DRAINAGE STRATEGY

Construction of New 3G Synthetic Pitch

Job No. 3310

For
Wrexham County Borough Council

Sports Labs Ltd
1 Adam Square
Brucefield Industry Park,
Livingston
EH54 9DE

Contract Number: 3310

Issued by: Sports Labs on behalf of Wrexham County Borough Council

Description of Works: Construction of a new 3G synthetic pitch

Date of Issue: November 2024

Version	Issue Date	Details
Original (Planning)	November 2024	-
Approvals		Signatures
Author:	Calum Hirst	[redacted]
Checked by:	Graeme Stewart	[redacted]
Client approval:	For and on behalf of **Wrexham County Borough Council**	
Issued by: Location:	Sports Labs Ltd, 1 Adam Square, Brucefield Industry Park, Livingston, EH54 9DE	Tel: +44(0)1506 444 755 E-mail: info@sportslabs.co.uk

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1 SITE DETAILS

1.1 Site Overview



Figure 1 - Site Overview

1.2 Site Address

Ysgol Bryn Alyn
Church Street
Gwersyllt
Wrexham
LL11 4HD

1.3 Applicant Details

Wrexham County Borough Council
Wrexham Library
Rhosddu Road
Wrexham
LL11 1AU

Project Contact: Jonathan Miller
Email: Jonathan.Miller@wrexham.gov.uk

1.4 Agent Details

Sports Labs Ltd
1 Adam Square
Brucefield Industry Park
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EH54 9DE

Project Contact: Graeme Stewart
Position: Senior Project Engineer
Email: graeme@sportslabs.co.uk

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2 INTRODUCTION

2.1 Sports Labs Ltd has been appointed on behalf of Wrexham County Borough Council (WCBC) to develop an application for planning and SAB permission and for a proposed new 3G synthetic pitch, on the grounds of Ysgol Bryn Alyn, Church Street, Gwersyllt, Wrexham, LL11 4HD.

2.2 In order to assist in the approval of planning permission and the development of the proposed project, this document shall outline the SUDS drainage system put forward for the new pitch.

2.3 This document is carried out in accordance with the guidance within the National Planning Policy Framework (NPPF).

2.4 This document shall include the following minimum requirements as set out within the Local Authority Validation Checklist;

- A plan of the existing site layout.
- A topographical survey.
- Plans & drawings of the proposed site layout identifying the footprint of the area being drained.
- Runoff calculations indicating the proposed discharge rate with an allowance for climate change and proposed storage volume.
- Information on proposed SUDS measures describing how the proposed measures manage surface water.

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3 OVERVIEW OF PROPOSED REVELOPMENT

3.1 Existing Site Layout Plan

3.1.1 Refer to APPENDIX A – 3310-010 LOCATION PLAN. This indicates the proposed location of the new 3G pitch within the context of the existing facilities on the grounds of Ysgol Bryn Alyn, Wrexham.

3.2 Topographical Survey

3.2.1 Refer to APPENDIX B – 3310-050 TOPOGRAPHICAL SURVEY. This indicates the proposed footprint of the new 3G pitch and identifies the location of main features within the existing site such as kerb-lines, utilities, fencing and floodlighting.

3.2.2 Earthworks shall be undertaken over the site area. The new pitch platform shall match the levels of the existing natural grass pitch, falling from Northwest to Southeast. This is in-line with the requirements of FIFA Quality guidance as recognised by the Welsh FA.

3.3 Existing Ground Conditions

3.3.1 An on-site assessment by Soiltechnics found there to be approximately 300mm of topsoil across the site. The underlying soils vary across the site, with made ground found at depths between 0.2m and 0.7m, which is then underlain by gravel (weathered Cefn rock) in the northeast of the site, and clay (devensian till) to the south and west.

3.3.2 Infiltration testing was carried out in 2 locations, one of which was indicated there to be varying infiltration rates across the site. As shown in the ground investigation report, two tests were run in HP03, the slowest of which measured the infiltration rate at $2.75x10^{-6}$ m/s, and a single test in HP05 which showed the subsoil to be effectively impermeable. Given the variance across the site and average of the two test locations has been used in the drainage design of $1.38x10^{-6}$ m/s. Where an attenuation system has been included, the subsoils in this area have been assumed to be impervious.

4 DRAINAGE PROPOSAL

4.1 Overview of System

4.1.1 It is anticipated that there is an existing primary drainage system currently installed MUGAs, with an existing connection to the local surface water network. The existing system is to be removed and upgraded with a new system, which shall replace the existing connection into the local drainage network.

4.1.2 The new 3G synthetic pitch shall consist of a minimum 300mm thick sub-base layer of type1 stone modified for drainage. Above this is an optional porous asphalt engineered layer of 40mm thick, and a free draining shockpad up to 20mm and synthetic turf system 40mm.

4.1.3 The pitch drainage system shall consist of a lateral drainage system, with 80mm diameter perforated drains cut in at 10m centres. The lateral drains shall connect into a carrier drain of 150mm in diameter laid along the West touchline of the new pitch flowing to the Southwest corner of the site, where it shall connect via a silt trap into the new stone filled attenuation system which has been sized at 35.1m x 16.1m x 1.5m. It shall then outfall to the existing surface water network via a flow control manhole, with a silt trap, set to the greenfield runoff rate of 3.7l/s.

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4.2 Additional Supporting Drawings

4.2.1 Refer to APPENDIX C – 3310-100 GENERAL ARRANGEMENT, 200 DRAINAGE LAYOUT, 201 DRAINAGE DETAILS. This indicates the proposed footprint of the new 3G pitch and identifies the location of main features within the existing site such as kerb-lines, utilities, fencing and floodlighting.

4.3 Proposed SUDS measures Summary

4.3.1 The drainage system shall outfall to a new silt trap manhole to the Northeast of the park which connects into soakaway.

4.3.2 Refer to APPENDIX E – RUNOFF CALCULATIONS. In order to maximise the available attenuation within the pitch subbase, a flow control will be installed in the outfall manhole to restrict the flow to 10l/s. This allows the voids within the pitch subbase to act as an attenuation system. There are no impermeable membranes to be installed as part of this development so infiltration into the subsoils will continue, which will reduce any water reaching the outfall.

4.3.3 The pitch drainage will then outfall to the stone filled attenuation system. While it is likely that the subsoils will exhibit some level of permeability over time, for the purposes of this design they have been assumed to be impermeable. The new drainage system will then outfall to the existing network onsite at a controlled rate of 3.7l/s.

4.4 InfoDrainage Calculations

4.4.1 As part of the design of this drainage system detailed calculations were created to better inform the requirements of this site, see Appendix D. The system has been design to manage all storms to include the 1 in 100 year storm event +40% to account for climate change to allow for a robust system that will be effective and beneficial to the development and surrounding areas.

4.4.2 This drainage model confirms there will be no flooding anywhere in the new network during 1 in 30 year storms, and also that there will be no flooding during the 1 in 100 year +40% climate change storm, while restricting the discharge into the existing network to a rate of 3.7l/s.

4.4.3 For the purposes of this design, the infiltration rate for the subsoils under the pitch has been determined to be $1.38x10^{-6}$ m/s, with the subsoils under the attenuation system determined to be impermeable.

4.5 Construction Phase – Key Stage Inspections

4.5.1 As a quality control measure, the pitch construction is to be controlled by Key Stage Inspections (KSI's) at each phase of construction. This will allow porosity testing to be carried out in line with BS EN standards to ensure that the pitch is draining correctly at key stage of construction.

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5 FLOOD MAP DATA

5.1 Flood Map for Planning

5.1.1 Appendix E contains the flood map for planning downloaded from the Environment Agency website. This denotes that majority of the proposed site is in a flood zone 1 area with a low probability of flooding, with small bands of flood zone 2.

5.2 Long Term Surface Water Flooding

5.2.1 The below flood map data was obtained from the Natural Resources Wales website and details the long term surface water flood risk at the proposed site. As shown, the development area sits within Flood Zone 1. With this in mind the drainage design of the new development is of the utmost importance. It should be noted that the new proposal does not introduce any impermeable surfaces, and does increase the potential for surface water attenuation, thus decreasing the potential risk of flooding in the area.

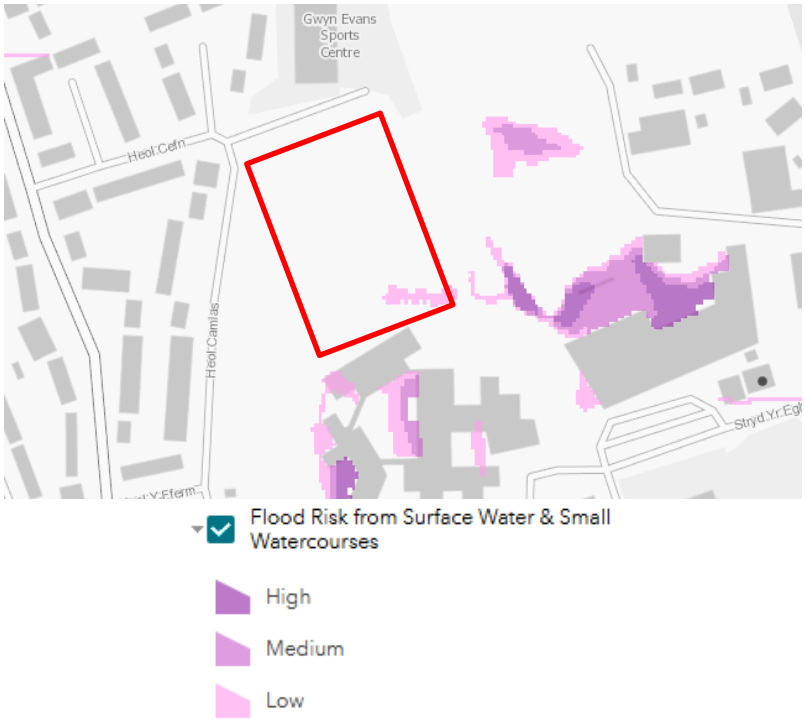


Figure 2 - Long term surface water flood map (Natural Resources Wales website, November 2024)

5.3 Long Term Rivers and Sea Flooding

5.3.1 The closest major water course to the development area is the River Alyn located approximately 1.2km to the East. There are also some minor waterways in the form of streams that are within 700m of the development.

5.3.2 Due to the nature of the site and surrounding area, the development area is not at any risk of flooding from rivers or the sea.

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6 OVERLAND EXEEDANCE

6.1 The overland exceedance routes have been considered as part of this design. It is noted that there is very little slope across the existing and proposed areas. Due to the pitch construction and the inclusion of kickboards to the full perimeter, no water shall runoff from the surface of the pitch on to adjacent land. All water landing within the new development will enter the proposed new drainage network.

7 POLICY CONSIDERATIONS

7.1 National Planning Policy Framework: 14. Meeting the Challenge of Climate Change, Flooding and Coastal Change

158. *Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures 56 . Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.*

7.1.1 Appendix D contains detailed drainage calculations for the proposed development which take into consideration 1 in 100 year storm events +40% for climate change. This approach is proactive and very mindful of the long term, future impact of climate change on the surface water drainage requirements of all developments. This network has been designed to ensure that there will be no adverse impacts on the development itself and the surrounding areas as a results of surface water drainage.

167. *All plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:*

(a) applying the sequential test and then, if necessary, the exception test as set out below;

7.1.2 The proposed development is primarily to be used by the school, meaning the indicated location is the most sensible. It is also noted that the development area is not noted as being of an elevated flood risk.

(b) safeguarding land from development that is required, or likely to be required, for current or future flood management;

7.1.3 The development area is not part of a flood management strategy, and given its location it is not anticipated to be incorporated in any future flood management plan.

(c) using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management); and

7.1.4 The new pitch construction incorporates 300mm depth of robust stone to form the pitch base. This stone has a large void ratio, allowing for surface water to be attenuated on site. As detailed in the drainage calculations (Appendix D), the stone base provides sufficient attenuation to allow all storm water to infiltrate naturally into the subsoils. This stone base replaces the existing cohesive materials and made ground which allow for very little infiltration.

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7.1.5 A new stone filled attenuation system sized at 35.1m x 16.1m 1.5m to ensure there is no flooding of the new pitch in all storms up to 1 in 100 year events plus 40% climate change.

(d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.

7.1.6 While accounting for a 1 in 100 year storm event +40% climate change, there will be no detrimental impact on any existing developments neighbouring this site, including the local residential properties.

7.2 DEFRA – Sustainable Drainage Systems: Non-Statutory Technical Standards for Sustainable Drainage Systems

7.2.1 The proposed development has been designed in line with this document to ensure that there will be no detrimental impact to the areas outside of the development. While there will be a connection made to the existing drainage outlet, the attached drainage calculations demonstrate that all surface water will be managed on site.

7.2.2 The greenfield runoff rate for the site has been calculated as 3.7l/s and it will be ensured that any outflow from the site is restricted below this. The drainage calculations incorporate a new manhole with a flow control orifice installed prior to connecting to the existing surface water outfall.

7.2.3 The pitch base will function as an attenuation system, with capacity to store a large volume of water, which has been show sufficient to manage all storm water received by the new pitch and allow it to gradually infiltrate into the existing subsoils. An attenuation system will be installed in addition to the pitch subbase to ensure there is no flooding of the new pitch of surrounding areas as a result of the proposed works.

8 SUMMARY

8.1 In conclusion, the new 3G synthetic pitch will not create any additional surface water runoff to the surrounding areas. The pitch base and new soakaway system will create sufficient attenuation to contain all surface water and allow it to infiltrate into the existing pitch subsoils. The drainage system has been designed to 1 in 100 year storm events +40% climate change.

8.2 The site is located within Flood Zone 1, per Appendix E, and is not designated as being at risk of any flooding from rivers or the sea.

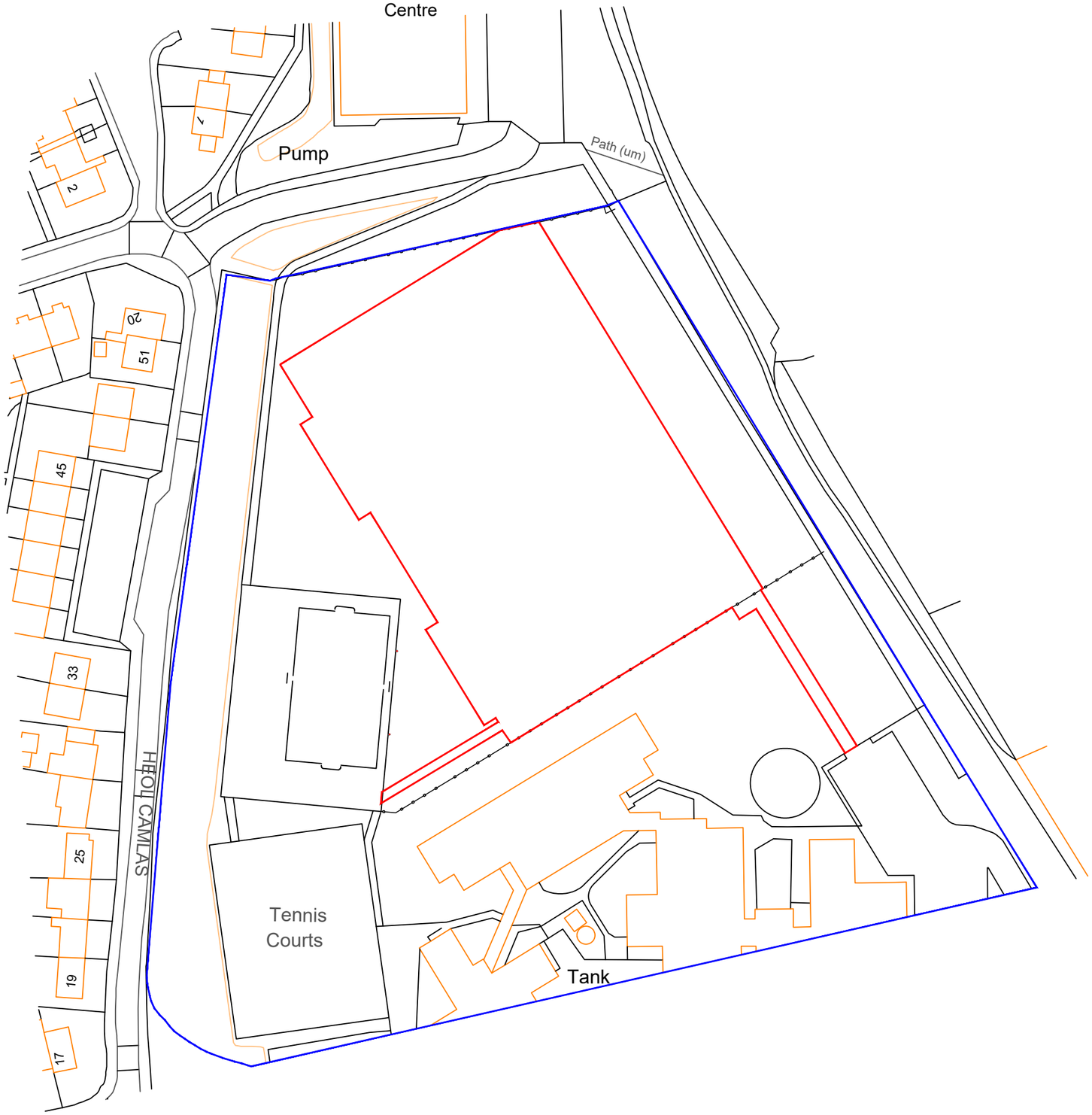
8.3 The proposed drainage strategy has been designed in accordance with the National Planning Policy Framework (NPPF) DEFRA Sustainable Drainage Systems.

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APPENDIX A – 3310-010 LOCATION PLAN

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01 LOCATION PLAN
SCALE: 1:1000

N

NOTES
It is the contractors responsibility to check design levels and sizes for compliance. Any discrepancies or errors to be identified to the design team.

KEY

Development Area

Ownership Boundary

REVISION	DETAILS	BY	DATE	CHECKED

sportslabsconsult
info@sportslabsconsult.com

YSGOL BRYN ALYN
LOCATION PLAN
CONSTRUCTION OF A NEW 3G SYNTHETIC PITCH

–

0 5 10 20 30 40 metres
Scale bar 1:1000 (metres)

Date: 11/2024 Scale: 1:1000 @ A3	Job. No. 3310	Drawn by: CH Checked by: DD

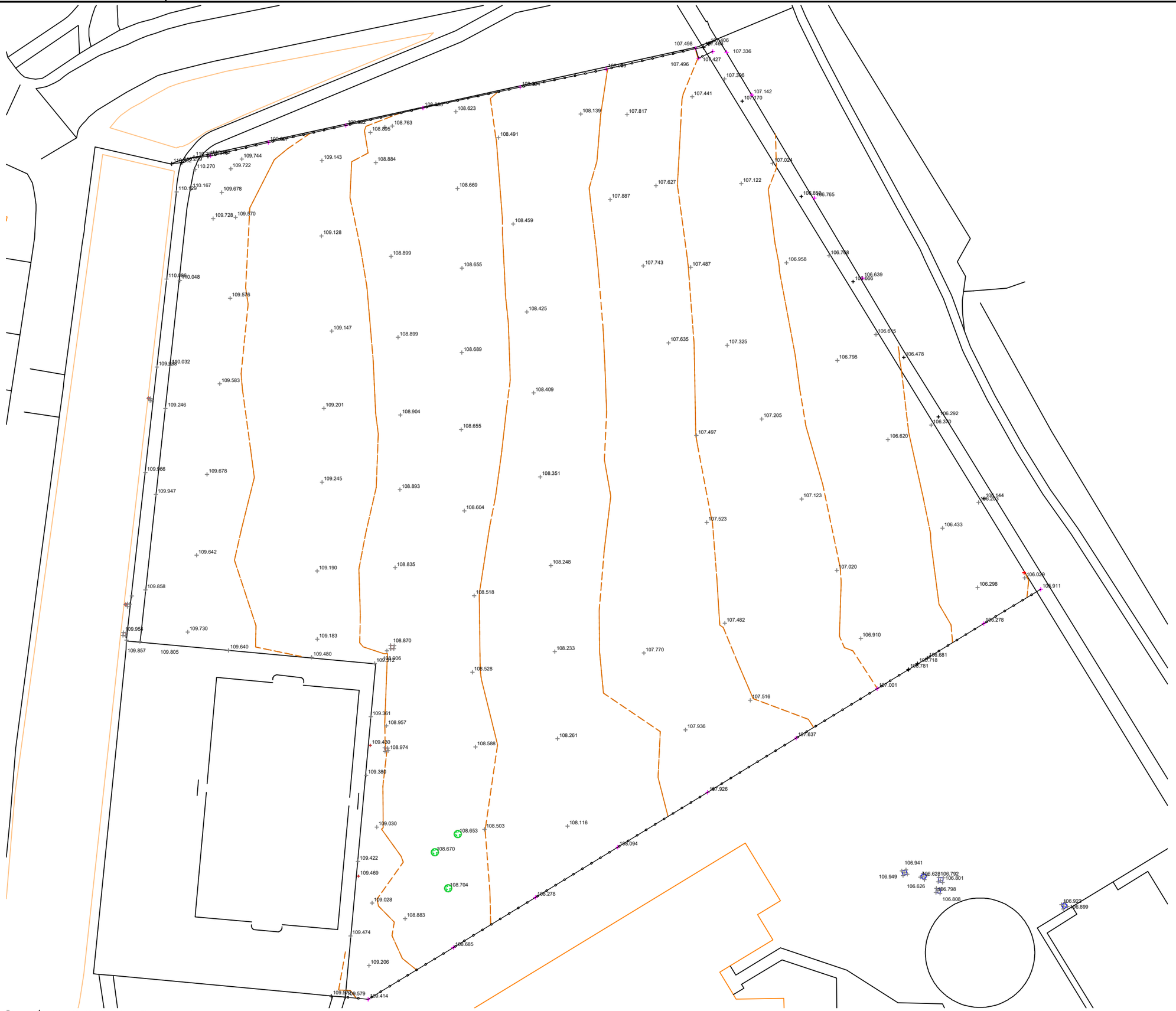
010

APPENDIX B – 3310-050 TOPOGRAPHICAL SURVEY

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DRG. NO. 050

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N

NOTES

It is the contractors responsibility to check design levels and sizes for compliance. Any discrepancies or errors to be identified to the design team.

Topographical Survey Undertaken to obtain existing levels and dimensions of the site.

Key

- Perimeter Fence
- Lighting Column
- Manhole

REVISION	DETAILS	BY	DATE	CHECKED

sportslabsconsult

info@sportslabsconsult.com

YSGOL BRYN ALYN

TOPOGRAPHICAL SURVEY

CONSTRUCTION OF A NEW 3G SYNTHETIC PITCH

Scale bar 1:500

0 5 10 20

Date: 11/2024	Job. No. 3310	Drawn by: CH
Scale: 1:500 @ A3		Checked by: GS

050

01 TOPOGRAPHICAL SURVEY

SCALE: 1:500

APPENDIX C – 3310-100 GENERAL ARRANGEMENT, 200 DRAINAGE LAYOUT, 201 DRAINAGE DETAILS

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DRG. NO. 100

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01 GENERAL ARRANGEMENT
SCALE: 1:500

N

NOTES
It is the contractors responsibility to check design levels and sizes for compliance. Any discrepancies or errors to be identified to the design team.

Line markings (Football, Inlaid White)

Length	-90.0m
Width	-55.0m

Total Synthetic Area

Length	-96.0m
Width	-61.0m
Total Area	**-5,851m²**

Key

- New 3.0m High Perimeter Fencing
- New 3G 40mm Synthetic Turf
- Existing Fencing
- Existing Inspection Chamber
- Existing Kerb
- New Detox Grid

REVISION	DETAILS	BY	DATE	CHECKED

sportslabsconsult

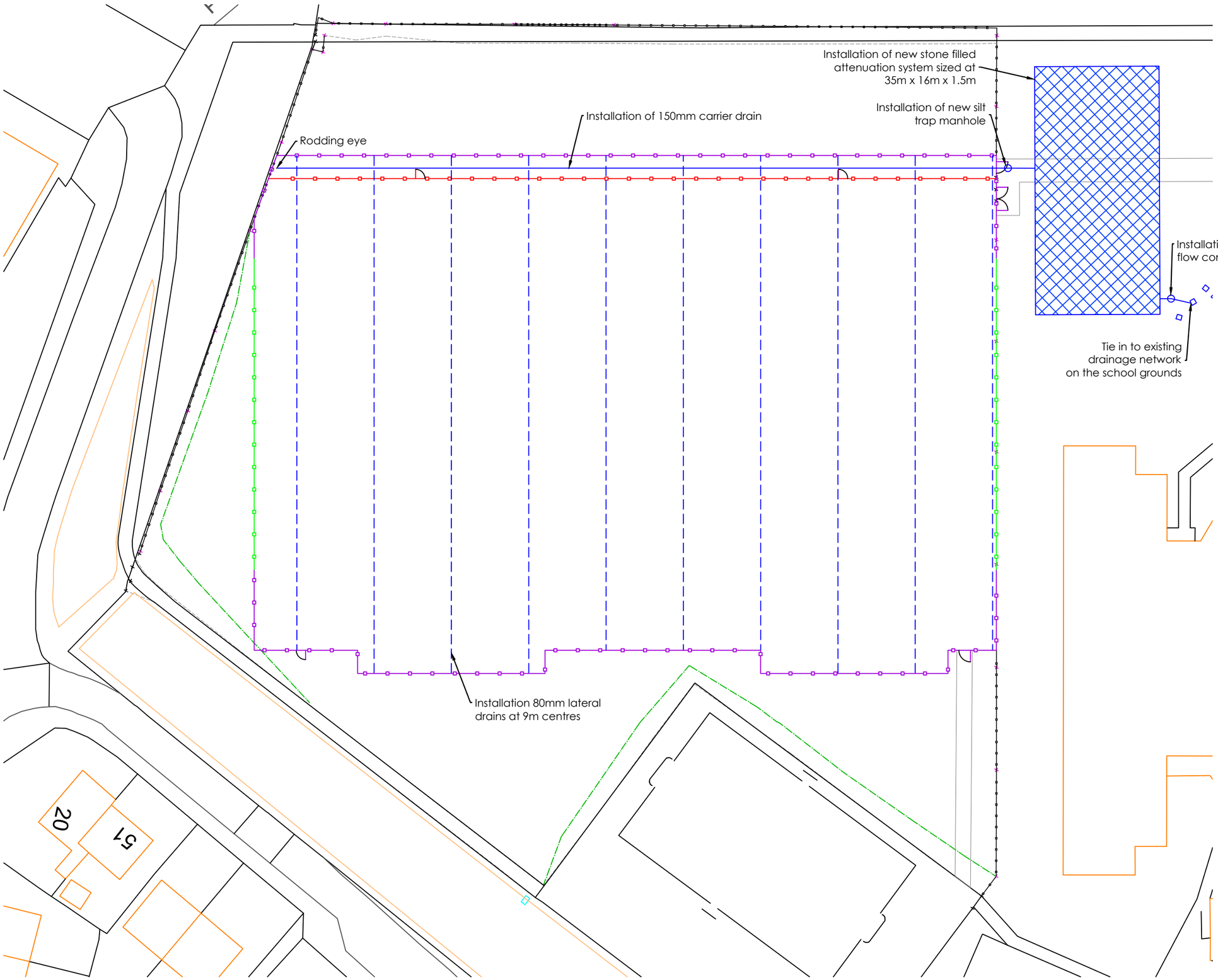
info@sportslabsconsult.com

YSGOL BRYN ALYN
GENERAL ARRANGEMENT
CONSTRUCTION OF A NEW 3G SYNTHETIC PITCH

0 5 10 20
Scale bar 1:500

Date: 11/2024 Scale: 1:500 @ A3	Job. No. 3310	Drawn by: CH Checked by: DD

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01 DRAINAGE LAYOUT
SCALE: 1:500

N

NOTES
It is the contractors responsibility to check design levels and sizes for compliance. Any discrepancies or errors to be identified to the design team.

Indicative levels are subject to Contractor's design.

New parallel drainage system
consisting of;

Lateral drainage - 80mm diamater at 6.0m centres

Carrier drainage - 150m diamater, location as shown

KEY

- Existing Fence
- New 3.0m Perimeter Fence
- New 1.2m Spectator Fence
- 80mm Diameter Perforated Pipe
- 150mm Diameter Perforated Pipe
- Existing Manhole
- New Manhole
- New Stone Filled Attenuation System

REVISION	DETAILS	BY	DATE	CHECKED

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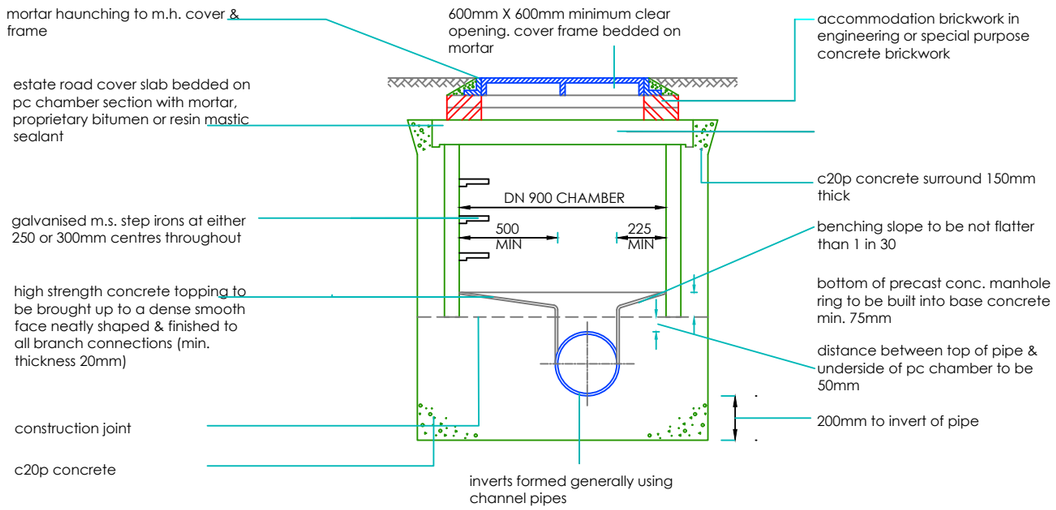
YSGOL BRYN ALYN
DRAINAGE LAYOUT
CONSTRUCTION OF A NEW 3G SYNTHETIC PITCH

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Scale bar 1:500

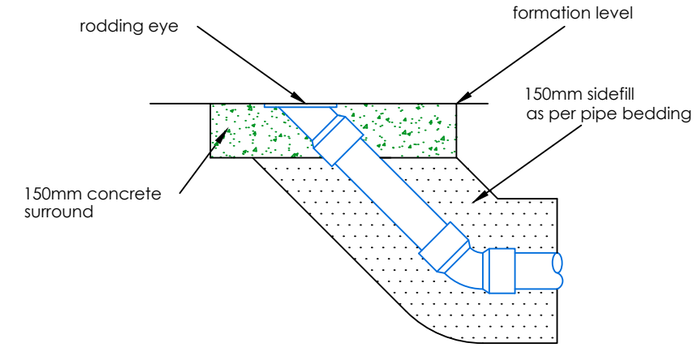
Date: 11/2024 Scale: 1:500 @ A3	Job. No. 3310	Drawn by: CH Checked by: DD

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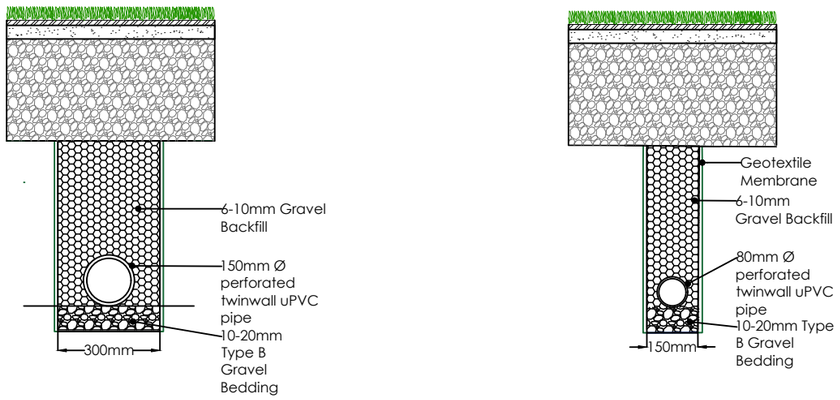
NOTES
It is the contractors responsibility to check design levels and sizes for compliance. Any discrepancies or errors to be identified to the design team.



01 STANDARD MANHOLE SECTION



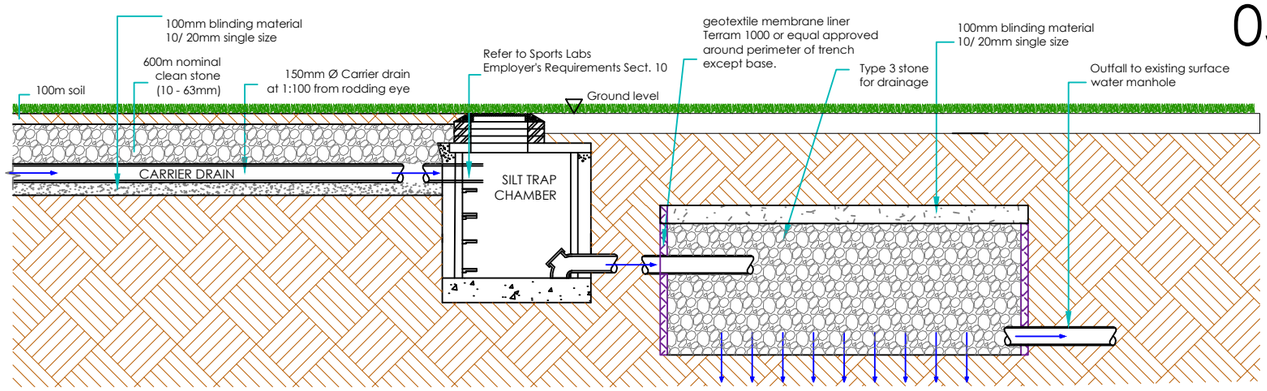
02 STANDARD RODDING EYE SECTION



03 STANDARD CARRIER DRAIN SECTION

04 STANDARD LATERAL DRAIN SECTION

05 STANDARD FLOW CONTROL MANHOLE SECTION



06 STANDARD ATTENUATION DETAIL
SCALE: NTS

REVISION	DETAILS	BY	DATE	CHECKED

sportslabsconsult

info@sportslabsconsult.com

YSGOL BRYN ALYN
DRAINAGE DETAILS
CONSTRUCTION OF A NEW 3G SYNTHETIC PITCH

Date: 11/2024	Job. No. 3310	Drawn by: CH
Scale: VARIES		Checked by: DD

APPENDIX D – DRAINAGE CALCULATIONS

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Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by: CH	Checked by: GS	Approved By: DD
Report Details: Type: Inflows Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		



Catchment Area

Type : Catchment Area

Area (ha)	0.628

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by:	Checked by:	Approved By:
	CH	GS	DD
Report Details: Type: Junctions Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
Manhole (1)	Manhole	331495.966	353637.820	106.801	0.630	106.171	Circular	1.200
Manhole (2)	Manhole	331495.938	353644.192	106.800	0.600	106.200	Circular	1.200
Manhole	Manhole	331495.762	353667.459	107.900	1.344	106.556	Circular	1.200

Name	Lock
Manhole (1)	None
Manhole (2)	None
Manhole	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
Manhole (1)	Inlet	Pipe (3)	(None)	No Restriction
Manhole (2)	Inlet	Pipe (2)	(None)	No Restriction
Manhole	Inlet	Pipe	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
Manhole (2)	Outlet	Pipe (3)	Orifice
	Diameter (m)	0.039	
	Coefficient of Discharge	0.600	
	Invert Level (m)	106.200	
Manhole	Outlet	Pipe (1)	Orifice
	Diameter (m)	0.065	
	Coefficient of Discharge	0.600	
	Invert Level (m)	106.556	

Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by: CH	Checked by: GS	Approved By: DD
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		



Soakaway

Type : Soakaway

Dimensions

Exceedance Level (m)	107.000
Depth (m)	1.700
Base Level (m)	105.300
Freeboard (mm)	0
Soakaway Shape	Rectangular
Diameter / Width (m)	35.100
Length (m)	16.100
Porosity (%)	37
Ineffective Storage Depth (m)	0.200
Number of Soakaways	1
Total Volume (m³)	313.636

Inlets

Inlet

Incoming Item(s)	Pipe (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (2)
Outlet Type	Free Discharge

Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by:	Checked by:	Approved By:
	CH	GS	DD
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		



Porous Paving

Type : Porous Paving

Dimensions

Exceedance Level (m)	107.898
Depth (m)	0.340
Base Level (m)	107.558
Paving Layer Depth (mm)	40
Membrane Percolation (m/hr)	500.0
Porosity (%)	33
Length (m)	115.378
Long. Slope (1:X)	200.00
Width (m)	54.409
Total Volume (m³)	623.227

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	80
No. of Barrels	10
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe
Outlet Type	Free Discharge

Advanced

Base Infiltration Rate (m/hr)	0.005
Side Infiltration Rate (m/hr)	0.005
Safety Factor	2.0
Conductivity (m/hr)	1000.0

Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by: CH	Checked by: GS	Approved By: DD
Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Porous Paving		Time of Concentration	0.628	100	0	100	0.628
TOTAL		**0.0**		**0.628**				**0.628**

Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by:	Checked by:	Approved By:
	CH	GS	DD
Report Details: Type: Network Design Criteria Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

Flow Options

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

1in1

Type: FSR

Return Period (years)	1.0
Region	England And Wales
M5-60 (mm)	18.0
Ratio R	0.318

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	0.300
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	☐

Pipe Size Library

Default

Add. Increment (mm)	75
Max. Diameter (mm)	0

Diameter (mm)	Min. Slope (1:X)	Max. Slope (1:X)
100	0.00	0.00
150	0.00	0.00

Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by:	Checked by:	Approved By:
	CH	GS	DD
Report Details: Type: Network Design Criteria Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

Manhole Options

Apply Offset	☐

Manhole Size Library

Default

Diameter / Width

Connection (mm)	Diameter / Length (m)	Width (m)
0	1.200	0.000
375	1.350	0.000
500	1.500	0.000
750	1.800	0.000

Additional Sizing

Connection (mm)	900
Diameter / Length (m)	0.900
Width (m)	0.000

Depth

Depth (m)	Diameter / Length (m)	Width (m)
0.000	1.050	0.000
1.500	1.200	0.000

Access

Depth (m)	Ladder Protrusion (mm)
0.000	130
3.000	230

Benching Requirements

Landing Width (mm)	500
Benching Width (mm)	225

Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by: CH	Checked by: GS	Approved By: DD
Report Details: Type: Outfall Details Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

Outfalls

Outfall	Outfall Type	Gated	Fixed Surcharged Level (m)	Level Curve
Manhole (1)	Free Discharge			

Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by: CH	Checked by: GS	Approved By: DD
Report Title: Rainfall Analysis Criteria	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

Runoff Type	Dynamic
Output Interval (mins)	1
Time Step	Reduced
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by: CH	Checked by: GS	Approved By: DD
Report Title: UK and Ireland Rural Runoff Calculator	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.628
SAAR (mm)	836.0
Soil	0.47
Region	Region 9
Urban	0
Return Period (years)	0

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 9	3.7	3.7	3.3	6.6	8.1

Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by: CH	Checked by: GS	Approved By: DD
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m^3)
Catchment Area	1in100+40: 100 years: +40 %: 15 mins: Winter	0.63	324.1	149.581

Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by: CH	Checked by: GS	Approved By: DD
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

Critical Storm Per Item: Rank By: Max. Depth

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
Manhole (1)	1in100+40: 100 years: +40 %: 960 mins: Winter	106.801	106.171	106.216	0.045	2.4	0.000	0.000	2.4	124.586	OK
Manhole (2)	1in100+40: 100 years: +40 %: 960 mins: Winter	106.800	106.200	106.798	0.598	2.4	0.677	0.000	2.4	124.625	Flood Risk
Manhole	1in100+40: 100 years: +40 %: 360 mins: Winter	107.900	106.556	107.841	1.285	9.9	1.453	0.000	9.9	320.313	Flood Risk

Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by: CH	Checked by: GS	Approved By: DD
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Porous Paving	1in100+40: 100 years: +40 %: 240 mins: Winter	108.180	107.850	72.7	266.258	0.000	10.0	233.876	57.278	OK
Soakaway	1in100+40: 100 years: +40 %: 960 mins: Winter	106.800	106.800	9.6	313.596	0.000	2.4	124.814	0.013	OK

Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by: CH	Checked by: GS	Approved By: DD
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

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
Pipe (3)	1in100+40: 100 years: +40 %: 960 mins: Winter	Pipe	Manhole (2)	Manhole (1)	106.800	106.798	0.046	124.586	0.5	0.2	2.4	Flood Risk
Pipe (1)	1in100+40: 100 years: +40 %: 360 mins: Winter	Pipe	Manhole	Soakaway	107.900	107.841	0.150	320.132	2.3	0.12	9.9	Flood Risk
Pipe (2)	1in100+40: 100 years: +40 %: 960 mins: Winter	Pipe	Soakaway	Manhole (2)	107.000	106.800	0.150	0.000	0.1	0.18	2.4	Surcharged
Pipe	1in100+40: 100 years: +40 %: 15 mins: Summer	Pipe	Porous Paving	Manhole	107.906	107.617	0.150	12.324	1.1	0.15	18.8	OK

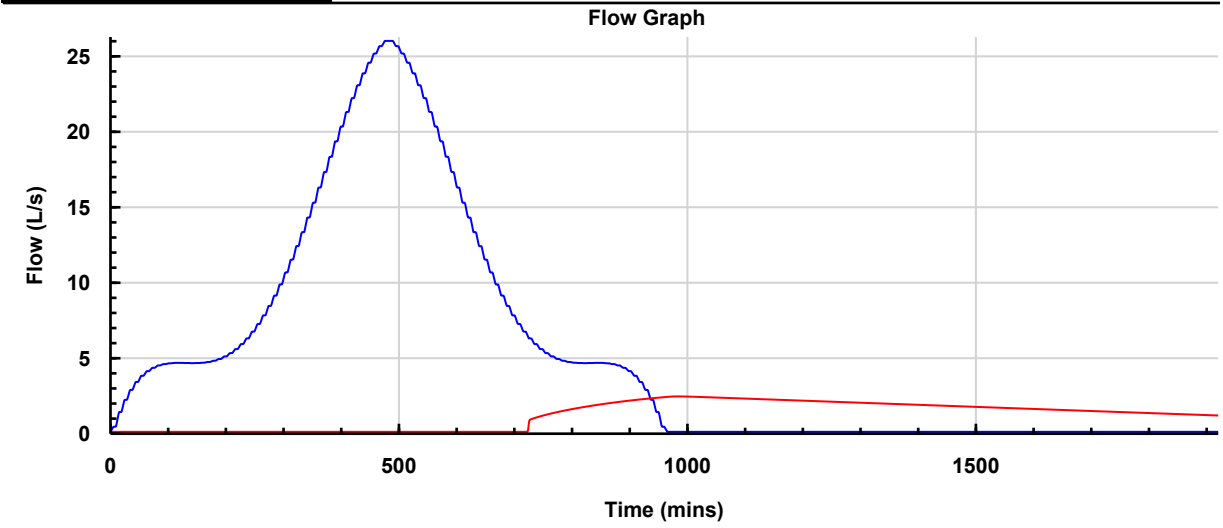
Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by: CH	Checked by: GS	Approved By: DD
Report Details: Type: Phase Management Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

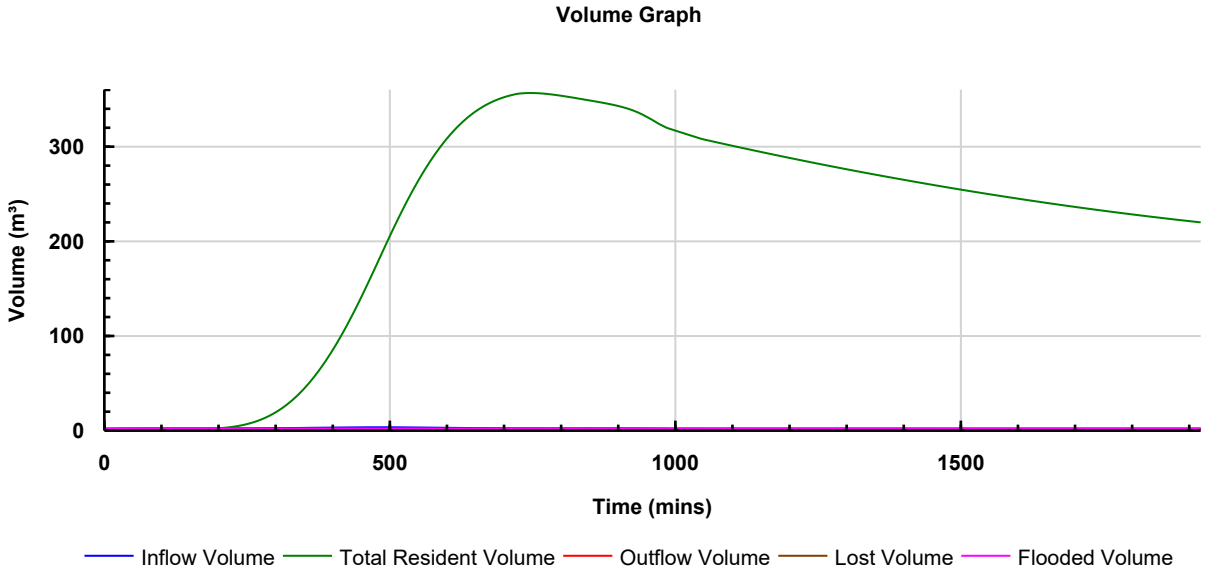
Phase
1in100+40: 100 years: Increase Rainfall (%): +40: 960 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Manhole (1)			2.4	124.586
TOTAL	26.0	592.700	2.4	124.586

Graphs



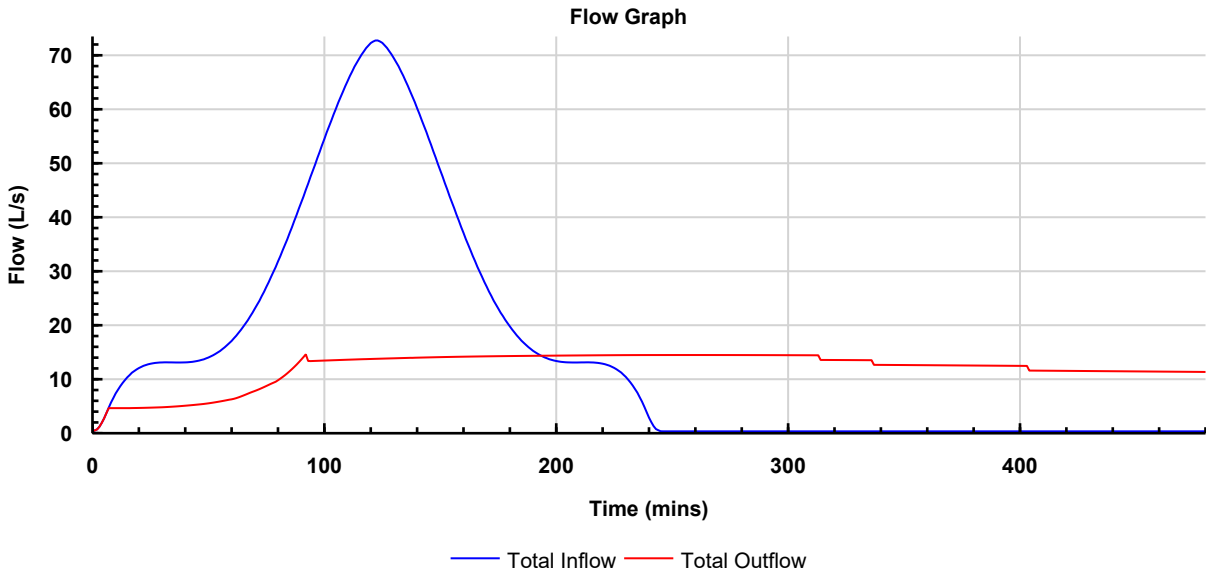


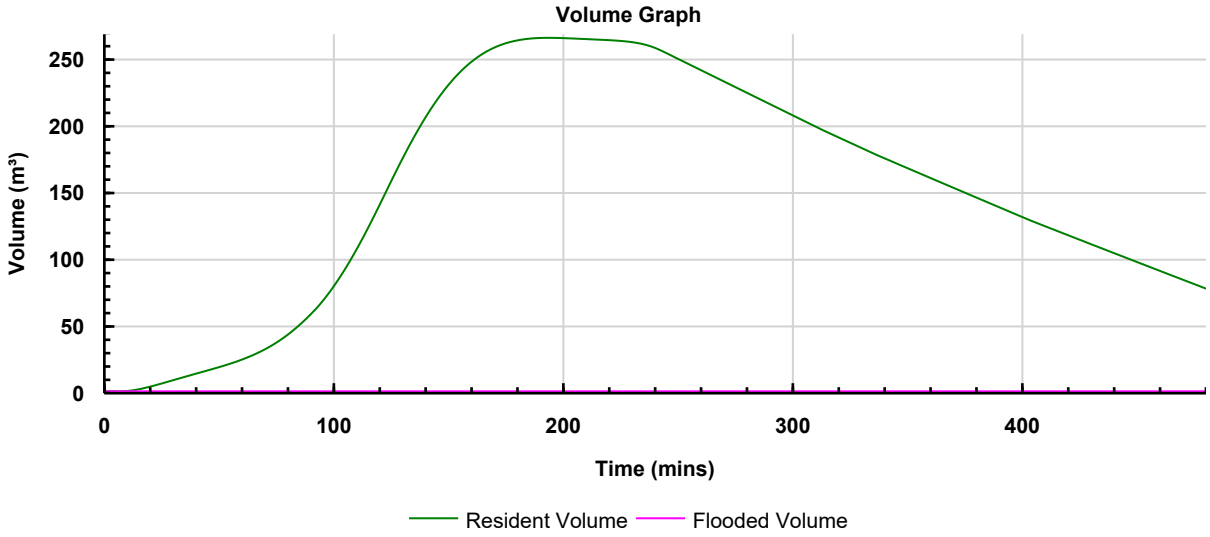
Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by:	Checked by:	Approved By:
	CH	GS	DD
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

Porous Paving
Critical Storm: 1in100+40: 100 years: Increase Rainfall (%): +40: 240 mins: Winter

Type : Porous Paving

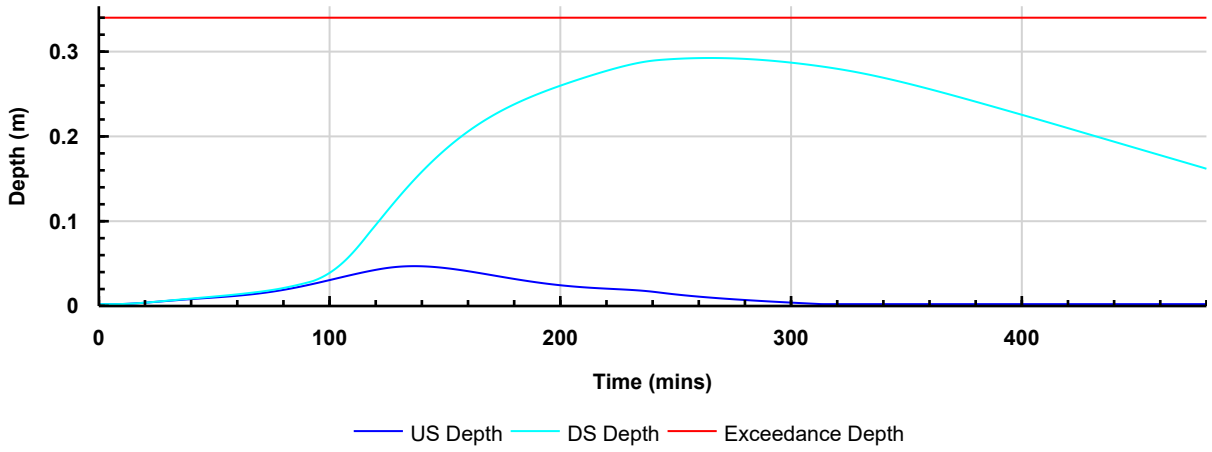
Graphs





Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by: CH	Checked by: GS	Approved By: DD
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

Depth Graph

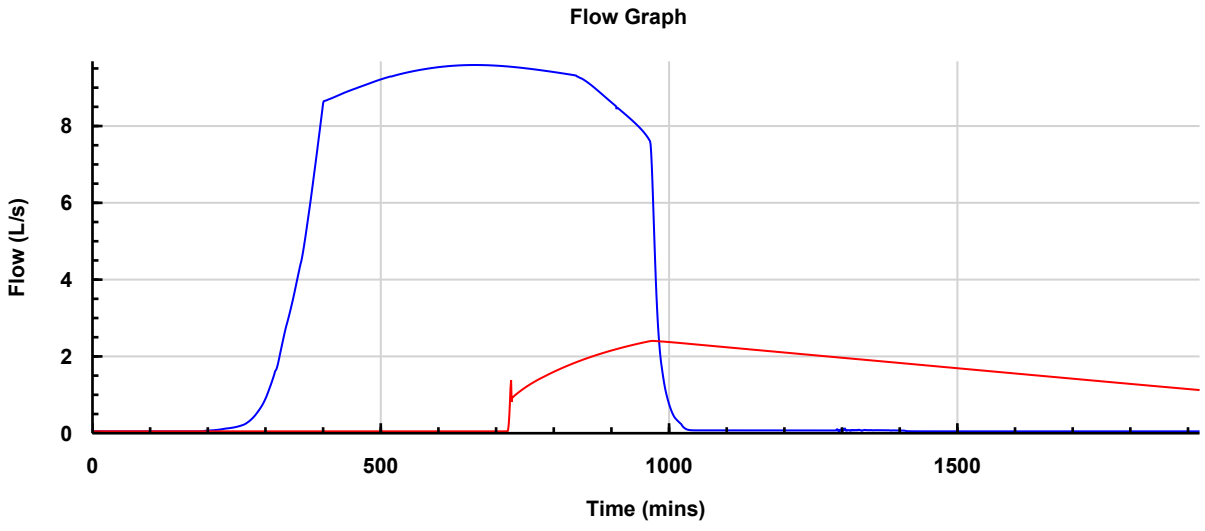


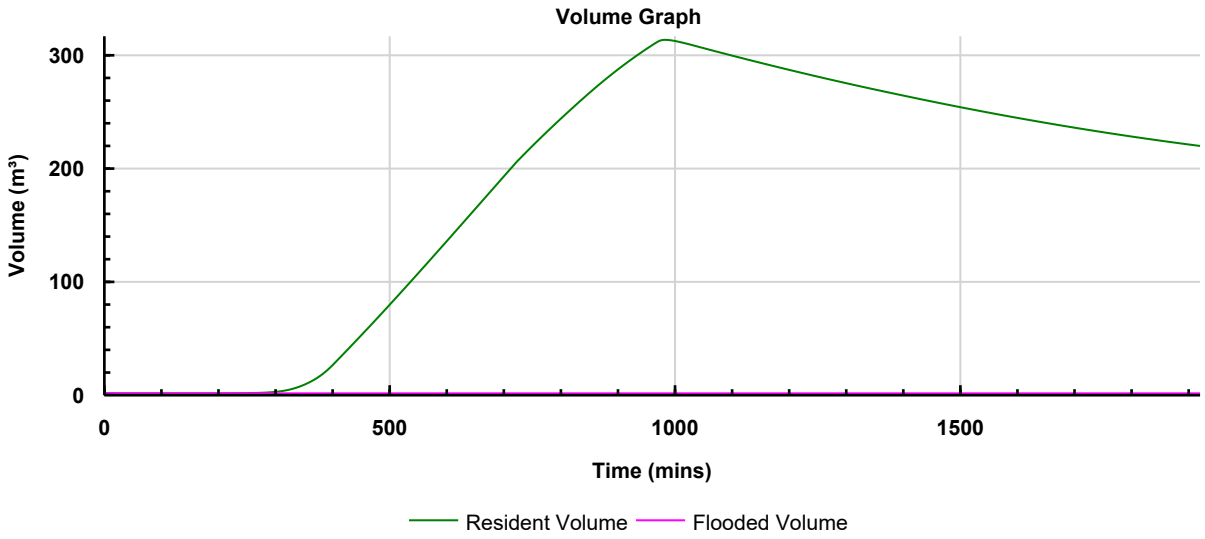
Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by:	Checked by:	Approved By:
	CH	GS	DD
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		

Soakaway
Critical Storm: 1in100+40: 100 years: Increase Rainfall (%): +40: 960 mins: Winter

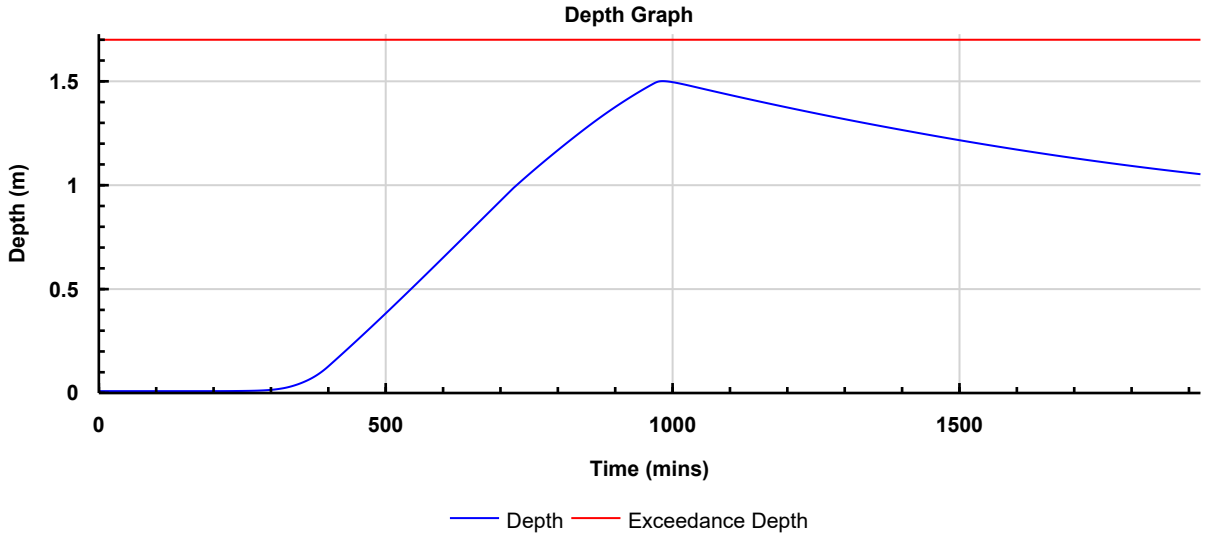
Type : Soakaway

Graphs





Project:	Date:		
Ysgol Bryn Alyn Church Street Gwersyllt, Wrexham	20/11/2024		
	Designed by: CH	Checked by: GS	Approved By: DD
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address: Sports Labs Ltd 1 Adam Square Livingston		



APPENDIX E – FLOOD MAP FOR PLANNING

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Cyfoeth Naturiol Cymru
Natural Resources Wales

Flood Map for Planning - Basic

Ysgol Bryn Alyn Floodmap



Legend

TAN15 Defended Zones

- Rivers
- Sea
- Rivers and Sea

Rivers and Sea

- Flood Zone 3
- Flood Zone 2

Surface Water and Small Watercourses

- Flood Zone 3
- Flood Zone 2

Scale at A3: 1:2,500

Date: 26/11/2024

N

0.1 0.05 0 0.1

km

British National Grid

Disclaimer

https://naturalresources.wales/flooding/disclaimer-for-our-flood-and-coastal-erosion-risk-maps/?lang=en

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END OF REPORT

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