



New Playzone Pitch Manley Park Manchester

Surface Water Strategy

R - 00226 – 001 – SDS – 0
October 2024

Report Originator(s)

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Revision	Date	Description	Written	Approved
0	29.10.24	First Issue	WRA	WRA



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Client

Labosport

Project

New Playzone Pitch, Manley Park, Manchester

Title

Surface Water Strategy

Page no. 2

Project ref 00226

Date October 2024

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SEA Drawing 00226/E02



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1.0 Introduction

1.1 Design Brief

- 1.1.1 The client, Labosport, requires a surface water drainage design for the installation of a playzone artificial pitch at Manley Park, Manchester
- 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. The benefit is limited to our instructing client, Labosport.

1.2 Site Location

- 1.2.1 The site is located within the grounds of Manley Park Sports and Community Centre to the southwest of Manchester City Centre. The approximate national grid reference is 382220E, 394620N and a site location plan is presented in appendix A.

1.3 Current Land Use

- 1.3.1 The site is currently an existing artificial turfed area.

1.4 Proposed Development

The proposed development will comprise the construction of a new playzone artificial sports pitch. A site layout is presented in Appendix B.

2.0 Surface Water Drainage

2.1 Existing Surface water drainage

- 2.1.1 The site is not served by any formal surface water drainage. There are United Utilities (UU) combined surrounding the site an asset plan is presented in Appendix C. There are existing ICs serving the existing building which we assume outfall to the surrounding combined sewers.

2.2 Proposed Storm Drainage Discharge

- 2.2.1 Paragraph 80 of the Planning Practice Guidance for 'Flood Risk and Coastal Change' defines the hierarchy of drainage options. Where reasonably practicable the aim should be to discharge stormwater as high up the following hierarchy of storm drainage options;

- Into the Ground (infiltration);
- To a surface water body;
- To a surface water sewer, highway drain or another drainage system, and
- To combined sewer

- 2.2.2 Each of these is consider separately below;

Into the ground

- 2.2.3 A ground investigation has been undertaken by Soiltechnics Ltd, with infiltration testing carried out. They have concluded that the use of soakaways at this site is not viable. This is further backed up by the fact that no existing soakaway features are present on site. Extracts from the ground investigation are presented in Appendix D.

To a surface water body

- 2.2.4 There are no existing watercourses or bodies within the vicinity of the site.

To a surface water sewer, highway drain or another drainage system

- 2.2.5 There are existing ICs chambers surrounding the existing building which we assume currently drain the building's surface water. These offer a viable outfall for the new pitches drainage.



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2.3 Proposed Surface Water Drainage Strategy

- 2.3.1 Proposals are to drain the new playzone pitch to the existing assumed surface water to the north which drains the existing building.
- 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 the increase in storm intensities up to 45%. 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 E. The site's drained areas are presented in Appendix F and equates to a total area of 410m².
- 2.3.3 Proposals are to restrict the pitches stormwater to as close to greenfield runoff 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 G which calculates that the Qbar value is 0.25l/s. Flows at this rate are not considered practical therefore we will restrict the surface water to 1.0l/s.
- 2.3.4 The new artificial grass pitch will consist of 15mm sand dressed synthetic turf, 15 porous shockpad along with a 50mm porous macadam and a 250mm permeable type 3 subbase, which will allow water to infiltration through the pitch make up to a series of new lateral drains which will collect surface water before out falling into an orifice flow control device with attenuation provided within the pitches makeup. The Pitch will be laid with a 1:500 fall.
- 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 H and shows that Pitch build-up provides adequate attenuation for all storm events up to and including the 1in100 year + 45% event.
- 2.3.6 A Drainage layout for the scheme is presented in Appendix I.

2.4 SUDS

- 2.4.1 The use of SUDS and pollution control measures have 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' is considered to be the most appropriate category, due to the minimal pollution hazard associated with the proposed Hockey Pitch , which will have no vehicle movements within its extent.
- 2.4.3 Surface water from the area will pass through the permeable subbase. Therefore acting 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 sites 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 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 glyphosphate 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 hazard 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, 48hrs after large storms for the first 6 months
	Establish slit accumulation rates and establish appropriate brushing frequencies.	Annually
	Monitor Inspection chambers	Annually



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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 satisfying the requirements of the National Planning Policies Framework.

3.1.2 References

- Department for Communities and Local Government (July 2021) - 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.



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Appendix A

Site Location Plan

LOCATION PLAN

CHECK ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORK

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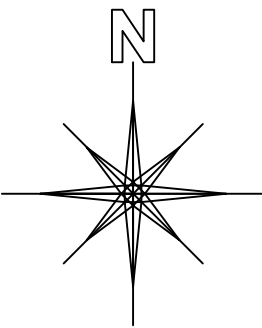
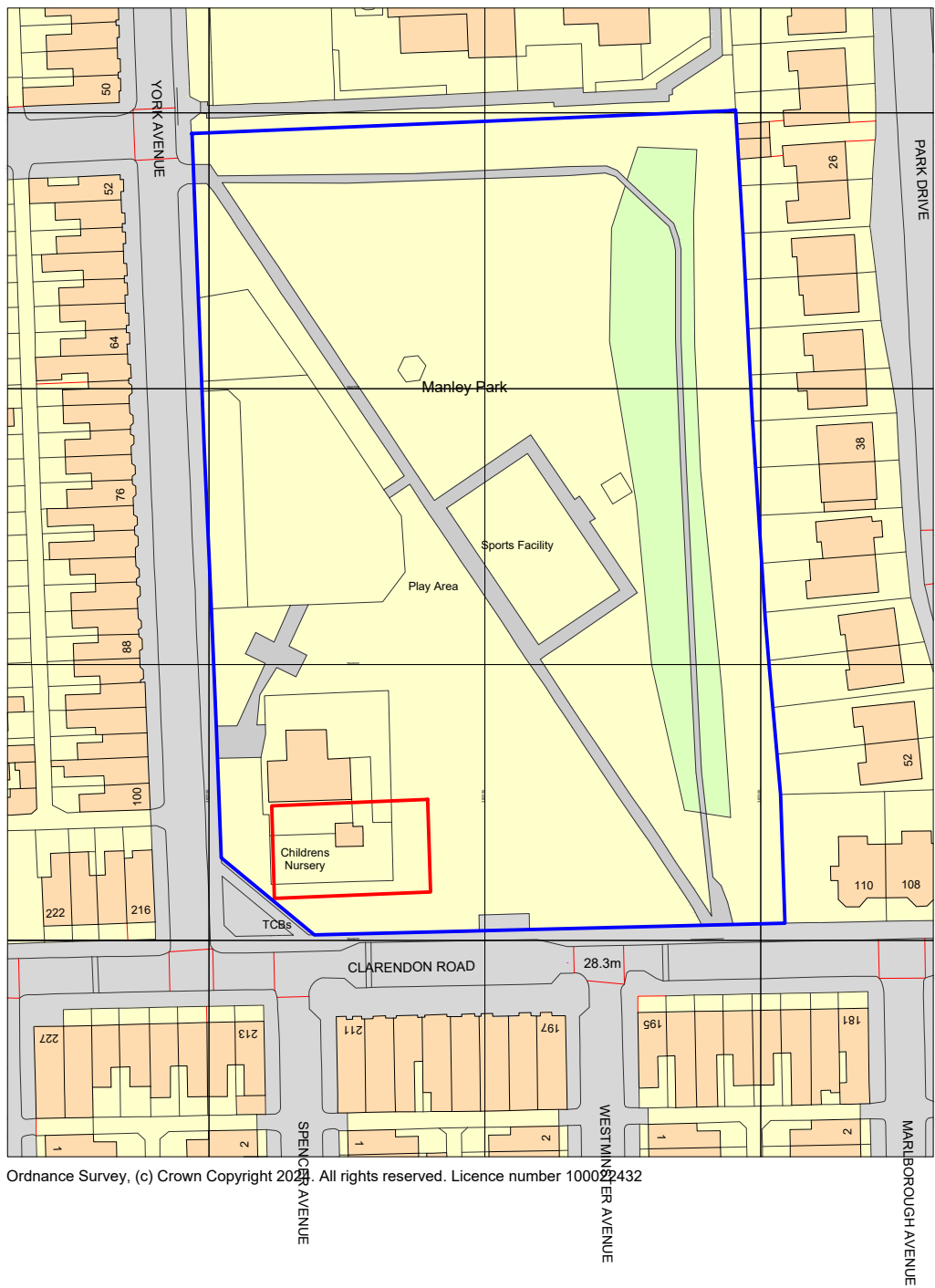
RELEVANT SERVICE DRAWINGS SHOULD BE OBTAINED FROM APPROPRIATE SERVICE PROVIDERS AND USED IN CONJUNCTION WITH THIS DRAWING

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APPLICATION SITE AREA
REQUIRED

LAND AREA UNDER
OWNERSHIP OF CLIENT



LEGEND / KEY



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SIS PITCHES UK

CLIENT

MANLEY PARK PLAYZONE FACILITY
DEVELOPMENT

PROJECT

LOCATION PLAN

DRAWING			
PLANNING	MD	01	
DATE	15/10/2024	PROJECT	24-0478 01P
PROJECT	A1	SCALE	1:1250
PAPER SIZE	A1	SCALE	1:1250



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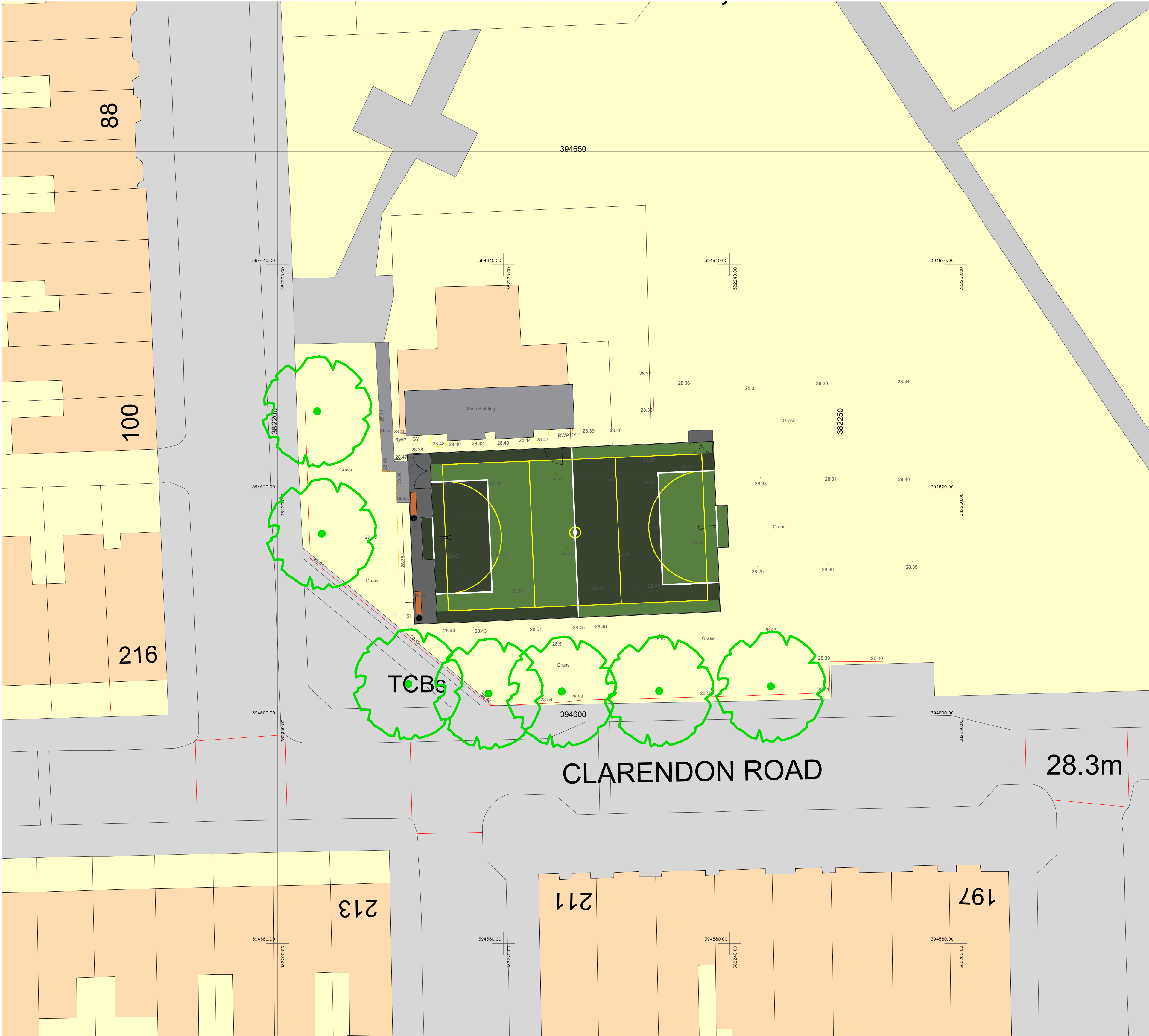
Title

Surface Water Strategy

Appendix B

Proposed Site Plan

PROPOSED LAYOUT



KEY SPORTS IDENTIFIED TO DICTATE PLAYZONE
DESIGN
FOOTBALL / NETBALL

PLAYZONE DESIGN
2G SAND DRESSED SYNTHETIC TURF SURFACED
PLAYZONE WITH PERIMETER FENCING,
FLOODLIGHTING, HARD-STANDING AREA AND
EQUIPMENT (REFURBISHMENT AND EXTENSION OF
EXISTING FACILITY REQUIRING SOME FULL
CONSTRUCTION AREAS)

CONSTRUCTION
250MM SUB BASE
50MM POROUS ASPHALT (MACADAM) LAYER
15MM IN-SITU SHOCKPAD
20MM SAND DRESSED SYNTHETIC TURF

DIMENSIONS
FENCE TO FENCE: 25 X 15M
2NR GOAL RECESSES = 3.66 X 1M
HARD STANDING SPECTATOR AREA = 15 X 2M
ACCESS ROUTE = UTILIZE EXISTING ROUTE TO WEST

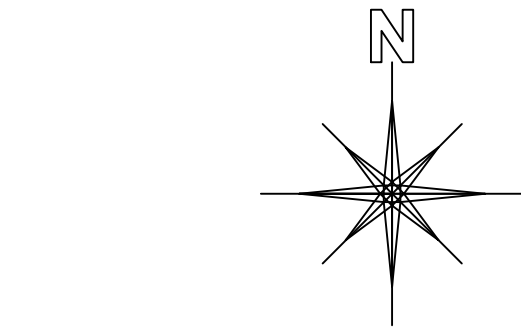
LINE MARKING
GOAL BOXES = 10.0 X 5.0M
GOAL LINE = 3.66LM
NETBALL MARKINGS = 13 X 23M

PERIMETER FENCING
3.0M HIGH TWIN BAR PANEL FENCING (RAL 6005 - DARK
GREEN)
AND 4.0M HIGH TWIN BAR PANEL FENCING (RAL 9016 -
WHITE OR SIMILAR)
2NR DOUBLE GATE(S) - ONE ENTRANCE, ONE FOR
STORAGE CONTAINER
1NR SINGLE GATE(S) LINKED TO MAIN BUILDING EXIT

LED FLOODLIGHTING
AVERAGE LUX = 120LUX
UNIFORMITY = 0.65
*LIKELY TO BE 4NR FENCE FIXED FLOODLIGHT SYSTEM,
TBC BY HALLIDAY LIGHTING*

EQUIPMENT
2NR GOALS (INTEGRAL TO FENCING)
2NR BENCHES
2NR WASTE BINS
1NR STORAGE CONTAINER
2NR NETBALL HOOP SYSTEMS

CHECK ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORK
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CLIENT
MANLEY PARK - PLAYZONE FACILITY
DEVELOPMENT

PRODUCT
PROPOSED LAYOUT

DRAWING			
DESIGN	MD	DATE	02
LSUK 24-0478	23.08.24		
PROJECT		SCALE	24-0478 01
A1	SCALE	1:200	



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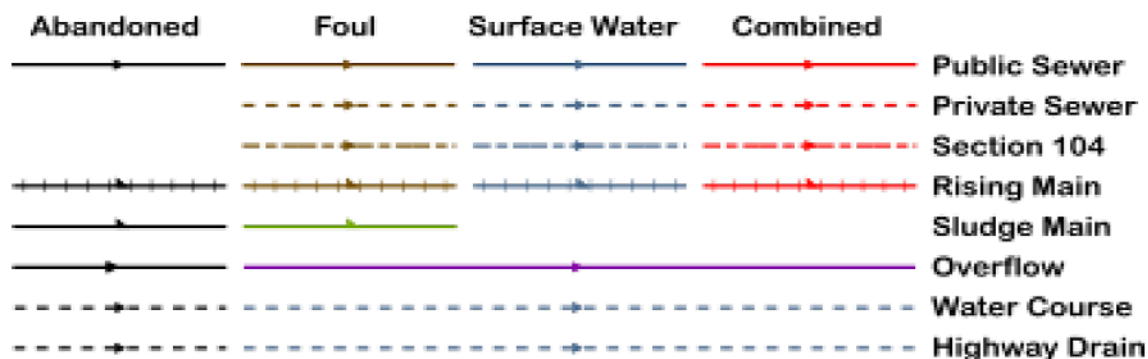
Title

Surface Water Strategy

Appendix C

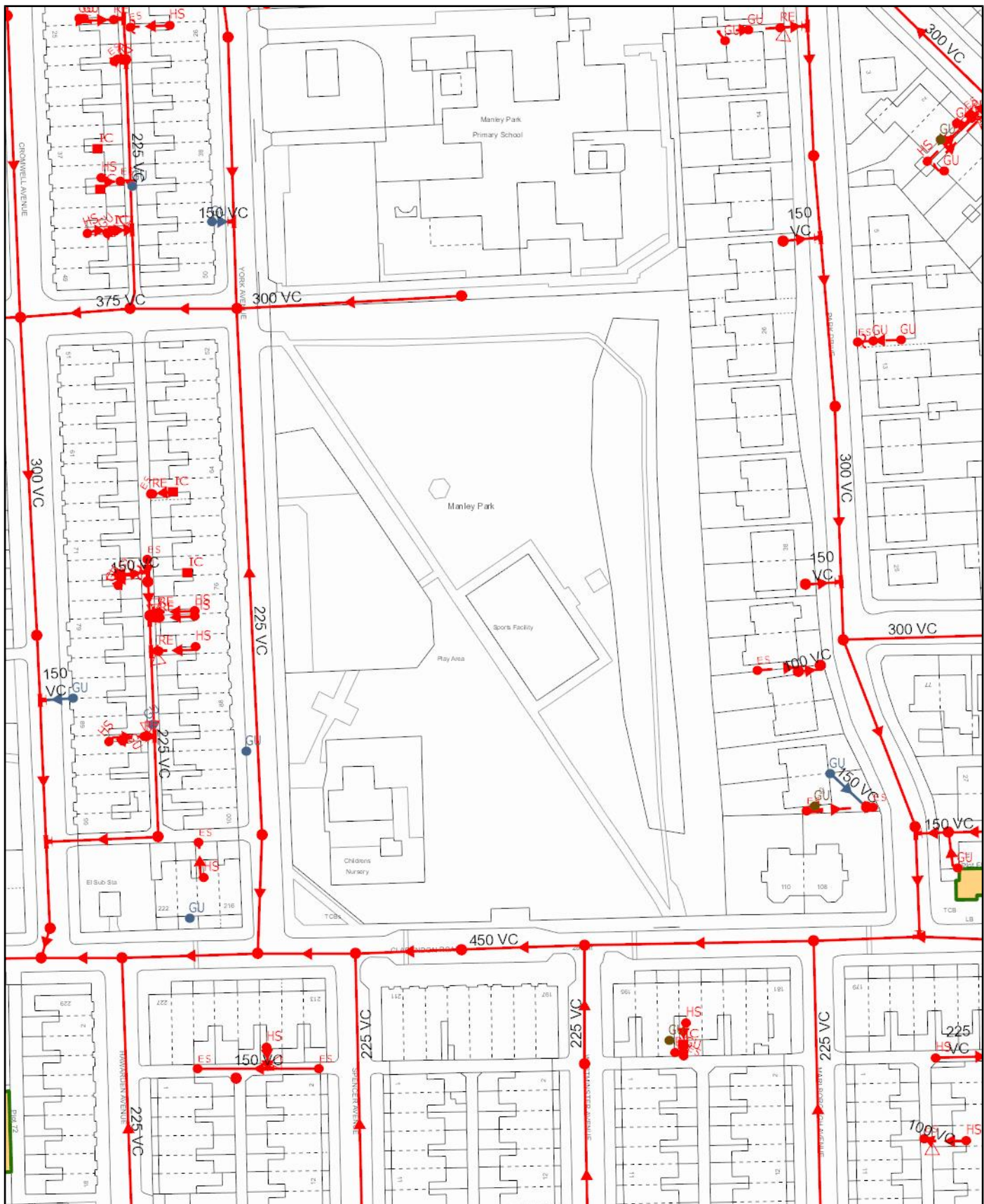
United Utilities Asset Plan

Wastewater Symbolology



All point assets follow the standard colour convention: **red** – combined **brown** - foul
blue – surface water **purple** - overflow

Manhole	Side Entry Manhole
Head of System	Outfall
Extent of Survey	Screen Chamber
Rodding Eye	Inspection Chamber
Inlet	Bifurcation Chamber
Discharge Point	Lamp Hole
Vortex	T Junction / Saddle
Penstock	Catchpit
Washout Chamber	Valve Chamber
Valve	Vent Column
Air Valve	Vortex Chamber
Non Return Valve	Penstock Chamber
Soakaway	Network Storage Tank
Gully	Sewer Overflow
Cascade	Ww Treatment Works
Flow Meter	Ww Pumping Station
Hatch Box	Septic Tank
Oil Interceptor	Control Kiosk
Summit	
Drop Shaft	Change of Characteristic
Orifice Plate	



Scale: 1:1250
Date: 28/11/2023

SEWER RECORDS

Address or Site Reference: 97 COLLEGE ROAD, MANCHESTER, M16 0AB
Printed by: Property Searches

 **United Utilities**
Water for the North West

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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Appendix D

Ground Investigation Extracts

Plan size of pad (m)	Ultimate bearing value (kN/m ²)	Presumed bearing value (kN/m ²)	Allowable bearing pressure (kN/m ²)
1.0 x 1.0	400	140	140
1.5 x 1.5	465	165	130
2.0 x 2.0	530	185	105

Table 7-A: Bearing values for floodlight foundations

7.5.5 The presumed bearing values have been derived from the ultimate bearing value by applying a factor of safety of 3. The presumed bearing capacities given above should not be exceeded in any loading cases.

7.5.6 The allowable bearing capacity is derived assuming a constant, uniformly applied load, with a settlement limit of 25mm. In the absence of in-situ testing within the granular Glaciofluvial Sheet Deposits, a relative density of 'loose' has been derived based on field observations and an SPT N-value of 8 is assumed.

7.6 Artificial Pitch

7.6.1 It is anticipated that the proposed PlayZone will be located at or about existing ground levels, with the formation located on Glaciofluvial Sheet Deposits and Localised Made Ground. Topsoil will require removal from the extension area. It is assumed that the subbase to the existing MUGA will be reused where possible, however the deposits of sand below the formation are unlikely to be considered suitable for reuse.

7.6.2 CBR value of 3% has been determined from remoulded CBR laboratory testing on a composite sample of Glaciofluvial Sheet Deposits, referenced CBR01. The results are presented in Appendix D. A similar value is also likely to be typical for Mad Ground deposits at the site.

7.6.3 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.

7.6.4 Where the formation spans between localised Made Ground and Glaciofluvial Sheet Deposits, it is recommended a geosynthetic reinforcement is introduced to minimise the potential effects of differential settlement between the differing soil types.

7.7 Drainage

7.7.1 Infiltration testing has been undertaken within the granular sub-base and natural subgrade beneath the existing artificial MUGA and the extension area, following the principles of BRE 365: Soakaway Design (2016).

7.7.2 The results are presented in Appendix D and summarised below:

Exploratory Hole ID	Stratum tested	Cycle	Infiltration rate (m/s)
TP03	Made Ground - Subbase	1	2.29 x 10 ⁻³
		2	1.26 x 10 ⁻³
		3	7.16 x 10 ⁻⁴

- 7.7.3 The Glaciofluvial Sheet Deposit soils were encountered as a granular material, with some fines content. Indicative infiltration testing was undertaken in TP01 at a depth of 0.55m and TP05 at a depth of 1.1m in the Glaciofluvial Sheet Deposits. During the test, no significant fall in water was observed.
- 7.7.4 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.
- 7.7.5 Subbase soils exhibit permeability and are likely to be suitable for reuse in the PlayZone design.
- 7.7.6 An existing drainage/sewer manhole was observed, located immediately northwest of the wider site, adjacent to the community centre entrance. It is possible this drainage system could be a practical option for the disposal of surface water collected by the proposed PlayZone development. However, a comprehensive drainage assessment will be required to determine the potential impact on the capacity of the existing systems and to confirm drainage gradients will be achievable across the proposed pitch area. Photographic evidence of the manhole is presented below within Figure 7-A.

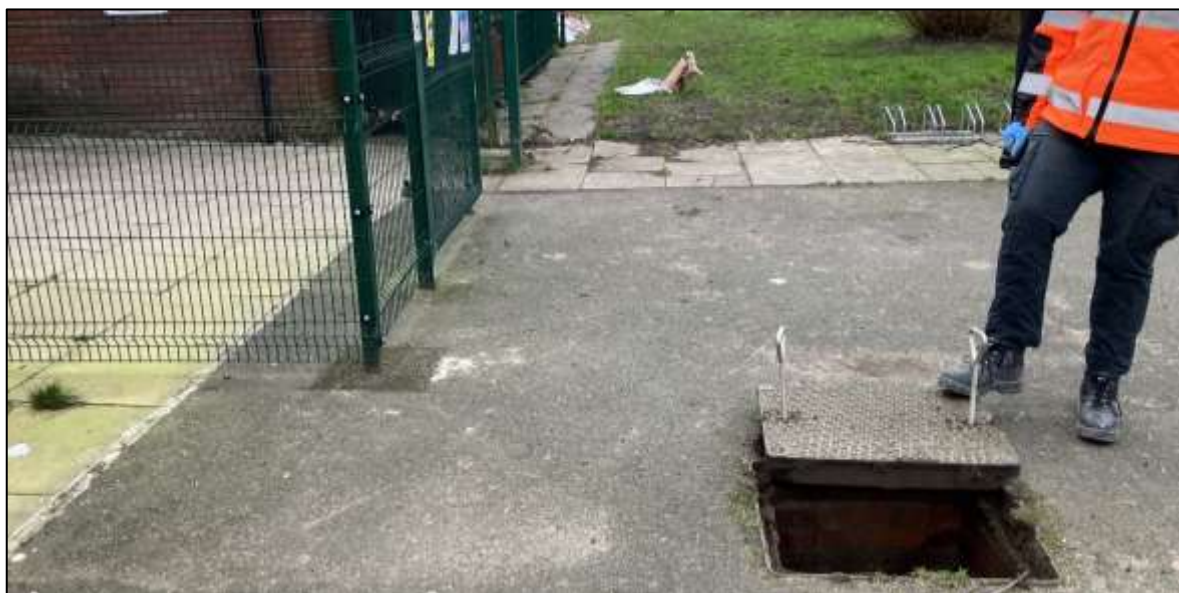


Figure 7-A: Location of Manhole chamber northwest of existing building

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 brownfield 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
Glaciofluvial Sheet Deposits	N/A	DS-1	AC-1s

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



Key:
Site Features

Site Boundary

Pitch Boundary

Exploratory Holes

Hand Pit

Infiltration Testing

Notes
1) Base image provided by Google.
2) All drawn features are approximate.
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Map data © 2023 Google

A	Feb 2024	First issue
REV	DATE	COMMENT ON VARIATION

soiltechnics
environmental • geotechnical • building fabric

PROJECT
Manley Park, Manchester

TITLE
Exploratory Hole Location Plan

DRAWING No.
STV6310-D01-A

Key to legends

Composite materials, soils and lithology					
	Topsoil		Made Ground		Boulders
	Clay		Coal		Cobbles
	Gravel		Limestone		Mudstone
	Sand		Sandstone		Silt
					Siltstone
					Chalk
					Concrete
					Peat

Note: Composite soil types are signified by combined symbols.

Key to 'test results' and 'sampling' columns

Test result		Sampling	
Depth	Records depth that the test was carried out (i.e.: at 2.10m or between 2.10m and 2.55m)	From (m) To (m)	Records depth of sampling
	PP – Pocket penetrometer result reported as an equivalent undrained shear strength (kN/m ²) by applying a factor of 50.		D Disturbed sample
			B Bulk disturbed sample
			ES Environmental sample
Result	SV – Hand held shear vane result reported as an undrained shear strength (kN/m ²). Where multiple readings are taken at the same level the average value is shown on the log. * Signifies that instrument limit reached.	Type	W Water sample
			U Undisturbed thick-walled sample 100mm diameter sampler
			UT Undisturbed thin walled sample 100mm diameter sampler
			UTF Failed undisturbed sample

Water observations

Described at foot of log and shown in the 'water strike' column.

 Water level observed after specified delay in drilling

 Water strike

Density

Density recorded in brackets determined by qualitative field assessment or inferred from density testing and soil descriptions from across the site (i.e.: [Medium dense]).

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
ARTIFICIAL SURFACING. (MADE GROUND)	0.01						0.17	0.22	B
Grey slightly silty medium to coarse SAND. (MADE GROUND)									
...between 0.1m and 0.11m depth, geotextile membrane noted.									
Orangish brown gravelly slightly silty medium SAND. Gravel is medium to coarse subrounded sandstone. (GLACIOFLUVIAL SHEET DEPOSITS)	0.17								
Dark grey to brown mottled orange gravelly silty medium SAND. Gravel is fine to coarse subrounded sandstone and mudstone. (GLACIOFLUVIAL SHEET DEPOSITS)	0.22								
							0.30	0.50	B
									
									
									
									
									
TRIAL PIT TERMINATED AT 0.55m	0.55								

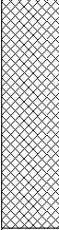
Notes Trial pit sides remained upright and stable upon completion. Terminated at scheduled depth.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 05/02/2024
	Method Hand tools	Logged by JT	Sheet number Sheet 1 of 1
Groundwater observations Groundwater not encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	TP01

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
ARTIFICIAL SURFACING. (MADE GROUND)	0.01						0.10	0.20	B
Grey slightly silty medium to coarse SAND. (MADE GROUND)	0.08								
Cream sandy slightly silty fine to coarse subrounded to subangular GRAVEL of limestone. (MADE GROUND)	0.20								
...between 0.2m and 0.21m depth, geotextile membrane noted.									
Dark brown to black very gravelly silty medium to coarse SAND. Gravel is fine to coarse subangular to subrounded sandstone and clinker. (MADE GROUND)									
									
									
									
									
									
									
									
									
									
									
									
									
									
									

Notes Trial pit sides remained upright and stable upon completion. Terminated at scheduled depth.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 05/02/2024
	Method Hand tools	Logged by JT	Sheet number Sheet 1 of 1
Groundwater observations Groundwater not encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	TP02

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
ARTIFICIAL SURFACING. (MADE GROUND)	0.01						0.10	0.20	B
Light grey to grey slightly silty medium to coarse SAND. (MADE GROUND)	0.10								
Cream to white slightly silty fine to coarse subrounded to subangular GRAVEL of limestone. (MADE GROUND)	0.27								
Light brown to brown mottled orangish slightly gravelly slightly silty fine to medium SAND. Gravel is fine to medium, subangular sandstone. (GLACIOFLUVIAL SHEET DEPOSITS)	0.67								
TRIAL PIT TERMINATED AT 0.67m									

Notes Trial pit sides remained upright and stable upon completion. Terminated at scheduled depth.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 05/02/2024
	Method Hand tools	Logged by JT	Sheet number Sheet 1 of 1
Groundwater observations Groundwater not encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	TP03

STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
ARTIFICIAL SURFACING. (MADE GROUND)	0.01						0.10	0.17	B
Grey slightly silty medium to coarse SAND. (MADE GROUND)	0.07								
Light grey slightly silty fine to coarse subrounded to subangular GRAVEL of limestone. (MADE GROUND)	0.17								
...between 0.17m and 0.18m depth, geotextile membrane noted.									
Brown to dark brown slightly gravelly slightly silty fine to medium SAND with frequent roots and rootlets. Gravel is fine to coarse subangular brick and ceramic. (MADE GROUND)							0.20	0.50	B
TRIAL PIT TERMINATED AT 0.57m	0.57								

Notes Trial pit sides remained upright and stable upon completion. Terminated at scheduled depth.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 05/02/2024
	Method Hand tools	Logged by JT	Sheet number Sheet 1 of 1
Groundwater observations Groundwater not encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	TP04

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 very soft dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)	0.25						0.10	0.11	D
Dark brown slightly gravelly slightly silty fine to medium SAND with occasional roots and rootlets. Gravel is fine to medium subrounded mudstone. (GLACIOFLUVIAL SHEET DEPOSITS)							0.30	0.40	B
[Loose] orange to grey slightly gravelly silty fine to medium SAND with occasional rootlets. Gravel is fine subangular sandstone. (GLACIOFLUVIAL SHEET DEPOSITS)	0.44						0.50	1.00	B
TRIAL PIT TERMINATED AT 1.10m	1.10								

Notes Trial pit sides remained upright and stable upon completion. Terminated at scheduled depth.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 05/02/2024
	Method Hand tools	Logged by JT	Sheet number Sheet 1 of 1
Groundwater observations Groundwater not encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	TP05

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 very soft slightly sandy slightly silty CLAY with frequent rootlets. (TOPSOIL)	0.25						0.10	0.60	D
Dark brown slightly gravelly slightly silty fine to medium SAND with frequent roots and rootlets. Gravel is fine to medium angular to subangular brick, ceramic and sandstone. (MADE GROUND)							0.30		B
[Loose] orangish brown mottled grey silty fine to medium SAND with some gravel sized pockets of clay. (GLACIOFLUVIAL SHEET DEPOSITS)	0.65						0.70	1.20	B
TRIAL PIT TERMINATED AT 1.20m	1.20								

Notes Trial pit sides remained upright and stable upon completion. Terminated at scheduled depth.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 05/02/2024
	Method Hand tools	Logged by JT	Sheet number Sheet 1 of 1
Groundwater observations Groundwater not encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	TP06



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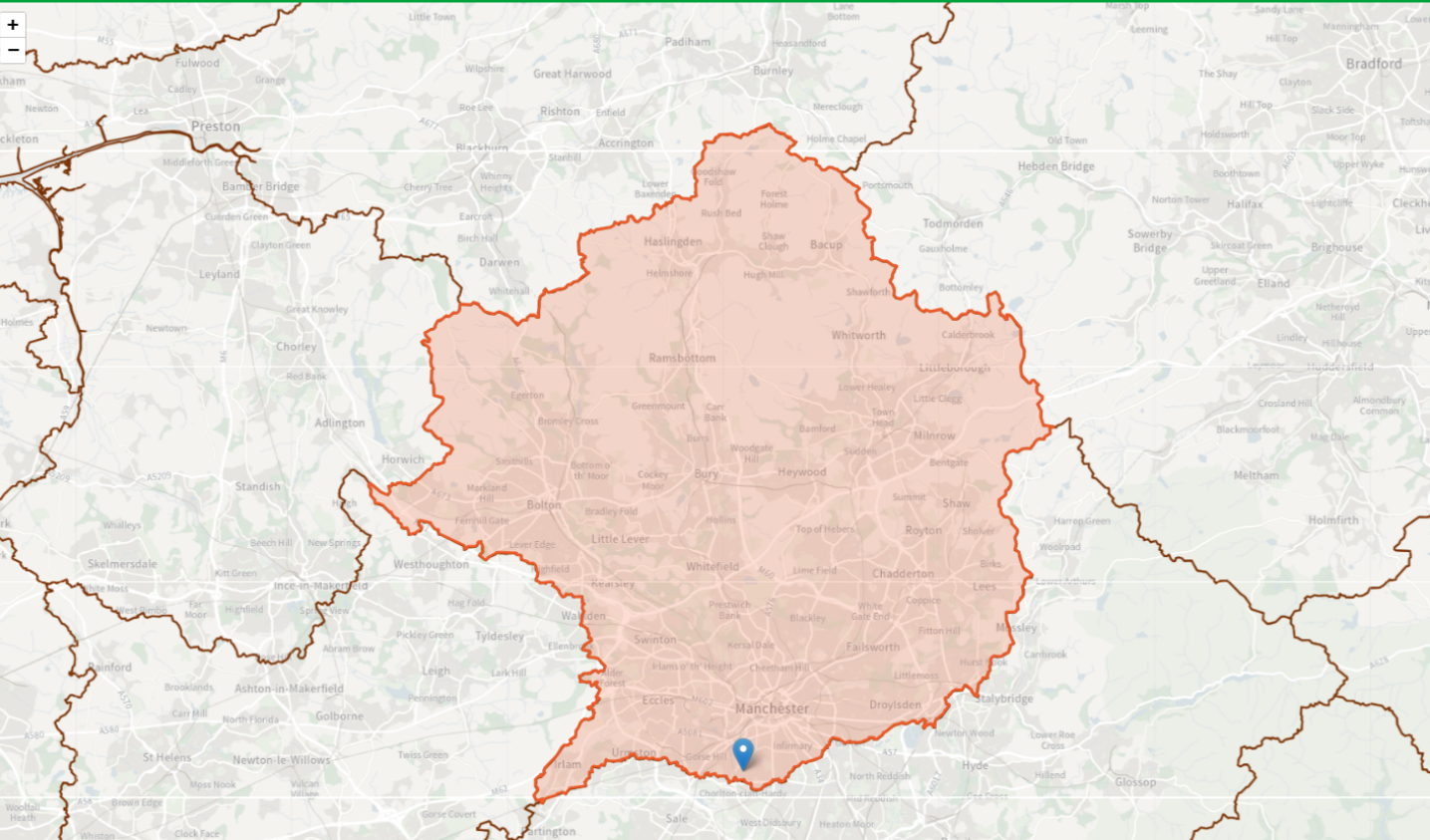
New Playzone Pitch, Manley Park, Manchester

Title

Surface Water Strategy

Appendix E

Environment Agency Climate Change Allowances Extract



Irwell Management Catchment peak rainfall allowances

3.3% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	25%	35%
2070s	30%	40%

1% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	25%	40%
2070s	30%	45%

*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



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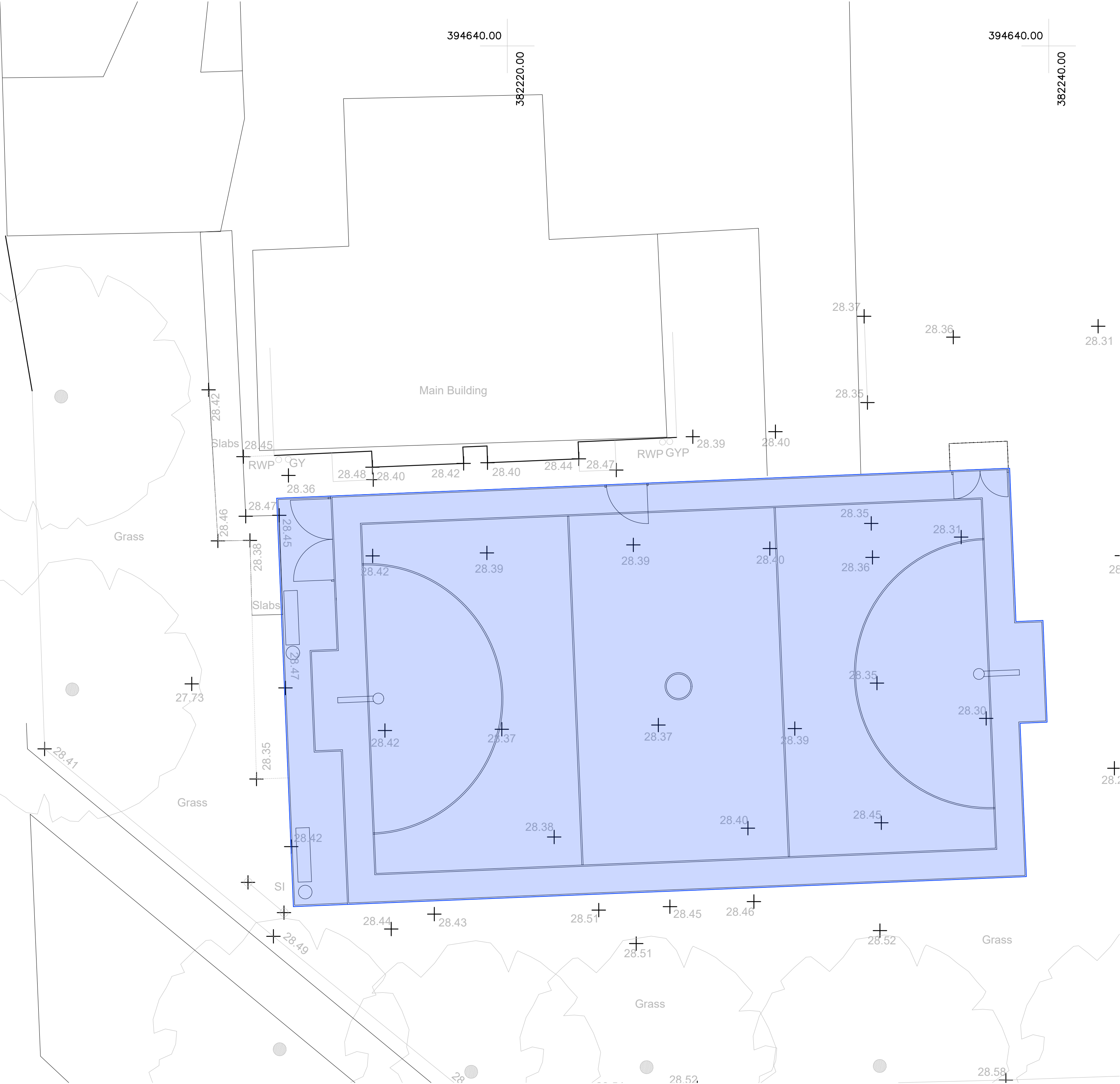
Title

Surface Water Strategy

Appendix F

Proposed Drained Areas

SEA Drawing 00226/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:



Drained Area = 410m²

Rev.	Date	By	Description
 SEA CONSULTING ENGINEERS [CONSULTING CIVIL & STRUCTURAL ENGINEERS] E: warren@seace.co.uk T: 07976310054			
PROJECT NEW PLAYZONE PITCH MANLEY PARK MANCHESTER			
DRAWING PROPOSED DRAINED AREAS			
SCALE: 1:100@A2		DATE: 28.10.2024	
DRAWN BY: WRA		REV: -	
STATUS: FOR APPROVAL			
DWG No: 00226/E01			-



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Title

Surface Water Strategy

Appendix G

Greenfield Runoff Calculations

Calculated by: Warren Allsopp

Site name: Playzone Pitch

Site location: Manley Park, Manchester

Site Details

Latitude: 53.44800° N

Longitude: 2.26925° W

Reference: 1035721616

Date: Oct 28 2024 11:42

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.

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.1

Methodology

Q_{BAR} estimation method: Calculate from SPR and SAAR

SPR estimation method: Calculate from SOIL type

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	850	850
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	0.61	0.61
1 in 1 year (l/s):	0.53	0.53
1 in 30 years (l/s):	1.03	1.03
1 in 100 year (l/s):	1.26	1.26
1 in 200 years (l/s):	1.44	1.44

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at 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 www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of 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, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.



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New Playzone Pitch, Manley Park, Manchester

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Surface Water Strategy

Appendix H

Surface Water Calculations

Nodes

Name	Area (ha)	Cover Level (m)	Diameter (mm)	Depth (m)
1	0.041	28.400	450	0.335

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	1.000	Drain Down Time (mins)	240	Check Discharge Volume x
Winter CV	1.000	Additional Storage (m³/ha)	0.0	

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	45	0	0

Node 1 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.695	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	27.620	Diameter (m)	0.024		

Node 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	28.065	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	
Safety Factor	2.0	Width (m)	27.000	Inf Depth (m)	
Porosity	0.30	Length (m)	15.000		

Results for 1 year Critical Storm Duration. Lowest mass balance: 96.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	1	78	28.090	0.025	2.4	1.2754	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
120 minute summer	1	Orifice	0.8	4.7

Results for 30 year Critical Storm Duration. Lowest mass balance: 96.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	1	60	28.157	0.092	8.5	9.3289	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
60 minute winter	1	Orifice	0.9	12.6

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 96.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	1	118	28.251	0.186	9.4	20.7951	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
120 minute winter	1	Orifice	0.9	18.9



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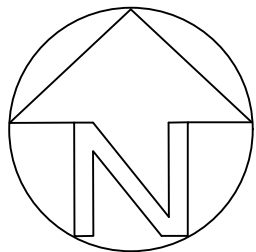
Title

Surface Water Strategy

Appendix I

Proposed Drainage Layout

SEA Drawing 00226/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:

- Assuming Existing Storm/Combined water drainage
- Proposed 80mm lateral drains beneath pitch.
- Proposed Surface water
- Proposed Pitch spot levels
- Proposed pitch gradients
- Proposed permeable type 3 subase extends beneath pitch, depth 250mm, providing attenuation for the 1 in 100 year + 45% event.
- Overland flow diection in case of system failure

