CHESTER WOOL FACTORY

Sandycroft

Drainage Strategy Report

107014-RP-D-0001

Rev: P02

January 2025

JPS CIVIL + STRUCTURAL ENGINEERS

Document History

Job Number: 107014		Document Ref: RP-D-0001		
P02	Drainage Strategy	SB	RH	25.02.2024
P01	Drainage Strategy	RH	MM	30.01.2025
Revision	Purpose Description	Originated	Authorised	Date

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1 Introduction

1.1 Commission

Cassidy & Ashton appointed JP Structural Design (JPS) on behalf of the Chester Wool Factory to undertake this Drainage Strategy Report in support of a Planning Application for the construction of a new warehouse facility off Factory Road, Sandycroft.

1.2 Limitations

The findings of this Strategy have been based on data available at the time of the study and on the review of available information that has been undertaken to date. They relate to the current development proposals as outlined in **Appendix A**. Should the proposed end use of the site change after the completion of this assessment, then the findings of this report will need to be reviewed and updated accordingly.

2 Existing Site and Proposed Development

2.1 Existing Site

The site covers an area northeast of Factory Road comprising derelict and previously demolished industrial units. The site covers an area of approximately 8,345m^2 as shown on the site information drawing in **Appendix B**.

The site is roughly rectangular in shape and relatively flat.

2.2 Existing Drainage

The sewer records for the site have been obtained (an extract is shown the information drawing in **Appendix B**), which suggested a transferred sewer crosses the site to a pump station within the adjacent site to the west. Further to this on-site investigations have been attempted although found the system to be in a poor condition following previously undertaken demolition works. A lot of the drainage network was found to be surcharged although it has not been able to determine whether this is due to blockages in the system or due to the pump station not clearing the network fully. Further to this, a GPR survey has been undertaken.

We have therefore produced an Existing Drainage Plan shown in **Appendix C** by interpolating between the various pieces of information available. Extracts from the CCTV survey are included in **Appendix D** although all information will require verification on site.

2.3 Existing Flood Design

In accordance with the NRW Developers Advice Maps (shown in **Appendix B**), the site is located within Flood Zone C1 – described as "areas of the floodplain which are developed and served by significant infrastructure, including flood defences"

Subsequently a separate Flood Consequence Assessment has been prepared by Tier Consult which ultimately concluded that the site should be expected to remain dry in all but the most extreme conditions although recommendations were included predominantly concerning the minimum level the building should be constructed to as 6.55m.

2.4 Proposed Development

The proposed development is for a new warehouse to store products and materials for the Chester Wool Company with workshop and office areas, service delivery yard with dock levellers and car parking facilities.

2.5 Ground Investigation

It is necessary to identify the most appropriate method of controlling and discharging surface water. The design should seek to improve the local run-off profile by using systems that can either attenuate run-off and reduce peak flow rates or positively impact on the existing flood profile. As evidence to the most suitable method of discharging surface water, an extract from the site investigation / Geo-Environmental report prepared for the site is by Tier is included within **Appendix E**. As shown it

was found that the site is underlain by brown silty sands with shallow groundwater which was encountered at depths of 1.2-1.7m

It is therefore anticipated that infiltration methods will not be a viable solution for the site.

3 Drainage Strategy

3.1 Existing Sewer

It is proposed to seek a diversion agreement to amended the existing sewer crossing the site to ensure it is clear of the new building line etc, this will need to in accordance with a Section 185 agreement with Welsh Water.

3.2 Foul Drainage

The foul drainage peak discharge will increase slightly following completion of the scheme with the creation of additional office space and welfare facilities; however this is still anticipated of being less than 1.0 l/s additional peak flow.

For the foul design proposals, we would therefore advocate a new separate foul drainage system is designed to serve the proposed development and connected to the existing foul network serving the estate.

3.3 Surface Water Drainage

In accordance with the Welsh Assembly Government's implementation of Schedule 3, the Surface Water Drainage strategy adheres to the principles of;

- Reducing Flood Risk
- Improving Water Quality
- Protecting and Improving the Environment
- Ensuring the Stability & Durability of Drainage Systems

The site will be subject to a SAB application and the completed Application Advice is contained in **Appendix F**.

3.4 Drainage Proposals

A preliminary drainage proposal drawing is contained in **Appendix G**, the calculated Qbar for the site is contained in **Appendix H**. Surface Water calculations are contained in **Appendix I** with a schematic layout contained in **Appendix J**.

3.5 O&M Manual

During the detail design stage & construction, full details of the final design will be submitted and included in the O&M manuals to ensure the drainage system is regularly maintained with particular regards to the surface water system. This will include manufacturer's guidelines for maintenance and replacement and full details of the flow control device as well as means to operate the drain down features in a blockage situation. A draft copy is contained within **Appendix K**.

4 Conclusions

4.1 Conclusions

The proposed site has suitable points of connection for the disposal of the foul and surface water run-off generated by the proposed development. Whilst it is within a Flood Risk zone as concluded within the FCA it is considered that measures can taken to appropriately mitigate the risk.

We would expect the proposed development to be free from general objections in respect to draining the site but anticipate that the use of infiltration techniques will not be possible. There will also be suitable conditions imposed to ensure that the drainage proposals are designed and constructed in accordance with relevant statutory requirements.

5 Appendices

Appendix A – Site Plans

0m 4m 8m 12m 16m

Drawing Scale 1:200 @ A1

Rev	Description	By	Date
P04	Landscape scheme updated	SP	17-02-25
P03	Cladding Co-ordination Exercise and External Works revised to Reflect Survey and Consultant Input. Balancing Pond Added and Pedestrian Access Route Revised	SP	11.02.2025
P02	Drawing issued for review	AB	19.11.2024
P01	First issue of drawing for review	AB	28.10.2024

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St Andrews Business Centre, Mold, Flintshire, CH7 1XB T: 01352 706 246

Client

Rose Farmhouse Properties Ltd

Project

New Build Warehouse
11, Factory Road, Sandycroft

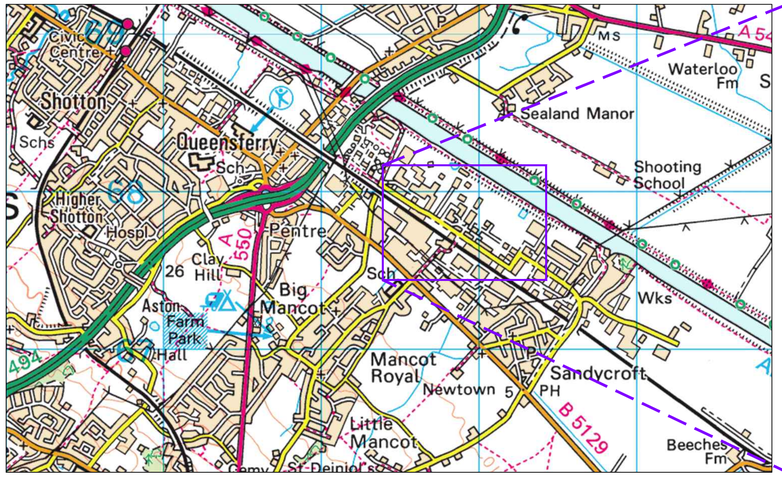
Drawing Title

Site_Plan_Proposed

Drawn by	AB	Checked by	SP	Date	04/10/24
Suitability	S0 - WORK IN PROGRESS			Scale @ A1	1 : 200

C+A JOB NO.	PROJECT - ORIGINATOR - VOL. - LEVEL - TYPE - ROLE - NUMBER	REV.
12382	FRS-CAA-XX-XX-DR-A-1015	P04

Appendix B – Site Information Drawing



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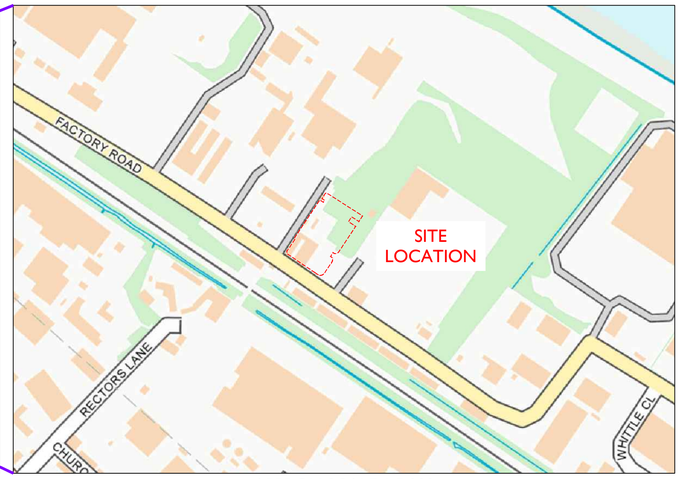

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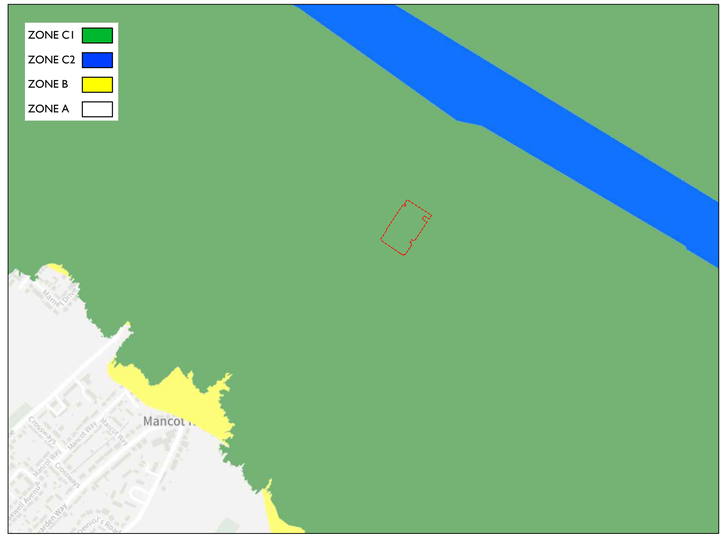


DEVELOPMENT ADVICE MAP
APPROX SCALE 1:7,500

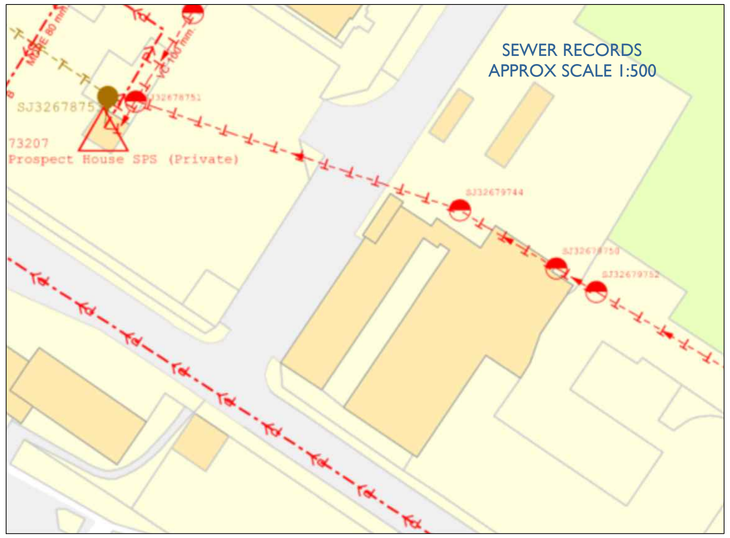
SITE CO-ORDINATES

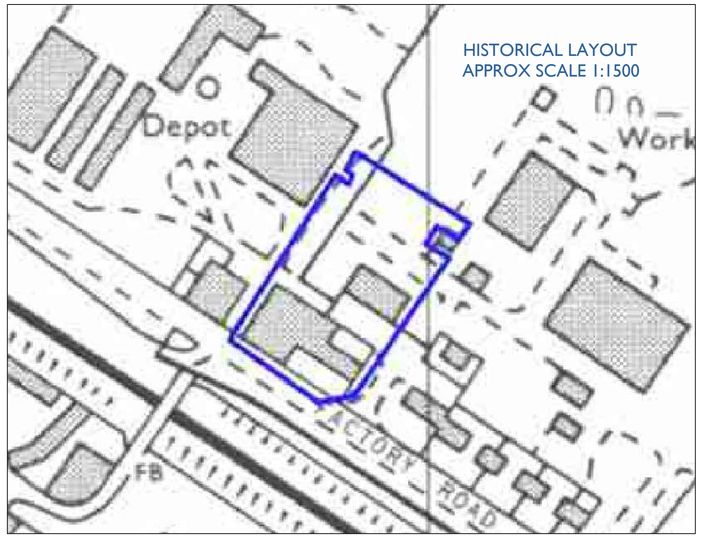
OS X (Eastings)	332923
OS Y (Northings)	367715
Nearest Post Code	CH5 2QJ
Nat Grid	SJ329677 / SJ3292367715

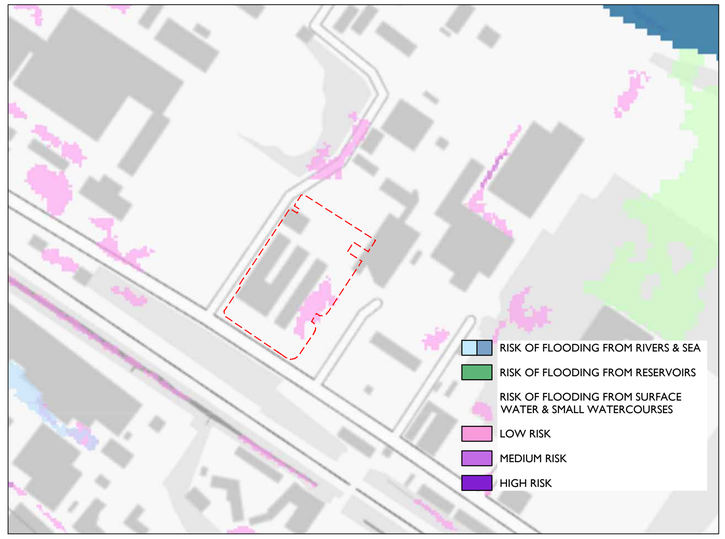
AREAS

- SITE BOUNDARY 8,345 SQ M
- EXISTING IMPERMEABLE AREA 4,690 SQ M
- ADDITIONAL IMPERMEABLE AREA 1,615 SQ M
- EXISTING IMPERMEABLE AREA TO BE REMOVED 595 SQ M

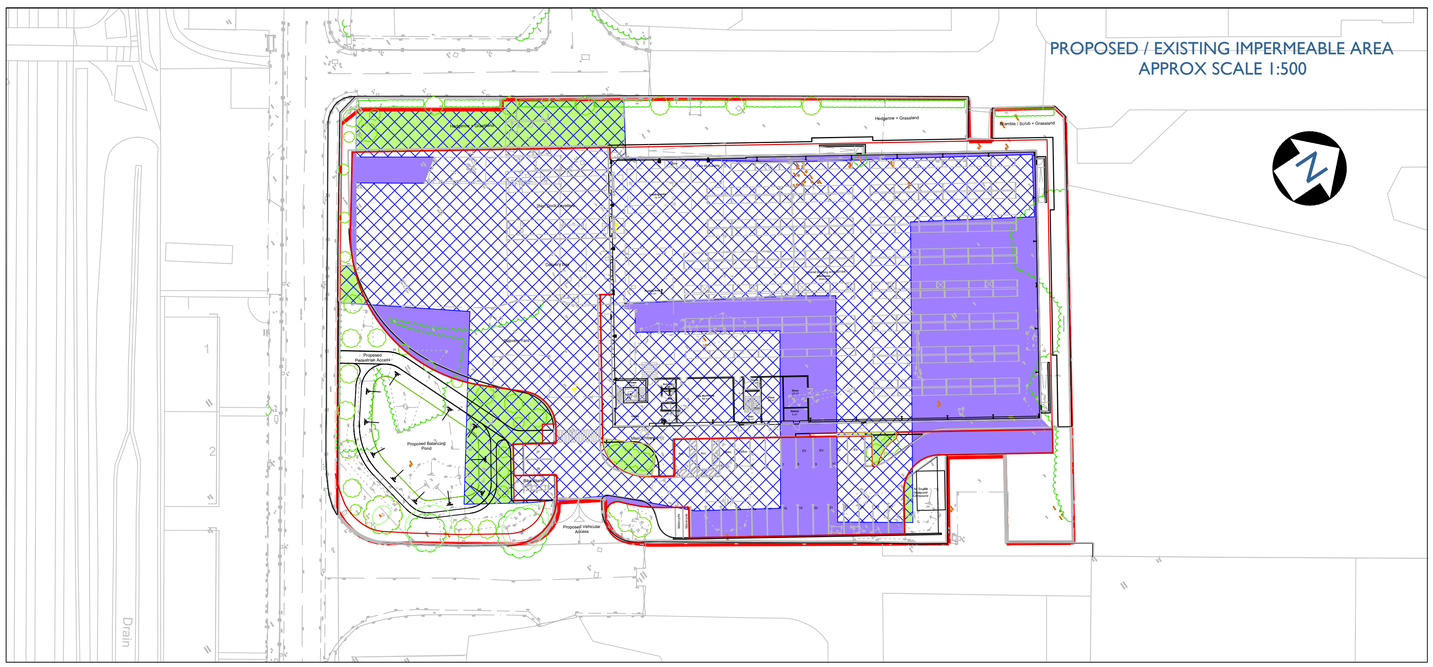
TOTAL CATCHMENT AREA AFTER DEVELOPMENT
5,710 sq m

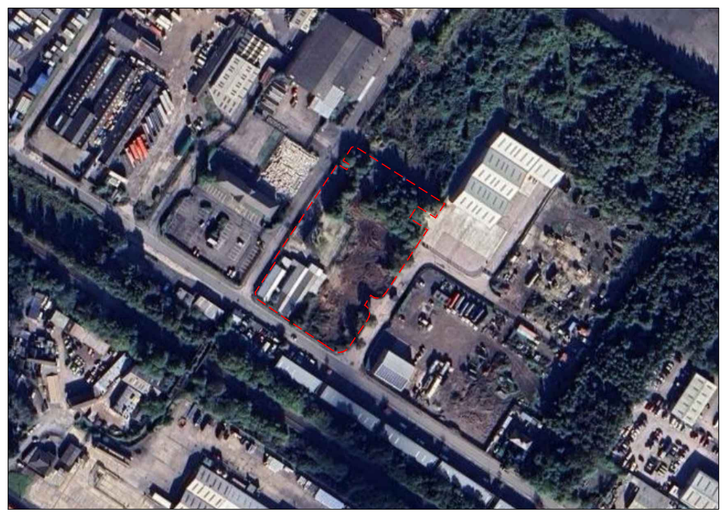






FLOOD RISK MAP
APPROX SCALE 1:2,500





EXISTING SATELITE IMAGE
APPROX SCALE 1:2,000

REV	DESCRIPTION	BY	CHK	APR	DATE
-	-	-	-	-	-

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PURPOSE OF ISSUE	PRELIMINARY
STATUS	P
PROJECT	CHESTER WOOL COMPANY SANDYCROFT
TITLE	DRAINAGE SCHEME SITE INFORMATION
CLIENT	CASSIDY & ASHTON
DRAWN BY	SB
CHECKED BY	RH
APPROVED BY	JP
DATE	30.01.2025
SCALE (@ A1)	AS SHOWN
PROJECT NUMBER	107014
DRAWING NUMBER	1001
REV	P01

Appendix C – Existing Drainage

EXMH20
CL 5.58
IL utr

EXMH019
CL 5.45
IL 4.66

EXMH07
CL 5.58
IL ud

EXMH012
CL 5.57
IL 4.19

EXMH011
CL 5.67
IL 4.87

EXMH04
CL 5.66
IL 3.98

EXMH010
ASSUMED SJ32679744
CL 5.59
IL ukn

EXMH06
CL 5.92
IL 4.76

EXMH05
CL 5.74
IL 5.24

EXMH03
CL 5.66
IL 5.01

ASSUMED SJ32679750
CL ukn
IL ukn

EXMH01
CL 5.62
IL 5.07

EXMH09
CL 5.58
IL 4.08

EXMH08
CL 5.65
IL 4.53

EXMH02
CL ukn
IL ukn

ASSUMED SJ32679752
CL ukn
IL ukn

EXMH016
ASSUMED
SJ32679751
CL 5.68
IL 4.62

EXMH016
CL 5.68
IL 4.94

EXMH014
ASSUMED SJ32679743
CL 5.61
IL 4.65

EXMH015
ASSUMED SJ32679650
CL 5.67
IL 4.66

SJ32679642
CL ukn
IL ukn

EXISTING DRAINAGE NOTES

THE LOCATION LINE & LEVEL OF ALL KNOWN EXISTING DRAINAGE PIPEWORK INDICATED ON THIS DRAWING IS APPROXIMATE AND FOR GUIDANCE PURPOSES ONLY.

KEY

- FWS — EXISTING FOUL WATER SEWER
- SWS — EXISTING SW SEWER
- CFS — EXISTING COMBINED SEWER
- HD — EXISTING HIGHWAY DRAIN
- EXISTING FOUL DRAIN
- EXISTING SW DRAIN
- EXISTING COMBINED FLOW DRAIN
- ASSUMED EXISTING DRAINAGE
- sfr — SHOWN FROM RECORD INFORMATION

THE CONTRACTOR SHALL MAKE ALLOWANCE FOR RAISING / LOWERING ALL EXISTING ACCESS COVERS & FRAMES TO SUIT NEW FINISHED LEVELS.

THIS DRAWING HAS BEEN PRODUCED BY COMPARING INFORMATION FROM VARIOUS RECORD PLANS AGAINST THE TOPOGRAPHICAL SURVEY DATA OBTAINED. AS SUCH THE ACCURACY CANNOT BE GUARANTEED AND THE CONTRACTOR IS TO VERIFY THE EXISTING LAYOUT & LEVELS PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS.

REV	DESCRIPTION	BY	CHK	APR	DATE
-	-	-	-	-	-

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PURPOSE OF ISSUE: PRELIMINARY	STATUS: P
PROJECT: CHESTER WOOL COMPANY SANDYCROFT	
TITLE: DRAINAGE SCHEME EXISTING LAYOUT	
CLIENT: CASSIDY & ASHTON	
DRAWN BY: SB	CHECKED BY: RH
APPROVED BY: JP	
DATE: 23.01.2025	SCALE (@ A1): 1:200
PROJECT NUMBER: 107014	
DRAWING NUMBER: 0601	REV: P01

Appendix D – CCTV Survey

Underground Surveys (UK) Ltd
Unit CG17 & 18 Warrington Business Park, Long Lane
Tel. 01925 444 664
info@undergroundsurveys.co.uk

Project

Project Name:	15463 Survey Ops Sandycroft
Project Description:	CCTV Drainage Inspection Report
Project Number:	15463
Project Date:	19/11/2024
Inspection Standard:	MSCC5 Sewers & Drainage GB (SRM5 Scoring)

Underground Surveys (UK) Ltd
Unit CG17 & 18 Warrington Business Park, Long Lane
Tel. 01925 444 664
info@undergroundsurveys.co.uk

Scoring Summary

Project Name	Project Number	Project Date
15463 Survey Ops Sandycroft	15463	19/11/2024

Structural Defects

Grade 3: Best practice suggests consideration should be given to repairs in the medium term.

Grade 4: Best practice suggests consideration should be given to repairs to avoid a potential collapse.

Grade 5: Best practice suggests that this pipe is at risk of collapse at any time. Urgent consideration should be given to repairs to avoid total failure.

Section	PLR	Grade	Description
2	Pipe01AX	4	Hole in drain or sewer from 12 o'clock to 2 o'clock
4	MH05X	4	Broken pipe at joint from 11 o'clock to 4 o'clock

Service / Operational Condition

Grade 3: Best practice suggests consideration should be given to maintenance activities in the medium term.

Grade 4: Best practice suggests consideration should be given to maintenance activity to avoid potential blockages.

Grade 5: Best practice suggests that this pipe is at a high risk of backing up or causing flooding.

Section	PLR	Grade	Description
1	MH01X	4	Settled deposits, fine, 60% cross-sectional area loss
2	Pipe01AX	4	Settled deposits, fine, 45% cross-sectional area loss, finish
4	MH05X	4	Multiple defects
6	MH06X	5	Roots, mass, 45% cross-sectional area loss
8	Pipe05BX	4	Settled deposits, fine, 60% cross-sectional area loss
12	Pipe06DX	4	Settled deposits, fine, 50% cross-sectional area loss
15	Pipe08AX	4	Settled deposits, fine, 25% cross-sectional area loss, finish

Abandoned Surveys

Section	PLR	Description
1	MH01X	Survey abandoned
2	Pipe01AX	Survey abandoned
3	MH03X	Survey abandoned
4	MH05X	Survey abandoned
4	MH05X	Survey abandoned
6	MH06X	Survey abandoned
8	Pipe05BX	Survey abandoned
9	Pipe06AX	Survey abandoned
10	Pipe06BX	Survey abandoned
11	Pipe06CX	Survey abandoned
12	Pipe06DX	Survey abandoned
13	Pipe06EX	Survey abandoned

Underground Surveys (UK) Ltd
Unit CG17 & 18 Warrington Business Park, Long Lane
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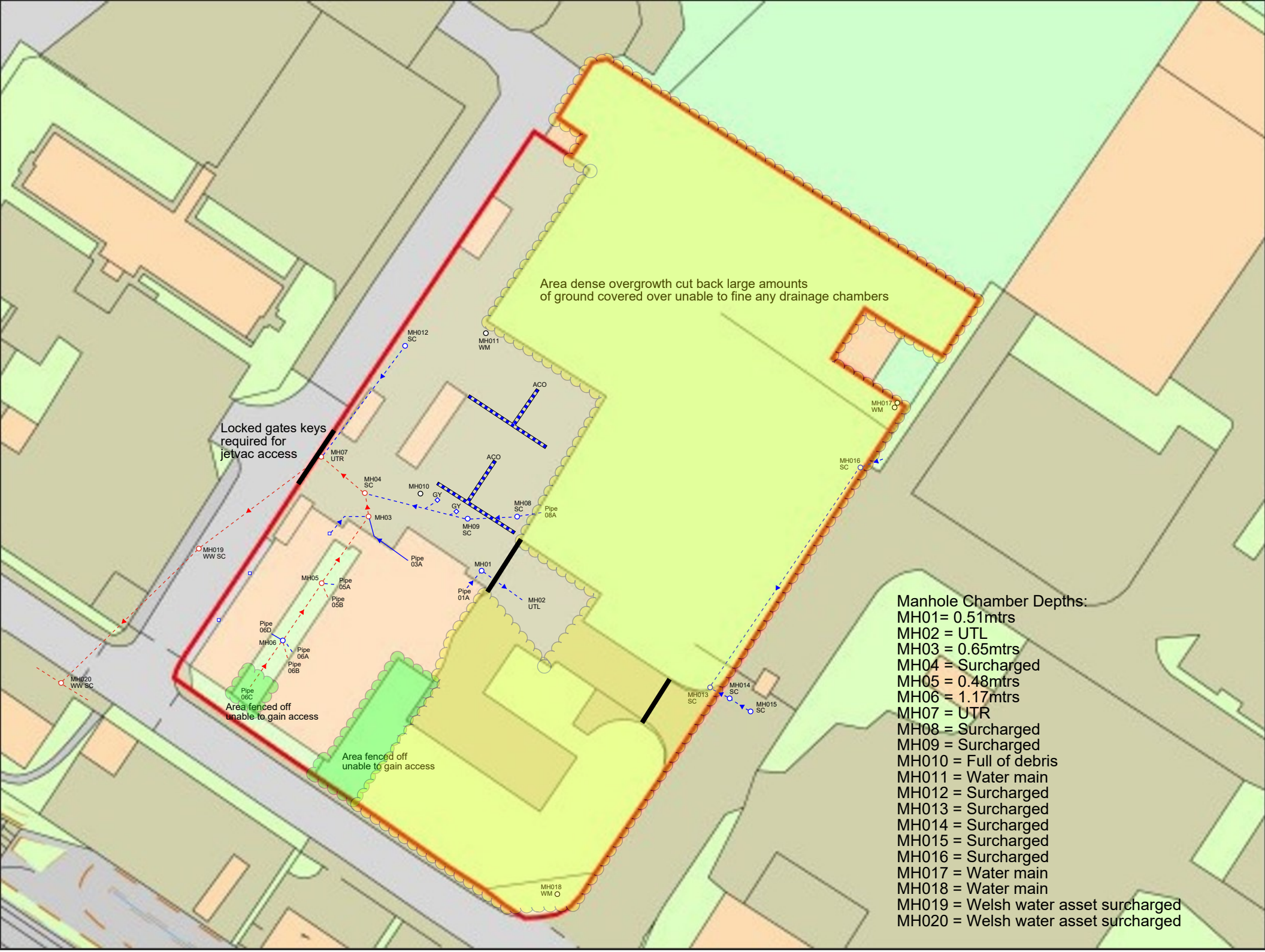
Scoring Summary

Project Name	Project Number	Project Date
15463 Survey Ops Sandycroft	15463	19/11/2024

Section	PLR	Description
14	MH04X	Survey abandoned
15	Pipe08AX	Survey abandoned
16	MH08X	Survey abandoned
17	MH09X	Survey abandoned
18	MH07X	Survey abandoned
19	MH19X	Survey abandoned
20	MH12X	Survey abandoned
21	MH16X	Survey abandoned
22	MH15X	Survey abandoned
23	MH14X	Survey abandoned

Information

These scoring summaries are based on the SRM grading from the WRc.



Manhole Chamber Depths:
MH01= 0.51mtrs
MH02 = UTL
MH03 = 0.65mtrs
MH04 = Surcharged
MH05 = 0.48mtrs
MH06 = 1.17mtrs
MH07 = UTR
MH08 = Surcharged
MH09 = Surcharged
MH010 = Full of debris
MH011 = Water main
MH012 = Surcharged
MH013 = Surcharged
MH014 = Surcharged
MH015 = Surcharged
MH016 = Surcharged
MH017 = Water main
MH018 = Water main
MH019 = Welsh water asset surcharged
MH020 = Welsh water asset surcharged

Appendix E – GI Extract

GROUND INVESTIGATION REPORT 11 FACTORY ROAD, SANDYCROFT, DEESIDE

TE1799-TE-00-XX-RP-GE-001-V01

VERSION 1.0

25 JANUARY 2024

FINAL

Prepared for:

Cassidy + Ashton

Prepared by: Henry Cox

Tier Environmental Ltd

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7. GROUND CONDITIONS

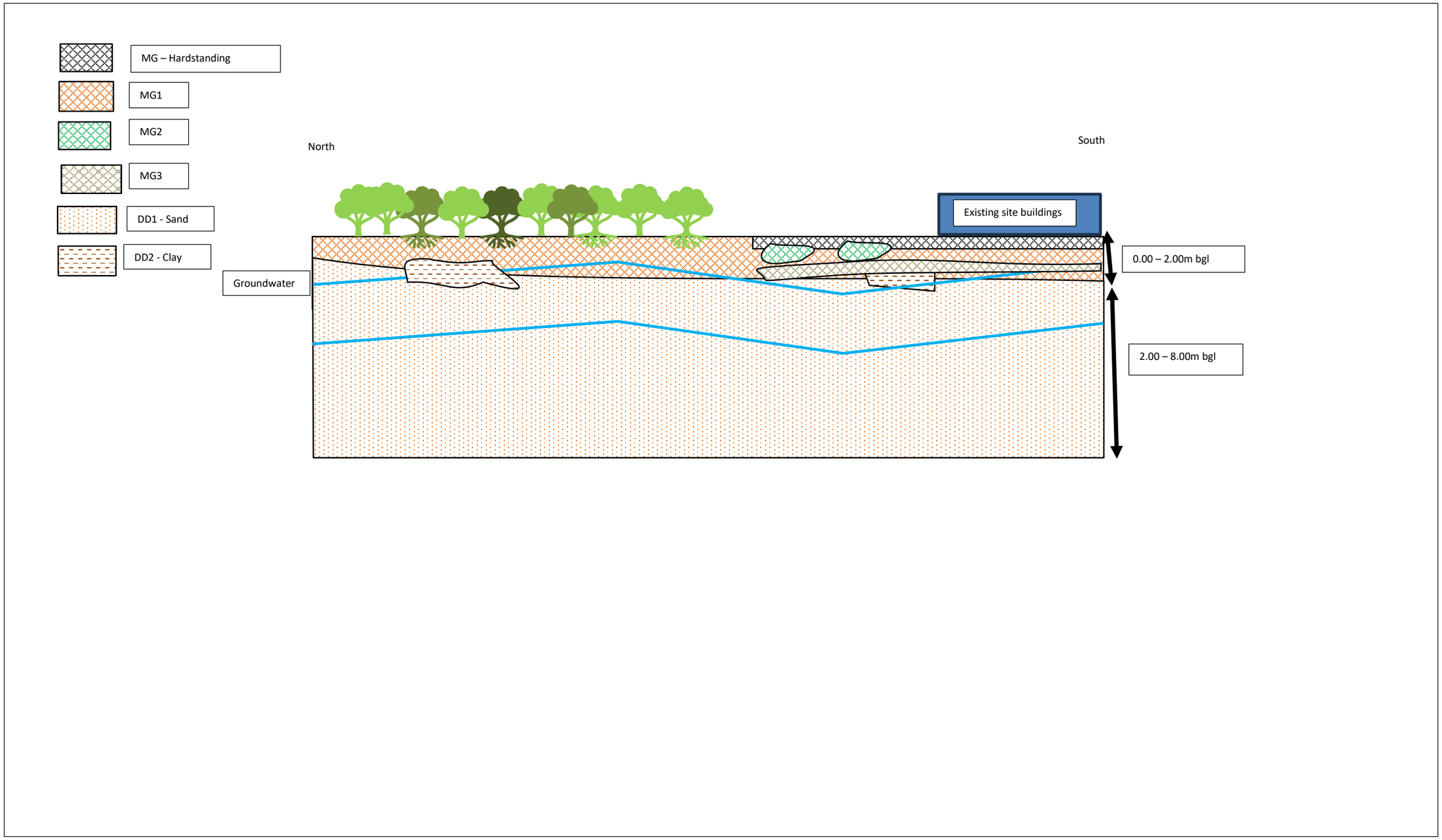
The following section provides a summary of the ground conditions encountered during the ground investigation including strata profile, obstructions and visual / olfactory evidence of contamination. Exploratory hole logs are provided in Appendix B.

Photographs of ground investigation works are provided in Appendix G.

7.1. Strata Profile

Figure 7.1 presented below provide a schematic summary of the ground conditions beneath the site. The distinct populations of strata identified have been numbered and correspond with the more detailed descriptions below.

Figure 7.1 Schematic Drawing of Ground Conditions



7.2. Strata Descriptions

Made Ground – Hardstanding

Concrete Grey *CONCRETE* comprising of 45% aggregate of subangular limestone and mixed natural lithologies.	
Locations encountered	CP02a, CP02b, CP03
Depths encountered from top of stratum (range)	Ground level
Depths encountered to base of stratum (range)	0.15m to 0.30m bgl
Thickness (range)	0.15m to 0.30m
Spatial location on site	Southwestern area of the site
Asphalt	
Locations encountered	WS01, WS02
Depths encountered from top of stratum (range)	Ground level
Depths encountered to base of stratum (range)	0.05m to 0.10m bgl
Thickness (range)	0.05m to 0.10m
Spatial location on site	Southern areas of site

Made Ground – MG1

Locations encountered	CP01, CP02b, WS01 to WS05
Depths encountered from top of stratum (range)	Ground level to 0.30m bgl
Depths encountered to base of stratum (range)	0.60m to 1.40m bgl
Thickness (range)	0.55m to 1.20m
Spatial location on site	Widespread across the site
General description	Brown/pinkish sandy clayey Gravel/ sandy Gravel/Gravel/Gravelly Clay. Gravel of mudstone and limestone and occasional brick fragments.

Made Ground – MG2

Locations encountered	CP03, WS02
Depths encountered from top of stratum (range)	0.15 0.40m bgl
Depths encountered to base of stratum (range)	0.60m to 2.00m bgl
Thickness (range)	0.20m to 1.85m
Spatial location on site	Encountered in the west and south of the site only.
General description	Black gravelly ASH. Gravel of fine to coarse, subrounded coal.

MG3 - Possible MG

Locations encountered	CP02b, WS02 & WS03
Depths encountered from top of stratum (range)	0.60 to 1.40m bgl
Depths encountered to base of stratum (range)	1.50m to 2.00m bgl
Thickness (range)	0.40m to 1.30m
Spatial location on site	Southwestern area of site
General description	Light brown, mottled grey silts and clays

Drift Deposits – DD1

Tidal Flat Deposits - Sands	
Locations encountered	CP01, CP02b, CP03, WS01 to WS04
Depths encountered from top of stratum (range)	1.00 to 2.10m bgl
Proven depths encountered to base of stratum (range)	5.45m to 8.15m bgl
Proven thickness (range)	3.35m to 6.80m
Spatial location on site	Widespread across the site
General description	Grey silty/sightly silty Sand

Drift Deposits – DD2

Tidal Flat Deposits – Sandy Clays	
Locations encountered	WS01, HDP01 & HDP02
Depths encountered from top of stratum (range)	0.20 to 1.25m bgl
Proven depths encountered to base of stratum (range)	1.20m to 2.10m bgl
Proven thickness (range)	1.20m to 2.10m
Spatial location on site	Eastern area of site
General description	Grey sandy Clay.

7.3. Obstructions

The following potential structures were encountered during the ground investigation works.

Table 7.1 Structures Summary Table

Exploratory Hole Location	Location on Site	Depth of Base of Feature (m bgl)	General description and comments
CP02a	Southwest	0.30	Initial concrete coring of cable percussive borehole terminated on suspected metal structure. Perhaps in association with possible underground tank in this area.

Sandycroft, Deeside Exploratory Hole Location Plan

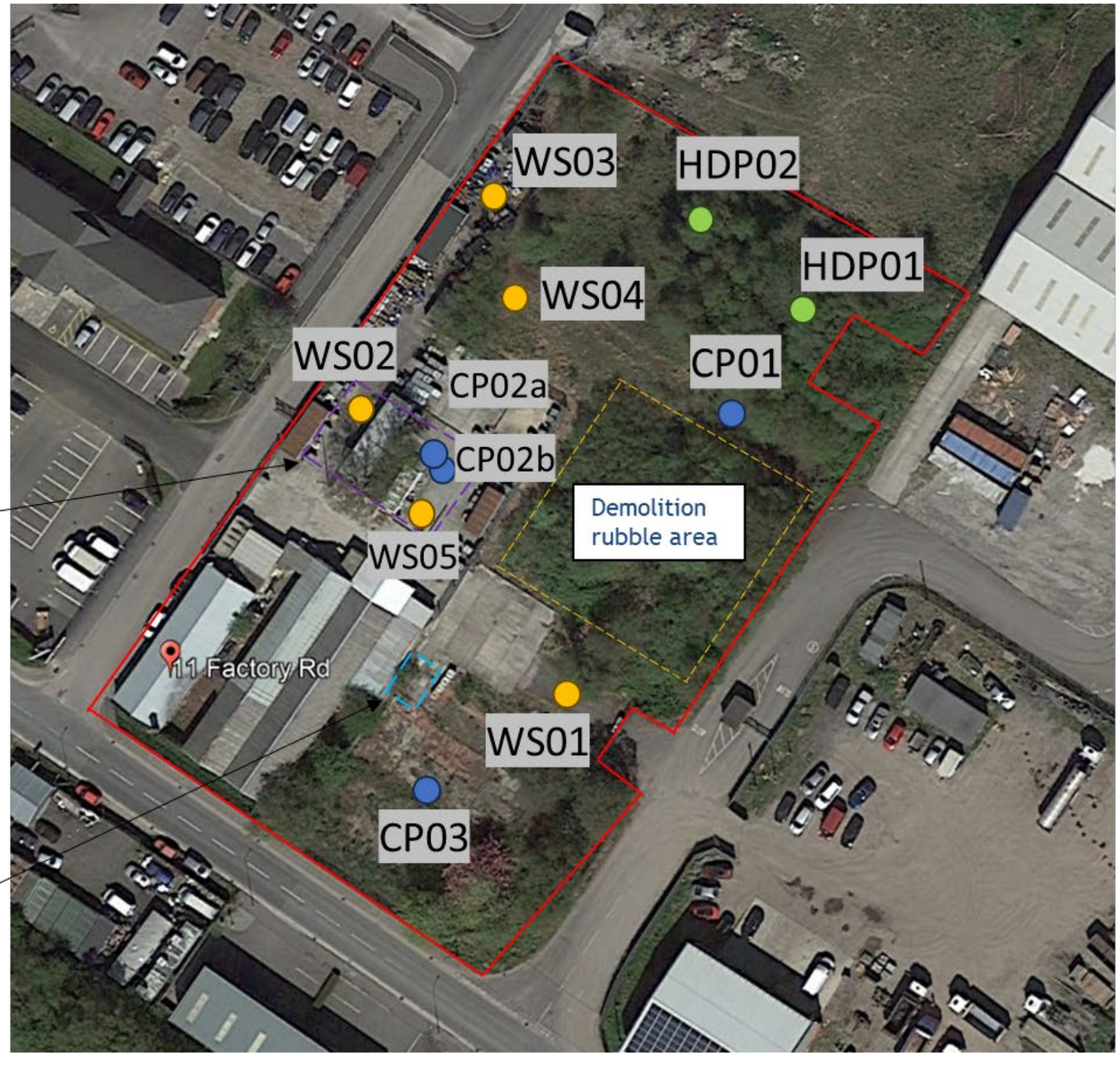
Contract Number:	TE1799
Contract:	Sandycroft, Deeside
Client:	Cassidy + Ashton

(WS02) Slight hydrocarbon odour observed within hand dug pit starter pit.

Known hydrocarbon impacted area

(WS05) Slight hydrocarbon odour observed within hand dug pit starter pit.

Possible ACM located



(CP02a) Concrete coring refused on suspected metal obstruction at 0.3m bgl. Location moved 1m SE to CP02b.

(CP02b) Moderate hydrocarbon odour becoming slight odour down to target depth of borehole.

Scale: NTS		
Drawn by: HC	Approved: SL	
Drawing Number: TE1799-TE-00-XX-GE-DR-001-V01		

APPENDIX B - EXPLORATORY HOLE LOGS

Borehole Log

Borehole No. **CP01**

Sheet 1 of 1

Project Name: Factory Road, Sandycroft	Project No. TE1799	Co-ords: -	Hole Type CP
Location: Deeside		Level:	Scale 1:50
Client: Cassidy and Ashton		Dates: 04/12/2023 -	Logged By HC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.40			MADE GROUND: Vegetation over light greyish brown, slightly silty GRAVEL. Gravel is coarse, angular to subangular limestone (Sub-base)
		0.20	ES					MADE GROUND
		0.50	ES					MADE GROUND: Firm, dark brown, mottled bluish grey, slightly sandy , gravelly CLAY. Gravel is fine to medium mudstone, sandstone and occasional brick and coal fragments. Sand is coarse.
		1.00	D		1.20			MADE GROUND
		1.20	SPTL					Medium dense, brown, silty SAND. Sand is fine to medium
		1.20	S	N=13 (1,1/3,3,3,4)				
		1.70 - 2.00	B					
		2.20	SPTL					
		2.20	S	N=22 (2,3/4,5,6,7)				
		3.40	SPTL		3.50			Medium dense, light brown sand. Sand is medium to coarse
		3.40	S	N=20 (2,3/5,4,4,7)				
		3.50 - 3.80	B					
		4.50	SPTL					
		4.50	S	N=20 (3,4/4,5,5,6)				
		5.50	SPTL					
		5.50	S	N=12 (2,2/3,3,3,3)				
		6.50	SPTL					
		6.50	S	N=17 (2,2/3,3,4,7)				
		7.00 - 7.30	B					
		7.60	SPTL					
		7.60	S	N=11 (2,2/2,3,3,3)				
					8.05			End of borehole at 8.05 m

Remarks

1) Groundwater ingress encountered at 2.20m rising to 1.70m 2) No visual or olfactory evidence of contamination.

Borehole Log

Borehole No. **CP02b**

Sheet 1 of 1

Project Name: Factory Road, Sandycroft	Project No. TE1799	Co-ords: -	Hole Type CP
Location: Deeside		Level:	Scale 1:50
Client: Cassidy and Ashton		Dates: 05/12/2023 -	Logged By HC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES		0.20			MADE GROUND: Grey CONCRETE comprising of 45% aggregates of medium to coarse, subangular limestone and mixed natural lithologies. No rebar
		0.60	D		0.40			MADE GROUND
		1.00	ES					MADE GROUND: Brown, slightly sandy GRAVEL. Gravel is fine to coarse, subangular to subrounded concrete, brick and limestone. Sand is coarse. Occasional cobbles and subangular concrete.
		1.20	SPTL					
		1.20	S	N=11 (1,2/2,3,3,3)	1.40			MADE GROUND
		1.50	ES					MADE GROUND: Dark brown, sandy GRAVEL. Gravel is fine to coarse concrete, brick and limestone. Sand is coarse.
		1.70 - 2.00	B		1.80			MADE GROUND
		2.20	SPTL					POSSIBLE MADE GROUND: Firm, grey, slightly gravelly, slightly sandy CLAY. Gravel is medium to coarse, subrounded mudstone.
		2.20	S	N=15 (2,2/3,3,4,5)				POSSIBLE MADE GROUND
								Medium dense, light brown, silty SAND, Sand is fine to medium.
		3.30	SPTL		3.30			Medium dense, slightly silty SAND. Sand is fine to medium.
		3.30	S	N=19 (3,4/4,5,5,5)				
		3.70 - 4.00	B					
		4.50	SPTL					
		4.50	S	N=16 (3,3/4,4,4,4)				
		5.50	SPTL					
		5.50	S	N=21 (3,3/4,5,5,7)				
		6.60	SPTL					
		6.60	S	N=19 (3,4/4,5,5,5)				
		7.00	ES					
		7.00 - 7.30	B					
		7.70	SPTL					
		7.70	S	N=24 (3,4/5,5,6,8)				
					8.15			End of borehole at 8.15 m

Remarks

1) Cable percussion for geoenvironmental purposes 2) Groundwater encountered at 2.20m bgl rising to 1.80m bgl. 3) Moderate to slight hydrocarbon odour from 1.40m bgl to base of borehole.

Borehole Log

Borehole No. **CP03**

Sheet 1 of 1

Project Name: Factory Road, Sandycroft	Project No. TE1799	Co-ords: -	Hole Type CP
Location: Deeside		Level:	Scale 1:50
Client: Cassidy and Ashton		Dates: 05/12/2023 -	Logged By HC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15			MADE GROUND: Pinkish grey CONCRETE comprising of 40-45% aggregate of angular to subangular, medium to coarse limestone and mixed natural lithologies. MADE GROUND
		0.30	ES					
		0.50	D					
		1.20	SPTL					MADE GROUND: Black, gravelly ASH. Gravel is medium to coarse, coal fragments and possible plasterboard MADE GROUND
		1.20	S	N=14 (2,2/3,3,4,4)				
					2.00			Loose, greyish brown, silty SAND. Sand is fine to medium.
		2.20	SPTL					
		2.20	S	N=5 (1,2/1,2,1,1)				
		2.50	ES					
		2.70 - 3.00	B					
		3.40	SPTL					
		3.40	S	N=6 (1,1/2,2,1,1)				
		4.40	SPTL		4.40			Dense, greyish brown, slightly silty SAND. Sand is fine to medium.
		4.40	S	N=35 (4,4/6,7,10,12)				
		5.00 - 5.30	B					
		5.50	SPTL					
		5.50	S	N=33 (4,5/7,8,9,9)				
		6.50	SPTL		6.50			Medium dense, greyish brown, slightly silty SAND. Sand is fine to medium.
		6.50	S	N=21 (4,5/5,5,5,6)				
		7.00 - 7.30	B					
		7.70	SPTL					
		7.70	S	N=23 (4,5/5,5,6,7)				
					8.15			End of borehole at 8.15 m

Remarks

1) Cable percussion for geoenvironmental purposes 2) Groundwater ingress encountered at 2.20m bgl. 3) Terminated at target depth 4) No visual or olfactory evidence of contamination.

Appendix F – SAB Application Form

1. Applicant Details

Applicant Name and Address

Title and Name		
Company		Chester Wool Company
Suffix (unit/name/number)		Unit 3
Address line 1		Deeside Industrial Estate
Address line 2		Prospect Park
Address line 3		Parkway
Town		Deeside
County		Flintshire
Postcode		CH5 2NS
Phone number	**Mobile**	
	Works	
	Home	
e-mail address		

Agent Name and Address

Title and Name		Russell Hardy
Company		JP Structural Design Ltd
Suffix (unit/name/number)		Honeycomb West
Address line 1		Honeycomb
Address line 2		Chester Business Park
Address line 3		
Town		Chester
County		Cheshire
Postcode		CH4 9QH
Phone number	**Mobile**	07711107672
	Works	
	Home	
e-mail address		russell@jpstructural.co.uk

Preferred contact	Applicant ☐	Agent ☒

2. Site Details

A general description of site location supported by a plan specifying the construction area and the extent of the drainage system for which approval is sought MUST be submitted. Plans shall be at a scale of 1:2500. All plans MUST show the direction of North.

Name of proposed development	Chester Wool Company Sandycroft

Grid Reference (E/N)	**332923**	**367715**
Suffix (unit/name/number)	11	
Address line 1	Factory Road	
Address line 2	Deeside	
Address line 3		
Town		
County	Flintshire	
Postcode	CH5 2QJ	

Description of proposed development	New Warehouse with offices, workshops, car parks and service yard	
Total application site area (Ha)	0.8345	
Is the existing site currently developed i.e. Brownfield or is it currently undeveloped i.e. Greenfield?	Brownfield	
Existing use	Industrial	
Proposed use	Industrial	
Does the site cross more than one SAB area?	Yes ☐	No ☒
If "Yes", please confirm the proportionate area in each SAB below: (The main contact will be the SAB that has most of the surface water drainage system within its boundary.)		

SAB	% of Site Area

3. Interest in the Land

What interest do you have in the land?		
Owner	Yes ☒	No ☐
Prospective Owner	Yes ☐	No ☐
Other (please provide details)		

4. Application

Has any prior advice been sought from the SAB about this application?			Yes ☐	No ☒
If Yes, please complete the following information about the advice you were given. This will help the SAB to deal with this application more efficiently.				
Officer Name				
Reference number		**Date**		
Details of pre-application advice received				

Does this application relate to any other SAB application already made?	Yes ☐	No ☒
If "Yes", please provide SAB Reference number		

Is this application part of a phased approach to development of the site, or one of multiple applications for the same site?	Yes ☐	No ☒
If "Yes", please provide brief details		

Is this application one of two or more applications made at the same time, each setting out an alternative proposal for construction of a drainage system	Yes ☐	No ☒
If "Yes", please provide details of other applications made at the same time (include SAB Reference number if available)		

5. Application Fee

It is recommended you contact the SAB directly to ensure the correct fee is paid with the application.

		Area of Land (Ha)	Fraction	Fees
Application fee		N/A	N/A	£350.00
Each 0.1ha or fraction of 0.1ha, for first 0.5ha	**£70.00**	0.5	5	£350.00
Each 0.1ha or fraction of 0.1ha, from 0.5ha up to and including 1ha	**£50.00**	0.4	4	£200.00
Each 0.1ha or fraction of 0.1ha, from 1ha up to and including 5ha	**£20.00**			
Each additional 0.1ha or fraction of 0.1ha above 5Ha.	**£10.00**			
Is the applicant a town/community council?		If yes, application fee is half the amount		
<u>If applicable</u> – reduction of 50% application fee due to this being an alternative proposal made at the same time.				
<u>If applicable</u> – application fee adjustment due to cross-SAB area approvals needed.				
			Total Fees	£900.00

6. Environmental Impact Assessment (EiA) Statement

Does this application relate to a development that is the subject of an EiA application under the Town & Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017(1)?	Yes ☐	No ☒

7. Compliance with Statutory National Standards for Sustainable Drainage Systems (SuDS)

All sustainable drainage systems MUST comply with the Statutory National Standards for Sustainable Drainage Systems (SuDS) for Wales. You are advised to refer to the detailed text in the Standards that relate to the information required below. The Standards are re-produced, in the Guidance to assist in completing this application form.

Standard Principles

The Principles listed below will underpin the design of surface water management schemes to meet the Statutory National Standards. Please provide a brief summary in each of the boxes below relating to each of the bulleted Standard Principles and itemised Standards 1 to 6, showing how your proposed drainage scheme complies with this statutory requirement.

Compliance with Standard Principles

My proposed surface water drainage scheme will comply in the following way/s:

The proposed development is an industrial unit within a very industrial area. The ground is known to be poor for infiltration measures with a high-water level (presumed to be under tidal influence) from the River Dee approximately 200m away.

Prevention

It is proposed that the new car park will be a permeable paving design to assist in managing the water generated at source.

Good Housekeeping Measures

The installation of permeable paving will also act as filters, removing many pollutants through collection and biodegradation before returning cleansed water to the natural environment. Runoff from the roofs is considered to be a low risk in terms of pollution controls although it is proposed to install a downstream defender within the proposals for the removal of sediment and a floatable trash and oil which may have entered the system from the concrete service yard areas.

Site Source Controls

The site forward flow will be controlled by a hydrobrake. As the water cannot be managed adequality on site, it will be slowly conveyed elseswhere

Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.

1. 107014-0602 – Proposed Drainage

Standards 1 to 6

Compliance with Standard S1 - Surface water runoff destination
My proposed surface water drainage scheme will comply in the following way/s:
In determining a suitable methodology for disposal of surface water flows from this development, it is necessary to explore the technical options outlined under Standard S1 of the SNSSUDS 2018 document published by Welsh Government. This states that disposal should be made through the hierarchical approach which are, in order of preference; surface water runoff collected for use, infiltration methods, discharge to surface water body, discharge to a surface water sewer, highway sewer or another drainage system and finally discharge to a combined sewer. Each of these options are considered below. **Collected for Use** Due to primary function of the building as product storage there is very limited requirement for re-use of water. **Infiltration Methods** As outlined earlier in the form the ground investigation has confirmed the site to have a high water table under tidal influence, it has therefore been considered as unsuitable for infiltration methods. **Discharge to Surface Water Body** It is not possible to discharge to a surface water body without crossing third party land. **Discharge to Surface Water Sewer and Discharge to a Combined Sewer** It is proposed to maintain the sites connection to the existing combined sewer network serving the industrial estate
Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.
1. 107014-0601 – Existing Drainage 2. 107014-0602 – Proposed Drainage 3. 107014-1001 – Site Information 4. GI Report Extract

Compliance with Standard S2 - Surface water runoff hydraulic control

My proposed surface water drainage scheme will comply in the following way/s:

HR Wallingford online greenfield runoff rate has been utilised to confirm for a site of 0.835 ha the Qbar for the site would be 1.52 l/s and it is therefore proposed to restrict the peak discharge from the site to 2 l/s. This should be acknowledge as a significant betterment to the existing unrestricted flow which for an estimated previous impermeable area of 4690m2 would generate a peak of 65 l/s based on basic 50 mm/hr rainfall rate.

Based on the parameters of the 1 in 100 year event with a 40% allowance for climatic change, the site shows no flooding with the attenuation tank and balancing pond provide the required storage volume of 330 cubic metres.

Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.

1. 107014-0602 – Proposed Drainage
2. Qbar calculations
3. Drainage Schematic Layout
4. Surface Water Model calculations

Compliance with Standard S3 – Water Quality
My proposed surface water drainage scheme will comply in the following way/s:
As stated previously, The installation of permeable paving will also act as filters, removing many pollutants through collection and biodegradation before returning cleansed water to the natural environment. Settlement will also occur in the balancing pond, ensuring that excessive sediment is removed from the forward flow The basin will feature appropriate planting to treat any run-off through bio-remediation. It is also proposed to install a downstream defender within the proposals for the removal of any final sediment or pollutants prior to discharge to the sewer.
Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.
1. 107014-0602 – Proposed Drainage

Compliance with Standard S4 – Amenity
My proposed surface water drainage scheme will comply in the following way/s:
Whilst acknowledging the industrial nature of the immediate vicinity it is still hoped the ponds will offer tangible benefits, beyond flood prevention and environmental conservation, providing an aesthetic value, creating a green space for recreation and relaxation.
Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.
1. 107014-0602 – Proposed Drainage

Compliance with Standard S5 – Biodiversity
My proposed surface water drainage scheme will comply in the following way/s:
The new balancing pond will serve as habitats for diverse flora and fauna. The environment created by balancing ponds will also attracts wildlife, fostering biodiversity in urban areas. Plants, aquatic organisms, and even some species of birds and insects thrive in these environments, enriching local ecosystems.
Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.
1. 107014-0602 – Proposed Drainage

Compliance with Standard S6 – Design of drainage for Construction and Maintenance and Structural Integrity
My proposed surface water drainage scheme will comply in the following way/s:
Just to confirm, the proposed system will not be required for adoption as it does not serve more than one property. However, it will still be designed to the standards set out in Ciria C753 & Sewers for Adoption 7th Edition. The proposed drainage scheme consists of predominantly standard products and methods of construction that should not concern a suitably experienced and qualified contractor. An O&M manual will also be provided in due course, including the final 'As Built' constructions drawings and a maintenance schedule for the drainage system.
Relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown Table A and Table B of this Guidance **MUST** be listed below, and all relevant material submitted.
1. 107014-0602 – Proposed Drainage 2. 107014-RP-D-0002 - O&M Plan

8. Assessment of Flood Risk

Is the site within an area at risk of flooding? Refer to Natural Resources Wales Development Advice maps. (Natural Resources Wales / Development and flood risk)	Yes ☒	No ☐
If the proposed development is within the area at risk of flooding, you will need to consider whether it is appropriate to submit a flood consequences assessment. (Refer to Technical Advice Note 15 (TAN15).		

Is the site located within an area susceptible to surface water flooding? Refer to NRW Surface Water Flood Maps.	Yes ☐	No ☒
Is the site located within an area susceptible to groundwater flooding?	Yes ☐	No ☒
Is there a watercourse (as defined under Section 72 Land Drainage Act 1991) **located within 20m of the proposed development?**	Yes ☐	No ☒

9. Surface Water Discharge Hierarchy

Surface water drainage arrangements shall demonstrate the proposed surface water drainage complies with National SuDS Standards. As much of the runoff as possible should be discharged to each hierarchy element before a lower hierarchy element is considered. Collection and infiltration methods of drainage are required to be considered in the first instance. With reference to the hierarchy levels below, please indicate your proposed drainage arrangements.

Level	**Yes**	**No**
1. Collect for use	☐	☒
2. Infiltration	☐	☒
3. To watercourse	☐	☒
a. Is it an Ordinary Watercourse?	☐	☒
b. Is it a Main River?	☐	☒
4. To surface water sewer	☐	☒
a. Is it a Highway drain?	☐	☒
b. Is it a public sewer?	☐	☒
c. Is it a private sewer?	☐	☒
d. Other	☐	☒
5. To combined sewer	☒	☐

Has advice been sought from the asset owners?	Yes ☐	No ☒
Has advice been sought from the land owners?	Yes ☒	No ☐

10. Infiltration Assessment

Where infiltration drainage is proposed, testing should be carried out to a methodology agreed with the SAB e.g. Infiltration Drainage - Manual of Good Practice (CIRIA R156) and BRE Soakaway Design (DG 365 – 2016), and be used to inform the design, construction, maintenance, testing and assessment of infiltration systems.

Has infiltration testing been carried out?		Yes ☐	No ☒	
Analysis of development Geology (including both bedrock and superficial deposits where known)		Silty brown sands with a high water table within the tidal influence of the River Dee		
Depth to groundwater (metres)		**1.2m**		
Borehole testing	**Reference**	**CP03**		
	Date	**5**	**12**	**23**

Has a Contaminated Land Assessment been undertaken?	Yes ☒	No ☐
Is the infiltration drainage proposed on contaminated land?	Yes ☐	No ☒

Infiltration test result	NA

11. Non-performance Bond, Adoption, Operation & Maintenance

What are your proposals regarding cost of works, adoption and maintenance of the SuDS scheme?

Non-performance Bond – Estimated cost of work	NA
Adoption (including land agreements etc)	NA
Funded Maintenance Plan for the lifetime of the development	NA

12. SuDS Scheme Application Checklist

Please complete the following checklist and make sure you have read the Guidance on Making SuDS Applications for SAB Approval, the Guidance on completing the Full Application Form, and provided all the necessary information in support of your application:	
Correct Full Application fee.	Yes ☒
Completed, signed and dated Full Application form.	Yes ☒
Plan/s specifying the construction area and the extent of the drainage system for which approval is sought. All plan/s shall be at a scale of 1:2500 and MUST show the direction of North.	Yes ☒
Taken account of SAB Guidance on technical information to be submitted to enable SAB to assess your Full Application.	Yes ☒

13. Declaration

I/ we hereby apply for SuDS Approval as described in this form and the accompanying plans/drawings and additional information. I confirm that I have read and complied with the National SuDS Standards and, to the best of my knowledge, any facts stated are true and accurate and any opinions given are the genuine opinions of the persons giving them.
This form has been completed using evidence from the Flood Consequences Assessment where applicable, surface water drainage strategy and site plans and associated documents.
This form has been completed using accurate information. It can be used as a summary of the detailed surface water drainage proposals on this site, and clearly shows that these drainage proposals conform to the National SuDS Standards for Wales.

Form completed by	Russell Hardy
Signature	
Qualification of person responsible for signing off this application	BSc (Hons) Civil Engineering
Company	JPS
On behalf of (Client's details)	Chester Wool Company
Date	30.01.2025

Disclaimer

Information provided on this form and in supporting documents may be published on the SABs SuDS register and website and be made publicly available.

Appendix G – Proposed Drainage Layout

EXMH20
CL 5.58
IL utr

PM

CFS

DOWNSTREAM DEFENDER UNIT

SMH 1.0
WITH FLOW CONTROL DEVICE
TO LIMIT FORWARD FLOW TO 2
l/s @ 1.2m HEAD
CL 6.475
IL 3.950
IL 3.450 (SUMP BASE)

365m³ OF ATTENUATION CONSISTING OF
AQUA CELL 'PLUS-R' STORAGE BLOCKS
32 UNITS x 20 UNITS X 2 UNIT
(16m x 20m x 0.8m @ 95% VOID RATIO)
TO BE BACKFILLED & VENTED IN
ACCORDANCE WITH MANUFACTURERS
GUIDANCE & RECOMMENDATIONS TO CATER
FOR THE 100 YEAR STORM EVENT WITH A 40%
ALLOWANCE FOR CLIMATIC CHANGE

NOTE THE LEVELS OF THE EXISTING SEWERS NEEDS TO BE INVESTIGATED AND CONFIRMED (AND ANY OBSTRUCTIONS / ADDITIONAL SERVICES) PRIOR TO THE COMMENCEMENT OF ANY DRAINAGE WORKS.

CFMH 1.0
CL 5.650
ASSUMED
IL 3.500

150Ø

EXMH07
CL 5.58
IL ud

EXMH019
CL 5.45
IL 4.66

CFMH 1.1
CL 5.600
IL 3.690

SMH 1.1
CL 6.200
IL 4.165

Hedgerow + Grassland

150Ø @ 1:75

6m

375Ø @ 1:325

225Ø @ 1:8

SMH 2.0
CL 6.325
IL 4.285

Hedgerow + Grassland

Bramble / Scrub + Grassland

SMH 2.1
CL 5.775
IL 5.000

225Ø @ 1:100

RWP

Bins

RWP
Fork lift charging

RWP

RWP

RWP

SU

SU

EXMH010
ASSUMED SJ32679744
CL 5.59
IL ukn

2No. Dock Levellers
EXMH019
CL 5.45
IL 4.66

CL 6.000
TOC 5.000
IL 4.200

150Ø @ 1:75

6m

ASSUMED SJ32679750
CL ukn
IL ukn

Delivery Bay

Overall Building Area 3014m²

FFL +6.550

150Ø

RWP

SMH 1.6
CL 5.775
IL 5.000

RWP

SMH 1.2
CL 6.020
IL 4.245

375Ø

CFMH 1.2
CL 6.145
IL 3.990

375Ø @ 1:300

SMH 1.3
CL 6.225
IL 4.315

Delivery Yard

150Ø @ 1:75

6m

300Ø @ 1:256

300Ø @ 1:178

RG

REINFORCED HEADWALL
ALTHON REF H3C
IL 4.500

Proposed
Pedestrian Access

ASSUMED SJ32679752
CL ukn
IL ukn

FMH 1.1
CL 5.550
IL 4.850

SVP

SVP

SG

FO

FMH 1.0
CL 5.550
IL 4.590

RWP

RWP

RWP

RWP

RWP

300Ø @ 1:100

CFMH 1.3
CL 6.100
IL 4.400

Proposed Balancing
Pond

150Ø @ 1:70

Main Entrance

150Ø @ 1:70

Acc.

Acc.

Visitor

Visitor

300Ø @ 1:250

EV

EV

EV

EV

1

2

3

4

5

6

7

8

9

10

11

27

26

6m

150Ø @ 175

Bike Stand

SMH 1.4
CL 6.250
IL 4.485

225Ø @ 1:17

SMH 3.0
CL 5.800
IL 5.000

SMH 3.1
CL 6.150
IL 5.250

SU

Air Source
Heatpump
Compound

SMH 3.2
CL 6.150
IL 5.400

Motorcycle

Motorcycle

12

13

14

15

16

17

18

19

20

21

22

23

24

25

PREF 150Ø @ 1:250

Proposed Vehicular
Access

150Ø

RG

SMH 1.5
CL 5.575
IL 4.770

EXMH016
ASSUMED SJ32679751
CL 5.68
IL 4.62

EXMH016
CL 5.68
IL 4.94

EXMH014
ASSUMED SJ32679743
CL 5.61
IL 4.65

150Ø

CFS

CFS

CFS

CFS

EXMH015
ASSUMED SJ32679650
CL 5.67
IL 4.66

SJ32679642
CL ukn
IL ukn

CFS

RWP, SS & SVP POSITIONS DEPICTED ARE SUBJECT TO CONFIRMATION BY THE ARCHITECT OR M&E CONSULTANT

NOTES

1. THE WORKS SHALL BE IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS, NATIONAL BUILDING SPECIFICATION (NBS) AND SEWERS FOR ADOPTION, 7TH EDITION.

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS DRAWINGS, ARCHITECTS DRAWINGS, MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS.

3. THE LOCATION, LINE & LEVEL OF ALL KNOWN EXISTING BURIED SERVICE MAINS AND DRAINAGE PIPEWORK INDICATED ON THE DRAWINGS ARE APPROXIMATE AND FOR GUIDANCE PURPOSES ONLY. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE THEIR EXACT LINE & LEVEL, BY WAY OF HAND EXCAVATED TRIAL PITS, PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION WORKS ON SITE. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN THE STRUCTURAL INTEGRITY OF ALL ABOVE AND BELOW GROUND SERVICE MAINS / DRAINAGE INSTALLATIONS.

4. THE CONTRACTOR MUST COMPLY WITH ALL CURRENT LEGISLATION RELATING TO HEALTH & SAFETY.

5. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS, AND IS ALSO RESPONSIBLE FOR THE SAFE MAINTENANCE AND STABILITY OF EXISTING BUILDINGS AT ALL TIMES.

6. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE MITIGATION OF ALL OCCURRENCES OF GROUND WATER DURING THE CONSTRUCTION PERIOD.

7. THE CONTRACTOR SHALL MAKE ALLOWANCE FOR RAISING / LOWERING ALL EXISTING ACCESS COVERS & FRAMES TO SUIT NEW FINISHED LEVELS.

8. ALL SOFT / HARD PAVED AREAS AFFECTED BY THE WORKS SHALL BE FULLY REINSTATED UPON COMPLETION OF THE WORKS. ALL SURFACE MARKINGS DAMAGED BY THE WORKS SHALL BE FULLY REINSTATED.

9. ALL SURPLUS EXCAVATED MATERIAL SHALL BE DISPOSED OF OFF SITE.

10. ALL LEVELS ARE TO ORDNANCE DATUM

KEY

- CFS — EXISTING FOUL WATER SEWER
- EXISTING FOUL DRAIN
- EXISTING SW DRAIN
- PROPOSED FOUL DRAIN
- PROPOSED SW DRAIN
- FO — PROPOSED FOUL OUTLET
- SVP — PROPOSED SOIL VENT PIPE
- RWP — PROPOSED RAIN WATER DOWN PIPE

REV	DESCRIPTION	BY	CHK	APR	DATE
P03	UPDATED AS PER LATEST LAYOUT	SB	RH	JP	25.02.2025
P02	BALANCING POND INTRODUCED	RH	MM	JP	30.01.2025

JPS CIVIL + STRUCTURAL ENGINEERS
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PURPOSE OF ISSUE: PRELIMINARY
STATUS: P

PROJECT: CHESTER WOOL COMPANY SANDYCROFT

TITLE: DRAINAGE SCHEME PROPOSED LAYOUT

CLIENT: CASSIDY & ASHTON

DRAWN BY	CHECKED BY	APPROVED BY
SB	RH	JP

DATE	SCALE (@ A1)	PROJECT NUMBER
23.01.2025	1:200	107014

DRAWING NUMBER: 0602
REV: P03

Appendix H – Qbar Calculations

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Russell Hardy
Site name:	Factory Road
Site location:	

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.

Site Details

Latitude:	53.20224° N
Longitude:	3.00546° W
Reference:	1430666946
Date:	Jan 20 2025 12:40

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.835

Methodology

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

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	700	700
Hydrological region:	9	9
Growth curve factor 1 year:	0.88	0.88
Growth curve factor 30 years:	1.78	1.78
Growth curve factor 100 years:	2.18	2.18
Growth curve factor 200 years:	2.46	2.46

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.

(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.

(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):	1.52	1.52
1 in 1 year (l/s):	1.34	1.34
1 in 30 years (l/s):	2.71	2.71
1 in 100 year (l/s):	3.32	3.32
1 in 200 years (l/s):	3.74	3.74

Appendix I– Surface Water Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
SMH 1.6	0.075	4.00	5.575	1200	161.533	77.905	0.575
SMH 1.5	0.090	4.00	5.575	1200	161.459	54.919	0.805
SMH 3.0	0.104	4.00	5.800	1200	92.574	44.999	0.800
SMH 1.4			6.250	1200	90.362	54.855	1.765
SMH 1.3	0.075	4.00	6.225	1350	81.033	77.329	1.910
Pond		4.00	5.500		59.950	61.815	1.000
SMH 1.2			6.020	1350	59.928	77.479	1.795
Tank	0.132	4.00	6.000		59.890	94.725	1.800
SMH 1.1			6.200	1350	65.919	105.997	2.035
SMH 2.1	0.075	4.00	5.575	1200	161.571	103.168	0.575
Dock Lev	0.020	4.00	5.250	1200	87.426	99.392	0.750
SMH 2.0			6.325	1200	90.085	103.309	2.040
SMH 1.0			6.475	1350	87.048	105.928	2.525
EX MH 7			5.580	1200	88.182	112.213	2.080

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	SMH 1.6	SMH 1.5	22.986	0.600	5.000	4.770	0.230	100.0	300	4.24	50.0
1.001	SMH 1.5	SMH 1.4	71.097	0.600	4.770	4.485	0.285	249.5	300	5.44	50.0
2.000	SMH 3.0	SMH 1.4	10.101	0.600	5.000	4.560	0.440	23.0	225	4.06	50.0
1.002	SMH 1.4	SMH 1.3	24.333	0.600	4.485	4.390	0.095	256.1	300	5.85	50.0
1.003	SMH 1.3	SMH 1.2	21.106	0.600	4.315	4.245	0.070	300.0	375	6.19	50.0
3.000	Pond	SMH 1.2	15.664	0.600	4.500	4.320	0.180	87.0	300	4.15	50.0
1.004	SMH 1.2	Tank	17.246	0.600	4.225	4.200	0.025	689.8	375	6.61	50.0
1.005	Tank	SMH 1.1	12.783	0.600	4.200	4.165	0.035	365.2	375	6.84	50.0
1.006	SMH 1.1	SMH 1.0	21.129	0.600	4.165	3.950	0.215	98.3	375	7.03	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.572	111.1	14.2	0.275	0.505	0.075	0.0	72	1.088
1.001	0.991	70.0	31.3	0.505	1.465	0.165	0.0	140	0.963
2.000	2.742	109.0	19.7	0.575	1.465	0.104	0.0	65	2.095
1.002	0.978	69.1	51.0	1.465	1.535	0.269	0.0	192	1.067
1.003	1.041	114.9	65.3	1.535	1.400	0.344	0.0	203	1.072
3.000	1.686	119.2	0.0	0.700	1.400	0.000	0.0	0	0.000
1.004	0.682	75.3	65.3	1.420	1.425	0.344	0.0	271	0.765
1.005	0.942	104.0	90.3	1.425	1.660	0.476	0.0	271	1.056
1.006	1.827	201.8	90.3	1.660	2.150	0.476	0.0	175	1.778

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
4.000	SMH 2.1	SMH 2.0	71.486	0.600	5.000	4.285	0.715	100.0	225	4.91	50.0
5.000	Dock Lev	SMH 2.0	4.734	0.600	4.500	4.285	0.215	22.0	150	4.04	50.0
4.001	SMH 2.0	SMH 1.0	4.010	0.600	4.285	4.100	0.185	21.7	225	4.94	50.0
1.007	SMH 1.0	EX MH 7	6.386	0.600	3.950	3.500	0.450	14.2	150	7.07	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
4.000	1.307	52.0	14.2	0.350	1.815	0.075	0.0	80	1.119
5.000	2.155	38.1	3.8	0.600	1.890	0.020	0.0	32	1.383
4.001	2.822	112.2	18.0	1.815	2.150	0.095	0.0	61	2.092
1.007	2.688	47.5	108.3	2.375	1.930	0.571	0.0	150	2.738

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	22.986	100.0	300	Circular	5.575	5.000	0.275	5.575	4.770	0.505
1.001	71.097	249.5	300	Circular	5.575	4.770	0.505	6.250	4.485	1.465
2.000	10.101	23.0	225	Circular	5.800	5.000	0.575	6.250	4.560	1.465
1.002	24.333	256.1	300	Circular	6.250	4.485	1.465	6.225	4.390	1.535
1.003	21.106	300.0	375	Circular	6.225	4.315	1.535	6.020	4.245	1.400
3.000	15.664	87.0	300	Circular	5.500	4.500	0.700	6.020	4.320	1.400
1.004	17.246	689.8	375	Circular	6.020	4.225	1.420	6.000	4.200	1.425
1.005	12.783	365.2	375	Circular	6.000	4.200	1.425	6.200	4.165	1.660
1.006	21.129	98.3	375	Circular	6.200	4.165	1.660	6.475	3.950	2.150
4.000	71.486	100.0	225	Circular	5.575	5.000	0.350	6.325	4.285	1.815
5.000	4.734	22.0	150	Circular	5.250	4.500	0.600	6.325	4.285	1.890
4.001	4.010	21.7	225	Circular	6.325	4.285	1.815	6.475	4.100	2.150
1.007	6.386	14.2	150	Circular	6.475	3.950	2.375	5.580	3.500	1.930

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	SMH 1.6	1200	Manhole	Adoptable	SMH 1.5	1200	Manhole	Adoptable
1.001	SMH 1.5	1200	Manhole	Adoptable	SMH 1.4	1200	Manhole	Adoptable
2.000	SMH 3.0	1200	Manhole	Adoptable	SMH 1.4	1200	Manhole	Adoptable
1.002	SMH 1.4	1200	Manhole	Adoptable	SMH 1.3	1350	Manhole	Adoptable
1.003	SMH 1.3	1350	Manhole	Adoptable	SMH 1.2	1350	Manhole	Adoptable
3.000	Pond		Junction		SMH 1.2	1350	Manhole	Adoptable
1.004	SMH 1.2	1350	Manhole	Adoptable	Tank		Junction	
1.005	Tank		Junction		SMH 1.1	1350	Manhole	Adoptable
1.006	SMH 1.1	1350	Manhole	Adoptable	SMH 1.0	1350	Manhole	Adoptable
4.000	SMH 2.1	1200	Manhole	Adoptable	SMH 2.0	1200	Manhole	Adoptable
5.000	Dock Lev	1200	Manhole	Adoptable	SMH 2.0	1200	Manhole	Adoptable
4.001	SMH 2.0	1200	Manhole	Adoptable	SMH 1.0	1350	Manhole	Adoptable
1.007	SMH 1.0	1350	Manhole	Adoptable	EX MH 7	1200	Manhole	Adoptable

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	17.000	Additional Storage (m³/ha)	20.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

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 %)
100	40	0	0

Node SMH 1.0 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.007	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0064-2000-1200-2000
Invert Level (m)	3.950	Min Outlet Diameter (m)	0.100
Design Depth (m)	1.200	Min Node Diameter (mm)	1200
Design Flow (l/s)	2.0		

Node Tank Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	4.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	320.0	320.0	0.800	320.0	370.7	0.801	0.0	370.7

Node Pond Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	3.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	255

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	130.0	130.0	2.000	370.0	393.4

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Rainfall

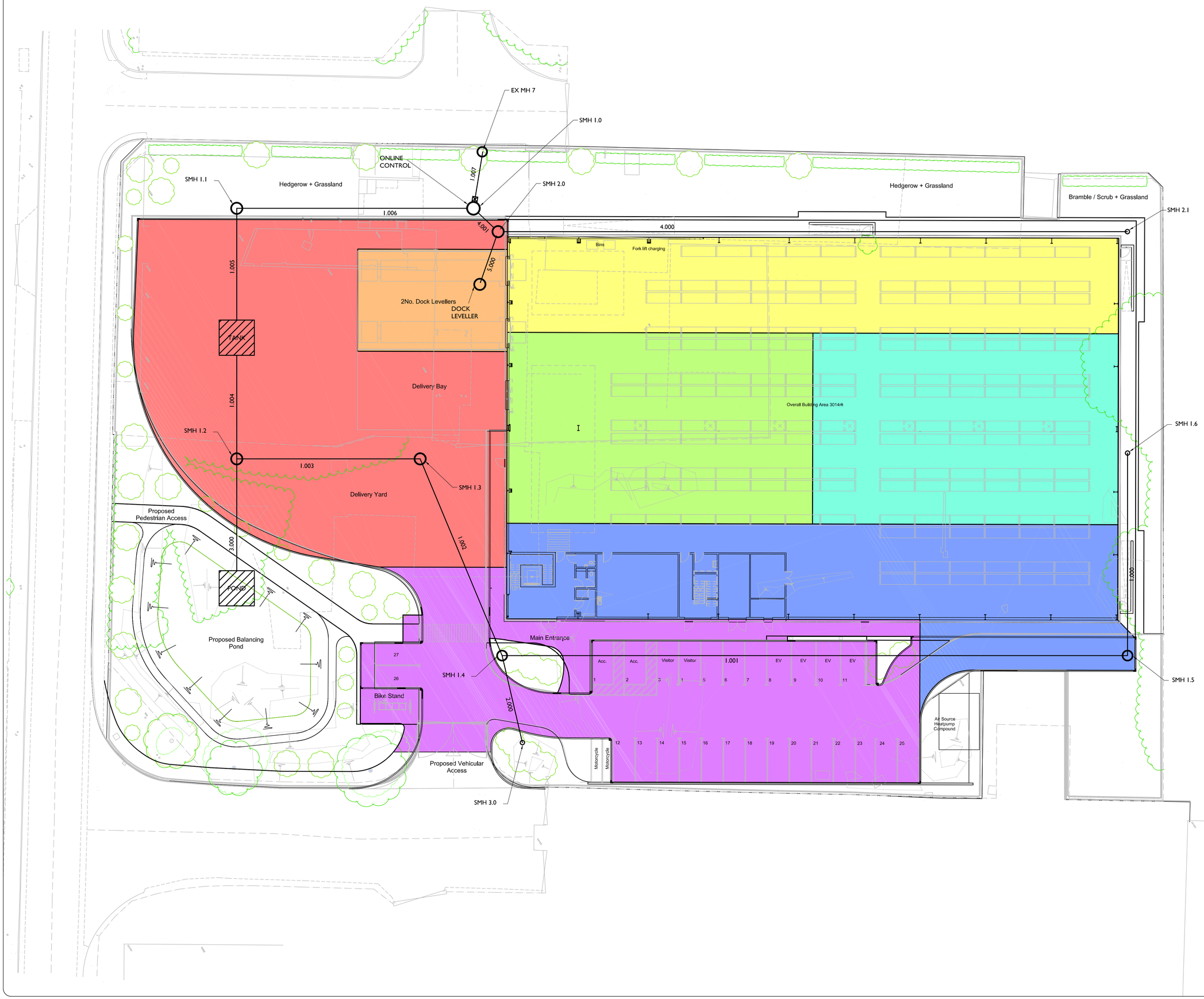
Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 15 minute summer	408.473	115.584
100 year +40% CC 15 minute winter	286.647	115.584
100 year +40% CC 30 minute summer	268.775	76.054
100 year +40% CC 30 minute winter	188.614	76.054
100 year +40% CC 60 minute summer	180.954	47.821
100 year +40% CC 60 minute winter	120.222	47.821
100 year +40% CC 120 minute summer	110.370	29.168
100 year +40% CC 120 minute winter	73.327	29.168
100 year +40% CC 180 minute summer	83.953	21.604
100 year +40% CC 180 minute winter	54.572	21.604
100 year +40% CC 240 minute summer	65.765	17.380
100 year +40% CC 240 minute winter	43.693	17.380
100 year +40% CC 360 minute summer	49.370	12.705
100 year +40% CC 360 minute winter	32.092	12.705
100 year +40% CC 480 minute summer	38.291	10.119
100 year +40% CC 480 minute winter	25.439	10.119
100 year +40% CC 600 minute summer	30.992	8.477
100 year +40% CC 600 minute winter	21.176	8.477
100 year +40% CC 720 minute summer	27.387	7.340
100 year +40% CC 720 minute winter	18.406	7.340
100 year +40% CC 960 minute summer	22.191	5.844
100 year +40% CC 960 minute winter	14.700	5.844
100 year +40% CC 1440 minute summer	15.789	4.232
100 year +40% CC 1440 minute winter	10.611	4.232
100 year +40% CC 2160 minute summer	11.070	3.059
100 year +40% CC 2160 minute winter	7.628	3.059
100 year +40% CC 2880 minute summer	9.060	2.428
100 year +40% CC 2880 minute winter	6.089	2.428
100 year +40% CC 4320 minute summer	6.697	1.751
100 year +40% CC 4320 minute winter	4.410	1.751
100 year +40% CC 5760 minute summer	5.418	1.387
100 year +40% CC 5760 minute winter	3.507	1.387
100 year +40% CC 7200 minute summer	4.536	1.157
100 year +40% CC 7200 minute winter	2.928	1.157
100 year +40% CC 8640 minute summer	3.910	0.998
100 year +40% CC 8640 minute winter	2.524	0.998
100 year +40% CC 10080 minute summer	3.448	0.880
100 year +40% CC 10080 minute winter	2.226	0.880

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.32%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SMH 1.6	11	5.539	0.539	41.7	2.0176	0.0000	FLOOD RISK
15 minute winter	SMH 1.5	11	5.506	0.736	76.2	2.4781	0.0000	FLOOD RISK
15 minute winter	SMH 3.0	11	5.271	0.271	57.8	1.0106	0.0000	SURCHARGED
15 minute winter	SMH 1.4	11	5.138	0.653	123.9	0.7390	0.0000	SURCHARGED
960 minute winter	SMH 1.3	945	4.914	0.599	11.4	1.3277	0.0000	SURCHARGED
960 minute winter	Pond	945	4.914	0.414	10.5	113.6204	0.0000	SURCHARGED
960 minute winter	SMH 1.2	945	4.914	0.689	11.2	0.9858	0.0000	SURCHARGED
960 minute winter	Tank	945	4.914	0.714	12.1	218.0600	0.0000	SURCHARGED
960 minute winter	SMH 1.1	945	4.914	0.749	7.7	1.0716	0.0000	SURCHARGED
15 minute summer	SMH 2.1	10	5.153	0.153	41.7	0.5734	0.0000	OK
960 minute winter	Dock Lev	945	4.914	0.414	0.7	0.6886	0.0000	SURCHARGED
960 minute winter	SMH 2.0	945	4.914	0.629	3.2	0.7112	0.0000	SURCHARGED
960 minute winter	SMH 1.0	945	4.914	0.964	7.0	1.3792	0.0000	SURCHARGED
960 minute winter	EX MH 7	945	3.520	0.020	1.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SMH 1.6	1.000	SMH 1.5	35.3	0.846	0.318	1.6187	
15 minute winter	SMH 1.5	1.001	SMH 1.4	74.9	1.064	1.070	5.0066	
15 minute winter	SMH 3.0	2.000	SMH 1.4	53.9	1.870	0.494	0.4017	
15 minute winter	SMH 1.4	1.002	SMH 1.3	123.7	1.757	1.791	1.7135	
960 minute winter	SMH 1.3	1.003	SMH 1.2	11.2	0.459	0.098	2.3279	
960 minute winter	Pond	3.000	SMH 1.2	-10.5	-0.279	-0.088	1.1030	
960 minute winter	SMH 1.2	1.004	Tank	8.4	0.578	0.111	1.9022	
960 minute winter	Tank	1.005	SMH 1.1	4.7	0.430	0.045	1.4099	
960 minute winter	SMH 1.1	1.006	SMH 1.0	-2.9	0.090	-0.015	2.3305	
15 minute summer	SMH 2.1	4.000	SMH 2.0	42.4	1.436	0.815	2.3258	
960 minute winter	Dock Lev	5.000	SMH 2.0	0.7	0.354	0.017	0.0833	
960 minute winter	SMH 2.0	4.001	SMH 1.0	7.0	0.701	0.062	0.1595	
960 minute winter	SMH 1.0	1.007	EX MH 7	1.8	1.267	0.038	0.0091	116.6

Appendix J – Schematic Layout



FLOW DRAINAGE NOTES

THIS DRAWING IS NOT FOR CONSTRUCTION.

THIS SKETCH PLAN HAS BEEN PRODUCED TO CORRELATE THE FLOW DRAINAGE MODEL WITH THE DRAINAGE PROPOSALS. WE HAVE ALSO HIGHLIGHTED WERE IT HAS BEEN NECESSARY TO INCLUDE 'FALSE' CHAMBERS / NODES OR JUNCTIONS TO LOCATE THE STORAGE FACILITIES / SAB FEATURES ETC. NOTE THE ATTENUATION IS CREATED AS A NODE WITHIN THE MODEL WITH VOLUMETRIC PROPERTIES

KEY

1.000 FLOW PIPE REF

FLOW PIPE RUN

CATCHMENT AREAS

KEY	AREA m² / HA	CONNECTION
	1320 / 0.132	TANK
	200 / 0.020	Dock Lev
	750 / 0.070	SMH 2.3
	750 / 0.075	SMH 1.3
	750 / 0.075	SMH 1.6
	900 / 0.090	SMH 1.5
	1040 / 0.104	SMH 3.0

REV	DESCRIPTION	BY	CHK	APR	DATE
-	-	-	-	-	-

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PURPOSE OF ISSUE: PRELIMINARY	STATUS: P
PROJECT: CHESTER WOOL COMPANY SANDYCROFT	
TITLE: PROPOSED DRAINAGE SCHEMATIC LAYOUT	
CLIENT: CASSIDY & ASHTON	
DRAWN BY: SB	CHECKED BY: RH
APPROVED BY: JP	
DATE: 30.01.2025	SCALE (@ A1): 1:200
PROJECT NUMBER: 107014	
DRAWING NUMBER: 1002	REV: P01

Appendix K – O&M Manual

CHESTER WOOL FACTORY

Sandycroft

Maintenance Plan

107014-RP-D-0002

Rev: P01

January 2025

JPS CIVIL + STRUCTURAL ENGINEERS

Table 1: SuDS Maintenance Inspection Checklist

GENERAL INFORMATION			
Site ID	Chester Wool Company, Factory Road, Sandycrofy		
Site Location and co-ordinates (GIS if appropriate)	CH5 2QJ, SJ329677, (332923, 367715)		
As Built Drawing Reference(s)	107014-0601		
Agreements Restrictions			
Discharge Type	**Connection**	**Outflow**	**Agreement**
Surface Water	To Public Sewer	2 l/s	S106
Foul	To Public Sewer	< 1 l/s	S106
Elements forming the SuDS scheme	Permeable Paving / Attenuation / Hydrobrake / Downstream Defender		

INFRASTRUCTURE	Inspection date				Inspection date			
RECOMMENDED FREQUENY – Annually	**Details**	**Y/N**	**Action required**	**Date Completed**	**Details**	**Y/N**	**Action required**	**Date Completed**
Is there evidence of any accidental damage to the system (e.g. wheel ruts?)								
Is there any evidence of tampering with the flow controls?								
Is there any evidence of tampering with the Attenuation Tanks?								
Are Attenuation tank vents clear?								
Are gullies/channels/kerb drainage clear of debris/detritus?								
Are Rainwater Down Pipes and gutters clear of debris /detritus?								
Does Downstream Defender require emptying / jetting?								
Does permeable or porous surfacing require sweeping to remove silt?								
Drainage network to be checked CCTV survey. A list of defects should be compiled with high, medium and low risk of failure. High risk defects should be fixed immediately, medium risk should be fixed within 6 months and low risk to be monitored.								

GENERAL INSPECTION ITEMS	Inspection date				Inspection date			
RECOMMENDED FREQUENY – Biannually	**Details**	**Y/N**	**Action required**	**Date Completed**	**Details**	**Y/N**	**Action required**	**Date Completed**
Is there any evidence of erosion, channelling, ponding (where not desirable) or other poor hydraulic performance?								
Is there any evidence of accidental spillages, oils, poor water quality, odours, nuisance insects?								
Have any health and safety risks been identified to either the public or maintenance operatives?								
Is there any deterioration in the surface of permeable or porous surfaces (e.g. rutting, spreading of blocks or signs of ponding water)?								

SILT/SEDIMENT ACCUMULATION	Inspection date				Inspection date			
RECOMMENDED FREQUENY – Monthly	**Details**	**Y/N**	**Action required**	**Date Completed**	**Details**	**Y/N**	**Action required**	**Date Completed**
Is there any sediment accumulation at inlets (or other defined accumulation zones such as the surface of filter drains or infiltration basins and within proprietary devices)?								
SYSTEM BLOCKAGES / LITTER BUILD UP								
Is there evidence of litter accumulation in the system? If yes, is this a blockage risk?								
Is there any evidence of any other clogging/blockage of outlets or drainage paths?								

VEGETATION	Inspection date				Inspection date			
RECOMMENDED FREQUENY – Monthly During Summer Quarterly Through Winter	**Details**	**Y/N**	**Action required**	**Date Completed**	**Details**	**Y/N**	**Action required**	**Date Completed**
Is the vegetation condition satisfactory (density, weed growth, coverage etc.)? (Check against approved planting regime.)								
Does any part of the system require weeding / pruning / mowing? (Check against maintenance frequency stated in approved design.)								
Is there any evidence of invasive species becoming established? If yes, state action required.								

Are there any other matters that could affect the performance of the system in relation to the design objectives for hydraulic, water quality, biodiversity and visual aspects? (Specify.)								
OTHER OBSERVATIONS								
Information appended (e.g. photos)								

	Inspection date				Inspection date			
	Details	**Y/N**	**Action required**	**Date Completed**	**Details**	**Y/N**	**Action required**	**Date Completed**
SUITABILITY OF CURRENT MAINTENANCE REGIME								
Continue as current Increase maintenance Decrease maintenance								
NEXT INSPECTION								
Proposed date for next inspection								

Additional Notes