Consulting Civil Engineers

Foul and Surface Water Drainage Strategy Report

Land to Rear of 83 St James Road, Sutton, Surrey SM1 2TJ

For

KC Services Group

Rev – **P1**

Reference **C2364**

Date **6th December 2023**

Revision	Date of Issue	Comments	Prepared By	Checked By
P	04.10.22	Initial Issue	LH	CS
P1	06.12.23	Revised to suit new siteplan	LH	CS

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Contents

1 Introduction

1.1.1 CGS Civils Ltd have been appointed by KC Services Group to undertake a drainage strategy report for a proposed development at Land to the Rear of 83 St James Road in Sutton, Surrey.

1.1.2 The purpose of this drainage strategy is to demonstrate how the development area can be satisfactorily drained without increasing flood risk onsite and elsewhere.

1.1.3 The existing site consists a detached garage and private garden space. The proposed development will consist of the conversion and extension of the existing detached garage to form a single 2-bedroom dwelling.

1.1.4 The proposed development is located as OS Grid Reference TQ 25211 64307 and has the post code SM1 2TJ.

1.1.5 The total green line boundary is approximately 0.016 Ha and the proposed development will result in a total of 0.0079 Ha of impermeable area, 0.006 Ha of which is roof areas and the other 0.0014 Ha will be hard paved areas.

1.1.6 The proposed site plan can be found in **Appendix A.**

Fig 1. Site Location

2 Site Geology

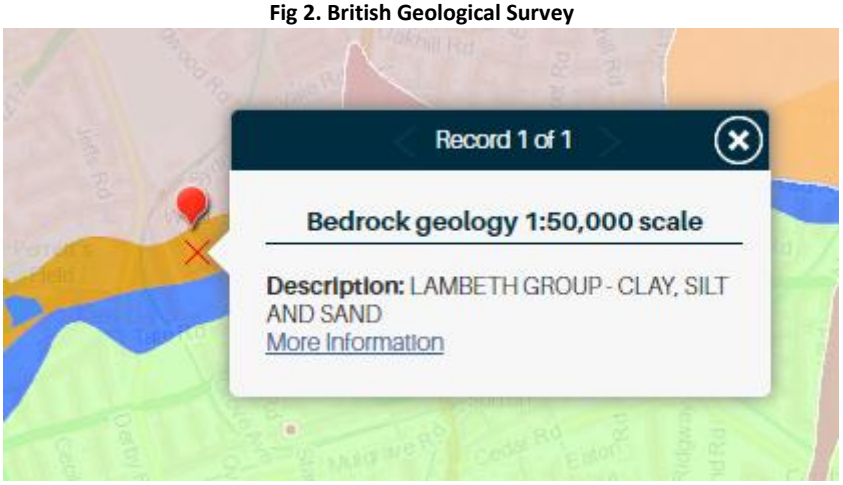
2.1 British Geological Survey information

2.1.1 The British Geological Survey confirms the bedrock geology to be made up Lambeth Group which is comprised of Clay, Silt and Sand. At the time of writing the British Geological Survey website does not have any recorded information of the Superfical deposits on site.

2.1.2 The British Geological survey also holds records of historical boreholes near the site which give some insight into the ground geology.

- Borehole TQ26SE53 (Located approx. 600m South of the site) – Clay, Sandy Clay and Chalk

Fig 2. British Geological Survey



3 Existing Drainage

3.1.1 It is not currently known how the existing site discharges surface water runoff. However, by looking at the existing detached garage on Google Street View, it is presumed that it connects into the existing foul water network utilised by 83 St James Road.

4 Proposed Drainage Strategy

4.1 SuDS Hierarchy

4.1.1 All options for the destination of run-off generated on site have been assessed in line with the SuDS hierarchy as set out in Building Regulations Part H document and DEFRA's Draft National Standards for SuDS.

Discharge Destination	
Discharge to Ground	N/A – No space on site and presence of clay makes it non-viable
Discharge to Watercourse	N/A – No watercourse available
Discharge to Surface Water Sewer	Yes – Located within St James Road. Restricted to 1.0l/s.
Discharge to Other Sewer	N/A due to above.

4.2 Surface Water Drainage

4.2.1 Based upon the information gathered from the British Geological survey, it is determined that soakaways are viable if taken down into the chalk layer which is located approximately 1mbl based upon the borehole records gathered. However, in order to account for stability issues as a result of discharging surface water runoff into chalk, the soakaway will need to be located at least 10m away from any building. Due to the small size of the proposed site, this is not achievable and as such, soakaways cannot be utilised.

4.2.2 The Thames Water sewer records confirm that there is an existing surface and foul water sewer located within St James Road. It is therefore proposed that all roof runoff is to be discharged into the surface water sewer at a restricted rate of 1.0l/s, due to the small roof area, there is no requirement for an attenuation tank to cater for the 1 in 100-year +40% storm. The proposed driveway is to be constructed from a porous material which will allow the driveway to freely drain to ground via infiltration. It is determined that there will be a small amount of infiltration within the clay layer on the site and sufficient storage within the porous sub-base of the porous paving to cater for the 1 in 100-year +40% storm. In an exceedance event, then the runoff from the proposed driveway will be captured by a channel drain and discharged into the storm water network. Approval from Thames Water under a S106 agreement is required for the proposed connection.

4.3 Foul water drainage

4.3.1 The foul water will discharge into a private foul water chamber within the boundaries of the plot which will connect into a private chamber within the boundaries of 83 St James Road. Approval from Thames Water under a S106 agreement is required for the proposed connection.

4.3.2 A CCTV survey should be undertaken to confirm if a connection onsite is possible and if remedial works are required.

5 Maintenance

5.1 Introduction

5.1.1 During construction, the Contractor will be responsible for maintaining the drainage and SuDS (Sustainable Drainage Systems). Upon handover, the occupier will take on the responsibility of these duties as laid out in this report.

5.1.2 The maintenance schedule for the proposed development will be split down into two separate categories; SuDS features and regular private drainage.

5.2 SuDS at Land to rear of 83 St James Road.

5.2.1 As listed above, in section 5.1.2, the SuDS features used on site will be **Permeable Paving.**

5.2.2 The SuDS features have been designed for easy maintenance and comprise:

- Regular Day-to-Day care – litter collection, regular gardening to control vegetation growth and checking inlets where water enters the SuDS features
- Occasional tasks – checking the SuDS features and removing any silt that builds up in the SuDS feature
- Remedial work – repairing damage where necessary

5.3 SuDS Drainage Maintenance Specification

5.3.1 Permeable Paving

In order to maintain the functioning of the permeable paving, the following maintenance requirements should be adhered to:

Table 21.3 Operation and maintenance requirements for permeable paving

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required take remedial action	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation rate and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

5.4 General Drainage Maintenance Specification

5.4.1 Inlet Structures and Inspection Chambers

- Inlet structures such as rainwater downpipes, road gullies and channel drains should be free from obstruction at all times to all free flow through the SuDS
- Inspection Chambers and Rodding Eyes are used on bends or where pipes come together. They allow access and cleaning to the system if necessary.

Inlet Structures and Inspection Chambers	
Regular Maintenance	**Frequency**
Inlet Structures **Inspect rainwater downpipes, channel drains and road gullies, removing obstructions and silt as necessary. Check that there is no physical damage.** **Strim vegetation 1m min surround to structures and keep area free from silt and debris**	Monthly
Inspections Chambers and below ground control chambers. **Remove cover and inspect, ensuring that the water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt.** **Undertake inspection after leaf fall in Autumn**	Annually
Occasional Maintenance **Check topsoil levels are 20mm above edges of chambers to avoid mower damage.**	As necessary
Remedial Work **Repair physical damage if necessary**	As required

5.4.2 Below ground drainage pipes

- Below ground drainage pipes convey water to the SuDS system. They should always be free from obstruction to allow free flow.

Below Ground Drainage Pipes	
Regular Maintenance	**Frequency**
Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months then annually
Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
Remove sediment from pre-treatment inlet structures and inspection chambers.	Annually or as required
Maintain vegetation to designed limits within the vicinity of below ground drainage pipes and tanks.	Monthly or as required
Remedial Work **Repair physical damage if necessary**	As required
Monitoring **Inspect all inlets, outlets and vents to ensure that they are in good conditions and operating as designed.**	Annually
Survey inside of pipe runs for sediment build up and remove if necessary.	Every 5 years or as required

6 Summary and Conclusions

6.1.1 CGS Civils has been instructed by KC Services Group to produce a Drainage statement under National Planning Policy Framework (NPPF) to support the Planning Application for demolition of an existing detached garage and development of a new 2-bedroom dwelling with associated access and parking.

6.1.2 The Surface Water will discharge to the local surface water sewer at a restricted rate of 1.0l/s. All roof areas are to be collected within a positive drainage network before discharging into the sewer. All hard paved areas are to be constructed from a porous material to allow them to freely drain to ground via infiltration. A channel drain is to be located on site in order to capture any further runoff from the hard paved areas. Approval from Thames water under a S106 agreement is required for this connection.

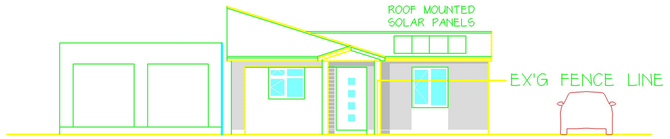
6.1.3 The Foul water will discharge into the local foul water sewer located within St James Road via an existing private chamber located on site which connects to a private chamber within the boundaries of 83 St James Road. Approval from Thames water under a S106 agreement is required for this connection.

6.1.4 The report has demonstrated that the proposed drainage measures ensure that suitable means of surface water and foul drainage can be achieved for the proposed development.

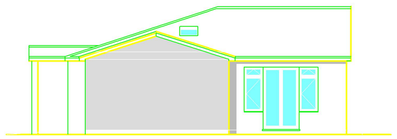
7 Appendices

7.1 Appendix A – Site Plan

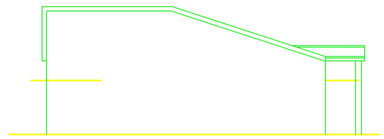
WINDOWS / DOORS: POWDER COATED ALUMINIUM



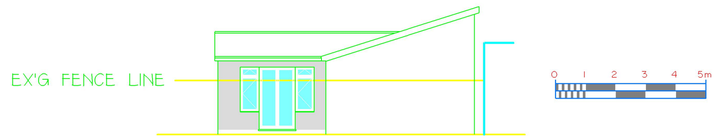
FRONT ELEVATION (FACING ST JAMES' AVE)



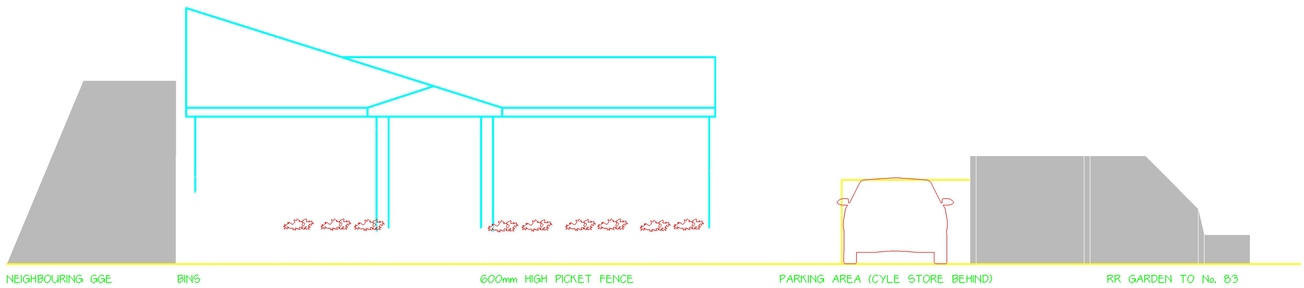
SIDE ELEVATION



SIDE ELEVATION



REAR ELEVATION

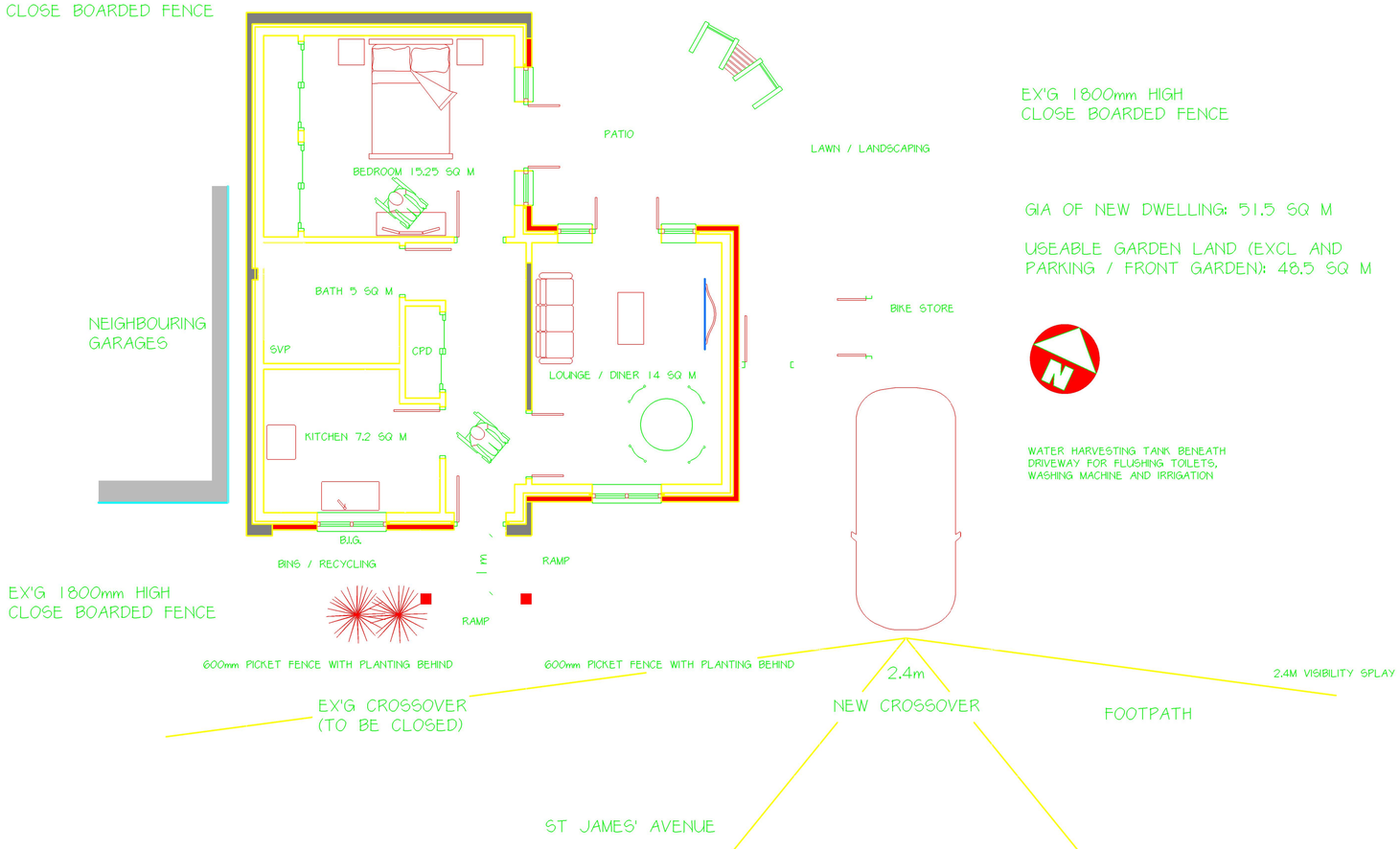


1:50 SCALE STREET SCENE ELEVATION

EX'G 1800mm HIGH
CLOSE BOARDED FENCE

VISIBLE BIKE STORE ELEVATIONS (TIMBER)

EX'G 1800mm HIGH
CLOSE BOARDED FENCE

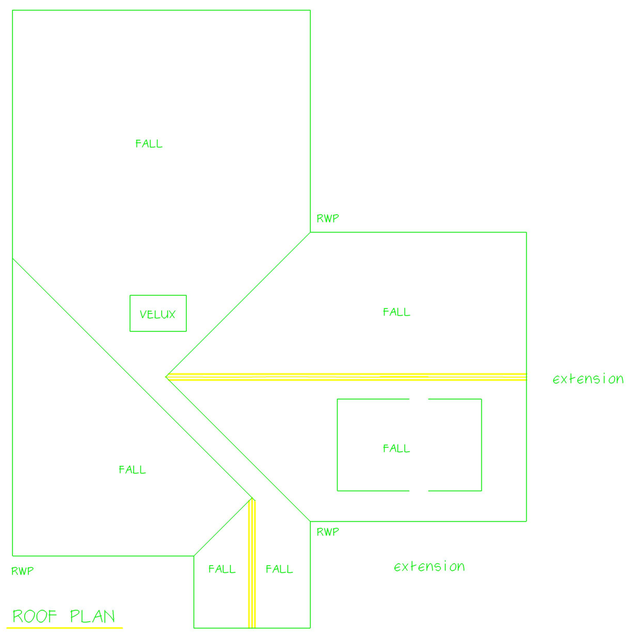


EX'G 1800mm HIGH
CLOSE BOARDED FENCE

GIA OF NEW DWELLING: 51.5 SQ M

USEABLE GARDEN LAND (EXCL AND
PARKING / FRONT GARDEN): 48.5 SQ M

WATER HARVESTING TANK BENEATH
DRIVEWAY FOR FLUSHING TOILETS,
WASHING MACHINE AND IRRIGATION



ROOF PLAN

0 1 2 3 4 5m

NUTFIELD ROAD

R/O 83 ST JAMES'S ROAD
SUTTON
SURREY
SM1 2TJ

CONVERSION AND
EXTENSION OF EX'G
GARAGE TO PROVIDE
NEW 1 BED DWELLING
PLANS / ELEVATIONS AS
EXISTING

1:50 / 1:100 @ A1

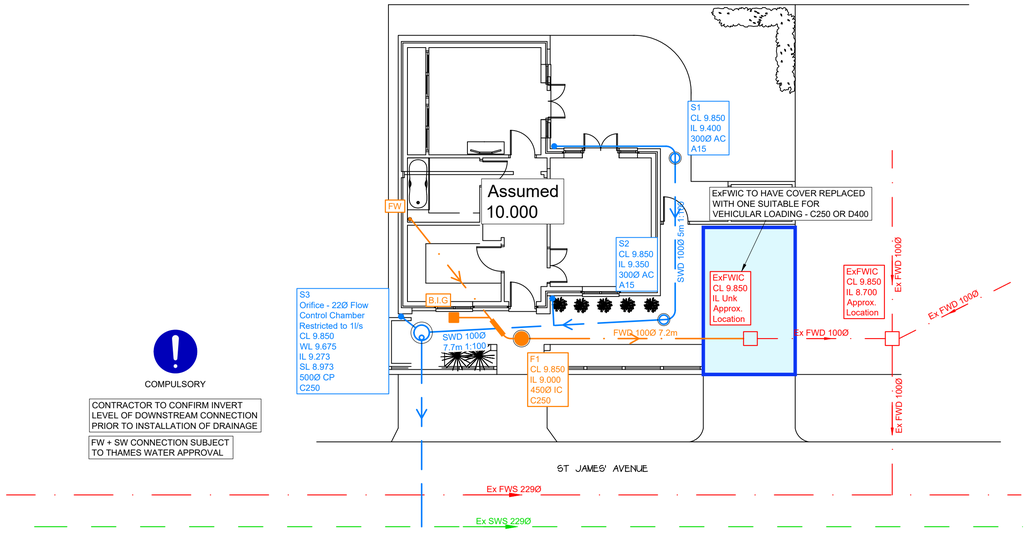
OCT 2023

835JR/23-02

7.2 Appendix B – Drainage Layout

DESIGN SUBJECT TO THE APPROVAL OF:
PLANNING AUTHORITY
BUILDING CONTROL
THAMES WATER

DESIGN SUBJECT TO THE CONFIRMATION OF:
EXTERNAL LEVELS DESIGN
LOCATION AND DEPTH OF EXISTING UTILITIES



COMPULSORY

CONTRACTOR TO CONFIRM INVERT LEVEL OF DOWNSTREAM CONNECTION PRIOR TO INSTALLATION OF DRAINAGE

FW + SW CONNECTION SUBJECT TO THAMES WATER APPROVAL

St James Road

DRAINAGE LEGEND (1:100)

EXISTING FEATURES

Ex FWD — Existing foul water sewer/drain and manhole

Ex SWD — Existing surface water sewer/drain and manhole

PROPOSED FEATURES

SWD — Storm water sewer/drain

Pipe crossing (thickening denotes pipe above)

Storm water access chamber (300Ø)

Storm water inspection chamber (450Ø)

Infiltrating porous paved parking area

CD — Channel drain

FWD — Foul water sewer/drain

Foul water inspection chamber (450Ø)

00.000 — Finished floor level

100Ø 4.5m 1:100
Z BED — PIPE INFO - DIAMETER, LENGTH, GRADIENT, BEDDING TYPE

ABBREVIATIONS

MH - MANHOLE
IC - INSPECTION CHAMBER
AC - ACCESS CHAMBER
CP - CATCHPIT
BC - BRAKE CHAMBER
RE - RODDING EYE
IL - INVERT LEVEL
SL - SUMP LEVEL
CL - COVER LEVEL

STANDARD DRAINAGE NOTES

1. DO NOT SCALE FROM THIS DRAWING, REFER TO FIGURED DIMENSIONS ONLY. THE CONTRACTOR SHOULD CHECK ALL DIMENSIONS ON SITE.
2. ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECT AND ENGINEERING DETAILS, DRAWINGS AND SPECIFICATIONS.
4. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ARCHITECT AND/OR ENGINEER IMMEDIATELY, SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.
5. BEFORE COMMENCING CONSTRUCTION THE CONTRACTOR MUST CHECK THE INVERT LEVELS OF EXISTING SEWERS TO WHICH CONNECTIONS ARE MADE. IN ADDITION THE CONTRACTOR MUST LOCATE AND DETERMINE INVERT LEVELS OF THE EXISTING SPURS TO WHICH CONNECTIONS ARE PROPOSED. ANY DISCREPANCIES ARE TO BE NOTIFIED TO THE ENGINEER IMMEDIATELY, PRIOR TO CONSTRUCTION.
6. ALL DRAINAGE WORKS SHOULD COMMENCE AT THE PROPOSED DOWNSTREAM CONNECTION POINT, THE WORKS CONTINUING UPSTREAM FOLLOWING CONFIRMATION OF THE TIE-IN INVERT LEVELS TO THE ENGINEER. CONNECTIONS TO MANHOLES OR LARGER SIZED PIPES ETC. SHOULD BE SOFFIT TO SOFFIT UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER, IF THIS IS NOT POSSIBLE INFORM THE ENGINEER IMMEDIATELY.
7. COVER LEVELS SHOWN ARE APPROXIMATE. COVERS AND FRAMES SHALL BE SET TO FINISHED GROUND LEVELS AND FALLS.
8. ALL UN-REFERENCED PIPES ARE TO BE 100mm DIA
9. ALL PIPES TO BE ADOPTED, OR CONNECTING TO ADOPTED SEWERS, TO BE VITRIFIED CLAY TO BS EN 295 AND BS65 (SWS ONLY), OR CONCRETE PIPES TO BE EN 1916 AND BS5911:PART 1.
10. ROAD GULLY OUTLET PIPES ARE TO BE 150mm DIA. WITH CONCRETE SURROUND AND FLEXIBLE JOINTS. ALL GULLIES SHALL BE FITTED WITH GRADE D400 GRATINGS AND FRAMES TO BS EN124, UNLESS OTHERWISE STATED.
11. ALL ADOPTABLE SEWERS SHALL BE CONSTRUCTED TO THE STANDARDS AND SPECIFICATION LAID DOWN DOWN IN 'SEWERS FOR ADOPTION' 6th EDITION, WITH A VIEW TO ADOPTION UPON COMPLETION OF WORKS.
12. ALL PRIVATE DRAINAGE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS APPROVED DOCUMENT PART-H, AND TO THE SATISFACTION OF THE BUILDING CONTROL INSPECTOR.
13. THE CONTRACTOR IS TO KEEP A RECORD OF ANY VARIATIONS MADE ON SITE, INCLUDING THE RELOCATION OF SEWERS OR DRAINS, SO THAT AN AS CONSTRUCTED DRAWING CAN BE PREPARED UPON COMPLETION OF THE PROJECT.
14. STUB CONNECTIONS TO ADOPTABLE MANHOLES SHALL BE MADE FROM VITRIFIED CLAY AND CONSIST OF TWO ROCKER PIPES LAID AT THE SAME GRADIENT AS THE UP OR DOWNSTREAM PIPE.
15. IF ANY SUB SOIL DRAINAGE SYSTEMS ARE UNCOVERED DURING THE WORKS CONTACT THE ENGINEER FOR INSTRUCTIONS. SUB SOIL DRAINS ARE TO BE DIVERTED AROUND NEW WORKS AND CONNECTED INTO THE SURFACE WATER.
16. NO PRIVATE AREAS ARE TO DRAIN ONTO ADOPTABLE AREAS AND VICE VERSA.
17. ALL EXISTING MANHOLE COVER'S, GULLIES, ETC, ARE TO BE RAISED/LOWERED TO SUIT NEW LEVELS.
18. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM THE LOCATION AND DEPTH OF ALL EXISTING SERVICES AND UTILITIES THAT MAY BE PRESENT
19. UPON COMPLETION BUT PRIOR TO HANDOVER, CONTRACTOR TO CARRY OUT FULL CCTV SURVEY OF DRAINAGE SYSTEM WHICH IS TO BE REVIEWED BY ENGINEER TO ENSURE SATISFACTORY INSTALLATION
20. MANHOLE AND CHAMBER COVER GRADES:

- 'A15' IN ALL LANDSCAPED AREAS AND ON FOOTPATHS
- 'B125' IN ALL DRIVEWAYS
- 'C250' IN PRIVATE PARKING AREAS
- 'D400' IN CARRIAGEWAY/ACCESS ROAD

Prefixed to drawing numbers shall signify the following:-

PL = PLANNING	Shall not be used for contract or construction purposes
P = PRELIMINARY	Shall not be used for contract or construction purposes
T = TENDER	Shall not be used for construction purposes
C = CONSTRUCTION	These are the only drawings that shall be used for construction purposes
R = RECORD	Record of actual completed work

REV	DATE	DESCRIPTION	BY	CHK	APP
PL1	06.12.23	REVISED TO SUIT NEW SITEPLAN	LH	CS	CS
PL-	03.10.22	PRELIMINARY ISSUE	LH	CS	CS

FOR PLANNING ONLY

cgs civils
Consulting Civil Engineers

CLIENT: KC SERVICES GROUP

ARCHITECT: NUTFIELD ROAD ARCHITECTS

JOB TITLE: LAND TO REAR OF 83 ST JAMES ROAD SUTTON, SURREY

DRAWING TITLE: DRAINAGE STRATEGY

DRAWN	ENGINEER	CHECKED	APPROVED
LH	C SLADE	CS	CS

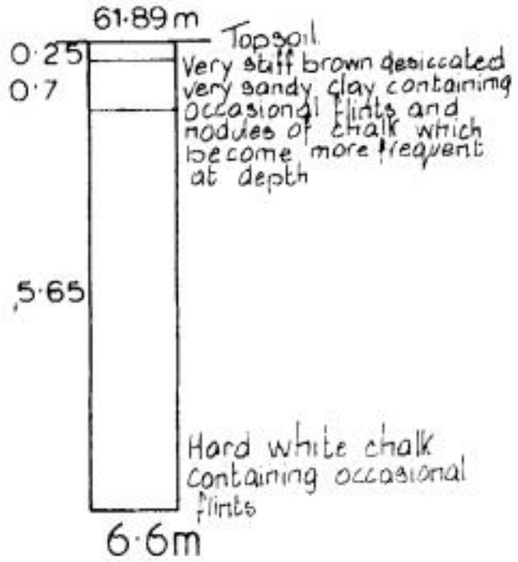
DATE	SCALE @ A1
OCT 2022	1:100

JOB No.	STATUS	DRAWING No.	REV.
C2364	PL	100	PL1

7.3 Appendix C – Borehole Logs

TQ26SE/53
2552.6376

1



TQ26SE/54
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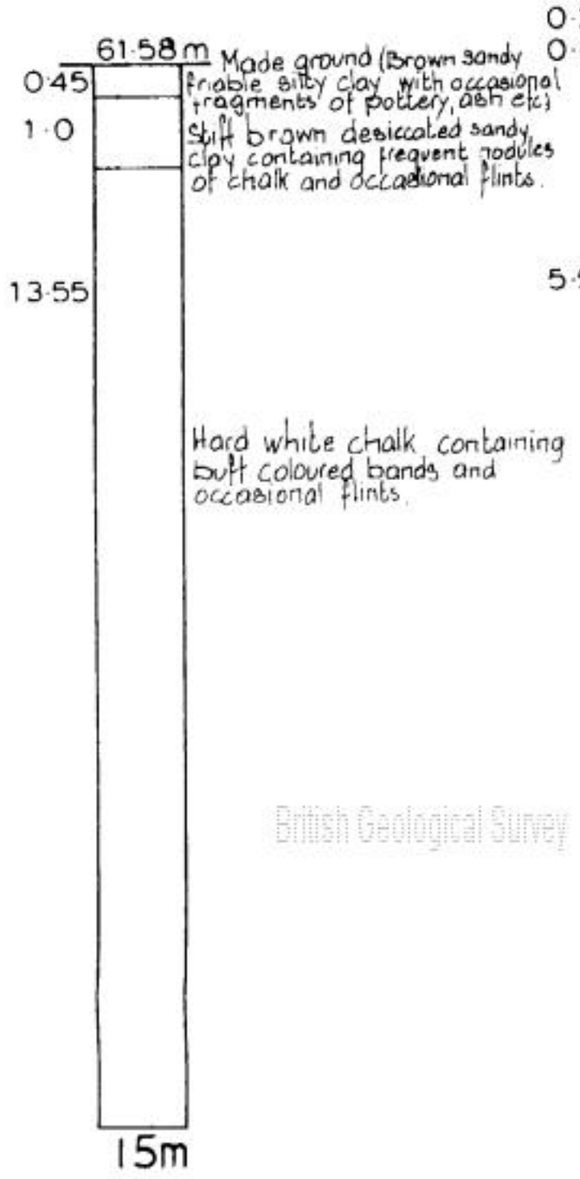

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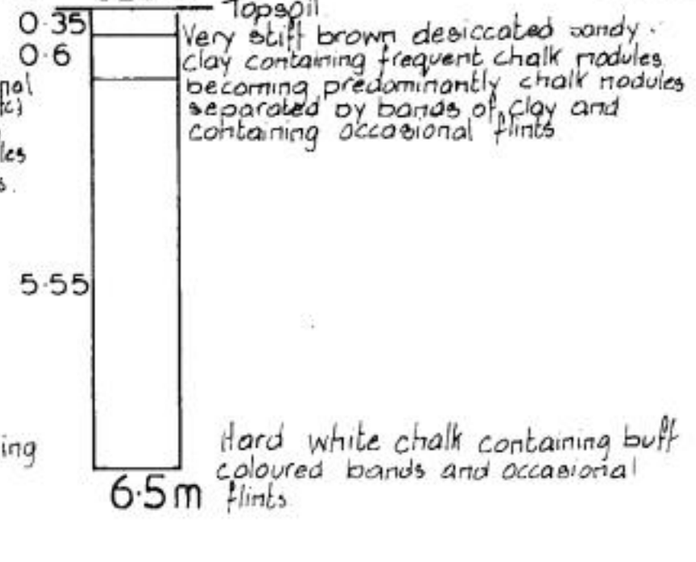

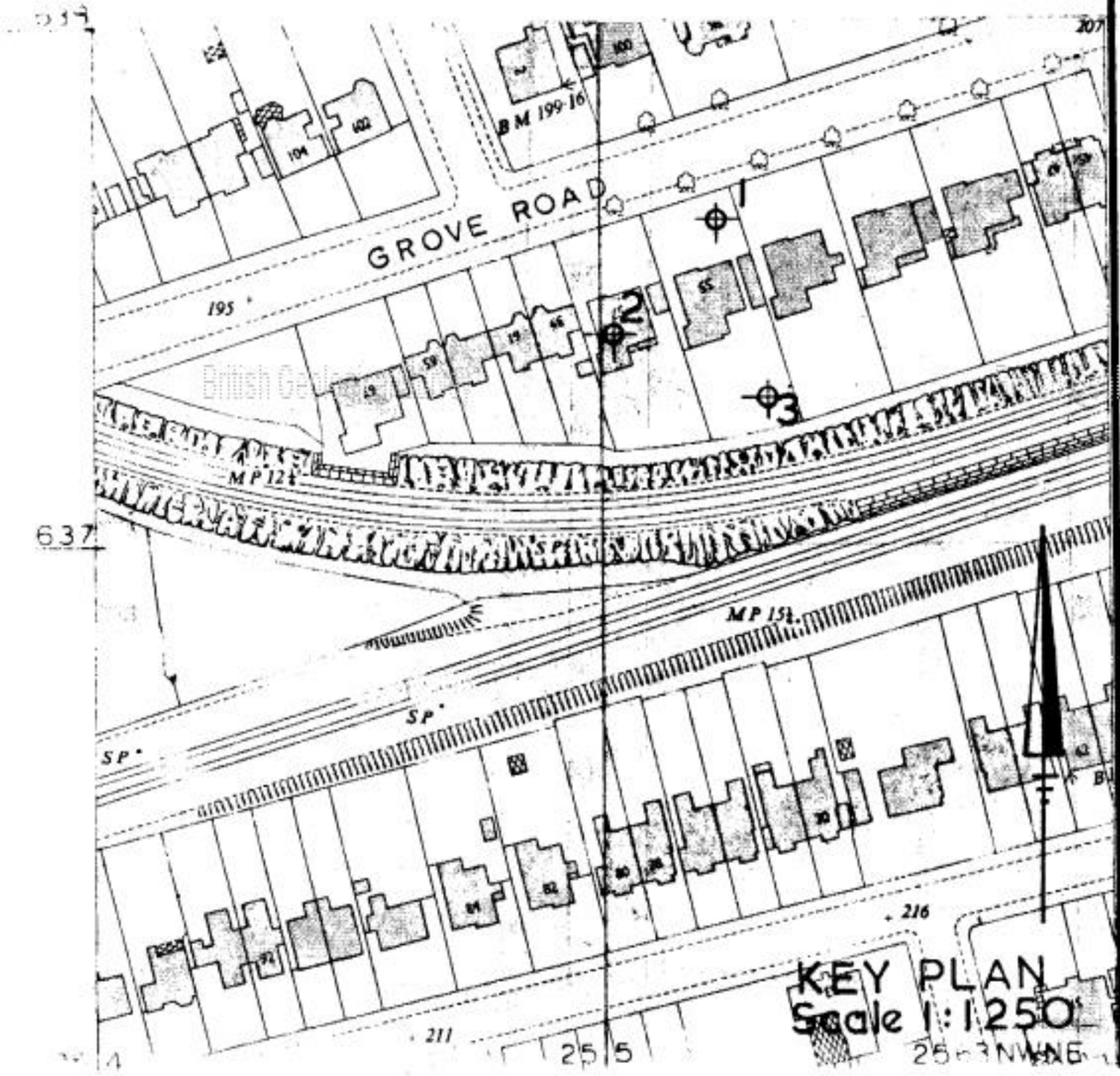

KEY PLAN
Scale 1:1250
25-3 NW NE

job no HO | drawing no 01

GLC ILEA

Department of Architecture and Civic Design
County Hall SE1 7PB

Architect Sir Roger Walters
KSG FRIBA FI Struct E

site ref | drawn | checked | section ref

telephone 01-633-8337

Architect

Notes

1. Newlyn Datum Levels
2. ⊕ Trial Borings
3. Water not encountered in October 1974

revisions | date

job 55, 57. Grove Road

SUTTON

title TRIAL BORINGS 1. 2. 3.

KEY PLAN & SECTIONS

scale VERTICAL 1:100 | date 13.12.1974

block | storey | section | room

job no HO | drawing no 01

bldg type | space | element | feature | material | key

7.4 Appendix D – Surface Water Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	0.350
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.003	5.00	9.850	300	-6.909	3.600	0.450
S2			9.850	300	-7.281	-8.875	0.500
S3	0.003	5.00	9.850	450	-15.187	-9.304	0.577
OUTFALL	0.000		9.850	450	-15.187	-15.634	0.640

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S1	S2	12.481	0.600	9.400	9.350	0.050	249.6	100	5.43	50.0
1.001	S2	S3	7.918	0.600	9.350	9.273	0.077	102.8	100	5.61	50.0
1.003	S3	OUTFALL	6.330	0.600	9.273	9.210	0.063	100.0	100	5.74	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.482	3.8	0.4	0.350	0.400	0.003	0.0	22	0.313
1.001	0.758	6.0	0.4	0.400	0.477	0.003	0.0	18	0.426
1.003	0.769	6.0	0.8	0.477	0.540	0.006	0.0	25	0.531

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	12.481	249.6	100	Circular	9.850	9.400	0.350	9.850	9.350	0.400
1.001	7.918	102.8	100	Circular	9.850	9.350	0.400	9.850	9.273	0.477
1.003	6.330	100.0	100	Circular	9.850	9.273	0.477	9.850	9.210	0.540

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	300	Manhole	Adoptable	S2	300	Manhole	Adoptable
1.001	S2	300	Manhole	Adoptable	S3	450	Manhole	Adoptable
1.003	S3	450	Manhole	Adoptable	OUTFALL	450	Manhole	Adoptable

Node S3 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.422	Discharge Coefficient	0.650
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	9.273	Diameter (m)	0.026		

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	S1	24	9.720	0.320	1.5	0.0653	0.0000	FLOOD RISK
30 minute winter	S2	25	9.719	0.369	1.0	0.0262	0.0000	FLOOD RISK
30 minute winter	S3	24	9.718	0.445	1.6	0.1171	0.0000	FLOOD RISK
15 minute summer	OUTFALL	1	9.210	0.000	0.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	S1	1.000	S2	1.0	0.374	0.263	0.0977	
30 minute winter	S2	1.001	S3	0.6	0.135	0.100	0.0620	
30 minute winter	S3	Orifice	OUTFALL	1.0				2.3