

Project No: 2024.101 B

Project: Proposed Sports Facility
Wythenshawe F.C
Timpson Rd., Wythenshawe, M23 9LL

Subject: Flood Risk Assessment and Drainage Strategy
for Planning Purposes

Date: August 2024



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1.0 INTRODUCTION

1.1 Scope of Project

It is proposed to construct a new sporting facility on an existing area of grass land that is currently used as a football pitch. There will also be associated hard and soft landscaping and car parking spaces to be utilised by the facility users. The site is located on Timpson Rd, Wythenshawe M23 9LL. To accompany a Planning Application, a Flood Risk Assessment and Drainage Strategy is required.

1.2 Sources of Information

In February 2019, the National Policy for Technical Requirements for Drainage were reinforced as part of the Planning Policy 25 to reflect flooding problems which several parts of the country had experienced in recent years leading up to the introduction of the new legislation.

In general terms, sites in excess of 1.0 Ha in area or within known areas of risk of flooding require both a Flood Risk Assessment and an appropriate drainage strategy.

The proposed development site is less than 1.0 Ha (0.81 Ha approx.) and lies within Flood Zone 1 of the Environment Agencies Flood Zone maps, therefore a Flood Risk Assessment is not necessary.

A Drainage Strategy will therefore be carried out using the following information:

- LMP Architects Drawing Number: 24/019/F01 - Indicative Site Layout - **Appendix 'A'**
- Percolation Test Results within BEK report ref. BEK-24072-2 – **Appendix 'B'**
- UK flood maps for planning

1.3 Policy Content

A high level assessment has concluded the site to be of low risk of surface water flooding and a very low risk of flooding from rivers and sea. However, in accordance with “Technical Guidance to the National Planning Policy Framework” the application of a sustainable drainage system shall be adopted to reduce the overall level of flood risk in the area and beyond.

The area of the existing site is in the main, permeable with large sections of the proposed development being of a hardstanding construction which will be impermeable. As such, a sustainable drainage solution will be provided to accommodate the design of the surface water discharge to include for 35% climate change (design life of development up to 75 years) and an area increase for urban creep is not applicable for this type of development.

2.0 EXISTING SITE DESCRIPTION AND LOCATION

2.1 Site Description

- 2.1.1 The site is located off Timpson Rd, Wythenshawe, M23 9LL
- 2.1.2 The proposed development site is bound by a football ground to the North, Railway track to the South, industrial building to the East and residential dwellings to the West. There is access to the development from Timpson Rd.
- 2.1.3 The development comprises the construction of a sports facility including a 5 a-side football pitch, 2No. tennis courts, 6No. doubles padel courts, 1No. singles padel court, 5No. shipping containers to act as building / storage, associated car parking and small area of soft landscaping.
- 2.1.4 The proposed site development area is approximately 0.810 Hectares and lies within Flood Zone 1.

2.2 Topography

- 2.2.1 From the site topographical survey, the site is fairly level, with the ground level to the North being circa 32.49 and to the South circa 32.1. Across the site from East to west the levels are circa 32.6 to the East and 32.1 to the west.

2.3 Hydrological Setting

- 2.3.1 There are no surface water features or licensed discharged consents located on or within 250m of the site.
- 2.3.2 The site is not located within an EA designated Flood zone and is considered to be ‘low risk’ from groundwater flooding and a low risk of flooding from reservoirs.

2.4 Geology and Hydrogeology

- 2.4.1 The proposed development site is located in a fairly built up area, consisting of industrial buildings and residential dwellings.
- 2.4.2 Percolation tests were attempted at 3No. Locations on the site, a location plan can be found within Appendix B. Within the excavations, the sub soil could be seen as brown sand with very silty Clay encountered underlain the sands, after 4 hours of testing the water was not infiltrating into the ground and therefore the test is deemed to have failed and disposal of surface water via infiltration is not considered a viable option.

3.0 FLOOD RISK

- 3.1 The Environment Agency Flood maps indicate the site to be located entirely within Flood Zone 1, land assessed as having less than a 1 in 1000 annual probability of river or sea flooding i.e. <0.1% Annual Exceedance Probability, in any one year.
- 3.2 There are no reservoirs, canals, ponds or other artificial watercourses or water bodies within 100m of any site boundary.

4.0 SURFACE WATER MANAGEMENT

- 4.1 Percolation test results can be found within Appendix B, the tests failed so disposing of the surface water run off from site via infiltration is not considered viable. It is proposed to connect the surface water system for the development directly into the existing mains surface water system sited within Timpson Rd. The site run off is to be attenuated and flow control device be installed to limit the run off from site to 5 l/s. A proposed site drainage plan, has been prepared by Graham Schofield Associates which is summarised below and the latter included in **Appendix 'C'**
- An assessment for the disposal of the surface water drainage was carried out in accordance with the preferred hierarchy thus: -
 - i. To soakaway – dependent upon site substrata.
 - ii. Nearest Watercourse.
 - iii. Designed to sustainable drainage standards for brownfield site with attenuation to limit the rate of discharge.
- 4.2 The surface water management strategy proposes to use a series of rainwater pipes and gullies to collect roof water from any enclosed structures constructed with a roof, the water will then flow into a network of underground drainage pipes and a limited discharge will be connected to the existing surface water drainage system to the North of the site.

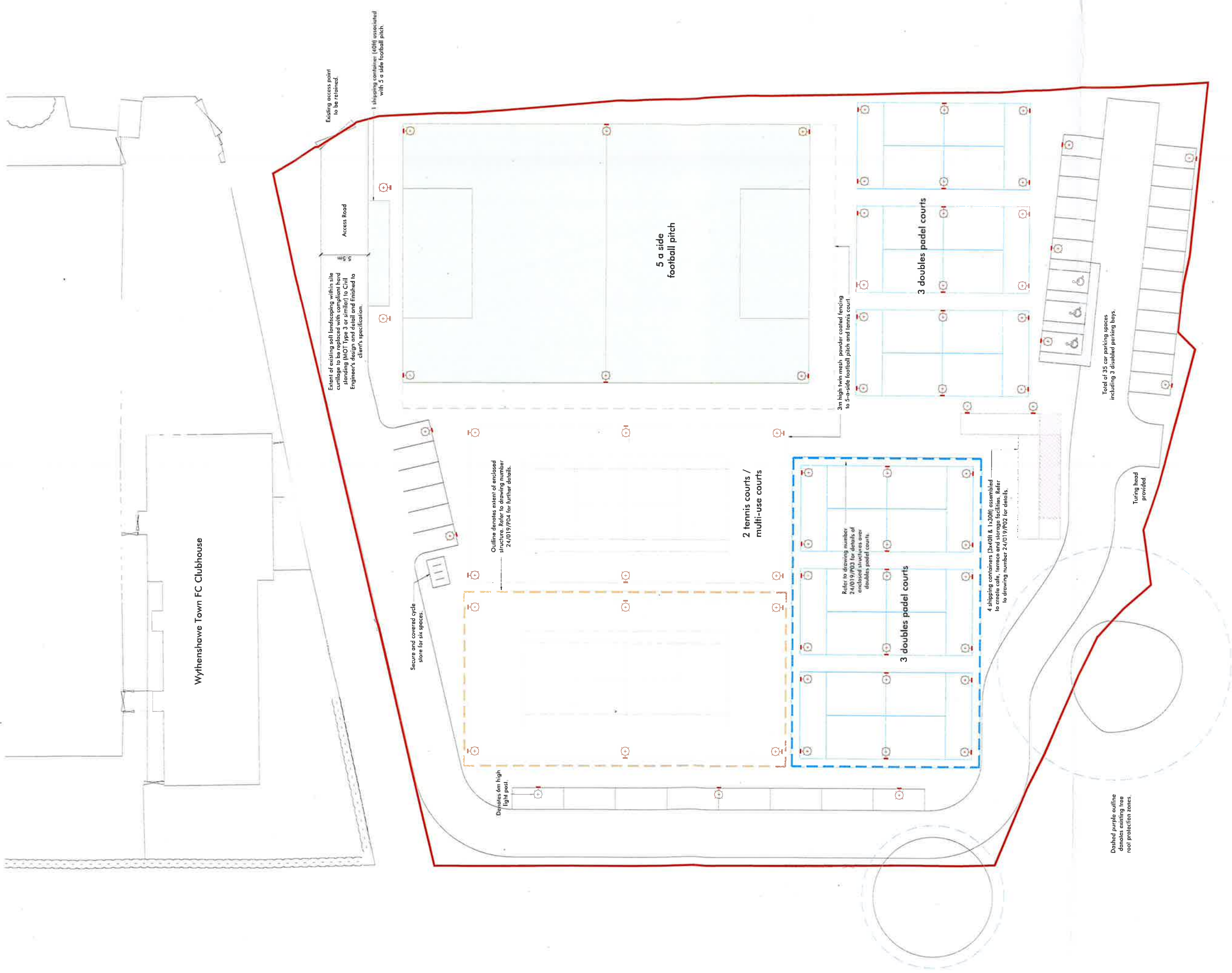
- 4.3 The surface water run-off from the hardstanding areas will infiltrate through the proposed permeable tarmac surfacing, into a specially constructed storage layer within the hardstanding build-up. The storage layer will also contain a porous pipe network which will allow the collected water to flow into a network of non-porous underground drainage pipes, which will then connect/combine to the surface water drainage system via a flow control device to limit the discharge into the existing surface water drainage system.

5.0 FOUL DRAINAGE

- 5.1 The foul water shall discharge into a package sewage treatment plant, prior to discharge into the surface water network. There will be one package plant for the proposed café to the South of the proposed development.

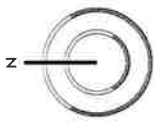
Appendix 'A'

LMP Drawing Number: 24/019/F01 - Indicative Site Layout



Revision Notes:

CLIENT	Knight, Tom
PROJECT	Proposed Sports & Leisure Facilities at Wythenshawe Town FC, Timpson Rd, Wythenshawe, Manchester, M23 9LL
DRAWING	Proposed Site Layout
DRAWN	WA
SCALE	1:200
SHEET	AT
NUMBER	03/11/24
REVISION	24/01/2021



0m 10m 20m
Scale 1:200

19/12/24

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Appendix 'B'

Percolation Test Results – Extract from BEK report ref. BEK-24072-2 (July 2024)

- 3.6.3 At the base of the remaining exploratory locations strata described as 'Brown sandy slightly silty CLAY with fine to coarse gravels of mixed lithology's and traces of siltstone' was encountered in Boreholes WS101, WS102, WS103 and WS104. In Borehole WS101 there is a lens of sand between 2.5 m and 3.1 m that is situated in between the clay.

Bedrock

- 3.6.4 Bedrock was not encountered during the site investigation works.

Groundwater

- 3.6.5 A summary of groundwater encountered during the site investigation is presented in Table 5 below:

Location	Depth to Water (m) bgl	Depth to Base (m) bgl	Comment
WS102	1.5	4.45	Water strike
WS103	1.8	3.45	Water strike
WS104	1.0	3.8	Water strike
WS105	2.0	4.45	Water strike
WS106	2.0	5.45	Water strike
TP102	1.6	1.7	Water strike
TP105	1.6	2.15	Water strike
TP106	1.8	2.0	Water strike
TP107	1.3	1.5	Water strike
TP108	1.3	2.0	Water strike
TP109	1.3	1.85	Water strike

Table 5: Summary of Groundwater Encountered During Site Investigation

- 3.6.6 Ash and clinker was noted to be present within a number of the made ground subtypes.

3.7 Infiltration Testing

- 3.7.1 The site investigation works included infiltration tests to determine soil infiltration rates using the BRE 365 (2016) methodology to assess the viability of disposal of surface water from the site via infiltration.
- 3.7.2 Infiltration testing was undertaken in accordance with the requirements set out in BRE 365 (2016). Three infiltration tests were undertaken at the site at locations that were accessible and outside the extents of any buried services. The test locations are presented on BEK Drawing No 24072-3, a copy of which is presented in Appendix G.

- 3.7.3 In accordance with BRE 365 'Fill the pit and allow it to drain three times to near empty; each time record the water level and time filling. Calculate the soil infiltration rate from the time taken for the water to fall from 75% to 25% effective storage depth in the pit, using the lowest f value of the three test results for design.'
- 3.7.4 The infiltration test trial pits were excavated using a tracked excavator to a depth of 1.5 m with the sides trimmed square. Water was discharged into the pits using a towed water bowser. A selection of photographs of the test pit and infiltration test is included within Appendix E.
- 3.7.5 The test pit dimensions are as follows:

Test Pit No.	Length (m)	Width (m)	Depth (m)	Area (m ³)
TP101	1.70	0.60	1.50	1.53
TP102	1.70	0.60	1.50	1.53
TP103	1.60	0.60	1.50	1.44

Table 6: Infiltration test pit dimensions

- 3.7.6 The natural ground conditions underling the made ground were generally described as 'Brown SAND'. However 'Brown mottled grey very silty CLAY with rare organic matter' was encountered underlain the sands in Trial Pit TP103 at 1.3 m to 1.6 m. Water was discharged into the pit and the time taken for the water to infiltration into the soil was recorded.
- 3.7.7 After 4 hours of testing, the water within Trial Pits TP101, TP102 and TP103 was not infiltrating into the ground therefore the test is considered to have failed as the water did not reach 25% effective depth. As such disposal of surface water via infiltration is not considered viable at the proposed development site. The infiltration test results are presented in Appendix D.
- 3.8 Environmental Monitoring**
- 3.8.1 Gas and groundwater monitoring is ongoing and the results will be assessed within an addendum report that will be completed when the gas monitoring programme has been completed.

Groundwater

- 3.8.2 Groundwater levels have been monitored on one occasion in the boreholes are summarised in the Table 7:



GEO-ENVIRONMENTAL CONSULTING

Soakaway Testing

Project Name	Wythenshawe Town FC	Location Reference:	TP101
Project Number	24072	Test Number:	1
Test Date	12/07/2024	Weather:	Sunny, Dry

FIELD MEASUREMENTS

Elapsed Time, t (m)	Water Level (mBGL)
0	1.00
1	1.00
2	1.00
3	1.00
4	1.00
5	1.00
10	1.00
20	1.01
30	1.04
40	1.06
50	1.08
60	1.10
90	1.12
120	1.16
180	1.21
240	1.24

INFILTRATION CALCULATION

Calculation of Soil Infiltration Rate (f) as per BRE Digest 365 "Soakaway Design".

Using:

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

V_{p75-25}	The effective storage volume of water (m ³) in the trial pit between 75% and 25% effective depth	0.32
a_{p50}	The internal surface area of the trial pit (m ²) up to 50% effective depth and including the base area	2.37
t_{p75-25}	The time (s) for the water level to fall from 75% to 25% effective depth	0

Soakage Pit Length (m)	1.50
Soakage Pit Width (m)	0.60
Soakage Pit Depth (m)	1.70
Soakage Pit Area (m ²)	1.53

Start Water Level (mBGL)	1
Total Depth of Test (m)	0.70
75% Effective Depth (mBGL)	1.18
50% Effective Depth (m)	0.35
25% Effective Depth (mBGL)	1.53

Time at 75% Effective Depth (minutes)	0
Time at 25% Effective Depth (minutes)	0

INFILTRATION RATE

Soil Infiltration Rate (f)

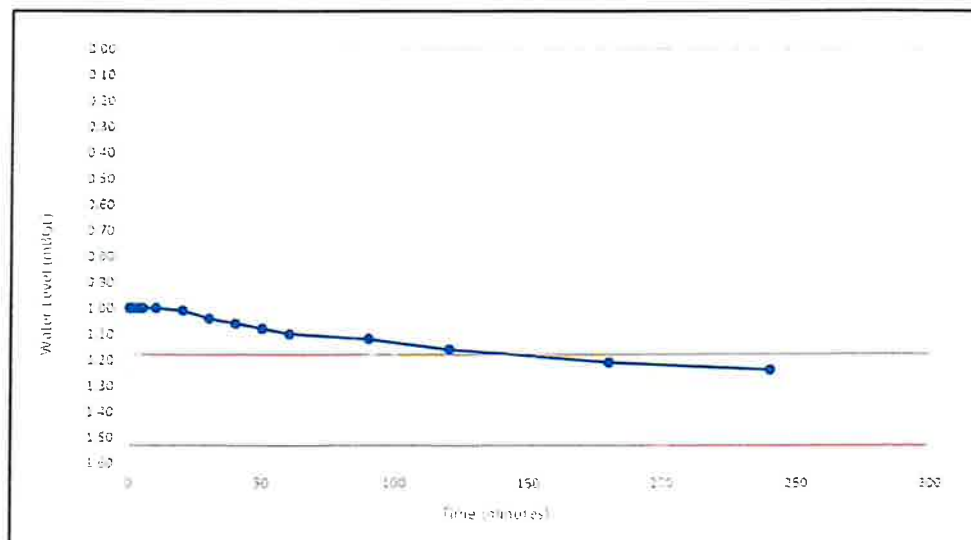
m/s

m/hour

Test Failed to Reach 25% Effective Depth

Test Failed to Reach 25% Effective Depth

Test Failed to Reach 25% Effective Depth





GEO-ENVIRONMENTAL CONSULTING

Soakaway Testing

Project Name	Wythenshawe Town FC	Location Reference:	TP102
Project Number	24072	Test Number:	1
Test Date	12/07/2024	Weather:	Sunny, Dry

FIELD MEASUREMENTS

Elapsed Time, t (m)	Water Level (mBGL)
0	1.00
1	1.00
2	1.00
3	1.00
4	1.00
5	1.00
10	1.00
20	1.02
30	1.04
40	1.05
50	1.06
60	1.06
90	1.07
120	1.09
180	1.10
240	1.12

INFILTRATION CALCULATION

Calculation of Soil Infiltration Rate (f) as per BRE Digest 365 "Soakaway Design".

Using:

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

V_{p75-25}	The effective storage volume of water (m ³) in the trial pit between 75% and 25% effective depth	0.32
a_{p50}	The internal surface area of the trial pit (m ²) up to 50% effective depth and including the base area	2.37
t_{p75-25}	The time (s) for the water level to fall from 75% to 25% effective depth	0

Soakage Pit Length (m)	1.50
Soakage Pit Width (m)	0.60
Soakage Pit Depth (m)	1.70
Soakage Pit Area (m ²)	1.53

Start Water Level (mBGL)	1
Total Depth of Test (m)	0.70
75% Effective Depth (mBGL)	1.18
50% Effective Depth (m)	0.35
25% Effective Depth (mBGL)	1.53

Time at 75% Effective Depth (minutes)	0
Time at 25% Effective Depth (minutes)	0

INFILTRATION RATE

Soil Infiltration Rate (f)

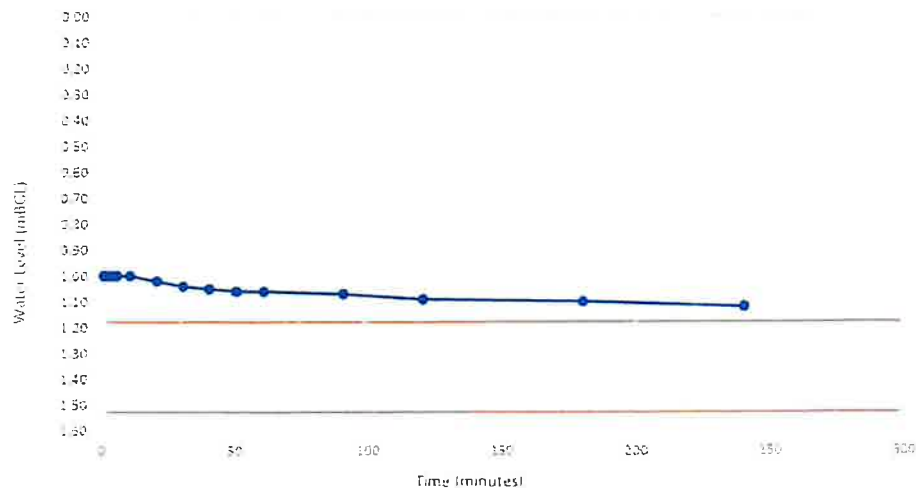
m/s

m/hour

Test Failed to Reach 25% Effective Depth

Test Failed to Reach 25% Effective Depth

Test Failed to Reach 25% Effective Depth





GEO-ENVIRONMENTAL CONSULTING

Soakaway Testing

Project Name	Wythenshawe Town FC	Location Reference:	TP103
Project Number	24072	Test Number:	1
Test Date	12/07/2024	Weather:	Sunny, Dry

FIELD MEASUREMENTS

Elapsed Time, t (m)	Water Level (mBGL)
0	1.00
1	1.00
2	1.00
3	1.00
4	1.00
5	1.00
10	1.00
20	1.00
30	1.00
40	1.00
50	1.00
60	1.00
90	1.00
120	1.00
180	1.00
240	1.00

INFILTRATION CALCULATION

Calculation of Soil Infiltration Rate (f) as per BRE Digest 365 "Soakaway Design".

Using:

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

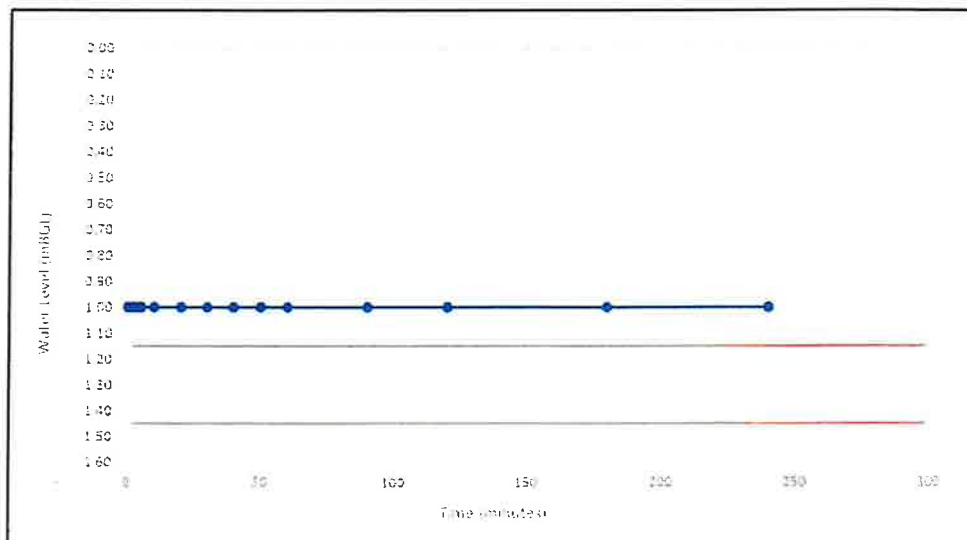
Where:

V_{p75-25}	The effective storage volume of water (m ³) in the trial pit between 75% and 25% effective depth	0.27
a_{p50}	The internal surface area of the trial pit (m ²) up to 50% effective depth and including the base area	2.16
t_{p75-25}	The time (s) for the water level to fall from 75% to 25% effective depth	0

Soakage Pit Length (m)	1.50
Soakage Pit Width (m)	0.60
Soakage Pit Depth (m)	1.60
Soakage Pit Area (m ²)	1.44
Start Water Level (mBGL)	1
Total Depth of Test (m)	0.60
75% Effective Depth (mBGL)	1.15
50% Effective Depth (m)	0.30
25% Effective Depth (mBGL)	1.45
Time at 75% Effective Depth (minutes)	0
Time at 25% Effective Depth (minutes)	0

INFILTRATION RATE

Soil Infiltration Rate (f)	Test Failed to Reach 25% Effective Depth
m/s	Test Failed to Reach 25% Effective Depth
m/hour	Test Failed to Reach 25% Effective Depth





LEGEND

-  WINDOW SAMPLE BOREHOLE
-  WINDOW SAMPLE BOREHOLE (GAS/GROUNDWATER WELLS)
-  TRIAL PIT
-  TRIAL PIT (INFILTRATION TEST)

REV	DESCRIPTION	DATE	BY



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JOB TITLE:

LAND AT WYTHENS LAWE TOWN
FC, WYTHENS LAWE

DRAWING TITLE:

SITE INVESTIGATION PLAN

SCALE: A3
N.T.S.

DRAWN BY:
D.L.

APPROVED BY:
M.B.

DATE:
13/06/24

DRAWING No.
24072-3

REV.

Appendix 'C'

GSA Drawing Number 2024.101.D01 – Indicative Drainage Layout

