Project Ref: T_23_2737
Report Ref: T2737_Drainage Strategy Rev A

Oak Moss Group,

Rackery Lane,

Llay Industrial Park,

Llay

Drainage Strategy

Tier Consult Ltd
Unit 5 Office Village,
Sandpiper Court,
Chester Business Park,
Chester CH4 9QZ
01244 684 900

Registered Company No. 04638546

1.0 Introduction

1.1 Tier Consult have been appointed by Oak Moss Group, to prepare a drainage strategy proposal for the proposed development at Rackery Lane, Llay Industrial Park.

1.2 The report aims to provide an outline of the proposed drainage strategy, taking account of the requirements of the Wales Planning Policy (12th Edition).

2.0 Site Description and Development Proposal

2.1 The site is located adjacent to Noth Wales Police Station on Davy Way in Llay Industrial Park, Llay, Wrexham. The approximate National Grid Reference for the centre of the site is SJ325566 with coordinates Easting: 332566, Northing: 356647 at postcode LL12 0PB.

2.2 The proposed development is 3.19 ha. There are currently two options being proposed with a max impermeable area of 2.17 ha.

2.3 A topographic survey (Appendix A) has been undertaken by Cheshire Surveys indicates that the site predominantly falls from north to south with site levels varying from circa 100.8m to 97.4m. A ditch runs along the western boundary of the development however this lies within the adjacent property.

2.4 The soilscapes mapping details the site conditions to be slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. Information from the British Geological Survey Map indicates that the geological sequence below the site comprises mudstone, sandstone and conglomerate.

2.5 The geotechnical report comprised by 'Tier Environmental Ltd' provides details of the current ground conditions which includes topsoil or hardstanding overlying made ground soils. This is all underlaid by glacial till. The report also reports findings of contamination within the made ground.

3.0 Existing Drainage

3.1 The development land is existing agricultural greenfield and as such there is an existing drainage ditch to the western boundary of the site. This however lies within third party land.

4.0 Surface Water Drainage

4.1 The Wales Planning Policy and Schedule 3 of the Flood and Water Management Act 2010 prescribe a hierarchal approach to surface water discharge. In order of preference, surface water should be discharged via:

a)· Infiltration systems / soakaways

b) To a watercourse / surface water body
c) To a sewer or other formal drainage system.

4.2 Infiltration/Soakaways

4.2.1 The ground infiltration testing has not been carried out on the site at this stage and due to the ground conditions along with potential contamination, this is deemed not suitable.

4.3 Discharges to Watercourse

4.3.1 There is an existing watercourse along the western boundary of the site however any connection to this will need a third party agreement to discharge flows from the development.

4.4 Discharges to Sewer

4.4.1 There is a highway drain to the north of the development within Davy Way. From initial discussions with the local authority, we have been advised that this would be a viable discharge point for surface water flows

4.4.2 The Dŵr Cymru Welsh Water (DCWW) public sewer records indicate the presence of foul sewer located within Davy Way.

4.4.3 Welsh Water have identified a manhole within Davy Way for the proposed point of discharge from the site within the response to a developer enquiry.

5.0 Proposed Surface Water Drainage Strategy

5.1 There are currently two proposed discharge locations being explored. Following the guidance within planning guidance the first outfall would be to the existing watercourse within the adjacent land, however as this is subject to a third party agreement a second outfall point is proposed to the existing highway drain, previously mentioned in Davy Way.

5.2 The surface water drainage system for the site is proposed to convey flows via gravity system to each respective outfall option at greenfield QBAR rate.

5.3 The storm water drainage system is to be designed in accordance with the requirements of the *Wales Planning Policy* and *Schedule 3 of the Flood and Water Management Act 2010,* to ensure that flood risk is not increased, either on or off site, for all storm events up to and including the 1 in 100 year + 40% climate change events.

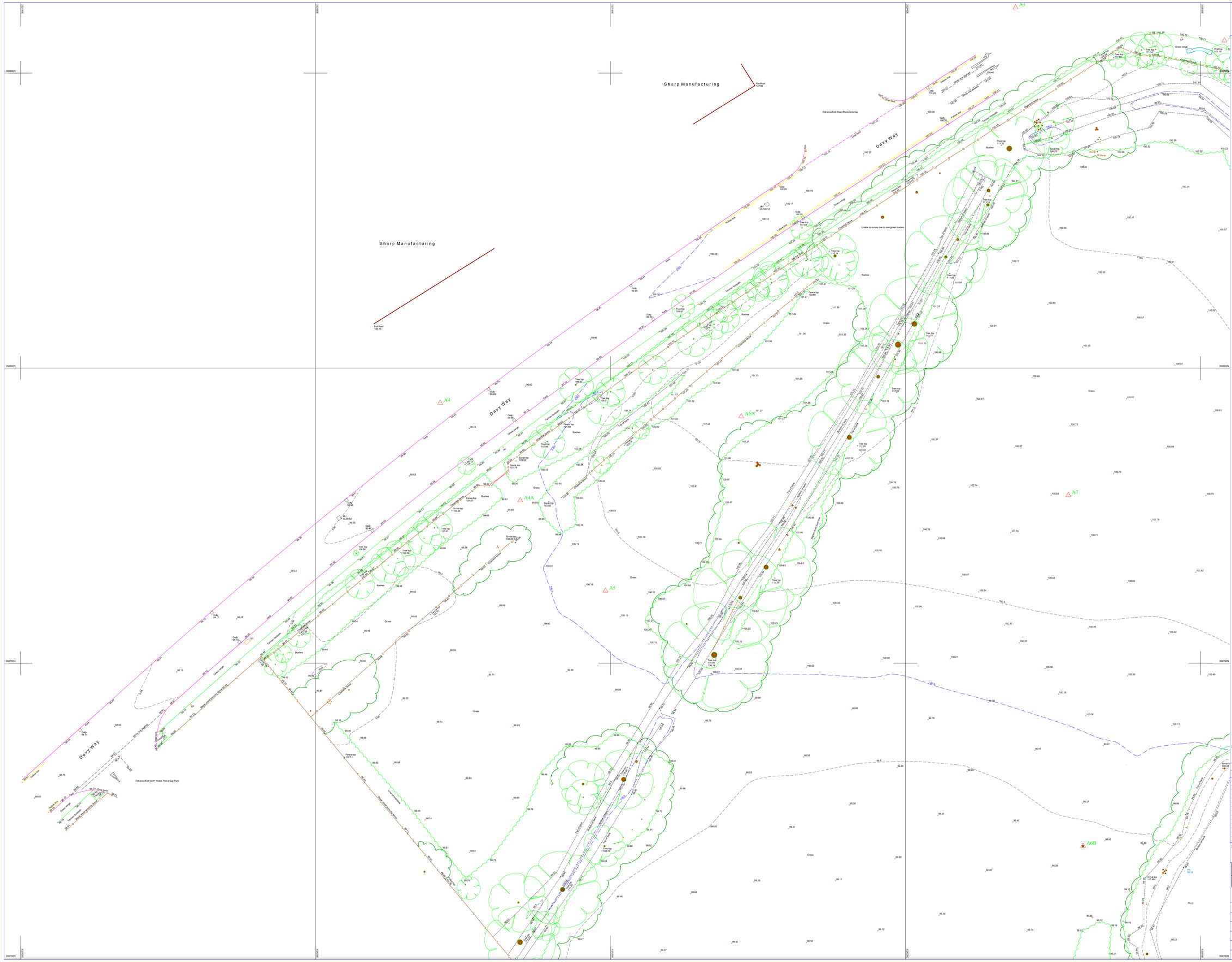
5.4 The development area equates to 3.19 ha. The greenfield QBAR rate (Appendix B) for the development area equates to 17.11 l/s based on the site area above. As such it is proposed to restrict peak surface water flows to 17 l/s off site.

5.5 Surface water runoff from roofs, private drives and any adoptable highways, will drain via a piped network to an attenuation facility which will provide attenuation storage for all flows up to and including the 1 in 100 year event plus 40% for climatic change.

5.6 SuDS features such as filter drains and permeable paving will be incorporated into the surface water drainage proposals to aid in the mitigation requirements for water quality prior to discharging to the wider natural surface water drainage network. Proposed drainage layout is pertained in Appendix C.

Appendix A

Topographic Survey



Services carried out by Cheshire Surveys Ltd

Topographical Surveys - Measured Building Surveys - 3D Laser Scanning - Check Surveys
Monitoring Surveys - Deformation Surveys - Volumetric Surveys - Levelling - Setting Out

Disclaimer:
All efforts have been made to survey all utility services within the boundary of the survey We can not guarantee that we have been able to locate everything and further investigation will be required to establish full extents of services

Legend

- Armco
- Barrier
- Bottom Of Bank
- Bollard
- Borehole
- Building
- Canopy
- Centreline
- Chainlink Fence
- Channel Line
- Closeboard Fence
- Concrete Edge
- Concrete Post & Panel Fence
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Abbreviations

BT	BT Manhole	IC	Inspection Cover
CATV	Cable TV	INV	Invert Level
CCTV	Close Circuit TV	LP	Lamp Post
DPC	Damp Proof Course	MH	Man Hole
EARTH	Earth Point	OH	Overhead Cable
EP	Electricity Pole	OSBM	Ordnance Survey
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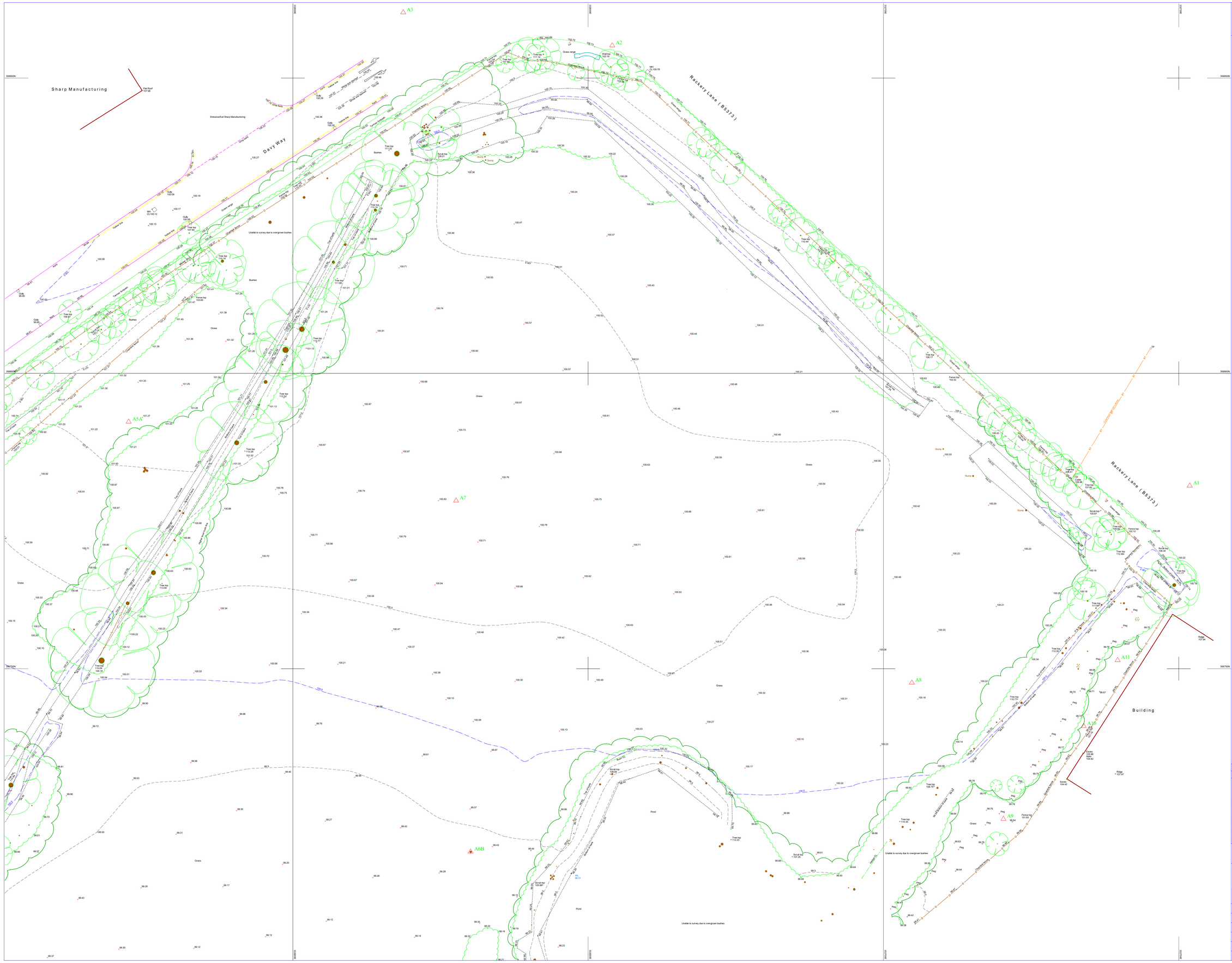
SURVEY STATIONS

Name	Easting	Northing	Height
A1	332751.867	356780.975	100.414
A10	332733.897	356740.269	99.892
A11	332739.655	356751.434	99.823
A2	332654.079	356855.490	100.741
A3	332618.674	356861.101	100.730
A4	332521.178	356794.089	99.874
A4A	332534.728	356777.557	99.800
A5	332549.168	356762.256	100.282
A5A	332572.193	356791.801	101.304
A6	332576.879	356695.109	99.072
A6A	332637.862	356676.261	98.820
A6B	332630.102	356718.993	99.746
A7	332627.630	356778.441	100.816
A8	332704.799	356747.618	100.385
A9	332720.326	356724.554	99.898

NOTES:
Horizontal and vertical control established using SmartNet GPS Network and OSGB36(15) coordinate System
This survey has been converted to a local grid orientated to OS grid. Position is only true at one point to OS coordinates

CHESHIRE SURVEYS LTD
Setting out and Survey Engineers
Unit 2, Barrowmore Enterprise Estate, Gt Barrow, Chester CH3 7JS
Email : gary@cheshiresurveys.co.uk Tel: 01829 741859 Mob: 077 8099 3661

Client	Oak Moss Group		
Location	Land Off Davy Way, Llay		
Description	Topographical Survey (Sheet 1 of 3)		
Drg. No.:	B0772/4579/1/*/1	Surveyed By:	GF
Scale: 1:	200/A0	Drawn By:	GF
Date:	28/09/2023	Amend:	*



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CCTV	Close Circuit TV	LP	Lamp Post
DPC	Damp Proof Course	MH	Man Hole
EARTH	Earth Point	OH	Overhead Cable
EP	Electricity Pole	OSBM	Ordnance Survey
ER	Earth Rod	RS	Road Sign
ES	Escarpment	TP	Telegraph Pole
FFL	Finish Floor Level	W	Water Cover
G	Gulley	WL	Water Level

Rev_A

Trees removed from survey that have been removed on site, as requested by client. 30/10/2024

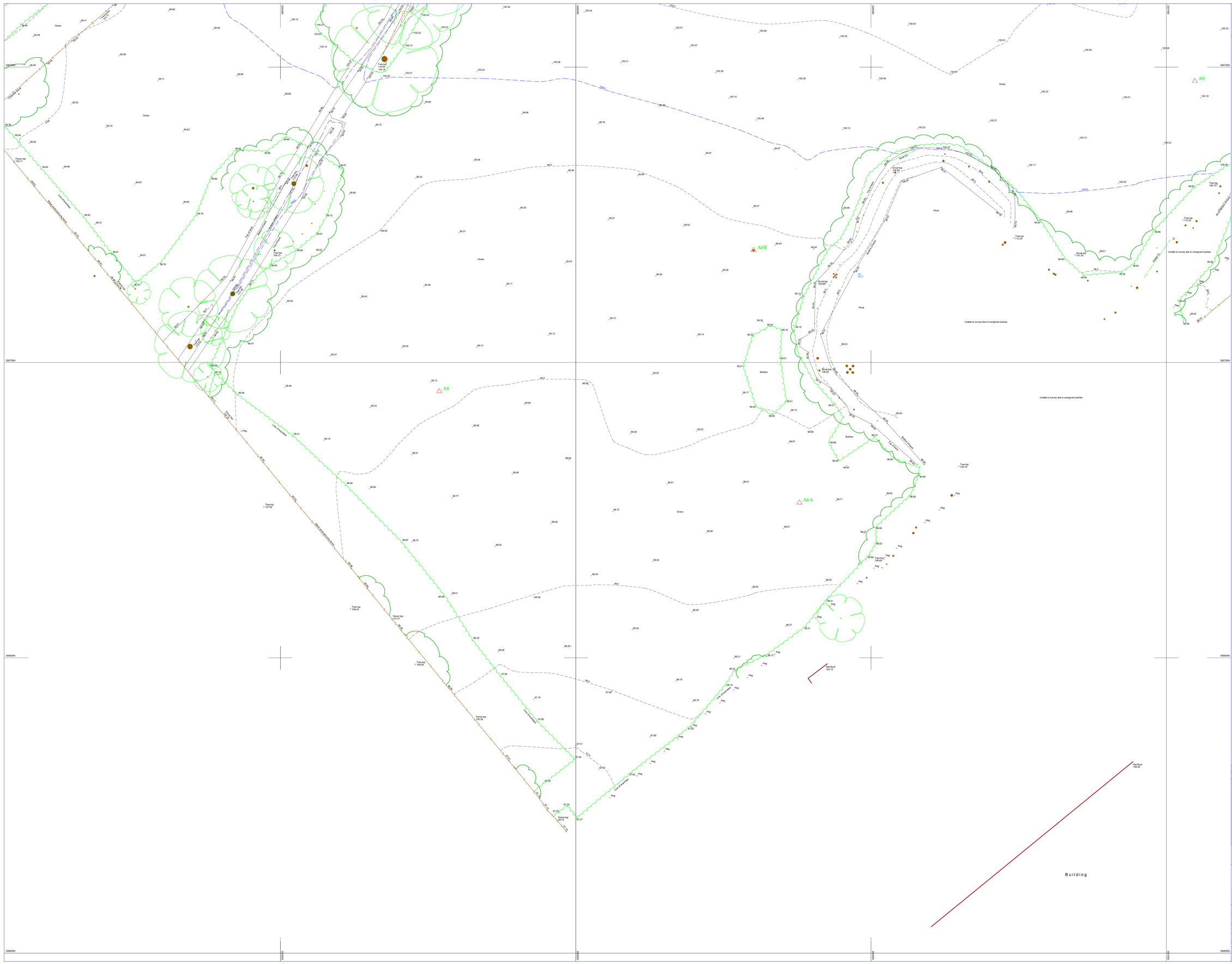
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Client	Oak Moss Group		
Location	Land Off Davy Way, Llay		
Description	Topographical Survey (Sheet 2 of 3)		
Drg. No.:	B0772/4579/1/*/2	Surveyed By:	GF
Scale: 1:	200/A0	Drawn By:	GF
Date:	28/09/2023	Amend:	*



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Location	Land Off Davy Way, Llay		
Description	Topographical Survey (Sheet 3 of 3)		
Drg. No.:	B0772/4579/1/*/3	Surveyed By:	GF
Scale: 1:	200/A0	Drawn By:	GF
Date:	28/09/2023	Amend:	*

Appendix B

Greenfield Run-off Calculation

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff toc

Calculated by:	Worran Lloyd
Site name:	Llay
Site location:	Davy Way

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:	53.10363° N
Longitude:	3.00819° W
Reference:	2889101723
Date:	Jul 01 2024 15:42

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 3.19

Methodology

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

Soil characteristics

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

Hydrological characteristics

	Default	Edited
SAAR (mm):	766	766
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 c
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 c
for discharge is usually set at 5.0 l/s if
from vegetation and other materials is
Lower consent flow rates may be set v
blockage risk is addressed by using ap
drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low eno
use of soakaways to avoid discharge c
would normally be preferred for dispos
surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	17.11	17.11
1 in 1 year (l/s):	15.06	15.06
1 in 30 years (l/s):	30.46	30.46
1 in 100 year (l/s):	37.31	37.31
1 in 200 years (l/s):	42.1	42.1

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Appendix C

Drainage Layouts

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Notes

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3. ALL DIMENSIONS ARE IN MILLIMETRES UNO, FOR THE PURPOSES OF CONSTRUCTION THIS DRAWING MUST NOT BE SCALED AND ONLY WRITTEN DIMENSIONS USED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION AND ANY DISCREPANCIES TO BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER IN WRITING.
4. THE LOCATION LINE & LEVEL OF ALL KNOWN EXISTING DRAINAGE PIPEWORK INDICATED ON THE DRAWINGS ARE APPROXIMATE AND FOR GUIDANCE PURPOSES ONLY.
5. CONNECTION TO THE EXISTING PUBLIC SEWERS WILL BE SUBJECT TO THE RELEVANT APPROVALS FROM THE STATUTORY UNDERTAKER.

Legend:

NOTE:
ALL EXISTING DRAINAGE TBC.

- PROPOSED SURFACE WATER DRAIN.
- PROPOSED SURFACE WATER INSPECTION CHAMBER / MANHOLE.
- PROPOSED LINEAR DRAINAGE CHANNEL.
- PROPOSED SURFACE WATER CELLULAR ATTENUATION SYSTEM.

NOTE:
PROPOSED DRAINAGE IS INDICATIVE ONLY.

Rev	Date	By	Description	Chk	App
P1	04.04.2024	CCF	Preliminary Issue	WNL	PJB

Status
PRELIMINARY

TIER CONSULT GROUP.
Unit 5 Office Village,
Sandpiper Court,
Chester Business Park,
Chester,
CH4 9QZ
T: 01244 684 900

Client:
Oak Moss Group

Project Title:
Rackery Lane,
Llay

Drawing Title:
PROPOSED SURFACE WATER DRAINAGE STRATEGY.
OPTION 4b.

Drawing Scale:	Drawn By:	Drawing Start Date:
1:500 @ A1	C.C.FITTON	04.04.2024

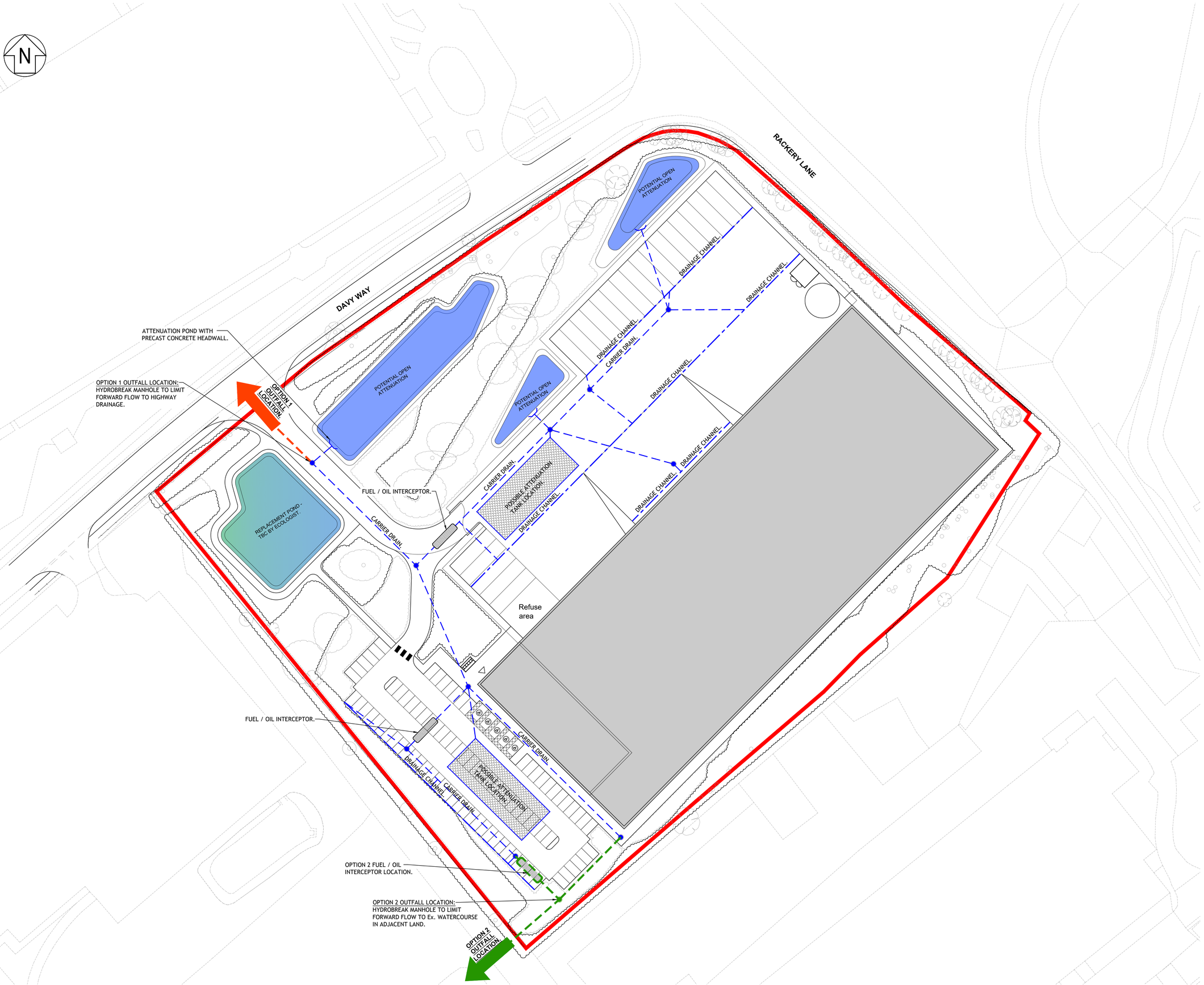
TIER Project Number:
T_23_2737

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T_23_2737-55-01

Revision:
P1

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OPTION 5.

Drawing Scale:	Drawn By:	Drawing Start Date:
1:500 @ A1	C.C.FITTON	04.04.2024

TIER Project Number:
T_23_2737

Drawing No:
T_23_2737-55-02

Revision:
P1

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