



**Proposed New AGP
Manchester Communications Academy
Manchester**

Surface Water Design

R - 00256 – 001 – SWD – A
May 2025

Report Originator(s)

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Revision Record

Revision	Date	Description	Written	Approved
0	04.05.25	First Issue	WRA	WRA



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Client

McArdle SportTec

Project

Manchester Communications Academy

Title

Surface Water Design

Page no. 2

Project ref 00257

Date May 2025

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SEA Drawing 00256/E02

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SEA Drawing 00256/E03



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1.0 Introduction

1.1 Design Brief

- 1.1.1 The client, McArdle SportTec requires a surface water drainage design for the installation of an extended Artificial Grass Pitch (AGP) at Manchester Communications Academy
- 1.1.2 This report provides design proposals to ensure surface water is managed adequately and to discharge conditions 22 of planning approval reference 141465/FO/2024.

1.2 Site Location

- 1.2.1 The site is located approximately 200m to the northeast of Manchester Communications Academy at the following postal address:
Lathbury Road
Manchester
M9 5GF

1.3 Current Land Use

- 1.3.1 The existing site is an all-weather pitch, which is being refurbished; the remainder of the site is an open field. Appendix A presents the site's topographical survey.

1.4 Proposed Development

The proposed development comprises the refurbishment and extension of the existing 95m x 52m AGP. The proposed development layout is presented in Appendix B.



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2.0 Surface Water Drainage

2.1 Existing Surface water drainage

- 2.1.1 There is existing surface water drains serving the site, which drain the existing all-weather pitch, outfalling to an existing culverted watercourse to the southwest. Appendix C shows the existing surface water drains, surveyed as part of developments to the south of the site.
- 2.1.2 The existing all-weather sports pitch has a positive outfall to the existing surface water drainage with a total drained area of 5045m². SEA drawing E01, appendix D, shows this drained area.
- 2.1.3 Existing surface water flows have been calculated using the 'modified rational method', which calculates flow rates from drained areas based on rainfall intensity. The equation is as follows

$Q = 2.78 \times i \times A / 10,000$, where

Q = flow rate in l/s

i = rainfall intensity in mm/hr (in the UK a rainfall intensity of 50mm/hr is used.)

A = drained area in m²

- 2.1.4 Based on the drained area noted above equates to an existing flow rate of **70.1l/s**.

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 considered separately below;

Into the ground

2.2.3 A ground investigation has been undertaken by Soiltechnics Ltd, report reference R-STV5997-R01-B. Infiltration testing was undertaken as part of the site works, and they concluded that the use of a soakaway is not viable. An extract from their report can be viewed in Appendix E.

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 As discussed in section 2.1, above, existing surface water drains serve the site. These drains provide a viable outfall for the site's surface water.

2.3 Proposed Surface Water Drainage Design

- 2.3.1 Proposals are to utilise the existing pitch drainage with additional lateral drains added. Due to the location of the existing outfall chamber being within the new pitch extent the chamber will have to be relocated south.

The design will use FEH22 rainfall parameters and will be for all drained areas on the site to accommodate storms up to the 1 in 100 year event, plus a 45% Allowance for climate change. 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 F. The site's drained areas are presented in Appendix G and equate to a total area of 6270m².

As this development is part refurbishment, the existing levels and gradients will remain unchanged. The Current pitch gradients are 1in100, which limits the volume of attenuation available. Taking this into consideration, a new HydroBrake flow control chamber is proposed to restrict the flow below the existing calculated brownfield rate of 70.1l/ as much as possible.

- 2.3.2 The AGP will consist of a 50mm synthetic surface, 10mm shockpad, 40mm porous macadam and 300mm permeable type 3 subbase, which will allow water to infiltration through the pitch make up to a series of existing and new lateral drains which will collect surface water before outfalling into a flow control chamber with attenuation provided within the pitches make up.
- 2.3.3 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 AGP provides adequate attenuation for the 1in100 year + 45% event with a total flow rate of 56.5l/s
- 2.3.4 **The total flow rate from the site equates to 52.5l/s which offers a 25% betterment on the existing flow rate of 70.1l/s**
- 2.3.5 A drainage layout and details are presented in Appendix J.

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 for the proposed pitch, due to the minimal pollution hazard associated with the proposed AGP, which will have no vehicle movements within its extent.
- 2.4.3 Surface water from the AGP will pass through the permeable sub-base. Therefore acting very similar to permeable paving. The new car parking is also considered a permeable pavement.
- 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 within the AGP 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 silt 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.
- The Building Regulations (2015) - Drainage and Waste Disposal - Approved Document H.
- 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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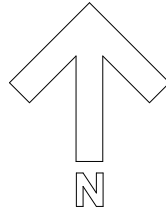
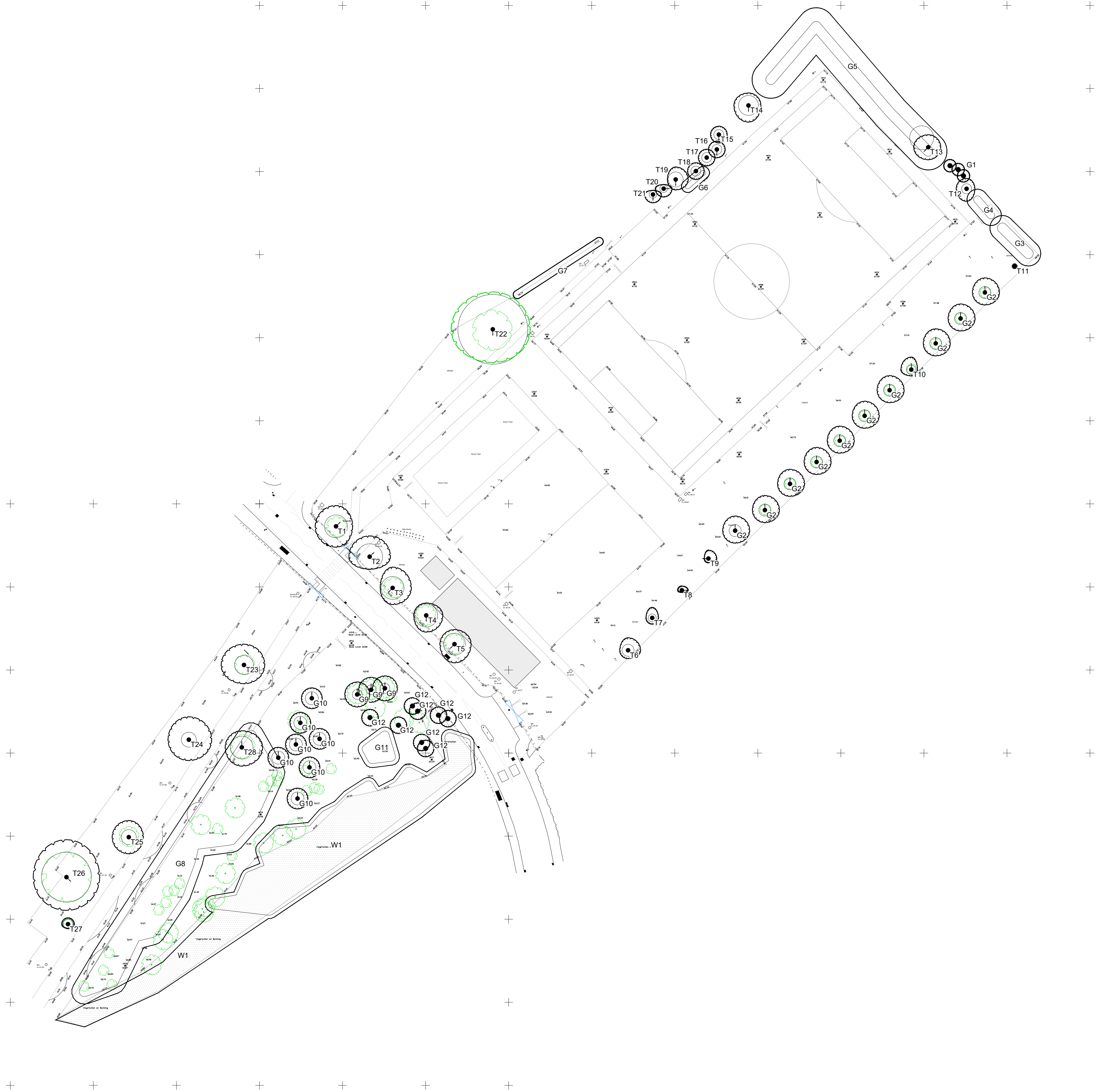
Surface Water Design

Appendix A

Topographical Survey



Scale bar 1 : 500



Initial Issue			
Rev	A m e n d m e n t	Date	By
Client MANCHESTER COMMUNICATIONS ACADEMY M40 8NT			
Project 3G STP FA FRAMEWORK PROJECT			
Drawing TOPOGRAPHICAL AND TREE SURVEY			
Drawn	HJ	Date	02-08-24
Checked		Plot No	01
		Prelim	Check
		Final	
Job No	Drawing No		Rev
	MCA-MUK3213-06		



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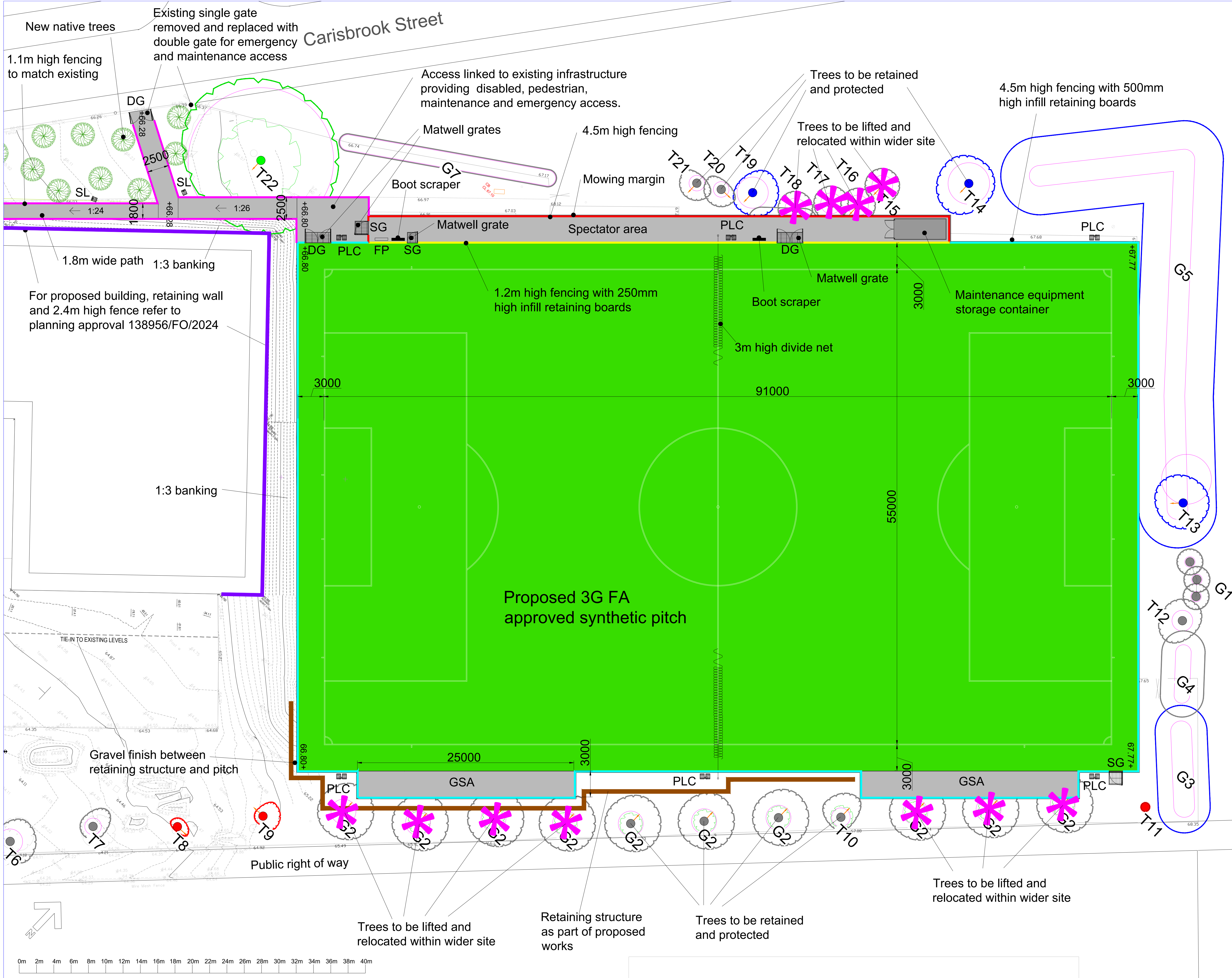
Manchester Communications Academy

Title

Surface Water Design

Appendix B

Proposed Site Plan



NOTES

- Porous asphalt
- 3G synthetic turf playing area
- SG Single Gate
- DG Double Gate
- FP Feeder Pillar
- PLC Pitch Light Column (15m high)
- SL Street Light Column (6m high)
- GSA Goal Storage Area
- 1.1m high fencing to match existing
- 1.2m high fencing with 250mm high infill retaining boards
- 4.5m high fencing with 500mm high infill retaining boards
- 4.5m high fencing
- Retaining structure
- For retaining structure and 2.4m high fence refer to planning approval 138956/FO/2024
- Existing trees to be lifted and relocated with wider site
- New native tree

For pitch line markings see drawing MCA-MUK3213-11

Rev	Initial Issue	Amendment	Date	By
1				

Client: MANCHESTER COMMUNICATIONS ACADEMY M40 8NT

Project: 3G STP FA FRAMEWORK PROJECT

Drawing: PROPOSED PITCH LAYOUT

McARDLE SPORT TEC

Drawn	Checkd	Plot No	Date	Scale	1:200	Prelim	Check	Final
NJM		01	28-01-24					

Job No	Drawing No	Rev
	MCA-MUK3213-02	J



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Appendix C

Existing Drainage Layout



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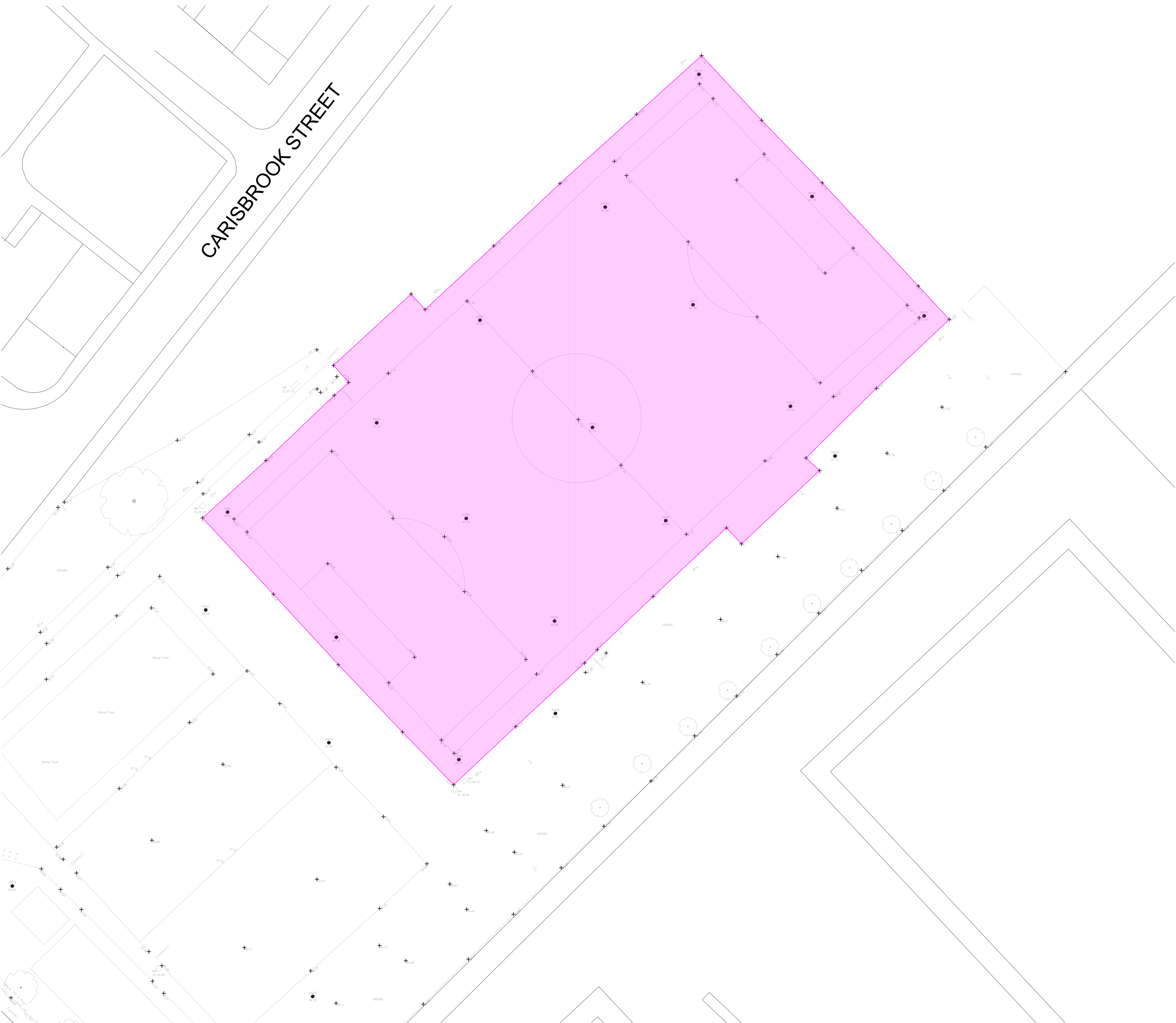
Title

Surface Water Design

Appendix D

Existing Drained Area

SEA Drawing 00256/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 Structural 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.

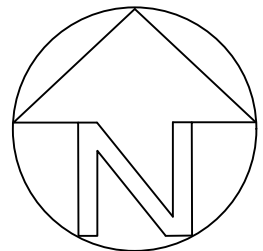
So as far as is reasonably practicable, risks inherent in the design have been eliminated. Where it has been considered that elimination of a risk (or part of a risk) is not reasonably practicable, it has been reduced.

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

None

DRAWING KEY:

Existing Drained Areas = 5045m²



Rev.	Date	By	Description
 SEA CONSULTING ENGINEERS [CONSULTING CIVIL & STRUCTURAL ENGINEERS] E: warren@seace.co.uk T: 07976310054			
PROJECT ARTIFICIAL GRASS PITCH MANCHESTER COMMUNICATIONS ACADEMY			
DRAWING EXISTING DRAINED AREAS			
SCALE: 1:250@A1		DATE: 02.05.2025	
DRAWN BY: WRA		REV: -	
STATUS: FOR APPROVAL			
DWG No: 00267/E01			-



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Appendix E

Ground Investigation Extracts

- 7.3.8 Consideration should also be given to excavating, sorting and compacting the top 1m depth of Made Ground to achieve consistent levels of compaction across the FTP and car park area in particular (where buried obstructions/concrete is present) and minimising the potential effects of differential settlement. In addition, consideration to the use of a geosynthetic reinforcement is recommended to minimise the impact of differential settlement.
- 7.3.9 Increasing and homogenising the density of the Made Ground through ground improvement techniques such as rolling dynamic compaction (RDC) or permeation grouting/lime & cement stabilisation could also be considered. These are notably expensive and would require specialist input at the feasibility stage.
- 7.3.10 The Made Ground deposits soils are considered frost susceptible and this may override the CBR criteria for pavement foundation design purposes.
- 7.3.11 We recommend, as soon as formation is trimmed and rolled, that sub-base is laid in order to avoid deterioration of the subgrade in wet or frosty conditions.

7.4 Drainage and Infiltration Potential

- 7.4.1 Infiltration testing in trial pits has been undertaken at the site following the principles of BRE 365: Soakaway Design (2016), with permeability testing in boreholes undertaken in accordance with BS EN ISO 22282 Geotechnical investigation and testing – Geohydraulic testing (2012). The results are presented in Appendix C and summarised below.
- 7.4.2 Natural soils were not encountered during the investigations, with significant thickness of Made Ground present site wide.
- 7.4.3 Indicative infiltration testing was undertaken in the Made Ground subgrade below the existing FTP in HP04 and HP12 between depths of 0.3m and 0.76m, however, insufficient infiltration was observed over 90 minutes of monitoring to accurately calculate a soil infiltration rate.
- 7.4.4 Permeability testing was also undertaken in Made Ground deposits in borehole WS06, between depths of 2.2m to 5.45m bgl. Some infiltration was observed, however, dissipation of water was slow and a permeability of 2.32×10^{-7} m/s has been derived.
- 7.4.5 Infiltration testing was also undertaken within the subbase beneath the existing FTP (HP14). Two tests were performed, and a worst-case permeability of 1.48×10^{-3} m/s has been derived.
- 7.4.6 Indicative infiltration testing was also undertaken in the Made Ground in HP17 and HP18 within the proposed car park area, between depths of 0.31m and 1.05m, however, insufficient infiltration was observed over 90 minutes of monitoring to accurately calculate a soil infiltration rate.

7.4.7 Discharge of stormwater collected by the proposed development into Made Ground deposits are not considered amenable. Water freely/directly discharged into the Made Ground could cause collapse of air voids contained in these deposits, which promotes compaction of the soils around the soakaway causing depression of the general area around the soakaway as well as potentially affecting pipe runs leading to the soakaway. In addition, soakaways would promote leaching of contaminants within the Made Ground soil.

7.4.8 No existing soakaway features were observed on site during our ground investigation works; however, a full drainage survey was not undertaken. Connection to the foul/surface water sewers to the west and east of the existing FTP may be possible. If this is considered an option 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 FTP/car park area.

7.5 Aggressiveness of the ground to buried concrete

7.5.1 The aggressiveness of the ground with respect to buried concrete has been assessed in accordance with British Research Establishment Special Digest 1: Concrete in Aggressive Ground Third Edition (2005).

7.5.2 The site is interpreted to be a brownfield site where pyrite is likely to be present.

7.5.3 The classification of strata is presented below:

Stratum	Design sulphate classification	Aggressive chemical environment for concrete classification
Made Ground (proposed FTP extension)	DS-1	AC-1
Made Ground (proposed car park)	DS-1	AC-1s

Table 8: Summary of the aggressiveness of the ground to buried concrete

7.6 Recommendations for further works

7.6.1 If a piled foundation solution is adopted for the proposed floodlighting, it is recommended this investigation is supplemented with further onsite deeper boreholes providing parameters to facilitate design and construction.

7.6.2 If ground improvement (such as dynamic compaction, rapid impact compaction or controlled modulus columns) is utilised, potentially allowing adoption of shallow foundations, or lime/cement stabilisation is utilised below the proposed pitch/car park, specialist input at an early stage is recommended.

In an attempt to reduce the hazardous waste classification of Made Ground in the proposed car park area, further testing could be carried out (including cleaned TPH testing) to enable more detailed and/or statistical or zoned analysis.



Key:
Exploratory Holes
[Hand Pit symbol] Hand Pit
[DCP symbol] DCPs (CBR)
[WLS symbol] WLS
[Infiltration Testing symbol] Infiltration Testing
Site Features
[Proposed FTP Area symbol] Proposed FTP Area

Notes
1) Base image provided by Google.
2) All drawn features are approximate.

Contains OS data © Crown copyright [and database right] [2023]
Map data © 2023 Google

A	May 2023	First issue
REV	DATE	COMMENT ON VARIATION

soiltechnics
environmental • geotechnical • building fabric

PROJECT
Manchester Communications Academy

TITLE
Exploratory Hole Location Plan (Proposed Pitch Area)

PROJECT No. STV5997	DRAWING 01	REVISION 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
ARTIFICIAL TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.26								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.46						0.56	0.71	D
...at 0.46m depth depth, woven membrane. Brown sandy clayey angular to subangular fine to coarse GRAVEL of brick, sandstone, concrete and clinker. (MADE GROUND)	0.76								
TRIAL PIT TERMINATED AT 0.76m									

Notes Trial pit sides remained upright and stable upon completion.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 12/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	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
ARTIFICIAL TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subrounded fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.26								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.44								
...at 0.44m depth depth, woven membrane. Brown sandy slightly clayey angular to subangular fine to coarse GRAVEL with low cobble content of concrete. Gravel is brick, concrete and clinker. (MADE GROUND)	0.71						0.56	0.71	D
TRIAL PIT TERMINATED AT 0.71m									

Notes Trial pit sides remained upright and stable upon completion.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 12/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	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
ARTIFICIAL TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.25								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.46						0.56	0.71	D
...at 0.46m depth depth, woven membrane. Brown sandy clayey angular to subangular fine to coarse GRAVEL with low cobble content of concrete. Gravel is brick, sandstone, concrete, clinker and wood. (MADE GROUND)	0.76								
TRIAL PIT TERMINATED AT 0.76m									

Notes Trial pit sides remained upright and stable upon completion.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 12/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	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
ARTIFICIAL TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.24								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.46						0.56	0.71	D
...at 0.46m depth depth, woven membrane.									
Brown sandy clayey angular to subangular fine to coarse GRAVEL with low cobble content of concrete. Gravel is brick, sandstone, concrete, clinker and wood. (MADE GROUND)	0.71								
TRIAL PIT TERMINATED AT 0.71m									

Notes Trial pit sides remained upright and stable upon completion. Infiltration testing performed within SUBGRADE.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 11/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	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
ARTIFICIAL TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.28								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.48						0.56	0.71	D
...at 0.48m depth depth, woven membrane. Brown clayey very angular to subangular fine to coarse GRAVEL of brick, sandstone, concrete, clinker and wood. (MADE GROUND)	0.76								
TRIAL PIT TERMINATED AT 0.76m									

Notes Trial pit sides remained upright and stable upon completion.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 11/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	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
ARTIFICIAL TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.24								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.43						0.56	0.71	D
...at 0.43m depth depth, woven membrane. Brown sandy clayey angular to subangular fine to coarse GRAVEL with low cobble content of concrete. Gravel is brick, sandstone, concrete, clinker and wood. (MADE GROUND)	0.71								
TRIAL PIT TERMINATED AT 0.71m									

Notes Trial pit sides remained upright and stable upon completion.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 12/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	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
ARTIFICIAL TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.26								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.46								
...at 0.46m depth depth, woven membrane. Brown sandy clayey angular to subangular fine to coarse GRAVEL with low cobble content of concrete. Gravel is brick, concrete and clinker. (MADE GROUND)	0.71						0.56	0.71	D
TRIAL PIT TERMINATED AT 0.71m									

Notes Trial pit sides remained upright and stable upon completion.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 11/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	HP07

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 TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.26								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.44								
...at 0.44m depth depth, woven membrane. Brown sandy clayey angular to subangular fine to coarse GRAVEL with low cobble content of concrete. Gravel is brick, sandstone, concrete, clinker and wood. (MADE GROUND)	0.71						0.56	0.71	D
TRIAL PIT TERMINATED AT 0.71m									

Notes Trial pit sides remained upright and stable upon completion.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 12/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	HP08

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 TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.26								
...at 0.38m depth depth, woven membrane.	0.38								
Brown sandy clayey angular to subangular fine to coarse GRAVEL with low cobble content of brick. Gravel is brick, sandstone, concrete, clinker and wood. (MADE GROUND)							0.56	0.71	D
TRIAL PIT TERMINATED AT 0.71m	0.71								

Notes Trial pit sides remained upright and stable upon completion.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 12/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	HP09

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 TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.26								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.48								
.....at 0.48m depth depth, woven membrane. Brown sandy clayey angular to subangular fine to coarse GRAVEL of brick, sandstone, concrete and clinker. (MADE GROUND)	0.66						0.56	0.71	D
Dark brown ashy sandy angular to subangular fine to medium GRAVEL of clinker and brick. (MADE GROUND)	0.76								
TRIAL PIT TERMINATED AT 0.76m									

Notes Trial pit sides remained upright and stable upon completion.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 12/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	HP10

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 TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.26								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.47								
...at 0.47m depth depth, woven membrane. Brown sandy clayey angular to subangular fine to coarse GRAVEL with low cobble content of brick. Gravel is brick, sandstone, concrete, ceramic and clinker. (MADE GROUND)	0.66						0.56	0.71	D
Dark brown ashy sandy angular to subangular fine to medium GRAVEL of clinker, brick and ceramic. (MADE GROUND)	0.76								
TRIAL PIT TERMINATED AT 0.76m									

Notes Trial pit sides remained upright and stable upon completion.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 11/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	HP11

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 TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.28								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.46						0.56	0.71	D
...at 0.46m depth depth, woven membrane. Brown very sandy clayey angular to subangular fine to coarse GRAVEL of brick, sandstone, concrete, clinker and wood. (MADE GROUND)	0.76								
TRIAL PIT TERMINATED AT 0.76m									

Notes Trial pit sides remained upright and stable upon completion. Infiltration testing performed on SUBBASE.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 11/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	HP12

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 TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.26								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.46								
...at 0.46m depth depth, woven membrane. Brown sandy angular to subangular fine to coarse GRAVEL with low cobble content of concrete. Gravel is brick, sandstone, concrete and clinker. (MADE GROUND)	0.66						0.56	0.66	D
TRIAL PIT TERMINATED AT 0.66m									

Notes Trial pit sides remained upright and stable upon completion.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 12/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	HP13

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 TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.29								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.44								
...at 0.44m depth depth, woven membrane. Brown sandy angular to subangular fine to coarse GRAVEL of brick, sandstone, concrete and ceramic. (MADE GROUND)	0.76						0.56	0.71	D
TRIAL PIT TERMINATED AT 0.76m									

Notes Trial pit sides remained upright and stable upon completion. Infiltration testing performed on SUBBASE.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 12/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	HP14

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 TURF. (MADE GROUND)	0.03								
SHOCK PAD. (MADE GROUND)	0.08								
ASPHALT. (ASPHALT)	0.16								
Yellowish brown sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.26								
Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND - SUBBASE)	0.42								
...at 0.42m depth depth, woven membrane. Brown sandy slightly clayey angular to subangular fine to coarse GRAVEL of brick, sandstone, concrete, clinker and wood. (MADE GROUND)	0.66						0.56	0.66	D
TRIAL PIT TERMINATED AT 0.66m									

Notes Trial pit sides remained upright and stable upon completion.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 12/05/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by KD	Revision A
	Co-ordinates -	Checked by DH	HP15

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 dark brown sandy clayey fine to coarse angular to subangular GRAVEL of brick, concrete, ceramic, clinker and sandstone with medium cobble content of angular brick and concrete. (MADE GROUND)	0.50						0.30	0.50	B
...at 0.5m depth, concrete obstruction.									
TRIAL PIT TERMINATED AT 0.50m									

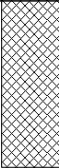
Notes Trial pit sides remained upright and stable upon completion. Terminated due to concrete obstruction.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 07/09/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by JC	Revision A
	Co-ordinates -	Checked by JP	HP16A

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 stiff brown mottled grey slightly gravelly CLAY with low cobble content of concrete. Gravel is fine to medium angular to subangular brick and concrete. (MADE GROUND) ...at 0.2m depth, concrete obstruction.	0.20				PP 0.10	PP=154	0.10	0.20	D
TRIAL PIT TERMINATED AT 0.20m									

Notes Trial pit sides remained upright and stable upon completion. Terminated due to concrete obstruction.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 07/09/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by JC	Revision A
	Co-ordinates -	Checked by JP	HP16B

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 stiff brown mottled grey slightly gravelly CLAY with low cobble content of concrete. Gravel is fine to medium angular to subangular brick and concrete. (MADE GROUND)	0.60				PP 0.35	PP=100			
...at 0.6m depth, concrete obstruction.									
TRIAL PIT TERMINATED AT 0.60m									

Notes Trial pit sides remained upright and stable upon completion. Terminated due to concrete obstruction.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 07/09/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by JC	Revision A
	Co-ordinates -	Checked by JP	HP16C

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 firm dark brown slightly sandy slightly gravelly CLAY with medium cobble content of concrete and brick. Gravel is fine to coarse angular to subrounded brick, concrete, plastic, ceramic and stone. (MADE GROUND)	1.10				PP 0.30	PP=63			
					PP 0.60	PP=50	0.50	0.60	D
							0.70	0.80	D
					PP 0.90	PP=75	0.90	1.00	D
...at 0.9m depth, ether odour noted.									
TRIAL PIT TERMINATED AT 1.10m									

Notes Trial pit sides remained upright and stable upon completion. Infiltration testing performed.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 07/09/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by JC	Revision A
	Co-ordinates -	Checked by JP	HP17

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 dark brown clayey fine to coarse angular to subangular GRAVEL of brick, concrete, ceramic, clinker and sandstone with cobbles of medium brick and concrete. (MADE GROUND)	0.55						0.65	0.95	B
Dark brown very gravelly fine to medium SAND. Gravel is fine to coarse angular to subangular brick, concrete, sandstone and clinker with frequent ash. (MADE GROUND)									
TRIAL PIT TERMINATED AT 1.05m	1.05								

Notes Trial pit sides remained upright and stable upon completion. Infiltration testing performed.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 07/09/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by JC	Revision A
	Co-ordinates -	Checked by JP	HP18

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 firm dark brown slightly sandy slightly gravelly CLAY with medium cobble content of concrete and brick. Gravel is fine to coarse angular to subrounded brick, concrete, plastic, ceramic and stone. (MADE GROUND)	1.00				PP 0.30	PP=92	0.20	0.30	D
					PP 0.60	PP=104	0.60	0.70	D
							0.90	1.00	D
TRIAL PIT TERMINATED AT 1.00m									

Notes Trial pit sides remained upright and stable upon completion.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 07/09/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by JC	Revision A
	Co-ordinates -	Checked by JP	HP19

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 firm dark brown slightly sandy slightly gravelly CLAY with medium cobble content of brick. Gravel is fine to coarse angular to subrounded brick, concrete, plastic, ceramic and stone. (MADE GROUND) ...at 0.1m depth, concrete boulder.	1.00				PP 0.40	PP=50	0.30	0.40	D
							0.50	0.60	D
							0.90	1.00	D
TRIAL PIT TERMINATED AT 1.00m									

Notes Terminated due to concrete boulder obstruction.	Title Trial pit record	Dimensions (w x l) 0.30m x 0.30m	Date(s) 07/09/2023
	Method Hand tools	Logged by CB	Sheet number Sheet 1 of 1
Groundwater observations No groundwater encountered.	Level (m OD) -	Compiled by JC	Revision A
	Co-ordinates -	Checked by JP	HP20



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Client

McArdle SportTec

Project

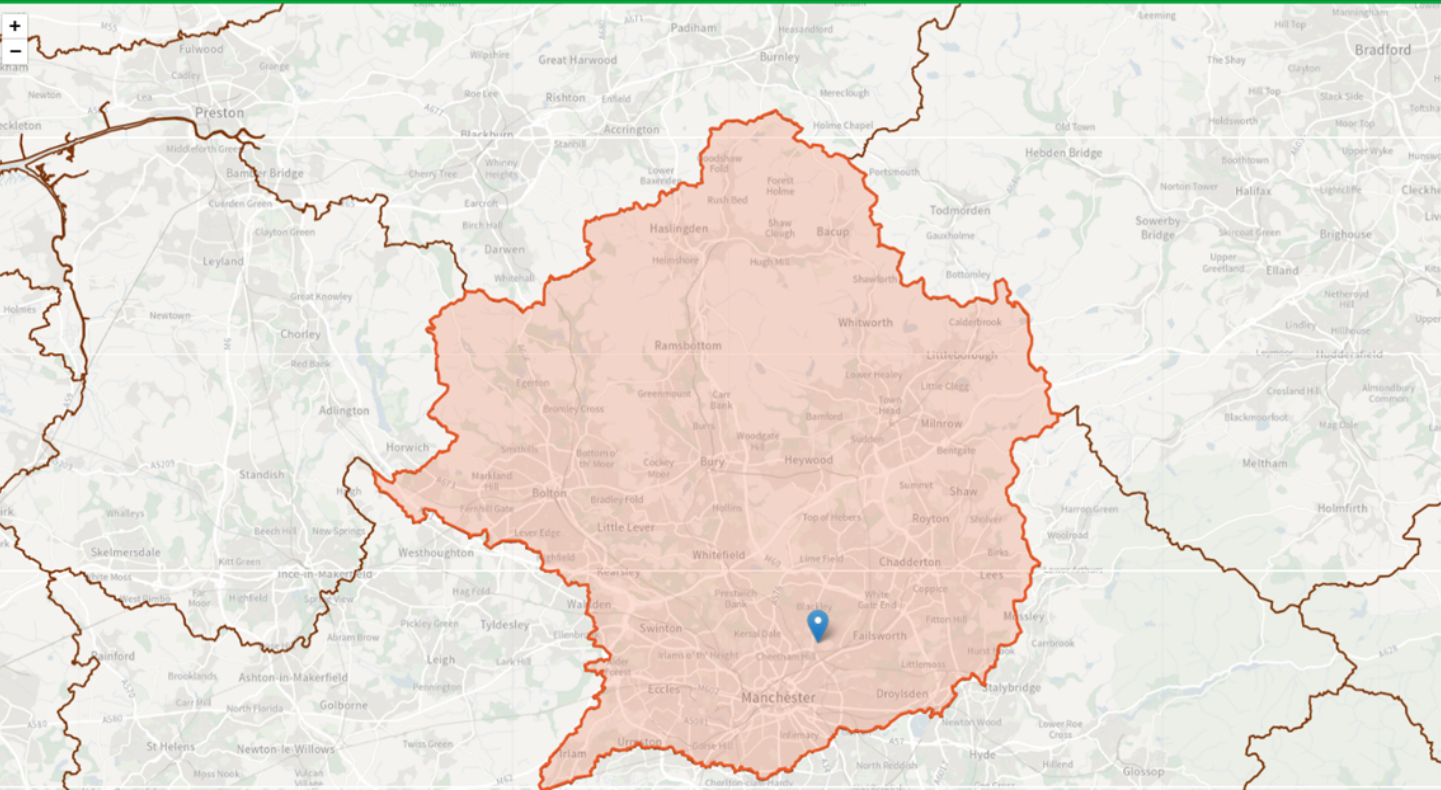
Manchester Communications Academy

Title

Surface Water Design

Appendix F

EA Climate Allowance 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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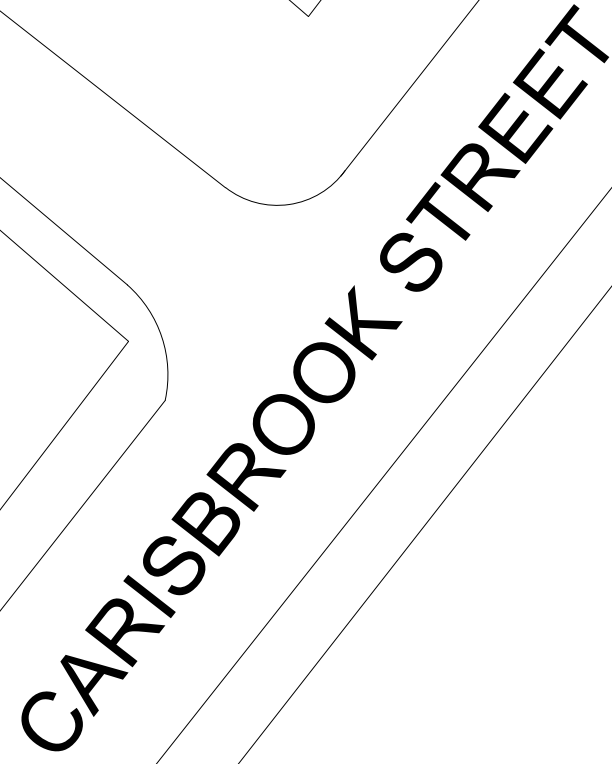
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Project	Manchester Communications Academy
Title	Surface Water Design

Appendix G

Proposed Drained Areas

SEA Drawing 00256/E02



Existing Drained Areas = 6270m²

DWG No: 00267/E02 -



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Surface Water Design

Appendix H

AGP Surface Water Calculations

Nodes

Name	Area (ha)	Cover Level (m)	Diameter (mm)	Depth (m)
1	0.627	66.800	2100	0.400

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 (m³/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	45	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)	65.600	Product Number	CTL-SHE-0298-5250-1200-5250
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.375
Design Flow (l/s)	52.5	Min Node Diameter (mm)	2100

Node 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	66.400	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	59	Depth (m)	
Safety Factor	2.0	Width (m)	64.700	Inf Depth (m)	
Porosity	0.30	Length (m)	97.000		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	11	66.168	-0.232	55.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute winter	1	Hydro-Brake®	52.5	25.9

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	1	25	66.626	0.226	164.3	57.3451	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
30 minute winter	1	Hydro-Brake®	52.3	129.8

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	1	48	66.779	0.379	208.5	152.9498	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
60 minute winter	1	Hydro-Brake®	52.5	305.7



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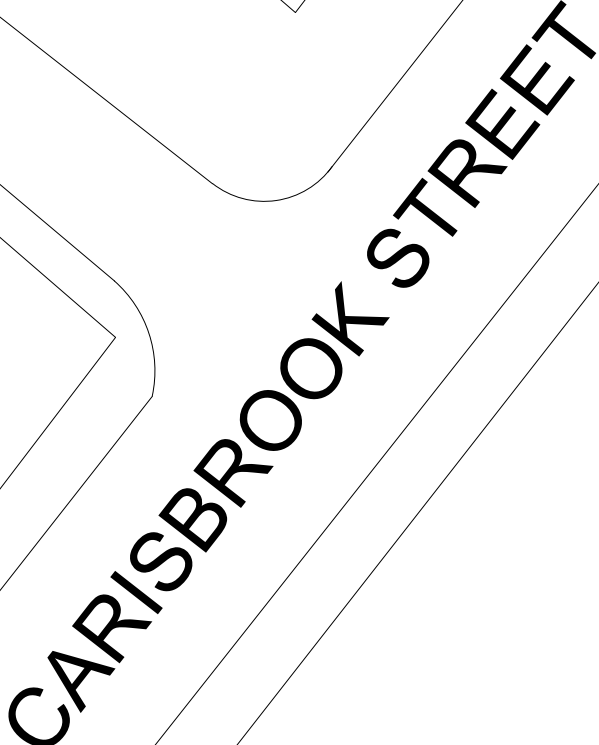
Title

Surface Water Design

Appendix J

Proposed Drainage Layout

SEA Drawing 00256/E03



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 Structural 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

DRAWING KEY

Existing Surface Water

Existing pitch drainage to remain

--- New lateral pitch drainage, 80mmØ, for extended pitch area

Proposed new surface water drainage

Proposed permeable subbase extends beneath AGP. Minimum depth 300mm

1:500

Proposed pitch falls

Overland Flows in the event of system failure

Rev:	Date	By	Description
 <p>SEA CONSULTING ENGINEERS</p> <p>[CONSULTING CIVIL & STRUCTURAL ENGINEERS]</p> <p>E: warren@seace.co.uk T: 07976310054</p>			
<p><u>PROJECT</u></p> <p>ARTIFICIAL GRASS PITCH MANCHESTER COMMUNICATIONS ACADEMY</p>			
<p><u>DRAWING</u></p> <p>PROPOSED DRAINAGE LAYOUT</p>			
SCALE: 1:250@A1		DATE: 02.05.2025	
DRAWN BY: WRA		REV: -	
STATUS: FOR APPROVAL			
DWG No: 00267/E03			-

