



Flood Risk Assessment and Sustainable Drainage Strategy

Land South of 13 Tennyson Crescent, Waterloooville

October 2025

Project Number: 25220
Doc Number: 25220-FCE-XX-XX-RP-D-0001

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1. Introduction

- 1.1
- Fernbrook Consulting Engineers has been appointed by the applicant to provide a Flood Risk Assessment and Sustainable Drainage Strategy for the proposed development at Land South of 13 Tennyson Crescent, Waterloooville, PO7 6AE.
- 1.2
- This report has been prepared with specific reference to the requirements of the National Planning Policy Framework (NPPF) and the Planning Practice Guidance (PPG). This report also takes into consideration the requirements of the Local Flood Risk Management Strategy, the Non-Statutory Technical Standards for Sustainable Drainage Systems and CIRIA C753 The SuDS Manual.

Site Characteristics

- 1.3
- Refer to **Table 1-1** below for details of the site and the site location plan shown in **Figure 1-1** below.

Table 1-1 Site Details

Site Address	Land South of 13 Tennyson Crescent, Waterloooville, PO7 6AE
Grid reference	467922 mE, 110459 mN (SU 67922 10459)
Topography	Generally flat
Geology	Head over London Clay
Site Area	0.038 ha
Access	Macaulay Road

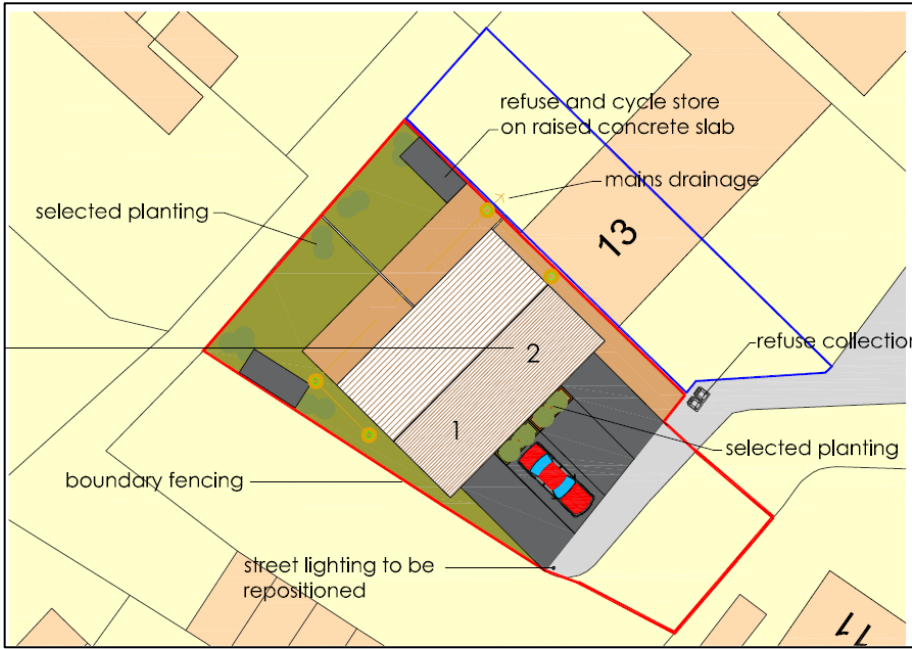
Figure 1-1 Site Location Plan



Development Proposals

- 1.4
- The proposed development is comprised of the Construction of 2No three bedroom dwellings with associated parking soft and hard landscaping, refuse and cycle store on land to the south of 13 Tennyson Crescent. Refer to **Figure 1.2** below for the proposed plan, and the full plans are included in **Appendix A**.

Figure 1-2 Proposed Development Plan



2. Baseline Conditions

Geology

- 2.1 Based on the British Geology Survey (BGS) online data, the site appears to be underlain by Head (Clay, silt and gravel) over London Clay. Refer to **Figure 2-1** below for an excerpt of the BGS map.

Figure 2-1 Bedrock Geology



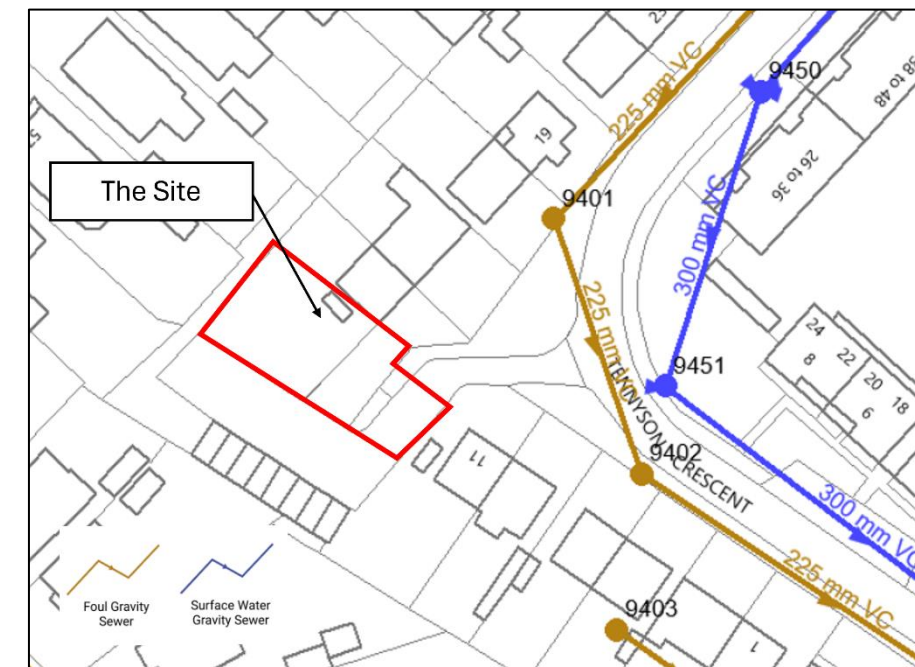
Hydrology

- 2.2 There are no watercourses in proximity of the site.

Existing Sewer Infrastructure

- 2.3 Based on the Southern Water sewer records, there appears to be separate foul and surface water sewers serving the properties along Tennyson Crescent. Refer to **Figure 2-2** below and **Appendix B** for Southern Water sewer records.

Figure 2-2 Thames Water Sewer Record Extract



3. Flood Risk Assessment

Flooding from River and Sea (Fluvial/Tidal Flooding)

- 3.1 The latest online Environment Agency flood zone map for planning shows that the site is in Flood Zone 1 (low probability).

Flooding from Surface Water (Pluvial)

- 3.2 Based on the Environment Agency flood data, the site appears to be at risk of surface water flooding. Refer to **Figure 3-1** below.

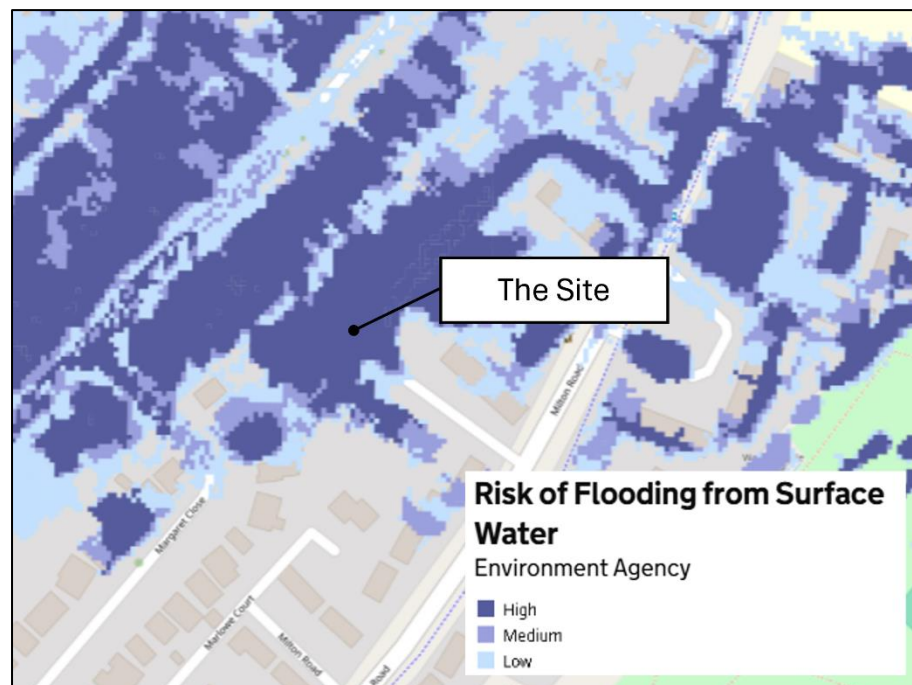


Figure 3-1 Risk of flooding from surface water

- 3.3 Based on the broad nature of the national data, it is also unlikely that the flood data will take account of the existing boundary walls, kerbs and drainage system on the site. – including gullies in the access road and parking area, refer to Figure 3-2 below.



Figure 3-2 Highway Gully

- 3.4 Therefore, the risk will likely be lower in reality. Post-development, surface water will also be managed through a sustainable drainage system (SuDS).
- 3.5 Based on the flood data, the maximum flood depth on site appears to be 300mm, which can be mitigated by raising FFLs 300mm above the adjacent external ground. Refer to **Figure 3-3** below.

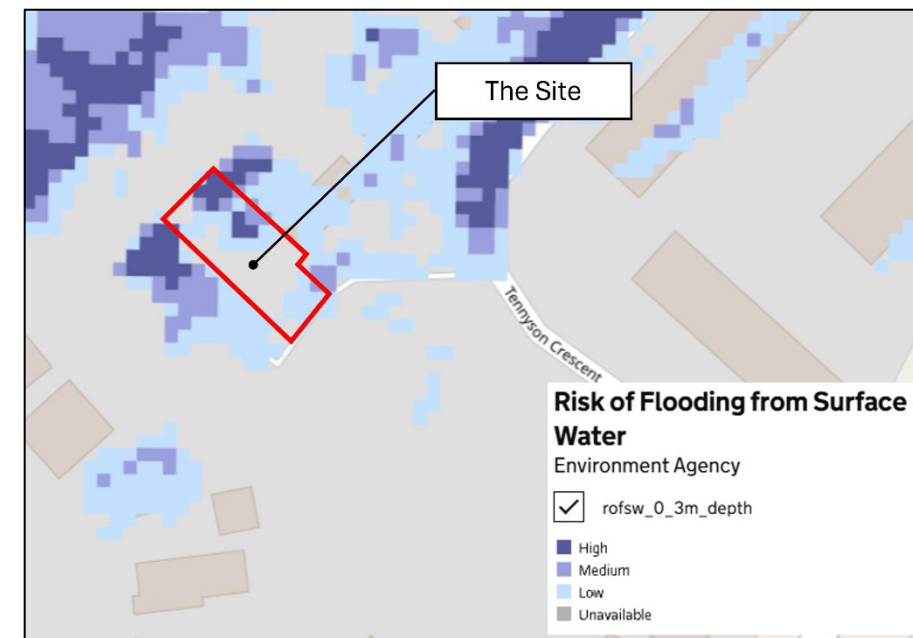


Figure 3-3 Risk of flooding from surface water – 300mm depth

- 3.6 Therefore, the risk of surface water flooding is assessed as low.

Flooding from Groundwater

- 3.7 Based on Defra's Magic Map application the site has low vulnerability to groundwater, refer to **Figure 3-4** below. Therefore, the risk of groundwater flooding is assessed as low.

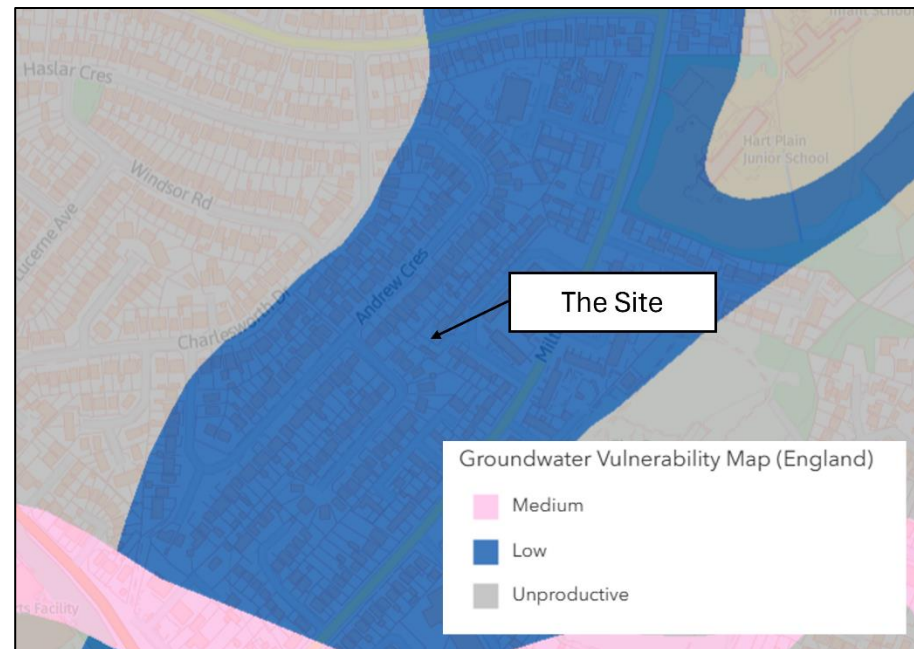


Figure 3-4 Groundwater Vulnerability Map

Flooding from Artificial Sources

- 3.8 The EA Long Term Flood Map has confirmed the site is not in a risk of reservoir flooding. Therefore, the risk of artificial flooding is considered to be very low.

4. Surface Water Management

- 4.1 This section of the report seeks to provide greater detail on the drainage proposals to demonstrate that surface water can be managed without increasing flood risk on site or elsewhere.

Pre-development surface water run-off conditions

- 4.2 The total site area is 403m² and to ensure that pre-development runoff rates are not exceeded, the greenfield runoff rates were calculated. Refer to **Table 4-1** below for results, and **Appendix C** for calculations.

Table 4-1 Pre-development runoff rates

Rainfall event	Greenfield Runoff rate (l/s)
Q2	0.3
Q30	0.8
Q100	1.1

Peak Flow Control

- 4.3 Surface water runoff will be managed by conveying flows from the site to the Southern Water 300mm dia. surface water sewer in Tennyson Crescent. Where feasible existing connections serving 13 Tennyson Crescent will be utilised, although the existing sewer is deep enough to facilitate a new gravity connection if required.
- 4.4 Surface water flows from the site will be restricted to a maximum of 1.1 l/s (Q100 greenfield rate) for all events up to the 1 in 100 year plus climate change scenario.

Sustainable Drainage Systems (SuDS)

- 4.5 Based on the SuDS Hierarchy, the most appropriate SuDS for this development are rainwater butts and permeable paving, refer to **Figure 4-1** below for an indicative image of a permeable paving.

Figure 4-1 Indicative Green Roof



Storage Requirements

- 4.6 In accordance with the NPPF, the proposed residential development will allow a 40% increase to rainfall intensity to allow for predicted impacts of climate change on surface water runoff.
- 4.7 Permeable paving with a geo-cellular sub-base sized 56m² x 0.3m deep, with a 95% void ratio, would provide the required 16m³ of storage to ensure surface water runoff is managed without any flooding for all events up to the 1 in 100 year plus climate change scenario.
- 4.8 Refer to **Table 4-2** for the simulation summary and **Appendix C** for MicroDrainage calculations and drawing **25220-FCE-XX-XX-DR-D-0500** illustrating how the Site could be drained.

Table 4-2 Simulation summary

Return period	Volume (m ³)	Discharge rate (l/s)
1 in 1 year	2.7	0.9
1 in 30 year + 35% CC	11.8	1.0
1 in 100 year + 40% CC	16.6	1.1

- 4.9 In accordance with the Non-statutory Technical Guidance for Sustainable Drainage Systems, the post-development discharge rate does not exceed the rate of discharge from the development prior to redevelopment. Therefore, the risk of flooding from impermeable areas is assessed as low.

Maintenance

4.10 The maintenance of all SuDS components will be in accord with the best practices and the CIRIA C753 The SuDS Manual. he recommended Operation and Maintenance requirements for the proposed drainage system are outlined in Error! Reference source not found.. Refer to **Appendix D** for a recommended SuDS Management Plan.

Table 4-3 SuDS Management Plan

Maintenance Task	Description	Frequency
Regular Maintenance		
Litter management	Pick up all litter in garden and remove from site	Monthly
Inlets and outlets	Inspect monthly, remove silt from slab aprons and debris. Strim 1m round for access	Monthly
Hard surfaces	Sweep all paving regularly.	As required
Occasional tasks		
Inspection and control chambers	Annual inspection, remove silt and check free flow	Annually
Remedial work		
Repairs	Inspect SuDS system regularly to check for damage or failure. Undertake remedial work as required.	As required

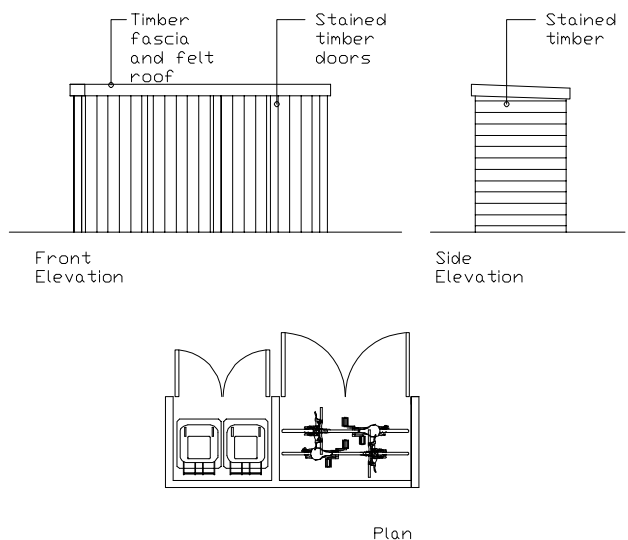
5. Conclusion

- 5.1 Fernbrook Consulting Engineers has been appointed by the applicant to provide a Flood Risk Assessment and Sustainable Drainage Strategy for the proposed development at Land South of 13 Tennyson Crescent, Waterloooville, PO7 6AE.
- 5.2 The proposed development is comprised of the Construction of 2No three bedroom dwellings with associated parking soft and hard landscaping, refuse and cycle store on land to the south of 13 Tennyson Crescent
- 5.3 Based on the Environment Agency's (EA) Flood map for planning the site appears to be located in Flood Zone 1, low risk. All other sources of flooding are assessed as low.
- 5.4 Based on the SuDS Hierarchy, the most appropriate SuDS for this development are rainwater butts and permeable paving
- 5.5 Surface water flows from the site will be restricted to a maximum of 1.1 l/s (Q100 greenfield rate) for all events up to the 1 in 100 year plus climate change scenario. Permeable paving with a geo-cellular sub-base sized 56m² x 0.3m deep, with a 95% void ratio, would provide the required 16m³ of storage to ensure surface water runoff is managed without any flooding for all events up to the 1 in 100 year plus climate change scenario.
- 5.6 In conclusion, this report demonstrates that the proposals are consistent with the aims of the NPPF and its Planning Practice Guidance, along with the aims of the Local Flood Risk Management Strategy and the London Plan. Surface water runoff can be adequately managed without increasing the risk of flooding on site or elsewhere.

APPENDIX A – PROPOSED DEVELOPMENT PLANS

All dimensions to be checked on site prior to commencement of any construction works. Figured dimensions are to be used in preference to scaled dimensions.

Refuse & Cycle Store

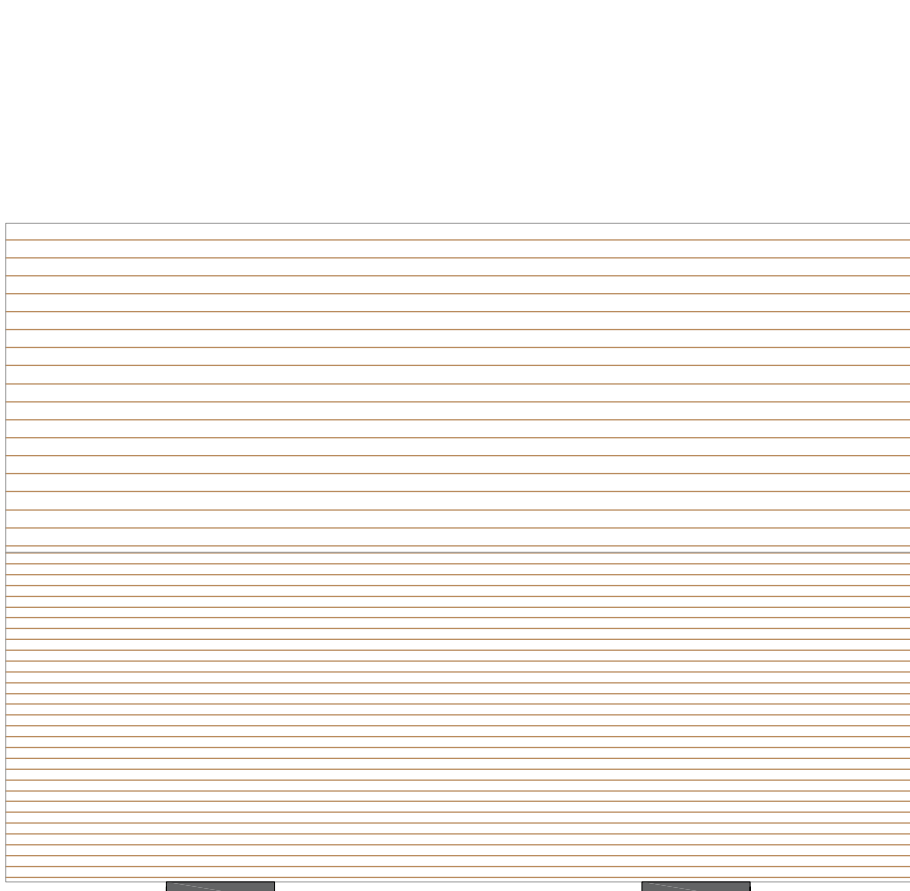


Materials Schedule

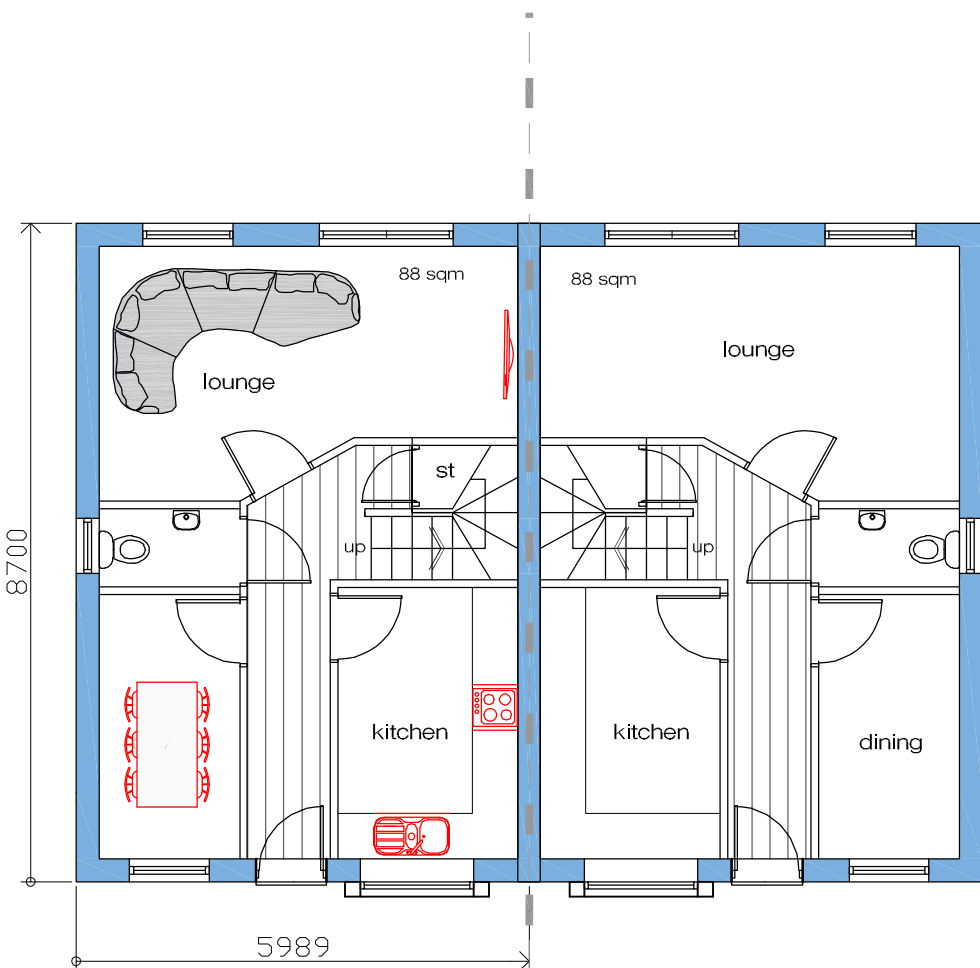
- A Stock facing brick
- B UPVc double glazed windows and doors
- C Smooth through colour render
- D Composite cladding
- E Concrete interlocking tile
- F Plastic fascia and soffit

Schedule of Accommodation

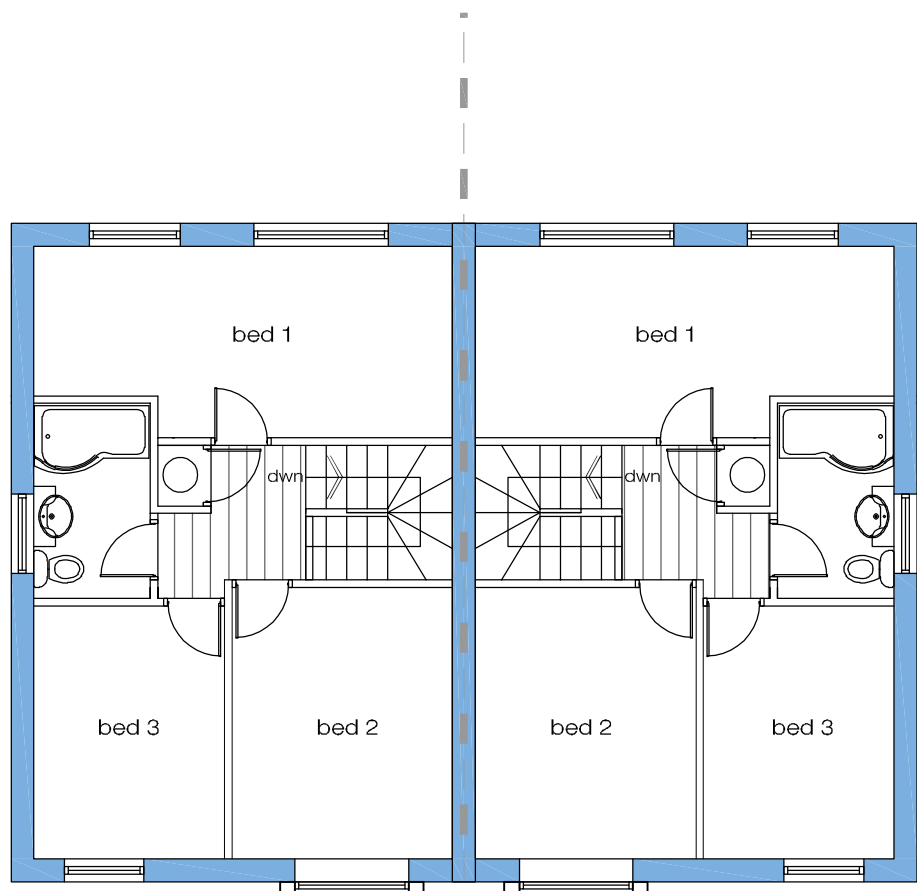
2 x 3 bedroom 4 person @ 88 sqm per property



Proposed Roof Plan

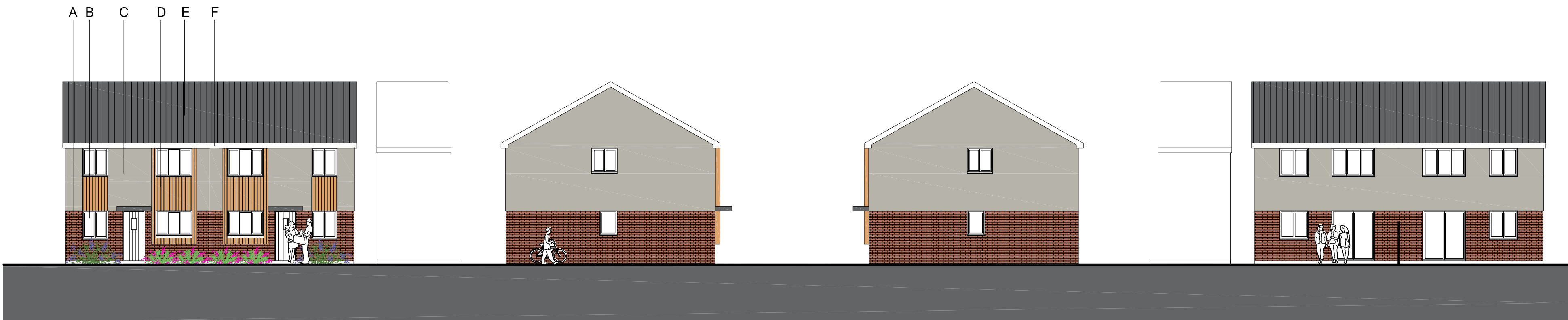


Proposed Ground Floor Plan



Proposed First Floor Plan

Scale In Metres
0 1 2 3 4 5 for 1:100

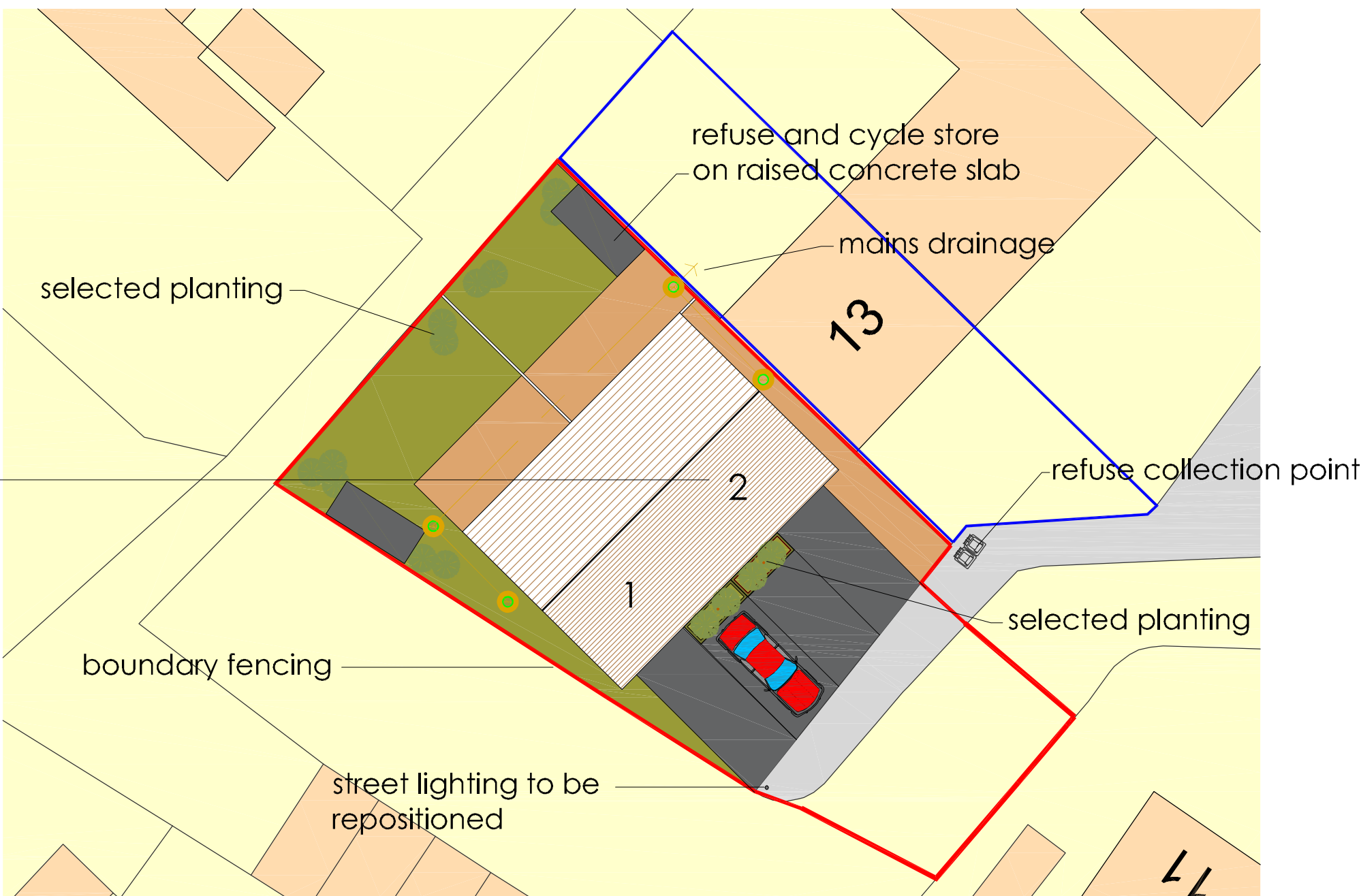


South East Elevation

South West Elevation

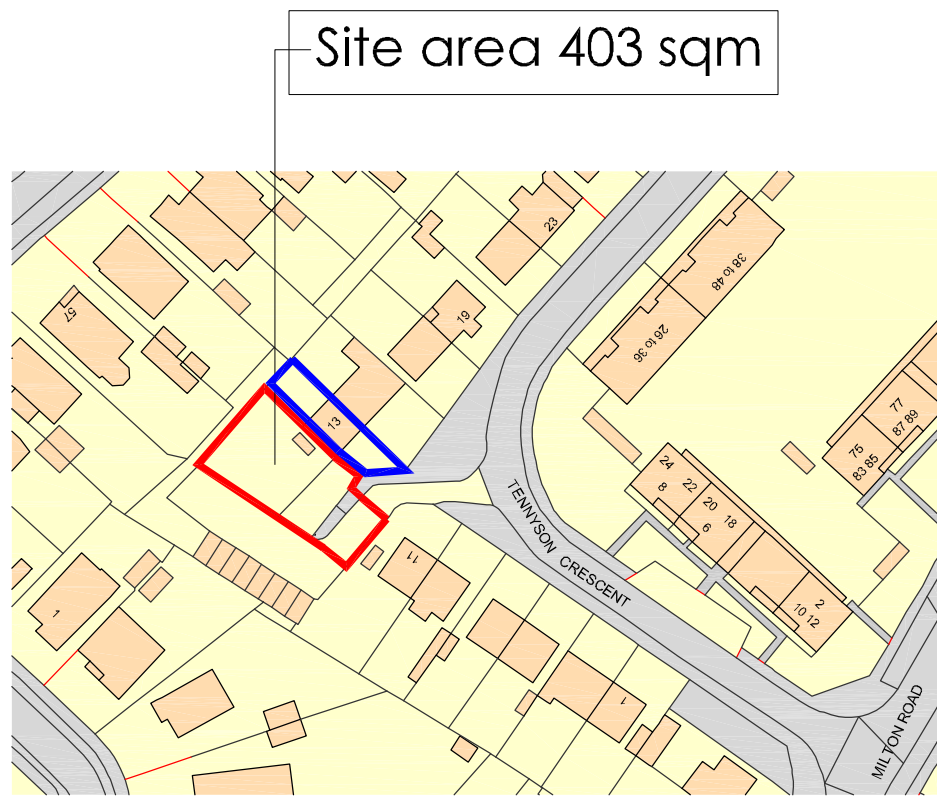
North East Elevation

North West Elevation



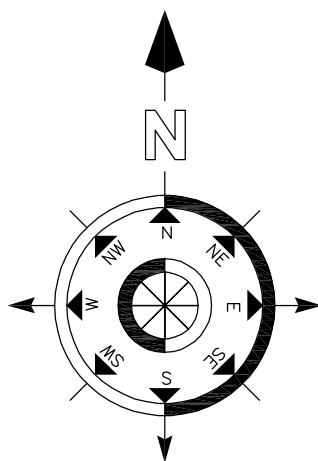
Proposed Dwellings

Scale In Metres
0 1 2 3 4 5 10 for 1:200



Site area 403 sqm

Scale In Metres
0 10 20 30 40 50 60 for 1:1250



Scale In Metres
0 10 20 30 40 50 60 for 1:1250
Scale In Metres
0 5 10 15 20 25 for 1:500
Scale In Metres
0 1 2 3 4 5 10 for 1:200
Scale In Metres
0 1 2 3 4 5 for 1:100
Scale In Metres
0 1 2 for 1:50
Scale In Metres
0 0.5 1 for 1:20
Scale In Metres
0 0.5 for 1:10

01	redline update	April 25	CRF
Revision:	Description:	Date:	DRAWN:
Project:			
Land to the South of 13 Tennyson Crescent Waterlooville Hants			

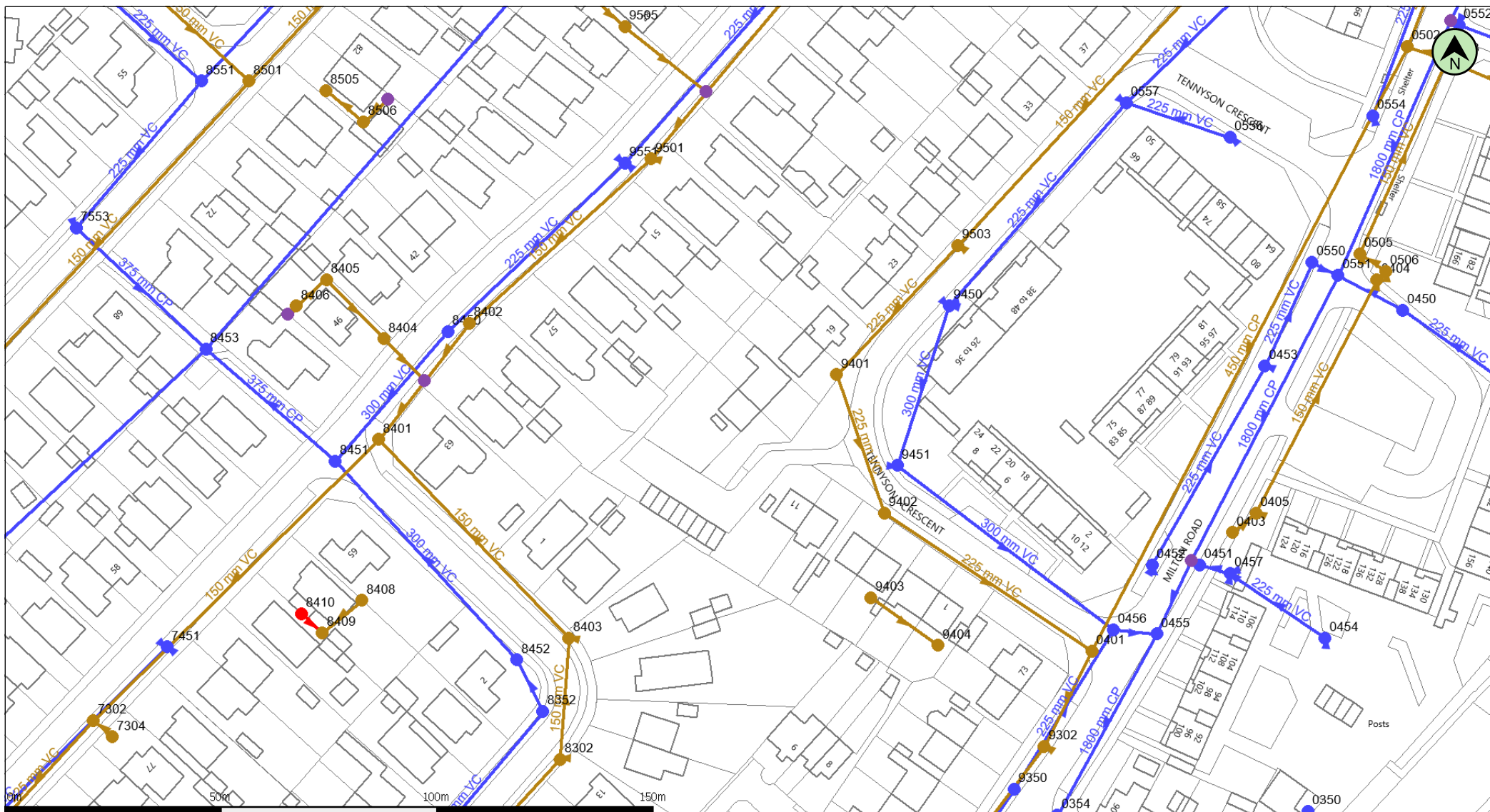
Drawing Title:
Proposed Dwellings

Chris Flint Associates Ltd			
CHARTERED SURVEYORS - PROJECT MANAGERS DEVELOPMENT CONSULTANTS			

Drawn By	Date	SHEET SIZE	Approved By	Date
CF	01/01/25	A1		
CFA	Drawing No.	Revision:	Scale:	
	FULL	01	1-100	

PLANNING			
BEECHWOOD - 20 QUEENS ROAD - WATERLOOVILLE - PO7 7SB tel: 023 92 432484 fax: 023 92 358554 Email: chrisflintassociates@gmail.com			

APPENDIX B – SOUTHERN WATER RECORDS

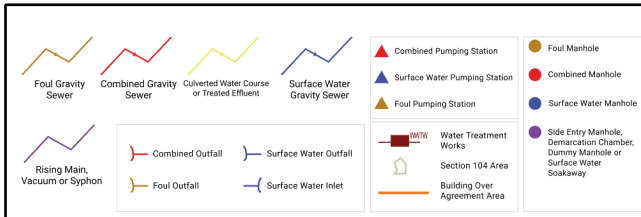


(c) Crown copyright and database rights 2025 Ordnance Survey AC0000808122 Date: 15/09/25 Scale: 1:1250 Map Centre: 467930,110469 Data updated: 21/08/25 Our Ref: 1879261 - 1 Wastewater Plan A4 Powered by digdat

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 2025 Ordnance Survey AC0000808122. 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.



dominic.ramdeen@fernbrook.co

25220



Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
8410	C	0.00	0.00	-
0401	F	41.14	37.64	-
0403	F	41.15	0.00	-
0404	F	41.21	39.41	-
0405	F	41.47	39.89	-
0502	F	40.71	38.21	-
0503	F	40.99	38.90	-
0505	F	40.88	39.28	-
0506	F	41.18	39.37	-
7302	F	38.92	36.12	-
7304	F	0.00	0.00	-
8302	F	39.75	37.39	-
8401	F	39.38	36.41	-
8402	F	39.63	36.74	-
8403	F	39.68	36.91	-
8404	F	0.00	0.00	-
8405	F	0.00	0.00	-
8406	F	0.00	0.00	-
8408	F	0.00	0.00	-
8409	F	0.00	0.00	-
8501	F	39.43	36.63	-
8505	F	0.00	0.00	-
8506	F	0.00	0.00	-
9302	F	41.62	37.61	-
9401	F	39.84	38.40	-
9402	F	40.23	38.30	-
9403	F	0.00	0.00	-
9404	F	0.00	0.00	-
9501	F	39.81	37.06	-
9503	F	39.81	38.67	-
9505	F	0.00	0.00	-
0350	S	42.11	0.00	-

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0354	S	41.89	35.46	-
0450	S	41.25	39.40	-
0451	S	41.32	39.42	-
0452	S	41.13	39.45	-
0453	S	40.78	39.23	-
0454	S	41.49	39.74	-
0455	S	41.57	35.58	-
0456	S	41.09	37.55	-
0457	S	41.44	39.63	-
0550	S	40.73	38.97	-
0551	S	40.79	35.95	-
0552	S	40.88	35.88	-
0554	S	40.73	39.93	-
0556	S	40.51	39.13	-
0557	S	40.21	38.95	-
7451	S	39.01	37.66	-
7553	S	39.04	37.09	-
8352	S	39.80	0.00	-
8450	S	39.56	37.63	-
8451	S	39.31	37.36	-
8452	S	39.63	0.00	-
8453	S	38.97	36.76	-
8551	S	39.27	37.27	-
9350	S	41.71	40.16	-
9450	S	39.75	38.65	-
9451	S	40.40	38.73	-
9551	S	39.78	38.28	-

APPENDIX C – DRAINAGE STRATEGY CALCULATIONS & DRAWINGS

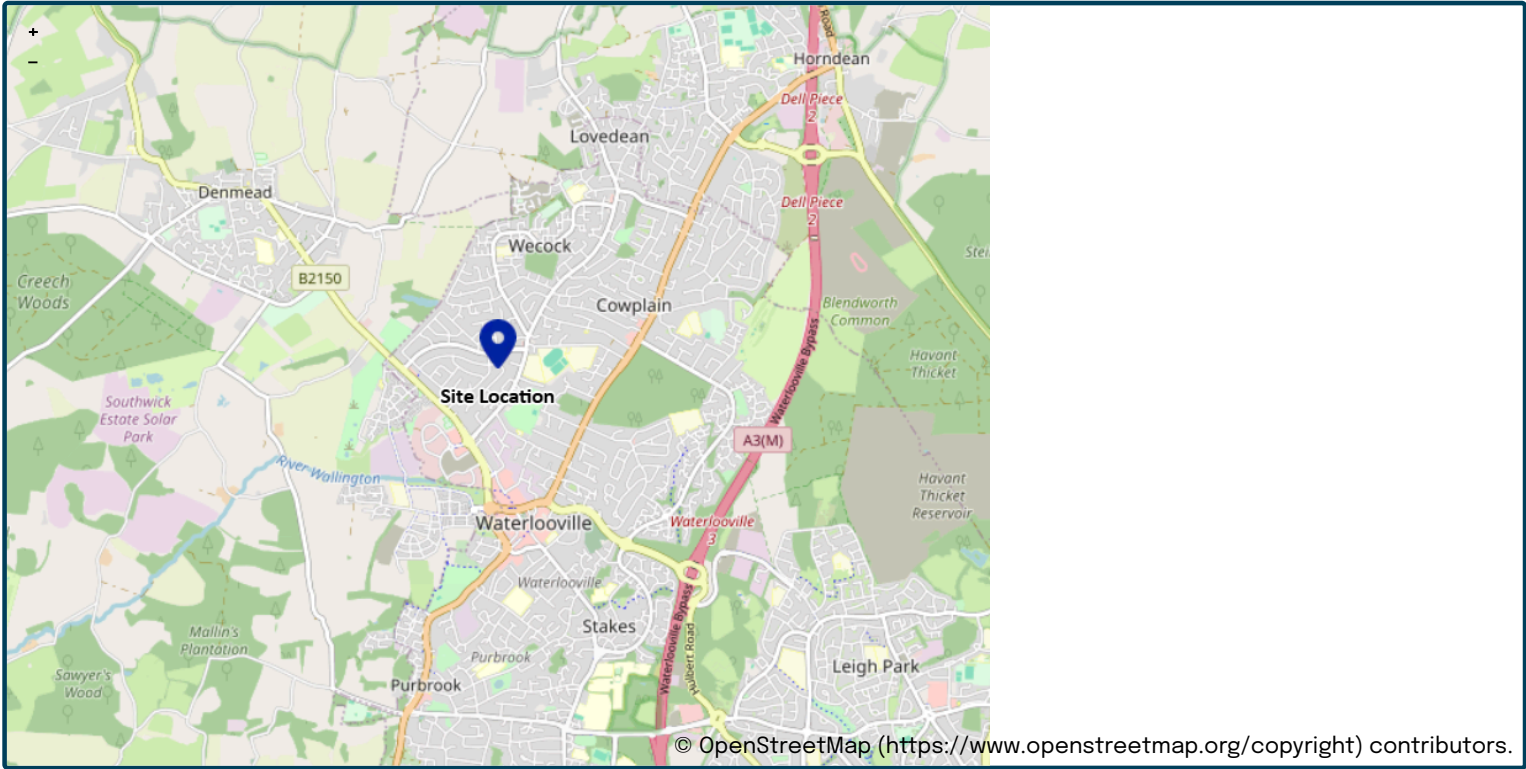
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	01/10/2025
Calculated by	DR
Reference	01/10/2025
Model version	2.1.2

Location

Site name	Land South of 13 Tennyson Crescent
Site location	Waterlooville



Site easting (British National Grid)	467924
Site northing (British National Grid)	110453

Site details

Total site area (ha)	0.0403	ha
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Greenfield runoff

Method

Method	FEH statistical
--------	-----------------

FEH statistical

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	789	mm	789
BFIHOST	0.222		
QMed-QBar conversion	1.136		1.136
QMed (l/s)	0.3	l/s	
QBar (FEH statistical) (l/s)	0.34	l/s	

Growth curve factors

	<u>My value</u>		<u>Map value</u>
Hydrological region	7		7
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

Method	FEH statistical	
Flow rate 1 year (l/s)	0.3	l/s
Flow rate 2 year (l/s)	0.3	l/s
Flow rate 10 years (l/s)	0.5	l/s
Flow rate 30 years (l/s)	0.8	l/s
Flow rate 100 years (l/s)	1.1	l/s
Flow rate 200 years (l/s)	1.3	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.1.2) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Fernbrook Consulting Engineers		Page 1
. London BR1 4DQ	Job No. 25220 Land South of Tennyson Cres. Surface Water Calculations	
Date 01/10/2025 13:30 File 25220-MD-SW-01.MDX	Designed by DR Checked by CR	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Pipe Sizes STANDARD Manhole Sizes STANDARD

Designed with Level Soffits

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.027	4-8	0.009

Network Design Table for Storm

Network Results Table



Micro
Drainage

Designed by DR
Checked by CR

Network 2020.1.3

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
------------------------	-----------------	-----------------	-----------------	------------------------	-------------	-----------

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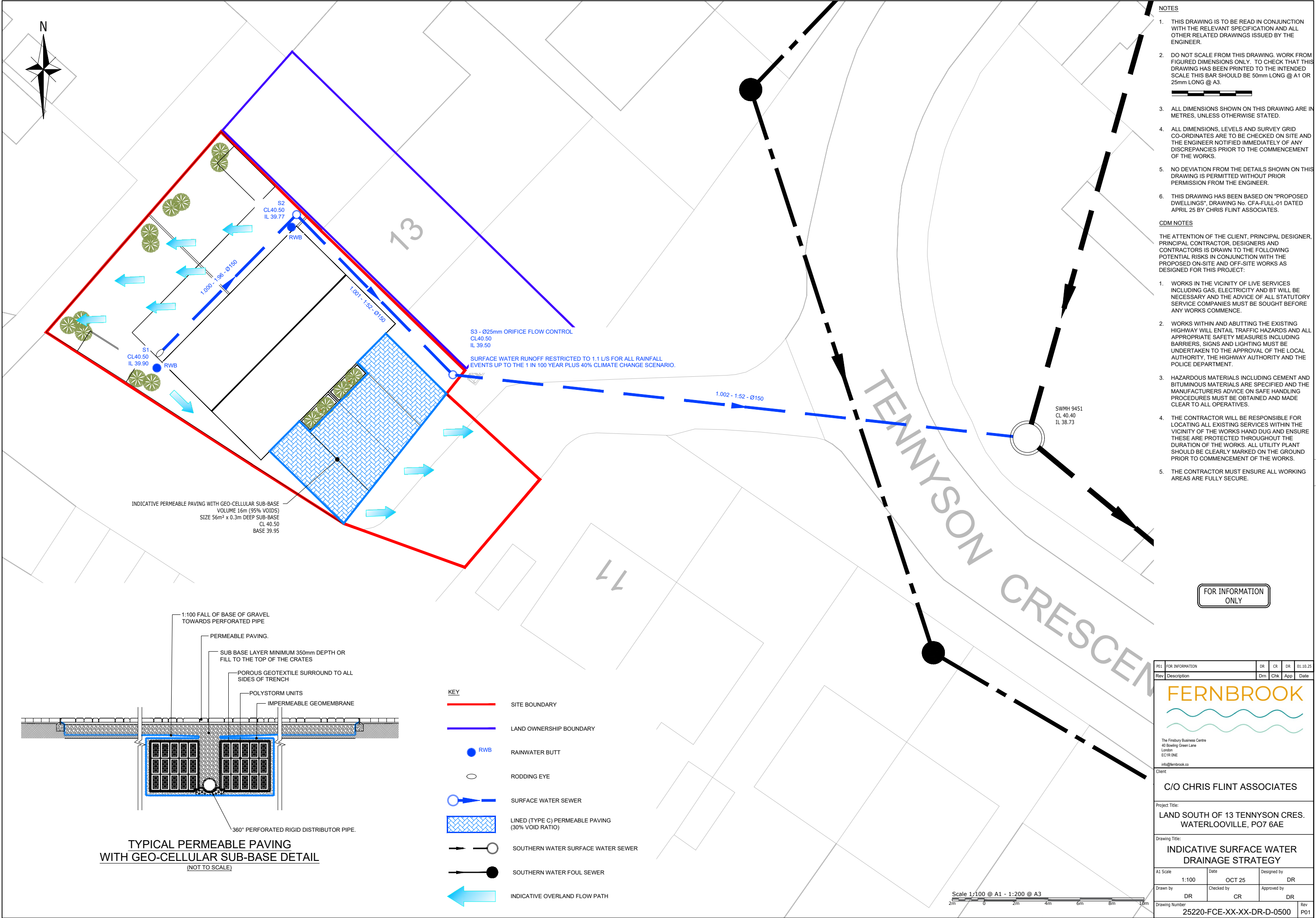
Fernbrook Consulting Engineers		Page 3
. London BR1 4DQ	Job No. 25220 Land South of Tennyson Cres. Surface Water Calculations	
	Date 01/10/2025 13:30 File 25220-MD-SW-01.MDX	
Innovyze	Network 2020.1.3	
<u>Online Controls for Storm</u> <u>Orifice Manhole: 3, DS/PN: 1.002, Volume (m³): 1.4</u> Diameter (m) 0.025 Discharge Coefficient 0.600 Invert Level (m) 39.500		
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. London BR1 4DQ	Job No. 25220 Land South of Tennyson Cres. Surface Water Calculations																									
Date 01/10/2025 13:30 File 25220-MD-SW-01.MDX	Designed by DR Checked by CR																									
Innovyze Network 2020.1.3																										
<u>Storage Structures for Storm</u>																										
<u>Porous Car Park Manhole: 3, DS/PN: 1.002</u>																										
<table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.00000</td> <td>Width (m)</td> <td>5.6</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>1000</td> <td>Length (m)</td> <td>10.0</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>15.6</td> <td>Slope (1:X)</td> <td>0.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>5</td> </tr> <tr> <td>Porosity</td> <td>0.95</td> <td>Evaporation (mm/day)</td> <td>3</td> </tr> <tr> <td>Invert Level (m)</td> <td>39.950</td> <td>Membrane Depth (mm)</td> <td>0</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.6	Membrane Percolation (mm/hr)	1000	Length (m)	10.0	Max Percolation (l/s)	15.6	Slope (1:X)	0.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.95	Evaporation (mm/day)	3	Invert Level (m)	39.950	Membrane Depth (mm)	0
Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.6																							
Membrane Percolation (mm/hr)	1000	Length (m)	10.0																							
Max Percolation (l/s)	15.6	Slope (1:X)	0.0																							
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1.000		1				0.645				13.6 FLOOD RISK	
1.001		2				0.899				25.7 FLOOD RISK	
1.002		3		0.000		16.641				1.1 FLOOD RISK	

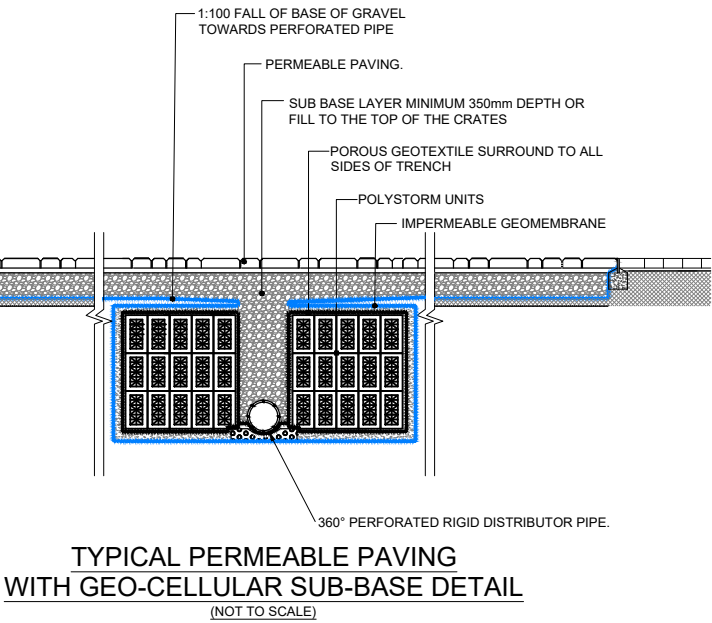


- NOTES**
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION AND ALL OTHER RELATED DRAWINGS ISSUED BY THE ENGINEER.
 2. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY. TO CHECK THAT THIS DRAWING HAS BEEN PRINTED TO THE INTENDED SCALE THIS BAR SHOULD BE 50mm LONG @ A1 OR 25mm LONG @ A3.
 3. ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES, UNLESS OTHERWISE STATED.
 4. ALL DIMENSIONS, LEVELS AND SURVEY GRID CO-ORDINATES ARE TO BE CHECKED ON SITE AND THE ENGINEER NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF THE WORKS.
 5. NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
 6. THIS DRAWING HAS BEEN BASED ON "PROPOSED DWELLINGS", DRAWING No. CFA-FULL-01 DATED APRIL 25 BY CHRIS FLINT ASSOCIATES.

- CDM NOTES**
- THE ATTENTION OF THE CLIENT, PRINCIPAL DESIGNER, PRINCIPAL CONTRACTOR, DESIGNERS AND CONTRACTORS IS DRAWN TO THE FOLLOWING POTENTIAL RISKS IN CONJUNCTION WITH THE PROPOSED ON-SITE AND OFF-SITE WORKS AS DESIGNED FOR THIS PROJECT:
1. WORKS IN THE VICINITY OF LIVE SERVICES INCLUDING GAS, ELECTRICITY AND BT WILL BE NECESSARY AND THE ADVICE OF ALL STATUTORY SERVICE COMPANIES MUST BE SOUGHT BEFORE ANY WORKS COMMENCE.
 2. WORKS WITHIN AND ABUTTING THE EXISTING HIGHWAY WILL ENTAIL TRAFFIC HAZARDS AND ALL APPROPRIATE SAFETY MEASURES INCLUDING BARRIERS, SIGNS AND LIGHTING MUST BE UNDERTAKEN TO THE APPROVAL OF THE LOCAL AUTHORITY, THE HIGHWAY AUTHORITY AND THE POLICE DEPARTMENT.
 3. HAZARDOUS MATERIALS INCLUDING CEMENT AND BITUMINOUS MATERIALS ARE SPECIFIED AND THE MANUFACTURERS ADVICE ON SAFE HANDLING PROCEDURES MUST BE OBTAINED AND MADE CLEAR TO ALL OPERATIVES.
 4. THE CONTRACTOR WILL BE RESPONSIBLE FOR LOCATING ALL EXISTING SERVICES WITHIN THE VICINITY OF THE WORKS HAND DUG AND ENSURE THESE ARE PROTECTED THROUGHOUT THE DURATION OF THE WORKS. ALL UTILITY PLANT SHOULD BE CLEARLY MARKED ON THE GROUND PRIOR TO COMMENCEMENT OF THE WORKS.
 5. THE CONTRACTOR MUST ENSURE ALL WORKING AREAS ARE FULLY SECURE.

FOR INFORMATION ONLY

P01	FOR INFORMATION	DR	CR	DR	01.10.25
Rev	Description	Dwn	Chk	App	Date
FERNBROOK					
The Finbury Business Centre 40 Bowling Green Lane London EC1R 0NE info@ferbrook.co					
Client					
C/O CHRIS FLINT ASSOCIATES					
Project Title:					
LAND SOUTH OF 13 TENNYSON CRES. WATERLOOVILLE, P07 6AE					
Drawing Title:					
INDICATIVE SURFACE WATER DRAINAGE STRATEGY					
A1 Scale	Date	Designed by			
1:100	OCT 25	DR			
Drawn by	Checked by	Approved by			
DR	CR	DR			
Drawing Number	Rev				
25220-FCE-XX-XX-DR-D-0500	P01				



- KEY**
- SITE BOUNDARY
 - LAND OWNERSHIP BOUNDARY
 - RAINWATER BUTT
 - RODDING EYE
 - SURFACE WATER SEWER
 - LINED (TYPE C) PERMEABLE PAVING (30% VOID RATIO)
 - SOUTHERN WATER SURFACE WATER SEWER
 - SOUTHERN WATER FOUL SEWER
 - INDICATIVE OVERLAND FLOW PATH

Scale 1:100 @ A1 - 1:200 @ A3

APPENDIX D – DRAINAGE MAINTENANCE PLAN

SuDS MANAGEMENT PLAN

This long-term Management Plan of the Sustainable Drainage System should be implemented at **Land South of 13 Tennyson Road, Waterloo, PO7 6AE** to ensure that the drainage network functions as designed. This plan is intended to cover all on-site drainage structures. The Site Management Team should oversee and implement the SuDS Management Plan and designate a qualified person who will be responsible for the proper operation and maintenance of the surface water drainage system.

Stormwater Runoff Quality

The stormwater management system protects and enhances the stormwater runoff water quality through the removal of sediment and pollutants, catchpit manholes and silt trapped gullies will reduce the amount of pollutants entering the system. Preventive maintenance of the system will include a comprehensive source reduction program of regular sweeping and litter removal, prohibitions on the use of pesticides, and maintenance of bin areas.

Drainage System

Maintenance and cleaning of surface water manholes and SuDS components will assure adequate performance. This maintenance program is outlined below;

Maintenance Program

The Site Management Team will conduct the operation and maintenance plan set forth in this document. The Site Management will ensure that inspections and record keeping are timely and accurate. Inspection & Maintenance Log Forms (attached) should include the date and physical conditions of the structures, depth of sediment in structures, evidence of overtopping or debris blockage and maintenance required of each structure. Records of maintenance will be kept on file at the property and copies of Inspection & Maintenance Log sheets indicating all work and inspections will be available to the Council upon request.

Concurrent with inspection and cleaning, all litter shall be picked up and removed from the parking areas, external bin store, wetland areas, and soft landscaping.

Regular maintenance should include;

1. Inspect permeable paving inlets/outlets and remove any debris every 6 months or as determined to be reasonable based on experience with the installed systems to ensure that the system continues to work as intended and is free of debris; quarterly, inspect inspection chambers and manholes; if depth of sediment in sumps exceeds 50% capacity, sediment must be removed. Excessive sediment shall be removed and properly disposed by a licensed drainage cleaning company.
2. Inspection of external bin store for spillage and scattered litter must be performed on a regular basis to prevent the spread of pollutants into the stormwater management system.

Winter Maintenance Program

Ensure that drainage structures are not blocked by ice, snow, debris or rubbish during winter months.

Fertiliser Use

Only slow-release organic low-phosphorous fertilisers will be used in any landscaped areas in order to limit the amount of nutrients that could enter the stormwater system.

Maintenance Task	Description	Frequency
<i>Regular Maintenance</i>		
Litter management	Pick up all litter in suds and landscape areas and remove from site	Monthly
Landscaped & Vegetated Areas	Trim plants and grass verges, paths and amenity at 35-50mm with 75mm max. Leaving grass in situ	As required or monthly
Inlets and outlets	Inspect monthly, remove silt from slab aprons and debris. Strim 1m round for access	Monthly
Hard surfaces	Sweep all paving regularly. Sweep and suction brush permeable paving in autumn after leaf fall.	Annually
<i>Occasional tasks</i>		
Inspection and control chambers	Annual inspection, remove silt and check free flow	Annually
<i>Remedial work</i>		
	Inspect suds system regularly to check for damage or failure. Undertake remedial work as required.	As required

Drainage Operation and Maintenance Log

Site Maintenance Supervisor: _____ Date: _____

☐ Routine ☐ Response to rainfall event __ in ☐ Other: _____

BMP	Frequency	Date Performed	Comments
Inlets/outlets and Manholes	Monthly Inspections		
	Maintenance Quarterly and as necessary		
Pavement Areas (parking, driveways, service areas)	Monthly Sweeping		
	Rubbish & Litter Removal as Necessary		
Landscaped & Vegetated Areas	Maintenance as necessary		