

ADEPT

CIVIL AND STRUCTURAL CONSULTING ENGINEERS



Drainage Strategy & Flood Risk Assessment

100.21092 - Satellite Industrial Park

Table of Contents

1.0 Introduction and brief.....	4
2.0 Limitations of report.....	4
3.0 Description of the existing site.....	5
4.0 Hydrology, hydrogeology and geology	8
5.0 Proposed development	9
6.0 Flood risk sources and extents.....	11
7.0 Communications.....	15
8.0 Conclusions.....	16

ADEPT

CIVIL AND STRUCTURAL CONSULTING ENGINEERS

Client: Mileway
Project Name: Satellite Industrial Park
Report Title: Flood Risk Assessment and Drainage Strategy Report
Document ref: 100.21092-ACE-ZZ-ZZ-RP-C-0001
Date: 13th July 2022

Revision	Suitability	Date	Author	Checked	Approved	Description
P01	S3	19/07/2022	WD	JBW	NB	First Issue
P02	S3	21/09/2022	JBW	NB	NB	Site Layout Updated
P03	S3	18/03/2024	JBW	NB	NB	Site Layout Updated
P04	S3	03/04/2024	JBW	NB	NB	Revised following comments

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1.0 Introduction and brief

Adept Consulting Engineers Ltd was commissioned to provide a Flood Risk Assessment (FRA) and Drainage Strategy for Satellite Industrial Park by Mileway.

2.0 Limitations of report

Preliminary calculations and a concept drainage design have been undertaken as part of this study. The preliminary calculations and concept design are based on the information and assumptions covered in this report at the time of preparation and provide a concept design for points of connection and general design parameters only.

The report is based on the interpretation and assessment of data provided by third parties. Adept Consulting Engineers Limited cannot guarantee the reliability of the third party information obtained. The conclusions and findings of the report may change if the third party data is subsequently amended or updated.

3.0 Description of the existing site

The site is located at Satellite Industrial Park, Wolverhampton, WV11 3QG. The grid reference is SO 94712 99556.

A site location plan is appended.

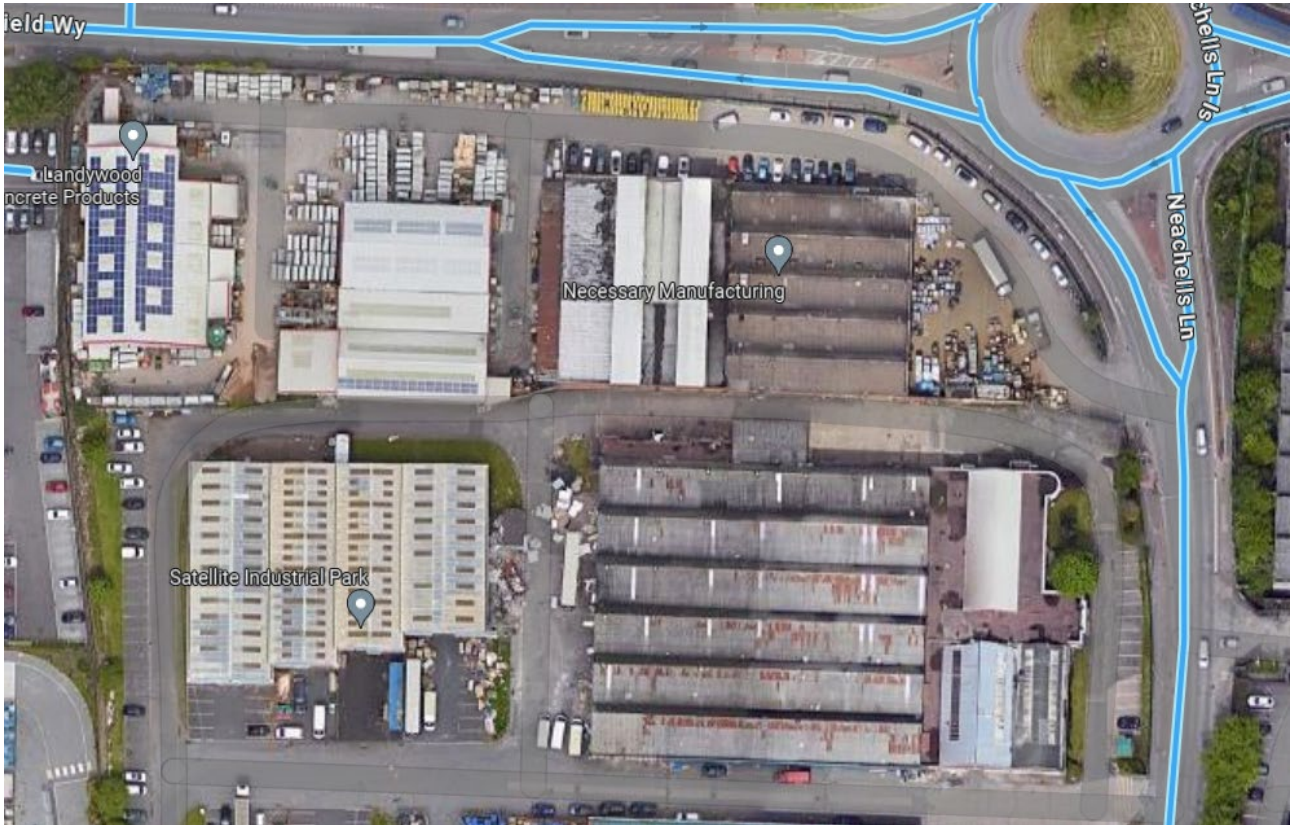


Figure 3.1: Site Plan

A topographical survey is appended.

Site description	
Total Site Area	0.97 Ha Red line boundary
Existing Impermeable Area	0.72 Ha
Land use	Warehousing
Topography	The site is relatively flat due to the existing structure. There is steps in the North of the site. The road ramps down in the North West corner.
Known Site Constraints	Existing infrastructure



Figure 3.2: Access to site from Neachells Lane



Figure 3.3: North East corner steps out of existing building.



Figure 3.4: North West corner steps out of the existing building.



Figure 3.5: View from the NE corner down the East boundary of the site.

4.0 Hydrology, hydrogeology and geology

Watercourses and waterbodies

There are no watercourses or waterbodies within viable communication, or presenting a flood risk.

Sewerage

Existing sewerage is shown on the appended survey plans. Combined sewer overflows are suspected to be within these networks. The ultimate surface water discharge allowance may be influenced by this, Severn Trent Water are yet to confirm.

Geology

The geological assessment for this site has been based on the appended site investigation report and digital online data published by the British Geological Survey (BGS).

The report determines that there is made ground over a natural clay horizon throughout the site.

According to BGS the superficial deposits are Till, Devensian – Diamicton Sedimentary Deposits deposited during the Quaternary period.

According to the published BGS data the site is underlain by a Pennine Lower Coat Measures Formation – Mudstone, siltstone and sandstone sedimentary bedrock.

5.0 Proposed development

Development Outline

The proposed development entails the demolition of existing industrial units and the erection of a building for use as a builders merchant, with external storage yard and parking for 29 vehicles.

With this in mind the vulnerability of the site will remain within the 'less vulnerable' category as defined in Schedule 10 of the Environmental Permitting (England and Wales) Regulations 2010.

Architectural plans are appended.

Proposed Surface Water Drainage Strategy

The proposed discharge rate for the site has been calculated using a brownfield rate with the appropriate reduction, in line with current guidance.

The brownfield rate is established thus:

$$2.78 * \text{Area (Ha)} * \text{Rainfall Intensity (mm/hr)} = Q \text{ (l/s)}$$

$$2.78 * 0.72 * 50 = 100$$

Consideration is given to the capacity of the existing surface water sewerage and the proposal of a singular point of discharge via an an existing connection. A discharge to the existing 225mm surface water sewer has been assessed. Therefore, a reduced discharge rate of 25 l/s was modelled, offering a calculated reduction in discharge rate of 75%.

Total impermeable area	0.72 Ha
Peak discharge from site	25 l/s
Maximum attenuation volume required to accommodate the peak 1 in 100 year + 40% CC storm	228m ³ approximately

Foul Drainage

Foul water discharge will be made to the closest foul sewer which is believed to be at the north of the site, within the site boundary. In accordance with the awaited PreDevelopment response from Severn Trent Water.

However, our current proposals include two connections to the same foul water sewer. The eastern most connection will pick up and foul water drainage from the industrial unit. The western most connection will pick up a gully from bin store should this be required.

SuDS Assessment and Water Quality

The surface water discharge train has been assessed in line with the SuDS hierarchy and manual. The provisions are detailed below.

Hierarchy Level 1 – Infiltration

Infiltration has been deemed not viable following the initial desk top investigations and the results of the ground investigation.

Falling head and soakaway testing is to be undertaken on site as part of the Phase 2 intrusive investigation work to confirm this assumption.

The use of soakaways has therefore been discounted.

Hierarchy Level 2 – Discharge to surface water body

There are no nearby water courses to the site. It is not possible to discharge to a surface water body.

Discharge to a surface water body has therefore been discounted.

Hierarchy Level 3 – Discharge to surface water sewer or highway drain

Following a CCTV drainage survey of the site there are several viable options to allow for a surface water connection.

Discharge to a surface water sewer is the next viable option.

Water Quality Assessment

In accordance with CIRIA guidance, the pollution level for a commercial yard and delivery area, non-residential car parking (e.g. retail parking) is "Medium".

In accordance with the CIRIA guidance, any surface water treatment prior to discharge will be required to achieve the following levels:

- Total suspended soils – 0.7
- Metals – 0.6
- Hydrocarbons – 0.7

The use of a SPEL Stormceptor ESR Range By-Pass System 354C1/ESR interceptor prior to the attenuation, as specified on the Proposed Drainage Layout, will provide the following levels.

- Total suspended soils – 0.8
- Metals – 0.6
- Hydrocarbons – 0.9

Silt traps will also be located at specified manholes to provide the required pollution mitigation from the roof water discharge.

6.0 Flood risk sources and extents

Summary

A summary of the sources and level of flood risk (negligible, low, medium or high) is given in Table 6.1 below.

Table 6.1 Summary of the sources and level of Flood Risk	
Source	Risk Level
Fluvial	Low
Tidal - Coastal	Low
Surface Water / Pluvial	Low
Groundwater	Low
Surcharged Sewers	Response awaited from STW
Other Man Made Sources	Low

The sources and level of flood risk are demonstrated below.

Fluvial

Shown to be in Flood Zone 1 , no further discussion required.
An extract from the gov.uk website is shown below,

The screenshot shows the GOV.UK website interface for checking long-term flood risk. At the top, it says 'Check your long term flood risk' and 'BETA This is a new service - your feedback will help us to improve it.' Below this is a navigation link '< Back'. The main heading is 'Learn more about this area's flood risk'. A prompt says 'Select the type of flood risk information you're interested in. The map will then update.' There are two input fields: 'Flood risk' with a dropdown menu currently set to 'Extent of flooding', and 'Location' with a text box 'Enter a place or postcode'. Below these is a map showing a residential area with roads like Bentleybridge Way, Kenmare Way, Bolton Road, Hart Road, Wednesfield Way, Phoenix Road, and Neachells. A red line highlights a path through the area. A legend below the map indicates 'Extent of flooding from rivers or the sea' with four categories: High (dark blue), Medium (medium blue), Low (light blue), and Very low (very light blue). A location pin icon is also present. At the bottom of the map area, it says 'Contains OS data © Crown copyright and database rights 2022'.

[View the flood risk information for the location you originally searched for](#)

[View the flood risk information for another location](#)

This information meets the requirements of the EU Floods Directive 2007/60/EC

Tidal

The site is not at risk of tidal flooding, remote to the coast or tidal influence.

Surface Water / Pluvial

Surface water flood risk mapping from the gov.uk website shows that the site is in general not at risk of surface water flooding. An overland flow path located to the west and running south to north does not impact the site and appropriate external levels will continue to protect the site.



BETA This is a new service – your [feedback](#) will help us to improve it.

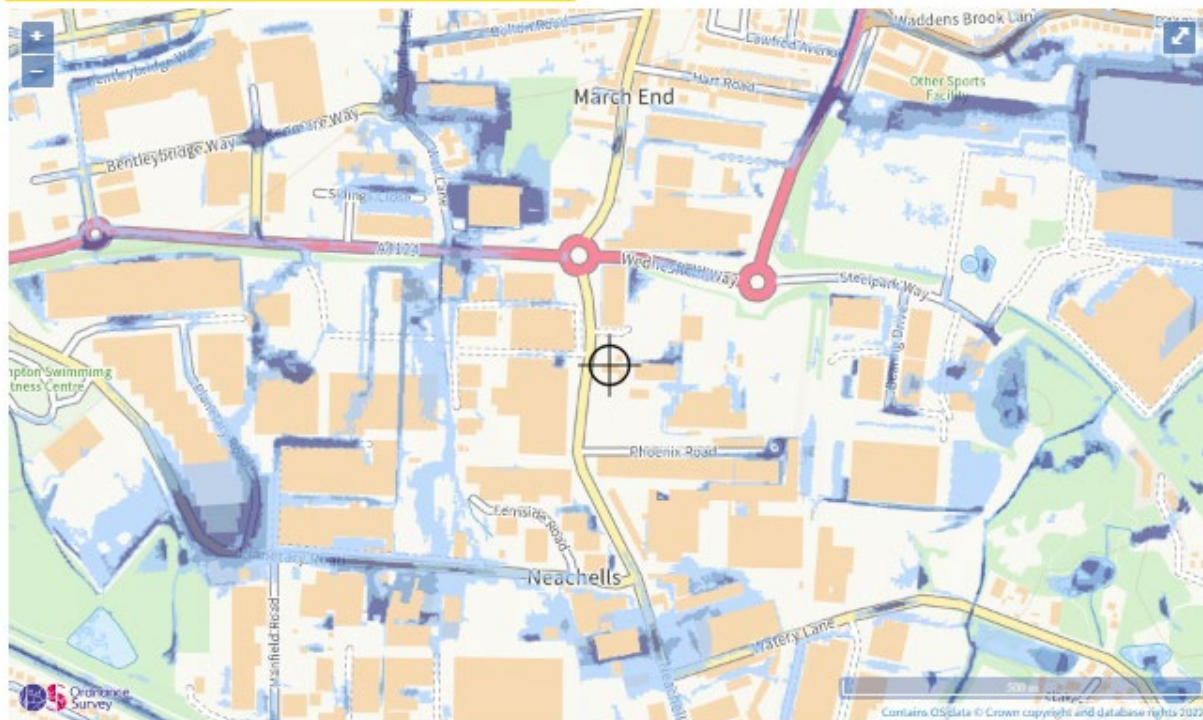
[Back](#)

Learn more about this area's flood risk

Select the type of flood risk information you're interested in. The map will then update.

Flood risk:

Location:



Extent of flooding from surface water

● High ● Medium ● Low ○ Very low 📍 Location you selected

[View the flood risk information for the location you originally searched for](#)

[View the flood risk information for another location](#)

This information meets the requirements of the EU Floods Directive 2007/60/EC

Groundwater Flooding

The site is not perceived to be at risk of groundwater flooding due to the clay subsoil and full impermeable surface.

Surcharged Sewers

Adopted sewerage is the responsibility of the statutory sewerage undertaker and therefore beyond the influence of this design.

Other Man Made Sources

The site is not at risk of reservoir or canal flooding.

Climate Change

Adept Consulting Engineers apply a climate change factor of 40% where required.

Design Consideration and Flood Mitigation

The site is not at risk of flooding and normal freeboard mitigation would suffice.

7.0 Communications

Discussions with Environment Agency-N/A

Discussions with the Lead Local Flood Authority- via planning process

Discussions with Sewerage Undertaker- PreDev response received, appended

8.0 Conclusions

Existing Drainage

A CCTV survey has been completed, the results are appended.

Proposed Drainage Strategy

The surface water attenuation proposal is demonstrated on the appended strategy plan. The surface water discharge rate is yet to be approved by STW and may be party to change, thus impacting attenuation requirements. The overall strategy would, however remain the same.

Flood Risk

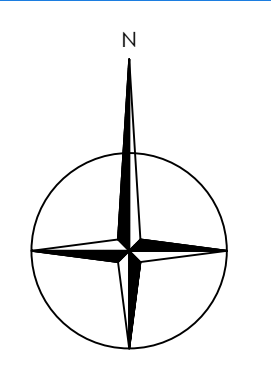
The is not at risk of flooding from any source, pending comment from STW.

Recommendations for further work/investigation and obtaining agreement

Confirm discharge rate with STW and LLFA.

Appendix A

- Topographical Survey
- GPR Survey
- Architectural Plans



LEGEND

1.00	EXISTING BUILDING	1.01	NEW BUILDING
1.02	EXISTING WALL	1.03	NEW WALL
1.04	EXISTING DOOR	1.05	NEW DOOR
1.06	EXISTING WINDOW	1.07	NEW WINDOW
1.08	EXISTING ROOF	1.09	NEW ROOF
1.10	EXISTING FLOOR	1.11	NEW FLOOR
1.12	EXISTING CEILING	1.13	NEW CEILING
1.14	EXISTING STAIR	1.15	NEW STAIR
1.16	EXISTING LIFT	1.17	NEW LIFT
1.18	EXISTING CORE	1.19	NEW CORE
1.20	EXISTING STRUCTURE	1.21	NEW STRUCTURE
1.22	EXISTING FOUNDATION	1.23	NEW FOUNDATION
1.24	EXISTING RETAINING WALL	1.25	NEW RETAINING WALL
1.26	EXISTING CURB	1.27	NEW CURB
1.28	EXISTING DRIVE	1.29	NEW DRIVE
1.30	EXISTING PAVEMENT	1.31	NEW PAVEMENT
1.32	EXISTING GRASS	1.33	NEW GRASS
1.34	EXISTING TREE	1.35	NEW TREE
1.36	EXISTING FENCE	1.37	NEW FENCE
1.38	EXISTING GATE	1.39	NEW GATE
1.40	EXISTING SIGN	1.41	NEW SIGN
1.42	EXISTING LIGHT	1.43	NEW LIGHT
1.44	EXISTING UTILITY	1.45	NEW UTILITY
1.46	EXISTING TELEPHONE	1.47	NEW TELEPHONE
1.48	EXISTING CABLE	1.49	NEW CABLE
1.50	EXISTING POINT	1.51	NEW POINT
1.52	EXISTING MARKER	1.53	NEW MARKER
1.54	EXISTING BENCH MARK	1.55	NEW BENCH MARK
1.56	EXISTING CONTROL POINT	1.57	NEW CONTROL POINT
1.58	EXISTING ADJUSTMENT POINT	1.59	NEW ADJUSTMENT POINT
1.60	EXISTING BOUNDARY	1.61	NEW BOUNDARY
1.62	EXISTING EASEMENT	1.63	NEW EASEMENT
1.64	EXISTING RIGHT OF WAY	1.65	NEW RIGHT OF WAY
1.66	EXISTING ROAD	1.67	NEW ROAD
1.68	EXISTING HIGHWAY	1.69	NEW HIGHWAY
1.70	EXISTING AIRWAY	1.71	NEW AIRWAY
1.72	EXISTING WATERWAY	1.73	NEW WATERWAY
1.74	EXISTING DRAINAGE	1.75	NEW DRAINAGE
1.76	EXISTING GULLY	1.77	NEW GULLY
1.78	EXISTING MANHOLE	1.79	NEW MANHOLE
1.80	EXISTING SEWER	1.81	NEW SEWER
1.82	EXISTING WATER	1.83	NEW WATER
1.84	EXISTING GAS	1.85	NEW GAS
1.86	EXISTING ELECTRIC	1.87	NEW ELECTRIC
1.88	EXISTING TELEPHONE	1.89	NEW TELEPHONE
1.90	EXISTING CABLE	1.91	NEW CABLE
1.92	EXISTING FIBRE	1.93	NEW FIBRE
1.94	EXISTING RAILWAY	1.95	NEW RAILWAY
1.96	EXISTING CANAL	1.97	NEW CANAL
1.98	EXISTING TUNNEL	1.99	NEW TUNNEL
1.100	EXISTING POINT	1.101	NEW POINT
1.102	EXISTING MARKER	1.103	NEW MARKER
1.104	EXISTING BENCH MARK	1.105	NEW BENCH MARK
1.106	EXISTING CONTROL POINT	1.107	NEW CONTROL POINT
1.108	EXISTING ADJUSTMENT POINT	1.109	NEW ADJUSTMENT POINT
1.110	EXISTING BOUNDARY	1.111	NEW BOUNDARY
1.112	EXISTING EASEMENT	1.113	NEW EASEMENT
1.114	EXISTING RIGHT OF WAY	1.115	NEW RIGHT OF WAY
1.116	EXISTING ROAD	1.117	NEW ROAD
1.118	EXISTING HIGHWAY	1.119	NEW HIGHWAY
1.120	EXISTING AIRWAY	1.121	NEW AIRWAY
1.122	EXISTING WATERWAY	1.123	NEW WATERWAY
1.124	EXISTING DRAINAGE	1.125	NEW DRAINAGE
1.126	EXISTING GULLY	1.127	NEW GULLY
1.128	EXISTING MANHOLE	1.129	NEW MANHOLE
1.130	EXISTING SEWER	1.131	NEW SEWER
1.132	EXISTING WATER	1.133	NEW WATER
1.134	EXISTING GAS	1.135	NEW GAS
1.136	EXISTING ELECTRIC	1.137	NEW ELECTRIC
1.138	EXISTING TELEPHONE	1.139	NEW TELEPHONE
1.140	EXISTING CABLE	1.141	NEW CABLE
1.142	EXISTING FIBRE	1.143	NEW FIBRE
1.144	EXISTING RAILWAY	1.145	NEW RAILWAY
1.146	EXISTING CANAL	1.147	NEW CANAL
1.148	EXISTING TUNNEL	1.149	NEW TUNNEL
1.150	EXISTING POINT	1.151	NEW POINT
1.152	EXISTING MARKER	1.153	NEW MARKER
1.154	EXISTING BENCH MARK	1.155	NEW BENCH MARK
1.156	EXISTING CONTROL POINT	1.157	NEW CONTROL POINT
1.158	EXISTING ADJUSTMENT POINT	1.159	NEW ADJUSTMENT POINT
1.160	EXISTING BOUNDARY	1.161	NEW BOUNDARY
1.162	EXISTING EASEMENT	1.163	NEW EASEMENT
1.164	EXISTING RIGHT OF WAY	1.165	NEW RIGHT OF WAY
1.166	EXISTING ROAD	1.167	NEW ROAD
1.168	EXISTING HIGHWAY	1.169	NEW HIGHWAY
1.170	EXISTING AIRWAY	1.171	NEW AIRWAY
1.172	EXISTING WATERWAY	1.173	NEW WATERWAY
1.174	EXISTING DRAINAGE	1.175	NEW DRAINAGE
1.176	EXISTING GULLY	1.177	NEW GULLY
1.178	EXISTING MANHOLE	1.179	NEW MANHOLE
1.180	EXISTING SEWER	1.181	NEW SEWER
1.182	EXISTING WATER	1.183	NEW WATER
1.184	EXISTING GAS	1.185	NEW GAS
1.186	EXISTING ELECTRIC	1.187	NEW ELECTRIC
1.188	EXISTING TELEPHONE	1.189	NEW TELEPHONE
1.190	EXISTING CABLE	1.191	NEW CABLE
1.192	EXISTING FIBRE	1.193	NEW FIBRE
1.194	EXISTING RAILWAY	1.195	NEW RAILWAY
1.196	EXISTING CANAL	1.197	NEW CANAL
1.198	EXISTING TUNNEL	1.199	NEW TUNNEL
1.200	EXISTING POINT	1.201	NEW POINT

NOTES:

1. All dimensions to 0.00 (nearest) Decimals. Established using network RTK surveying on a plane local grid orientated to National Grid.
2. Services shown on this plan are shown as they appear on the ground. They are taken from the data provided to the surveyor by the client. The surveyor has not been able to verify the accuracy of the data provided. The client is responsible for the accuracy of the data provided.
3. Please note survey control established for mapping only. Control should be used for the purposes of the survey only. Control should not be used for the purposes of the survey.
4. Only numbers and services visible at time of survey shown.
5. Lines shown are symbolic only and are representative of the average condition.

DISCLAIMER:

At Layer Surveys Ltd and experienced staff use modern up-to-date technology and best practice engineering and other knowledge to locate and trace sub-surface utilities. However the performance of the survey is dependent on the quality of the data provided to the surveyor. Layer Surveys Ltd cannot guarantee the accuracy of the data provided. The client is responsible for the accuracy of the data provided.

Where services are not shown it may be possible to locate them by other means. In such cases, services will be shown as a single untraced line. The client is responsible for the accuracy of the data provided.

Successful tracing of non-conductive materials may be limited. Drains and gullies are not traced where possible to some extent but it is not always possible to introduce the service due to narrow pipe size and/or obstructions.

Depth information of underground services/features are generally accurate to within +/- 0.05m. Depth of 2m depth may be accurate to +/- 0.20m but this cannot be guaranteed. Depths shown usually refer to the top of the service. Quality power and other depths may vary to avoid blocks of drainage channels unless otherwise stated.

Some above ground features may have been observed at time of survey. It is not always possible to operate the ground penetrating radar in areas including but not limited to dense vegetation, rubble, debris and/or rough/uneven ground.

Survey Stations

Name	Easting	Northing	Height
S1	364600.838	296275.025	139.789
S2	364600.824	296275.025	139.789
S3	364600.809	296275.025	139.789
S4	364600.817	296275.025	139.789
S5	364600.805	296275.025	139.789
S6	364600.808	296275.025	139.789
S7	364600.821	296275.025	139.789
S8	364600.814	296275.025	139.789



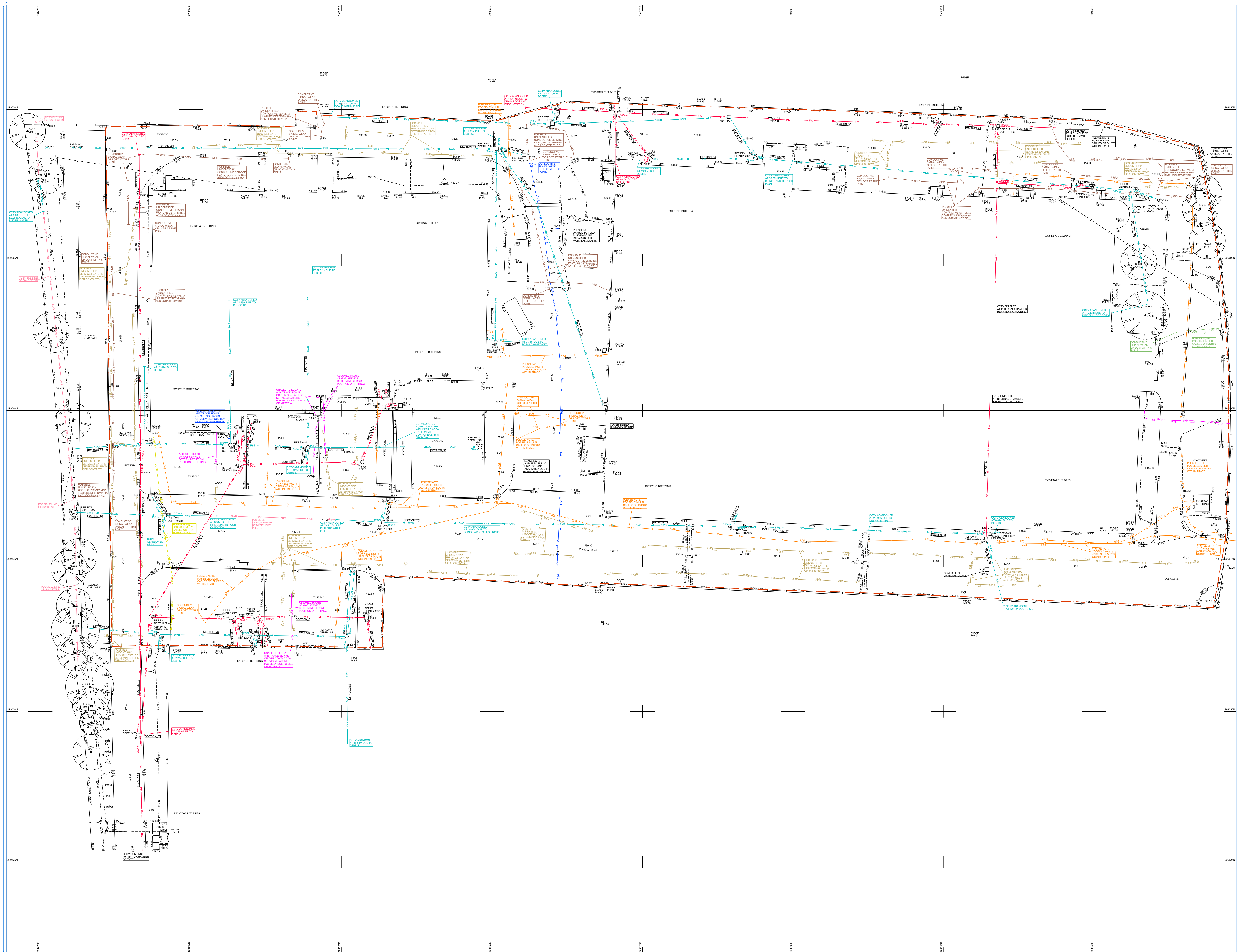
REV	DATE	DESCRIPTION



Client
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Project Title
 Satellite Industrial Park
 Wakehampton
 WV11 3QG

Surveyed	Drawn	Checked
S.T	L.M.W	Layer Surveys
Scale 1:200	Date May 22	Drawing Ref. No. 01
		Size A0
		Rev



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PLAN GRID NORTH

LEGEND

NOTES:

DISCLAIMER:

Name	SURVEY STATIONS		Height
	Easting	Northing	
LS1	284800.838	296579.620	136.789
LS2	284800.200	296582.233	136.791
LS3	284650.809	296644.559	136.301
LS4	284650.877	296646.893	136.303
LS5	284485.845	296644.071	136.307
LS6	284485.923	296646.909	136.310
LS8	284528.914	296579.945	136.813

REV DATE DESCRIPTION

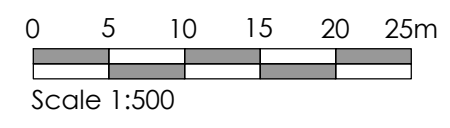
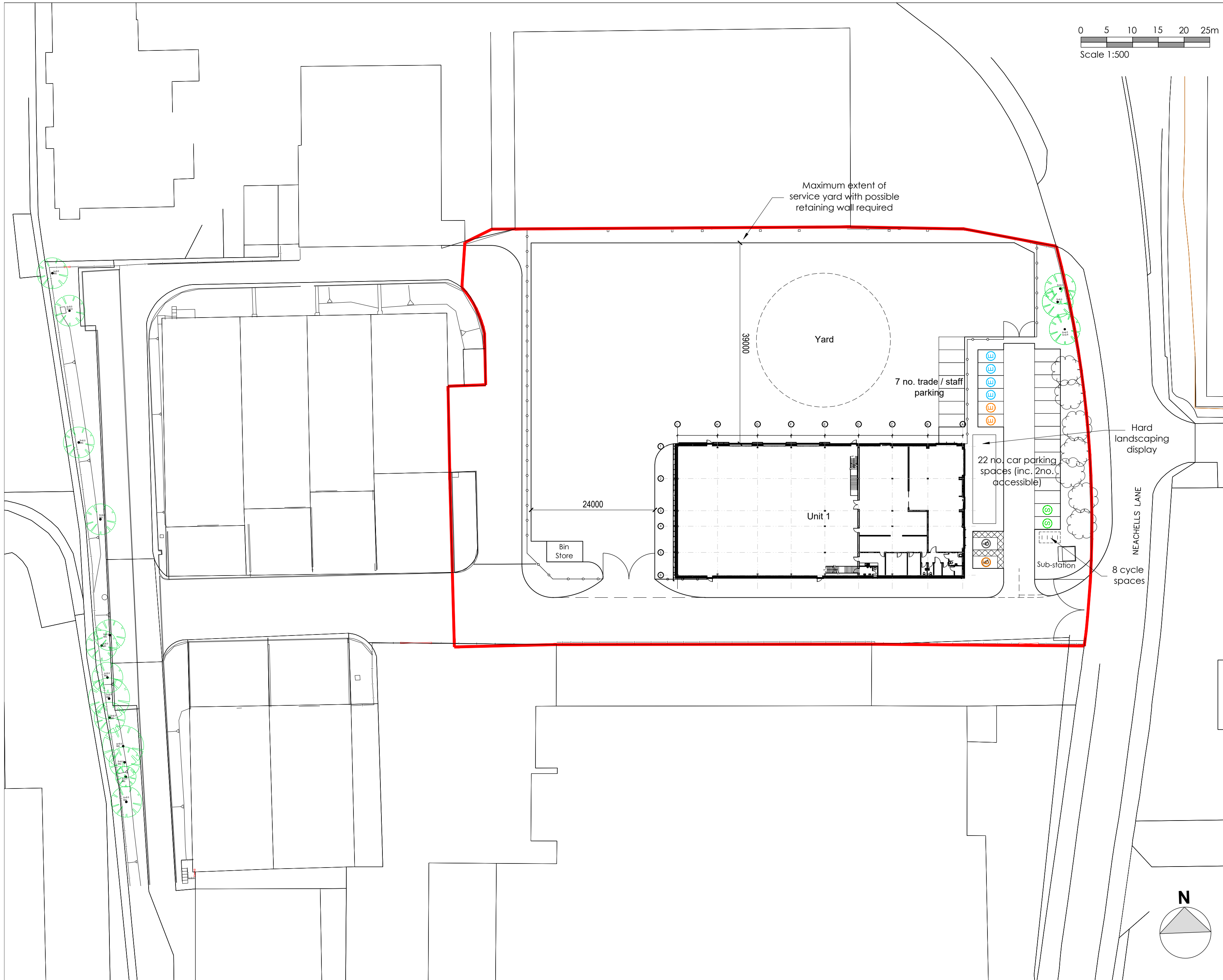
Layer Surveys Ltd
 See the Complete Structure

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 M2 4XX

Project Title
 Satellite Industrial Park
 Wakehampton
 WV11 3QG

Surveyed	Drawn	Checked
T.W.	LT	Layer Surveys

Scale	Date	Drawing Ref.	No.	Size	Rev
1:200	May 22	1262_U	01	A0	



- All dimensions and levels are to be checked on site.
- Any discrepancies are to be reported to the architect before any work commences
- This drawing shall not be scaled to ascertain any dimensions. Work to figured dimensions only.
- This drawing shall not be reproduced without express written permission from AEW.
- Title overlay drawings and ownership boundaries are produced using all reasonable endeavors. AEW cannot be responsible for the accuracy or scale discrepancy of base plans supplied to them.
- All works are to be undertaken in accordance with Building Regulations and the latest British Standards.
- All proprietary materials and products are to be used strictly in accordance with the manufacturers recommendations.

CDM 2015

Client notified of duties: August 2021
 Principal Designer: Gent Visick
 Unless noted below, all known hazards have been highlighted on the drawing.

NOTE:
 Proposed landscaping shown indicatively only

Schedule of Accommodation

Unit	GIA	Car Parking (Accessible)
Unit 1	1,390m ² / 15,000ft ²	29 (2)
Mezzanine	578.61m ² / 6,228.1ft ²	-
Total	1,968.61m ² / 21,228.1ft ²	29(2)

- Planning Application Development 2.40acres / 0.97ha
- Proposed Fence
- Carshare spaces (5% min.)
- EV spaces (3 no.)
- Future EV spaces (4 no.)

P03	27/02/24	DT	CF
Planning Issue			
P02	06/12/23	MB	AS
Building footprint updated			
P01	20/10/23	DT	CL
Initial Issue			
REV	Date	Drawn by: -	Checked by: -

Status: For Information
 drawing stage: Planning

client: Mileway

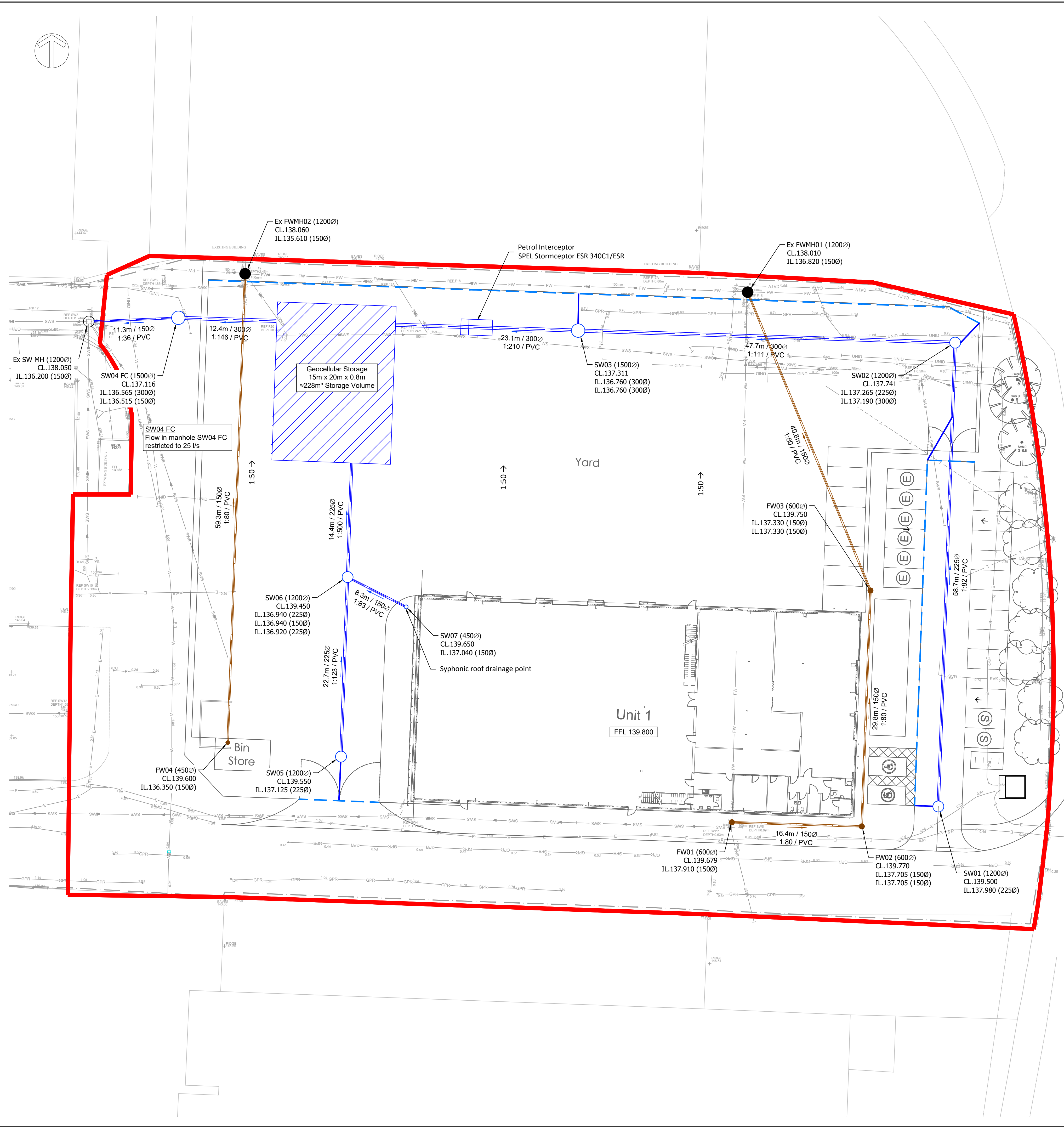
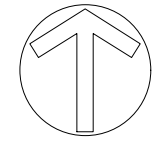
project: Satellite Industrial Park Wolverhampton

drawing title: Proposed Site Plan

date: Oct 2023 drawn: DT
 scale@A2: 1:500 checked: CF

Appendix B

- Drainage Layout Plan
- Drainage Calculations
- Relevant Communications
 - Developer Enquiry - Severn Trent Water
- Maintenance Schedule
- Flood Risk Advice



General Notes

Architectural Site Plan Provided by
AEW Architects

1. Do not scale from this drawing
2. All Dimension in mm unless notified otherwise
3. Refer to drawing 100.21092-ACE-XX-XX-DR-C-1050 & 1051 for Construction Details

Drainage Notes

1. Drainage drawings should be read in conjunction with Adept specification for drainage works and any other subsequent additions to this list. Adoptable drainage and works on public sewers will be governed by the requirements of the local water authority. Works affecting watercourses will be governed by the requirements of any or all of the Environment Agency, the local drainage board and the Lead Local Flood Authority.
2. All building drainage works shall be carried out in accordance with the current British/European standards BSEN752, the current building regulations and the local authority building control or NHBC specifications and requirements.
3. All materials and workmanship shall be in accordance with Adept drawings and specifications and generally in accordance with the latest version of the published document "Sewerage Sector Guidance".
4. Manhole cover levels may be subject to revision to suit proposed levels. Scheduled cover levels given on drainage drawings cannot be used to set the external works or floor levels.
5. All Junctions are to be done using a 'Y' junction to direct the flow in line with the main pipe.
6. Setting out information for manholes may be provided on the drawings, especially where chambers are remote from a building. Otherwise chambers are shown in relation to features set out on other drawings and can be adjusted in location to suit the given gradients. However it is critical that external manholes have cover levels lower than FFL to minimise flooding issues should drains surcharge or block.
7. Invert levels of all outfall points to be confirmed prior to commencing drainage works. Position size and depth of all existing drains and services shall be established prior to commencement on site and any discrepancies resolved by the design team ahead of construction.
8. The contractor shall provide protection, temporary and permanent support, and temporary and permanent diversion works, necessary to all existing services sufficient to enable construction of the drainage system indicated on the drawings.
9. Temporary water management discharges cannot enter the public sewer system without consent from the water authority. They cannot enter a watercourse without consent from either the LLFA or the EA. In both cases where consent is granted some treatment of the water may be required ahead of it entering either sewer or watercourse.
10. Land drainage should not be discharged to either foul or surface water drains that are connected into a proposed or existing public sewer system.
11. Location of RWPs are assumed at this stage and to be confirmed by the architect. The final locations may affect the storm water network.
12. Foul water not currently being shown or where it is expected to discharge to.

Surface Water drains connected to Private Drains

Private drains and sewers are maintained by their owners; generally the owner of the land they pass through. There is a general responsibility on downstream owners to maintain flows from upstream and for upstream owners not to increase or decrease flows. New connections require the owner's consent. A new, previously unanticipated connection will generally change how a private drain performs. The owner owner may accept and approve a connection that will detrimentally affect the performance of the system both upstream and downstream of of the new connection. The performance of a private drain is controlled by the design parameters considered at the time it was installed, its current use and the performance and capacity of the feature it discharges into (be it another private drain, a public sewer or a watercourse). Most sewer authorities will require a Section 106 agreement for a new indirect connection to their network when the private sewer being used connects to their public sewer.

Surface Water Discharge

Surface Water discharged from the proposed impermeable surface is to be restricted in line with the below assumptions with attenuation provided up to the 100 year storm plus an allowance of 40% for climate change. Storm water associated with the 30yr storm will be stored below ground in a sub-base / sub-base replacement system. Storm water in excess of the 30yr storm, up to the 100year storm plus climate change will be stored above ground on the service yard.

The site will be discharged to an existing Surface Water system on site. Location & Rate to be agreed with the Lead Local Flood Authority (LLFA).

Do Not Scale

DESIGN REVIEW

Design review by:	**	Checked by:	**
-------------------	----	-------------	----

Residual hazards:

Health, Safety & Environmental Notes

NOTES

- Site Boundary
- Proposed Storm Water Network
- Proposed Channel Drain
- Proposed Foul Water Network
- 1:50 → Assumed Ground Falls

15.03.24	Site Layout Plan Updated	JBW	NB	P3
21.09.22	Site Layout Plan Updated	JBW	NB	P2
14.07.22	First Issue	JBW	WD	P1
Date	Description	By	Chk	Rev



Web: www.adeptcsce.com | Originating Office: Manchester
 Email: inbox@adeptcsce.com | 7 St James Square, 4th Floor,
 Tel: 0113 239 4518 (Head Office) | Manchester, M2 6DN
 Tel: 0161 974 3620

Project
**Satellite Industrial Park
Wolverhampton**


Title
Proposed Drainage Layout

Client
Mileway

Scale @ A1	Initial author	Initial checker	Approver	Initial Date
1:250	JBW	WD	NB	Jul '22

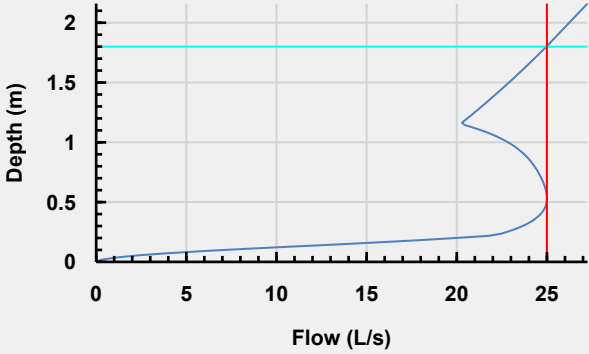
Status	Purpose	Adopt Ref
S3	Preliminary	100.21092

Project Number	Originator	Volume	Level	Type	Role	Drig. No.	Rev.
100.21092-ACE-XX-XX-DR-C-1000							P3

Project: 100.21092 Satellite Industrial Park, Wolverhampton Revision: P1	Date: 12/03/2024	Designed by: JBW	Checked by: TT	Approved By: NB	
Report Details: Type: Junctions Storm Phase: Phase	Company Address: Adept Consulting Engineers 4th Floor, 7 St James Square Manchester, M2 6DN				

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SW01	Outlet	Pipe (3)	Free Discharge
SW05	Outlet	Pipe (1)	Free Discharge
SW07	Outlet	Pipe	Free Discharge
SW06	Outlet	Pipe (8)	Free Discharge
SW02	Outlet	Pipe (4)	Free Discharge
SW03	Outlet	Pipe (6)	Free Discharge

SW04 FC	Outlet	Pipe (5)	Hydro-Brake®	
	Invert Level (m)		136.555	
	Design Depth (m)		1.800	
	Design Flow (L/s)		25.0	
	Objective	Minimise Upstream Storage Requirements		
	Application	Surface Water Only		
	Sump Available		<input checked="" type="checkbox"/>	
	Unit Reference	SHE-0207-2500-1800-2500		
				

Project: 100.21092 Satellite Industrial Park, Wolverhampton Revision: P1	Date: 12/03/2024	Designed by: JBW		Checked by: TT	Approved By: NB
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: Adept Consulting Engineers 4th Floor, 7 St James Square Manchester, M2 6DN				



Tank

Type : Tank

Dimensions

Exceedance Level (m)	138.990
Depth (m)	2.340
Base Level (m)	136.650
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	95
Average Slope (1:X)	0.00
Total Volume (m³)	229.824

Depth (m)	Area (m²)	Volume (m³)
0.000	300.000	0.000
0.800	300.000	228.000
0.801	300.001	228.285

Inlets

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (8)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (6)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (2)
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	30.111

Project: 100.21092 Satellite Industrial Park, Wolverhampton Revision: P1		Date: 12/03/2024		
		Designed by: JBW	Checked by: TT	Approved By: NB
Report Details: Type: Connections Storm Phase: Phase		Company Address: Adept Consulting Engineers 4th Floor, 7 St James Square Manchester, M2 6DN		




Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
Pipe (3)	59.234	Pipe	54.593		0.6	225	139.500	138.350
Pipe (4)	69.475	Pipe	149.408		0.6	300	138.990	137.190
Pipe (5)	10.360	Pipe	29.184		0.6	150	138.600	136.555
Pipe	62.674	Pipe	63.629		0.6	225	139.650	137.925
Pipe (1)	27.248	Pipe	147.284		0.6	225	139.550	137.125
Pipe (8)	1.925	Pipe	6.639		0.6	225	139.450	136.940
Pipe (6)	7.022	Pipe	93.622		0.6	300	138.990	136.725
Pipe (2)	6.460	Pipe	143.561		0.6	300	138.990	136.650

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Part Family	Lock	Flow Restriction (L/s)
Pipe (3)	138.990	137.265		All	
Pipe (4)	138.990	136.725		All	
Pipe (5)	138.050	136.200		All	26.4
Pipe	139.450	136.940		None	
Pipe (1)	139.450	136.940		All	
Pipe (8)	138.990	136.650		None	
Pipe (6)	138.990	136.650		All	
Pipe (2)	138.600	136.605		All	

Project: 100.21092 Satellite Industrial Park, Wolverhampton Revision: P1		Date: 12/03/2024		
		Designed by: JBW	Checked by: TT	Approved By: NB
Report Details: Type: Inflow Summary Storm Phase: Phase		Company Address: Adept Consulting Engineers 4th Floor, 7 St James Square Manchester, M2 6DN		



Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Access Yard	SW06		Time of Concentration	0.064	100	0	100	0.064
Car Park	SW01		Time of Concentration	0.077	100	0	100	0.077
Unit 1	SW07		Time of Concentration	0.075	100	0	100	0.075
Yard	SW02		Time of Concentration	0.212	100	0	100	0.212
Yard	SW03		Time of Concentration	0.094	100	0	100	0.094
Yard (1)	SW05		Time of Concentration	0.082	100	0	100	0.082
TOTAL		0.0		0.605				0.605

Project: 100.21092 Satellite Industrial Park, Wolverhampton Revision: P1	Date: 12/03/2024			
Report Title: Rainfall Analysis Criteria	Designed by: JBW		Checked by: TT	Approved By: NB
Company Address: Adept Consulting Engineers 4th Floor, 7 St James Square Manchester, M2 6DN				

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	<input type="checkbox"/>

Rainfall

FSR

Type: FSR


Region	England And Wales
M5-60 (mm)	19.0
Ratio R	0.400
Summer	<input checked="" type="checkbox"/>
Winter	<input checked="" type="checkbox"/>

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	40.000

Storm Durations


Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project: 100.21092 Satellite Industrial Park, Wolverhampton Revision: P1	Date: 12/03/2024	Designed by: JBW		Checked by: TT	Approved By: NB	
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Adept Consulting Engineers 4th Floor, 7 St James Square Manchester, M2 6DN					



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW01	FSR: 100 years: +40 %: 15 mins: Winter	139.5 00	138.3 50	138.92 6	0.576	45.6	0.652	0.000	30.4	21.048	Surcharged
SW05	FSR: 100 years: +40 %: 15 mins: Winter	139.5 50	137.1 25	137.40 0	0.275	48.5	0.311	0.000	43.3	22.435	Surcharged
SW07	FSR: 100 years: +40 %: 15 mins: Winter	139.6 50	137.9 25	138.05 9	0.134	44.5	0.151	0.000	43.0	20.636	OK
SW06	FSR: 100 years: +40 %: 120 mins: Winter	139.4 50	136.9 40	137.35 8	0.418	41.5	0.473	0.000	38.6	121.208	Surcharged
SW02	FSR: 100 years: +40 %: 15 mins: Winter	138.9 90	137.1 90	138.65 8	1.468	156.2	1.660	0.000	142.9	78.665	Surcharged
SW03	FSR: 100 years: +40 %: 15 mins: Winter	138.9 90	136.7 25	137.43 9	0.714	198.7	1.261	0.000	195.7	101.362	Surcharged
Existing SW	FSR: 100 years: +40 %: 240 mins: Winter	138.0 50	136.2 00	136.29 7	0.097	25.0	0.000	0.000	25.0	386.389	OK
SW04 FC	FSR: 100 years: +40 %: 120 mins: Winter	138.6 00	136.5 55	137.35 0	0.795	25.4	1.405	0.000	25.0	290.456	Surcharged

Project: 100.21092 Satellite Industrial Park, Wolverhampton Revision: P1		Date: 12/03/2024			
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: JBW	Checked by: TT	Approved By: NB	
		Company Address: Adept Consulting Engineers 4th Floor, 7 St James Square Manchester, M2 6DN			



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Tank	FSR: 100 years: +40 %: 120 mins: Winter	137.356	137.356	0.706	0.706	108.1	201.258	0.000	0.000	25.4	290.982	81	12.430

Project: 100.21092 Satellite Industrial Park, Wolverhampton Revision: P1	Date: 12/03/2024		
	Designed by: JBW	Checked by: TT	Approved By: NB
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Adept Consulting Engineers 4th Floor, 7 St James Square Manchester, M2 6DN		



Status
OK

WONDERFUL ON TAP



Severn Trent Water Ltd
Oxley Moor Road
Wolverhampton
WV9 5HN

www.stwater.co.uk
network.solutions@severntrent.co.uk

Contact: Michael Taylor

Reference: 1050243

17th February 2023

Oliver Boyes
Adept Consulting Engineers
1912 Mill
Sunny Bank Mills
Leeds
LS28 5UJ

Dear Sir

Proposed redevelopment: Neachells Lane Wolverhampton

I refer to your 'Development Enquiry Request' in respect of the above site. Please find enclosed the sewer records that are included in the fee together with the Supplementary Guidance Notes which refer to surface water disposal from development sites.

Public Sewers in Site – Required Protection

Due to a change in legislation on 1 October 2011, there may be former private sewers on the site which have transferred to the responsibility of Severn Trent Water Ltd, which are not shown on the statutory sewer records but are located in your client's land. These sewers would also have protective strips that we will not allow to be built over. If such sewers are identified to be present on the site, please contact us for further guidance.

Foul Water Drainage

The nearest public foul sewers shown on our records is a 225mm foul sewer located to the north of the site on Wednesfield Way, There maybe private unmapped sewers serving the existing properties that are suitable.

It is anticipated that the additional foul flows will be approx 0.3l/s at 2 x DWF will have no adverse impact on the network. As such, a gravity connection to the public sewers is acceptable subject to a formal S.106 sewer connection approval (see later).

Surface Water Drainage

Under the terms of Section H of the Building Regulations 2000, the disposal of surface water by means of soakaways should be considered as the primary method. If these are found to be unsuitable, satisfactory evidence will need to be submitted. The evidence should be either percolation test results or by the

WONDERFUL ON TAP

SEVERN

TRENT

submission of a statement
from the SI consultant (extract or a supplementary letter).

Subject to above Severn Trent Water expects all surface water from the development to be drained in a sustainable way to the nearest, highway drainage or land drainage channel, that should be fully investigated subject to the developer discussing all aspects of the developments surface water drainage with the Local Lead Flood Authority (LLFA). Only once all these avenues have been exhausted will we consider a discharge at min of 50% betterment of proven existing rates, if the site positively drained to the surface water sewer previously, If existing rates cannot be proven then we would apply 5l/s to our surface water network located within the highway to the east m/h 6652.

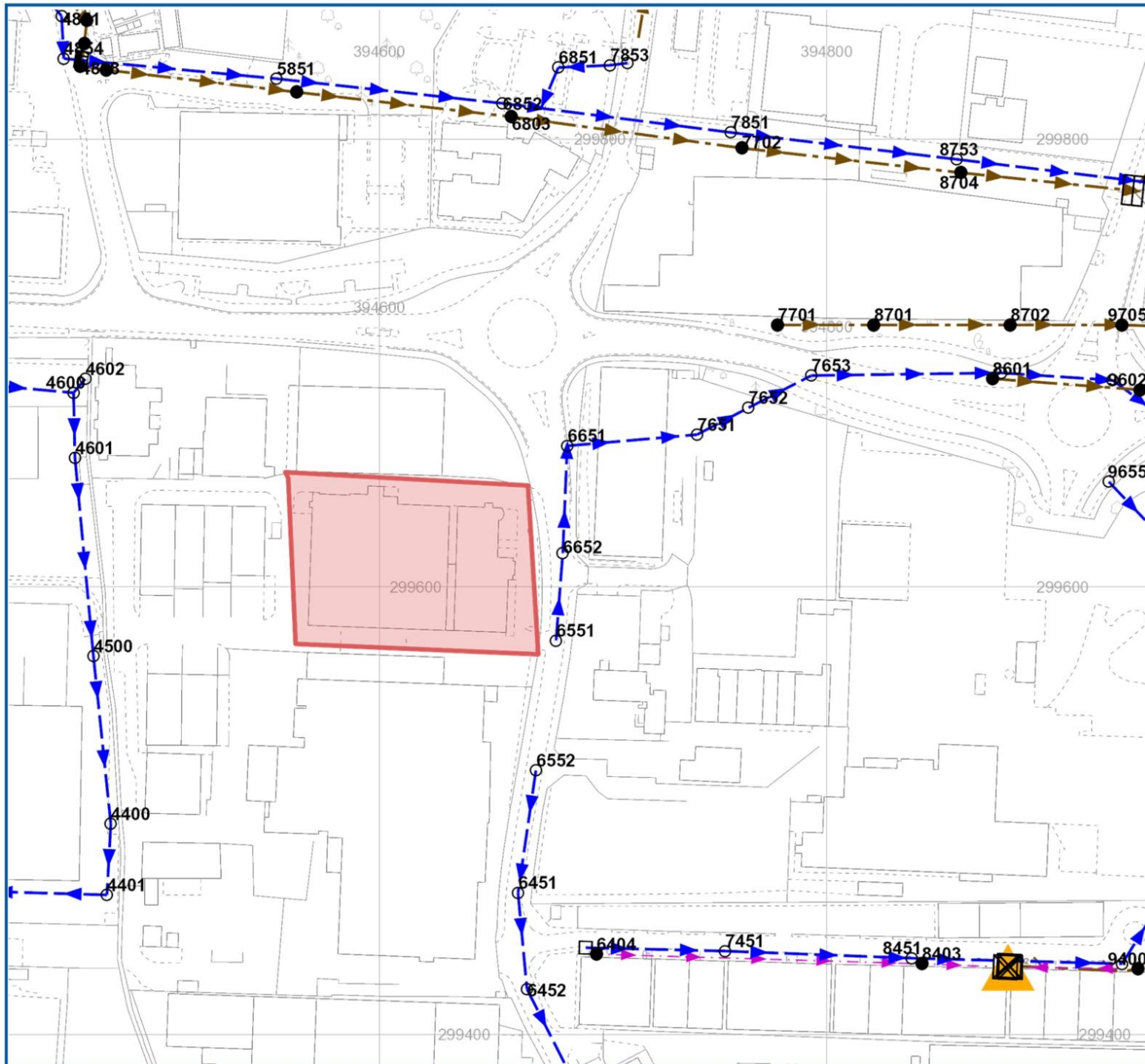
New Connections

For any new connections (including the re-use of existing connections) to the public sewerage system, the developer will need to submit Section 106 application forms. Our New Connections department are responsible for handling all such enquiries and applications. To contact them for an application form and associated guidance notes please call 0800 707 6600 or download from www.stwater.co.uk.

Please quote is 1050243 in any future correspondence (including e-mails) with STW Limited. Please note that 'Development Enquiry' responses are only valid for 6 months from the date of this letter.

Yours sincerely,

Michael Taylor
Senior Evaluation Technician
Network Solutions
Developer Services



Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SO94998652	<UNK>	<UNK>	<UNK>	S	CO	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SO94999651	<UNK>	<UNK>	<UNK>	S	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SO94997651	136.044	<UNK>	133.48	S	CO	C	375	<UNK>	0	31/12/1899 00:00:00
SO94998451	134.0079	132.328	132.06	S	VC	C	375	<UNK>	348.26	31/12/1899 00:00:00
SO94999602	134.5	<UNK>	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SO94999655	135.0899	<UNK>	127.51	S	CO	C	600	<UNK>	0	31/12/1899 00:00:00
SO94994804	138.4299	133.96	133.17	F	CO	C	600	<UNK>	108.32	31/12/1899 00:00:00
SO94994801	138.91	135.23	135.11	F	CO	C	600	<UNK>	87.25	31/12/1899 00:00:00
SO94994808	138.6399	134.7	134.27	F	CO	C	600	<UNK>	27.49	31/12/1899 00:00:00
SO94994807	138.7599	135.11	<UNK>	F	CO	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
SO94994807	138.7599	135.11	<UNK>	F	CO	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
SO94997653	135.99	132.92	<UNK>	S	CO	C	375	<UNK>	0	31/12/1899 00:00:00
SO94997702	136.5899	132.16	131.71	F	CO	C	600	<UNK>	219.16	31/12/1899 00:00:00
SO94997851	136.4199	133.12	132.45	S	CO	C	1200	<UNK>	151.81	31/12/1899 00:00:00
SO94998704	135.0399	131.61	131.19	F	CO	C	675	<UNK>	184.1	31/12/1899 00:00:00
SO94996651	140.41	<UNK>	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SO94998601	135.7089	132.31	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SO94999705	133.3699	131.93	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SO94998753	135.0899	132.45	131.62	S	CC	R	1800	1000	110.46	31/12/1899 00:00:00
SO94997451	135.72	134.15	132.328	S	VC	C	300	<UNK>	45.86	31/12/1899 00:00:00
SO94997852	139.169	136.74	136.71	S	VC	C	225	<UNK>	268.67	31/12/1899 00:00:00
SO94999454	132.942	132.05	131.64	S	VC	C	375	<UNK>	71	31/12/1899 00:00:00
SO94997701	136.1699	134.37	134.23	F	VC	C	225	<UNK>	307.14	31/12/1899 00:00:00
SO94998403	133.8379	132.17	130.98	F	VC	C	150	<UNK>	33.05	31/12/1899 00:00:00
SO94998702	135.69	133.14	132.43	F	VC	C	225	<UNK>	70.42	31/12/1899 00:00:00
SO94997652	136.005	133.38	132.96	S	CO	C	375	<UNK>	75.17	31/12/1899 00:00:00
SO94996551	140.35	138.94	138.15	S	VC	C	225	<UNK>	49.52	31/12/1899 00:00:00
SO94996404	137.666	136.1	132.17	F	VC	C	150	<UNK>	37.04	31/12/1899 00:00:00
SO94996652	139.8999	138.15	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00

LEGEND

<ul style="list-style-type: none"> Ancillary Balancing Lagoon Grease Trap Interceptor Screen Chamber Flushing Chamber Scalway Overflow Fitting Blind Shaft Facility Connector Head Node Lamphole Sewerage Air Valve Sewerage Chemical Injection Point Sewerage Hatch Box Sewerage Pressure Washout Vent Column Waste Water Outfall Control Valve Hydrobale Penstock 	<ul style="list-style-type: none"> Sewerage Isolation Valve Sewerage Non Return Valve Manhole Foul Bifurcation Manhole Combined Bifurcation Manhole Surface Water Bifurcation Manhole Dual Manhole Foul Single Manhole Combined Single Manhole Surface Water Single Manhole Twin Manhole Foul Adopted Manhole Combined Adopted Manhole Surface Adopted Manhole Transfered Manhole Unsurveyed Manhole Operational Site Waste Water Pump Transfered Asset S104 S104 S102 Null Private 	<ul style="list-style-type: none"> Null None Highway Drain Adopted Sewer Storage Disposal Site Off-Line Waste Water Storage On-Line Waste Water Storage Wet Well Waste Water Process Structure Sewage Treatment Point Sewage Treatment Structure Sludge Treatment Point Sludge Treatment Structure Gravety Sewer Pipe Foul Gravety Sewer Combined Gravety Sewer Surface Water Gravety Sewer S104 Surface Water Gravety Sewer S104 Combined Gravety Sewer S104 Foul Gravety Sewer Private Surface Water Gravety Sewer Private Combined Gravety Sewer 	<ul style="list-style-type: none"> Private Foul Gravety Sewer Surface Water Unserved Pipe Combined Unserved Pipe Foul Unserved Pipe Transfered Surface Water Sewer Transfered Combined Sewer Transfered Foul Sewer Disposal Pipe Overflow Pipe Culverted Water Course Waste Internal Site Pipe Sewer Service Connection Gravety Sewer Others Pressure Sewer Pipe Surface Water Pressure Sewer Combined Pressure Sewer Foul Pressure Sewer S104 Surface Water Pressure Sewer S104 Combined Pressure Sewer S104 Foul Pressure Sewer Private Surface Water Pressure Sewer Private Combined Pressure Sewer Private Foul Pressure Sewer Service Pipe 	<ul style="list-style-type: none"> Surface Water Vacuum Sewer Foul Vacuum Sewer Combined Vacuum Sewer S104 Surface Water Vacuum Sewer S104 Combined Vacuum Sewer S104 Foul Vacuum Sewer Private Surface Water Vacuum Sewer Private Combined Vacuum Sewer Private Foul Vacuum Sewer Surface Water Siphon Combined Siphon Foul Siphon Private Surface Water Siphon Private Combined Siphon Private Foul Siphon S104 Surface Water Siphon S104 Combined Siphon S104 Foul Siphon Surface Water Unserved Pipe Combined Unserved Pipe Foul Unserved Pipe Disposal Pipe 	<ul style="list-style-type: none"> Surface Water Lateral Drain Combined Lateral Drain Foul Lateral Drain S104 Surface Water Lateral Drain S104 Combined Lateral Drain S104 Foul Lateral Drain Private Surface Water Lateral Drain Private Combined Lateral Drain Private Foul Lateral Drain Transfered Surface Water Lateral Drain Transfered Combined Lateral Drain Transfered Foul Lateral Drain
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MATERIALS

- NONE
- AC - ASBESTOS CEME
- BR - BRICK
- CC - CONCRETE BOX CULVERT
- CI - CAST IRON
- CO - CONCRETE
- CSB - CONCRETE SEGMENTS (BOLTED)
- CSU - CONCRETE SEGMENTS (UNBOLTED)
- DI - DUCTILE IRON
- GRP - GLASS REINFORCED PLASTIC
- MAC - MASONRY IN REGULAR COURSES
- MAR - MASONRY RANDOMLY COURSED
- PE - POLYETHYLENE
- PF - PITCH
- PP - POLYPROPYLENE
- PSC - PLASTIC STEEL COMPOSITE
- PVC - POLYVINYL CHLORIDE
- RPM - REINFORCED PLASTIC MATRIX
- SI - SPUN (GREY) IRON
- ST - STEEL
- U - UNKNOWN
- VC - VITRIFIED CLAY
- XXX - OTHER

CATEGORIES


- W - WEIR
- C - CASCADE
- DB - DAMBOARD
- SE - SIDE ENTRY
- FV - FLAP VALVE
- BD - BACK DROP
- S - SIPHON
- D - HIGHWAY DRAIN
- S104 - SECTION 104

SHAPE

- C - CIRCULAR
- E - EGG SHAPED
- O - OTHER
- R - RECTANGLE
- S - SQUARE
- T - TRAPEZOIDAL
- U - UNKNOWN

PURPOSE

- C - COMBINED
- E - FINAL EFFLUENT
- F - FOUL
- L - SLUDGE
- S - SURFACE WATER



Severn Trent Water Limited
 Asset Data Management
 PO Box 5344
 Coventry
 CV3 9FT
 Telephone: 0345 601 6616

SEWER RECORD (Tabular)

O/S Map Scale: 1:2,500 **This map is centred upon:**

Date of Issue: 17-02-23 **X:** 394688.68 **Y:** 299622.29

Disclaimer Statement:

- Do not scale off this Map.
- This plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.
- On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012. Private pumping stations, which form part of these sewers or lateral drains, will transfer to ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on the map.
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SUPPLEMENTARY GUIDANCE NOTES RELATING TO DISPOSAL OF SURFACE WATER



Introduction

The purpose of this guidance note is to provide advice to applicants when completing the surface water drainage design for a new development, both for Greenfield and Brownfield sites. This does not affect foul drainage disposal which should be discussed with Severn Trent as early as possible to ensure additional flows can be accommodated without undue delay to the development.

Lead Local Flood Authority (LLFA) Consultation

Since April 2015, the LLFA have assumed the role of being a statutory consultee in the planning process for developments of 10 dwellings or more; or equivalent non-residential and/or mixed development. The LLFAs role is vital to ensure that surface water disposal on new development is adequately assessed so that the local planning authority can satisfy themselves that drainage proposals are satisfactory and to make sure, through the use of planning conditions or planning obligations, that there are clear arrangements in place for future maintenance of sustainable drainage systems (SuDS) over the lifetime of the development. This will also ensure surface water disposal aligns with local planning policies, flood risk strategies and national policies, such as the National Planning Policy Framework (NPPF).

It is strongly recommend that the LLFA are involved in early pre-application discussions when the development of a site is initially being considered. Pre-application discussions will help to ensure that SuDS are appropriately considered ahead of or as part of preliminary development layouts, and that they are fully integrated into the final development layout. Whilst Severn Trent are willing to advise on sewerage availability this does not negate the planning requirement relating to adequacy of SuDS on new development.

SuDS Hierarchy

Severn Trent is fully supportive of the fundamental SuDS principle that priority should be given to managing surface water as close to source as possible. In accordance with national standards and guidance a sequential series of checks should be undertaken to ensure the relevant SuDS features are being proposed whereby (in order of priority) rainwater re-use, infiltration to ground and controlled discharge to a water body are properly considered ahead of any controlled connection to a culverted watercourse/other drainage system or public surface water sewer.

A controlled connection to a public combined/foul sewer would only be considered under rare exceptional circumstances where all other options have been completely exhausted. Acceptance of surface water into a combined sewer is not only unsustainable because of the need to convey/treat rainwater but is also takes away existing capacity which could constraint the connection of foul flows on future development. It is also possible that connection of additional surface water flows will require capacity upgrades to the existing sewerage system which may delay development.

Connection to a Public Sewer

Whilst Severn Trent will be able to provide advice on potential public surface water sewer connection options, it is essential that a developer contacts the LLFA as early as possible to discuss surface water disposal as they will be able to provide guidance on surface water flood risk policy which may influence SuDS requirements. It is strongly recommended that LLFA discussions take place before contacting Severn Trent. Where the outcome of LLFA discussions concludes that a controlled discharge to the public sewerage system is the only viable option then Severn Trent would be pleased to discuss sewer connection options, satisfied that the LLFA have been consulted in line with their surface water management role and in their capacity as statutory consultee.

Evidence must be provided to demonstrate why the sequential SuDS checks have concluded that a connection to the public sewer is required. This must include a Site Investigation Report including percolation test data/graphs/calculations/results together with relevant correspondence with the LLFA.

Design Standards

Surface water disposal design should consider the interactions between the adoptable sewer design criteria based on a 30 year design storm (outlined in 'Sewers For Adoption') and the "Non-statutory technical standards for SuDS" requirement to restrict discharge from a site up to and including the 1 in 100 year critical storm event plus an allowance for climate change as required by the LLFA.

For Greenfield development, the peak runoff rate should never exceed the peak pre-development run-off rates/volumes for the same rainfall event irrespective of the design storm duration consistent with the national non-statutory technical standards. For developments which were previously developed (Brownfield), the peak runoff rate must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment again for the same rainfall event. This requirement to remove pre-development surface water discharges to the sewerage system will help remove capacity constraints and aid future development.

To establish the pre-development run-off rates a detailed existing drainage survey will be required indicating pipe locations including sizes and levels, impermeable area connectivity to each pipe and topographical information to support existing drainage assumptions. Photographs of the existing buildings and surface features should be provided and where necessary a CCTV sewer survey should be provided to support the drainage survey to demonstrate connectivity.

In line with 'Sewers for Adoption', the drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event. For higher storm return periods the drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur during a 1 in 100 year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station, electricity substation, water booster station) within the development.

Small Developments



Whilst developments of fewer than 10 dwellings (or their equivalent) are excluded from the post April 2015 planning requirements the underlying principles regarding sustainable surface water management are still valid. The collective impacts of surface water discharges from smaller developments can have an adverse impact on flood risk, especially in smaller rural catchments where smaller sewerage systems are more susceptible to increases in surface water inflow. On small developments infiltration to ground and peak flow attenuation must be considered to mitigate flood risk in the community but where a sewer connection is envisaged then the developer is recommended to discuss surface water disposal options with Severn Trent as early as possible.

Contact

For further assistance please contact our Network Solutions team via:

network.solutions@severntrent.co.uk

Drainage Asset Maintenance Schedule

 Surface  Foul

Maintenance Activity	Drainage Component	Required Action	Typical Frequency
Visual Inspection	Gully Sump unit Catch pit / silt trap Attenuation structures Channel drain Outlet chamber Flow control chamber Pipework Full retention interceptor Bypass interceptor Forecourt interceptor	Inspect for sediment and debris Inspect inlets and outlets for blockage (where applicable)	Monthly for first year and twice yearly thereafter, after severe storm Twice yearly Twice yearly or after severe storm as a minimum, refer to manufacturer guidance. Forecourt interceptor requires emptying after fuel spillage
Monitoring	Attenuation structures	Check attenuation inspection points to ensure emptying is occurring (little to no water should be present after consecutive days of dry weather)	Twice yearly, once after heavy rainfall and once after consecutive dry weather
Litter and Debris Removal	Manhole All sump units (gullies, channel drains and catch pits) Access chambers and pre-treatment devices Flow control chamber Gutters & leaf guards	Remove all litter and debris	Twice yearly or after severe storm

Litter and Debris Removal - Continued			Twice yearly (spring, start of winter), or as required
Jet Wash	Pipework	High pressure jet-wash any pipe work which has silt accumulation. Care must be taken that any silts within the pipework are not unnecessarily flushed into the attenuation structures (use of bungs and jet-vac of chamber prior to removal of bungs)	Twice yearly, or as required
	Attenuation structures	High pressure jet-wash all perforated pipework and or access points. All water to be jet vac to remove any suspended silts within the water	Five yearly, or as required
Sediment Management and Removal	ALL SUDS	Sediment accumulation should be monitored as part of the inspection regime, rate of sediment accumulation noted	Appropriate frequencies determined upon inspection
Inspection	Pipework Manhole	Check if functioning correctly	Once site is fully operational: twice yearly for 1 st year, annually after

Additional notes:

- Any defects (broken/misaligned pipes, root infestation, damage to soakaways, missing parts, etc.) that are identified during inspections/maintenance should be reported back to the property/site owner so that remedial actions can be undertaken promptly to repair these defects.
- SuDS maintenance based on CIRIA 2015 chapter 32 where further information can also be found.
- Refer to manufacturer guidance for maintenance schedules of all proprietary treatment systems.

Flood Risk Advice

Table 1: Flood Zones

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency’s [Flood Map for Planning \(Rivers and Sea\)](#), available on the Environment Agency’s web site, as indicated in the table below.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.(Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency’s Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

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Table 2: Flood risk vulnerability classification

Essential infrastructure

- Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.
- Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood.
- Wind turbines.

Highly vulnerable

- Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding.
- Emergency dispersal points.
- Basement dwellings.
- Caravans, mobile homes and park homes intended for permanent residential use.
- Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').

More vulnerable

- Hospitals
- Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels.

- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non-residential uses for health services, nurseries and educational establishments.
- Landfill* and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Less vulnerable

- Police, ambulance and fire stations which are not required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill* and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.

Water-compatible development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

* * * Landfill is as defined in [Schedule 10 of the Environmental Permitting \(England and Wales\) Regulations 2010](#).

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Table 3: Flood risk vulnerability and flood zone 'compatibility'

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓

Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓*

Key:

- ✓ Development is appropriate.
- X Development should not be permitted.

Notes to table 3:

- This table does not show the application of the [Sequential Test](#) which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and [Exception Tests](#) do not need to be applied to [minor developments](#) and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

* * * In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

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