LAND OFF ROMSEY ROAD
WHITEPARISH

FLOOD RISK & DRAINAGE STATEMENT

BARGATE HOMES

Date: 10th October 2025
Ref: KTG/25/RP/0857/**7191**
Rev: **A**

DOCUMENT CONTROL RECORD

Document Control

	Name and Position	***Signature***	***Date***
Prepared by:	Alistair McShane Civil Engineering Director		10.10.25
Checked by:	Karl Gebhart Civil Engineering Director		10.10.25

Revision Record

Rev	***Date***	***Issue Status***	***Prepared by***	***Checked by***
-	10-10-25	First issue for comment		
A	20-10-25	Second issue following Client comments	K Gebhart	A McShane

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Appendix C: Surface Water Drainage Strategy & Calculations
Appendix D: SUDS Management Plan
Appendix E: Flood Risk Assessment
Appendix F: LLFA Consultee Responses

References

Environment Agency Flood Map Information © and database right www.environment_agency.gov.uk

Contains British Geological Survey materials © NERC (2018)

National Planning Policy Framework (Department for Communities and Local Government, March 2012)

PPG Flood risk and coastal change (Department for Communities and Local Government, March 2014)

Introduction

1.1 Bargate Homes is seeking Reserved Matters Consent for the residential development at Land off Romsey Road, Whiteparish. The development consists of 25 dwellings together with associated infrastructure and landscaping.
The Reserved Matters application relates to the approved outline application Ref: PL/2022/09532

1.2 MJA Consulting has been appointed to undertake the RM planning engineering design together with associated Flood Risk Statement and Development Drainage Strategy following on from the approved outline planning design.

1.3 This statement is in support of the Flood Risk Assessment undertaken by Condon Drew Associates Ref: 1294 dated December 2022 and the comments received from Wiltshire Council Ref: ENQ/2025/00215 dated 17 March 2025. The following is to confirm the potential flood risks associated with the site and to provide a suitable strategy for the disposal of surface and foul water from the proposed development.

Figure 1: Site location

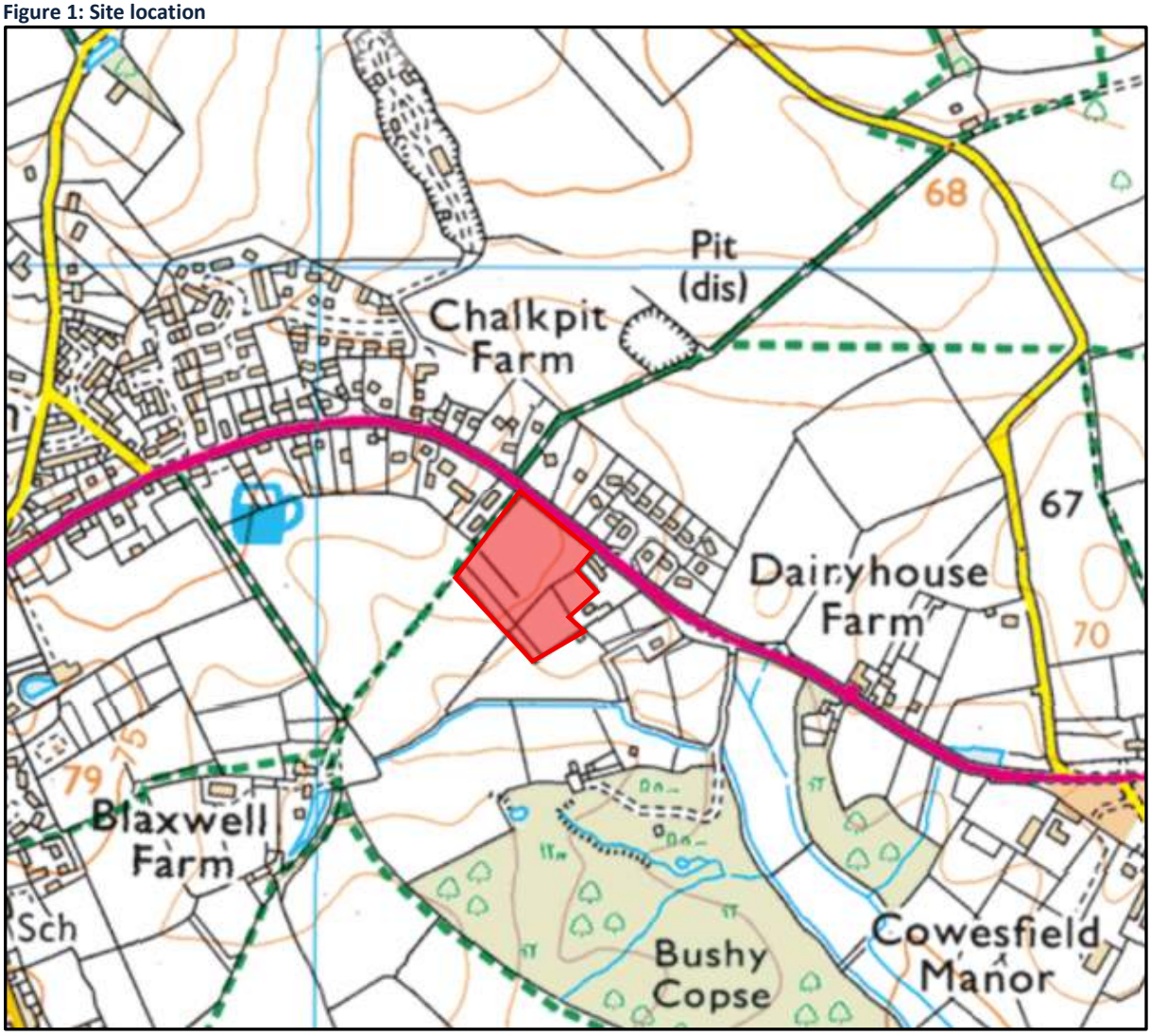


Image courtesy of: Bing Maps, 2022 Microsoft Corporation Image courtesy of Ordnance Survey

Figure 2: Development site

Image courtesy of: Google Maps, 2022 Microsoft Corporation

1.4 The development covers an area of approximately 1.71 Hectares and lies south of Romsey Road and is bounded by existing housing to the north and west and open fields to the south east and south west. The site access will be via a new access off Romsey Road.

1.5 The site falls generally from north-west to south-east with levels ranging from 67.70m to 61.70m AOD.

Geology:

1.6 The published geology within the BGS Mapping indicates that the site is not underlain by superficial deposits with the shallow bedrock comprising the Lambeth Group (clay, silt, sand and gravel.

An intrusive ground investigation undertaken by Forge Environmental Management Ltd. the sub-strata was as follows:

- Topsoil to a depth of between 0.20m and 0.35m
- underlain by natural soils comprised predominantly a soft to firm sandy silty clay proven to a depth of 3.0m.

1.7 Soakage tests carried as part of the outline application in 3No. test locations confirmed that infiltration is very poor with 2 tests providing unusable test data and a third showing infiltration was poor with an infiltration rate of $2.8x10^{-6}$ m/s. It is therefore not proposed to drain the development by infiltration means only.

Existing Site Runoff:

1.8 As outlined in the Flood Risk and drainage strategy report submitted for the outline planning application the surface water from the current site drains towards an existing drainage ditch located 50m from the southern boundary.

Existing greenfield runoff rates have been calculated as:

- 1 year: 4.5 l/sec
- QBar: 5.3 l/sec
- 30 year: 12.1 l/sec
- 100 year: 17 l/sec

The QBAR rate is 5.3 l/s which would ordinarily be used as the controlled discharge rate however Wiltshire Council in their response dated 20th March 2025 required a 20% betterment of the Qbar run off rate and therefore the controlled rate from the site for all generated surface water storm events will be 4.25l/s

Development Site Flood Risk

2.1 The assessment of flood risk to the site requires that all potential forms of flooding are considered. In accordance with the Environment Agency's Flood Risk Assessment Guidance, NPPF, PPG and CIRIA Report 624, sources of flooding to be assessed include tidal, fluvial (rivers, streams and watercourses), pluvial (overland rainfall runoff), groundwater, artificial sources (canals and reservoirs) and existing/proposed sewerage and water mains infrastructure.

2.2 The main sources of data for flood risk and recorded incidents of flooding for this site has been the Environment Agency, Wiltshire Council Strategic Flood Risk Assessments (SFRA) dated July 2013 together with the level 2 SFRA completed in 2010 and revised in May 2019.

2.3 Within the SFRA studies, consultation was carried out with all appropriate authorities and organisations including the Environment Agency, Southern Water, local councils and local community stakeholders to identify known or perceived problem areas with respect to flooding.

2.4 With reference to the above, and in the context of the proposed development, there have been no historic issues found for the site of flooding from the following potential sources including:

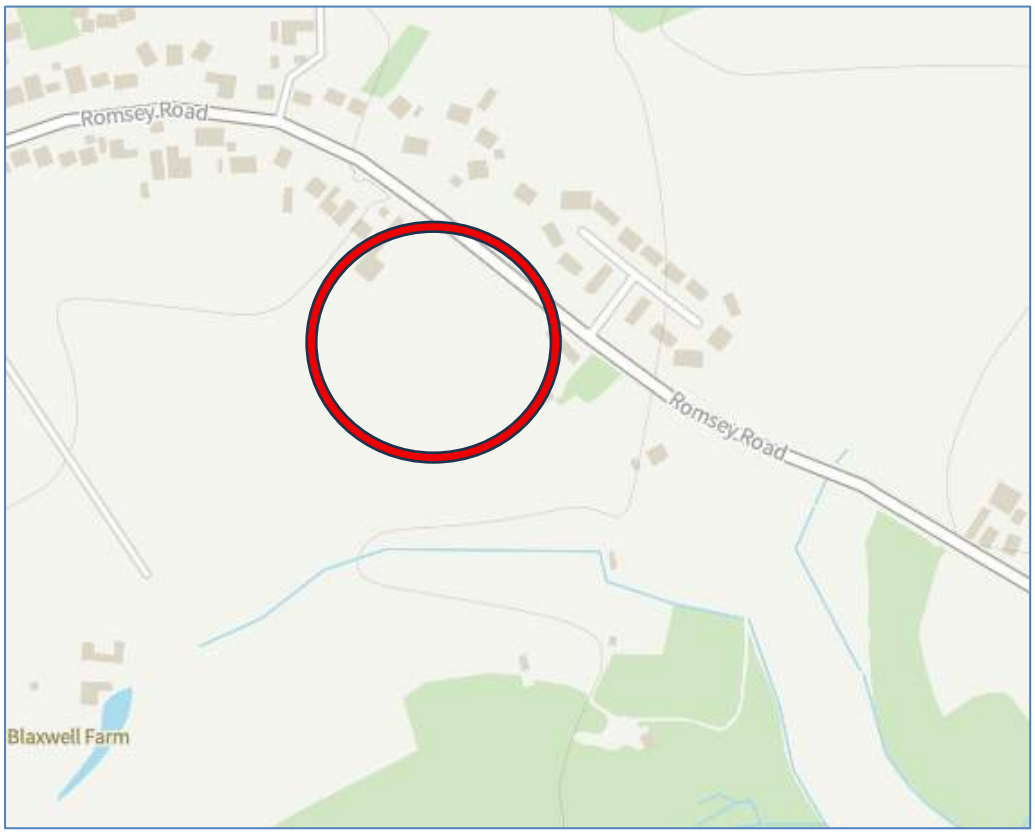
- Fluvial (Rivers and Sea).
- Tidal.
- Groundwater.
- Pluvial (Surface water runoff).
- Existing foul, storm and combined sewers or potable water main infrastructure.

Fluvial

2.5 The Environment Agency (EA) carries out a national flood risk assessment which assesses the probability of flooding to land from all main rivers in England. The results of this modelling are combined and calibrated against data from recorded flood events to produce the Environment Agency's Flood Zone Map.

2.6 The latest on-line Environment Agency 'Flood Zone Map' confirms that the site is unaffected by Fluvial Flooding and lies wholly within Flood Zone 1 and within the lowest risk category.

Figure 3: Extract from Environment Agency River and Sea Water Flood Map (Oct 2025)



Contains Environment Agency information © Environment Agency 2025

Key:

Main Rivers

Dark Blue : (Flood Zone 3)
Shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded: from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year, or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.

Light Blue : (Flood Zone 2)
Shows the additional extent of an extreme flood from rivers or the sea.
These outlying areas are likely to be affected by a major flood, with up to a 0.1% (1 in 1000) chance of occurring each year. These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements.

Clear : (Flood Zone 1)
Shows the area where flooding from rivers and the sea is very unlikely.
There is less than a 0.1% (1 in 1000) chance of flooding occurring each year.

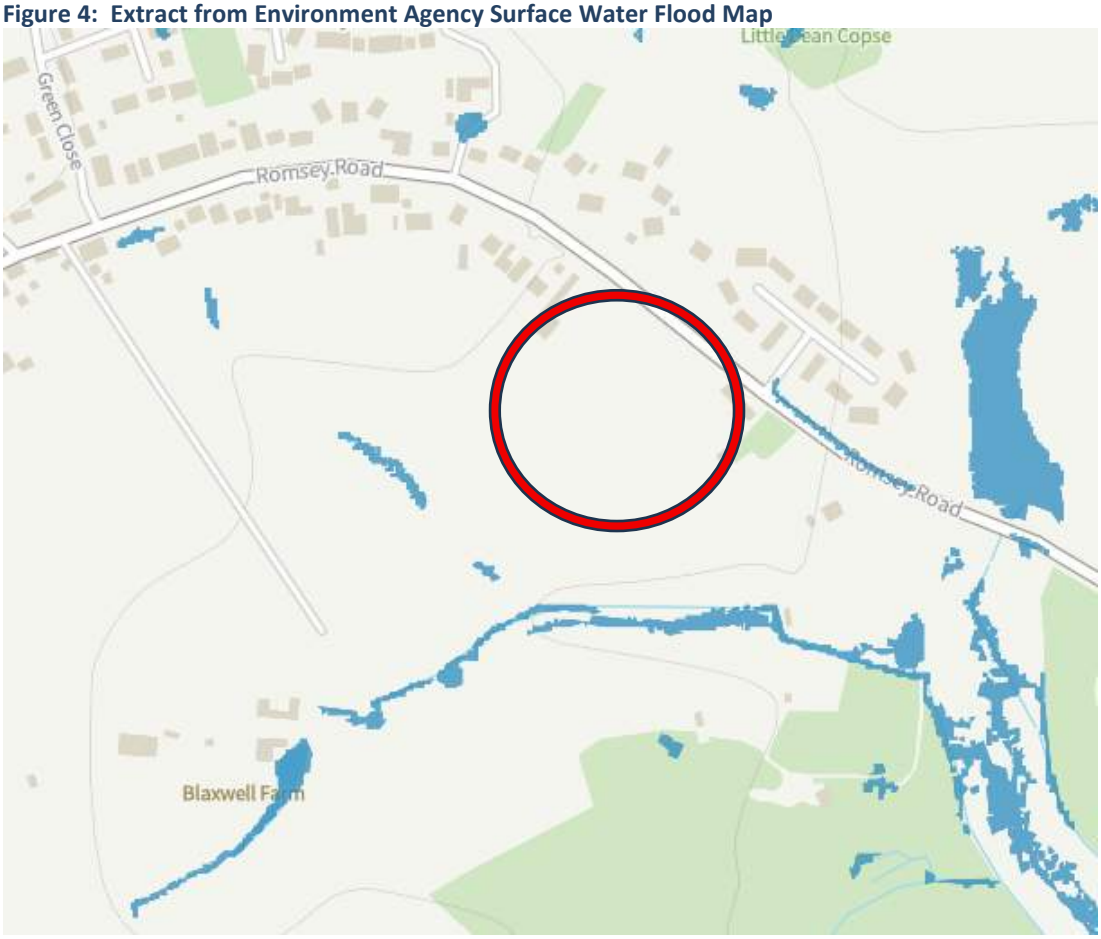
Tidal

2.7 The development site and local area do not encounter a risk from tidal flooding as confirmed by the SFRA and the Environment Agency.

Surface Water

2.8 The Environment Agency's Flood Map for Surface Water (Figure 4) is a theoretical assessment of potential overland flow paths, ground levels and drainage systems using course modelling to indicate areas that may be susceptible to surface water flooding.

Figure 4: Extract from Environment Agency Surface Water Flood Map



Contains Environment Agency information © Environment Agency 2025

Key:

High (Greater than 1:30(3.3%) chance of flooding)

Medium (Between 1:100(1%) and 1:30(3.3%) chance of flooding)

Low (Between 1:1000 (0.1%) and 1:100 (1%) chance of flooding)

Very Low (Less than 1:1000 (0.1%) chance of flooding)

2.9 The latest Environment Agency 'Surface Water Flood Zone Map') indicates that the existing site has a 'very low' (less than a 1:1000 or 0.1%) risk of flooding from surface water runoff.

2.10 Since the SFRA reports were produced, no further evidence of surface water flooding at the site has been identified.

2.11 The original FRA undertaken by Condon Drew Associates highlighted a watercourse with a surface water flood risk to the south of the development site some 50m from the southern boundary. This lies outside of the proposed redline boundary and does not affect the proposed development site.

Groundwater

2.12 No evidence has been found via the SFRA, Environment Agency or local records that the site or area within the vicinity of the site is affected by groundwater flooding.

Existing Sewers & Water Mains

2.13 There have been no recorded incidents of flooding from the existing foul and surface water sewers or potable water mains within the vicinity of the development.

Sequential Test

2.14 The flood risk technical guidance to the National Planning Policy Framework (NPPF) categorises residential developments such as dwellings and hotels as 'More Vulnerable' within the risk classification. 'More vulnerable' developments located within Flood Zone 1 are considered appropriate under the NPPF.

2.15 The NPPF guidance states that planning authorities should complete a risk-based 'Sequential Test' at all stages of the planning process, to steer new development to areas with the lowest probability of flooding. Under the requirements of the 'Sequential Test' and as the proposed development is already located within Flood Zone 1 (lowest risk), there are no more suitable, developable and deliverable alternative sites, better located from a flood risk perspective which could accommodate the proposed development.

2.16 The implementation of a robust drainage scheme to collect, attenuate and convey the surface water runoff from the proposed development will mitigate any residual risk of surface water flooding to the site in its redeveloped state.

Surface Water Drainage Strategy

3.1 The National Planning Policy Framework (NPPF) requires that developments do not exacerbate flood risks both to the development site and to offsite parties and land, which means there is a need to control surface water drainage and overland runoff to ensure there are no increases in peak rates and volumes of runoff as a result of the development.

3.2 Environment Agency guidance and government legislation such as the Flood and Water Management Act (Defra 2010) requires surface water drainage strategies for new developments to be in accordance with the ideals of 'sustainable development' via the provision of Sustainable Drainage Systems (SuDS).

3.3 The Building Regulations Document H (2015) details the appropriate hierarchy of potential methods for disposing of surface water from a development:

- A soakaway or some other adequate infiltration system, or where that is not practicable;
- A watercourse, or where that is not possible;
- A sewer.

3.4 The principles of the development drainage strategy were set and approved as part of the Condon Drew Associates Flood Risk Assessment. This established the discharge rates and the locations of the outfall points.
The approved drainage strategy highlighted that all storm attenuation can accommodate the 1 in 100 year + 45% climate change, an additional 10% allowance of impermeable area for urban creep has been accommodated within the attenuation basin.

3.5 Following a meeting between the land owner/developer, Wiltshire Council agents (Atkinsrealis) and MJA Consulting dated 21st May 2024 (refer to appendix F) the principals of the SUD's design, attenuation storage and drainage strategy were agreed as follows:

- Private drives to be permeable paving with permeable sub base stone. However, due to the low infiltration rate a positive outfall to be provided and any infiltration ignored when calculating run off.
- House roofs and roads to drain via gravity to new sewers located within the development carriageways.
- Development sewers to drain into reed lined swales prior to discharging into an attenuation basin with siltation forebays on headwalls.
- Attenuation basin to drain via a hydrobrake control chamber with an outfall sewer across the neighbouring third party land via a deed of easement. Deed of easement signed on 30th August 2024 which grants rights of access to construct, repair and maintain the outfall in pertuity.
- The final outfall from the sewer to be close to the receiving watercourse but via a stone bed to mimic a spring and natural run off.

3.6 The approved FRA outlines the Greenfield runoff rate of QBar for the development at 2.4 l/sec which has set the maximum discharge rate for the surface water outfall. This rate has

been assessed based upon the assumed impermeable area within the proposed development. However, reviewing Wiltshire Council "Drainage & Betterment Strategy" document the Greenfield runoff is assessed on the development area then betterment provided over the GFR rate. Therefore we have taken the 1 year GFR rate for the developable area which equates to 5.3 l/sec, a reduction of 20% has then been applied. This then ensures that the 1 year discharge for the developable site is lower than the predicted GFR

3.7 The development will outfall to the existing watercourse to the south of the development at a maximum rate of 4.3 l/sec this represents a 20% reduction below the Qbar rate of 5.3 l/sec as required by Wiltshire Council.

3.8 As outlined the infiltration rates are variable which precludes the usage of standard infiltration devices such as soakaways, swales and infiltration basins. However, where possible areas of tanked permeable paving and permeable type sub base have been included within driveways and parking bays, which drains any rain falling within this area.
This will then provide water treatment, recharge groundwater and reduces the volume of runoff entering the piped and attenuated network.

3.9 The surface water drainage design for the development follows the principles as outlined above. Runoff generated from the hard standing areas including roofs, driveways and roads will typically drain via the piped network and a attenuation basin. A 10% allowance for urban creep has also been included in the calculations with the flow restricted to the agreed rates and attenuated for all storm events up to, and including, the 1 in 100 +45% events for the predicted potential increase in peak rainfall up to 2115.

Water Quality and Pollution Prevention

3.10 The SUDs provided within the development area will be via sealed permeable type sub-base for driveways and parking areas together with silt collection forebays within the attenuation basin together with a Vortex separator against the contamination of the downstream watercourse.

3.11 The CIRIA SuDS Manual 2015 details an approach for establishing the hazard posed by the intended land use activates and the extent to which the proposed SuDS components can reduce and mitigate the contamination risk to the receiving waterbody.
Referring to Table 26.2 – 'Pollution hazard indices for different land use classifications' the proposed development and land use results in a low pollution hazard , therefore a 'Simple Index' method can be used to make a qualitative assessment of the proposed SuDS management.

Pollution hazard indices (Table 26.2):

Land Use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Individual driveways, low traffic roads and non-residential car parking.	Low	0.5	0.4	0.4

3.12 To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index (for each contaminant type) that equals or exceeds the pollution hazard index (for each contaminant type):

SUDs Mitigation Indices (Table 26.3):

Type of SUDs component (Within development)	Mitigation indices		
	TSS	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7
Vortex Separator	0.8	0.5	0.7

Where the mitigation index of an individual component is insufficient, two components (or index)

A factor of 0.5 is used to account or the reduced performance of a secondary or tertiary component associated with already reduced inflow concentrations. The table below provides an assessment and comparison of pollution hazards for the development runoff and the available SUDS mitigation.

		Total suspended solids (TSS)	Metals	Hydrocarbons
Land Use	Residential Areas	0.7	0.6	0.45
SUDs Mitigation	Permeable paving & Vortex Separator	0.7 + (0.8x0.5) 1.10	0.6 + (0.5x0.5) 0.85	0.7 + (0.7x0.5) 1.05
		Acceptable	Acceptable	Acceptable

Overland Flood Flow / Exceedance

3.13 The occurrence of an extreme rainfall event exceeding the design storm of the drainage network or failure / blockages has been considered.
Any flood water that occurs as a result of surcharging of manholes within the upstream piped system will be contained within the road limits by raised kerb edges and driveway entrance levels, where it will be temporarily stored until capacity returns within the drainage system.

3.14 To mitigate the residual risk of overland flooding the design levels of hard paved and landscaped areas as part of the proposed design of the development will aim to contain and safely direct any flood flows to areas of the site as to cause minimum flood risk and disruption to properties and residents.

SuDS Management and Maintenance

3.15 It is the intention the development drainage will be maintained by the development management company who will be entrusted with a robust inspection, de-silting and maintenance programme to ensure the optimum operation of the surface water drainage

system is continually maintained in perpetuity. For further information refer to the SUD's Management and Maintenance Plan in Appendix D

Foul water drainage strategy

6.1 The foul water generated from each property will drain via gravity through the private house drainage before discharging to a new sewer network located typically within the development road system.

Connections to the public sewer network are subject to S106 connection approval from Southern Water.

6.3 The predicted peak foul sewer discharge from the whole site to the existing foul network based on the Sewers for Adoption figure (4000 l/dwelling/day) for 25 units will be 1.15 l/s.

6.4 The foul sewers within the development will be maintained by the development Management Company.

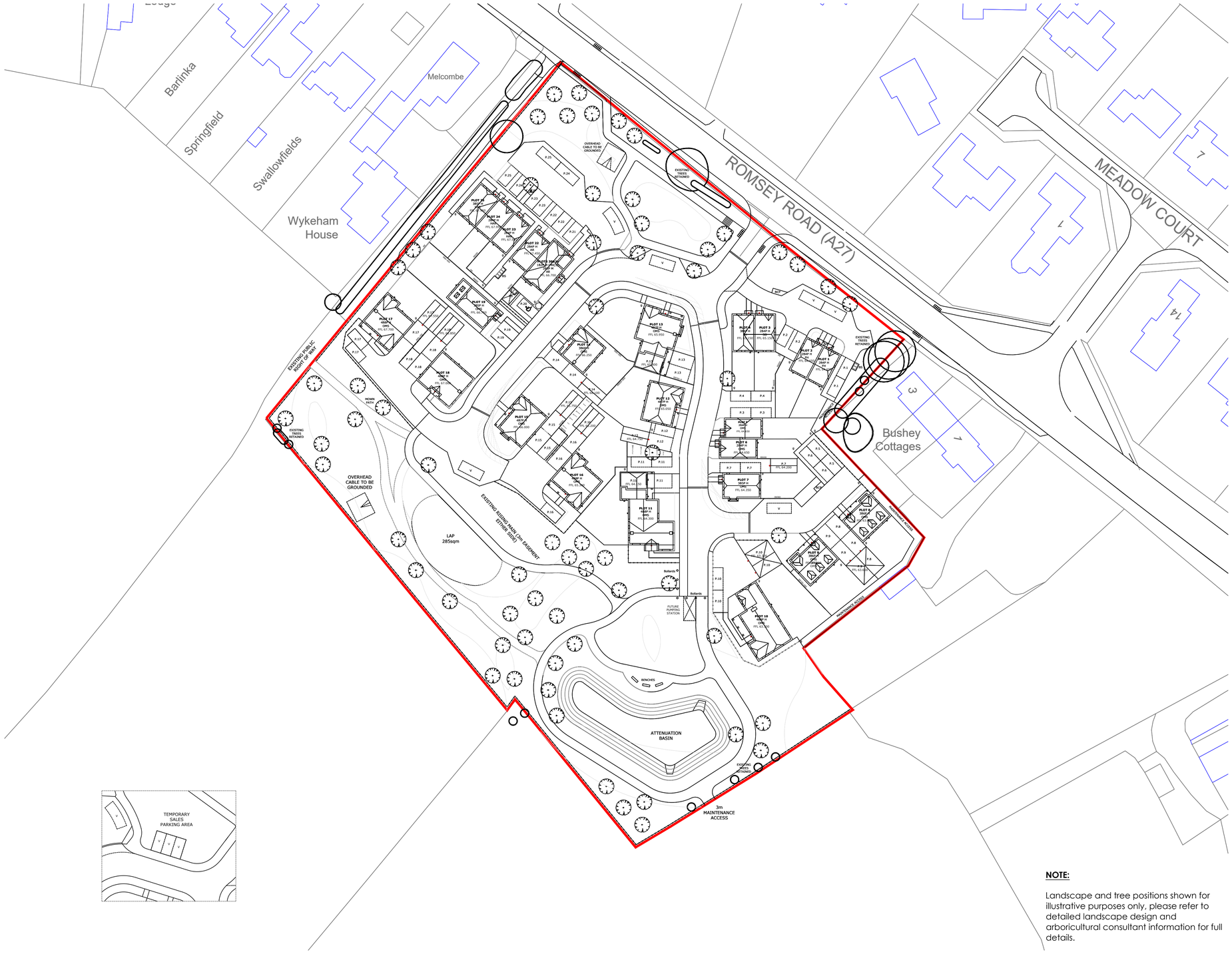
6.5 Outline Planning Permission PL/2022/09532 was granted permission on 10th June 2024 and under the current Water Authority legislation Southern Water have 2 years following grant of permission to ensure that capacity is available for the new development flows; any required sewer modelling work and upgrades will be paid for via the development infrastructure charge.

This will ensure that the proposed development has a 'no detriment' impact on the local foul sewer system and does not create an increase in flood risk.

APPENDIX A
SITE LAYOUT

GENERAL NOTES:

1. This drawing is the copyright of KSA Architects Ltd and may not be copied, altered or reproduced in any form or passed on to a third party without written consent. If in doubt ASK.
2. This drawing has been produced as a guide, and is subject to further detailed information being provided, including but not limited to a full topographical survey, service enquires and an arboriculture study.



NOTE:

Landscape and tree positions shown for illustrative purposes only, please refer to detailed landscape design and arboricultural consultant information for full details.

N

0 5 10 25

(SCALE 1:500)

Rev	Date	Description	Rev By	Ckd By
H	10.10.25	T10 shown retained	DRK	SS
G	09.10.25	Minor amendments to landscaped areas, Romsey Road kerb lines indicated	DRK	SS
F	30.09.25	Roof plans updated	DRK	SS
E	18.09.25	Updated to reflect latest Civil Engineer information. Retaining walls indicated	DRK	SS
D	12.09.25	Level data updated	DRK	SS
C	12.09.25	Plot 15 substituted, minor amends throughout.	DRK	SS
B	08.09.25	Footpaths updated	DRK	SS
A	05.09.25	First issue	DRK	SS

KSA The people orientated placemakers.

Client

BARGATE

Project

LAND SOUTH OF ROMSEY ROAD
WHITEPARISH
SALISBURY
WILTSHIRE

Drawing Title

SITE PLAN

Drawing Status: PRELIMINARY

Scale: 1:500 @ A1

Document Ref.: 1371 SK110

Revision: H

Drawn By: DK

RIBA Chartered Practice

KSA Architects Ltd. Concept House
35 Kingston Crescent, North End
Portsmouth, Hampshire, PO2 8AA

Phone: **023 9267 3618**
Email: **info@ksaltd.co.uk**
Web: **www.ksaltd.co.uk**

APPENDIX B
FOUL AND SURFACE WATER DRAINAGE STRATEGY

KEY:

Proposed Adoptable Sewers:

Foul sewer

Storm sewer

Highway Gully

Rising Main

Adoptable Lateral (150mm dia)

Adoptable Access Chamber

Proposed Private Drainage:

Foul drain

Storm drain

Rodding eye

Yard gully

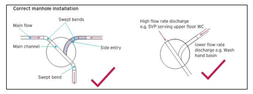
Linear drain (LINEAR DRAIN)

PCC 900x450mm Gully

Permavoid – Surface Water Collector & Distribution Cell
Size and specification, site specific.

Private inspection chambers shall be non-access structural wall plastic. Chamber sizes to accord with manufacturers specifications, Building Regulations Part H, BS EN 752 and to NHBC Standards.

All pre-formed chambers to installed in accordance with NHBC Technical Guidance 5.3/01 and diagrams below:



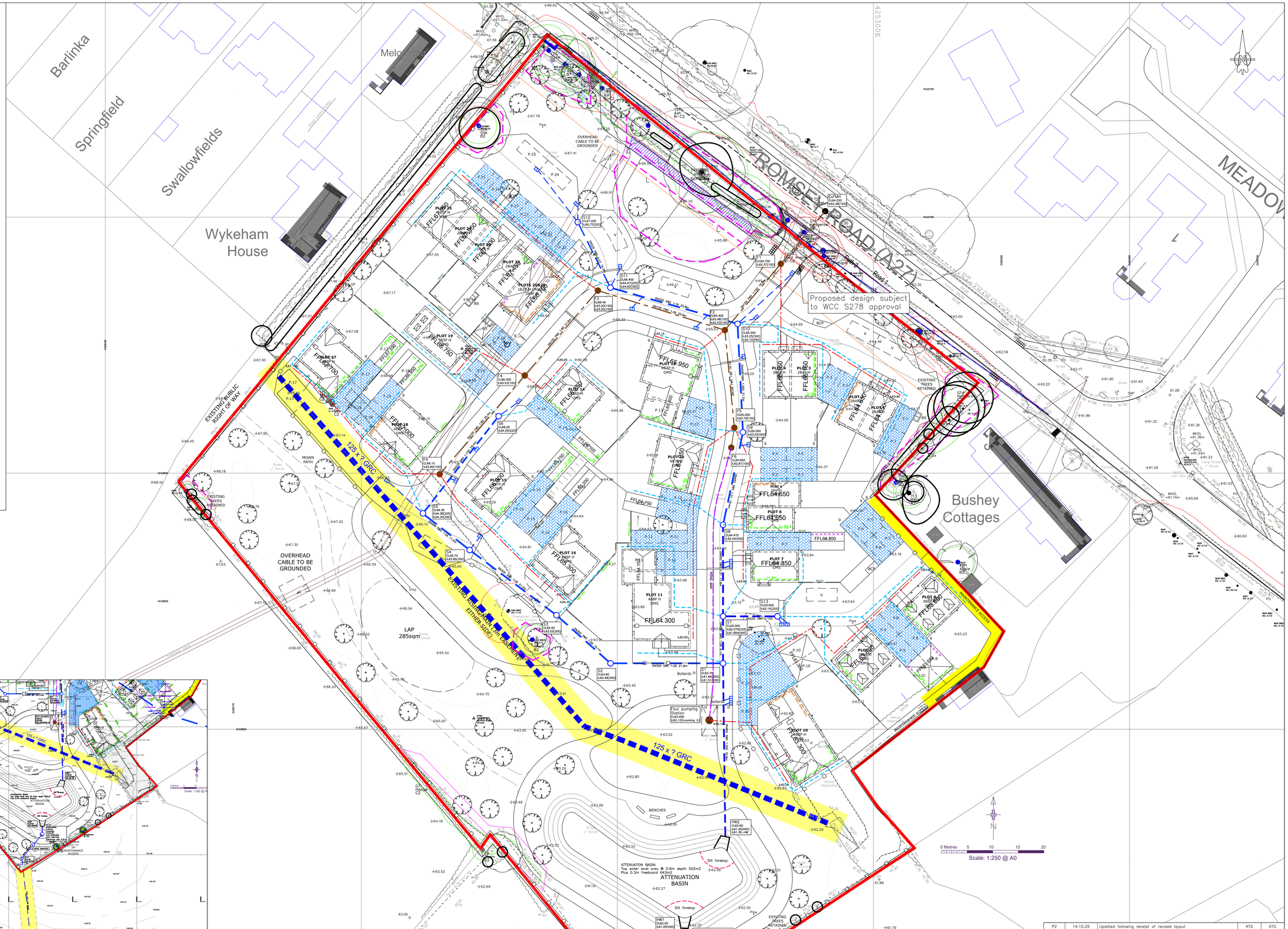
Invert levels shown thus: F10.00 S10.00

Tanked permeable block paving:

Root protection zones:

Notes:

1. Do not scale from this drawing.
2. All dimensions in metres.
3. All levels relate to ordnance datum.
4. This drawing shall be read in conjunction with all other contract documents.
5. Any discrepancies with the drawings shall be reported to the Engineer.
6. The level & location of all existing services shall be verified and marked on site by the Contractor prior to commencing any construction work.


Barlinka
Springfield
Swallowfields
Wykeham House
Melcombe House
ROMSEY ROAD (A27)
MEADOW
Bushey Cottages
Proposed design subject to WCC S278 approval
EXISTING PUBLIC RIGHT OF WAY
EXISTING TREES RETAINED
OVERHEAD CABLE TO BE GROUNDED
125 x ? GRC
EXISTING 125 MAIN 2m EITHER SIDE
LAP 285sqm
MAINTENANCE ACCESS
3m MAINTENANCE ACCESS
ATTENUATION BASIN
ATTENUATION BASIN: Top water level area @ 0.9m depth 552m2 Plus 0.3m freeboard 643m2
Silt forebay
Hydrobrake control chamber CL62.60 IL61.200(450) IL61.150(150) Discharge rate 4.3l/s
Vortex separator
Foul pumping Station CL63.400 IL62.120(Incoming S3)
Bollards
BENCHES
PLOT 1 FFL64.300
PLOT 2 FFL64.650
PLOT 6 FFL64.850
PLOT 7 FFL64.850
PLOT 10 FFL65.300
PLOT 11 FFL64.300
PLOT 16 FFL65.300
PLOT 19 FFL66.750
PLOT 37 FFL67.700
PLOT 38 FFL67.700
PLOT 39 FFL67.700
PLOT 40 FFL67.700
PLOT 41 FFL67.700
PLOT 42 FFL67.700
PLOT 43 FFL67.700
PLOT 44 FFL67.700
PLOT 45 FFL67.700
PLOT 46 FFL67.700
PLOT 47 FFL67.700
PLOT 48 FFL67.700
PLOT 49 FFL67.700
PLOT

APPENDIX C

SURFACE WATER DRAINAGE STRATEGY & CALCULATIONS

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.400
Area (ha)	1.250	Urban	0.000
SAAR (mm)	850	Region Number	Region 7

Results	**l/s**
QBAR Rural	5.3
QBAR Urban	5.3
Q1 year	4.5
Q1 year	4.5
Q30 years	12.1
Q100 years	17.0

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 425262 123674 SU 25262 23674
Data Type	Point
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.900
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.407	4-8	0.175

Total Area Contributing (ha) = 0.582

Total Pipe Volume (m³) = 28.004

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	14.292	1.100	13.0	0.017	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	25.826	1.350	19.1	0.084	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	21.197	0.070	302.8	0.076	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.07	65.770	0.017	0.0	0.0	0.0	3.65	145.1	2.8
S1.001	50.00	5.18	64.595	0.101	0.0	0.0	0.0	3.61	255.3	16.4
S1.002	50.00	5.49	63.095	0.177	0.0	0.0	0.0	1.16	185.0	28.8

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.003	18.476	0.585	31.6	0.030	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.004	17.880	0.586	30.5	0.051	0.00	0.0	0.600	o	450	Pipe/Conduit	
S2.000	10.614	0.071	149.5	0.076	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.005	9.174	0.344	26.7	0.024	0.00	0.0	0.600	o	450	Pipe/Conduit	
S3.000	24.052	0.170	141.5	0.057	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	11.591	0.455	25.5	0.050	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.002	21.188	0.820	25.8	0.018	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.003	14.139	0.550	25.7	0.046	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.004	21.975	0.820	26.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.006	33.842	0.305	111.0	0.053	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.007	19.591	0.055	356.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.008	14.209	0.700	20.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.003	50.00	5.57	63.025	0.207	0.0	0.0	0.0	3.63	577.0	33.6
S1.004	50.00	5.65	62.440	0.258	0.0	0.0	0.0	3.69	587.1	41.9
S2.000	50.00	5.17	62.150	0.076	0.0	0.0	0.0	1.07	42.4	12.3
S1.005	50.00	5.69	61.854	0.358	0.0	0.0	0.0	3.95	628.1	58.2
S3.000	50.00	5.37	64.550	0.057	0.0	0.0	0.0	1.10	43.6	9.3
S3.001	50.00	5.43	64.305	0.107	0.0	0.0	0.0	3.13	221.1	17.4
S3.002	50.00	5.54	63.850	0.125	0.0	0.0	0.0	3.11	219.5	20.3
S3.003	50.00	5.62	63.030	0.171	0.0	0.0	0.0	3.11	220.1	27.8
S3.004	50.00	5.74	62.480	0.171	0.0	0.0	0.0	3.05	215.5	27.8
S1.006	50.00	6.03	61.510	0.582	0.0	0.0	0.0	1.93	306.9	94.6
S1.007	50.00	6.33	61.205	0.582	0.0	0.0	0.0	1.07	170.4	94.6
S1.008	50.00	5.11	61.150	0.000	5.0	0.0	0.0	2.25	39.7	5.0

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.017	0.017	0.017
1.001	-	-	100	0.084	0.084	0.084
1.002	-	-	100	0.076	0.076	0.076
1.003	-	-	100	0.030	0.030	0.030
1.004	-	-	100	0.051	0.051	0.051
2.000	-	-	100	0.076	0.076	0.076
1.005	-	-	100	0.024	0.024	0.024
3.000	-	-	100	0.057	0.057	0.057
3.001	-	-	100	0.050	0.050	0.050
3.002	-	-	100	0.018	0.018	0.018
3.003	-	-	100	0.046	0.046	0.046
3.004	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.053	0.053	0.053
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.582	0.582	0.582

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.008	S	61.500	60.450	0.000	0	0

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S15, DS/PN: S1.008, Volume (m³): 4.8

Unit Reference	MD-SHE-0097-4300-1050-4300
Design Head (m)	1.050
Design Flow (l/s)	4.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	97
Invert Level (m)	61.150
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.050	4.3
Flush-Flo™	0.314	4.3
Kick-Flo®	0.664	3.5
Mean Flow over Head Range	-	3.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.2	1.200	4.6	3.000	7.0	7.000	10.5
0.200	4.2	1.400	4.9	3.500	7.5	7.500	10.8
0.300	4.3	1.600	5.2	4.000	8.0	8.000	11.2
0.400	4.3	1.800	5.5	4.500	8.5	8.500	11.5
0.500	4.1	2.000	5.8	5.000	8.9	9.000	11.8
0.600	3.8	2.200	6.1	5.500	9.3	9.500	12.1
0.800	3.8	2.400	6.3	6.000	9.7		
1.000	4.2	2.600	6.6	6.500	10.1		

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Storage Structures for Storm

Tank or Pond Manhole: S15, DS/PN: S1.008

Invert Level (m) 61.200

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	285.0	1.250	660.0	1.500	1000.0

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 425262 123674 SU 25262 23674
Data Type Point
Cv (Summer) 1.000
Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Summer	2	+0%					65.795
S1.001	S2	15 Summer	2	+0%					64.651
S1.002	S3	15 Summer	2	+0%					63.233
S1.003	S4	15 Summer	2	+0%					63.112
S1.004	S5	15 Summer	2	+0%	100/15 Summer				62.537
S2.000	S6	15 Summer	2	+0%	100/15 Summer				62.254
S1.005	S6	15 Summer	2	+0%	100/15 Summer				61.988
S3.000	S8	15 Summer	2	+0%	100/15 Summer				64.633
S3.001	S9	15 Summer	2	+0%					64.374
S3.002	S10	15 Summer	2	+0%					63.919
S3.003	S11	15 Summer	2	+0%	100/15 Summer				63.113
S3.004	S12	15 Summer	2	+0%	100/15 Summer				62.561
S1.006	S7	15 Summer	2	+0%	30/15 Summer				61.704
S1.007	S14	15 Summer	2	+0%	30/15 Summer				61.497
S1.008	S15	360 Summer	2	+0%	2/15 Summer				61.481

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	-0.200	0.000	0.03			3.5	OK	
S1.001	S2	-0.244	0.000	0.08			17.9	OK	
S1.002	S3	-0.312	0.000	0.20			30.6	OK	
S1.003	S4	-0.363	0.000	0.08			35.6	OK	
S1.004	S5	-0.353	0.000	0.10			44.3	OK	
S2.000	S6	-0.121	0.000	0.43			15.4	OK	
S1.005	S6	-0.316	0.000	0.19			63.7	OK	
S3.000	S8	-0.142	0.000	0.29			11.4	OK	
S3.001	S9	-0.231	0.000	0.12			20.0	OK	
S3.002	S10	-0.231	0.000	0.12			22.9	OK	
S3.003	S11	-0.217	0.000	0.17			30.7	OK	
S3.004	S12	-0.219	0.000	0.16			30.8	OK	
S1.006	S7	-0.256	0.000	0.39			103.4	OK	
S1.007	S14	-0.158	0.000	0.74			101.9	OK	
S1.008	S15	0.181	0.000	0.12			4.3	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 425262 123674 SU 25262 23674
Data Type Point
Cv (Summer) 1.000
Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Summer	30	+0%					65.805
S1.001	S2	15 Summer	30	+0%					64.688
S1.002	S3	15 Summer	30	+0%					63.336
S1.003	S4	15 Summer	30	+0%					63.170
S1.004	S5	15 Summer	30	+0%	100/15 Summer				62.604
S2.000	S6	15 Summer	30	+0%	100/15 Summer				62.320
S1.005	S6	15 Summer	30	+0%	100/15 Summer				62.124
S3.000	S8	15 Summer	30	+0%	100/15 Summer				64.678
S3.001	S9	15 Summer	30	+0%					64.415
S3.002	S10	15 Summer	30	+0%					63.962
S3.003	S11	15 Summer	30	+0%	100/15 Summer				63.168
S3.004	S12	15 Summer	30	+0%	100/15 Summer				62.615
S1.006	S7	15 Summer	30	+0%	30/15 Summer				62.074
S1.007	S14	15 Summer	30	+0%	30/15 Summer				61.788
S1.008	S15	360 Winter	30	+0%	2/15 Summer				61.749

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	-0.190	0.000	0.06			7.3	OK	
S1.001	S2	-0.207	0.000	0.21			47.8	OK	
S1.002	S3	-0.209	0.000	0.56			84.2	OK	
S1.003	S4	-0.305	0.000	0.23			98.2	OK	
S1.004	S5	-0.286	0.000	0.28			122.1	OK	
S2.000	S6	-0.055	0.000	0.92			32.7	OK	
S1.005	S6	-0.180	0.000	0.49			161.9	OK	
S3.000	S8	-0.097	0.000	0.60			24.1	OK	
S3.001	S9	-0.190	0.000	0.28			48.0	OK	
S3.002	S10	-0.188	0.000	0.29			56.4	OK	
S3.003	S11	-0.162	0.000	0.43			78.2	OK	
S3.004	S12	-0.165	0.000	0.41			77.7	OK	
S1.006	S7	0.114	0.000	0.97			259.8	SURCHARGED	
S1.007	S14	0.133	0.000	1.85			253.8	SURCHARGED	
S1.008	S15	0.449	0.000	0.12			4.3	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 425262 123674 SU 25262 23674
Data Type Point
Cv (Summer) 1.000
Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Summer	100	+45%					65.819
S1.001	S2	15 Summer	100	+45%					64.723
S1.002	S3	15 Summer	100	+45%					63.545
S1.003	S4	15 Summer	100	+45%					63.309
S1.004	S5	15 Summer	100	+45%	100/15 Summer				63.247
S2.000	S6	15 Summer	100	+45%	100/15 Summer				63.316
S1.005	S6	15 Summer	100	+45%	100/15 Summer				63.136
S3.000	S8	15 Summer	100	+45%	100/15 Summer				64.809
S3.001	S9	15 Summer	100	+45%					64.460
S3.002	S10	15 Summer	100	+45%					64.008
S3.003	S11	15 Summer	100	+45%	100/15 Summer				63.539
S3.004	S12	15 Summer	100	+45%	100/15 Summer				63.279
S1.006	S7	15 Summer	100	+45%	30/15 Summer				62.919
S1.007	S14	600 Winter	100	+45%	30/15 Summer				62.183
S1.008	S15	600 Winter	100	+45%	2/15 Summer				62.182

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	-0.176	0.000	0.11			13.4	OK	
S1.001	S2	-0.172	0.000	0.38			87.3	OK	
S1.002	S3	0.000	0.000	1.00			150.9	OK	
S1.003	S4	-0.166	0.000	0.41			175.4	OK	
S1.004	S5	0.357	0.000	0.44			191.1	SURCHARGED	
S2.000	S6	0.941	0.000	1.55			55.3	FLOOD RISK	
S1.005	S6	0.832	0.000	0.79			262.1	SURCHARGED	
S3.000	S8	0.034	0.000	1.10			44.1	SURCHARGED	
S3.001	S9	-0.145	0.000	0.51			87.0	OK	
S3.002	S10	-0.142	0.000	0.53			102.1	OK	
S3.003	S11	0.209	0.000	0.72			132.3	SURCHARGED	
S3.004	S12	0.499	0.000	0.66			125.1	SURCHARGED	
S1.006	S7	0.959	0.000	1.56			419.0	SURCHARGED	
S1.007	S14	0.528	0.000	0.28			38.0	SURCHARGED	
S1.008	S15	0.882	0.000	0.12			4.3	SURCHARGED	

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APPENDIX D
SUDS MANAGEMENT PLAN

SUDs Management Plan

Storm water pipework & Road Gullies

The key maintenance requirement for the surface water drainage system includes the removal of sediments and debris from the system as required.

All storm water pipe work should be visually inspected a minimum of monthly for the first three months after installation and then a minimum of once year.

As road gullies are the first on the treatment train and susceptible to higher silt loadings, these will need to be inspected a minimum of monthly for the first three months after installation and then a minimum of every four months.

During this inspection identify any gully pots or pipes that require remedial maintenance such removal of sediment, debris, leaves and litter as required.
This involves the removal all protective covers and grids and the cleaning out of channels or gully pots by hand or with suitable jetting equipment.

During the first year of operation each gully should be inspected every 3 months, and every 6 months thereafter for structural integrity and cleaned out as required.

Permeable Block Paving

Key Maintenance Requirements:

- Sweeping
- Regular brushing and vacuuming (to be carried out by a specialist contractor)

Regular inspection and maintenance is important for the effective operation of permeable pavements and should be inspected regularly, preferably during and after heavy rainfall to check effective operation and to identify any areas of ponding.

Permeable block paving needs to be regularly cleaned of silt and other sediments to preserve infiltration capability and should have a minimum of three surface sweepings per year.

A brush and suction cleaner, which can be a lorry-mounted device or a smaller precinct sweeper, should be used and the sweeping regime should be as follows:

1. End of winter (April) – to collect winter debris.
2. Mid-summer (July/August) – to collect dust, flower and grass-type deposits.
3. After autumn leaf fall (November).

Care should be taken in adjusting vacuuming equipment to avoid removal of jointing material and any lost material should be replaced.

To ensure the continual optimal performance of the permeable paving, it is recommended that the following maintenance should be carried out. The following guidelines are offered as an initial regime, but maybe either increased or decreased depending on the local environment and any external contributing factors:

- A visual inspection of the paving may be carried out on a regular basis.
  This will confirm the effectiveness of the agitation maintenance due to variations between sites and allow any refinement of the regular agitation activity if necessary.

- The paving should be agitated (e.g. brushed, vacuumed, etc.) at least twice a year.
  This is to ensure no vegetation of any sort is allowed to grow and develop in the joints. Ideally, this activity should be carried out in the spring and autumn seasons.

- The paving should be inspected after any heavy precipitation to ensure no displacement of any organic matter onto the surface of the pavement.
- For winter maintenance, the controlled use of de-icing may be used without causing significant detrimental effects towards the permeable pavements performance.
  When used carefully, the use of these chlorides will not result in an increase in the chloride levels in the local ground.

- Weed growth – when sedimentation occurs in areas of permeable paving then there is the potential for weed growth, this will typically occur where there are overhanging trees or soft landscaping slopes down on to the paving or in areas which do not receive over run from vehicles particularly frequently. Weeds can be removed from the surface through the controlled application of proprietary non-persistent contact herbicides. Those containing Glyphosate are the most suitable.

Depending on the amount of usage and the environment the permeable pavement has received and been exposed to, the laying course material may require either replacement or cleaning after a 25 to 30 year period. This would be evident if the infiltration rate of the paving became prolonged, allowing ponding to develop.
Should this occur, the uplifting and cleaning (or replacing, depending on the costings of the activity) of the laying course maybe considered. The laying course material, jointing and blocks may be reused (once cleaned), minimising costs.

Driveways

Driveways & Private Roads will either be constructed as permeable block paving (outlined above) or constructed as an impervious surface drained via traditional deep trapped / yard gullies discharging into a permeable high-void aggregate sub-base layer beneath. This sub-base allows for filtration of pollutants from the runoff which is discharge to the perforated filter pipework below.

General yard gully and linear channel maintenance involves the removal of dead leaves, soil, litter from the gratings and sediments from the sump within the gully pot or channel. This involves the removal all protective covers and grids and the cleaning out of channels or gully pots by hand or with suitable jetting equipment.
During the first year of operation each gully and channel should be inspected every 3 months, and every 6 months thereafter for structural integrity and cleaned out as required.

Attenuation Basins

Key Maintenance Requirements**:**

- Litter/trash removal
- Inlet/outlet headwall inspection and cleaning
- Vegetation management
- Sediment monitoring and removal when required

Regular inspection and maintenance is important for the effective operation of the attenuation basin. The basin will be subject to a routine monitoring and maintenance schedule as part of the general site management. This will be carried out at intervals detailed below, and shall comprise of the following operations:
Collection and removal of all litter/large debris from the attenuation pond, inlets, outflows, and water margins once a month.
Monthly inspection of the attenuation ponds to check the following, and repair as necessary:
1. Any failure in the operation of the inlet and outlet headwalls unless adopted by others in which case they will be notified of any observed defect.
2. Any damage or erosion to the perimeter edges and slopes of the attenuation ponds.

Please see landscape management plan for further details of planting and management.

An annual check carried out by a suitably qualified person, to assess the condition and operation of the attenuation basin inlet and outflow, and the accumulation of silt/sediment.

A record of maintenance visits and remedial operations shall be maintained.

Desilting of Attenuation Basins

In addition to regular routine items, SuDS maintenance will be carried out which may include de-silting the attenuation ponds, usually on a 10-15 year cycle depending on the on-going silt level checking. This can be an intrusive operation when carried out within housing areas and prior to any planned desilting or dredging, consultation will be undertaken with both the LLFA and the Environment Agency.

Before any desilting operations are carried out, residents and members of the public in the general area will be informed and those in the immediate vicinity will be notified in writing well in advance of commencement of works.

The desilting work will be carried out under the supervision of consulting engineers and to a pre-agreed method statement. Such a method statement should be submitted in writing to the local authority and agreed in advance of the commencement of the works.

Prior to desilting works commencing, a suitably qualified ecologist shall be appointed to undertake an assessment of the ecological interest within the pond and its margins. In the event that the attenuation ponds develop particular ecological interest, then careful consideration will be given to the timing of this operation.

Hydrodynamic Vortex Separator & Filter

SDS Ltd Aqua Swirl proprietary Hydrodynamic Vortex Separator provided on the outfalls to the attenuation basin and from the access road.

Maintenance:
Long term performance of the Aqua Swirl or any other device depends on inspection and maintenance program.
Recommended schedule in line with CIRIA C753 guidance; upon hand over – 3 months -6 months -12 months and then annually or as deemed necessary from details obtain from previous inspections. Each site sediment loadings will be different and at its highest just after the build phase, hence why a more frequent visit is required at the start of the programme.

The Aqua-Swirl® has been designed to minimize and simplify the inspection and maintenance process. The single chamber system can be inspected and maintained entirely from the surface thereby eliminating the need for confined space entry. Furthermore, the entire structure (specifically, the floor) is accessible for visual inspection from the surface. There are no areas of the structure that are blocked from visual inspection or periodic cleaning. Inspection of any free- floating oil and floatable debris can be directly observed and maintained through the manhole access provided directly over the swirl chamber. Chamber system can be inspected and maintained entirely from the surface.

Inspection:
To inspect the Aqua-Swirl®, remove the manhole cover. The only tools needed to inspect the Aqua-Swirl® system are a flashlight and a measuring device such as a stadia rod or pole. Given the easy and direct accessibility provided, floating oil and debris can be observed directly from the surface.

Sediment depths can easily be determined by lowering a measuring device to the top of the sediment pile and to the surface of the water.

When the sediment pile is within 42 to 48 inches of the water surface (or sediment pile thickness is 18 to 24 inches as measured from the base), the system should be maintained. The maximum Sediment storage capacity of the Aqua-Swirl® is reached when the sediment pile is within 30 inches of the water surface (or sediment accumulation is 36 inches thick as measured from the base).

It should be noted that to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile. Keep in mind that the finer sediment at the top of the pile may offer less resistance to the measuring device than the larger particles which typically occur deeper within the sediment pile.

The Aqua-Swirl® design allows for the sediment to accumulate in a semi-conical fashion as illustrated above. That is, the depth to sediment as measured below the water surface may be less in the center of the swirl chamber; and likewise, may be greater at the edges of the swirl chamber.

Removal:
Cleaning the Aqua-Swirl® is simple and quick. Free-floating oil and floatable debris can be observed and removed directly through the 750mm service access riser provided. A vacuum truck is typically used to remove the accumulated sediment and debris. An advantage of the Aqua-Swirl® design is that the entire sediment storage area can be reached with a vacuum hose from the surface (reaching all the sides). Since there are no multiple or limited (hidden or “blind”) chambers in the Aqua-Swirl®, there are no restrictions to impede on-site maintenance tasks.

Disposal:
Sediments excavated from swales that receive runoff from residential or standard road and roof areas are generally not toxic or hazardous material and can be safely disposed of by either land application or landfilling. All removed products should be disposed of in line with local council and environmental requirements

Outfall Headwalls

Outfall headwalls should be visually inspected a minimum of monthly for the first three months after installation and then a minimum of once a year. Accumulated sediments, debris and any overgrown vegetative material should be removed from the culvert and margins of the outlet headwalls as necessary. During the inspections the general operation, and structural condition of the headwall and any erosion of banks or scour control features should be identified and rehabilitated as required.

Flow Control Chamber

The key maintenance requirement for the flow control chambers will be the inspection of the units for blockages of the vortex flow control unit and silt removal from sump of chamber.

The hydraulic vortex flow control unit has no moving parts and is self-activating, requiring minimal maintenance. After initial installation, it is recommended that the unit be inspected monthly for three months.

Thereafter the manhole chamber and control device should be inspected at least every six months to verify the condition and operation of the unit and check for blockages within the inlet of the chamber and of the flow control device. During these inspections, accumulated silts should be removed and the sump cleaned out using a conventional sump vacuum cleaner. Flow Controls are fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur.

APPENDIX E
FLOOD RISK ASSESSMENT

LAND SOUTH OF ROMSEY ROAD

WHITEPARISH, WILTSHIRE

FLOOD RISK ASSESSMENT

PREPARED FOR

Condon Drew Associates

33 COLSTON AVENUE

BRISTOL

BS1 4UA

DECEMBER 2022

DOCUMENT HISTORY

Project Number: 1294

Project Title: Land South of Romsey Road

Document Reference: Flood Risk Assessment

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Issue 5	Issue For Client Comment			
Issue 6	Issue for Planning Submission			

NOTICE

This document and its contents have been prepared and are intended solely for information and use of Macra Ltd in relation to an application for residential development on land south of Romsey Road in Whiteparish, Wiltshire.

This document has been prepared for the titled project or named part thereof and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authority of Condon Drew Associates Ltd being obtained. Condon Drew Associates Ltd accepts no responsibility or liability for the consequence of this document being used for a purpose other than the purposes for which it was commissioned. Any person using or relying on the document for such other purposes agrees and will by such use or reliance be taken to confirm this agreement to indemnify Condon Drew Associates Ltd for all loss or damage resulting there from.

TECHNICAL SUMMARY

Our Ref	1294
Site Name	Land South of Romsey Road
Client	Macra
Nearest Postcode	RG20 9JW
Site Size	1.7ha
Site Proposals	Up to 25 new residential dwellings
Flood Risk (Rivers and Seas)	Very low
Flood Risk (Surface Water)	Very low
Flood Risk (Reservoirs)	Very low
Flood Risk (Other Sources)	Low - Medium
Greenfield Runoff Rate (l/s)	2.4
SuDS Features Proposed	Attenuation Basin
Attenuation Volume	480 m^3
Foul Drainage Strategy	Gravity discharge from site to existing Foul Sewer.

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1 INTRODUCTION

Brief

1.1 Condon Drew Associates Ltd. (CDA) have been appointed by Macra Ltd. (the Client) to prepare a Flood Risk Assessment (FRA) and surface and foul water drainage strategy to support an outline planning application (all matters reserved except external access) for the erection of up to 25 dwellings with access parking and associated landscaping.

Requirement for a Flood Risk Assessment

1.2 The site is shown to be located in Flood Zone 1 on the Government Flood Map for Planning. In line with advice from the NPPF, all developments in Flood Zone 1 larger than 1 Ha require a site-specific FRA.

Purpose of the Report

1.3 As the site is located in Flood Zone 1, the main purpose of the Report is to confirm that the proposed development will not increase risk of flooding elsewhere.

1.4 The Report demonstrates that with respect to flooding risks, the Site is appropriate for development and is compatible with the NPPF and appropriate policies and best practice procedures in relation to flood risk.

Scope of the Risk Assessment

1.5 This FRA outlines the flood risk and drainage issues in relation to the development proposals. The purpose of this report is to demonstrate how the development complies with planning policy on flood risk (National Planning Policy Framework, and the supporting Planning Practice Guidance) and drainage.

1.6 The structure of this report is summarised below:

- Section 2: Describes the existing conditions with respect to flooding and drainage;
- Section 3: Provides a commentary on how flood risk from a range of potential sources may or may not constrain the development proposals;
- Section 4: Outlines the development proposals and suitability of the development;
- Section 5: Describes how surface water can be discharged from the site without

increasing flood risk elsewhere;

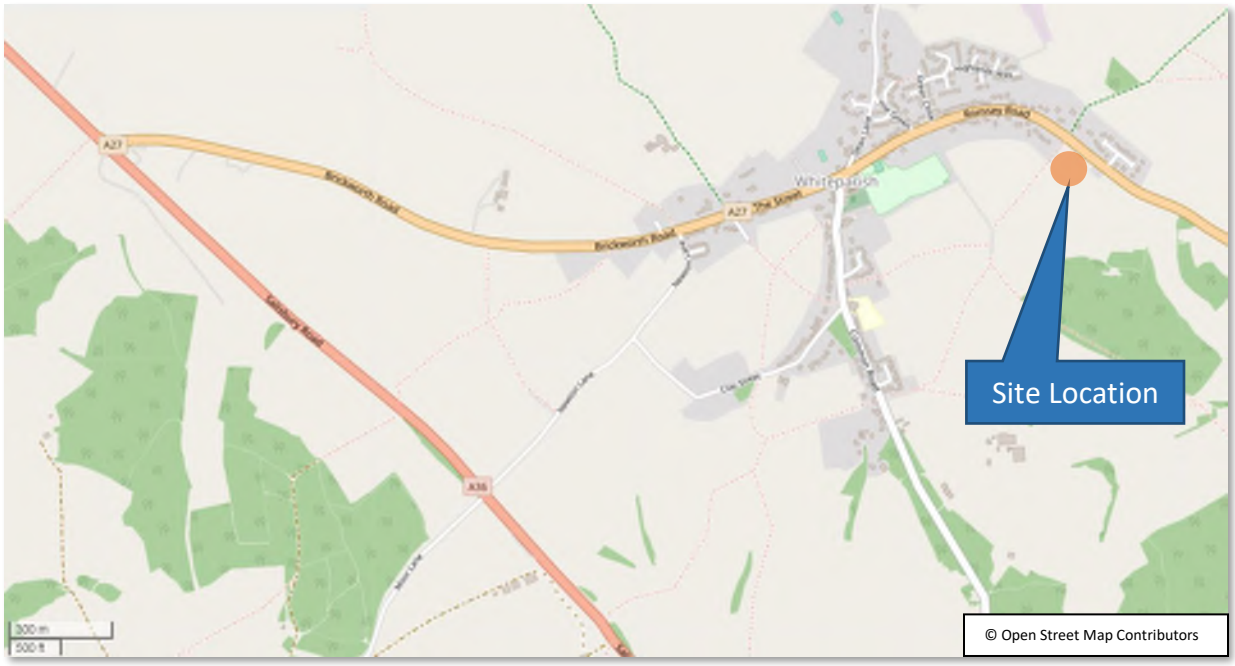
- Section 6: Describes how foul water can be discharged from the site;
- Section 7: Considers the consents that may be required post application;
- Section 8: Presents a summary of the report and identifies the main conclusions that can be drawn.

2 SITE DESCRIPTION

Site Location

2.1 The site is located to the south of Romsey Road some 650m from the centre of Whiteparish. To the east of the site is a row of terraced housed and to the west of the site is residential development that continues into the centre of the village. On the northern side of Romsey Road are residential properties, while to the south is an undeveloped field used for grazing. The site location in its local context is shown in **Figure 2.1** below:

Figure 2.1: Site Location



Topography

2.2 A topographical survey of the site was undertaken by Dando Surveying Ltd. in August 2019 and is included in **Appendix A**. From the topographical survey, it can be seen that the site falls gently from northwest to southeast at a relatively constant gradient of around 1 in 25. There is a shallow valley in the centre of the site. Levels range from approximately 68.0mAOD at the north-western boundary to 61.4mAOD at the very southern corner of the site.

Hydrology

2.3 There are no watercourses on, or immediately adjacent to the Site. The nearest ordinary watercourse is to the south of the site approximately 50m from the site boundary. This is a small channel located

along a field boundary, which runs east and discharges into the Park Water some 1km from the site.

2.4 The nearest Main River (as designated by the EA) is the River Blackwater, with its closest point 3.75km north of the site.

2.5 There are existing Southern Water foul sewers in the area, with a network to the north of the Site in Romsey Road. This sewer discharges into a foul pumping station 175m east of the site. This can be seen in **Appendix B**. The local foul network is connected to the Whiteparish Wastewater Treatment Works (WWTW) located to the south west of the village at grid reference SU 24019 22550.

Hydrogeology

2.6 According to the British Geological Survey (BGS), the bedrock geology at the site is Reading Formation (Sand) with no recorded superficial deposits.

2.7 A Ground Investigation has been undertaken by Forge Environmental Management. The natural soils were a sandy clay and generally cohesive, with infiltration testing showing the site is not suitable for soakaways or other infiltration devices as a mode of surface water discharge. Full details can be seen in the ground investigation report, an extract of which is included in **Appendix I**.

3 FLOOD RISK

National Planning Policy Framework

3.1 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. The NPPF was revised in July 2021 with recent revisions including added onus on using opportunities provided by new developments to reduce the causes and impacts of flooding.

3.2 Flooding is addressed in Section 14 'Meeting the Challenge of Climate Change, Flooding and Coastal Change' of the NPPF. Footnote 55 to the NPPF states:

> *"A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use."*

3.3 The Planning Practise Guidance (PPG) supports the NPPF and was also updated, where required, in August 2022. **Table 3.1** (below) is taken from the PPG and sets out the Flood Zone Definitions.

Table 3.1: Flood Zones (PPG Table 1)

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2, 3a and 3b)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)

Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: • land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

3.4 **Table 3.2** (below) defines development by its vulnerability to flooding, with the majority of all development types covered. As can be seen, residential development falls under the "More Vulnerable" category.

Table 3.2: Flood Risk Vulnerability Classification (NPPF Annex 3)

Essential Infrastructure
• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including infrastructure for electricity supply including generation, storage and distribution systems; including electricity generating power

stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood.Wind turbines. • Solar farms
Highly Vulnerable
• Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure')
More Vulnerable
• Hospitals • ***Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.*** • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable

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

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

3.5 **Table 3.3** (overleaf) considers the compatibility of the vulnerability classes from **Table 3.2** with the different Flood Zones from **Table 3.1.** As shown, residential developments are appropriate in Flood Zone 1.

Table 3.3: Flood Risk Vulnerability and Flood Zone Compatibility (PPG Table 2)

Flood Zone	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

Notes to **Table 3.3**:

- This table does not show the application of the Sequential Test which should be applied first to guide development to the lowest flood risk areas; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and Exception Tests do not need to be applied to those developments set out in National Planning Policy Framework footnote 56. The Sequential and Exception Tests should be applied to 'major' and 'non major' development;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

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

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

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

Sequential Testing

3.6 The Site for the proposed development is exclusively within Flood Zone 1 and as per Table 2 of the PPG, this is compatible with the 'More Vulnerable' class of developments. To this end, the Sequential Test and the Exception Test are not required.

Strategic Flood Risk Assessment and Lead Local Flood Authority Information

3.7 Wiltshire Council (WC), as the Lead Local Flood Authority (LLFA) have produced several documents that investigate flooding issues and consider drainage options within the county.

3.8 A Wiltshire Council Level 1 Strategic Flood Risk Assessment (SFRA) was published in July 2013, with an SFRA Level 2 complete in July 2010. A revised version of the SFRA was published in May 2019.

3.9 The SFRA Level 1 includes flooding and drainage information. There are two mentions of Whiteparish in the SFRA, relating to ground conditions west of the village and a flood event in 1995, although the watercourse referenced is some distance from the site.

3.10 The SFRA flood risk maps have been collated online into a GIS mapping service[1]. A selection of pertinent maps with layers selected are included in **Appendix C**. These are discussed further in this Section.

3.11 A Surface Water Management Plan was produced in November 2011, however, this focuses on Chippenham, Trowbridge and Salisbury.

3.12 A Preliminary Flood Risk Assessment (PFRA) was published in May 2011. Again, there is no specific mention of Whiteparish, however the document is intended to give a high-level view of flood risk to the county.

[1] http://wiltscouncil.maps.arcgis.com/apps/webappviewer/index.html?id=28c00215d87b468a9a0cd79c63d3d270

Pre-Application

3.13 A Pre-Application was submitted to WC in January 2021, reference 21/00949/PREAPP, with a response received in April 2021. The pre-app related to an earlier proposal that included the change of use of land for a burial ground. The full response is included as **Appendix J**, though in summary, the drainage points raised were as follows:

- The site is in an area of high risk of groundwater flooding.
- Infiltration techniques may not be suitable for the site, but will require additional information if proposed.
- The proposed discharge rate of 2.4 l/s is acceptable.
- Surface water drainage must follow the surface water disposal hierarchy.
- Land Drainage Consent will be required for any works to be carried out on an ordinary watercourse.
- Drainage design should follow guidance where there is no flooding in the 1 in 30 year event, the 1 in 100 (+45% climate change) event does not cause flooding of any buildings, and that flows in excess of the 1 in 100 year event will be managed to minimise risks to people and property.
- SuDS should be used within the site.
- Permission will be required to cross third party land.
- Groundwater testing has been requested (preferably seasonal).
- Information was also provided on burial grounds as the previous application included such an area. The below has been included for completeness, but is not relevant to the new application:
    - In line with the EA requirements, all burials are to be:
        - At least 50m from any potable groundwater supply source.
        - At least 30m from any watercourse or spring.
        - At least 10m from field drains.
        - Not in standing water, with the base of the grave above the water table.

Sources of Flooding

3.14 The development will be located entirely within Environment Agency (EA) Flood Zone 1, an area with a low probability of flooding. Therefore, a residential development here is appropriate.

3.15 As such, this FRA has been prepared to demonstrate that the development will not increase flood risk elsewhere.

3.16 There are a wide range of potential flooding mechanisms which can cause flooding. Each potential source of flooding is discussed individually below:

Tidal Flooding

3.17 Tidal flooding occurs through inundation from the sea or estuarine waters. The Site is some 17km from the coast, and at an elevation in excess of 60mAOD. As such tidal flooding will not be discussed further in this report.

Fluvial Flooding

3.18 Fluvial flooding occurs through the inundation from rivers and watercourses. The siting within Flood Zone 1 indicates that the Site has a low risk of flooding from fluvial sources (<0.1% annual probability).

3.19 The Government Flood Map for Planning, shown in **Figure 3.1**, overleaf, shows the site in relation to Fluvial and Tidal Flood Zones.

Surface Water Flooding

3.20 This form of flooding can occur during high intensity rainfall events as sheet runoff from fields or large hard paved areas.

3.21 The Government Flood Risk from Surface Water is shown in **Figure 3.2** overleaf. There is no flood risk shown within the site, with a channel of surface water flood risk along the ordinary watercourse to the south of the site.

Figure 3.1: Government Flood Map for Planning

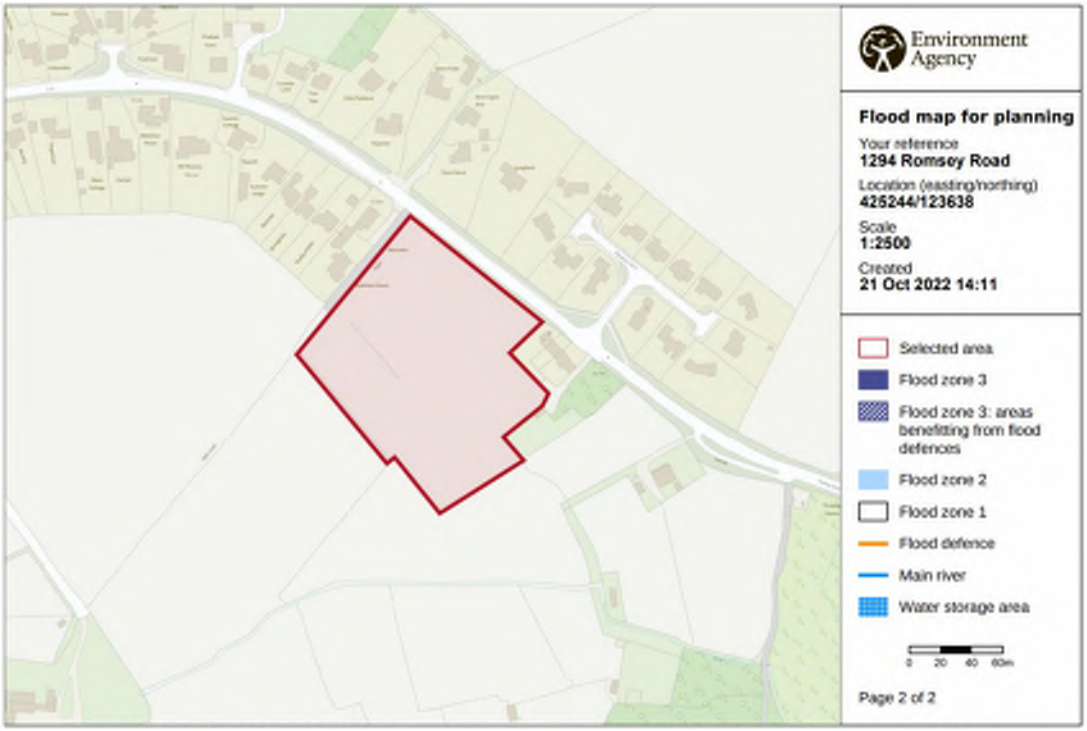


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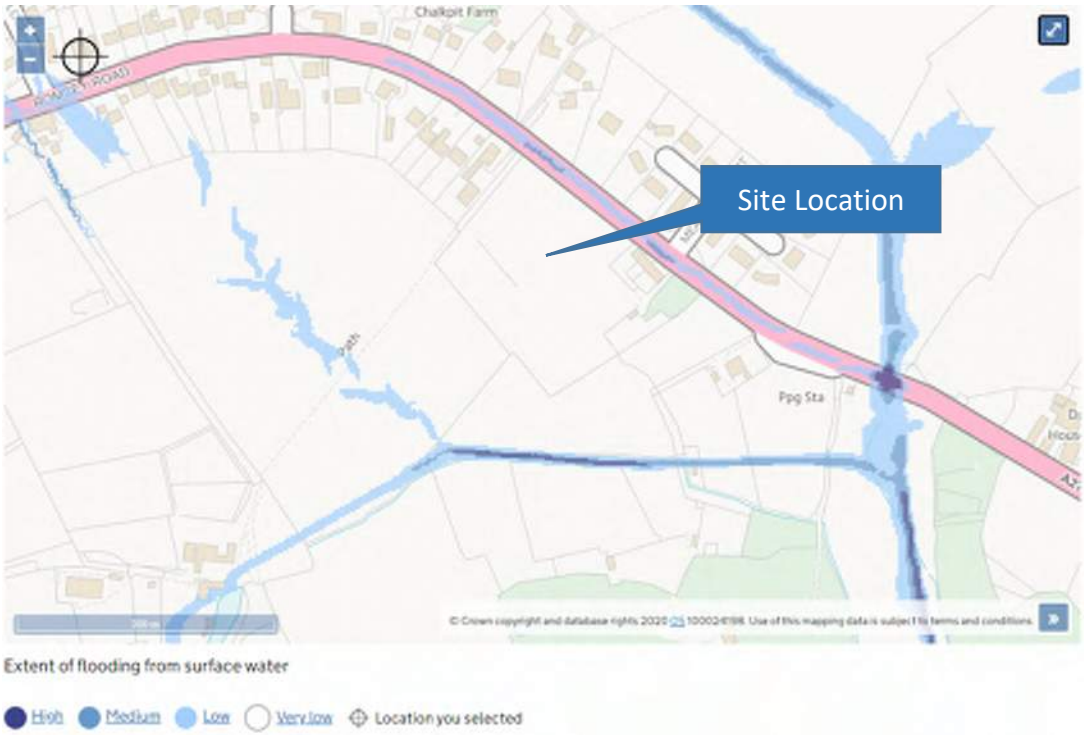
Figure 3.2: The Government Long Term Flood Risk Information: Surface Water Flood Risk Map



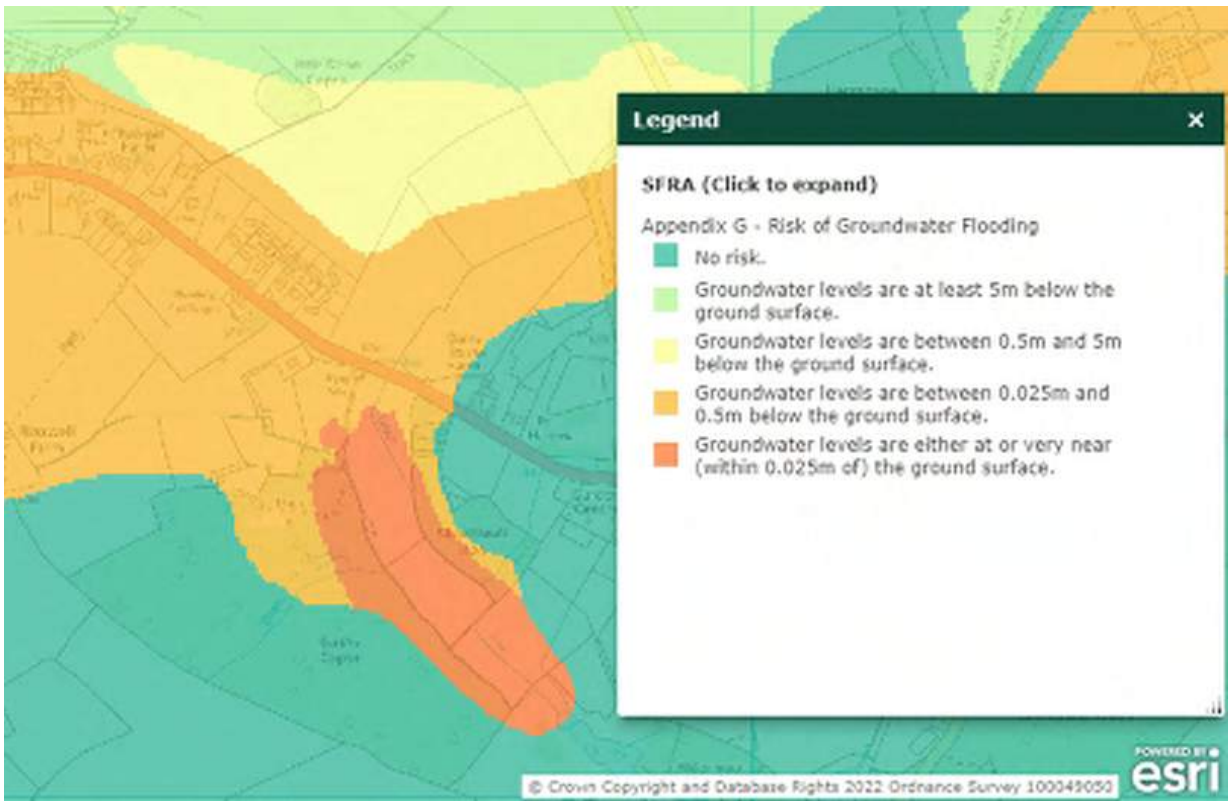
Sewer Flooding

3.22 The SFRA maps (**Appendix C**) indicates that there have been nine instances of sewer flooding in the post code shared by the site. From the SFRA map, it is unclear exactly where these instances have been located, however as the sewers adjacent to the site are in Romsey Road, which is generally 1m lower than the site, risk of sewer flooding to the site is low. As part of the site's development, it is a requirement to ensure that flooding is not increased as a result of the development.

Groundwater Flooding

3.23 The SFRA maps identify the area around the site as having groundwater levels between 0.025m and 0.5m below ground level, as shown in **Figure 3.3**, below.

Figure 3.2: SFRA Risk of Groundwater Flooding Map



3.24 While the mapping does not provide qualitative levels of risk to the groundwater risk zones, the risk is rated from 0 to 4, with 0 being no risk and 4 identifying groundwater levels at or very close to the surface. The SFRA, section 3.4.3 states "*The JBA Groundwater Flood Map should be used in combination with other information, such as local data or historic data. It should not be used as sole evidence for any specific flood risk management, land use planning or other decisions at any scale. The data can however help to identify areas for further assessment at a local scale, where finer*

resolution datasets may exist or more data could be gathered."

3.25 In line with this recommendation, the GI includes a section investigating groundwater. The GI in its entirety has been submitted with the application, with the groundwater section form the executive summary stating that:

> *The site is in an area considered by the Strategic Flood Risk Assessment to be at moderate risk of groundwater flooding, however site investigation did not encounter groundwater in the deepest trial pit in the lowest part of the site. Historical flood event maps do not show any floods on the site relating to water table.*

3.26 Based on the site investigation, it has been taken that the site is within a 'Low' groundwater flood risk zone.

3.27 There are no other sources identified as being a flood risk to the site. The Government Long term flood risk maps show the site not to be at risk of flooding from reservoirs.

Flood Risk from other Sources

3.28 There are no other sources identified as being a flood risk to the site. The Government Long term flood risk maps show the site not to be at risk of flooding from reservoirs.

Summary of Flood Risk

3.29 **Table 3.5** below summarises the flood risk to the site:

Table 3.5: Flood Risk Summary

Source	Probability of Flooding	Pre-Mitigation Flood Risk	Post-Mitigation Flood Risk
Tidal	-	-	-
Fluvial	<0.1% AEP	Negligible	Negligible
Pluvial	<0.1% AEP	Negligible	Negligible
Groundwater	Low	Low	Low
Reservoir Breaches	-	-	-
Sewer	Low	Low	Low
Other Sources	-	-	-

Flood Mitigation Measures

3.30 This Report provides evidence that the Site is not constrained by flood risk from all sources. Evidence presented shows that any local risk of flooding is not high, and the residual risk is compatible with the proposed use. No additional mitigation measures are therefore necessary.

3.31 Consideration should be given to the surface water runoff from the site. A suitable surface water drainage strategy should be able to mitigate the existing flood risk to the site, whilst ensuring risk downstream is not increased.

4 PROPOSED DEVELOPMENT

Development Proposals

4.1 Proposals for the site comprise the erection of up to 25 new dwellings. The proposal is in 'outline' with all matters except external access reserved for future consideration. Illustrative details of the development proposals are shown on the Architect's plans submitted with the application however, for reference, the proposed plans are included in **Appendix D**.

Development Vulnerability

4.2 The land is currently classed as 'Less Vulnerable' with the proposed development to be classed as 'More Vulnerable.' However, as mentioned previously, the siting of the development in Flood Zone 1 means that a "More Vulnerable" development is appropriate.

Assessment of Pre and Post Development Areas

4.3 The existing site covers an area of approximately 1.7Ha. There are no existing structures on the site, therefore existing conditions are greenfield.

4.4 Proposals for the site include 25 new dwellings with private drives and adopted highways within an area extending to approximately 1.1 hectares. An impermeable area plan has been created for the proposals, with the highways and private areas measuring 0.44Ha.

4.5 Unmitigated, this total increase in impermeable area would result in increased rates of surface water runoff from the site.

4.6 The proposed surface water drainage strategy has been produced with the contributing area for the network taken as the highways area as measured, and the private area with a 10% tolerance added on to account for urban creep.

Assessment of Pre and Post Development Surface Water Discharge Rates

4.7 An assessment of the existing greenfield runoff rates has been undertaken, in order to provide the runoff rates that the drainage strategy will need to adhere to. Only the development area has been assessed for the greenfield runoff. All calculations are shown in **Appendix E**, with the rates for a variety of return events shown in **Table 4.1** overleaf:

Table 4.1: Existing Greenfield Runoff Rates

Return Period	Greenfield Runoff (ls^{-1})
Q1	2.1
Qbar	2.4
Q30	5.8
Q100	7.7

4.8 It is proposed to restrict runoff rates post development to the Qbar rate for the site. This will ensure that flood risk is not increased post-development, and during more extreme events the runoff rate from the development will be reduced.

4.9 **Figure 4.1** shows the site location on Defra's Magic Map in relation to drinking water safeguard and source protection zones. These are all well over 50m away from the site boundary.

Figure 4.1: Defra Magic Map Drinking Water Safeguard Zones and Source Protection Zones

4.10 The nearest watercourse and field drain is the ditch to the south of the site some 50m from the site boundary.

5 SURFACE WATER DRAINAGE STRATEGY AND SUDS

SuDS and Design Principles

5.1 It is proposed to employ solutions based on Sustainable Drainage Systems (SuDS) to manage any increase in the run-off from the designed impermeable areas in the proposed development.

5.2 The following goals should be met in order that the appropriate SuDS solutions are designed according to the relevant policy requirements and best practice guidance:

- The proposed development will not increase the risk of flooding elsewhere;
- The SuDS strategy will dispose surface water runoff from the proposed development;
- Risks are identified against the deliverability of the strategy;
- Betterments will be offered where possible;
- Residual risks will be identified and mitigation measures will be put into place; and
- A maintenance schedule will be outlined.

Proposed Surface Water Drainage Principles

5.3 In order to ensure that surface water runoff from the site does not cause an increase in flood risk, the management of runoff has been considered via a sequential approach, in line with Building Regulations and the NPPF. The following options for the disposal of surface water runoff were considered, in order of preference:

- To the ground (infiltration);
- To a surface water body;
- To a surface water sewer, highway drain or another drainage system;
- To a combined sewer.

5.4 The site is located on bedrock of Reading Formation, with infiltration testing showing that soakaways are not viable for the site.

5.5 There is an ordinary watercourse approximately 50m to the south of the site. Whilst outside the site boundary, LiDAR data shows that the watercourse is at a lower level than the site, and indeed, is the existing receptor of surface water runoff from the site. It is proposed to discharge surface water

runoff to this ordinary watercourse, mimicking the existing drainage regime

Proposed Surface Water Drainage Strategy

5.6 As explained above, it is proposed to discharge surface water runoff at greenfield rates to the watercourse to the south of the site. On site attenuation, will be provided to ensure that no flooding takes place during any rainfall event up to and including the 1 in 100 year return period plus 45% climate change event. It is proposed to attenuate water in an above ground basin at the southeast of the site. A flow control device will limit the discharge from the site to the Qbar greenfield runoff rate.

5.7 A preliminary hydraulic model has been created for the site based on the illustrative site plan and, following the Design and Construction Guidance (the Code) the system includes no surcharging within the network during the 1-in-1 year storm, no flooding within the 1-in-30 year event, and any flooding within the 1-in-100 year event with a 45% climate change allowance is retained on site.

5.8 The only flooding in the Q100+45% event is occurs in shorter duration storms (only the 15 minute winter storm) and is due to lack of capacity at the upper end of the network. The volume of flood water is 0.67m^3-2.86m^3 at three different chambers, and on flooding, will flow over the highway and re-enter the system further down the network where there is spare capacity. The calculations for the model are included in **Appendix E**.

5.9 The proposed point of discharge is to the minor watercourse to the south of the site. The ditch is approximately 65m to the south of the attenuation basin. The final connection will be laid over third party land. It is expected that this can either be agreed with the landowner, or requisitioned via Southern Water.

5.10 The layout of the drainage strategy is included in **Appendix G** and outlines an indicative pipe layout along with the attenuation crates and point of discharge.

5.11 It is also recommended that rainwater harvesting butts are included for dwellings where appropriate to promote the reuse of storm water. These are not shown on the drainage strategy, nor are they included in any calculations as even if included, there is no guarantee that they will have spare capacity when a rainfall event starts.

Discharge Rates

5.12 A discharge rate of 2.4 ls^{-1} is proposed for the site in line with the greenfield runoff rate for the

average storm (Qbar). This will be achieved by the use of a flow control chamber at the downstream end of the drainage system.

Attenuation Features

5.13 As mentioned, it is proposed that attenuation is offered up in an above ground attenuation basin at the southeast of the site. The basin has been designed as 1m deep. At the detailed design stage, it is expected that this will be refined in line with the final detailed layout.

5.14 A volume of 480m^3 is stored in the critical Q100 + 45% storm.

5.15 The SuDS basin could be incorporated into ecological proposals for the site which will likely increase the area required, however, as can be seen on the site layout, there is scope for an increased footprint.

Overland Flood Routes

5.16 In setting the final external levels for the development it is important to ensure that if flows in exceedance of the 1 in 100 years plus 45% allowance for climate change storm event occur or a failure of the site surface water drainage system occurs, that suitable overland flood routes are provided within the development to ensure no localised flooding of the buildings occurs within the development.

5.17 It is therefore proposed to direct overland surface water flows to the south of the application site, given that the site naturally drains in that direction. This will also ensure exceedance flows discharge at the same point as the drainage system, and mimic existing drainage conditions. The routes are shown on drawing 1294-001.

Residual Flood Risk

5.18 If the above mitigation measures are provided as part of the development, it is considered that the primary residual flood risk would be as a result of some type of failure of the site's drainage system during the lifetime of the development. Regular, ongoing maintenance will therefore be required to ensure that the capacity of the system is maintained as it has been designed.

5.19 There remains a residual risk of a storm event that exceeds the capacity of the drainage system, as events beyond the 1 in 100 year plus 45% allowance for climate change storm event will not be catered for explicitly. This is in line with planning guidance as designing for more extreme storm

becomes unviable due to the increased mitigation required versus the decreasing chance of such a storm occurring.

Future Maintenance Responsibilities

5.20 As it is anticipated that upon completion of the development the surface water sewers will be adopted under a Section 104 agreement with Southern Water, responsibility for the maintenance of the new surface water drainage systems will eventually be with Southern Water.

5.21 At the time of writing, it is not known whether the SuDS features will be offered up for adoption by the Local Authority or maintained by a management company.

5.22 In the event of Southern Water not adopting the drainage system, there are alternatives that can be explored. One such option could be adoption by the Local Authority following a commuted sum to the Local Authority.

5.23 Maintenance of SuDS features should be undertaken in accordance with guidance set out in the SuDS Manual (Ciria C753). The maintenance guidelines for attenuation basins are included in **Appendix H**.

5.24 Full details of the drainage strategy will be a matter for the detailed design and can be addressed by a planning condition.

5.25 Paragraph 059 of the PPG includes nine points that supporting information (including a SuDS strategy) should provide. For convenience, these points are outlined in **Table 5.1**, below. Some of the points are paraphrased, however they can read in full at https://www.gov.uk/guidance/flood-risk-and-coastal-change#para59.

Table 5.1: PPG Paragraph 095 / Reference ID: 7-059-20220825 Responses

Ref	PPG Question	Response
1	What are the existing surface water drainage arrangements for the site?	Surface water currently flows overland to the south / south west of the site and beyond to existing agricultural land to a ditch approximately 50m south of the site boundary.
2	What are the existing runoff rates and volumes?	Qbar is 2.4 l/s for the site. Please see **Table 4.1** for the full rates. Runoff volume is 264m^3.

3	What are proposals for managing and discharging surface water from the site using sustainable drainage systems and accounting for the predicted impacts of climate change? What are the proposals for restricting discharge rates?	All surface water runoff from the proposed impermeable areas within the site will discharge to an attenuation basin at the low point of the site. Flow will be controlled to Qbar and discharge, following the existing regime to the ditch to the south. In line with the government advice for peak rainfall intensity allowance, a climate change allowance of 45% has been applied to the Q100 storm as the site lies within the Test and Itchen Management Catchment peak rainfall allowances. It is proposed that the discharge is controlled using a flow control chamber. This could be a simple orifice, or a more efficient vortex control and will be detrained at the detailed design stage.
4	Demonstrate how the hierarchy of drainage options has been followed. Explain and justify why the types of sustainable drainage systems and method of discharge have been selected and why they are considered appropriate	The SuDS hierarchy is outlined in section 5.3. Infiltration has been ruled out following a ground investigation at the site (see **Appendix I**). The next option in the hierarchy is proposed, being discharge to a surface water body. Above ground attenuation features are proposed as these provide additional water quality benefits and can have multiple uses. NB SuDS are not deemed inappropriate, therefore the latter part of this question is not applicable.

5	How have SuDS been integrated with other aspects of the development such as open space, for an efficient use of the site?	The attenuation basin is located in public open space and is designed to have shallow slopes in line with the SuDS Manual (1:5 or shallower). As such, the basin could be used for recreation during dry weather. There are also ecological benefits to utilising above ground storage and appropriate planting could provide a net benefit to the local ecosystem.
6	What multifunctional benefits will the sustainable drainage system provide?	The basin will provide open space for residents to use for recreational purposes, as well as providing the opportunity for water compatible planting to encourage biodiversity.
7	What opportunities to reduce the causes and impacts of flooding have been identified and included as part of the proposed sustainable drainage system?	Open space is maximised on the site, with the lower third of the site being predominantly open space. Rainwater harvesting is promoted and will reduce the surface water entering the system.
8	How will run-off from the completed development be prevented from causing an impact elsewhere?	With discharge restricted to Qbar, any storms above the average storm will have lower rates of runoff than the undeveloped site. Levels within the site naturally fall to the basin location and detailed design of the levels will ensure that any overland flow paths in exceedance events are conveyed to the basin.
9	How has the sustainable drainage system been designed to facilitate maintenance and, where relevant, adoption? What are the plans for ensuring an acceptable standard of operation and maintenance throughout the lifetime of the development?	The basin is situated in open space, with access available for the periphery. The drainage system will, where possible be located in public space rather than private allowing access as required.

		It is proposed that the system is offered to Southern Water under a Section 104 adoption to ensure that maintenance is undertaken to their standard.

6 FOUL DRAINAGE ASSESSMENT

Existing Foul Drainage

6.1 As stated in Section 2.5 there is a Southern Water public foul sewer in Romsey Road, which is shown in **Appendix B**. This sewer flows to the Southern Water pumping station approximately 200m east of the site and then to the Whiteparish WWTW to the south west of the village.

Proposed Foul Drainage Strategy

6.2 The application site is to consist of up to 25 residential units. Based on a peak flow of 4,000 litres per dwelling per day, the peak foul flow has been assessed as being 1.16 ls^{-1}. Average flows are therefore expected to be 0.19 ls^{-1}.

6.3 It is proposed that foul flows from all dwellings are discharged to the existing Southern Water public foul sewer in Romsey Road. The site will drain by gravity to the existing sewer.

6.4 In order to facilitate a gravity connection, levels in the southeast corner of the site will need to raise approximately 800mm.

6.5 The foul drainage layout is shown no drawing 1294-501 in **Appendix G**.

7 CONSENTS REQUIRED

Section 106

7.1 Any new connection to the Southern Water public sewer system will require a Section 106 application under the Water Industry Act 1991.

Section 104 Agreement

7.2 The foul and surface water system within the proposed development is to be constructed to adoptable standards such that it can at a future date be adopted by Southern Water. As such, the proposed foul and surface water sewers will be subject to an agreement under S104 of the Water Industry Act 1991.

Land Drainage Consent

7.3 In respect to the construction of any new surface water outfall into the existing watercourse, it will be necessary to obtain a Land Drainage Consent from Wiltshire County Council as LLFA as the watercourse is classified as an ordinary watercourse.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 This Flood Risk Assessment has been prepared in support of an outline planning application for a development site at Romsey Road, Whiteparish. The report has been prepared to assess flood risk to the site from all sources. It also produces a drainage strategy for the site that ensures flood risk downstream of the site does not increase as a result of the redevelopment.

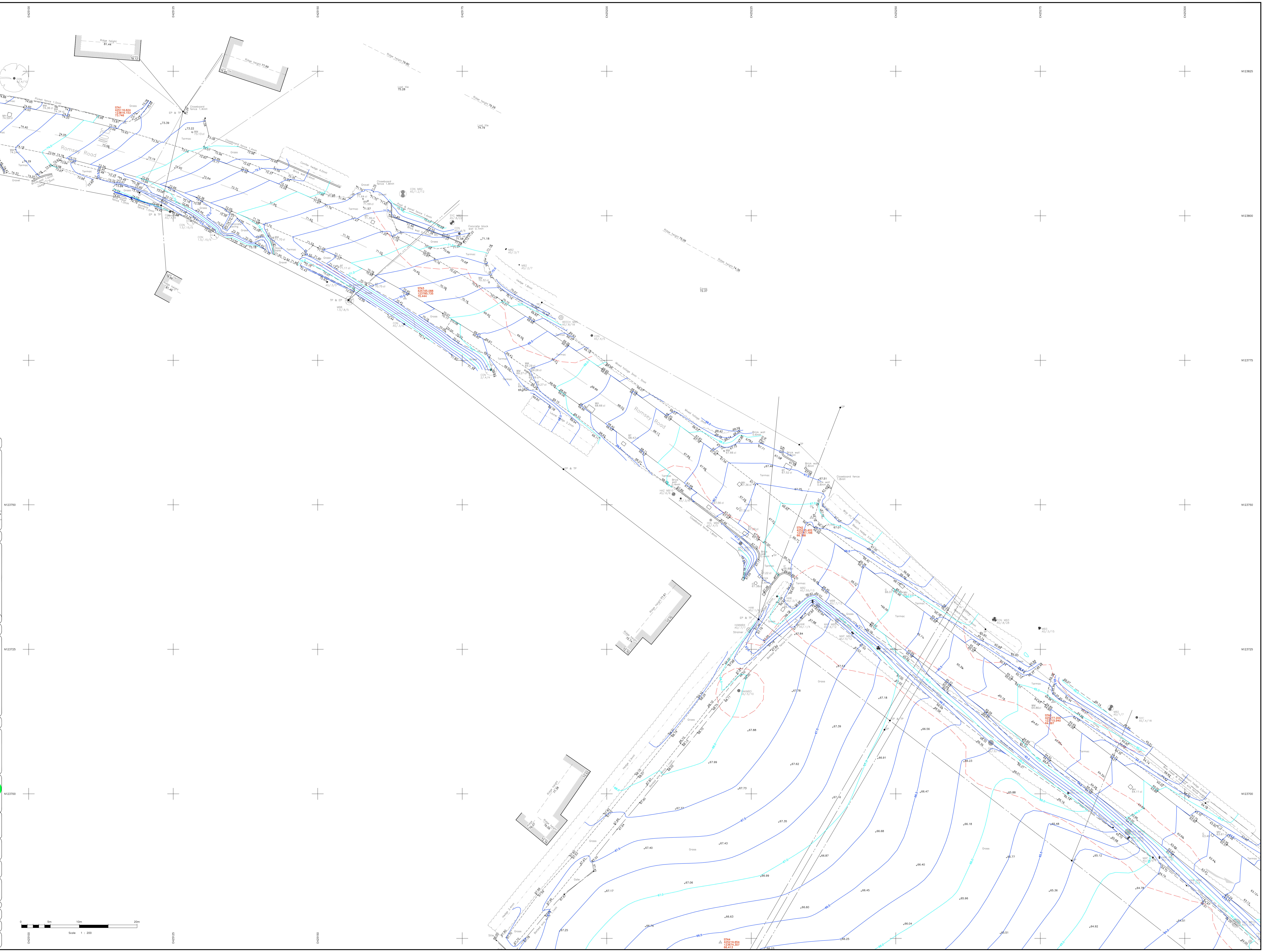
8.2 In summary, this report demonstrates that:

- The site is in Flood Zone 1, which is at low risk of flooding from fluvial and tidal sources. However, the site is larger than 1Ha, and as such require a site-specific FRA to comply with planning policy.
- 'Outline' proposals for the application site comprise the erection of up to 25 new dwellings.
- The site comprises grassland and agricultural fields and therefore it is classified as greenfield.
- The proposed development is classified as 'More Vulnerable' according to Annex 3 of the NPPF.
- In accordance to Table 2 of the NPPG – Flood Risk & Coastal Change, the proposed development is acceptable and there is no requirement for sequential and exception tests.
- The application site is not at risk from reservoir flooding.
- The application site is underlain by Reading Formation with low permeability rates. Infiltration is not suitable for the site.
- The existing Qbar rate of discharge has been calculated to be 2.4 ls^{-1}. It is proposed that discharge from the site will match this rate.
- Attenuation storage will be provided in an above ground basin to ensure that there is no flooding during any rainfall event up to and including the 1 in 100 year return period rainfall event with a 45% allowance for Climate Change.
- Foul flows will be discharged via a gravity connection to the Southern Water foul sewer in Romsey Road.

APPENDICES

APPENDIX A

Topographical Survey



Tree Abbreviations

ASH	Ash	LP	London Plane
BAY	Bay	MAP	Maple
BEE	Beech	OAK	Oak
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CED	Cedar	RM	Red Maple
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LAU	Laurel	**MB	Multiple stems/trunks Overall dia. shown
LI	Lime		

Trees denoted with "approx" have been surveyed by remote methods and therefore their positions & dimensions cannot be guaranteed.

Tree Dimensions (average) Spread/Trunk Dia/Height — AS - As shown by red line; UTS - Unable to survey

Key

AV	Air Valve	LP	Lamp Post
BL	Bollard	M	Meter
BM	Bench Mark	MH	Manhole Cover
BP	Boundary Point	MK	Marker
BT	BT Cover	MS	Milestone
CATV	Cable Television Cover	RG	Ridge Level
cab	Cabinet	RS	Road Sign
cl	Cover Level	rwp	Rain Water Pipe
EP	Electric Power Pole	SC	Stop Cock
EV	Eaves Level (u/s fascia)	Str	Strainer
FH	Fire Hydrant	SV	Stop Valve
FL	Floor Level	svp	Soil Vent Pipe
FP	Fence Post	TH	Threshold Level
G	Gully	TL	Traffic Light
GP	Gate Post	TP	Telephone Pole
GV	Gas Valve	UTL	Unable To Lift
IC	Inspection Chamber	VP	Vent Pipe
il	Invert Level	WM	Water Meter
KO	Kerb Outlet	WO	Wash Out
	Buildings & Walls		Double Gates
	Glass Roofed		Single Gate

Linetypes

Bank
Building
Drop kerb
Channel
Electric
Fence
Foliage
FWS (Estimated Size From Surface)
Grid Cross
Hedge
Kerb
Manhole
Pipe
Ridge
SWS (Estimated Size From Surface)
Telephone
Track/Path
Tree Canopy
Verge
Water line
Wall

Coordinate System

This survey has been oriented to the O.S. National Grid (OSGB36) via a global position system and the O.S. Active Network (OS Net) OSGB36. True OSGB36 coordinates have been established at STN2 E425235.402 N123747.796 and a further OSBG36 point established to create a true O.S. bearing for angle orientation. All levels are based on O.S.Datum. A scale factor of 1:1 has been applied to the survey and therefore the coordinate system must be considered arbitrary.

DANDOsurveying ltd

Land & Measured Building Surveyors

27-29 New Street
Charfield
South Glos.
GL12 8ES

Tel: 01453 845017
Tel: 01453 845360
www.dandosurveying.co.uk
enquiries@dandosurveying.co.uk

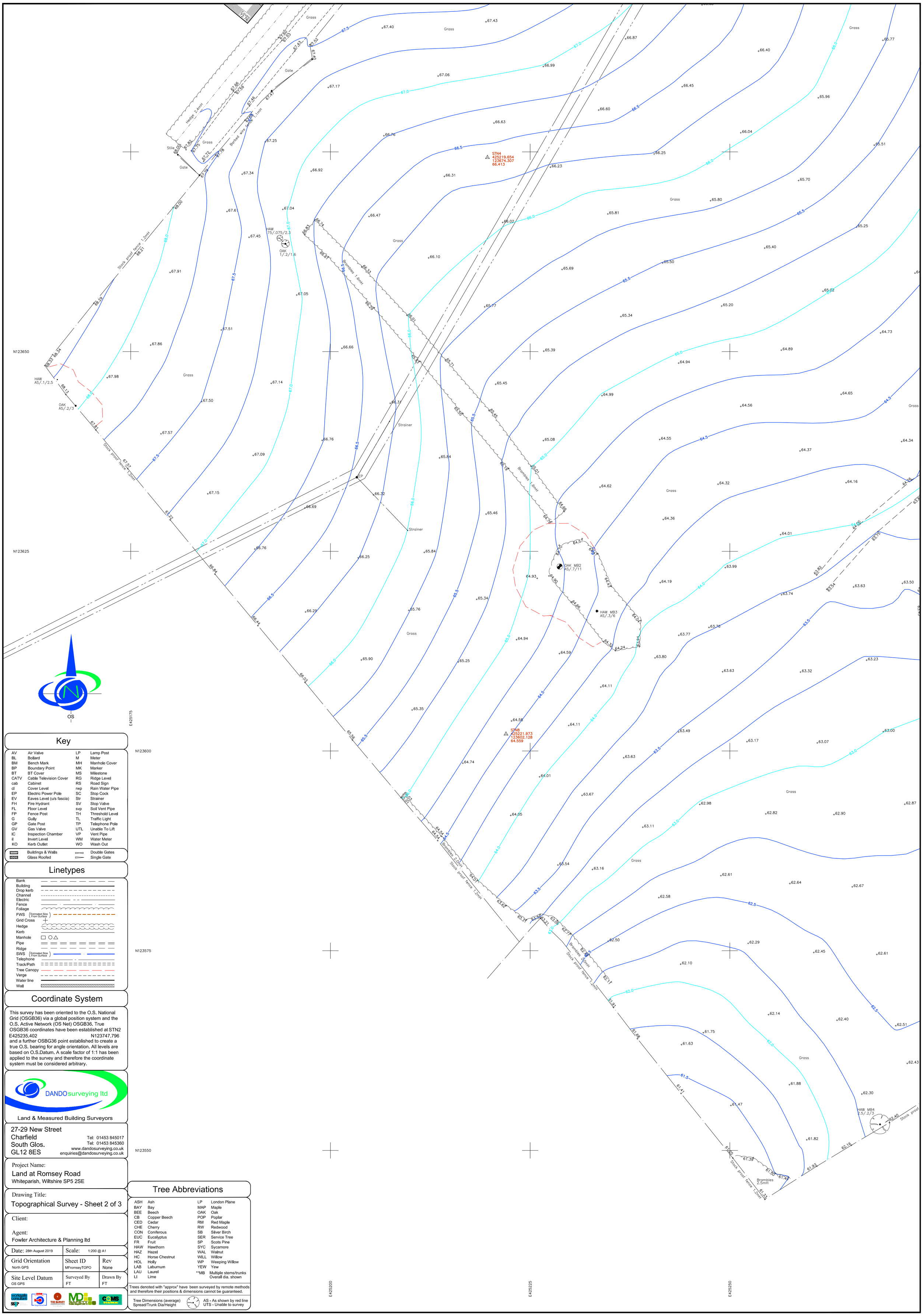
Project Name:
Land at Romsey Road
Whiteparish, Wiltshire SP5 2SE

Drawing Title:
Topographical Survey - Sheet 1 of 3

Client:

Agent:
Fowler Architecture & Planning ltd

Date: 28th August 2019	Scale: 1:200 @ A0	
Grid Orientation North GPS	Sheet ID MFromseyTOPO	Rev None
Site Level Datum OS GPS	Surveyed By FT	Drawn By FT



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	Buildings & Walls		Double Gates
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Linetypes

Bank
Building
Drop kerb
Channel
Electric
Fence
Foliage
FWS (Estimated Size From Surface)
Grid Cross
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Kerb
Manhole
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Project Name:
Land at Romsey Road
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Drawing Title:
Topographical Survey - Sheet 2 of 3

Client:

Agent:
Fowler Architecture & Planning ltd

Date: 28th August 2019	Scale: 1:200 @ A1	
Grid Orientation North GPS	Sheet ID MFromseyTOPO	Rev None
Site Level Datum OS GPS	Surveyed By FT	Drawn By FT

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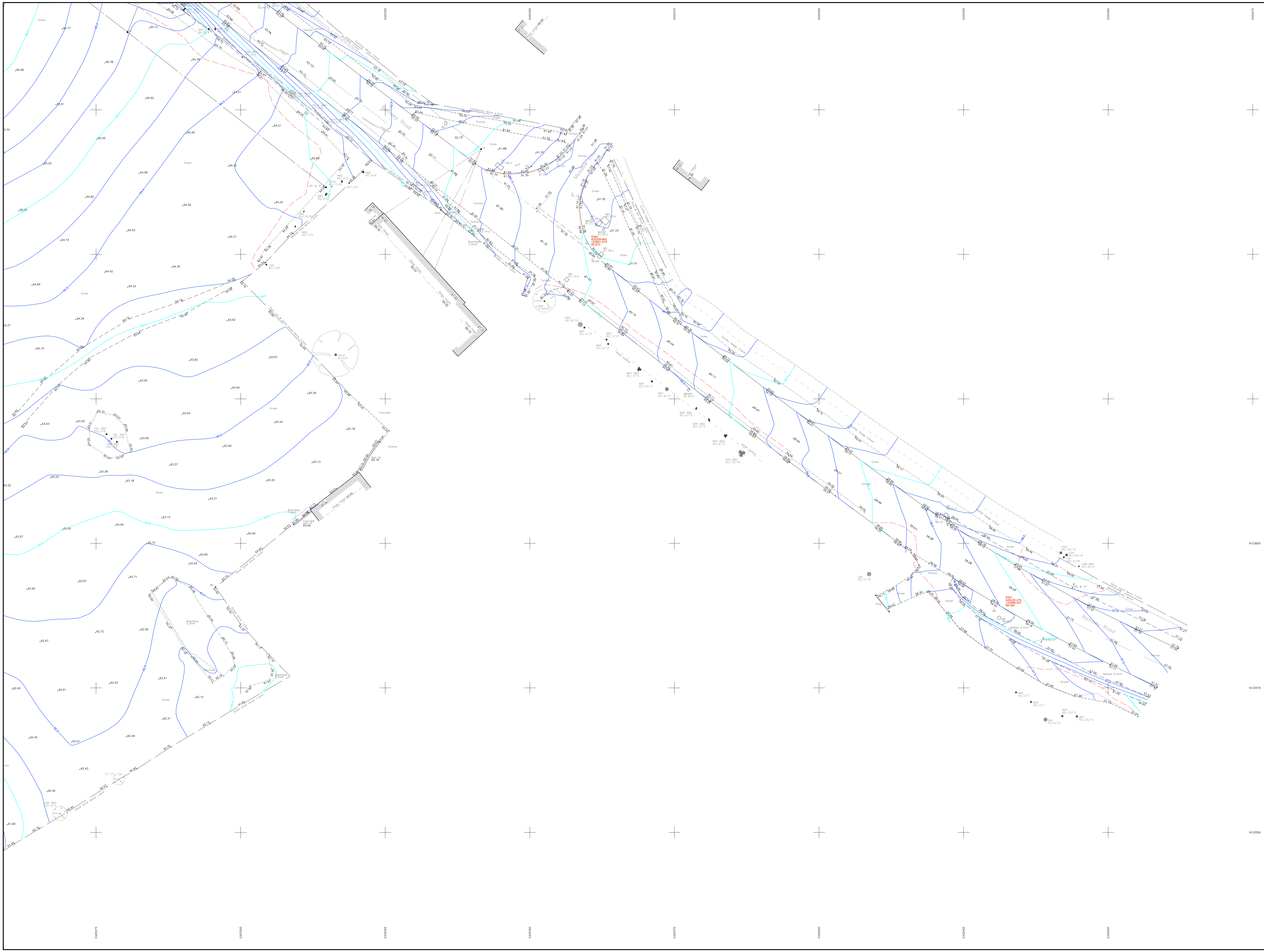

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Glass Roofed — Single Gate

Linetypes

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Project Name:
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Drawing Title:
Topographical Survey - Sheet 3 of 3

Client:

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Date: 28th August 2019	Scale: 1:200 @ A0	
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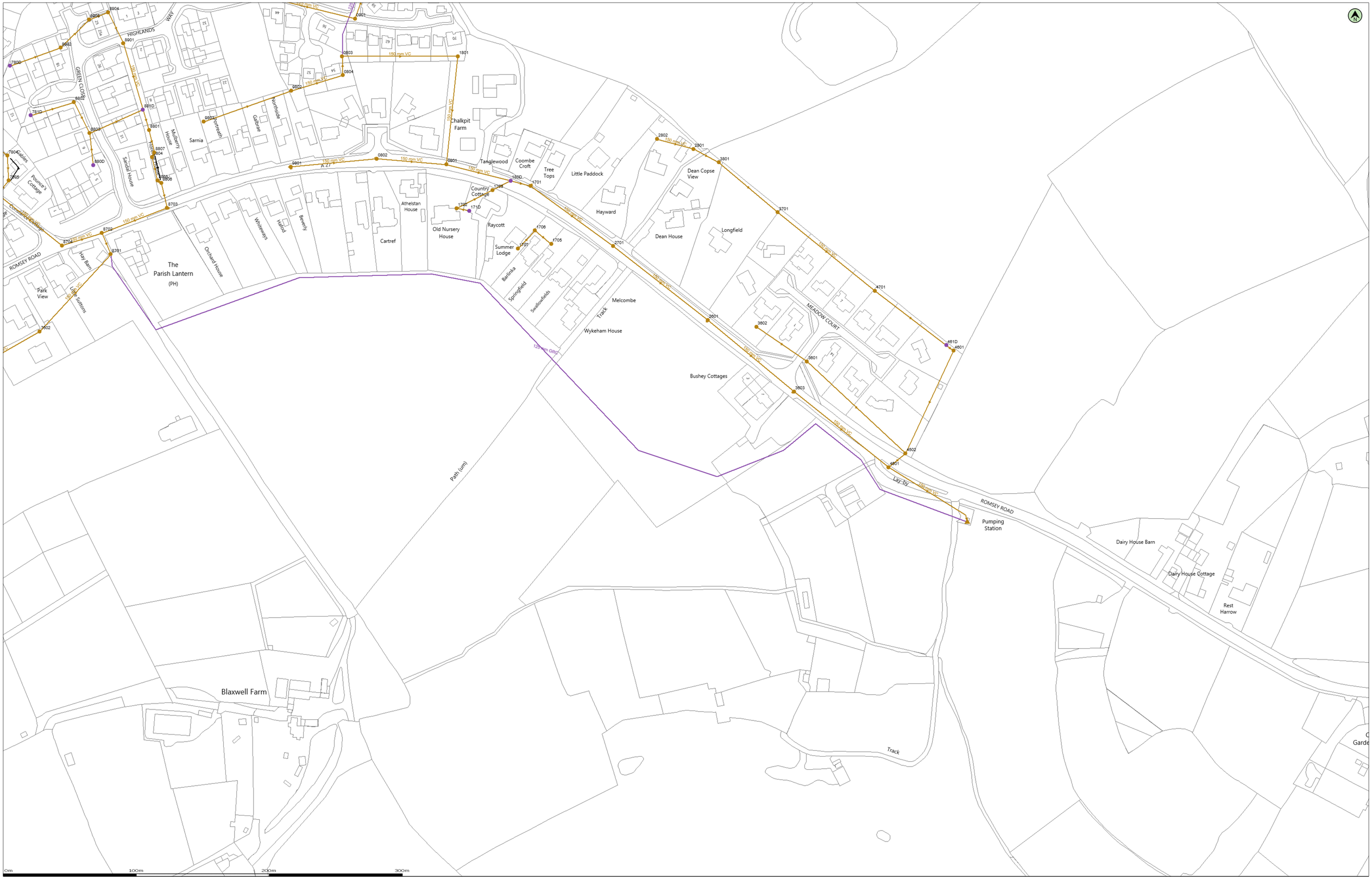
Site Level Datum OS GPS	Surveyed By FT	Drawn By FT

APPENDIX B

Southern Water Asset Plans



(c) Crown copyright and database rights 2020 Ordnance Survey 100031673 | Date: 15/10/20 | Scale: 1:1250 | Map Centre: 425277,123609 | Data updated: 21/09/20 | Our Ref: 448338 - 1 | Wastewater Plan A1

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.

Foul Gravity Sewer | Combined Gravity Sewer | Culverted Water Course or Treated Effluent | Surface Water Gravity Sewer | Rising Main, Vacuum or Syphon | Combined Pumping Station | Surface Water Pumping Station | Foul Pumping Station | WTW Water Treatment Works | Section 104 Area | Building Over Agreement Area | Foul Manhole | Combined Manhole | Surface Water Manhole | Side Entry Manhole, Decantation Chamber, Dummy Manhole or Surface Water Soakaway

Combined Outfall | Foul Outfall | Surface Water Outfall | Surface Water Inlet

matt.mercer@condondrew.com

1295-Romsey Road

WATER for LIFE from Southern Water.

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0801	F	74.56	71.25	
0802	F	74.63	72.74	
0803	F	77.02	0.00	
0804	F	77.77	0.00	
0901	F	0.00	0.00	
1701	F	71.39	69.69	
1702	F	0.00	0.00	
1703	F	0.00	0.00	
1705	F	0.00	0.00	
1706	F	0.00	0.00	
1707	F	0.00	0.00	
171D	F	0.00	0.00	
1801	F	74.67	0.00	
180D	F	0.00	0.00	
2601	F	64.11	62.28	
2701	F	67.36	65.54	
2801	F	64.78	0.00	
2802	F	69.31	0.00	
3601	F	61.34	0.00	
3602	F	61.72	0.00	
3603	F	61.11	59.41	
3701	F	63.01	0.00	
3801	F	65.15	0.00	
4501	F	58.44	55.19	
4502	F	58.63	0.00	
4601	F	57.46	0.00	
461D	F	0.00	0.00	
4701	F	60.24	0.00	
7602	F	79.04	74.81	
7804	F	83.56	82.15	
7805	F	0.00	0.00	
780D	F	0.00	0.00	
781D	F	0.00	0.00	
8701	F	77.89	75.12	
8702	F	78.37	75.37	
8703	F	77.87	75.76	
8704	F	78.81	76.94	
8801	F	79.33	0.00	
8802	F	0.00	0.00	
8803	F	0.00	0.00	
8804	F	79.09	76.30	
8805	F	78.37	76.08	
8806	F	78.01	76.05	
8807	F	78.27	76.34	
880D	F	0.00	0.00	
881D	F	0.00	0.00	
8901	F	79.44	0.00	
8902	F	0.00	0.00	
8903	F	0.00	0.00	
8904	F	0.00	0.00	
9801	F	78.23	76.89	
9802	F	70.06	0.00	
9803	F	73.05	0.00	

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

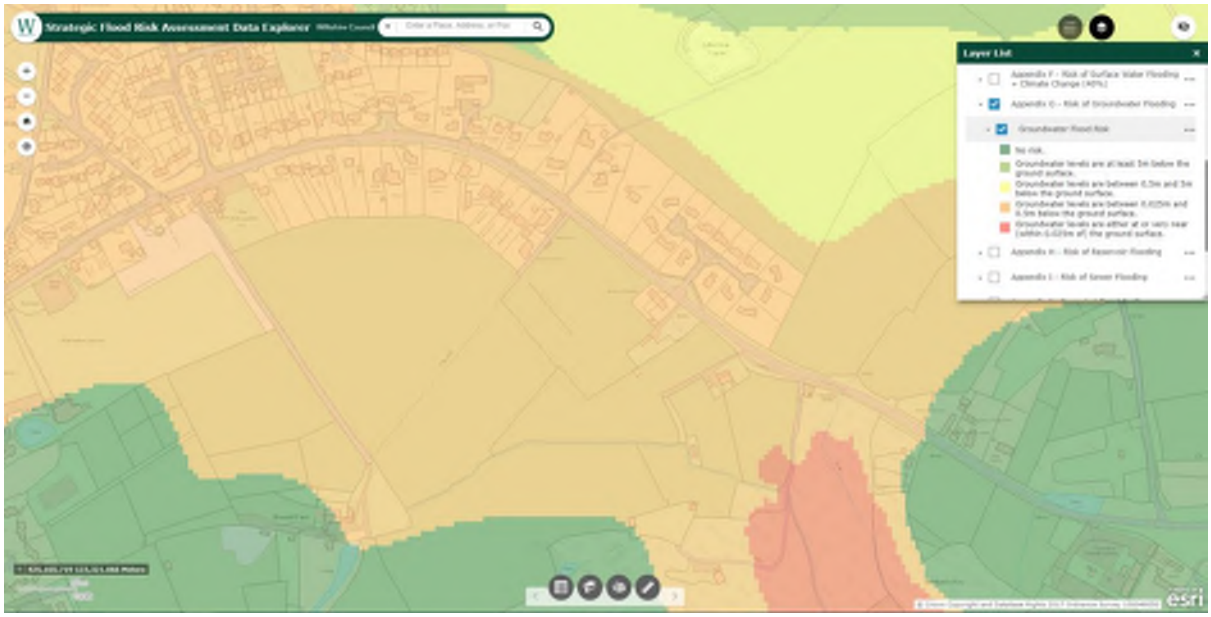
Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

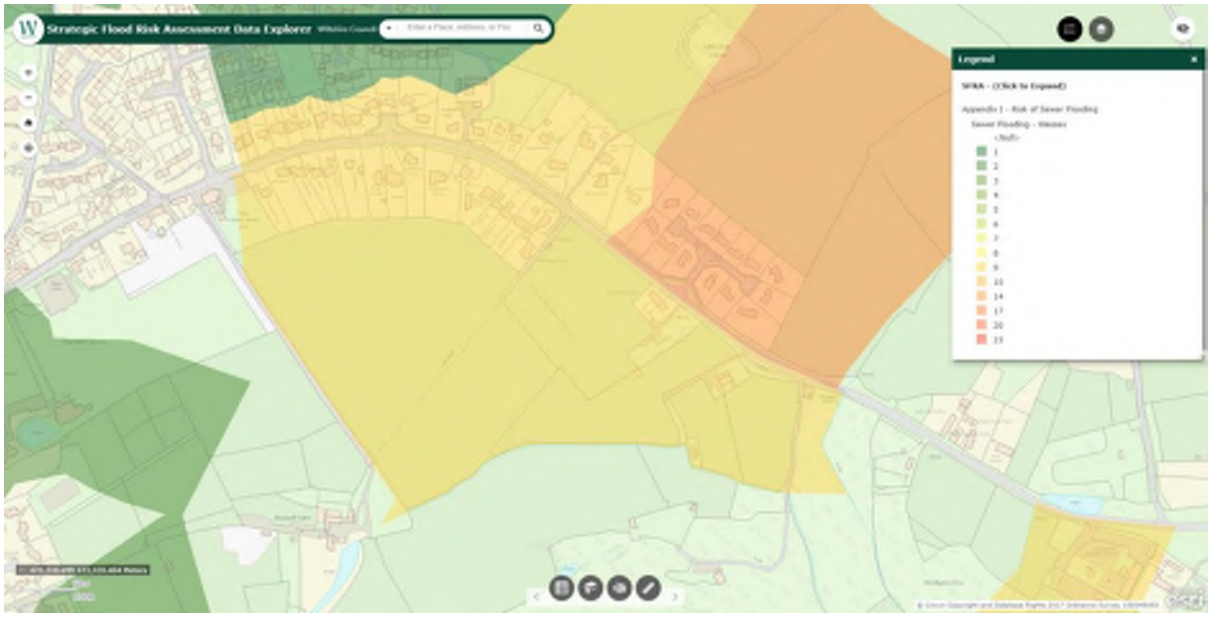
Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

APPENDIX C

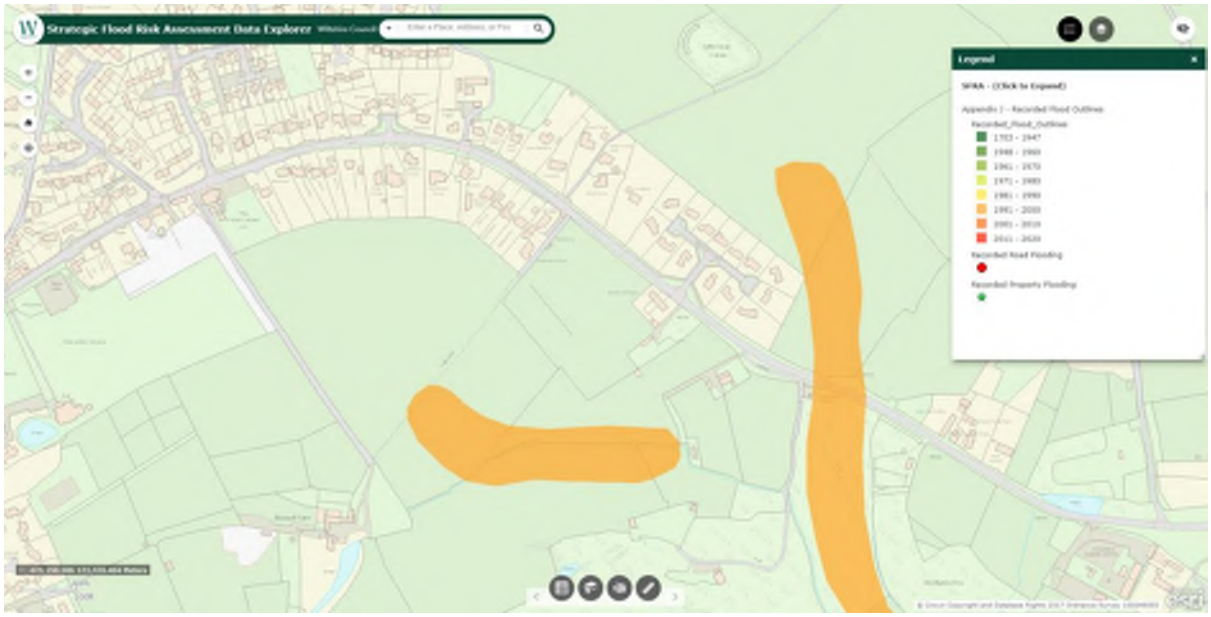
SFRA Flooding History Map



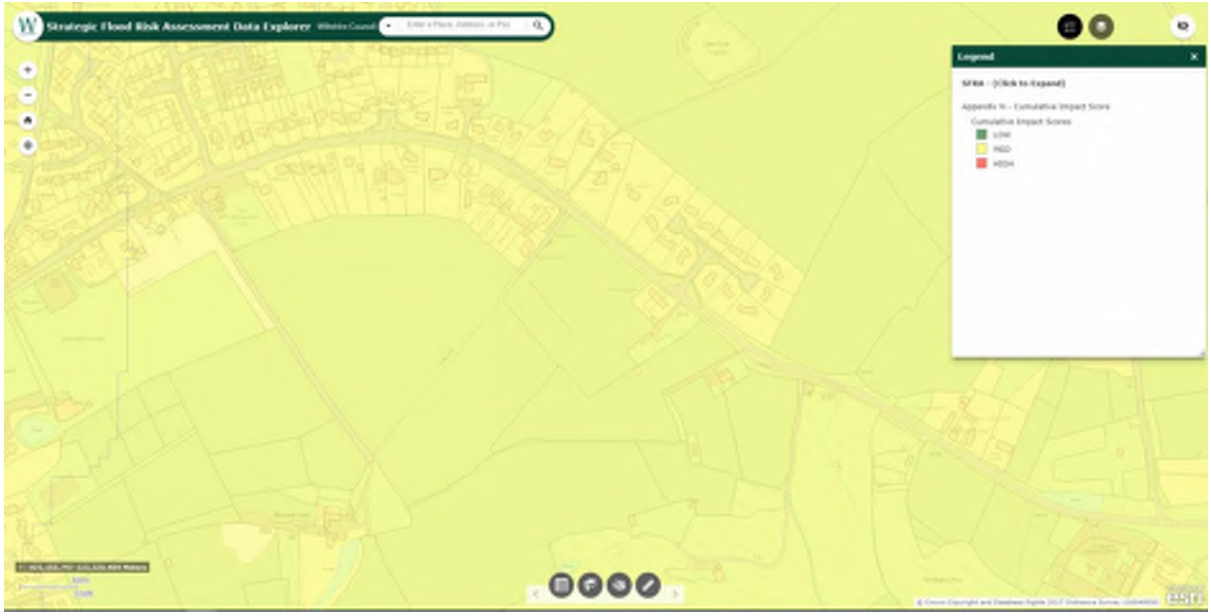
SFRA Groundwater flood risk map



SFRA Risk of Sewer Flooding



SFRA Recorded Flooding



SFRA Cumulative Impact Score

APPENDIX D

Site Masterplan

KEY

- SITE BOUNDARY
- RETAINED EXISTING VEGETATION
- PROPOSED TREES
- PROPOSED SHRUBS/HEDGEROWS
- OPEN SPACE
- INDICATIVE BUILT FORM
- MAIN VEHICLE ROUTE
- VEHICLE/PEDESTRIAN ACCESS
- PEDESTRIAN ACCESS
- PROPOSED FOOTWAYS
- INDICATIVE PATH THROUGH PUBLIC OPEN SPACE
- PLAY AREA
- SUSTAINABLE DRAINAGE SYSTEMS (SuDS)
- PUBLIC RIGHT OF WAY
- BUS STOP

0 50 100m

1:1000 (at A2)

LAND AT ROMSEY ROAD, WHITEPARISH – **ILLUSTRATIVE MASTERPLAN**

PEGASUSGROUP.CO.UK | TEAM/DRAWN BY: BA | APPROVED BY: PM: TB | DATE: 28/09/2022 | SCALE: 1:1000@A2 | DRWG: P22-172_DE_003_B_01 | CLIENT: MACRA LTD

PEGASUS GROUP

APPENDIX E

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	0.300	Preferred Cover Depth (m)	1.200
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)
S01	0.024	5.00	67.410	1200	425235.808	123704.323	1.350
S02	0.018	5.00	67.052	1200	425241.680	123700.374	1.372
S03	0.042	5.00	66.580	1200	425251.003	123698.391	1.355
S14	0.010	5.00	65.192	1200	425280.961	123685.048	1.350
S04	0.013	5.00	65.243	1200	425276.861	123679.664	1.544
S13	0.092	5.00	64.989	1200	425296.071	123646.984	2.139
S05	0.016	5.00	65.166	1200	425268.063	123665.710	2.515
S06	0.062	5.00	65.056	1200	425256.583	123655.628	2.468
S12	0.022	5.00	67.200	1200	425192.855	123656.263	1.320
S11	0.048	5.00	66.236	1200	425208.305	123643.830	2.363
S07	0.050	5.00	64.363	1200	425241.469	123624.543	2.351
S08	0.023	5.00	63.477	1200	425262.062	123613.953	1.645
S09	0.027	5.00	63.029	1200	425279.488	123606.406	1.530
S10	0.010	5.00	62.606	1200	425290.689	123596.029	1.651
POND_IN			62.472	1200	425280.590	123574.058	2.012
POND_OUT		5.00	61.818	1200	425257.186	123561.325	1.422
FCC			61.712	1200	425256.791	123557.065	1.427
OUT			60.000	1200	425251.196	123496.705	1.350

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	S01	S02	7.076	0.600	66.060	65.680	0.380	18.6	150	5.05	50.0
1.001	S02	S03	9.532	0.600	65.680	65.225	0.454	21.0	150	5.12	50.0
1.002	S03	S04	31.927	0.600	65.225	63.774	1.451	22.0	150	5.37	50.0
2.000	S14	S04	6.767	0.600	63.842	63.774	0.068	99.5	150	5.11	50.0
1.003	S04	S05	16.496	0.600	63.699	62.726	0.973	17.0	225	5.46	50.0
3.000	S13	S05	33.691	0.600	62.850	62.651	0.199	169.3	300	5.47	50.0
1.004	S05	S06	15.279	0.600	62.651	62.588	0.063	242.5	300	5.72	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	2.345	41.4	3.2	1.200	1.222	0.024	0.0	28	1.386
1.001	2.208	39.0	5.6	1.222	1.205	0.042	0.0	38	1.576
1.002	2.156	38.1	11.3	1.205	1.319	0.084	0.0	56	1.884
2.000	1.007	17.8	1.3	1.200	1.319	0.010	0.0	27	0.585
1.003	3.193	127.0	14.4	1.319	2.215	0.106	0.0	51	2.128
3.000	1.205	85.2	12.5	1.839	2.215	0.092	0.0	77	0.867
1.004	1.005	71.0	29.1	2.215	2.168	0.215	0.0	134	0.957

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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)
1.005	S06	S07	34.565	0.600	62.588	62.012	0.576	60.0	300	6.00	50.0
4.000	S12	S11	19.831	0.600	65.880	63.873	2.007	9.9	150	5.10	50.0
4.001	S11	S07	38.365	0.600	63.873	63.013	0.860	44.6	150	5.53	50.0
1.006	S07	S08	23.156	0.600	62.012	61.832	0.180	128.8	300	6.28	50.0
1.007	S08	S09	18.990	0.600	61.832	61.499	0.333	57.0	300	6.43	50.0
1.008	S09	S10	15.269	0.600	61.499	60.955	0.544	28.0	300	6.52	50.0
1.009	S10	POND_IN	24.181	0.600	60.955	60.856	0.099	244.3	300	6.92	50.0
5.000	POND_OUT	FCC	4.278	0.600	60.396	60.285	0.111	38.4	150	5.04	50.0
5.001	FCC	OUT	60.619	0.600	60.285	58.650	1.635	37.1	150	5.65	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)
1.005	2.033	143.7	37.5	2.168	2.051	0.277	0.0	104	1.717
4.000	3.224	57.0	3.0	1.170	2.213	0.022	0.0	23	1.703
4.001	1.510	26.7	9.5	2.213	1.200	0.070	0.0	62	1.385
1.006	1.384	97.8	53.8	2.051	1.345	0.397	0.0	159	1.416
1.007	2.086	147.4	56.9	1.345	1.230	0.420	0.0	129	1.956
1.008	2.980	210.6	60.6	1.230	1.351	0.447	0.0	110	2.588
1.009	1.001	70.8	61.9	1.351	1.316	0.457	0.0	218	1.124
5.000	1.629	28.8	0.0	1.272	1.277	0.000	0.0	0	0.000
5.001	1.658	29.3	0.0	1.277	1.200	0.000	0.0	0	0.000

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	7.076	18.6	150	Circular	67.410	66.060	1.200	67.052	65.680	1.222
1.001	9.532	21.0	150	Circular	67.052	65.680	1.222	66.580	65.225	1.205
1.002	31.927	22.0	150	Circular	66.580	65.225	1.205	65.243	63.774	1.319
2.000	6.767	99.5	150	Circular	65.192	63.842	1.200	65.243	63.774	1.319
1.003	16.496	17.0	225	Circular	65.243	63.699	1.319	65.166	62.726	2.215
3.000	33.691	169.3	300	Circular	64.989	62.850	1.839	65.166	62.651	2.215
1.004	15.279	242.5	300	Circular	65.166	62.651	2.215	65.056	62.588	2.168
1.005	34.565	60.0	300	Circular	65.056	62.588	2.168	64.363	62.012	2.051
4.000	19.831	9.9	150	Circular	67.200	65.880	1.170	66.236	63.873	2.213
4.001	38.365	44.6	150	Circular	66.236	63.873	2.213	64.363	63.013	1.200
1.006	23.156	128.8	300	Circular	64.363	62.012	2.051	63.477	61.832	1.345

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S01	1200	Manhole	Adoptable	S02	1200	Manhole	Adoptable
1.001	S02	1200	Manhole	Adoptable	S03	1200	Manhole	Adoptable
1.002	S03	1200	Manhole	Adoptable	S04	1200	Manhole	Adoptable
2.000	S14	1200	Manhole	Adoptable	S04	1200	Manhole	Adoptable
1.003	S04	1200	Manhole	Adoptable	S05	1200	Manhole	Adoptable
3.000	S13	1200	Manhole	Adoptable	S05	1200	Manhole	Adoptable
1.004	S05	1200	Manhole	Adoptable	S06	1200	Manhole	Adoptable
1.005	S06	1200	Manhole	Adoptable	S07	1200	Manhole	Adoptable
4.000	S12	1200	Manhole	Adoptable	S11	1200	Manhole	Adoptable
4.001	S11	1200	Manhole	Adoptable	S07	1200	Manhole	Adoptable
1.006	S07	1200	Manhole	Adoptable	S08	1200	Manhole	Adoptable

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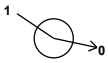
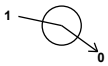
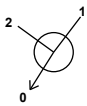
Pipeline Schedule

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)
1.007	18.990	57.0	300	Circular	63.477	61.832	1.345	63.029	61.499	1.230
1.008	15.269	28.0	300	Circular	63.029	61.499	1.230	62.606	60.955	1.351
1.009	24.181	244.3	300	Circular	62.606	60.955	1.351	62.472	60.856	1.316
5.000	4.278	38.4	150	Circular	61.818	60.396	1.272	61.712	60.285	1.277
5.001	60.619	37.1	150	Circular	61.712	60.285	1.277	60.000	58.650	1.200

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.007	S08	1200	Manhole	Adoptable	S09	1200	Manhole	Adoptable
1.008	S09	1200	Manhole	Adoptable	S10	1200	Manhole	Adoptable
1.009	S10	1200	Manhole	Adoptable	POND_IN	1200	Manhole	Adoptable
5.000	POND_OUT	1200	Manhole	Adoptable	FCC	1200	Manhole	Adoptable
5.001	FCC	1200	Manhole	Adoptable	OUT	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S01	425235.808	123704.323	67.410	1.350	1200		0	1.000	66.060	150
S02	425241.680	123700.374	67.052	1.372	1200		1	1.000	65.680	150
							0	1.001	65.680	150
S03	425251.003	123698.391	66.580	1.355	1200		1	1.001	65.225	150
							0	1.002	65.225	150
S14	425280.961	123685.048	65.192	1.350	1200		0	2.000	63.842	150
S04	425276.861	123679.664	65.243	1.544	1200		1	2.000	63.774	150
							2	1.002	63.774	150
							0	1.003	63.699	225
S13	425296.071	123646.984	64.989	2.139	1200		0	3.000	62.850	300
S05	425268.063	123665.710	65.166	2.515	1200		1	3.000	62.651	300
							2	1.003	62.726	225
							0	1.004	62.651	300
S06	425256.583	123655.628	65.056	2.468	1200		1	1.004	62.588	300
							0	1.005	62.588	300

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
S12	425192.855	123656.263	67.200	1.320	1200		0	4.000	65.880	150
S11	425208.305	123643.830	66.236	2.363	1200		1	4.000	63.873	150
							0	4.001	63.873	150
S07	425241.469	123624.543	64.363	2.351	1200		1	4.001	63.013	150
							2	1.005	62.012	300
							0	1.006	62.012	300
S08	425262.062	123613.953	63.477	1.645	1200		1	1.006	61.832	300
							0	1.007	61.832	300
S09	425279.488	123606.406	63.029	1.530	1200		1	1.007	61.499	300
							0	1.008	61.499	300
S10	425290.689	123596.029	62.606	1.651	1200		1	1.008	60.955	300
							0	1.009	60.955	300
POND_IN	425280.590	123574.058	62.472	2.012	1200		1	1.009	60.856	300
POND_OUT	425257.186	123561.325	61.818	1.422	1200		0	5.000	60.396	150
FCC	425256.791	123557.065	61.712	1.427	1200		1	5.000	60.285	150
							0	5.001	60.285	150
OUT	425251.196	123496.705	60.000	1.350	1200		1	5.001	58.650	150

Simulation Settings

Rainfall Methodology	FSR	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	0.0
M5-60 (mm)	20.000	Check Discharge Rate(s)	✓
Ratio-R	0.300	2 year (l/s)	2.1
Summer CV	0.750	30 year (l/s)	5.8
Winter CV	1.000	100 year (l/s)	7.7
Analysis Speed	Detailed	Check Discharge Volume	x
Skip Steady State	x		

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Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	45	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	2.40
Greenfield Method	IH124	Growth Factor 100 year	3.19
Positively Drained Area (ha)	1.100	Betterment (%)	0
SAAR (mm)	819	QBar	2.4
Soil Index	2	Q 2 year (l/s)	2.1
SPR	0.30	Q 30 year (l/s)	5.8
Region	7	Q 100 year (l/s)	7.7
Growth Factor 2 year	0.88		

Node FCC Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	60.285	Product Number	CTL-SHE-0056-1500-1168-1500
Design Depth (m)	1.168	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.5	Min Node Diameter (mm)	1200

Node POND_OUT Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	32.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	60.396	Main Channel Slope (1:X)	500.0
Safety Factor	2.0	Time to half empty (mins)		Main Channel n	0.030

Inlets

POND_IN

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	286.0	0.0	1.000	875.0	0.0	1.001	1000.0	0.0	1.300	1100.0	0.0

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.50%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S01	10	66.094	0.034	4.7	0.0385	0.0000	OK
15 minute winter	S02	10	65.727	0.047	8.3	0.0529	0.0000	OK
15 minute winter	S03	10	65.296	0.070	16.5	0.0794	0.0000	OK
15 minute winter	S14	10	63.876	0.034	1.9	0.0387	0.0000	OK
15 minute winter	S04	10	63.760	0.061	20.7	0.0690	0.0000	OK
15 minute winter	S13	10	62.942	0.092	18.2	0.1045	0.0000	OK
15 minute winter	S05	11	62.816	0.165	41.7	0.1866	0.0000	OK
15 minute winter	S06	11	62.713	0.125	53.0	0.1416	0.0000	OK
15 minute winter	S12	10	65.908	0.028	4.3	0.0315	0.0000	OK
15 minute winter	S11	10	63.950	0.077	13.8	0.0869	0.0000	OK
15 minute winter	S07	11	62.225	0.213	75.9	0.2412	0.0000	OK
15 minute winter	S08	11	62.008	0.176	80.7	0.1986	0.0000	OK
15 minute winter	S09	11	61.637	0.138	85.6	0.1560	0.0000	OK
15 minute winter	S10	11	61.286	0.331	89.1	0.3741	0.0000	SURCHARGED
960 minute winter	POND_IN	915	60.768	0.308	8.3	0.3487	0.0000	OK
960 minute winter	POND_OUT	915	60.768	0.372	4.9	0.4211	0.0000	SURCHARGED
960 minute winter	FCC	915	60.768	0.483	4.2	0.5463	0.0000	SURCHARGED
15 minute summer	OUT	1	58.650	0.000	1.3	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)
15 minute winter	S01	1.000	S02	4.7	1.224	0.113	0.0272	
15 minute winter	S02	1.001	S03	8.2	1.292	0.210	0.0608	
15 minute winter	S03	1.002	S04	16.2	2.037	0.425	0.2536	
15 minute winter	S14	2.000	S04	1.9	0.638	0.105	0.0198	
15 minute winter	S04	1.003	S05	20.6	1.982	0.162	0.1931	
15 minute winter	S13	3.000	S05	17.9	0.623	0.210	0.9743	
15 minute winter	S05	1.004	S06	41.5	1.229	0.584	0.5158	
15 minute winter	S06	1.005	S07	53.3	1.301	0.371	1.4065	
15 minute winter	S12	4.000	S11	4.3	0.794	0.075	0.1124	
15 minute winter	S11	4.001	S07	13.3	1.496	0.500	0.3426	
15 minute winter	S07	1.006	S08	76.4	1.582	0.781	1.1159	
15 minute winter	S08	1.007	S09	80.6	2.169	0.547	0.7067	
15 minute winter	S09	1.008	S10	87.2	1.558	0.414	0.7789	
15 minute winter	S10	1.009	POND_IN	86.9	1.270	1.227	1.5515	
960 minute winter	POND_IN	Flow through pond	POND_OUT	4.9	0.029	0.000	132.1193	
960 minute winter	POND_OUT	5.000	FCC	4.2	0.325	0.147	0.0753	
960 minute winter	FCC	Hydro-Brake®	OUT	1.3				76.9

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.50%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S01	10	66.107	0.047	8.8	0.0535	0.0000	OK
15 minute winter	S02	10	65.745	0.065	15.5	0.0740	0.0000	OK
15 minute winter	S03	10	65.332	0.107	31.1	0.1207	0.0000	OK
15 minute winter	S14	10	63.890	0.048	3.6	0.0543	0.0000	OK
15 minute winter	S04	10	63.784	0.085	39.1	0.0963	0.0000	OK
15 minute winter	S13	12	63.062	0.212	34.4	0.2402	0.0000	OK
15 minute winter	S05	12	63.037	0.386	79.0	0.4367	0.0000	SURCHARGED
15 minute winter	S06	12	62.953	0.365	96.4	0.4134	0.0000	SURCHARGED
15 minute winter	S12	10	65.918	0.038	8.2	0.0434	0.0000	OK
15 minute winter	S11	11	63.995	0.122	26.0	0.1377	0.0000	OK
15 minute winter	S07	11	62.709	0.697	132.2	0.7886	0.0000	SURCHARGED
15 minute winter	S08	11	62.342	0.510	130.4	0.5763	0.0000	SURCHARGED
15 minute winter	S09	11	61.984	0.485	139.1	0.5481	0.0000	SURCHARGED
15 minute winter	S10	11	61.636	0.681	142.0	0.7707	0.0000	SURCHARGED
1440 minute winter	POND_IN	1410	61.015	0.555	10.5	0.6271	0.0000	OK
1440 minute winter	POND_OUT	1410	61.015	0.619	5.9	0.6995	0.0000	SURCHARGED
1440 minute winter	FCC	1410	61.014	0.729	3.9	0.8247	0.0000	SURCHARGED
15 minute summer	OUT	1	58.650	0.000	1.3	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)
15 minute winter	S01	1.000	S02	8.8	1.449	0.211	0.0429	
15 minute winter	S02	1.001	S03	15.4	1.471	0.394	0.0990	
15 minute winter	S03	1.002	S04	30.5	2.340	0.802	0.4168	
15 minute winter	S14	2.000	S04	3.5	0.757	0.198	0.0315	
15 minute winter	S04	1.003	S05	38.9	2.010	0.307	0.4398	
15 minute winter	S13	3.000	S05	34.0	0.723	0.399	2.0847	
15 minute winter	S05	1.004	S06	73.2	1.385	1.031	1.0759	
15 minute winter	S06	1.005	S07	89.0	1.396	0.620	2.4340	
15 minute winter	S12	4.000	S11	8.2	0.881	0.143	0.1870	
15 minute winter	S11	4.001	S07	25.3	1.687	0.947	0.5745	
15 minute winter	S07	1.006	S08	122.3	1.737	1.251	1.6306	
15 minute winter	S08	1.007	S09	129.6	2.135	0.879	1.3373	
15 minute winter	S09	1.008	S10	138.5	1.967	0.657	1.0752	
15 minute winter	S10	1.009	POND_IN	141.8	2.013	2.003	1.6751	
1440 minute winter	POND_IN	Flow through pond	POND_OUT	5.9	0.019	0.000	269.6736	
1440 minute winter	POND_OUT	5.000	FCC	3.9	0.278	0.134	0.0753	
1440 minute winter	FCC	Hydro-Brake®	OUT	1.3				113.6

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.50%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S01	12	66.828	0.768	16.5	0.8684	0.0000	SURCHARGED
15 minute winter	S02	12	66.777	1.097	27.1	1.2409	0.0000	FLOOD RISK
15 minute winter	S03	12	66.580	1.355	45.6	1.5325	0.6700	FLOOD
15 minute winter	S14	12	65.160	1.318	11.5	1.4908	0.0000	FLOOD RISK
15 minute winter	S04	12	65.148	1.449	55.5	1.6392	0.0000	FLOOD RISK
15 minute winter	S13	11	64.989	2.139	64.5	2.4192	2.8263	FLOOD
15 minute winter	S05	11	64.986	2.335	94.5	2.6405	0.0000	FLOOD RISK
15 minute winter	S06	11	64.861	2.273	124.6	2.5713	0.0000	FLOOD RISK
15 minute winter	S12	12	66.025	0.145	15.4	0.1637	0.0000	OK
15 minute winter	S11	12	65.974	2.101	48.2	2.3768	0.0000	FLOOD RISK
15 minute winter	S07	11	64.339	2.327	187.8	2.6314	0.0000	FLOOD RISK
15 minute winter	S08	11	63.477	1.645	200.8	1.8605	2.8624	FLOOD
15 minute winter	S09	11	62.820	1.320	193.9	1.4934	0.0000	FLOOD RISK
15 minute winter	S10	11	62.140	1.185	200.7	1.3400	0.0000	SURCHARGED
1440 minute winter	POND_IN	1410	61.393	0.933	19.3	1.0551	0.0000	OK
1440 minute winter	POND_OUT	1410	61.393	0.997	10.3	1.1275	0.0000	SURCHARGED
1440 minute winter	FCC	1410	61.392	1.107	1.5	1.2525	0.0000	SURCHARGED
15 minute summer	OUT	1	58.650	0.000	1.3	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)
15 minute winter	S01	1.000	S02	15.2	1.549	0.368	0.1246	
15 minute winter	S02	1.001	S03	22.0	1.507	0.563	0.1678	
15 minute winter	S03	1.002	S04	40.2	2.317	1.054	0.5621	
15 minute winter	S14	2.000	S04	10.2	0.819	0.571	0.1191	
15 minute winter	S04	1.003	S05	57.3	1.954	0.451	0.6561	
15 minute winter	S13	3.000	S05	50.9	0.755	0.597	2.3725	
15 minute winter	S05	1.004	S06	95.0	1.384	1.338	1.0759	
15 minute winter	S06	1.005	S07	123.1	1.749	0.857	2.4340	
15 minute winter	S12	4.000	S11	14.6	1.052	0.257	0.3472	
15 minute winter	S11	4.001	S07	34.6	1.964	1.296	0.6754	
15 minute winter	S07	1.006	S08	185.7	2.637	1.898	1.6306	
15 minute winter	S08	1.007	S09	181.7	2.580	1.232	1.3373	
15 minute winter	S09	1.008	S10	194.1	2.756	0.921	1.0752	
15 minute winter	S10	1.009	POND_IN	200.8	2.852	2.838	1.6856	
1440 minute winter	POND_IN	Flow through pond	POND_OUT	10.3	0.042	0.000	551.4183	
1440 minute winter	POND_OUT	5.000	FCC	1.5	0.349	0.051	0.0753	
1440 minute winter	FCC	Hydro-Brake®	OUT	1.5				128.2

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APPENDIX F

Site Photographs

Southern Water Foul Pumping Station

View from the west of the site eastwards towards the proposed discharge point

View into the site from the Northern-most Point

APPENDIX G

Drainage Strategy and Impermeable Area Plan

REV	DETAILS	DRAWN	CHECKED	DATE
A	DRAINAGE LAYOUT AMENDED. ATTENUATION BASIN ADDED	JMD	MRM	28.10.2022

NOTES:

1. Do not scale from this drawing.
2. This drawing is for illustrative purposes only and not for construction.
3. This drawing is to be read and printed in colour.
4. All dimensions are shown in metres, unless specified otherwise.

KEY

Impermeable Area: Highway - 1780m²

Impermeable Area: Private Area - 2730m²

PROJECT: Romsey Road, Whiteparish

CLIENT: Macra Ltd

DRAWING TITLE: Impermeable Areas Plan

Condon Drew Associates

DRAWN:	CHECKED:	DATE:	SCALES:	SHEET SIZE:	DRAWING NUMBER:	REVISION:
MRM	PD	13.11.2020	1:1000	A3	1294-502	-

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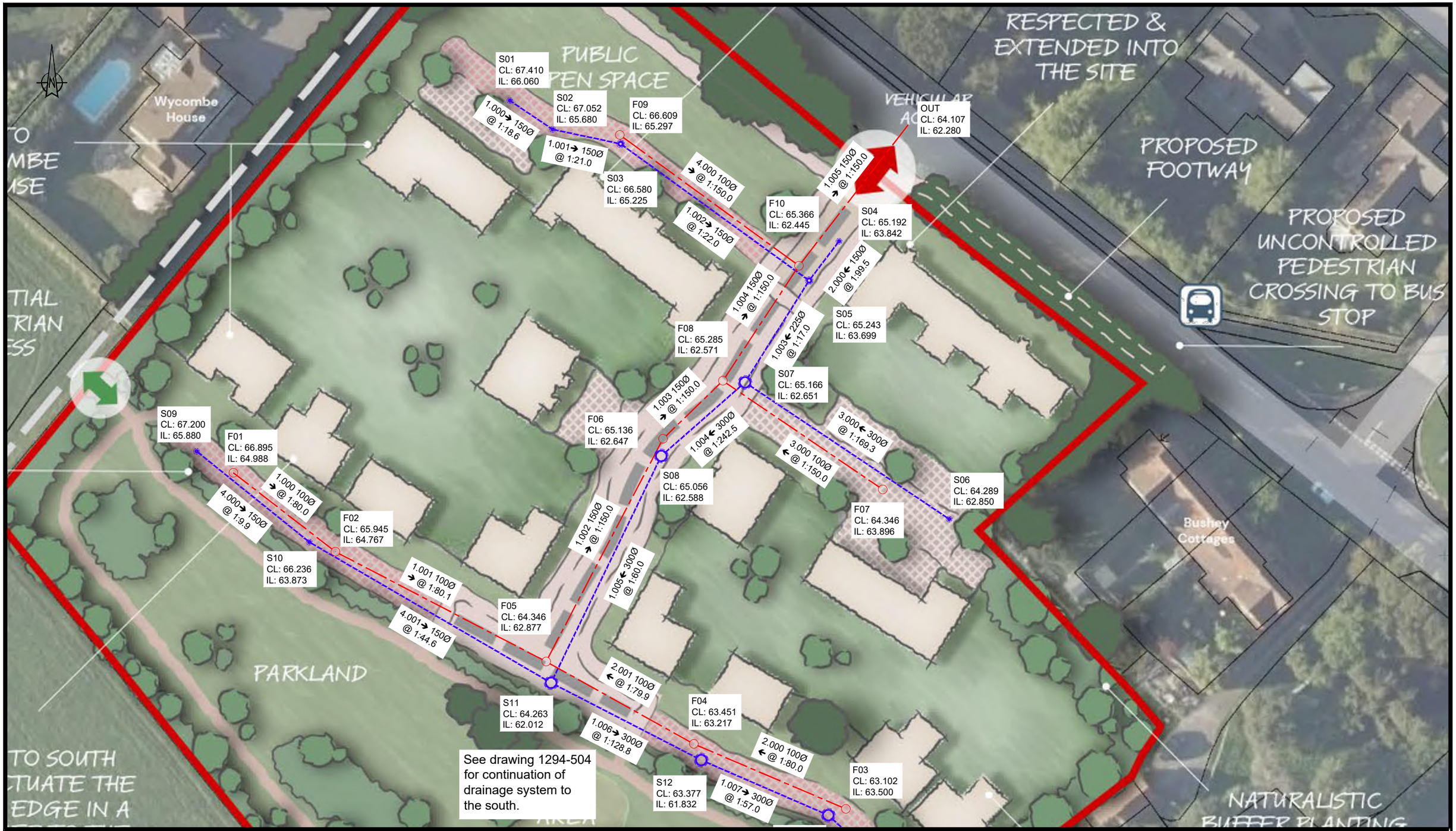

REV	DETAILS	DRAWN	CHECKED	DATE

NOTES:

1. Do not scale from this drawing.
2. This drawing is for illustrative purposes only and not for construction.
3. This drawing is to be read and printed in colour.
4. All dimensions are shown in metres, unless specified otherwise.

KEY

- SURFACE WATER SEWER
- SURFACE WATER INSPECTION CHAMBER
- FLOW CONTROL CHAMBER
- FOUL WATER SEWER
- FOUL WATER INSPECTION CHAMBER

PROJECT: Romsey Road, Whiteparish

CLIENT: Macra Ltd

DRAWING TITLE: Proposed Surface Water Drainage Strategy - North

Condon Drew Associates

DRAWN:	CHECKED:	DATE:	SCALES:	SHEET SIZE:	DRAWING NUMBER:	REVISION:
JMD	MRM	01.11.2022	1:500	A3	1294-503	-

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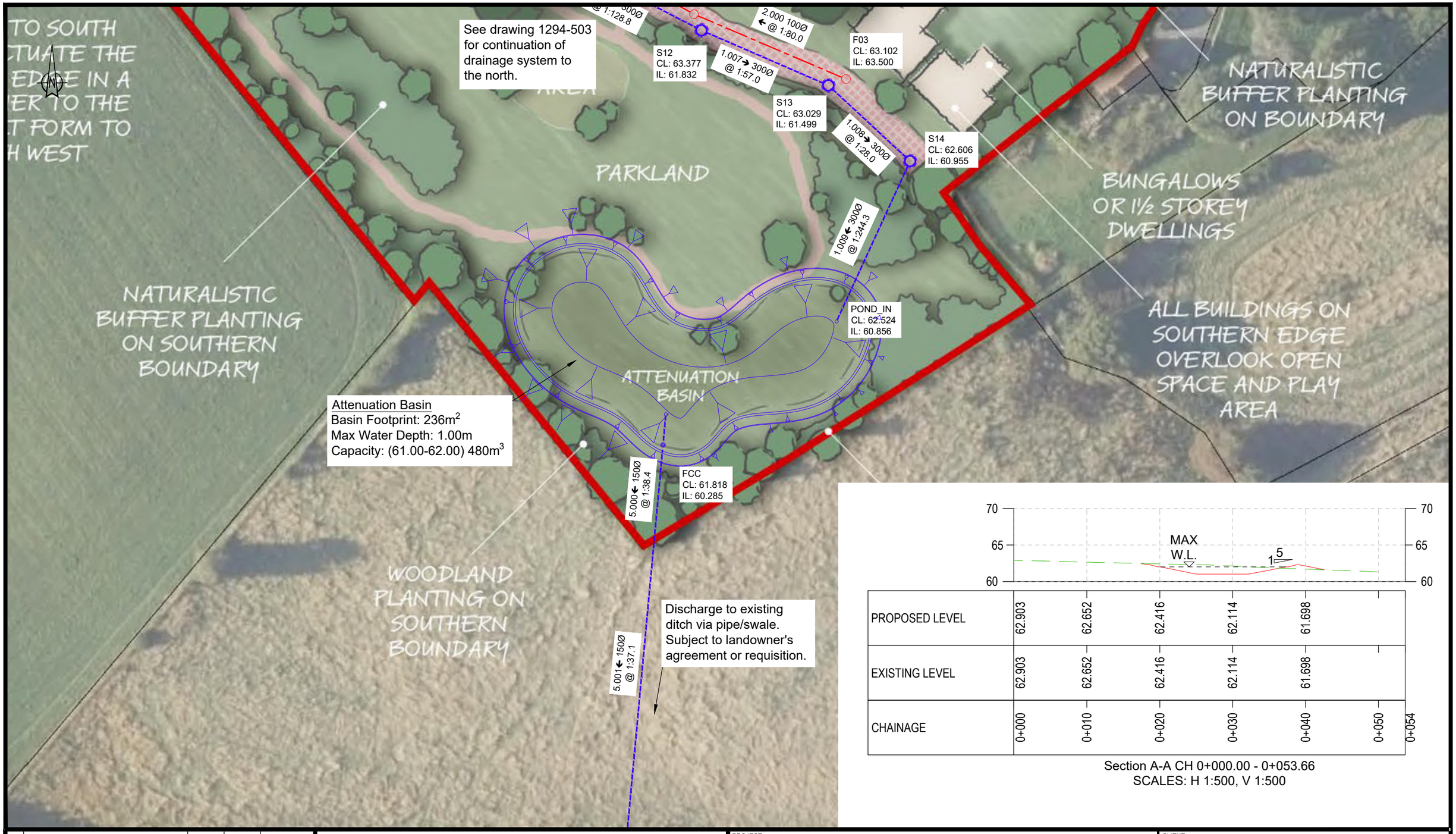

Section A-A CH 0+000.00 - 0+053.66
SCALES: H 1:500, V 1:500

REV	DETAILS	DRAWN	CHECKED	DATE

NOTES:
1. Do not scale from this drawing.
2. This drawing is for illustrative purposes only and not for construction.
3. This drawing is to be read and printed in colour.
4. All dimensions are shown in metres, unless specified otherwise.

KEY
- SURFACE WATER SEWER
- SURFACE WATER INSPECTION CHAMBER
- FLOW CONTROL CHAMBER
- FOUL WATER SEWER
- FOUL WATER INSPECTION CHAMBER

PROJECT: Romsey Road, Whiteparish

CLIENT: Macra Ltd

DRAWING TITLE: Proposed Surface Water Drainage Strategy - South

Condon Drew Associates

DRAWN:	CHECKED:	DATE:	SCALES:	SHEET SIZE:	DRAWING NUMBER:	REVISION:
JMD	MRM	01.11.2022	1:500	A3	1294-504	-

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APPENDIX H

Maintenance Guidelines from the SuDS Manual

TABLE 22.1 Operation and maintenance requirements for detention basins

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

APPENDIX I

Infiltration Testing Results

16.0 INFILTRATION TESTING

16.1 In-situ Testing Results

In-situ infiltration testing was undertaken in pits SA1, SA2 and SA3 the results sheets for which are contained in Appendix I but are also summarised in Table 16.1.1 below

Table 3.5.1: Infiltration Testing Results

Ref	*Description*	*Depth to water (m)*		*Level drop (m)*	*Time (minutes)*	*Infiltration Rate (m/s)*
		start	*end*			
SA1	*2.5m long x 0.5m wide x 1.5m deep In a sandy silty CLAY*	*0.220*	*0.250*	*0.030*	*180*	*Unable to calculate in accordance with BRE365*
SA2	2.0m long x 0.5m wide x 1.5m deep *In a sandy silty CLAY over a clayey silty SAND from 0.90m*	*0.700*	*0.810*	*0.110*	*180*	*Unable to calculate in accordance with BRE365*
SA3	*1.8m long x 0.5m wide x 1.5m deep In a sandy silty CLAY*	*0.310*	*0.320*	*0.010*	*210*	*Unable to calculate in accordance with BRE365*

16.2 Interpretation of the Results

The results would appear to show that the soils around SA1 and SA3, located in the central and western parts of the proposed residential area, respectively, would not be suitable for soakaway drainage. However, SA2 in the eastern part, probably due to the less cohesive nature of the strata (clayey silty SAND) between 0.9 and 1.5m bgl, did indicate some capacity to allow infiltration with the water level falling 110mm in three hours.

Unfortunately, due to time constraints and the need to backfilled all the pits before leaving site that evening there was insufficient time available for the water level to fall by the minimum 50% (i.e. 400mm) in accordance with the procedures outlined in BRE Digest 365 Soakaway design 1991.

The graphs showing the recorded infiltration results are contained within Appendix I but also included is an estimated graph for SA2 on which the time for the pit to drain based upon the rate of 110mm in three hours has been extrapolated, which indicates the pit would be empty in 24 hours (i.e. fall to 1.5m in 1440 minutes). Based upon this estimation for SA2 the results of the infiltration testing would be:

SA1 - location unsuitable for a soakaway

SA2 – soils have an estimated infiltration rate = 2.81 x 10^{-6} m/s; and

SA3 – location unsuitable for soakaway drainage

16.3 Conclusion

The results from the in-situ infiltration tests undertaken have shown that the areas where the soils are generally cohesive (sandy silty CLAY) have a very limited capacity to permit the infiltration of water. However, in localised areas of more sandy soils (e.g. SA2 in eastern section) there is some potential for a soakaway drainage design solution for surface water (estimated as 2.81m/s x 10^{-6}m/s).

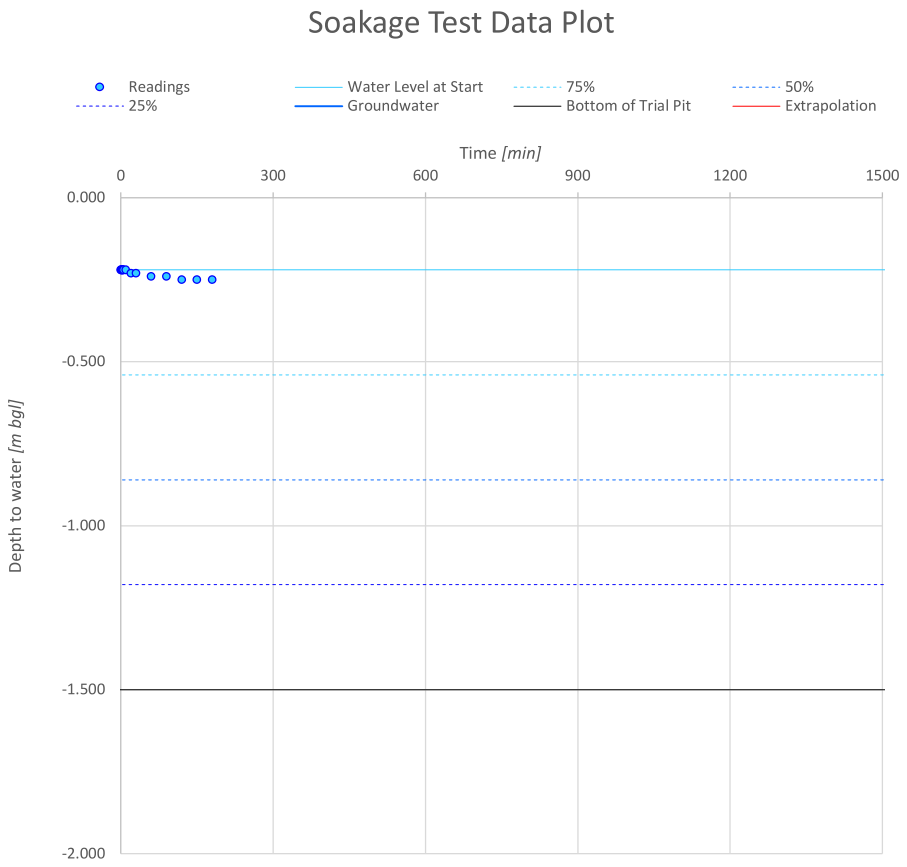
SOIL INFILTRATION RATE

Client:	Macra Ltd
Project Title:	Whiteparish
Project No:	WHI187.D

Borehole No:	SA1	**Length *[m]* :**	2.50
Test No:	1	**Depth *[m]* :**	1.50
Date:	9th April 2020	**Width *[m]* :**	0.50
Logged by:	RB	**Groundwater *[m bgl]* :**	

Ground Conditions	**from - to *[m bgl]***		**Description**
	0.00	0.20	sandy clay topsoil
	0.20	1.50	brown/orange soft to firm sandy silty CLAY

Time	**Water Depth**
[min]	***[m bgl]***
0	0.220
1	0.220
2	0.220
3	0.220
4	0.220
5	0.220
6	
7	
8	
9	
10	0.220
15	
20	0.230
30	0.230
40	
50	
60	0.240
90	0.240
120	0.250
150	0.250
180	0.250



Soil Infiltration Rate [m/s]: $$f = \frac{V_{p75\_25}}{a_{s50} \times tp_{75-25}}$$

with:

V_{p75_25}	as Effective Storage Volume of water between 75% and 25% effective storage depth ***[m³]***	**0.80**
a_{s50}	as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area ***[m²]***	**5.09**
t_{p75_25}	as Time for the water level to fall from 75% to 25% effective storage depth ***[s]***	**n/a**

Soil Infiltration Rate *[m/s]* : n/a

Remarks: Result could not be calculated. Soakage test failed.

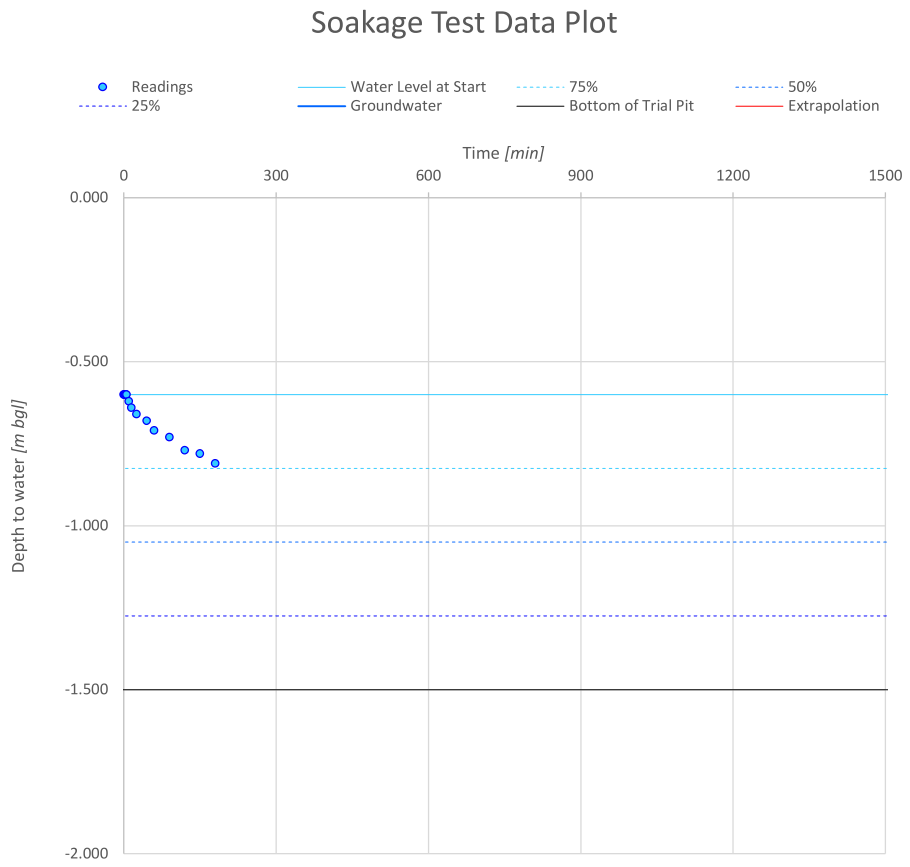
SOIL INFILTRATION RATE

Client:	Macra Ltd
Project Title:	Whiteparish
Project No:	WHI187.D

Borehole No:	SA2	**Length *[m]* :**	2.00
Test No:	1	**Depth *[m]* :**	1.50
Date:	9th April 2020	**Width *[m]* :**	0.50
Logged by:	RB	**Groundwater *[m bgl]* :**	

Ground Conditions	**from - to *[m bgl]***		**Description**
	0.00	0.20	sandy clay topsoil
	0.20	0.90	dark brown firm sandy silty CLAY
	0.90	1.50	Orange medium dense clayey silty fine SAND

Time	**Water Depth**
[min]	***[m bgl]***
0	0.600
1	0.600
2	0.600
3	0.600
4	0.600
5	0.600
6	
7	
8	
9	
10	0.620
15	0.640
25	0.660
45	0.680
60	0.710
90	0.730
120	0.770
150	0.780
180	0.810



Soil Infiltration Rate [m/s]: $$f = \frac{V_{p75\_25}}{a_{s50} \times tp_{75-25}}$$

with:

V_{p75_25}	as Effective Storage Volume of water between 75% and 25% effective storage depth ***[m³]***	**0.45**
a_{s50}	as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area ***[m²]***	**3.25**
t_{p75_25}	as Time for the water level to fall from 75% to 25% effective storage depth ***[s]***	**n/a**

Soil Infiltration Rate *[m/s]* : n/a

Remarks: Result could not be calculated. Soakage test failed.

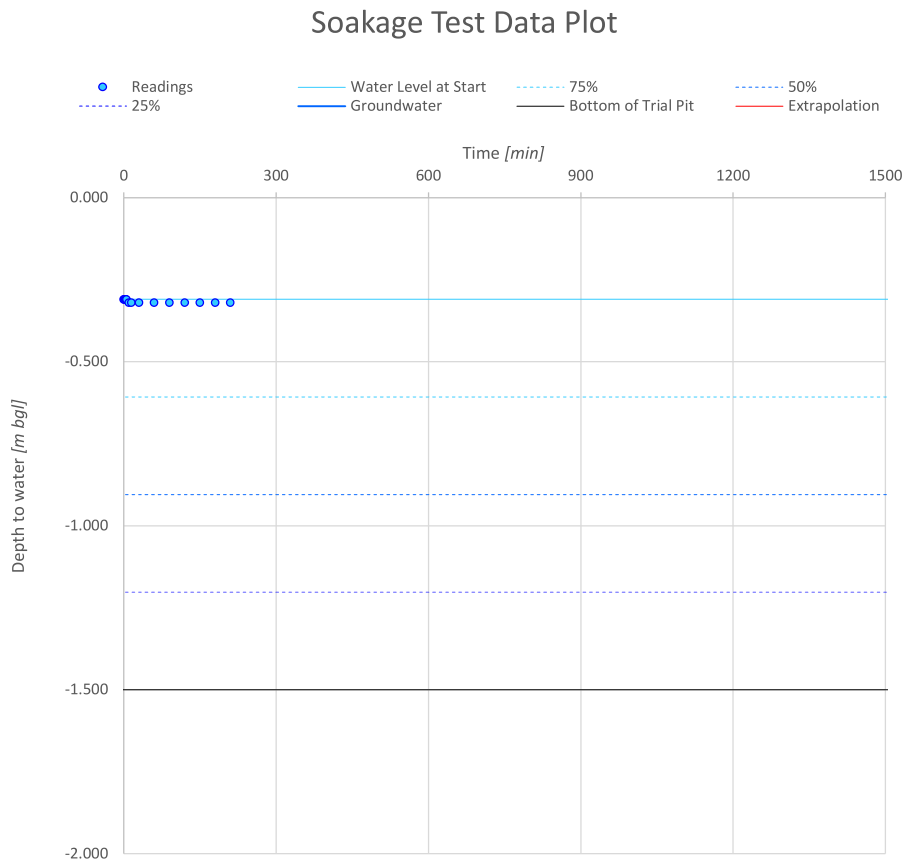
SOIL INFILTRATION RATE

Client:	Macra Ltd
Project Title:	Whiteparish
Project No:	WHI187.D

Borehole No:	SA3	**Length *[m]* :**	1.80
Test No:	1	**Depth *[m]* :**	1.50
Date:	9th April 2020	**Width *[m]* :**	0.40
Logged by:	RB	**Groundwater *[m bgl]* :**	

Ground Conditions	**from - to *[m bgl]***		**Description**
	0.00	0.20	sandy clay topsoil
	0.20	1.10	light brown firm slightly sandy silty CLAY
	1.10	1.50	light grey firm slightly sandy silty CLAY

Time	**Water Depth**
[min]	***[m bgl]***
0	0.310
1	0.310
2	0.310
3	0.310
4	0.310
5	0.310
6	
7	
8	
9	
10	0.320
15	0.320
20	
30	0.320
40	
50	
60	0.320
90	0.320
120	0.320
150	0.320
180	0.320
210	0.320



Soil Infiltration Rate [m/s]: $$f = \frac{V_{p75\_25}}{a_{s50} \times tp_{75-25}}$$

with:

V_{p75_25}	as Effective Storage Volume of water between 75% and 25% effective storage depth ***[m³]***	**0.43**
a_{s50}	as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area ***[m²]***	**3.34**
t_{p75_25}	as Time for the water level to fall from 75% to 25% effective storage depth ***[s]***	**n/a**

Soil Infiltration Rate *[m/s]* : n/a

Remarks: Result could not be calculated. Soakage test failed.

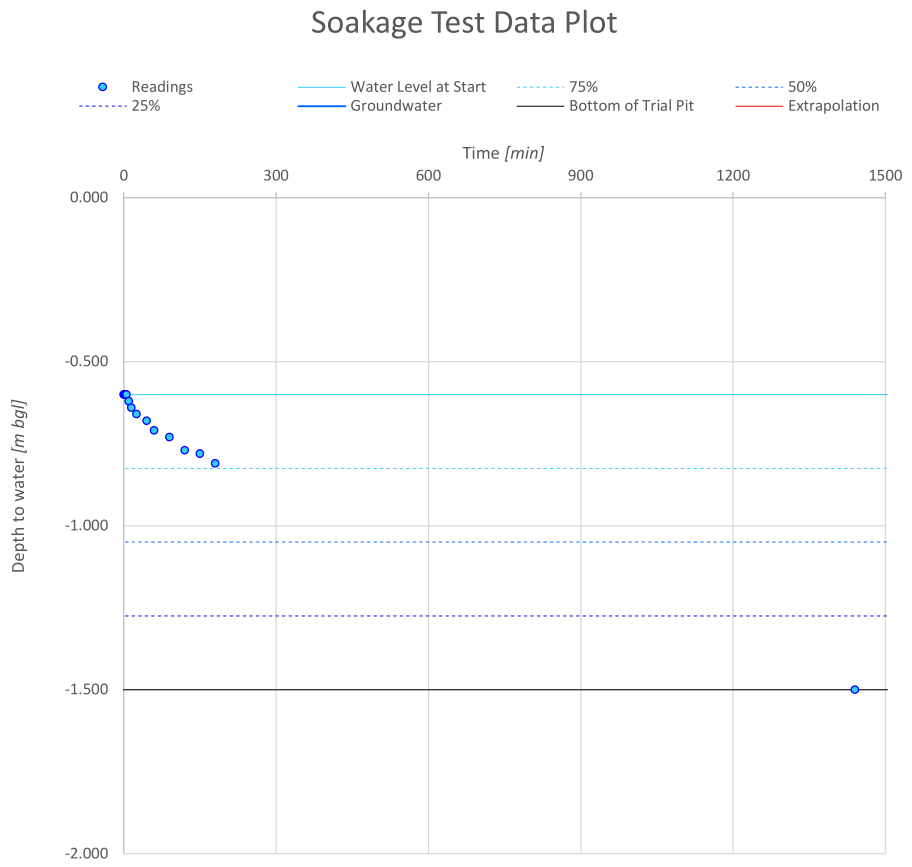
SOIL INFILTRATION RATE

Client:	Macra Ltd
Project Title:	Whiteparish
Project No:	WHI187.D

Borehole No:	SA2	**Length *[m]* :**	2.00
Test No:	1	**Depth *[m]* :**	1.50
Date:	9th April 2020	**Width *[m]* :**	0.50
Logged by:	RB	**Groundwater *[m bgl]* :**	

Ground Conditions	**from - to *[m bgl]***		**Description**
	0.00	0.20	sandy clay topsoil
	0.20	0.90	dark brown firm sandy silty CLAY
	0.90	1.50	Orange medium dense fine clayey silty SAND

Time	**Water Depth**
[min]	***[m bgl]***
0	0.600
1	0.600
2	0.600
3	0.600
4	0.600
5	0.600
6	
7	
8	
9	
10	0.620
15	0.640
25	0.660
45	0.680
60	0.710
90	0.730
120	0.770
150	0.780
180	0.810
1440	1.500



Soil Infiltration Rate [m/s]: $$f = \frac{V_{p75\_25}}{a_{s50} \times tp_{75-25}}$$

with:

V_{p75_25}	as Effective Storage Volume of water between 75% and 25% effective storage depth ***[m ³]***	**0.45**
a_{s50}	as Internal Surface Area of the soakage trial pit up to 50% storage depth including the base area ***[m ²]***	**3.25**
t_{p75_25}	as Time for the water level to fall from 75% to 25% effective storage depth ***[s]***	**4.9.E+04**

Soil Infiltration Rate *[m/s]* : 2.81E-06

Remarks:

APPENDIX J

Pre-Application Response

Wiltshire Council

07 April 2021

Mr Arron Smith
39 High Street
Pewsey
SN9 5AD

Development Services
Wiltshire Council
Tel: 0300 456 0114
Email:developmentmanagement@wiltshire.gov.uk
www.wiltshire.gov.uk

Dear Sir/Madam,

Application No:	21/00949/PREAPP
Proposal	Pre-Application Enquiry prior to the submission of an outline planning application (all matters reserved except external access) for the erection of up to 25 dwellings with access, parking, and associated landscaping. Provision of land for a new burial ground with access and car parking
Site Address	Land adjacent to Wykeham House, Romsey Road, Whiteparish, Salisbury, Wiltshire, SP5 2SD
On Behalf of:	Mr Arron Smith

Thank you for your application registered on 29/01/2021. In response to your enquiry I hope that you will find the following information helpful.

Please note that this advice represents officers' informal opinion based upon the information you have provided. It is given without prejudice to any decision the Council may make on any subsequent formal planning application. In particular, a planning application will be the subject of publicity and consultation in accordance with the Council's procedures which may bring to light additional issues, and as you will be aware, advice offered is based on the planning policies that apply at the time of writing.

Summary of Officer View

The proposal is considered to be unacceptable as it would be in conflict with the policies of the development plan. Submission of a planning application is not recommended. This response explains the reasons why the development is considered to be unacceptable.

Constraints:

Area of high ground water levels and risk of groundwater flooding

Relevant Planning History:

Nothing recent

Relevant Planning Policies:

Wiltshire Core Strategy:-
CP1 – Settlement strategy
CP2 – Delivery Strategy

CP3 – Infrastructure requirements
CP23 - Spatial Strategy: Southern Wiltshire Community Area
CP43 – providing affordable homes
CP45 – Meeting Wiltshire's housing needs
CP50 – Biodiversity and geodiversity
CP51 – Landscape
CP52 – Green Infrastructure
CP57 – Ensuring high quality design and place shaping
CP58 – Ensuring the conservation of the historic environment
CP60 – Sustainable transport
CP61 – Transport and new development
CP64 – Demand management
CP67 – flood risk

Assessment

Consultee Responses

WC Drainage Engineer:-
The site is located in an area at risk of groundwater flooding and high groundwater levels may impact on infiltration techniques. Therefore the applicant will need to provide the following at application stage if infiltration is the desired method of surface water disposal:

- Infiltration test results in accordance with British Research Establishment (BRE) Digest 365 – Soakaway Design.
- Results of a groundwater level assessment (taking into account seasonal variation) to ensure that a minimum of 1m clearance is available between the base of the soakaway and the maximum groundwater level.

The application looks to discharge surface water run off from the site at a rate of 2.4l/s this would be acceptable.

Before committing to discharge to watercourse the applicant will need to demonstrate how the surface water disposal hierarchy has been applied and how all other options have been exhausted. The hierarchy is set out below:

1. Surface water runoff is collected for use.
2. Discharge into the ground via infiltration.
3. Discharge to a watercourse or other surface water body.
4. Discharge to surface water sewer or other drainage system, discharging to a watercourse or other surface water body.
5. Discharge to a combined sewer.

Wiltshire Council is the land drainage authority under the Land Drainage Act 1991. Land drainage consent is required if a development proposes to discharge flow into an ordinary watercourse or carry out work within 8m of an ordinary watercourse.

An ordinary watercourse is a watercourse that does not form part of a main river. The term watercourse includes all rivers and streams and all ditches, drains, cuts, culverts, dikes, sluices, sewers (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows. Wiltshire Council's land drainage byelaws can be downloaded here. The land drainage consent application form and guidance notes can be found on our website here.

The surface water drainage strategy should demonstrate that:

- The 1 in 30 year rainfall event is contained within the drainage system without causing flooding to any part of the site.

- The 1 in 100 year plus climate change rainfall event does not cause flooding to any building (including a basement) or utility plant.
- The site has been designed to ensure that flows in excess of the 1 in 100 year rainfall event are managed in exceedance routes that minimise the risks to people and property.

The drainage strategy should take account of climate change in line with Environment Agency guidance. A 40% uplift in peak rainfall intensity should be applied.

As this is a major development, paragraph 165 of the National Planning Policy Framework 2019 applies. Sustainable drainage systems (SuDS) should be incorporated, unless there is clear evidence that this would be inappropriate. The systems used should:

- have appropriate proposed minimum operational standards;
- have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and
- where possible, provide multifunctional benefits.

The applicant must provide evidence of permissions to cross third party land and permissions from riparian owners to discharge to the watercourse/river in perpetuity. There is no automatic right to cross third party land or discharge to a watercourse/river not in ownership of the applicant.

The site isn't in a source protection area so not too much concern about the burial contaminating water sources. However as you have correctly identified groundwater is potentially issue. I would advise that the applicant undertake groundwater testing to determine the height of groundwater in the area (Preferably seasonal testing if time permits). During previous consultations involving cemeteries I note the EA have requested the below, this is something we as the LLFA would ask for too.

All burials in the cemetery shall be:

- a minimum of 50 metres from any potable groundwater supply source
- a minimum of 30 metres from any water course or spring
- a minimum of 10 metres distance from field drains
- not in standing water and the base of the grave must be above the local water table.

WC Archaeology

The site of the proposed development is located outside the historic core of Whiteparish, but within a general area of good archaeological potential, with cropmarks showing ancient field systems to the north west and north east. Later prehistoric and Roman agricultural, settlement and funerary activity is common across the chalklands of Wiltshire and there is every possibility that further, as yet unrecorded features may exist within the site itself. I have examined the historic map archive and there appears to be no evidence of past modern development or any quarrying activity across the site, so if any archaeological features do survive here, then they will be relatively well-preserved. What is required at this stage is for further work to be carried out in order to fully assess the archaeological potential of the site prior to the determination of any planning application.

I would therefore advise that any future planning application is accompanied by a heritage statement. This statement should place the site within its archaeological context, assess the likelihood of archaeology surviving within it, assess the likely impact of the proposed development upon that archaeological resource and suggest a suitable strategy to mitigate such an impact. I would advise that the site is also made the subject of a geophysical survey in order to highlight any potential features. The results of this survey are to be incorporated into the conclusions of the heritage statement.

The heritage statement should be prepared and the geophysical survey carried out by qualified archaeologists working to the standards and guidelines set out for such works by the Chartered Institute for Archaeologists (CIfA). The costs of this work are to be borne by the applicant.

WC Highways

I note the proposal seeks the development of up to 25 residential dwellings, as well as the provision of a new burial ground. Two new vehicular accesses are proposed from the A27, one for the residential units and a separate access for the burial ground. Firstly, the site is located outside of the existing village policy boundary and I therefore have concerns with regards to the sustainability of the site for residential development due to the likely reliance upon the private car for any residents and visitors. This proposal is therefore, in my opinion, contrary to the sustainability policies contained in the Wiltshire Core Strategy (Core Policies 60 and 61) and the National Planning Policy Framework 2019 (Section 9, paras 102, 103, 108 & 110), which aim to reduce the need to travel particularly by private car and encourage the use of sustainable transport alternatives. However, if you did not feel that such a policy objection was appropriate in this instance, I have provided additional highway related comments below;

Both accesses are shown with visibility splays of 2.4m x 59m in both directions. These are based on actual 85th percentile speeds on the A27 and are considered acceptable, especially considering the 30mph speed limit.

The residential access is shown at a width of 5.5m, with two 2m wide footways and 6m radii. This geometry is also considered acceptable for this scale of development. I note that the proposed north-western footway will be set back from the adjacent A27, before tying-in to the existing footway provision north of the site. This is generally considered acceptable, however, details of the proposed treatment of the verge area between this new footway and the A27 will be required. The provision of informal tactile crossing points are welcomed.

The cemetery access is shown at a width of 5m, with 6m radii. Swept paths are provided to show that a hurse can make the manoeuvre. Generally, I would expect the footways, or at least one footway, to continue around the access radii to enable safe pedestrian access in to the site. I note that only 6 parking spaces are proposed, which strikes me as few in number. It would be beneficial for further detail to be provided about the general operation of this proposed cemetery, including the details of internment services, staffing provision, frequency of internments, visitor numbers etc. Without such information it is difficult to determine whether the access and parking arrangements are adequate for the proposed use.

To the south of the cemetery access, a new footway will be provided, which is welcomed. However, this will need to be continued slightly further to tie-in with the existing footway fronting 1-3 Bushey Cottages.

I have some issues with the indicative internal layout of the residential development, but as this is indicative only and that this submission and any future planning submission is likely to be Outline only, I shall reserve comment in the most part. In general, an adoptable layout should consist of either a 5.5m wide carriageway (or 4.8m minimum for this number of units), with two 2m wide footways, or, a shared surface arrangement with a 5.5m wide carriageway (or 4.8m minimum for this number of units) and a 2m wide service strip and a 0.5m buffer strip. In both arrangements, unallocated visitor car parking should be designed carefully based on a ratio of 1 space per 5 units. Courtyard/rear parking courts should be avoided where possible and all dwellings provided with adequate car and cycle parking to meet Wiltshire's respective parking standards.

Finally, I note that public footpath WHIT7 runs adjacent to the site. It would be essential for the development to provide a 2m wide pedestrian connection to this public right of way within the site.

WC Rights of Way

Footpath WHIT7 runs along the boundary of this development. A direct link to adoptable standard should be provide from the western corner of the site. We may require a small contribution towards upgrading

stiles to kissing gates on the nearby network, I will look into this this in more detail if the site is taken forward to an outline application.

WC Ecology

- The proposal site falls within the River Test SAC; as such, any future application will need to comply with whatever current guidelines are in place regarding potential impact on the integrity of the SAC and increased nitrogen loading. As such, the proposal will need to be subject to an appropriate assessment, which at this current time would not meet a favourable conclusion. The applicant should contact the Natural England Discretionary Advice Service to open discussion regarding a bespoke nitrogen mitigation scheme.
- The site is within 8km of the New Forest SAC/SPA/RAMSAR sites; there is *likely* to be a S106 contribution required per dwelling in line with that charged by the New Forest National Park Authority, who should be consulted as part of the application process.
- The site is within the core sustenance zone of the Mottisfont Bat SAC; this appear to be addressed in the preapp submission, but Natural England will need to be consulted.
- The site is within a medium risk zone for impact on great crested newts (GCN). Whiteparish is known to have populations of GCN present, so it could be assumed that GCN are present on site.
- The site and its boundaries form a significant part in the local green infrastructure network and wildlife corridors; the retention of this function should be retained and there is great opportunity for it to be improved by infilling boundary vegetation where it is missing.
- I note the submission of All Ecology reports (Ecological Appraisal Nov 2020 and Bat Activity Survey Nov 2020).

I recommend that any future application be supported by the following information:

- All ecological survey reports
- Construction Ecological Management Plan
- Landscape and Ecology Management Plan
- Lighting Strategy
- Details of how BNG will be achieved, using the latest version of the DEFRA Metric tool to calculate it.
- Given the lack of information known about potential presence of GCN on site and how they may be impacted (survey work not completed), I recommend that the applicant consider utilising the Natural England District Level Licensing Scheme; this can address potential presence of newts without delaying an application for seasonally-dependent surveys. If the ecological consultant assesses that a GCN licence is NOT required to complete works, despite the absence of evidence, then sufficient justification must be provided.

In order to receive a favourable appropriate assessment regarding the River Test SAC, any future application will need to include written confirmation from NE that it is adequate to offset the impacts of development in perpetuity. In addition they will need NE advice on how much to offset the burial ground by.

- Principle of development

As you are aware, this site lies outside the settlement boundary of the village of Whiteparish, and is therefore considered to be in open countryside for the purposes of the Development Plan (Core Strategy and the Housing Sites Allocations Plan) where development is to be resisted, except under certain circumstances such as for developments associated with rural enterprises or exceptions sites housing. The current proposal does not fit within any of the exemption development types and therefore needs to be considered against the key policies of CP1 and CP2 (accepting that the settlement is designated as a Large Village in CP23).

I would argue that these strategic policies which seek to limit development to within adopted settlement boundaries and named allocations are not out of date in that they are compatible with the aims and objectives of the NPPF in focussing development into sustainable locations.

The Council's settlement strategy is set out in the Core Strategy. CP1 identifies a four-tiered hierarchy of settlements where sustainable development will take place. Whiteparish is identified as a Large Village, which is the lowest of the 4 tiers, defined as settlements with a limited range of employment, services and facilities. Developments in Large Villages is limited to that needed to help meet the housing needs of settlements and to improve employment opportunities, services and facilities. The supporting text indicates that development will predominantly take the form of small housing and employment sites within the settlement boundaries, and that development outside the settlement boundaries will be strictly controlled.

CP2 sets out the delivery strategy, which seeks to deliver development in Wiltshire in the most sustainable manner. Within the defined limits of development for settlements, including Large Villages, there is a presumption in favour of sustainable development. Development is not permitted outside the limits of development, except in specified circumstances, which do not apply in this case. The policy states that these limits may only be altered thorough the identification of sites for development through subsequent Site Allocations Plan Documents or Neighbourhood Plans. The recently adopted Wiltshire Housings Sites Allocations Plan (2020) did re-visit the settlement boundary of the village, including re-assessing the sites identified in the SHELAA, and did not identify this site as suitable for development and inclusion either within a revised settlement boundary or as a specific allocation for housing.

Therefore the proposal is contrary to Policies CP1 and CP2 as it is outside of the settlement boundary for the village. There are no other policies within the Plan which are in favour of this type of development in this location, indeed Policy CP57 requires development to make a positive contribution to the character of Wiltshire through enhancing local distinctiveness, responding positively to existing townscape and landscape features, and CP60 and CP61 look to ensure that any development is sustainable in transport terms. There are also questions about whether the development can successfully mitigate for the impacts on protected species and habitats, and therefore may be at odds with policy CP50.

On that basis I conclude that there would be conflict with the development plan as a whole. Section 38(6) of the Planning and Compulory Purchase Act (2004) requires that applications for planning should be determined in accordance with the development plan, unless material considerations indicate otherwise.

It is accepted that the Council cannot currently demonstrate a 5 Year Housing Land Supply, however the shortfall is relatively modest at 4.62 years. The evidence also shows that within the Southern Wiltshire Community Area (which contains Whiteparish) that the number of dwellings required over the plan period has been met. If the tilted balance, as required by paragraph 11(d) of the NPPF is engaged then the consideration has to look at whether there are any adverse impacts of granting permission which would significantly and demonstrably outweigh the benefits in favour of development, when assessed against the policies in the NPPF as a whole.

I consider, that in the light of the doubts about whether the scheme can provide suitable mitigation for the adverse impacts of development on the River Test SAC and consequently the Solent SAC, SPA and Ramsar, then footnote 6 of paragraph 11 of the NPPF is applicable and that the principle in favour of sustainable does not apply. Your proposal is to secure the mitigation within another LPA's area. This would mean that Wiltshire Council would not have jurisdiction over any mitigation proposed, and could not guarantee its delivery in perpetuity, as required by the Habitats Regulations. Therefore an Appropriate Assessment may conclude that the impacts of the development could not be adequately mitigated and that planning permission should not be granted. The Habitats Regulations work on the precautionary principle of where there is doubt as to whether the scheme can deliver the necessary mitigation, then consent should not be granted. I consider that as there is doubt about the delivery of the necessary mitigation, and that there is likely to be an impact on the New Forest SAC/SPA/Ramsar then Footnote 6 is applicable.

Even if this were not to be the case, I consider that the scale and form of development in this location to be inappropriate and contrary to the provisions of Policies CP23, CP51, CP57, CP60 and CP61 of the Core Strategy in that this is a major development on the edge of a village which is characterised by ribbon development, with very modest areas of more formalised development such as around Green Close. The site currently reads as one of the fields which surround the settlement, and which plays a contribution to

the setting of the village due to its strong landscape setting along the A27. The approach to the village from the east is very open and rural in character and a scheme of about 25 dwellings in this location would be not in keeping with the requirements of Policy CP 57 relating to local distinctiveness.

I accept that the provision of the burial ground would appear to be something that the Parish Council are looking for, but there are issues as to whether this is the right location due to the high water table on the site, and the issues around the access and parking provision highlighted in the consultee responses above. I do not therefore consider that the provision of this facility will outweigh the fundamental objections to this proposal outside of the recently re-confirmed settlement boundary of Whiteparish.

I would suggest that if you want to pursue this site in the near future that you engage with the Council's review of the Local Plan and put the site forward for consideration as a positive allocation in that document or a suggestion that the settlement boundary is amended to accommodate the site.

Yours faithfully

Mike Wilmott
Head of Development Management

Officer's Name: Lynda King
Officer's Title: Senior Planning Officer
Direct Line: 0300 456 0114
Email: lynda.king@wiltshire.gov.uk

APPENDIX F

LLFA CONSULTEE RESPONSE

Wiltshire Council

Wiltshire Council Planning Consultation Response

17th March 2025

Wiltshire Council Drainage Engineer
Technical Services Drainage Engineer
Wiltshire Council

Application No: **ENQ/2025/00215**

APPLICATION FOR APPROVAL OF RESERVED MATTERS 'INTERNAL ACCESS', 'APPEARANCE', 'LANDSCAPING', 'LAYOUT' AND 'SCALE' FOLLOWING OUTLINE PLANNING PERMISSION PL/2022/09532

LAND AT ROMSEY ROAD, WHITEPARISH, SALISBURY, SP5 2SD

Pre-Application Advice: Drainage Strategy / Drainage Design

The applicant should note that in all instances the preference should be to utilise blue-green SuDS which provide multi-faceted benefits to the site (in terms of water quantity, quality, amenity and biodiversity); for example, for attenuation features preference should be given to use of swales / ponds / detention basins (if technically feasible) instead of attenuation tanks. The applicant should adopt a holistic approach to planning the site, and sufficient space for SuDS features should be provided at an early stage in order to fulfil the requirements of NPPF Paragraph 169; the LLFA will not accept statements that there is insufficient space for SuDS or that SuDS have not been utilised due to cost.

Any proposals should be designed in accordance with the Non-statutory Technical Standards for Sustainable Drainage Systems and the latest SuDS Manual (C753).

The LLFA would consider this to be a greenfield site for the purposes of planning.

The developer should provide the following information as part of future planning applications – for this we have aimed to build on the detail provided previously under the drainage consultation response to PL/2022/09532:

Drainage Strategy

- It is noted that the applicant previously planned to restrict discharge rates from the site to the greenfield Qbar rate (corresponding to the 1 in 2.33year rainfall event) for all events up to the 1in 100year + climate change storm; it is acknowledged that for the higher return period rainfall events this will provide betterment, however this will not provide the required level of betterment for lower return period events (such as the 1 in 1 year rainfall event). Wiltshire Council's betterment policy for greenfield sites states:

  "With regards the control of surface water discharges from new development, Wiltshire Council requires post development discharges from greenfield sites to provide 20% betterment over pre-development discharges for all storm events between the 1 in 1year and 1 in 100year return period events.

  For greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the greenfield runoff volume for the same event."

  The applicant will be required to submit calculations which demonstrate that the required 20% betterment against greenfield rates has been achieved for all storm events between the 1 in 1 year and the 1 in 100year return period storm events.

- Calculations which demonstrate that the proposed drainage design provides a sufficient level of water treatment to prevent pollution of the receiving watercourse. This should include a sensitivity analysis considering surcharged outfall conditions.
- Measures to prevent pollution of the receiving groundwater and/or surface waters.
- Surface water can be safely managed within the proposed development, up to and including a 1 in 100 year plus climate change event.
- Existing flood flow routes through the site have been maintained or where they will be affected, adequate measures to intercept and safely control flows through the site have been provided to ensure flood risk is not increased elsewhere.
- The strategy mimics the existing drainage characteristics of the site by retaining and utilising any existing drainage features.

Detailed Drainage calculations

- Calculations and drawings for the drainage system design showing designated holding areas and conveyance routes based on no flooding on site for a 1 in 30 year plus climate change rainfall event.
- Calculations and drawings for the drainage system design showing designated holding areas and conveyance routes based on no flooding on site for a 1 in 100 year plus climate change rainfall event in respect to a building (including basement) or utility plant susceptible to water within the development.
- Calculations should include an allowance for increased surface water runoff, as a result of urban creep, in accordance with LASOO guidance.
- Hydraulic Models should set the MADD factor / additional storage volume factor to $0m^3$ / ha in order to prevent an overestimation of storage capacity in the proposed drainage network.
- If the drainage model includes runoff from the full site (both permeable and impermeable areas), the default Cv values of 0.75 (summer) and 0.84 (winter) may be used. If runoff is only included from impermeable catchment areas within the drainage model, a Cv value of 1 must be used.
- If attenuation tanks are proposed that an allowance for reduced attenuation volume due to silt ingress (as per Section 21.9.9 of the SuDS Manual CIRIA C753)

Design Drawings

- Drawings showing conveyance routes for flows exceeding the 1 in 100 year plus climate change rainfall event that minimise the risk to people and property.
- Drawings showing evidence that the finished floor levels are above the maximum predicted 100 year flood level.
- The attenuation basin must be designed to include a min 300mm freeboard above the critical 1 in 100 year + climate change storm event.

Third party consent

- Evidence of permissions to cross third party land and permissions from riparian owners to discharge to the watercourse/river in perpetuity. There is no automatic right to cross third party land party land or discharge to a watercourse/river not in ownership of the applicant.

Construction

- A Construction Phase Management Plan to clearly demonstrate how surface water will be managed throughout the construction phase in order to prevent an increase in local flood risk / local pollution risk.

Informatives:

Wiltshire Council is the land drainage authority under the Land Drainage Act 1991. Land drainage consent is required if a development proposes to discharge flow into an ordinary watercourse or carry out work within 8m of an ordinary watercourse.

An ordinary watercourse is a watercourse that does not form part of a main river. The term watercourse includes all rivers and streams and all ditches, drains, cuts, culverts, dikes, sluices, sewers (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows.

Wiltshire Council's land drainage bylaws can be downloaded here. The land drainage consent application form and guidance notes can be found on our website here.

The table below stipulates the information typically required at each application stage. Provision of the correct information will expedite the processing of applications by the drainage team.

Pre-app	Outline	Full	Reserved matters	Discharge of conditions	Document to be submitted
✓	✓	✓			Flood Risk Assessment / Statement
✓	✓	✓			Drainage Strategy / Statement & sketch layout plan
	✓				Preliminary layout drawings
	✓				Preliminary “Outline” hydraulic calculations
	✓				Preliminary landscape proposals
	✓				Ground investigation report (for infiltration)
	✓	✓			Evidence of third party agreement for discharge to their system (in principle/ consent to discharge)
		✓		✓	Maintenance program and on-going maintenance responsibilities
		✓	✓		Detailed development layout
		✓	✓	✓	Detailed flood & drainage design drawings
		✓	✓	✓	Full Structural, hydraulic & ground investigations
		✓	✓	✓	Geotechnical factual and interpretive reports, including infiltration results
		✓	✓	✓	Evidence of measures to prevent pollution of the receiving groundwater and/or surface waters
		✓	✓	✓	Drawings showing conveyance routes for flows exceeding the 1 in 100 year plus climate change
		✓	✓	✓	Detailed landscaping details
		✓	✓	✓	Discharge agreements (temporary and permanent)
		✓	✓	✓	Development Management & Construction Phasing Plan

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Vijit Rathore (AtkinsRéalis) working on behalf of Wiltshire Council Drainage.

Responses to Consultee Comments

Wiltshire Council LLFA response dated 17th March 2025:

Pre-Application Advice: Drainage Strategy / Drainage Design
The applicant should note that in all instances the preference should be to utilise blue-green SuDS which provide multi-faceted benefits to the site (in terms of water quantity, quality, amenity and biodiversity); for example, for attenuation features preference should be given to use of swales / ponds / detention basins (if technically feasible) instead of attenuation tanks. The applicant should adopt a holistic approach to planning the site, and sufficient space for SuDS features should be provided at an early stage in order to fulfil the requirements of NPPF Paragraph 169; the LLFA will not accept statements that there is insufficient space for SuDS or that SuDS have not been utilised due to cost.

Any proposals should be designed in accordance with the Non-statutory Technical Standards for Sustainable Drainage Systems and the latest SuDS Manual (C753).

The LLFA would consider this to be a greenfield site for the purposes of planning.

The developer should provide the following information as part of future planning applications – for this we have aimed to build on the detail provided previously under the drainage consultation response to PL/2022/09532:

Drainage Strategy
• It is noted that the applicant previously planned to restrict discharge rates from the site to the greenfield Qbar rate (corresponding to the 1 in 2.33year rainfall event) for all events up to the 1in 100year + climate change storm; it is acknowledged that for the higher return period rainfall events this will provide betterment, however this will not provide the required level of betterment for lower return period events (such as the 1 in 1 year rainfall event). Wiltshire Council's betterment policy for greenfield sites states:

"With regards the control of surface water discharges from new development, Wiltshire Council requires post development discharges from greenfield sites to provide 20% betterment over pre-development discharges for all storm events between the 1 in 1year and 1 in 100year return period events.

Response:
20% betterment provided through reduction of Qbar rate from 5.3 l/sec to 4.3 l/sec for all storm events.

For greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the greenfield runoff volume for the same event."

The applicant will be required to submit calculations which demonstrate that the required 20% betterment against greenfield rates has been achieved for all storm events between the 1 in 1 year and the 1 in 100year return period storm events.

Response:
Noted, please refer to SWS calculations provided.

• Calculations which demonstrate that the proposed drainage design provides a sufficient level of water treatment to prevent pollution of the receiving watercourse. This should include a sensitivity analysis considering surcharged outfall conditions.
Response:
Please refer to pollution control and water quality

• Measures to prevent pollution of the receiving groundwater and/or surface waters.
Response:
Please refer to pollution control and water quality

• Surface water can be safely managed within the proposed development, up to and including a 1 in 100 year plus climate change event.
Response:
Noted, please refer to SWS calculations provided.

• Existing flood flow routes through the site have been maintained or where they will be affected, adequate measures to intercept and safely control flows through the site have been provided to ensure flood risk is not increased elsewhere.
Response:
Please refer to exceedance flow route layout

• The strategy mimics the existing drainage characteristics of the site by retaining and utilising any existing drainage features.
Response:
Comment noted and no existing drainage features are within the development site however the surface water network and flood exceedance routing mimics the surface water run off from the development area.

Detailed Drainage calculations
• Calculations and drawings for the drainage system design showing designated holding areas and conveyance routes based on no flooding on site for a 1 in 30 year plus climate change rainfall event.
Response:
Noted, please refer to SWS calculations provided.

• Calculations and drawings for the drainage system design showing designated holding areas and conveyance routes based on no flooding on site for a 1 in 100 year plus climate change rainfall event in respect to a building (including basement) or utility plant susceptible to water within the development.
Response:
Noted, please refer to SWS calculations provided.

• Calculations should include an allowance for increased surface water runoff, as a result of urban creep, in accordance with LASOO guidance.
Response:
Comment noted and 10% urban creep provision has been included for all impermeable areas within the storage volume of the attenuation basin and within the surface water network.

• Hydraulic Models should set the MADD factor / additional storage volume factor to 0m3 / ha in order to prevent an overestimation of storage capacity in the proposed drainage network.

Response:
Noted, please refer to SWS calculations provided.

• If the drainage model includes runoff from the full site (both permeable and impermeable areas), the default Cv values of 0.75 (summer) and 0.84 (winter) may be used. If runoff is only included from impermeable catchment areas within the drainage model, a Cv value of 1 must be used.
Response:
Noted, please refer to SWS calculations provided where Cv value of 1 used

• If attenuation tanks are proposed that an allowance for reduced attenuation volume due to silt ingress (as per Section 21.9.9 of the SuDS Manual CIRIA C753)
Response:
Comment noted and not applicable in this instance.

Design Drawings
• Drawings showing conveyance routes for flows exceeding the 1 in 100 year plus climate change rainfall event that minimise the risk to people and property.
Response:
Please refer to exceedance flow route layout

• Drawings showing evidence that the finished floor levels are above the maximum predicted 100 year flood level.
Response:
Not applicable as development sites within FZ1

• The attenuation basin must be designed to include a min 300mm freeboard above the critical 1 in 100 year + climate change storm event.
Response:
Comment noted and 300mm freeboard provided

Third party consent
• Evidence of permissions to cross third party land and permissions from riparian owners to discharge to the watercourse/river in perpetuity. There is no automatic right to cross third party land party land or discharge to a watercourse/river not in ownership of the applicant.
Response:
Deed of easement signed with Landowner dated 30th August 2024

Construction
• A Construction Phase Management Plan to clearly demonstrate how surface water will be managed throughout the construction phase in order to prevent an increase in local flood risk / local pollution risk.
Response:
Comment noted and a CPMP will be provided prior to commencement of construction

Karl Gebhart

From: Karl Gebhart <KarlG@mjaconsulting.co.uk>
Sent: 21 May 2024 17:06
To: Taylor, Barney; Wilding, Ben
Cc: Mike Mayock
Subject: Romsey Road, Whiteparish - PL/2022/09532

Afternoon All,

Many thanks for taking the time to discuss the SUD's and drainage comments/conditions made relating to the above application.

I can confirm the following was discussed and agreed subject to submitting further detailed information:

- In accordance with Wiltshire CC Policy discharge rates from Greenfield sites to show a 20% betterment over pre-developed discharges for both Peak Flow and volume for all storm events (1yr,30yr, 100yr & 100yr+45%c/c).
- As the catchment from the development enters waterways which ultimately discharge into Hampshire CC the 45% climate change applies.
- The attenuation basin to have a minimum freeboard of 300mm above the critical 1:100yr+45% climate change event
- Water Quality and Pollution Prevention calculations in accordance CIRIA Suds Manual 2015 required. Pollution control measures to include permeable paving to private driveways, reed lined swales, siltation forebays to incoming and outgoing headwalls within the attenuation basin.
- Not directly discussed in the meeting but the proposed drainage strategy layout to include exceedance flow routes and flood route arrows and confirmation all FFL's are above the predicated 1:100yr+45% climate change level.
- Again not directly discussed in the meeting but the CPMP to demonstrate how surface water will be managed throughout construction to prevent an increase in local flood/pollution risk eg silt fences and bunds around site periphery to prevent run off.
- Applicant to provide evidence of permission to cross third party land and third party land owner to confer riparian rights in perpetuity to developer.

Surface water Strategy

- Private drives to be permeable paving with permeable sub base stone. However, due to the low infiltration rate a positive outfall to be provided and any infiltration ignored when calculating run off.
- House roofs and roads to drain via gravity to new sewers located within the development carriageways.
- Development sewers to drain into reed lined swales prior to discharging into an attenuation basin with siltation forebays on headwalls.
- Attenuation basin to drain via a hydrobrake control chamber with an outfall sewer across the neighbouring third party land.
- The final outfall from the sewer to be close to the receiving watercourse but via a stone bed to mimic a spring and natural run off

Foul water Strategy

- An existing DN150 foul sewer is situated at the site entrance. The majority of the site will drain via gravity to this existing sewer however, 5/6 properties will need to be pumped via a package pump station due to the topography of the site.

I trust the above is an accurate reflection of our conversation however if I have missed anything off then please do not hesitate to correct me!

Barney, Unfortunately I don't have Lynda's email address therefore please can you forward this email to her for her records.

Many thanks

Karl Gebhart

MJA CONSULTING
Civil & Structural Engineers

Ipsum Court, 24 The Quadrant, Abingdon Science Park, Abingdon, Oxfordshire, OX14 3YS
T 01235 555173 || M 07778 291439 E karlg@mjaconsulting.co.uk
www.mjaconsulting.co.uk

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Karl Gebhart

From: Wilding, Ben <Ben.Wilding@atkinsrealis.com>
Sent: 22 May 2024 09:48
To: Karl Gebhart; Taylor, Barney
Cc: Mike Mayock; King, Lynda
Subject: RE: Romsey Road, Whiteparish - PL/2022/09532

Good morning Karl

Thank you for meeting with us yesterday.
I would agree with the below as a fair and accurate record of our conversation.

Kind Regards

Ben Wilding *MEng (Hons) CEng MICE*
Principal Civil Engineer

AtkinsRéalis

AtkinsRéalis on behalf of Wiltshire Council Drainage

E: ben.wilding@atkinsrealis.com
T: 0121 483 5490

From: Karl Gebhart <KarlG@mjaconsulting.co.uk>
Sent: Tuesday, May 21, 2024 5:06 PM
To: Taylor, Barney <Barney.Taylor@atkinsrealis.com>; Wilding, Ben <Ben.Wilding@atkinsrealis.com>
Cc: Mike Mayock <mike@macra.ltd>
Subject: Romsey Road, Whiteparish - PL/2022/09532

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Oxfordshire
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