body (SAB) submission for pre-application advice, received on the 24th of May 2023 regarding the above site (hereafter referred to as "the Site"), please find our comments below.

The application has been reviewed in consideration of the relevant legislation and policies in Schedule 3 of Flood and Water Management Act (2010) and the Sustainable Drainage (Approval and Adoption) (Wales) Order 2019 (SNSSuDS) and associated regulations, and The Well-being of Future Generations (Wales) Act 2015. The following information has been received and reviewed as part of this response:

- pre-app form cardiff - st illtyd's
- calculation - st illtyds yard - existing rate
- c3g-hyd-xx-xx-dr-c-1010 st illtyds 3g - sw drainage strategy
- calculation - st illtyds 3g - existing rate
- calculation - st illtyds yard
- calculation - st illtyds 3g

Review against the Statutory Standards for Sustainable Drainage General Principles

Manage water on or close to the surface and as close to the source as possible

The applicant proposes to manage surface water from the new development by allowing it to infiltrate through the 3G pitch surface and the porous asphalt play area construction. This will allow water to be intercepted at the surface and as close to the source as possible.

Treat rainfall as a valuable natural resource

The applicant proposes to treat rainfall as a valuable natural resource through the use of compensatory planting, where rainfall will be used to irrigate the vegetation.

GWEITHIO DROS GAERDYDD, GWEITHIO DROSOCH CHI

Mae'r Cyngor yn croesawu gohebiaeth yn Gymraeg, Saesneg neu'n ddwyieithog. Byddwn yn cyfathrebu â chi yn ôl eich dewis, dim ond i chi roi gwybod i ni pa un sydd well gennych. Ni fydd gohebu yn Gymraeg yn arwain at oedi.

WORKING FOR CARDIFF, WORKING FOR YOU

The Council welcomes correspondence in Welsh, English or bilingually. We will ensure that we communicate with you in the language of your choice, as long as you let us know which you prefer. Corresponding in Welsh will not lead to delay.



Ensure pollution is prevented at source, rather than relying on the drainage system to treat or intercept it

The applicant proposes to treat surface water run-off through the permeable construction of the 3G pitch and the porous asphalt play area. Catchpits have also been incorporated within the design to remove any suspended solids and silts. This will remove pollutants from the surface runoff prior to it being discharged from site.

Manage rainfall to help protect people from increased flood risk, and the environment from morphological and associated ecological damage resulting from changes in flow rates, patterns and sediment movement caused by the development

The applicant has proposed to attenuate surface water runoff on site and discharge through a Hydrobrake at a controlled rate, with systems being designed for the 1 in 100YRP +40%CC.

Exceedance drawings for both existing and proposed scenarios should be included with any application for full SAB approval.

Take account of likely future pressures on flood risk, the environment and water resources such as climate change and urban creep

Refer to standard 2 for further details.

A statement of flood risk with supporting maps from NRW has not been included at pre-application stage but should form part of the application for full SAB approval.

Use the SuDS Management Train, using drainage components in series across a site to achieve a robust surface water management system (rather than using a single "end of pipe" features, such as a pond, to serve the whole development

The applicant is proposing to manage surface water through the surface of the 3G pitch and the porous asphalt of the play area. Given the size and constrained nature of the site, this is deemed to be sufficient in the context of the development.

Maximise the delivery of benefits for amenity and biodiversity

The proposals for this Site are for a 3G pitch and an external play area. There is very limited scope to provide any biodiversity enhancement within these elements however the applicant is proposing to include compensatory biodiversity elsewhere on the site. This is proposed to run along one boundary of the 3G pitch and play area, in a location that it can also offer a visual amenity enhancement. Information on the type of planting and how this will increase biodiversity (types of habitats they are looking to support) should be provided at full SAB application stage.

Seek to make the best use of available land through multifunctional usage of public spaces and the public realm

The development proposed for this site does not lend itself to multifunctional use of public space. Given the context of the site, any opportunity to provide education regarding the SuDS features should be explored.

Perform safely, reliably and effectively over the design life of the development taking into account the need for reasonable levels of maintenance

Please refer to S6 for further details

Avoid the need for pumping where possible

The applicant does not propose pumping of surface water.

Be affordable, taking into account both the construction and long-term maintenance cost and the additional environmental and social benefits afforded by the system

Please refer to S6 for further details

Standard 1 – Surface Water Runoff Destination

Priority Level 1: reuse

There is no practical demand for non-potable water within the proposed development and so rainwater harvesting has been deemed unviable on this site. The applicant should however make reference to the use of surface water in providing irrigation for planting with any application for full SAB approval.

Recommendation – The applicant make reference to the use of surface water in providing irrigation for planting in any application for full SAB approval.

Priority Level 2: Infiltration

During a pre-application meeting the applicant advised that infiltration is unviable on this site. The applicant is advised to provide narrative and evidence to support this with any application for full SAB approval.

Recommendation – The applicant is advised to provide evidence that infiltration is unviable as a means of surface water disposal with any application for full SAB approval.

Priority Level 3: Surface Water Body

There is no watercourse within practicable distance from the Site. Therefore, the applicant does not propose to discharge to this level of the hierarchy.

Priority Level 4: Surface Water Sewer

The applicant proposes to discharge to the existing onsite surface water sewer. The applicant is advised to provide evidence of the condition of this connection and obtain consent from the downstream asset owner to discharge at an agreed rate.

Recommendation – The applicant submit CCTV survey of proposed connection to prove condition and capacity.

Recommendation – The applicant provides confirmation of consent to discharge (and rate) from downstream asset owner.

Priority Level 5: Combined Sewer

The applicant has met a higher priority level and therefore does not propose to discharge to a combined sewer.

Standard 2 – Hydraulic Control

Interception

Interception requirements will be met for the 3G pitch and the play area (constructed from porous asphalt) as long as they are only receiving surface water runoff for their own areas.

Runoff Rate

The applicant is proposing to discharge at Qbar. The applicant is advised that the minimum discharge rate accepted by Cardiff Council is 2.5l/s. This is to reduce the risk of blockage and for ongoing maintenance reasons.

Confirmation of consent to discharge from the downstream asset owner is required with any application for full SAB approval.

Recommendation – The applicant provides evidence of downstream asset owner's consent to discharge to their asset at an agreed rate.

When submitting hydraulic calculations this should be done using FEH13 data and results should be supplied for the 1YRP, 30YRP and 100YRP+40%CC for all events.

Recommendation – All calculations should be provided using FEH13 data and results should be supplied for the 1YRP, 30YRP and 100YRP+40%CC for all events.

Recommendation – The applicant set the maximum rainfall within the 'Design Criteria for Surface Water' to the maximum Microdrainage or equivalent will allow.

Recommendation – The applicant set the volumetric runoff coefficient within Microdrainage or equivalent to 1.0 for both winter and summer events.

Runoff Volume

The applicant is seeking to discharge at the minimum practicable rate and therefore is compliant with this part of the standard.

Attenuation

The applicant proposes to attenuate surface water runoff from the development within the subbase of the 3G pitch and porous asphalt construction play area. The applicant is reminded that hydraulic calculations should be provided using FEH data and results provided for the 1YRP+CC, 30YRP+CC and 10YRP+ 40% CC events.

Recommendation – The applicant provide hydraulic calculations (utilising FEH rainfall data), and provide results for the 1YRP, 30YRP and 100YRP+40%CC events.

Exceedance

No exceedance routing plans have been submitted as part of the pre-application.

Recommendation – The applicant provide routing of overland flow for existing and proposed scenarios. This should consider both exceedance events greater than the 100YRP+CC event, and the scenario of failure of the proposed system.

Standard 3 – Water Quality

The applicant has proposed permeable surfacing on both the 3G pitch and the play area to achieve water quality compliance. The applicant will need to provide a Simple Index Assessment with any application for full SAB approval.

Recommendation – The applicant provide a Simple Index Assessment with any application for full SAB approval.

Standard 4 – Amenity

The proposed development for the site includes a 3G pitch and an informal play area. These will provide amenity benefits to the users of the Site. The applicant is also proposing to include planting adjacent to the pitch and the play area, which will offer enhanced visual amenity.

Standard 5 – Biodiversity

The development proposals for the site greatly restrict the opportunity to incorporate green SuDS infrastructure. The applicant has however offered compensatory biodiversity to run adjacent to the 3G pitch and informal play area. The applicant is advised to provide planting information and identify the types of habitats they are looking to support with any application for full SAB approval.

Recommendation – The applicant provide a detailed planting and species information for the compensatory planting.

Recommendation – The applicant provide the common names (in addition to Latin names) for the planting within any bioretention areas.

Standard 6 – Construction, Operation and Maintenance

Technical drawings of SuDS features have not been provided at pre-application stage. Detailed and specific drawings will be expected at full application stage and the applicant must ensure that all SuDS elements are designed and constructed in accordance with appropriate standards and guidance – including (but not limited to) Building Regulations (Part H), Sewers for Adoption (particularly for elements for adoption by DCWW or SAB), CIRIA C737: Structural and Geotechnical Design of Modular Geocellular Drainage Systems, etc. The SAB cannot accept ‘typical’ construction drawings, and if a specific manufacturer’s product is to be used, technical specifications and drawings must be provided for this.

Recommendation – The applicant provide evidence of the proposed construction of the SuDS including standard and site-specific details (as required).

The applicant has not provided a maintenance plan at this stage. For a full SAB application, it is advised that a maintenance plan is produced as a standalone document that can be provided to the eventual

maintenance operatives. As a working document it should contain all the information a maintenance operative requires to successfully conduct maintenance activities.

This includes:

- A site plan showing the location of all SuDS features requiring maintenance.
- Access and parking arrangements; maintenance vehicles must not cause obstructions to the Highway, neighbouring properties, evacuation routes, emergency exits or pedestrian footways etc. Access arrangements may include contact arrangements for gated developments for example.
- A schedule of features outlining the number of each type of feature present at the development and the frequency of required maintenance.
- A description of maintenance activities required for each feature.
- A list of SuDS suitable plant species (from the landscape plan) that the maintenance provider may use in replacing vegetation where required.

Recommendation – The applicant provide a standalone SuDS Maintenance Plan with any application for full SAB approval.

The applicant has identified Cardiff Council's Education Department as the owners and operators of the site and all ongoing maintenance activities and funding will be carried out by them.

Construction management/information/communication and CDM information has not been submitted as part of the pre-application. This is not a requirement at pre-application stage and is often not known until full application stage. Wherever possible this information should be provided in a full application, however in recognition of the use of design and build contracts this element of the application may be conditioned provided the application contains a justification for this approach and clearly requests a conditions-based approach.

Recommendation – The applicant provides construction management/information/communication and CDM information.

Conclusion

The application is broadly in accordance with the standards and principles of the SNSuDS, however some key areas require additional information, detail and clarity. Please refer to the recommendations above for further information, however it should be noted that that these should not be considered exhaustive and further information may be requested on receipt of the full SAB application.

I trust the above meets your present requirements; however, please do not hesitate to contact me should you require anything further.

Yours sincerely,



Sarah Rees

Swyddog Arweiniol (Rheoli Perygl Llifogydd ac Arfordirol)
Lead Officer (Flood and Coastal Risk Management)
Planning, Transport and Environment

Appendix A - Summary of required information

APPENDIX A

Appendix A: Specific information and evidence requirements for future applications

Document	Comments
1. Flood Consequence Assessment (FCA)	Further information needed
Statement on flood risk	
2. Detailed Geotechnical Factual and Interpretative Report	Not Included
Basic information required	
3. Detailed Whole site SuDS Drainage Design Proposals	Further information needed
Required	
4. Detailed SuDS Asset Maintenance Plan	Not included
Required	
5. Amenity and Biodiversity Plan	Not included
Species information required	
6. Unstable and Contaminated Land Reports	Further information needed
Basic information required	
7. Water Quality Treatment and Pollution Prevention Strategy	Further information needed
Required	
8. Landscape Plan	Not included
Required	
9. Landscaping Layout Drawing	Not included
Required	
10. Construction Management Plan	Not Included
Required – see Standard 6	
11. Construction Phasing Plan	Not included
Required – see Standard 6	
12. Information and communications plan	Not included
Required – see Standard 6	
13. Construction (Design and Management) CDM Regulations 2015 File	Not Included
Required – see Standard 6	
14. Statutory Consents and Permissions	Not included
Required – Provide confirmation from downstream asset owner to connect.	
15. Drawing number issue sheet	Not Included
Required	
16. Outline/Full planning Permission Notice & Approved Layout Drawing	Not included
As a minimum application references should be provided where relevant.	
17. Site Location Plan	Not Included
Required	
18. Natural and Artificial Drainage Catchment and Sub-Catchment Plan	Further information Needed
Required	

Document	Comments
19. Concept Drawings	Included
Required	
20. General engineering layout drawings	Further information needed
Required	
21. Longitudinal section drawings	Not Included
Required for any adoptable elements. Preferred for non-adoptable elements to clarify proposed system design.	
22. Cross section drawings and standard detail drawings	Not Included
Standard and/or site-specific detail drawings required to assess performance and proposed construction standards.	
23. Specialist drawings	Not Included
Required or any specialist/sub-contracted design elements such as (but not limited to) geocellular systems, green/blue roof systems or vortex flow control devices)	