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Ref: 6534/R2
Scamps Hill
Lindfield
Mid Sussex

Flood Risk Assessment & Outline Drainage Strategy

February 2024

Lees Roxburgh Limited
Consulting Engineers

REPORT DETAILS

Site Name: Scamps Hill, Lindfield, Mid Sussex

Report Title: Flood Risk Assessment and Outline Drainage Strategy

Report Number: 6534/R2

Revision	Date	Status
-	February 2024	For Planning Submission

Client: Gladman Developments

Client Contact: Neil Williams

Prepared By: 

John E Lees B.Sc., C.Eng., M.I.C.E., M.C.I.W.E.M.

CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 Lees Roxburgh have been instructed by Gladman Developments to prepare a Flood Risk Assessment (FRA) and Outline Drainage Strategy for the proposed development of an area of land off Scamps Hill, Lindfield, Mid Sussex.

It is proposed that the land will be developed for residential purposes.

This FRA has been prepared in support of an outline planning application for up to 90 No. dwellings.

1.2 The site lies within an area designated on flood mapping as substantially Flood Risk Zone 1.

1.3 *The National Planning Policy Framework (NPPF)* and the accompanying *Planning Practice Guidance* set out the requirements for addressing flood risk with respect to potential development sites.

At over 1 hectare in area, the site is required to be the subject of an FRA.

1.4 Developers are required to provide an assessment which addresses the following;

- The potential for the proposed development to be affected by flooding either from the development proposal or external sources.
- The potential for the proposed development to increase the flood risk elsewhere.
- That mitigation measures introduced to deal with any risks identified can be successfully managed.
- That the site can be developed and occupied safely.

The NPPF indicates that an assessment of flood risk should be proportionate to the risk and appropriate to the scale, nature and location of the development. This report reflects the requirements of the NPPF in this regard.

1.5 This report has been prepared specifically for Gladman Developments for the sole purposes of the planning application and any reliance on its contents must be read in conjunction with the requirements of any subsequent planning conditions.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Location

2.1.1 The site is centred on National Grid references 535229, 124891 and is 7.34 ha in area **(Appendix 1).**

2.1.2 The site lies on the south eastern outskirts of Lindfield, and some 14km south east of Crawley town centre.

2.2 Access and Surrounding Land Use

2.2.1 The site is currently accessed via an entrance point off Scamps Hill (B2111), which forms its south west boundary.

2.2.2 Scrase Stream lies beyond the north west site boundary. Beyond the stream there is a small commercial area surrounded by housing, with Lindfield Common located 150m to the north west.

Scrase Stream flows away to the north east and then east to eventually join the River Ouse, which is located almost 1km away.

To the south east a second stream crosses beneath Scamps Hill and flows north east through Walstead Grange where it is briefly bifurcated within the grounds then continuing north east.

2.2.3 Beyond Scamps Hill to the south west there is recent, and some ongoing housing development built off Gravelye Lane, which joins Scamps Hill close to the west corner of the site. The new developments are an extension of more established housing that lies further to the south west.

2.2.4 To the south east is Walstead Grange comprising the main house, a cottage and various outbuildings. There is a small housing area that borders Scamps Hill beyond which there are generally open fields and woodland that extend from the south around to the north of the site with occasional farms and isolated properties. Little Walstead Wood lies immediately beyond the northeast boundary.

2.2.5 To the north of the site, and just east of Scrase Stream, there is a large area of land dedicated to small trees, apparently part of Little Walstead Farm to the north east of the site.

There are two tall telecoms masts located by an overgrown track that runs just outside the north east boundary between the site and the tree plantation.

2.3 Site Description

2.3.1 The site comprises three large fields extending beyond the boundary to Scrase Stream, with only the two occupying the north west area of the site proposed for development.

All the fields were grassed at the time of the site inspection.

2.3.2 Post and rail fencing lines the access track.

The boundary with Scamps Hill substantially comprises hedge reinforced with post and wire fencing.

The north east boundaries substantially comprise post and wire fencing with the remaining boundaries generally a mixture of post and rail and hedge reinforced with post and wire fencing.

2.4 Topography

2.4.1 The site falls in two directions. In the two north west fields levels fall towards Scrase Stream and in the remaining larger field levels fall towards the second stream. The ridge line between the two catchments falls north east.

2.4.2 Reference should be made to the topographical survey **(Appendix 2)** but boundary levels can be summarised as follows;

- West corner (adj. Scamps Hill)… 31.75m AOD
- North corner … 31.5m AOD
- South corner (adj. Scamps Hill)… 41.5m AOD
- High point north east boundary… 35.8m AOD
- East corner… 35.0m AOD

2.5 Existing Drainage

2.5.1 Watercourse systems in the area are identified in **Appendix 1B.**

2.5.2 As noted there are two watercourses associated with the site, Scrase Stream just beyond the north west boundary and the unnamed stream beyond the south east area.

Both are designated main rivers.

2.5.3 The sewer records **(Appendix 3)** identify infrastructure within Scamps Hill which appears to run within the western extent of the site frontage, continues along Scamps Hill before turning east.

Beyond Scamps Hill another system runs from the west then follows the line of the system described above to the east. Both these systems were noted as two large diameter steel pipes crossing the second stream within the grounds of Walstead Grange.

2.5.4 Manhole covers in Scamps Hill also generally reflect the presence of Southern Water adopted sewers in the area (**Appendix 3**).

3.0 FLOOD RISK

3.1 Flood Mapping

3.1.1 Gov. UK Flood Map for Planning

3.1.1.1 Reference to the Gov. UK Flood Map **(Figure 1)** identifies that the site is substantially located in a Zone 1 area of flood risk and about 250m to the south west of an extensive area of flood risk Zone 2/Zone 3.

Some localised areas of risk are identified confined to the route of Scrase Stream which abuts the north west boundary and the second stream to the south east which becomes more extensive in the adjacent woodland.

Flood Risk Zone 1 comprises land assessed as having a 1 in 1000 or less annual probability of flooding.

Flood Zone 2 comprises land assessed as having between a 1 in 100 and a 1 in 1000 annual probability of flooding.

Flood Zone 3 comprises land assessed as having greater than a 1 in 100 annual probability of flooding.

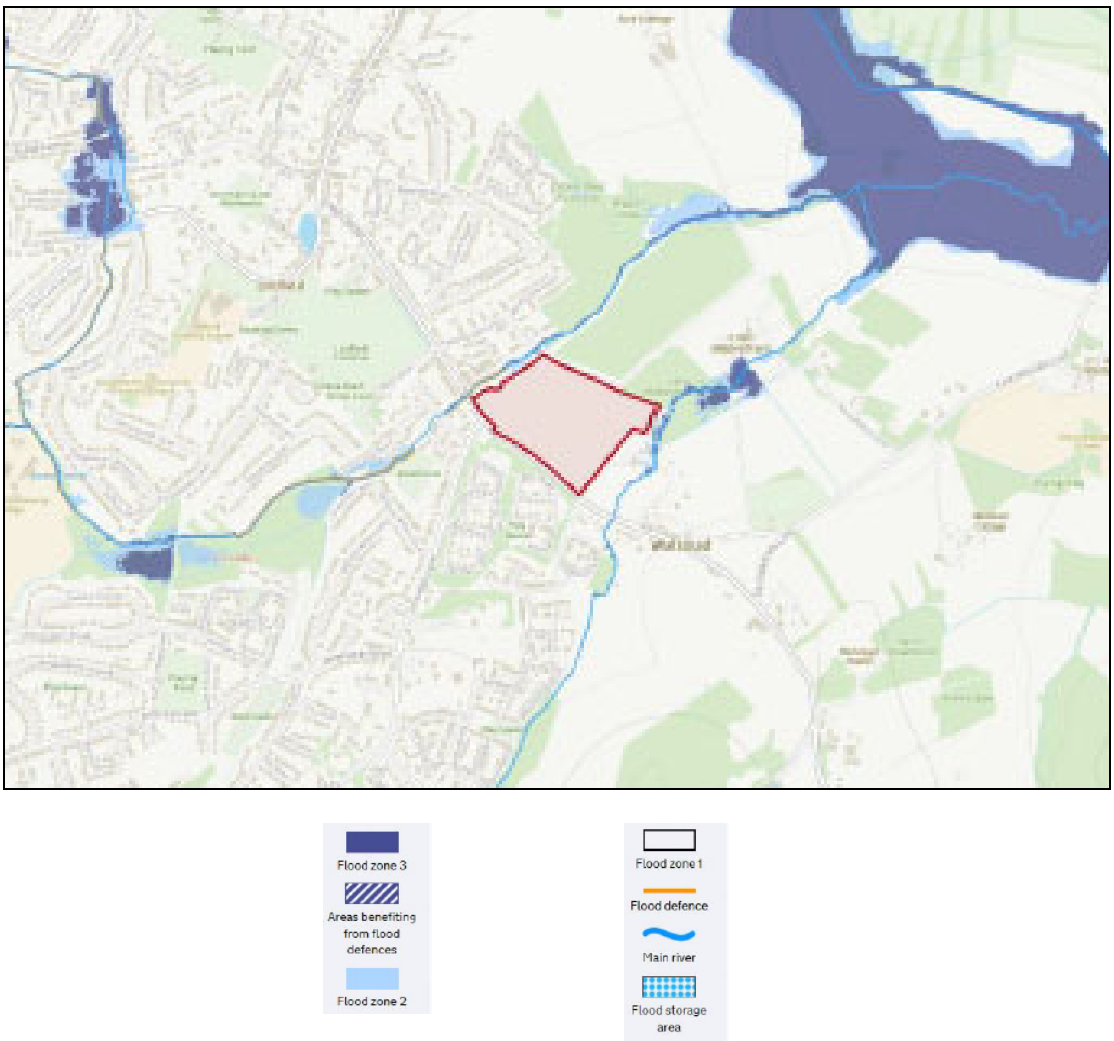

Figure 1: Gov. UK Flood Map for Planning

3.1.2 Gov. UK Surface Water Flood Risk

3.1.2.1 Reference to the Gov. UK Surface Water Flood Risk Map **(Figure 2)** identifies sporadic areas of risk within Lindfield and more extensive areas of risk generally linked to the various ditch and watercourse networks.

Areas of low to medium risk are identified beyond the north west boundary alongside Scrase Stream and beyond the south east boundary of the site along the route of the second stream.

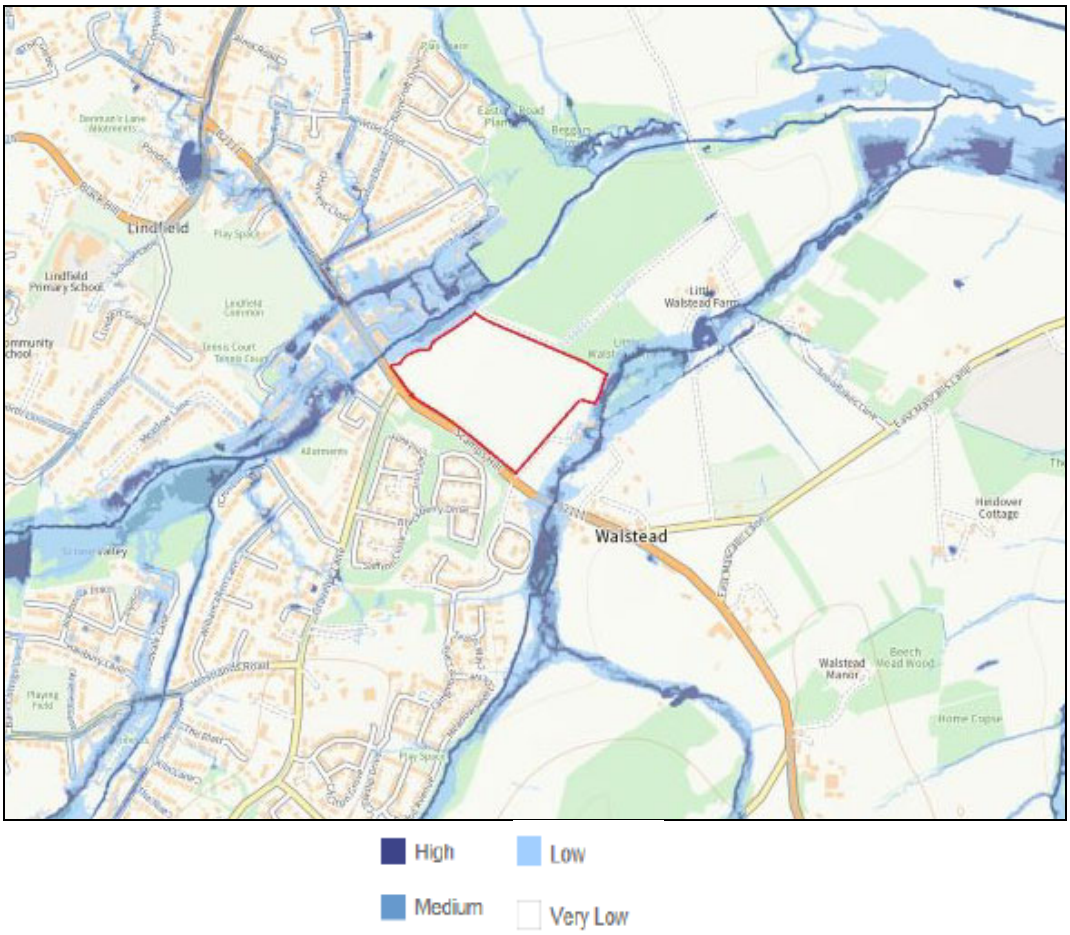

Figure 2: Gov. UK Flood Risk from Surface Water

3.1.3 Gov. UK Extent of Flooding from Reservoirs

3.1.3.1 Reference to the Gov. UK Extent of Flooding from Reservoirs Map (**Figure 3)** identifies that the site is not at risk from reservoir flooding.

Figure 3: Gov. UK Extent of Flooding from Reservoirs

3.2 Sequential and Exception Tests

3.2.1 As set out in the NPPF, the Sequential Test is a risk based approach which should be applied at all stages of the planning process in order to steer new development to areas at risk from the lowest probability of flooding (i.e. from Flood Zones 2 and 3 to Flood Zone 1).

3.2.2 The NPPF Planning Practice Guidance incorporates a list of appropriate land uses in each flood zone dependent on the vulnerability of the proposed development to flooding. Table 2 of the guidance classifies residential development as 'More Vulnerable'.

Reference is made to the table below, reproduced from Table 3 of the guidance, which sets out the Flood Risk Vulnerability Classification.

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 †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

3.2.3 The proposed development is classified in the NPPF as 'More Vulnerable' and will be located within a Zone 1 area of flood risk clear of the area of surface water flood risk along the route of the Scrase Stream. On this basis the Sequential and Exception Tests should not apply.

3.3 Sources of Flood Risk

3.3.1 Water Bodies, Watercourse Systems and Surface Water Flooding

3.3.1.1 There are no significant water bodies in the area which are considered as presenting a source of risk to the development.

3.3.1.2 Ground levels fall to the two watercourse networks (Scrase Stream to the north, unnamed watercourse to the south, both main river) which join some 700m to the north east and, ultimately outfall into the River Ouse.

The area proposed for development substantially falls towards Scrase Stream but is not impacted by any associated formal flood risk.

Scrase Stream is not therefore a potential source of risk to the development.

3.3.1.3 As noted under 3.1.2, mapping identifies a surface water flood risk running alongside Scrase Stream.

This needs to be considered as a potential source of risk to the development.

3.3.2 **Existing Sewers and Drainage**

3.3.2.1 Copies of Southern Water's public sewer records have been obtained and identify the presence of adopted drainage infrastructure in the area of the site. These records have been incorporated in **Appendix 3.**

3.3.2.2 Reference to the public sewer records identifies the following;

- Foul and surface water sewer systems generally within the residential development to the west including a 150mm diameter system to the opposite side of Scamps Hill to the north west.

- Pumped and gravity foul sewer networks within Scamps Hill and potentially encroaching within the eastern frontage of the site and continuing along Scamps Hill before turning east beyond the site boundary.

  Second system joining this system from the west and continuing east.

3.3.2.3 These systems are not considered as presenting a source of risk to the development.

3.3.3 **Land Drainage and Groundwater**

3.3.3.1 The site appeared generally well drained and with Scrase Stream available for connection no land drainage or groundwater issues are therefore anticipated which cannot readily be dealt with during the design and construction process.

3.3.4 **Comment**

3.3.4.1 On the basis of the assessment of the potential sources of flood risk described above, it is concluded that the risks associated with the following need to be addressed by this FRA;

- Surface water flooding to the north west

- Development drainage proposals

4.0 SURFACE WATER RUNOFF

4.1 Requirements for Surface Water Drainage of the Site

4.1.1 The NPPF recommends that surface water generated by the development site should, as far as is practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development.

4.1.2 Proposals should ensure that peak flow rates of surface water leaving the developed site are no greater than those prior to development, reducing surface water run off where possible.

4.2 Site Area

4.2.1 The site occupies an area of 7.34 ha of which 2.51ha is proposed for development.

4.3 Existing Site Run Off

4.3.1 The existing site is greenfield.

4.3.2 Existing greenfield run off rates have been calculated using HR Wallingford for the developable area (**Appendix 4)** and these are as follows;

- Q_{bar}… 14.56 litres/sec
- Q_{1}… 12.38 litres/sec
- Q_{30}… 33.49 litres/sec
- Q_{100}… 46.45 litres/sec

4.4 Surface Water Run Off from the Developed Site

4.4.1 The development plan is incorporated in **Appendix 5B.**

4.4.2 Uncontrolled flows from the development will exceed existing run off rates. It is considered that development run off rates limited to the existing run off rates identified in 4.3 would be appropriate.

5.0 SURFACE WATER DRAINAGE HIERARCHY

5.1 National Planning Practice Guidance

5.1.1 National Planning Practice Guidance states the aim that surface water run off should be discharged as high up the drainage hierarchy as reasonably practicable;

- Into the ground (infiltration)
- To a surface water body or watercourse
- To a surface water sewer, highway drain or other drainage system
- To a combined sewer

The following measures have therefore been considered and identified.

5.2 Potential for Ground Infiltration Based Drainage

5.2.1 A Phase 1 Geoenvironmental Assessment has been undertaken by Lees Roxburgh (Ref. 6534/R1) and has identified that the site is mapped as being free of Superficial Deposits with the possible exception of a ribbon of alluvium (clay, silt sand and gravel) associated with Scrase Stream to the north west boundary.

Bedrock comprising interbedded sandstone and siltstone of the Upper Tunbridge Wells Sand is mapped as immediately underlying the site and is likely to be weathered at surface. Reference to a 1989 borehole log at the west corner of the site identifies very sandy clay to a depth of 2m.

5.2.2 On this basis it is considered that infiltration based drainage is unlikely to be feasible but will be investigated at a more detailed stage.

Meanwhile for the purposes of the outline application, a positive surface water outfall from the development is proposed.

5.3 Surface Water Outfall to Watercourse

5.3.1 On this basis connection is proposed to Scrase Stream beyond the north west boundary of the site but within the overall land ownership.

6.0 FLOODING & SURFACE WATER DRAINAGE MITIGATION MEASURES

6.1 Scrase Stream and Surface Water Flooding

6.1.1 Mapping indicates that Scrase Stream does not present a risk to the development.

Surface water flood mapping however does indicate an area of risk, categorised as substantially low, running alongside (and interlinked) with Scrase Stream.

It is therefore proposed to contain the development proposals outside the mapped extent of surface water flood risk.

6.1.2 Further, it is anticipated that the topography will dictate floor levels being set higher than ground levels at the limit of development proposed, thus providing an additional factor of safety.

6.1.3 It is also noted that development will inherently reduce uncontrolled surface water run off and will therefore reduce flows contributing to the mapped surface water flood extent.

6.2 Development Drainage Proposals

6.2.1 Surface Water Drainage Scheme

6.2.1.1 Desk study work has established that ground conditions are unlikely to be suitable for the introduction of ground infiltration based drainage but will be investigated at a more detailed stage.

A positive surface water outfall into Scrase Stream is therefore proposed at this outline stage.

6.2.1.2 An attenuation basin is proposed in the north area of the development. Flow from the basin will be restricted to the existing Qbar rate of 14.56 litres/sec established under Section 4.3.2.

Highways, houses and associated hard surfaces will be served by a piped surface water system designed to adoptable standards to ensure, at minimum, no flooding up to the 1 in 30 year event and will discharge into the basin.

Overall flows up to the 1 in 100 year event plus allowance for urban creep and 45% climate change will be contained on site within the basin and pipe network.

The basin has been sized accordingly using Microdrainage Quick Storage Estimate (**Appendix 5A**) but remains subject to detailed design.

6.2.2 Future Maintenance

6.2.2.1 It is proposed that under the new Sewerage Sector Guidance the main piped system, the basin, control structure and outfall will be adopted by Southern Water.

6.2.3 Water Quality

6.2.3.1 Whilst the suitability of the ground conditions for the incorporation of infiltration based drainage techniques remains to be investigated, the risk to water quality from housing developments is categorised as low to very low.

6.2.3.2 The incorporation of trapped gullies to roads and the basins will nonetheless provide two levels of treatment.

6.2.4 Drainage Strategy

6.2.4.1 The drainage strategy for the development has been prepared accordingly and is incorporated in **Appendix 5B**.

6.3 Exceedance Flows

6.3.1 More generally, floor levels will be set a minimum of 0.15m above external ground level and will encourage any flows generated by an exceedance event (i.e. greater than the 1 in 100 year plus climate change design event) to pass safely through the development.

6.3.2 Flow routes will of course follow the topography and have been indicated in **Appendix 5B.**

6.4 Environment Agency Byelaws and Consents

6.4.1 As noted, in accordance with byelaw requirements the 8m maintenance strip to the top of bank to Scrase Stream will not be compromised.

6.4.2 Formal Environment Agency consent will be required to construct the outfall to the stream.

7.0 FOUL DRAINAGE

7.1 There is an existing 150mm diameter foul sewer located to the opposite side of Scamps Hill to the north west.

It is proposed that connection for foul flows be made to this system but this remains subject to confirmation by Southern Water.

7.2 Whilst levels would suggest a gravity connection from the development to the north west might be achievable, given its depth and the presence of two rising mains and other services, allowance for a pumped connection has been made at this stage but will be subject to design development.

7.3 The gravity foul system and pump station/rising main, if confirmed as being required, will be designed to adoptable standards and submitted for adoption under the new Sewerage Sector Guidance by Southern Water in conjunction with the surface water scheme.

7.4 The outline foul drainage strategy for the development has been prepared accordingly and is incorporated in **Appendix 5B.**

8.0 CONCLUSIONS

8.1 The site lies within the catchment of the River Ouse.

The proposal is for residential development, which is classified by the NPPF as 'More Vulnerable', and will be located in the Zone 1 area of flood risk clear of the localised area of risk confined to the route of the Scrase Stream beyond the north west boundary.

On this basis the Sequential and Exception Tests should not apply.

8.2 There are no significant water bodies in the area which are considered as presenting a source of risk to the development.

Scrase Stream is designated main river with mapping indicating that flows are contained in bank. Surface water flood mapping indicates an area of risk, categorised as substantially low, running alongside with Scrase Stream. It is therefore proposed to contain the development proposals outside the mapped extent of surface water flood risk.

Further, it is anticipated that the topography will dictate floor levels being set higher than ground levels at the limit of development proposed, thus providing an additional factor of safety. It is also noted that development will inherently reduce uncontrolled surface water run off and will therefore reduce flows contributing to the mapped surface water flood extent.

8.3 Desk study work has identified that ground conditions are unlikely to be suitable for the introduction of infiltration based drainage but which will be investigated at a more detailed stage. For the purposes of the outline application, a positive surface water outfall to Scrase Stream is proposed.

8.4 An attenuation basin is proposed in the north area of the development from which flows will be restricted to the existing Qbar rate of 14.56 litres/sec.

Highways, houses and associated hard surfaces will be served by a piped surface water system designed to adoptable standards to ensure, at minimum, no flooding up to the 1 in 30 year event and will discharge into the basin.

Overall flows up to the 1 in 100 year event plus allowance for urban creep and 45% climate change will be contained on site within the basin and pipe network.

8.5 It is proposed that under the new Sewerage Sector Guidance the main piped system, the basin, control structure and outfall will be adopted by Southern Water.

8.6 Although the risk to water quality from housing developments is categorised as low to very low, the incorporation of trapped gullies to roads and the basin will nonetheless provide two levels of treatment.

8.7 Floor levels will be set a minimum of 0.15m above external ground level and will encourage any flows generated by an exceedance event (i.e. greater than the 1 in 100 year plus climate change design event) to pass safely through the development.

8.8 Formal Environment Agency consent will be required for construction of the outfall to the stream.

8.9 It is proposed that connection for foul flows be made to an existing 150mm diameter foul sewer located to the opposite side of Scamps Hill to the north west subject to confirmation by Southern Water.

Whilst levels would suggest a gravity connection from the development to the north west might be achievable, given its depth and the presence of two rising mains and other services, allowance for a pumped connection has been made at this stage but will be subject to design development. The gravity foul system and pump station/rising main, if confirmed as being required, will be designed to adoptable standards and submitted for adoption under the new Sewerage Sector Guidance by Southern Water in conjunction with the surface water scheme.

8.10 It is therefore concluded that the development can be delivered in accordance with the NPPF so as not to be at risk of flooding from external sources or from within the development, and so as not to increase flood risk to the surrounding area and is therefore appropriate.

Appendix 1: Site Details

Appendix 1A: Location Plan

CD1.11

NOTES

N

0 50 100m

KEY

Site Boundary 6.62ha

Other Land under Applicant's Control

Noahs Ark Lane
Hall
Beechcroft
Sturrow Cottage
El Sub Sta
Whitelands
Noah's Ark Cottage
Ashlea
Clock Tower House
Lindfield Enterprise Park
Brookside
Tanthorne
Falconers
Kennels
Brook Cottage
Pumping Sta
School Barton
CS
Mast
Mast
Mast
Little Walstead Wood
Drain
Greyfriars
ESS
Gravelye Lane
Scamps Hill
Residential Development off Gravelye Lane
Tennis Court
Farm Cottage
Walstead Grange
FB
Ponds
FB
FB
Pond
Pond
Pond
FBs
Rising Bollards
Tythe Cottage
Walstead Spinney
Twin Oaks
Scamps Hill
Foxgloves
Brook Cottage
Ordnance Cottages
The Empress Fish & Chip Cafe
Tichbourne Cottages
Tichbourne
Woodlea

Gladman Developments Ltd.
Land off Scamps Hill
Lindfield

LOCATION PLAN

1:2000 @ A3
5th February 2024 KAD / KMN
9432-L-06 rev **D**

fpcr
masterplanning
environmental assessment
landscape design
urban design
ecology
architecture
arboriculture

FPCR Environment and Design Ltd
Lockington Hall
Lockington
Derby DE74 2RH

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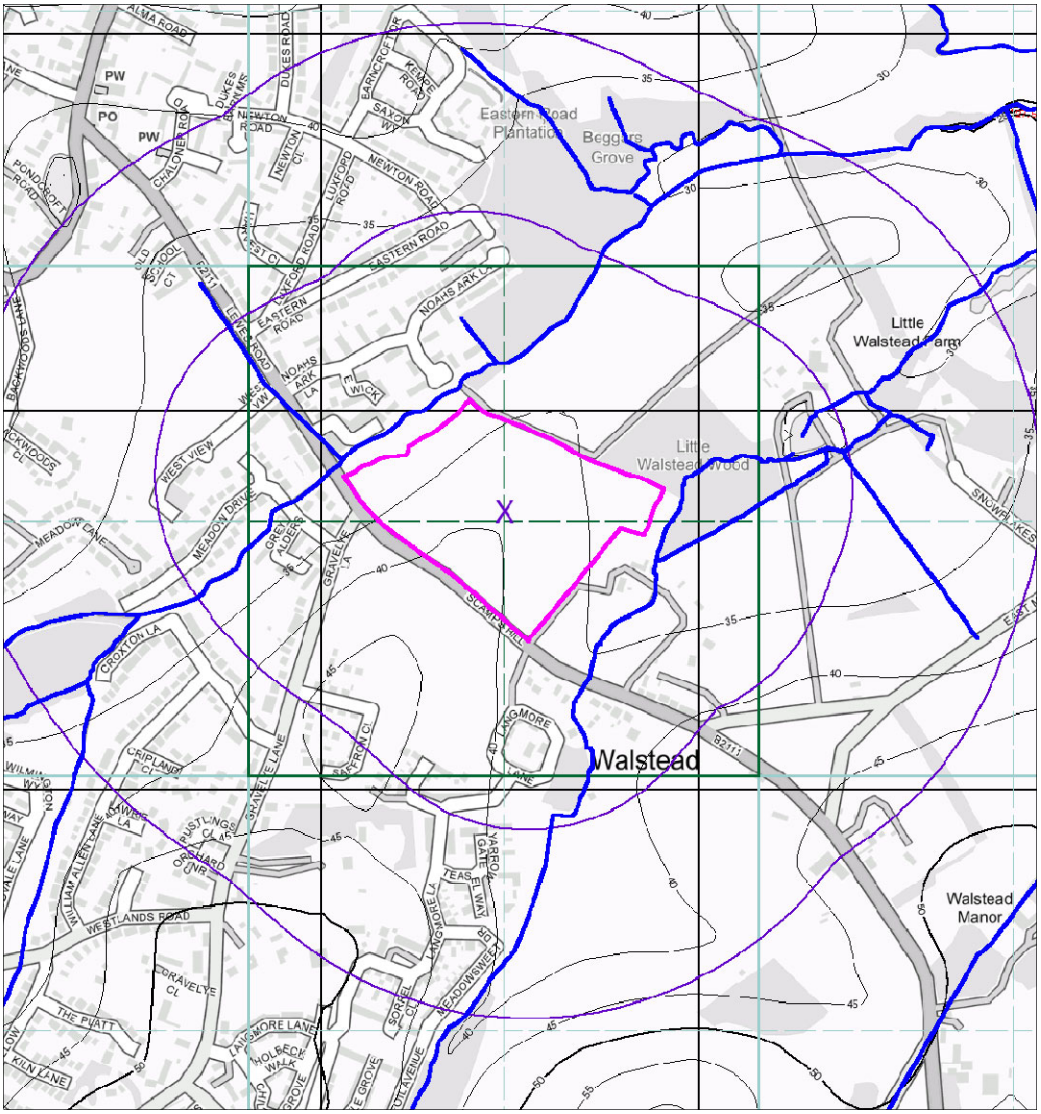
f: 01509 674565
e: mail@fpcr.co.uk
w: www.fpcr.co.uk

File: K:\9400\9432\LANDS\Plans\9432-L-06 Location Plan v2023.vwx

Appendix 1B: Watercourse Systems

N



WATERCOURSE SYSTEMS

SCAMPS HILL, LINDFIELD, MID SUSSEX

Appendix 2: Topographical Survey

Ref. 2020-035

N

NOTES

THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS TO A PLANE GRID. HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.

SITE CENTRE: E 535305, N 124836

LOCAL SCALE FACTOR: 0.9999051

ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM GENERATED BY ACTIVE GPS NETWORK.

DRAINAGE:-

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ACCESS TO MANHOLES OR DRAINAGE SYSTEMS. ALL PIPE RUNS ARE ASSUMED AND MEASURED FROM OR TO FROM THE SURFACE AND THUS WILL ONLY BE APPROXIMATE. ANY FLOW TYPES (FOUL WATER, SURFACE WATER OR COMBINED) ARE ASSUMED AND THEREFORE REQUIRE VERIFICATION.

ROAD MARKINGS:-

ROAD MARKINGS DISPLAYED ARE SYMBOLIC. LENGTH, SPACING AND THICKNESS ETC ARE INDICATIVE ONLY.

LEGEND

- 35.01 SPOT LEVEL
- SURVEY STATION
- SAPLING
- BUSH/ES/SHRUB
- TREE (INDICATIVE ONLY)
- HEDGE/AREA OF UNDERGROWTH
- 95.00 CONTOUR
- GATE
- OVERHEAD CABLE
- FENCE
- 1 PHOTOGRAPH LOCATION AND NUMBER
- APPROXIMATE CULVERT/BRIDGE OPENING

ABBREVIATIONS

AL	ARCH LEVEL	LB	LETTER BOX
AV	AIR VALVE	LP	LAMPOST
B	BOLLARD	MH	MANHOLE
BB	BELISHA BEACON	MKR	MARKER
BC	BOTTOM OF	OHC	OVERHEAD CABLE
BL	BCD LEVEL	OpL	OPENING LEVEL
BS	BUS STOP	OBM	OS BENCHMARK
CB	CATCH PIT	P	POST
CR	CLOSED BOARD FENCE	PR	POST AND RAIL FENCE
CL	CHAIN LINK FENCE	PW	POST AND WIRE FENCE
CaTV	CABLE TELEVISION COVER	PEC	PEDESTRIAN CROSSING
CC	CONTROL CABIN	PM	PARKING METER
CH	CHIMNEY	PO	PHONE BOX
Conck	CONCRETE PANEL FENCE	RWL	RETAINING WALL
CPY	CANOPY	SAP	SAPLING
CL	CROWN LEVEL	SEC	SECURITY CAMERA
Cwy	CABLE STAY	SGY	STRIP GULLY
CP	CONTROL VISION POINT	SL	SIGN LEVEL
CYR	CYCLE RACK	SP	SIGNPOST
DK	DROPPED KERB	Spk	SPRINGING LEVEL
DP	DOWNPIPE	SV	STOP VALVE
EIP	ELECTRIC INLET POINT	Tac	TACTILE PAVING
ER	ELECTRICITY COVER	TBS	TRAFFIC SIGNAL
EP	ELECTRICITY SUPPLY POLE	TE/T	TREE + NUMBER
ER	EARTH ROD	THL	THRESHOLD LEVEL
FH	FIRE HYDRANT	TL	TOP OF LIGHT
FL	FIELD LIGHT	TLy	TOP OF LIGHT
G/DP	GULLY AND DOWNPIPE	TrW	TOP OF WALL
GP	GATE POST	TP	TELEPHONE POLE
Gp	GAS PIPE	WM	WIRE MESH FENCE
GV	GAS VALVE	WPF	WOOD PANEL FENCE
IC	INSPECTION CHAMBER	WLY	WATER LEVEL
IL	INVERT LEVEL	WM	WATER METER
I/R	IRON RAILING FENCE	WO	WASH OUT
KO	KERB OUTLET		

STATION CO-ORDINATES

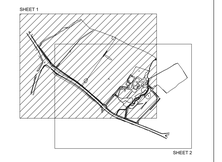
STATION	EASTING	NORTHING	LEVEL	DESCRIPTION
STN1	535394.63	124740.58	33.34	Survey Nail
STN3	535425.76	124768.22	32.77	Survey Nail
STN4	535337.42	124768.42	35.67	Survey Nail
STN10	535304.55	124727.73	36.43	Survey Nail
STN11	535270.84	124685.48	37.01	Survey Nail
STN15	535434.27	124825.35	36.77	Survey Nail
STN17	535438.93	124770.07	32.77	Survey Nail
STN19	535435.19	124737.19	32.77	Survey Nail
STN20	535395.19	124818.05	33.32	Survey Nail
STN21	535410.97	124783.19	32.70	Survey Nail
STN27	535007.89	124827.19	31.51	Survey Nail
STN28	535485.87	124583.89	39.74	Survey Nail
STN29	535243.66	124712.91	38.11	Survey Nail
STN30	535242.66	124712.91	38.11	Survey Nail
STN31	535210.27	124740.73	39.87	Survey Nail
STN32	535180.98	124764.15	40.82	Survey Nail
STN33	535130.63	124796.90	38.92	Survey Nail
STN35	535038.63	124863.15	33.35	Survey Nail

TREE SCHEDULE

See file 2020-035_Tree Schedule_01.xlsx

TREE DIAMETER MEASURED APPROXIMATELY 1.5M ABOVE GROUND LEVEL. TREE CANOPY RADII ARE ESTIMATES AND ARE REPRESENTATIVE OF THE GENERALISED CANOPY SIZE. TREE BOLE MAY NOT SIT CENTRALLY TO THE CANOPY. TREE HEIGHT ESTIMATED FROM GROUND LEVEL.

PLOT LOCATIONS



Rev	Date	Revision notes	By
*	*	*	*

DO NOT SCALE

Status

INFORMATION

Project

Walstead Grange, Lindfield.

Title

TOPOGRAPHICAL SURVEY AS OF 01.02.21 SHEET 1 OF 2

GLADMAN
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Drawn By	Publish Date	Scale(s)	Sheet Size
JW	17.02.21	1:500	A0

Project no.	Drawing no.	Revision
2020-035	Topo_01_2D	0

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NOTES

THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS TO A PLANE GRID. HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.

SITE CENTRE: E 535305, N 124836

LOCAL SCALE FACTOR: 0.9999051

ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM GENERATED BY ACTIVE GPS NETWORK.

DRAINAGE:-

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ACCESS TO MANHOLES OR DRAINAGE SYSTEMS. ALL PIPE INVERT LEVELS ARE ESTIMATED AND MEASURED FROM THE SURFACE AND THUS WILL ONLY BE APPROXIMATE. ANY FLOW TYPES (FOUL WATER, SURFACE WATER OR COMBINED) ARE ASSUMED AND THEREFORE REQUIRE VERIFICATION.

ROAD MARKINGS:-

ROAD MARKINGS DISPLAYED ARE SYMBOLIC. LENGTH, SPACING AND THICKNESS ETC ARE INDICATIVE ONLY.

LEGEND

- 30.01 SPOT LEVEL
- SURVEY STATION
- SAPLING
- BUSHES/SHRUB
- TREE (INDICATIVE ONLY)
- HEDGE/AREA OF UNDERGROWTH
- CONTOUR
- GATE
- OVERHEAD CABLE
- FENCE
- PHOTOGRAPH LOCATION AND NUMBER
- APPROXIMATE CULVERT/BRIDGE OPENING

ABBREVIATIONS

AoL	ARCH LEVEL	LB	LETTER BOX
AV	AIR VALVE	LP	LAMPOST
B	BOLLARD	MH	MANHOLE
BB	BELISHA BEACON	MKR	MARKER
BC	BACK OF CURB	OHC	OVERHEAD CABLE
BL	BCO LEVEL	OL	OPENING LEVEL
BS	BUS STOP	OBM	OS BENCHMARK
C	CENTRE LINE	P	POST
CB	CLOSED BOARD FENCE	PR	POST AND RAIL FENCE
CL	CHAIN LINK FENCE	PW	POST AND WIRE FENCE
CATV	CABLE TELEVISION COVER	PED	PEDESTRIAN CROSSING
CC	CONTROL CABIN	PM	PARKING METER
CH	CHIMNEY	PO	POWER POLE
Conc/p	CONCRETE PANEL FENCE	RWL	RETAINING WALL
CPY	CANOPY	SAP	SAPLING
CrL	CROWN LEVEL	SEC	SECURITY CAMERA
Cstv	CABLE STAY	SGY	STRIP GULLY
CTV	CCTV CAMERA	SL	SOFFIT LEVEL
CYR	CYCLE RACK	SP	SIGNPOST
DK	DROPPED KERB	Spl.	SPRINGING LEVEL
DP	DOWNPIPE	SV	STOP VALVE
EIP	ELECTRIC INLET POINT	Tac	TACTILE PAVING
EP	ELECTRICITY DISTRIBUTION COVER	TBS	TRAFFIC SIGNAL
EP	ELECTRICITY SUPPLY POLE	TE01	TREE + NUMBER
ER	EARTH ROD	THL	THRESHOLD LEVEL
FH	FIRE HYDRANT	TL	TOP OF LIGHT
FL	FIELD LEVEL	TLp	TOP OF LIGHT
G/DP	GULLY AND DOWNPIPE	TrW	TOP OF WALL
GP	GATE POST	TP	TELEPHONE POLE
Gp	GAS PIPE	WM	WIRE MESH FENCE
GV	GAS VALVE	WP	WOODEN RAIL FENCE
IC	INSPECTION CHAMBER	WLV	WATER LEVEL
IL	INVERT LEVEL	WM	WATER METER
IR	IRON RAILING FENCE	WO	WASH OUT
KO	KERB OUTLET		

STATION CO-ORDINATES

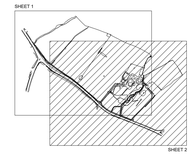
STATION	EASTING	NORTHING	LEVEL	DESCRIPTION
STN1	535394.63	124749.58	33.34	Survey Nail
STN3	535425.76	124768.22	32.77	Survey Nail
STN4	535337.42	124768.42	35.67	Survey Nail
STN10	535304.55	124727.73	36.43	Survey Nail
STN11	535270.84	124685.48	37.01	Survey Nail
STN15	535408.27	124825.39	36.77	Survey Nail
STN17	535436.93	124772.07	32.97	Survey Nail
STN19	535411.19	124751.19	33.51	Survey Nail
STN20	535395.19	124818.05	33.32	Survey Nail
STN21	535410.97	124783.19	32.70	Survey Nail
STN27	535007.89	124827.19	31.51	Survey Nail
STN28	535485.87	124583.89	39.74	Survey Nail
STN29	535242.66	124712.91	38.11	Survey Nail
STN30	535242.66	124712.91	38.11	Survey Nail
STN31	535210.27	124740.73	39.87	Survey Nail
STN32	535180.98	124764.15	40.82	Survey Nail
STN33	535130.63	124796.90	38.92	Survey Nail
STN35	535038.63	124863.15	33.35	Survey Nail

TREE SCHEDULE

See file 2020-035_Tree Schedule_01.xlsx

TREE DIAMETER MEASURED APPROXIMATELY 1.5M ABOVE GROUND LEVEL. TREE SPREADS ARE SYMBOLIC ONLY AND ARE REPRESENTATIVE OF THE GENERALISED CANOPY SIZE. TREE BOLE MAY NOT SIT CENTRALLY TO THE CANOPY. TREE HEIGHT ESTIMATED FROM GROUND LEVEL.

PLOT LOCATIONS



Rev	Date	Revision notes	By
*	*	*	*

DO NOT SCALE

Status: **INFORMATION**

Project: **Walstead Grange, Lindfield.**

Title: **TOPOGRAPHICAL SURVEY AS OF 01.02.21 SHEET 2 OF 2**

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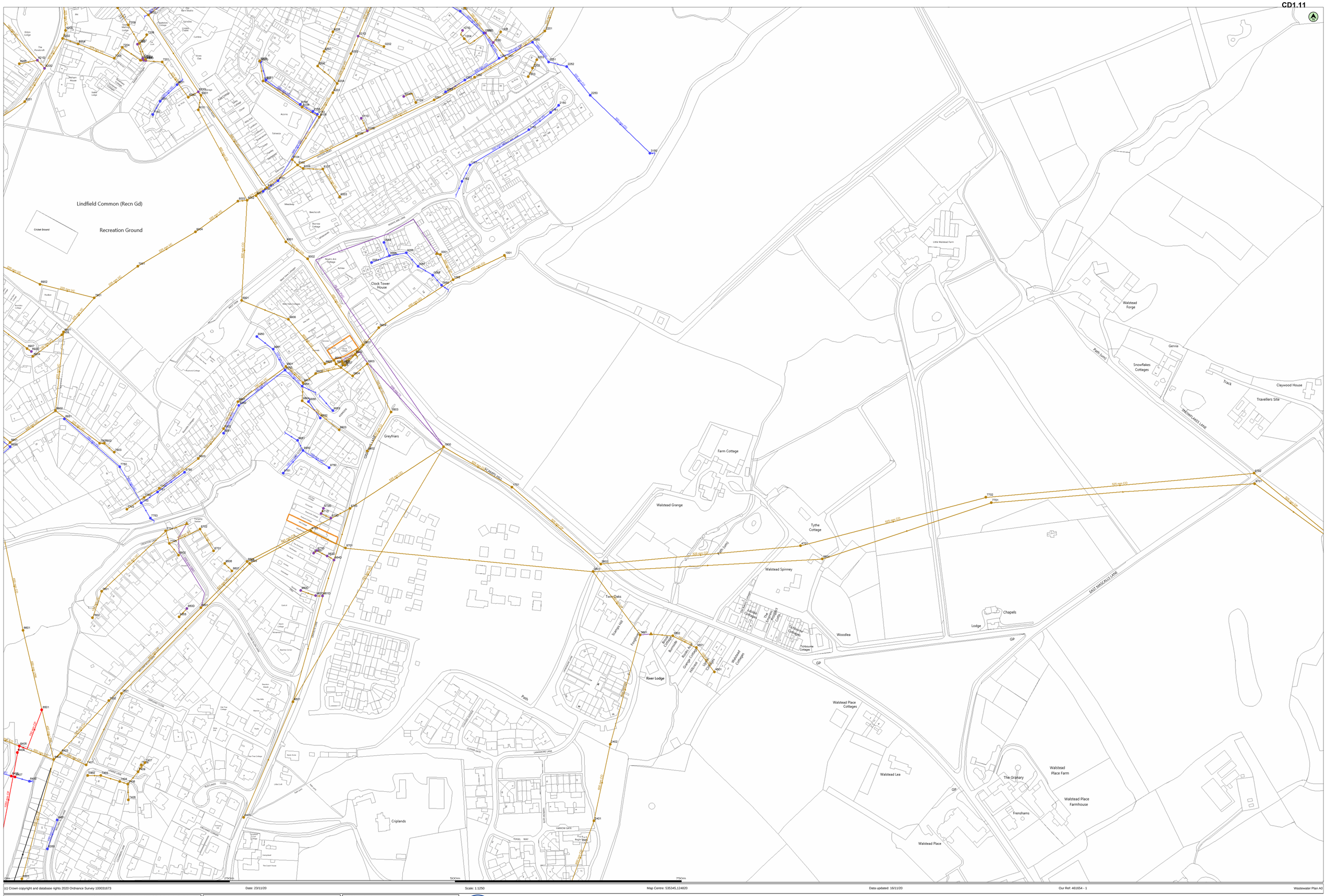
2020-035	Topo_02_2D	0

Appendix 3: Southern Water Public Sewer Records



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Date: 23/11/20 | Scale: 1:1250 | Map Centre: 535345,124820 | Data updated: 16/11/20 | Our Ref: 461654 - 1 | Wastewater Plan A0

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2020 Ordnance Survey 100031673 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

office@lieesroxburgh.co.uk

Walstead Grange

from Southern Water.

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
6404	C	36.98	34.43	
6405	C	36.96	0.00	
6406	C	37.06	33.85	
6407	C	36.71	0.00	
6501	C	35.36	0.00	
0001	F	30.72	29.82	
0101	F	0.00	31.00	
0103	F	0.00	0.00	
010D	F	0.00	0.00	
011D	F	0.00	0.00	
0201	F	34.04	0.00	
0202	F	0.00	0.00	
020D	F	0.00	0.00	
021D	F	0.00	0.00	
0802	F	35.67	33.22	
0803	F	33.67	32.19	
0804	F	32.15	31.14	
0901	F	31.88	0.00	
0902	F	31.72	29.83	
0903	F	32.34	31.36	
0904	F	0.00	29.70	
1001	F	30.87	0.00	
1002	F	31.06	29.66	
1201	F	34.50	32.94	
1202	F	34.43	32.53	
1203	F	0.00	0.00	
1204	F	0.00	0.00	
1205	F	0.00	0.00	
121D	F	0.00	0.00	
122D	F	0.00	0.00	
123D	F	0.00	0.00	
1301	F	36.50	35.15	
1701	F	40.97	33.98	
1800	F	36.27	0.00	
2201	F	34.11	33.28	
2202	F	0.00	0.00	
2203	F	0.00	0.00	
2401	F	37.59	35.35	
2402	F	36.56	34.99	
2601	F	37.34	33.67	
2602	F	0.00	33.60	
3501	F	36.77	35.07	
3601	F	35.80	34.53	
3602	F	35.27	34.12	
4501	F	38.66	37.93	
4701	F	34.86	33.48	
5601	F	35.74	33.30	
6201	F	37.34	34.94	
6202	F	35.97	34.65	
6203	F	35.91	34.72	
6204	F	35.59	34.41	
6205	F	0.00	35.50	
620D	F	34.73	34.73	
621D	F	0.00	35.29	
6301	F	0.00	34.90	
6402	F	36.24	34.19	
6403	F	0.00	34.08	
6601	F	33.21	31.62	
6801	F	36.74	33.49	
6802	F	36.11	33.22	
6901	F	36.19	32.82	
6902	F	37.85	35.19	
6903	F	36.33	35.10	
6904	F	0.00	35.60	
6907	F	0.00	0.00	
692D	F	0.00	0.00	
7001	F	0.00	32.30	
7201	F	0.00	32.94	
7202	F	35.54	33.47	
7203	F	34.43	33.45	
7204	F	0.00	33.84	
7205	F	35.19	34.23	
7206	F	0.00	0.00	
7207	F	0.00	0.00	
7208	F	0.00	0.00	
7209	F	0.00	0.00	
720D	F	0.00	0.00	
721D	F	0.00	0.00	
722D	F	0.00	0.00	
723D	F	0.00	0.00	
7303	F	0.00	0.00	
7401	F	39.43	33.97	
7402	F	0.00	0.00	
7403	F	0.00	0.00	
7404	F	0.00	0.00	
7405	F	0.00	0.00	
7406	F	0.00	0.00	
7407	F	0.00	0.00	
7408	F	0.00	0.00	
7409	F	0.00	0.00	
7501	F	37.54	34.16	
7502	F	37.58	34.53	
7601	F	33.59	32.10	
7602	F	34.15	32.35	
7701	F	32.07	31.14	
7701	F	35.93	33.27	
7702	F	31.97	31.30	
7702	F	34.76	0.00	
7703	F	32.03	31.42	
7704	F	32.60	30.95	
7705	F	33.13	31.48	
7801	F	34.35	33.44	
7802	F	34.18	33.47	
7803	F	33.77	33.52	
7901	F	35.42	32.58	
8001	F	32.35	30.32	
8002	F	32.19	30.39	
8003	F	32.49	31.85	
8004	F	33.34	32.05	
8101	F	33.52	30.97	
8201	F	33.57	32.07	
8202	F	33.72	32.30	
8203	F	34.90	33.54	
823D	F	32.17	32.17	
8403	F	0.00	0.00	
8601	F	36.61	34.34	
8602	F	33.63	0.00	
8603	F	36.52	0.00	
8604	F	36.15	34.30	
8605	F	0.00	0.00	
8606	F	0.00	0.00	
8607	F	0.00	0.00	
860D	F	0.00	0.00	
8701	F	34.62	33.74	
8702	F	0.00	32.64	
8801	F	32.02	30.22	
8802	F	32.29	30.47	
8803	F	32.43	30.83	
8901	F	31.67	29.66	
9001	F	31.37	30.05	
9002	F	31.58	0.00	
9003	F	0.00	0.00	
9101	F	32.31	30.42	
9102	F	32.50	30.67	
9103	F	32.56	31.42	
9104	F	32.65	31.83	
9105	F	33.20	0.00	
9106	F	33.66	32.41	
9107	F	0.00	0.00	
9201	F	33.53	32.37	
9202	F	34.57	0.00	
9203	F	34.40	33.32	
9204	F	0.00	0.00	
9206	F	0.00	0.00	
9207	F	0.00	0.00	
9208	F	0.00	0.00	
9501	F	43.23	0.00	
960D	F	0.00	0.00	
961D	F	0.00	0.00	
962D	F	0.00	0.00	
963D	F	0.00	0.00	
964D	F	0.00	0.00	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
9701	F	39.82	33.88	
9701	F	37.78	33.05	
9702	F	38.12	0.00	
9702	F	37.95	33.16	
9703	F	38.06	0.00	
970D	F	0.00	0.00	
971D	F	0.00	0.00	
972D	F	0.00	0.00	
973D	F	0.00	0.00	
974D	F	0.00	0.00	
9801	F	32.21	29.71	
9802	F	32.03	0.00	
9803	F	33.78	31.82	
9804	F	0.00	31.20	
9901	F	32.27	29.84	
9902	F	31.29	0.00	
9903	F	31.44	0.00	
9904	F	31.52	0.00	
9905	F	31.42	0.00	
9906	F	31.54	29.96	
9907	F	31.42	0.00	
9908	F	0.00	0.00	
0053	S	31.06	29.61	
0054	S	31.39	29.50	
0055	S	31.47	0.00	
0056	S	31.37	29.45	
0057	S	31.19	29.42	
0058	S	31.08	29.38	
0950	S	31.15	29.29	
1150	S	31.05	29.67	
1151	S	31.23	29.36	
1152	S	31.12	0.00	
1250	S	35.33	33.09	
1251	S	34.50	32.19	
1252	S	34.37	32.37	
1253	S	34.16	32.80	
1350	S	36.54	34.11	
2150	S	31.27	30.21	
2151	S	31.21	30.10	
2250	S	34.26	31.86	
2251	S	33.11	30.99	
2252	S	33.53	30.53	
2253	S	33.09	29.57	
3150	S	31.43	28.86	
6350	S	40.79	0.00	
6450	S	36.00	34.22	
6451	S	40.55	39.99	
6850	S	36.90	35.57	
6851	S	35.89	34.58	
7150	S	34.45	33.53	
7251	S	34.22	33.36	
7750	S	33.37	32.06	
7751	S	32.07	31.20	
7752	S	31.94	30.98	
7753	S	32.08	30.81	
8250	S	34.86	33.20	
8251	S	33.74	33.10	
8750	S	32.30	31.55	
8850	S	32.04	30.68	
8851	S	32.27	31.07	
8950	S	32.47	30.57	
9150	S	32.34	0.00	
9151	S	32.49	0.00	
9153	S	33.26	0.00	
9154	S	33.71	32.05	
9155	S	33.50	0.00	
9251	S	34.41	32.91	
9750	S	34.99	33.40	
9751	S	33.61	32.60	
9850	S	33.07	31.93	
9851	S	32.93	31.41	
9852	S	32.08	30.90	
9853	S	32.51	30.78	
9854	S	32.19	0.00	
9856	S	31.55	30.16	
9950	S	32.15	30.05	
9951	S	32.20	30.30	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix 4: Existing Run Off Rates

HR Wallingford

hr wallingford

Greenfield runoff rate estimation for sites

CD111

www.uksuds.com | Greenfield runoff tool

Calculated by:	Lees Roxburgh
Site name:	6534 Walstead Grange, Scamps Hill
Site location:	Lindfield

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:	51.00760° N
Longitude:	0.07562° W
Reference:	1836328362
Date:	Feb 12 2024 11:03

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 2.51

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):	819	819
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

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.

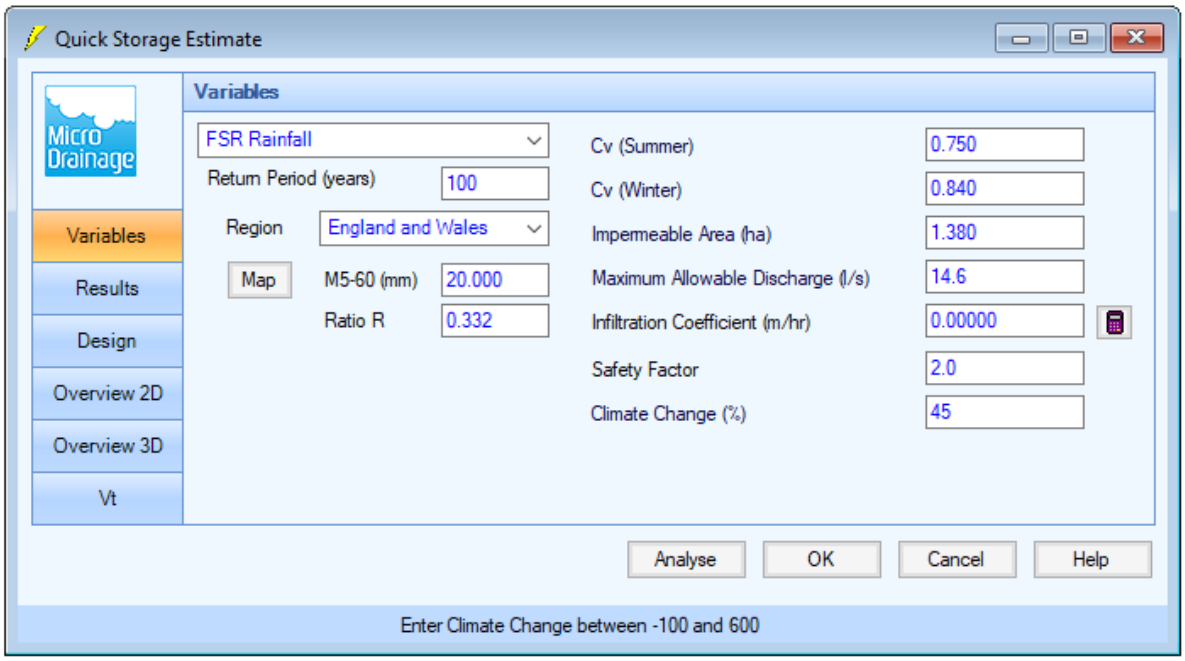
Greenfield runoff rates

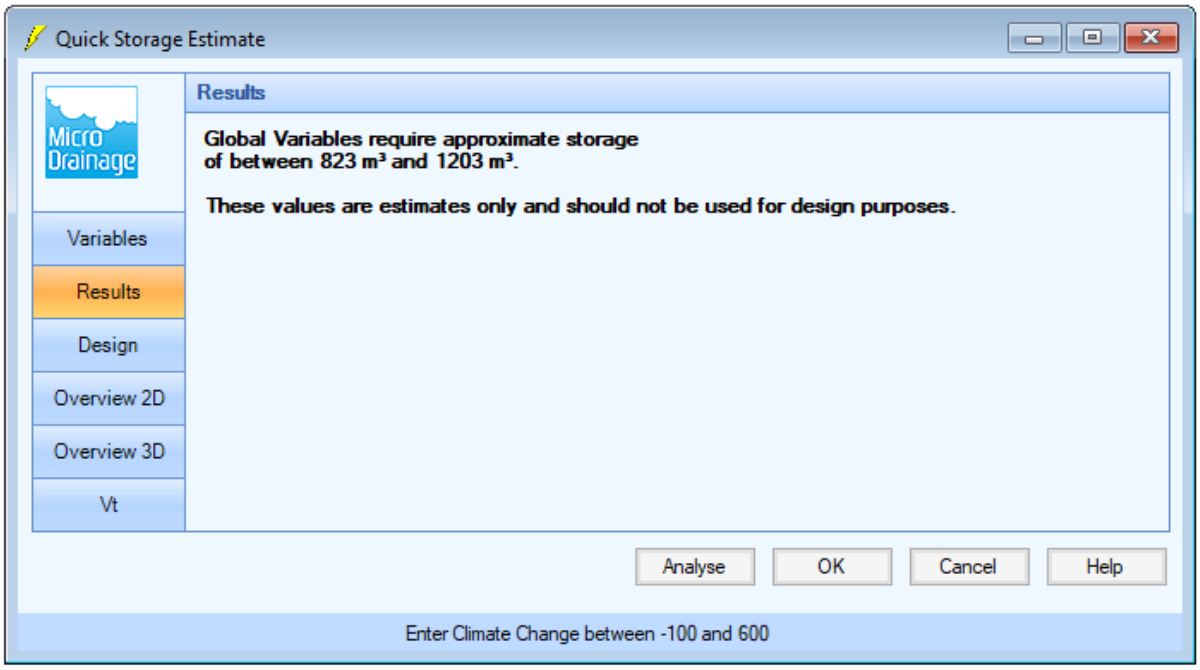
	Default	Edited
Q_{BAR} (l/s):	14.56	14.56
1 in 1 year (l/s):	12.38	12.38
1 in 30 years (l/s):	33.49	33.49
1 in 100 year (l/s):	46.45	46.45
1 in 200 years (l/s):	54.46	54.46

Appendix 5: Drainage Strategy

Appendix 5A: Surface Water Microdrainage Quick Storage Estimate

6543 Walstead Grange, Scamps Hill, Lindfield





Appendix 5B: Lees Roxburgh Drg. No. 6534/01-01

Scrase Stream

Attenuation Basin

Foul Pumping Station

PS

Existing Foul

Clock Tower House

Lindfield Enterprise Park

LINDFIELD ENTERPRISE PARK

Greyfriars

LEAP

TREES

Mast

35m

Grass

Notes

KEY

- Development Boundary
- Scrase Stream

Developable area = 2.51 Ha

Greenfield Runoff Rates

QBar ... 14.56 l/s
Q1 ... 12.38 l/s
Q30 ... 33.49 l/s
Q100 ... 46.45 l/s

Surface Water Attenuation

Attenuation basin to be designed to accommodate all storm events up to and including 1:100yr + 45% allowance for climate change + allowance for urban creep

- On-site surface water network
- Exceedance Flow Routes
- On site foul water network
- Pumped foul rising main TBC

Rev	Revision	By	Date

GLADMAN

Scamps Hill
Lindfield
Mid Sussex

Drainage Strategy

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Consulting Engineers
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Job No.	Drawing No.	Revision.
6534	01-01	

Scale A1 @ 1:500 | Date Feb 2024

Drawn By	Designed By	Checked By
RD	JEL	JEL