



**New Artificial Grass Pitch
Langho FC
Northcote Rd
Langho
BB6 8BE**

Surface Water Strategy

R - 00339 – 001 – SWS – 0
February 2026

Report Originator(s)

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Revision Record

Revision	Date	Description	Written	Approved
0	25.02.26	First Issue	WRA	WRA

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SEA Drawing 00339/E02

1.0 Introduction

1.1 Design Brief

- 1.1.1 The client, Labosport, requires a surface water drainage design for the installation of a new Artificial grass pitch (AGP) at Langho FC in Langho.
- 1.1.2 This report provides design proposals to ensure surface water is managed adequately, along with a SUDS assessment and maintenance schedule.
- 1.1.3 This report has been prepared by SEA Consulting Engineers Ltd. With the benefit limited to our instructing Client, Labosport.

1.2 Site Location

- 1.2.1 The proposed development lies within Langho, approximately 1km northeast of the village centre, at the following postal address:
Langho FC
Northcote Road
Langho
BB6 8BE
- 1.2.2 A site location plan is presented in Appendix A

1.3 Current Land Use

- 1.3.1 The existing site comprises an open playing field.

1.4 Proposed Development

- 1.4.1 The proposed development will comprise the construction of a new AGP. A proposed site plan is presented in Appendix B.

2.0 Surface Water Drainage

2.1 Existing Surface Water Drainage

- 2.1.1 The site does not have any formal surface water drainage, but there is an existing ditch along the west and southern boundary of the site.

2.2 Proposed Storm Drainage Discharge

- 2.2.1 In accordance with the National Planning Policy Framework (NPPF) and the National Planning Practice Guidance (NPPG), the site should be drained in the most sustainable manner.
- 2.2.2 The National standards for sustainable drainage systems (SuDS) (2025) clearly outline the hierarchy to be investigated by the developer when considering a surface water drainage strategy. As such, the developer must consider the following drainage options in the following order of priority:
- Priority 1 – Collected for non-potable use;
 - Priority 2 – Infiltrated to ground;
 - Priority 3 – Discharged to an above-ground surface water body;
 - Priority 4 – Discharged to a surface water sewer, highway drain, or other piped system;
 - Priority 5 – Discharged to a combined sewer.

Each of these is considered separately below.

Priority 1 – Collected for non-potable use

- 2.2.3 There is no significant or continuous on-site water demand, and therefore there is no scope for the reuse of surface water within the site, and so rainwater re-use is not proposed.

Priority 2 – Infiltrated to ground

- 2.2.4 A ground investigation has been carried out by Soiltechnics Ltd. Infiltration testing was carried out with negative results, and they have determined that the use of infiltration techniques is not viable. Extracts of the ground investigation report are presented in Appendix C

Priority 3 – Discharged to an above-ground surface water body

- 2.2.5 As described in section 2.1 above, there is an existing ditch to the west, which offers a viable outfall for the site's surface water.

Priority 4 – Discharged to a surface water sewer, highway drain, or other piped system

- 2.2.6 As an outfall to an above-ground surface water body is viable, this option has not been explored

2.3 Proposed Surface Water Drainage Strategy

- 2.3.1 Proposals are to drain the AGP to the existing ditch to the south of the site.
- 2.3.2 The design will use FEH22 rainfall parameters and will be for all drained areas of the site to accommodate storms up to the 1 in 100-year event and allow for an increase in storm intensities up to 50%. This is based on the Environment Agency updates of May 2022, which bases peak rainfall climate change allowance on river management catchment areas. An extract from the EA website based on the site location is presented in Appendix D. The site's drained areas are presented in Appendix E and equate to a total area of 6420m².
- 2.3.3 Proposals are to restrict the pitches' surface water to as close to greenfield runoff rates as possible. The online greenfield runoff tool by HR Wallingford has been used to assess the greenfield runoff rates, based on the site's drained areas. The calculations are presented in Appendix F and show that the Qbar value is 8.0l/s.
- 2.3.4 The new artificial grass pitch will consist of a synthetic surface, porous shockpad, along with porous macadam and a 250mm permeable type 3 subbase, all laid with a gradient of 1:275 south to north, which will allow water to infiltrate through the pitch make up to a series of new lateral drains which will collect surface water before outfalling into a HydroBrake flow control device, restricted to 8.0l/s with attenuation provided within the pitches make up. Flows will then outfall into the existing ditch to the west.
- 2.3.5 The system has been modelled using Causeway Flow for all storm durations up to 10,080mins. The calculations are presented in Appendix G and show that the pitch subbase provides adequate attenuation for the 1-in-30-year storm event. However, during the 1in100 year + 50% event, the calculations show a flooded volume of 101.35m³.
- 2.3.6 Flooding in the 1in100 + 50% storm event is acceptable as long as it can be demonstrated that water can be contained on site and not cause any issue to buildings or 3rd party land. It is proposed to provide an edging/kerb with a 125mm upstand kerb at the pitch edge to store this flooded water within the pitch extent. Based on the pitch gradient of 1:275, a maximum water depth of 110mm can be expected.
- 2.3.7 A drainage layout is presented in Appendix H, which shows the extent of this edging/kerb along with the aforementioned designs.

2.4 SUDS

- 2.4.1 The use of SUDS and pollution control measures has been assessed using the Simple Index Approach set out within the CIRIA SUDS Manual 2015. Based on Table 26.2 of the SUDS Manual, the pollution indices for the site are set out in Table 2.1 below.

Pollution Hazard Indices for Different Land Use Classifications				
Land use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05

Table 2.1 – Extract of table 26.2 of the SUD manual.

- 2.4.2 Residential roofs are considered to be the most appropriate category for the AGP, due to the minimal pollution hazard associated with it, which will have no vehicle movements within its extent.
- 2.4.3 Surface water from the AGP will pass through a permeable subbase. Therefore, it acts very similar to permeable paving.
- 2.4.4 Table 26.3 of The SuDS Manual shows the mitigation indices for a range of SuDS components for discharges to surface waters. An extract of this is provided in Table 2.2 below for the components relevant to the proposed development.

Indicative mitigation indices			
Type of SUDS Component	Mitigation Indices		
	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7

Table 2.2 – Extract from table 26.3 of the SUDS Manual

- 2.4.5 Based on the above, it can be seen that the permeable subbase will provide adequate treatment for the site's surface water.

2.5 Maintenance

- 2.5.1 All new surface water will remain private, and maintenance will be the responsibility of the landowner. The following maintenance plan shall be implemented.

Pitch and Permeable Subbase

Maintenance Schedule		
Maintenance Category	Required Action	Frequency
Regular Maintenance	Brushing (Standard cosmetic sweep over all areas)	Once a year, after the autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturers' recommendations. Particular attention to be paid to areas where water flows into pervious areas from adjacent impermeable areas, as this area is most likely to collect sediment
Occasional maintenance	Stabilise and mow adjacent contributing areas	As required
	Removal of weeds or management using an appropriate weed killer, applied directly into the weeds by an applicator rather than spraying	As required
Remedial Actions	Remediate any landscaping which, through vegetation maintenance strip, has been raised to within 50mm of the finished surface	As required
	Remedial work to any depressions, rutting and cracked surfacing considered detrimental to the performance or hazardous to users	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10-15 years, or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for 3 months after installation
	Inspect for areas of poor operation and/or weed growth – if required, take remedial action	3-monthly, 48 hours after large storms for the first 6 months
	Establish slit accumulation rates and establish appropriate brushing frequencies.	Annually
	Monitor Inspection chambers	Annually

3.0 Conclusion

3.1.1 Based on the above, and providing the above strategies are adopted, the developed site will not contribute further to flood risk and therefore satisfy the requirements of the National Planning Policies Framework.

3.1.2 References

- Department for Communities and Local Government (Feb 2025) - National Planning Policy Framework.
- BS 8533:2011 Assessing and managing flood risk in development – Code of Practice.
- CIRIA Report C635 Designing for exceedance in urban drainage – good practice.
- The SUDS Manual
- BS 8533:2011 Assessing and managing flood risk in development – Code of Practice.
- Design and Analysis of Urban Storm Drainage – The Wallingford procedure – Volume 1.



Client	Labosport
Project	New Artificial Grass Pitch, Langho FC
Title	Surface Water Strategy

Appendix A

Site Location Plan

LOCATION PLAN

CHECK ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORK

NO GUARANTEE CAN BE GIVEN THAT ALL SERVICES HAVE BEEN SHOWN ON THE DRAWING

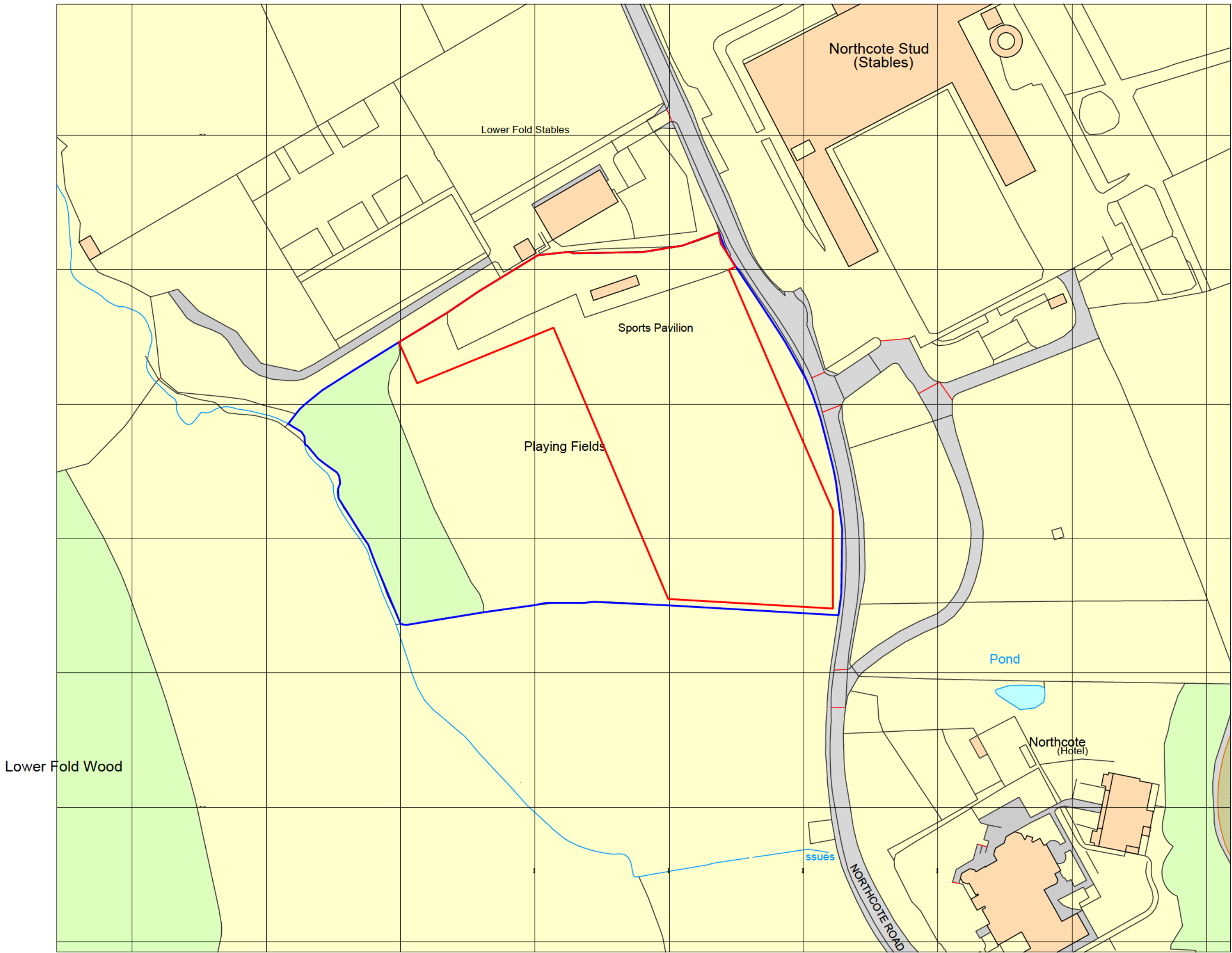
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RELEVANT SERVICE DRAWINGS SHOULD BE OBTAINED FROM APPROPRIATE SERVICE PROVIDERS AND USED IN CONJUNCTION WITH THIS DRAWING

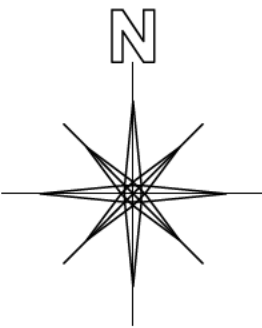
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- APPLICATION SITE
AREA REQUIRED
- LAND AREA UNDER
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CLIENT
G-234210 LANGHO FC
PROJECT
SYNTHETIC TURF PITCH (STP) DEVELOPMENT

LOCATION PLAN

DRAWING		PROJECT	
PLANNING	TW	01	
STATUS G-234210	DATE 05.02.26	25-0632 (G-234210) 01	
PROJECT G-234210	SCALE 1:1250		
PAPER SIZE A1	SCALE 1:1250	DRAWING	





Client	Labosport
Project	New Artificial Grass Pitch, Langho FC
Title	Surface Water Strategy

Appendix B

Proposed Site Plan

SITE PLAN

CHECK ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORK

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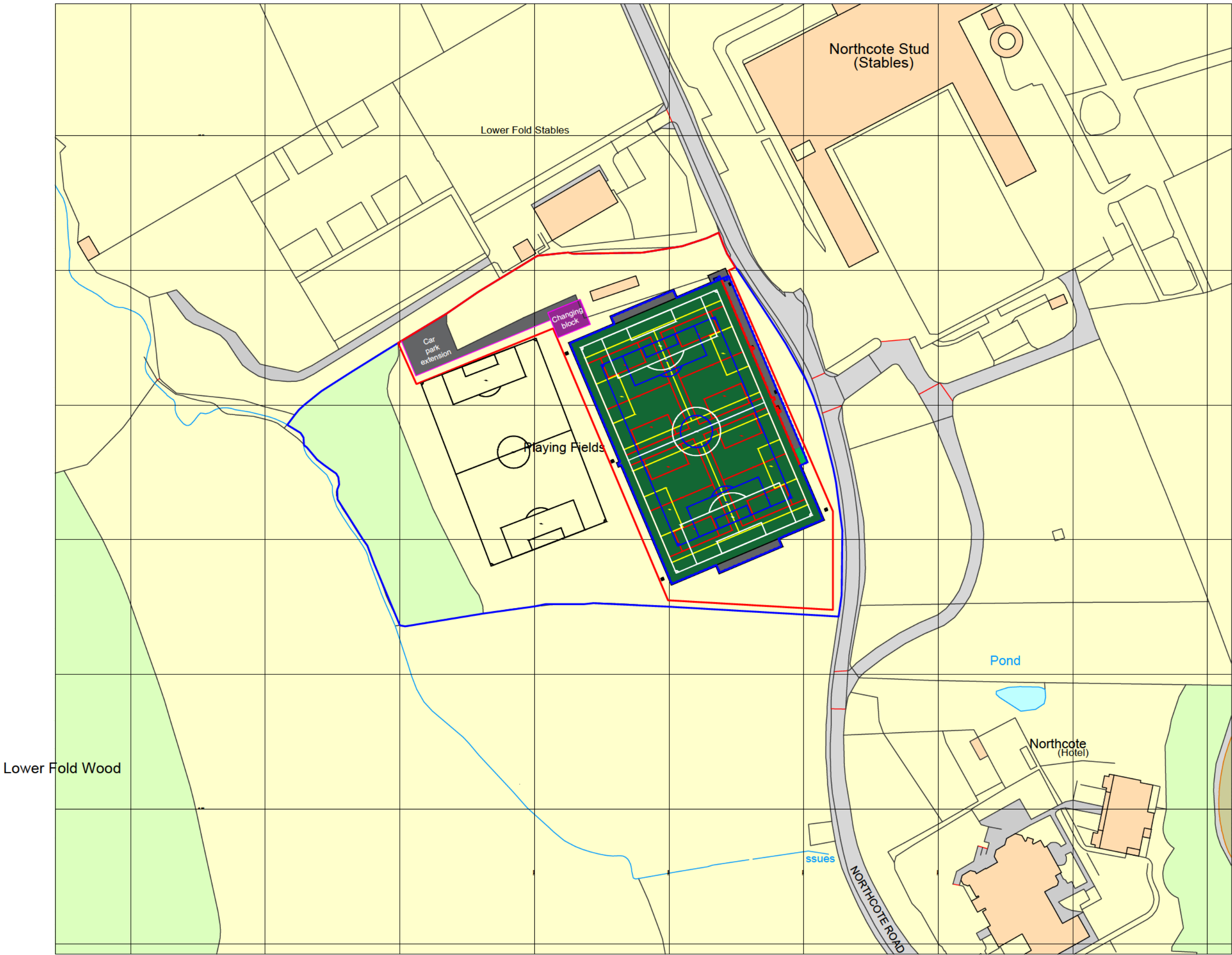
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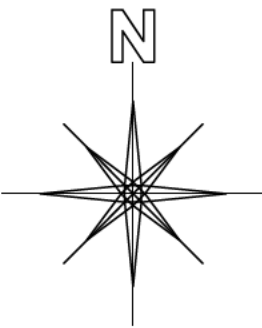
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PROJECT G-234210 LANGHO FC
SYNTHETIC TURF PITCH (STP) DEVELOPMENT

SITE PLAN

DRAWING		PROJECT	
PLANNING	TW	01	
STATUS	G-234210	DATE	02.02.26
PROJECT	LSUK-25-0632	PROJECT NAME	25-0632[G-234210] 02
PAPER SIZE	A1	SCALE	1:1250



Client	Labosport
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Appendix C

Ground Investigation Extracts

- 7.6.4 It is recommended that the formation level is trimmed and rolled following the requirements outlined in the Specification for Highway Works Series 600. Such a process will identify any soft/loose areas, which should either be excavated out and backfilled with a suitable well compacted material similar to those exposed in the sides of the resulting excavation, or large cobbles of a good quality stone rolled into the formation to stabilise the 'soft/loose' area.
- 7.6.5 The Devensian Till/ Reworked Devensian Till deposits are considered frost susceptible and this may override the CBR criteria for pavement foundation design purposes.

7.7 Drainage

- 7.7.1 Infiltration testing has been undertaken at the site following the principles of BRE 365: Soakaway Design (2016). The results are presented in Appendix C.
- 7.7.2 The deposits of the Devensian Till were encountered as a cohesive material. Indicative testing was undertaken within HP02, however only one cycle could be undertaken during the fieldwork due to the very slow dissipation of water added. Due to insufficient infiltration over the test period, permeability could not be determined.
- 7.7.3 As a result, such soils are considered to be effectively impermeable for the purposes of drainage design. On this basis, disposal of stormwater via a soakaway is not considered viable.
- 7.7.4 As an alternative, it is possible that the AGP drainage could key into an existing pitch drainage systems, if present. In addition, subject to permissions, water could potentially be discharged into the tributary of Bushburn Brook some 100m to the west of the AGP footprint. If these are considered options for the development a comprehensive drainage assessment will be required to determine the potential impact on the capacity of the existing systems, to identify the invert levels of existing features, and to confirm drainage gradients achievable across the proposed AGP area.

7.8 Aggressiveness of the Ground to Buried Concrete

- 7.8.1 The aggressiveness of the ground with respect to buried concrete has been assessed in accordance with Building Research Establishment Special Digest 1: Concrete in Aggressive Ground Third Edition (2005).
- 7.8.2 The site is interpreted to be a greenfield site where pyrite is unlikely to be present.
- 7.8.3 The classification of the strata is tabulated below:

Stratum	Disturbed / Undisturbed	Design sulphate class	Aggressive chemical environment for concrete class
Devensian Till	N/A	DS-1	AC-1s

Table 7-B: Summary of the aggressiveness of the ground to buried concrete



Key:

- Site Boundary
- Proposed AGP Footprint
- Proposed Parking
- Hand Pit
- Dynamic Cone Penetrometer (DCP) Test
- Soakaway Testing

Notes

1) Base image provided by Google.

2) All drawn features are approximate.

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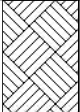
A	Dec 2025	First issue
REV	DATE	COMMENT ON VARIATION

soiltechnics
environmental • geotechnical • building fabric

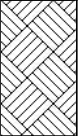
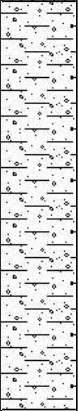
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Langho FC, Langho

TITLE
Exploratory Hole Location Plan

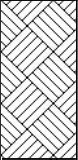
DRAWING No.
STX7133-D01-A

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto brown slightly sandy CLAY with frequent rootlets. (TOPSOIL - MADE GROUND)	0.25						0.10		ES
Firm orangish brown mottled grey slightly gravelly CLAY. Gravel is fine to coarse subangular sandstone and siltstone. (DEVENSIAN TILL)					PP 0.30	PP 109	0.40		D
					PP 0.60	PP 75	0.75		D
...at 0.8m depth, becoming soft.					PP 0.90	PP 38	1.10		D
TRIAL PIT TERMINATED AT 1.20m	1.20				PP 1.15	PP 54			

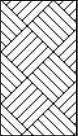
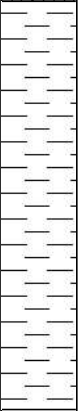
Notes Trial pit sides remained upright and stable upon completion.	Groundwater observations		Title Trial pit record	Dimensions (w x l) 0.35m x 0.35m	Date(s) 26/11/2025
	Strike (m)	Comments	Method Hand excavated	Plant used Hand tools	Sheet number Sheet 1 of 1
	1.00	Rising to 1.05m after completion of the pit.	Level (m OD) -	Logged by OH	Revision A
			Co-ordinates Not surveyed	Status FINAL	HP01

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)	0.30						0.20		ES
Firm orangish brown mottled grey slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded sandstone and siltstone. (DEVENSIAN TILL)					PP 0.40	PP 92			
					PP 0.70	PP 71	0.60		D
...at 1.00m depth, becoming soft	1.20				PP 1.00	PP 34	1.00		D
					PP 1.10	PP 17			
TRIAL PIT TERMINATED AT 1.20m									

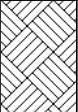
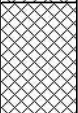
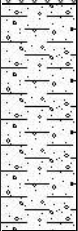
Notes Trial pit sides remained upright and stable upon completion. Infiltration testing performed.	Groundwater observations		Title Trial pit record	Dimensions (w x l) 0.35m x 0.35m	Date(s) 26/11/2025
	Strike (m)	Comments			
	1.10	No significant rise after 20 minutes.	Method Hand excavated	Plant used Hand tools	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by OH	Revision A
			Co-ordinates Not surveyed	Status FINAL	HP02

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto brown very sandy CLAY with frequent rootlets. (TOPSOIL)	0.35				PP 0.40	PP 79	0.30		ES
Firm orangish brown mottled grey slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded sandstone and siltstone. (DEVANSIAN TILL)							0.50		D
...at 0.8m depth, becoming soft.					PP 0.70	PP 75	1.10		D
	1.20				PP 0.90	PP 17			
TRIAL PIT TERMINATED AT 1.20m					PP 1.19	PP 13			

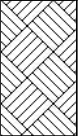
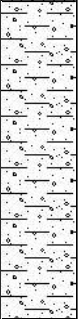
Notes Trial pit sides remained upright and stable upon completion.	Groundwater observations		Title Trial pit record	Dimensions (w x l) 0.35m x 0.40m	Date(s) 26/11/2025
	Strike (m)	Comments	Method Hand excavated	Plant used Hand tools	Sheet number Sheet 1 of 1
	1.15	No significant rise after 20 minutes.	Level (m OD) -	Logged by OH	Revision A
			Co-ordinates Not surveyed	Status FINAL	HP03

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto brown slightly gravelly slightly clayey fine to coarse SAND with many rootlets. Gravel is fine to coarse angular to subrounded concrete, siltstone and occasional brick. (TOPSOIL)	0.30						0.15		ES
Firm orangish brown mottled grey slightly gravelly CLAY with low cobble content of subrounded siltstone. (DEVENSIAN TILL)					PP 0.30	PP 117	0.40		D
...at 0.9m depth, becoming soft.					PP 0.60	PP 75			
	1.20				PP 0.90	PP 25	1.00		D
TRIAL PIT TERMINATED AT 1.20m					PP 1.19	PP 21			

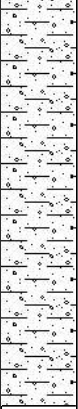
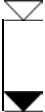
Notes Trial pit sides remained upright and stable upon completion.	Groundwater observations		Title Trial pit record	Dimensions (w x l) 0.35m x 0.35m	Date(s) 26/11/2025
	Strike (m)	Comments	Method Hand excavated	Plant used Hand tools	Sheet number Sheet 1 of 1
	1.00	Rising to 0.9m upon completion.	Level (m OD) -	Logged by OH	Revision A
			Co-ordinates Not surveyed	Status FINAL	HP04

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto brown slightly gravelly slightly clayey fine to coarse SAND with frequent rootlets. Gravel is fine to coarse angular to subrounded concrete, siltstone and occasional brick. (TOPSOIL - MADE GROUND)	0.25				PP 0.40	PP 50	0.20		ES
Firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded sandstone and siltstone. (REWORKED DEVANSIAN TILL)							0.40 0.40		ES D
Firm grey mottled orangish brown slightly gravelly CLAY with low cobble content of subrounded siltstone. Gravel is fine to coarse angular to subrounded sandstone, siltstone and quartzite. (DEVANSIAN TILL)	0.50				PP 0.80	PP 59	0.75		D
TRIAL PIT TERMINATED AT 1.00m	1.00								

Notes Trial pit sides remained upright and stable upon completion. Terminated due to presence of cobble in base of pit.	Groundwater observations		Title Trial pit record	Dimensions (w x l) 0.30m x 0.35m	Date(s) 26/11/2025
	Strike (m)	Comments			
			Method Hand excavated	Plant used Hand tools	Sheet number Sheet 1 of 1
			Level (m OD) -	Logged by OH	Revision A
	No groundwater strike recorded		Co-ordinates Not surveyed	Status FINAL	HP05

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)	0.30						0.20		ES
Firm grey mottled orangish brown slightly gravelly CLAY with low cobble content of subrounded siltstone. Gravel is fine to coarse angular to subrounded sandstone, siltstone and quartzite. (DEVANSIAN TILL)					PP 0.35	PP 46	0.40		D
					PP 0.70	PP 71			
	1.00				PP 0.90	PP 63			
TRIAL PIT TERMINATED AT 1.00m									

Notes Trial pit sides remained upright and stable upon completion.	Groundwater observations		Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 26/11/2025
	Strike (m)	Comments	Method Hand excavated	Plant used Hand tools	Sheet number Sheet 1 of 1
	0.95	Rising to 0.9m upon completion.	Level (m OD) -	Logged by OH	Revision A
			Co-ordinates Not surveyed	Status FINAL	HP06

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Dark brown slightly sandy fine to coarse GRAVEL of angular to subangular igneous rock. (MADE GROUND)	0.10						0.05		ES
Firm grey mottled orangish brown slightly gravelly CLAY. Gravel is fine to coarse angular to subangular sandstone and siltstone. (DEVENSIAN TILL) ...at 0.1m depth, fabric membrane observed.					PP 0.50	PP 46			
					PP 0.90	PP 46	0.80		D
TRIAL PIT TERMINATED AT 1.00m	1.00								

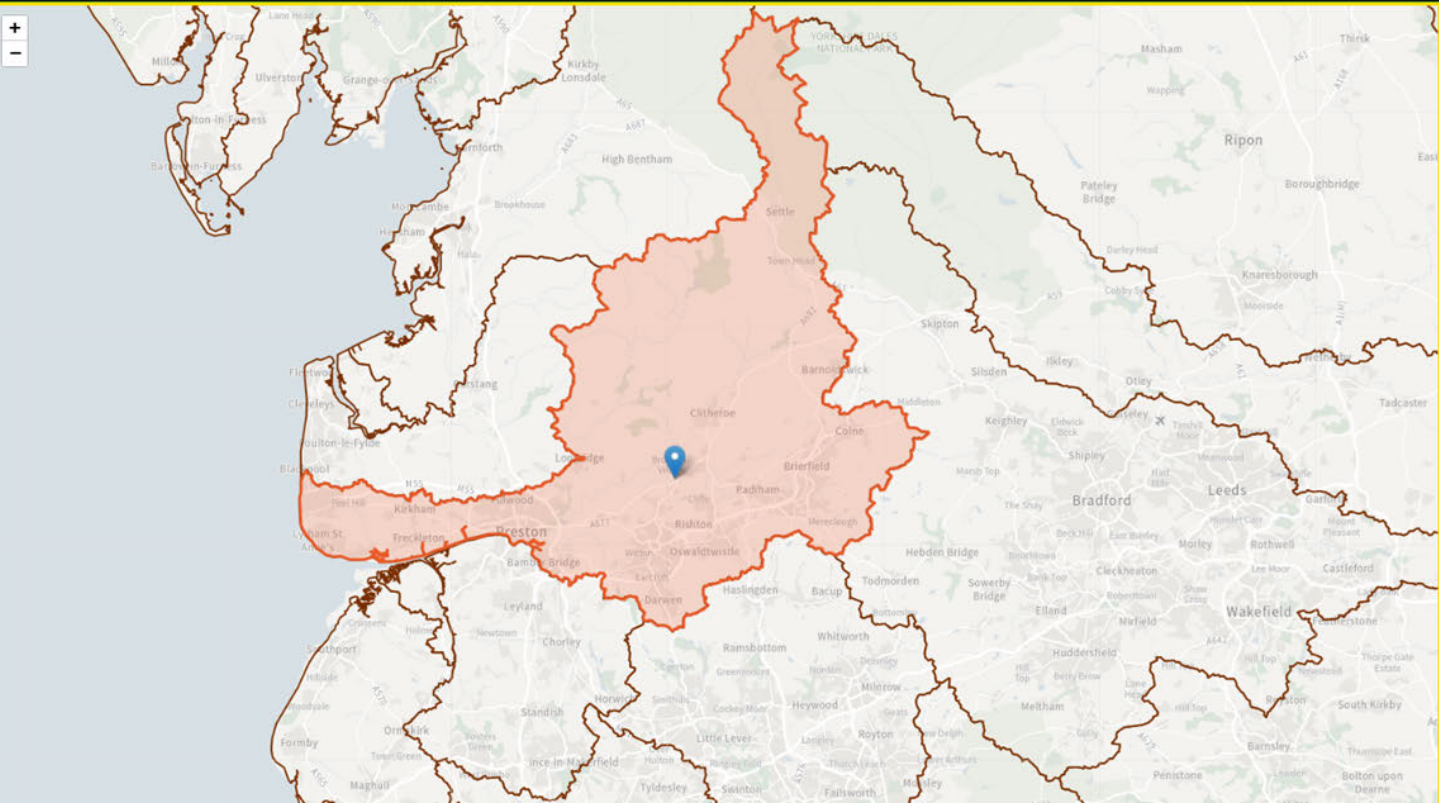
Notes Trial pit sides remained upright and stable upon completion.	Groundwater observations		Title Trial pit record	Dimensions (w x l) 0.35m x 0.30m	Date(s) 26/11/2025
	Strike (m)	Comments	Method Hand excavated	Plant used Hand tools	Sheet number Sheet 1 of 1
	0.70	Rising to 0.9m upon completion.	Level (m OD) -	Logged by OH	Revision A
			Co-ordinates Not surveyed	Status FINAL	HP07



Client	Labosport
Project	New Artificial Grass Pitch, Langho FC
Title	Surface Water Strategy

Appendix D

Environment Agency Climate Change Allowances



Ribble Management Catchment peak rainfall allowances

3.3% annual exceedance rainfall event

Epoch	3.3% annual exceedance rainfall event	
	Central allowance	Upper end allowance
2050s	25%	35%
2070s	30%	40%

1% annual exceedance rainfall event

Epoch	1% annual exceedance rainfall event	
	Central allowance	Upper end allowance
2050s	25%	40%
2070s	35%	50%

*Use '2050s' for development with a lifetime up to 2060 and use the 2070s epoch for development with a lifetime between 2061 and 2125.

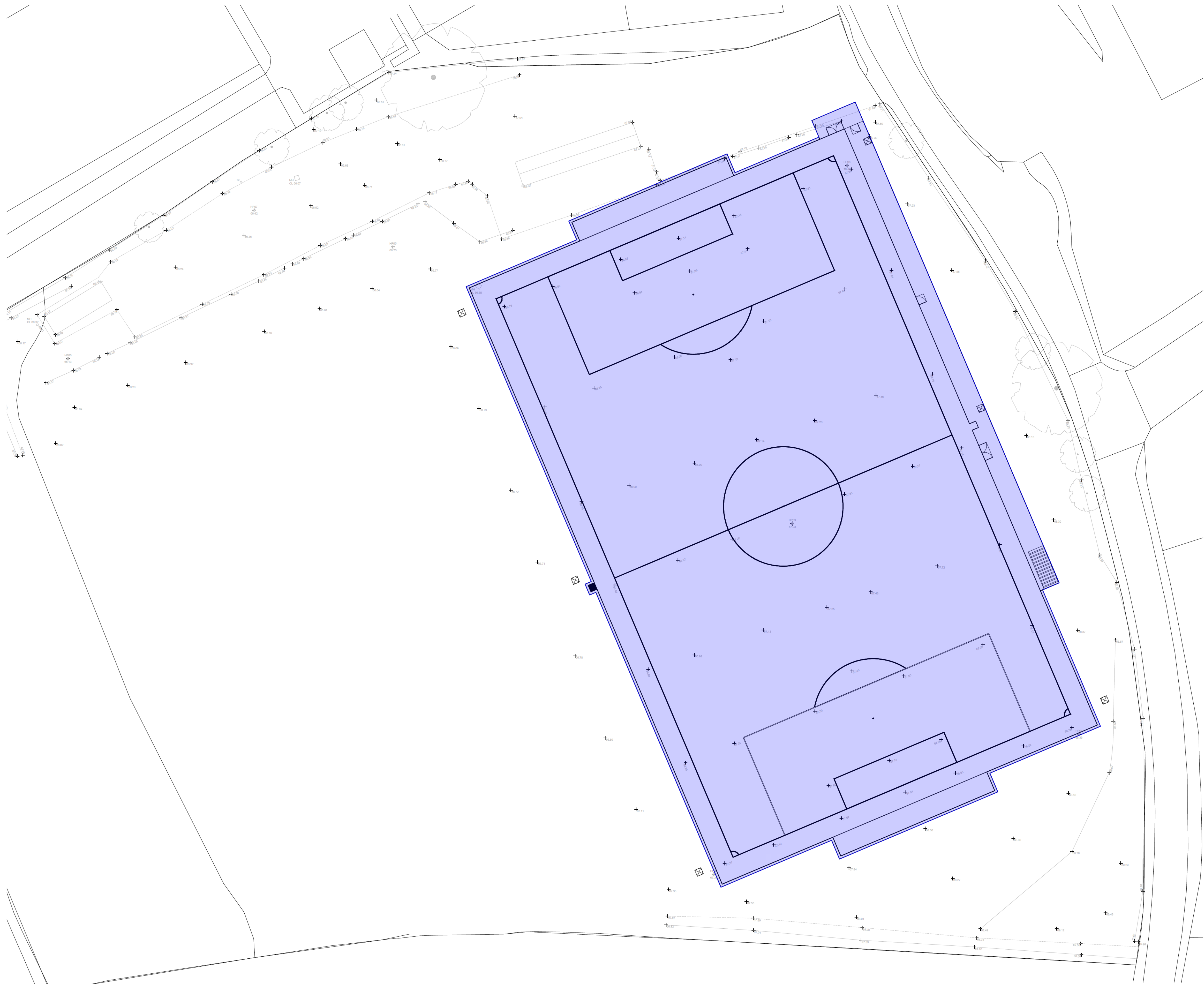
This map contains information generated by Met Office Hadley Centre (2019): UKCP Local Projections on a 5km grid over the UK for 1980-2080. Centre for Environmental Data Analysis, 2022



Client	Labosport
Project	New Artificial Grass Pitch, Langho FC
Title	Surface Water Strategy

Appendix E

Proposed Drained Areas
SEA Drawing 00339/E01



GENERAL

Do not scale from this drawing.

All dimensions are in millimetres unless noted otherwise.

All setting out to architects drawings.

Drawing to be read in conjunction with all other SEA drawings and architects drawings.

This scheme has been designed using the survey information provided by others. It shall be the responsibility of the contractor to verify levels, boundaries etc prior to commencing any works on site. SEA Consulting Engineers Ltd. shall not accept any responsibility for errors resulting from the survey.

All setting to be in accordance with the Architect's drawings, the Contractor is to check all dimensions and levels prior to commencement of work and report any discrepancies to the Engineer, including any encountered during construction works.

All dimensions should be checked on site prior to construction. Please notify the Engineer of any discrepancies before commencing or continuing any work.

HEALTH, SAFETY & THE ENVIRONMENT

In accordance with the Health and Safety at Work etc Act 1973 and the Construction (Design and Management) Regulations 2015, designs and details on this drawing have been the subject of a Designers Risk Assessment, to identify risks in construction, use, or demolition of the scheme.

It is not considered necessary for Designers to highlight obvious and/or common risks (such as deep excavations, manual handling and working around heavy plant) which Contractors should be familiar with.

So as far as is reasonably practicable, risks inherent in the design have been eliminated. Where it has been considered that elimination of a risk (or part of a risk) is not reasonably practicable, it has been reduced.

Significant unusual residual risks are identified below, beside the measures which have been adopted to eliminate and/or reduce them:

None identified.

DRAWING KEY:

Proposed drained area = 6,420m²

Rev.	Date	By	Description
SEA CONSULTING ENGINEERS [CONSULTING CIVIL & STRUCTURAL ENGINEERS] E: warren@seace.co.uk T: 07976310054			
PROJECT			
PROPOSED NEW AGP LANGHO FC			
DRAWING			
PROPOSED DRAINED AREA			
SCALE: 1:250@A1		DATE: 25.02.2026	
DRAWN BY: WRA		REV: -	
STATUS: FOR APPROVAL			



Appendix F

Greenfield Runoff Calculations

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

Project details

Date	23/02/2026
Calculated by	Warren Allsopp
Reference	00339
Model version	2.2.3

Location

Site name	New AGP
Site location	Langho FC



Site easting (British National Grid)	370488
Site northing (British National Grid)	435073

Site details

Total site area (ha)	0.642	ha
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Greenfield runoff

Method

Method	FEH statistical (2025)
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FEH statistical (2025)

	<u>My value</u>	<u>Map value</u>
SAAR9120 (mm)	1166	mm
BFIHOST19scaled	0.34	
QMed-QBar conversion	1.075	1.075
QMed (l/s)	7.4	l/s
QBar (FEH statistical 2025) (l/s)	8	l/s

Growth curve factors

	<u>My value</u>	<u>Map value</u>
Hydrological region	10	10
1 year growth factor	0.87	
2 year growth factor	0.93	
10 year growth factor	1.38	
30 year growth factor	1.7	
100 year growth factor	2.08	
200 year growth factor	2.37	

Results

Method	FEH statistical (2025)
Flow rate 1 year (l/s)	7.0
Flow rate 2 year (l/s)	7.4
Flow rate 10 years (l/s)	11.0
Flow rate 30 years (l/s)	13.6
Flow rate 100 years (l/s)	16.6
Flow rate 200 years (l/s)	18.9

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

Disclaimer

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



Client	Labosport
Project	New Artificial Grass Pitch, Langho FC
Title	Surface Water Strategy

Appendix G

Surface Water Calculations

Nodes

Name	Area (ha)	Cover Level (m)	Diameter (mm)	Depth (m)	Invert Level (m)
1	0.642	100.000	1200	0.350	99.650

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m ³ /ha)	20.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	50	0	0

Node 1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	98.800	Product Number	CTL-SHE-0129-8000-1200-8000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	8.0	Min Node Diameter (mm)	1200

Node 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	99.650	Slope (1:X)	275.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.250
Safety Factor	2.0	Width (m)	65.150	Inf Depth (m)	
Porosity	0.30	Length (m)	97.000		

Node 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	99.900	Slope (1:X)	275.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.100
Safety Factor	2.0	Width (m)	65.150	Inf Depth (m)	
Porosity	0.15	Length (m)	97.000		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	1	128	99.763	0.113	19.3	28.4222	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
180 minute winter	1	Hydro-Brake®	8.0	83.2

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.33%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	1	172	99.922	0.272	52.8	151.4377	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
180 minute winter	1	Hydro-Brake®	8.0	185.1

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.45%

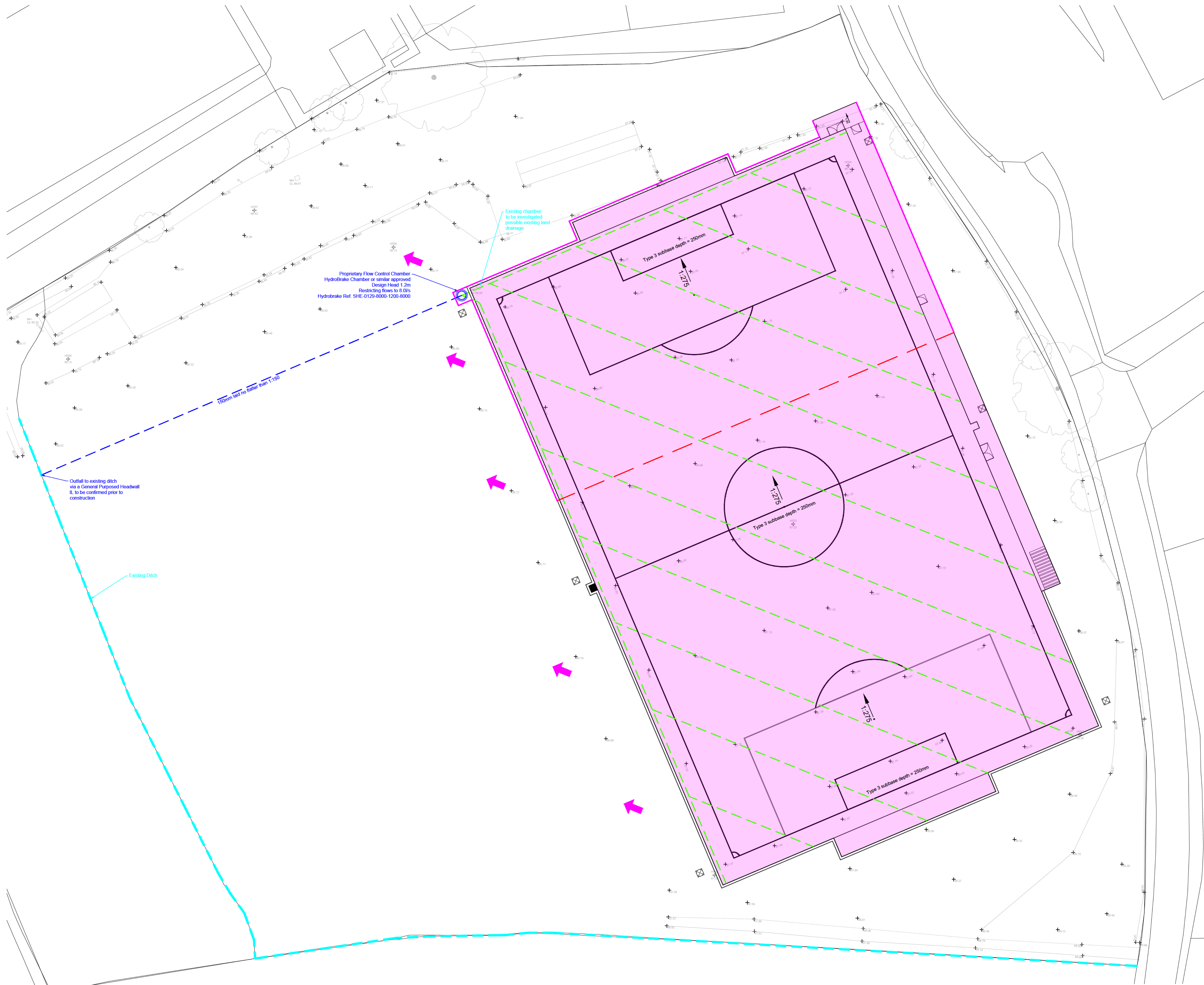
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	1	144	100.000	0.350	80.1	250.4233	101.3563	FLOOD
Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)				
240 minute winter	1	Hydro-Brake®	8.0	219.5				



Client	Labosport
Project	New Artificial Grass Pitch, Langho FC
Title	Surface Water Strategy

Appendix H

Proposed Drainage Layout
SEA Drawing 00339/E02



GENERAL

Do not scale from this drawing.

All dimensions are in millimetres unless noted otherwise.

All setting out to architects drawings.

Drawing to be read in conjunction with all other SEA drawings and architects drawings.

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None identified.

DRAWING KEY:

- Existing Ditch
- New lateral pitch drainage to be confirmed by pitch contractor
- Proposed surface water drainage
- Proposed permeable type 3 subbase extent beneath pitch, depth 300mm providing attenuation for the 1 in 30 year storm event.
- Proposed minimum extent of edging/kerb with a 125mm upstand to contain flooded water within pitch extent in the 1in100 + 40% storm event, total volume 101.4m³.
- Maximum Extent of 1in100 year + 40% flooded water, maximum depth 110mm.
- Minimum pitch gradients
- Overland Flows in the event of system failure

Rev.	Date	By	Description
 SEA CONSULTING ENGINEERS [CONSULTING CIVIL & STRUCTURAL ENGINEERS] E: warren@seace.co.uk T: 07976310054			
PROJECT PROPOSED NEW AGP LANGHO FC			
DRAWING PROPOSED DRAINAGE LAYOUT			
SCALE: 1:250@A1		DATE: 25.02.2026	
DRAWN BY: WRA		REV: -	
STATUS: FOR APPROVAL			

DWG No: 00339/E02

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