

DRAINAGE TECHNICAL NOTE

Project Name : Former Woodley Arms, Waldeck Street, Reading

Job No : 23-095-01

Note Title : Drainage Technical Note

Author : AK

Checked : SW

Approved : SW

Date : 06/07/2023

1.0 INTRODUCTION

1.1.1 This technical note has been prepared on behalf of K J Parker to address Reading Borough Council planning requirements and subsequent planning comments in relation to the site at Former Woodley Arms, Waldeck Street, Reading and proposed development comprising two blocks of flats with associated access, drives and infrastructure.

1.1.2 The below planning comments have been provided via e-mail (on the 27th March 2023) to the client's representative in relation to drainage documents submitted by others to date:

- A detailed drainage strategy that assesses the 1 in 1 year, 1 in 30 year and 1 in 100 years plus climate change has not been submitted with only the 1 in 10 year event assessed. This should include electronic assessments of the proposed drainage network to ensure that the proposal is sufficient and does not cause risk of flooding.
- An assessment would also be required to establish whether the site is in fact suitable for infiltration.
- Drainage Drawing 1559-GA-501 Site Drainage As Proposed differs and provides less storage than the calculations undertaken by WRD.
- No clarification has been provided to ascertain whether the drainage design has taken into account the SuDs hierarchy as set out by National Policy and this should be detailed within any assessment.



- Clarity should be provided on how surface water was previously managed on the site and also how the proposed scheme seeks to reduce the surface water run-off from the site without causing flood risk/ flooding.

2.0 FURTHER DRAINAGE EVIDENCE

2.1 *Relevant planning comment: A detailed drainage strategy that assesses the 1 in 1 year, 1 in 30 year and 1 in 100 years plus climate change has not been submitted with only the 1 in 10-year event assessed. This should include electronic assessments of the proposed drainage network to ensure that the proposal is sufficient and does not cause risk of flooding.*

2.1.1 Odyssey have used the '1559-GA-501 Rev.E Site Drainage As Proposed' drawing by RS Studio (please refer to **Appendix A** for this drawing) as a basis and modelled the proposed surface water (SW) system for the 1 in 1 year, 1 in 30 year and 1 in 100 years plus 40% climate change events to assess the flood risk.

2.1.2 Please refer to **Appendix B** for Micro drainage model output '23-095 Model Former Woodley Arms, Waldeck Street, Reading' which shows no flooding for any of the above design events.

2.2 *Relevant planning comment: An assessment would also be required to establish whether the site is in fact suitable for infiltration*

2.2.1 The proposal for the site is to discharge surface water run-off via infiltration – as per drawing '1559-GA-501 Rev.E Site Drainage As Proposed' in **Appendix A**.

2.2.2 The only information on the ground suitability for infiltration is contained in the WRD report No. 70728 (dated Feb 23) – please refer to **Appendix C** for this report.

2.2.3 WRD Report No. 70728 notes that percolation test results were provided by others and on this basis calculates the value of a soil infiltration rate as $f = 5.95 \times 10^{-6}$ m/s. Such rate indicates that the soil in general could sustain infiltration techniques.



2.3 *Relevant planning comment: Drainage drawing 1559-GA-501 Site Drainage As Proposed differs and provides less storage than the calculations undertaken by WRD*

2.3.1 The soakaway size shown on the '1559-GA-501 Rev.E Site Drainage As Proposed' did not follow the WRD calculations and did not allow for more extreme rainfall events.

2.3.2 Odyssey have therefore modelled the SW system including soakaway for the 1 in 1 year, 1 in 30 year and 1 in 100 years plus 40% climate change events to assess the flood risk.

2.3.3 Please refer to **Appendix B** for Microdrainage model output '23-095 Model Former Woodley Arms, Waldeck Street, Reading' and to **Appendix D** for a soakaway design drawing number 23-095-002 and dedicated soakaway calculations.

2.3.4 The 1559-GA-501 drainage drawing should be updated to include the increased soakaway size as shown on Odyssey drawing number 23-095-002.

2.4 *Relevant planning comment: No clarification has been provided to ascertain whether the drainage design has taken into account the SuDs hierarchy as set out by National Policy and this should be detailed within any assessment*

2.4.1 Planning practice 'Flood Risk and Coastal Change' guidance in paragraph 056 describes the hierarchy of drainage options. This hierarchy of drainage options is reproduced below:

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

2.4.2 The proposed use of a soakaway - as a discharge into the ground (infiltration) - puts the proposal for the site at the top of the SuDS hierarchy.

2.5 *Relevant planning comment: Clarity should be provided on how surface water was previously managed on the site and also how the proposed scheme seeks to reduce the surface water run off from the site without causing flood risk/ flooding*

2.5.1 There is no information available on how the site previously managed its surface water run-off.



2.5.2 Odyssey have prepared a 23-095-001 drawing that compares impermeable areas 'pre' and 'post-development' – please refer to **Appendix E** for the drawing.

2.5.3 The architect for the site advised that all hardstanding areas are to be constructed as a permeable surface, i.e., permeable paving. The 'pre-development' hardstanding areas of the site were of impermeable type.

2.5.4 Furthermore, inspection of the levels shown on the topographical survey of the 'pre-development' site suggests that approximately just over 100 m² of the hardstanding was draining its surface water run-off uncontrolled onto Waldeck Street. This situation would cease 'post-development'.

2.5.5 Additionally, the 'post-development' site will have more soft landscaped or gravel areas than in its 'pre-development' state.

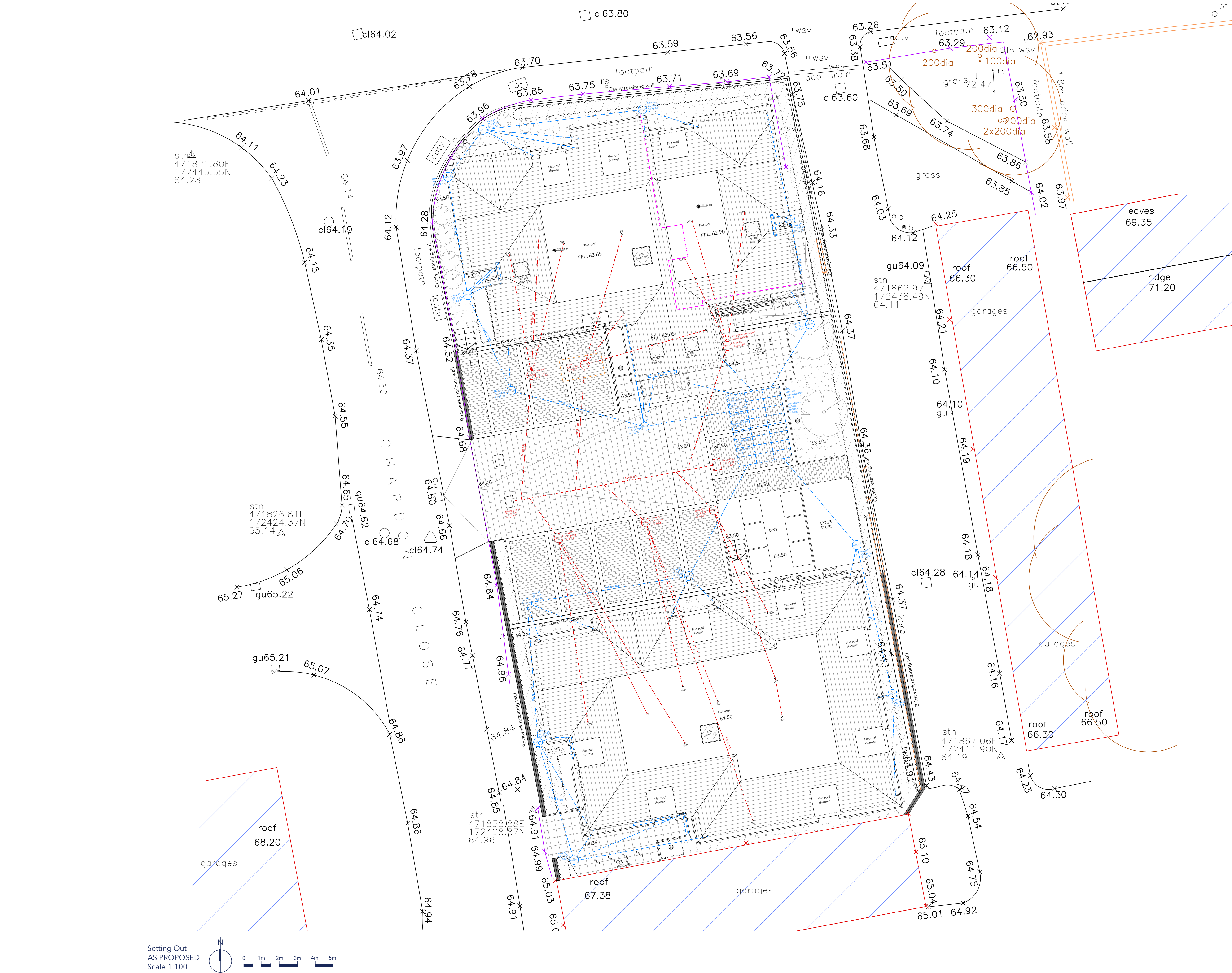
2.5.6 The above suggests that the site 'post-development' would seek to reduce the surface water run-off from the site and would not increase off-site flood risk when compared to the 'pre-development' state.

3.0 CONCLUSION

3.1.1 Planning comments have been reviewed and subject to the implementation of the increased soakaway size we confirm that planning comments have been addressed.

APPENDIX A

Drawing 1559-GA-501 Rev.E 'Site Drainage As Proposed'



- KEY
- Foul Waste 1:80 (100mm pipe unless otherwise stated)
 - Surface Water 1:100 (100mm pipe unless otherwise stated)
 - CL Cover Level
 - IL Invert Level
 - 450Ø PPIC Inspection Chamber
 - Slot Drain

- PROPOSED FEATURES
- DECIDUOUS TREE
 - ORNAMENTAL SHRUBS
 - HEDGE
 - 600mm HIGH BRICK WALL (materials to match buildings)
 - CONCRETE SLAB PAVING (Marshalls Saxon, 450x450mm, buff colour)
 - CONCRETE BLOCK PAVING (Marshalls Tegula, mixed gauge stretcher brick harvest colour)
 - CONCRETE BLOCK PAVING (Marshalls Tegula, mixed gauge stretcher brick pennant grey colour)
 - GRAVEL (6-10mm buff colour chippings 30mm deep on 100mm Type 1 sub-base on terram 1000 membrane, with timber edge)
 - CONCRETE KERB (Marshalls conservation style 145mm wide)
 - CONCRETE KERB (Marshalls conservation style 500mm wide, laid flush)
 - DROP KERB
 - LOW ENERGY LIGHT BOLLARD

For exact details of plants and trees Refer to Partridge Associates Landscape Proposals - 2031/2B

NOTE:
Drainage to be design accordance to National Build Standards Design and Construction Guidance for foul and surface water sewers

No.	Description	Date
E	General Amendments	15.03.2023
D	Drainage Amendments	13.01.2023
C	General Amendments	09.01.2023
B	General Amendments	04.01.2023
A	General Amendments	23.12.2022

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Drawing Title:
Site Drainage
AS PROPOSED

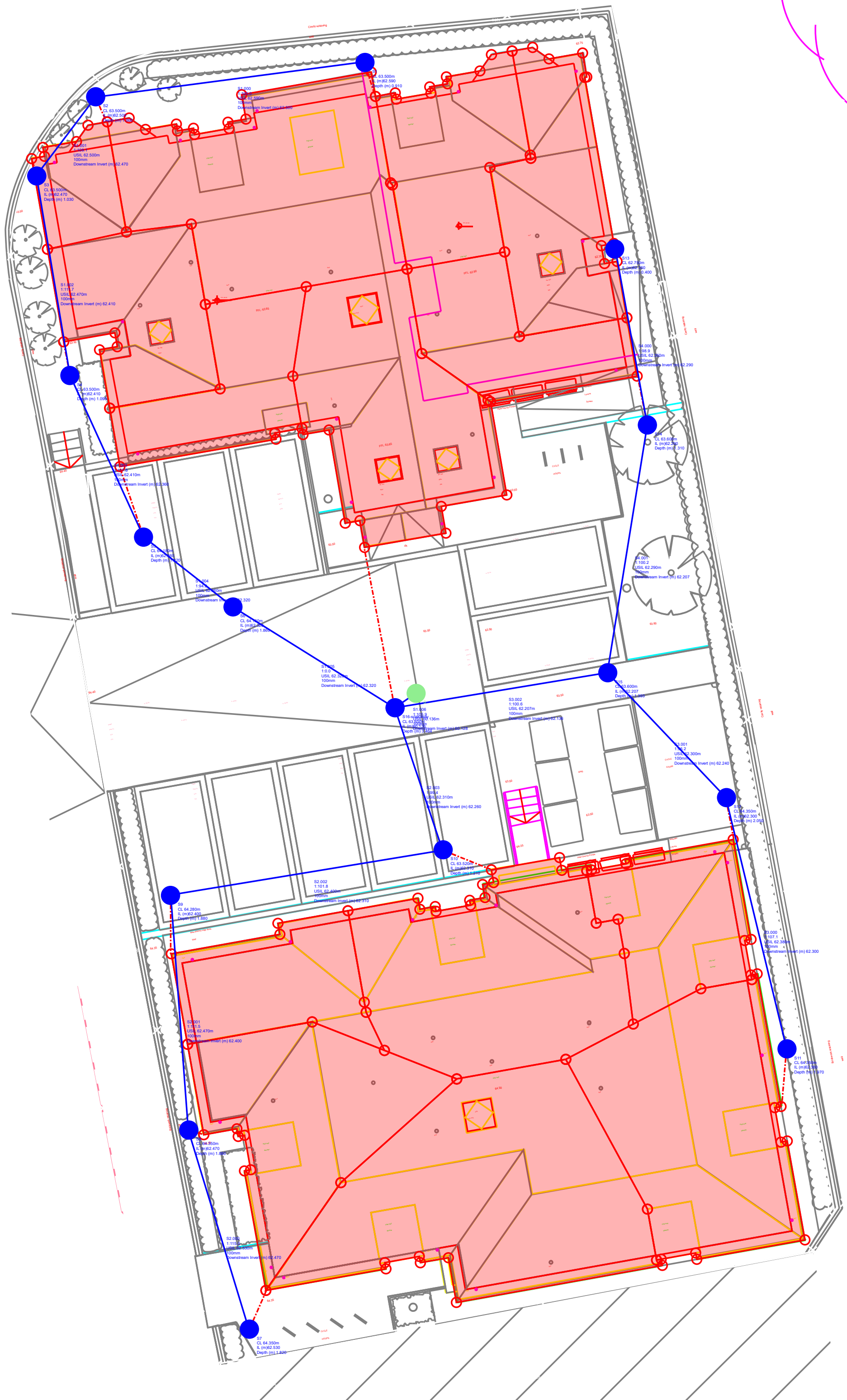
Project Title:
Woodley Arms
Waldeck Street, Reading,
RG1 2RF

Drawing No.:
1559-GA-501
Date: December 2022
Scale: 1:100
Drawn: LM
Checked: RS

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APPENDIX B

Micro Drainage Model Output



Odyssey		Page 1
Tuscany House White Hart Lane Basingstoke RG21 4AF	Former Woodley Arms Waldeck Street, Reading	
Date 26/06/2023 15:32 File 23-095 Woodley Arms.MDX	Designed by AK Checked by	
Micro Drainage	Network 2020.1.3	

Odyssey		Page 2
Tuscany House White Hart Lane Basingstoke RG21 4AF	Former Woodley Arms Waldeck Street, Reading	
Date 26/06/2023 15:32 File 23-095 Woodley Arms.MDX	Designed by AK Checked by	
Micro Drainage	Network 2020.1.3	

Existing Network Details for Proposed

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
S1.000	8.999	0.090	100.0	0.002	5.00	0.0	0.600	o	100	Pipe/Conduit
S1.001	3.272	0.030	109.1	0.005	0.00	0.0	0.600	o	100	Pipe/Conduit
S1.002	6.704	0.060	111.7	0.001	0.00	0.0	0.600	o	100	Pipe/Conduit
S1.003	5.890	0.050	117.8	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit
S1.004	3.761	0.040	94.0	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit
S1.005	6.326	0.000	0.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
S2.000	6.902	0.060	115.0	0.006	5.00	0.0	0.600	o	100	Pipe/Conduit
S2.001	7.803	0.070	111.5	0.004	0.00	0.0	0.600	o	100	Pipe/Conduit
S2.002	9.162	0.090	101.8	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit
S2.003	4.970	0.050	99.4	0.005	0.00	0.0	0.600	o	100	Pipe/Conduit
S3.000	8.569	0.080	107.1	0.005	5.00	0.0	0.600	o	100	Pipe/Conduit
S3.001	5.711	0.060	95.2	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S1.000	62.590	0.002	0.0	0.77	6.0
S1.001	62.500	0.007	0.0	0.74	5.8
S1.002	62.470	0.008	0.0	0.73	5.7
S1.003	62.410	0.011	0.0	0.71	5.6
S1.004	62.360	0.013	0.0	0.79	6.2
S1.005	62.320	0.013	0.0	0.00	0.0
S2.000	62.530	0.006	0.0	0.72	5.6
S2.001	62.470	0.010	0.0	0.73	5.7
S2.002	62.400	0.012	0.0	0.76	6.0
S2.003	62.310	0.017	0.0	0.77	6.1
S3.000	62.380	0.005	0.0	0.74	5.8
S3.001	62.300	0.007	0.0	0.79	6.2

Odyssey		Page 3
Tuscany House White Hart Lane Basingstoke RG21 4AF	Former Woodley Arms Waldeck Street, Reading	
Date 26/06/2023 15:32 File 23-095 Woodley Arms.MDX	Designed by AK Checked by	
Micro Drainage	Network 2020.1.3	

Existing Network Details for Proposed

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
S4.000	5.935	0.060	98.9	0.003	5.00	0.0	0.600	o	100	Pipe/Conduit
S4.001	8.316	0.083	100.2	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit
S3.002	7.145	0.071	100.6	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
S1.006	0.847	0.008	105.9	0.004	0.00	0.0	0.600	o	100	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S4.000	62.350	0.003	0.0	0.77	6.1
S4.001	62.290	0.005	0.0	0.77	6.0
S3.002	62.207	0.012	0.0	0.77	6.0
S1.006	60.136	0.045	0.0	0.75	5.9

Manhole Schedules for Proposed											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S1	63.500	0.910	Open Manhole	450	S1.000	62.590	100				
S2	63.500	1.000	Open Manhole	450	S1.001	62.500	100	S1.000	62.500	100	
S3	63.500	1.030	Open Manhole	450	S1.002	62.470	100	S1.001	62.470	100	
S4	63.500	1.090	Open Manhole	450	S1.003	62.410	100	S1.002	62.410	100	
S5	64.180	1.820	Open Manhole	450	S1.004	62.360	100	S1.003	62.360	100	
S6	64.180	1.860	Open Manhole	1200	S1.005	62.320	100	S1.004	62.320	100	
S7	64.350	1.820	Open Manhole	450	S2.000	62.530	100				
S8	64.350	1.880	Open Manhole	450	S2.001	62.470	100	S2.000	62.470	100	
S9	64.280	1.880	Open Manhole	450	S2.002	62.400	100	S2.001	62.400	100	
S10	63.520	1.210	Open Manhole	450	S2.003	62.310	100	S2.002	62.310	100	
S11	64.350	1.970	Open Manhole	450	S3.000	62.380	100				
S12	64.350	2.050	Open Manhole	450	S3.001	62.300	100	S3.000	62.300	100	
S13	62.750	0.400	Open Manhole	450	S4.000	62.350	100				
S14	63.600	1.310	Open Manhole	450	S4.001	62.290	100	S4.000	62.290	100	
S15	63.600	1.393	Open Manhole	1200	S3.002	62.207	100	S3.001	62.240	100	33
								S4.001	62.207	100	
S16-soakaway	63.600	3.464	Open Manhole	450	S1.006	60.136	100	S1.005	62.320	100	2184
								S2.003	62.260	100	2124
								S3.002	62.136	100	2000
S	63.600	3.472	Open Manhole	0		OUTFALL		S1.006	60.128	100	

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Tuscany House White Hart Lane Basingstoke RG21 4AF	Former Woodley Arms Waldeck Street, Reading	
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Micro Drainage	Network 2020.1.3	

Manhole Schedules for Proposed

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S12	471858.990	172423.733	471858.990	172423.733	Required	
S13	471855.286	172441.921	471855.286	172441.921	Required	
S14	471856.367	172436.085	471856.367	172436.085	Required	
S15	471855.055	172427.873	471855.055	172427.873	Required	
S16-soakaway	471848.005	172426.710	471848.005	172426.710	Required	
S	471848.704	172427.189			No Entry	

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Tuscany House White Hart Lane Basingstoke RG21 4AF	Former Woodley Arms Waldeck Street, Reading	
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PIPELINE SCHEDULES for Proposed

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	100	S1	63.500	62.590	0.810	Open Manhole	450
S1.001	o	100	S2	63.500	62.500	0.900	Open Manhole	450
S1.002	o	100	S3	63.500	62.470	0.930	Open Manhole	450
S1.003	o	100	S4	63.500	62.410	0.990	Open Manhole	450
S1.004	o	100	S5	64.180	62.360	1.720	Open Manhole	450
S1.005	o	100	S6	64.180	62.320	1.760	Open Manhole	1200
S2.000	o	100	S7	64.350	62.530	1.720	Open Manhole	450
S2.001	o	100	S8	64.350	62.470	1.780	Open Manhole	450
S2.002	o	100	S9	64.280	62.400	1.780	Open Manhole	450
S2.003	o	100	S10	63.520	62.310	1.110	Open Manhole	450
S3.000	o	100	S11	64.350	62.380	1.870	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	8.999	100.0	S2	63.500	62.500	0.900	Open Manhole	450
S1.001	3.272	109.1	S3	63.500	62.470	0.930	Open Manhole	450
S1.002	6.704	111.7	S4	63.500	62.410	0.990	Open Manhole	450
S1.003	5.890	117.8	S5	64.180	62.360	1.720	Open Manhole	450
S1.004	3.761	94.0	S6	64.180	62.320	1.760	Open Manhole	1200
S1.005	6.326	0.0	S16-soakaway	63.600	62.320	1.180	Open Manhole	450
S2.000	6.902	115.0	S8	64.350	62.470	1.780	Open Manhole	450
S2.001	7.803	111.5	S9	64.280	62.400	1.780	Open Manhole	450
S2.002	9.162	101.8	S10	63.520	62.310	1.110	Open Manhole	450
S2.003	4.970	99.4	S16-soakaway	63.600	62.260	1.240	Open Manhole	450
S3.000	8.569	107.1	S12	64.350	62.300	1.950	Open Manhole	450

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Tuscany House White Hart Lane Basingstoke RG21 4AF	Former Woodley Arms Waldeck Street, Reading	
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PIPELINE SCHEDULES for Proposed

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.001	o	100	S12	64.350	62.300	1.950	Open Manhole	450
S4.000	o	100	S13	62.750	62.350	0.300	Open Manhole	450
S4.001	o	100	S14	63.600	62.290	1.210	Open Manhole	450
S3.002	o	100	S15	63.600	62.207	1.293	Open Manhole	1200
S1.006	o	100	S16-soakaway	63.600	60.136	3.364	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.001	5.711	95.2	S15	63.600	62.240	1.260	Open Manhole	1200
S4.000	5.935	98.9	S14	63.600	62.290	1.210	Open Manhole	450
S4.001	8.316	100.2	S15	63.600	62.207	1.293	Open Manhole	1200
S3.002	7.145	100.6	S16-soakaway	63.600	62.136	1.364	Open Manhole	450
S1.006	0.847	105.9	S	63.600	60.128	3.372	Open Manhole	0

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Tuscany House White Hart Lane Basingstoke RG21 4AF	Former Woodley Arms Waldeck Street, Reading	
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Micro Drainage	Network 2020.1.3	

Area Summary for Proposed

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.002	0.002	0.002
1.001	User	-	100	0.005	0.005	0.005
1.002	User	-	100	0.001	0.001	0.001
1.003	User	-	100	0.002	0.002	0.002
1.004	User	-	100	0.002	0.002	0.002
1.005	-	-	100	0.000	0.000	0.000
2.000	User	-	100	0.006	0.006	0.006
2.001	User	-	100	0.004	0.004	0.004
2.002	User	-	100	0.002	0.002	0.002
2.003	User	-	100	0.005	0.005	0.005
3.000	User	-	100	0.005	0.005	0.005
3.001	User	-	100	0.002	0.002	0.002
4.000	User	-	100	0.003	0.003	0.003
4.001	User	-	100	0.002	0.002	0.002
3.002	-	-	100	0.000	0.000	0.000
1.006	User	-	100	0.004	0.004	0.004
				Total	Total	Total
				0.045	0.045	0.045

Free Flowing Outfall Details for Proposed

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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S1.006	S	63.600	60.128	0.000	0	0
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Tuscany House
White Hart Lane
Basingstoke RG21 4AF

Former Woodley Arms
Waldeck Street, Reading



Date 26/06/2023 15:32
File 23-095 Woodley Arms.MDX

Designed by AK
Checked by

Micro Drainage

Network 2020.1.3

Online Controls for Proposed

Pump Manhole: S16-soakaway, DS/PN: S1.006, Volume (m³): 0.7

Invert Level (m) 60.136

Odyssey		Page 11
Tuscany House White Hart Lane Basingstoke RG21 4AF	Former Woodley Arms Waldeck Street, Reading	
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Micro Drainage	Network 2020.1.3	

Storage Structures for Proposed

Infiltration Trench Manhole: S16-soakaway, DS/PN: S1.006

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	60.136	Cap Volume Depth (m)	2.000
Infiltration Coefficient Side (m/hr)	0.02142	Trench Width (m)	1.5	Cap Infiltration Depth (m)	2.000
Safety Factor	1.0	Trench Length (m)	13.0		
Porosity	0.95	Slope (1:X)	0.0		

Former Woodley Arms Waldeck Street, Reading
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Designed by AK
Checked by

Network 2020.1.3



<u>Simulation Criteria</u>					
Real Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	0.000

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

Rainfall Model	FSR M5-60 (mm)	18.700	Cv (Summer)	1.000
Region	England and Wales	Ratio R	0.400	Cv (Winter)
			1.000	

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Margin for Flood Risk Warning (mm) 150.0 DTS Status   ON Inertia Status OFF
Analysis Timestep      Fine DVD Status OFF
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Profile(s)													Summer and Winter			
Duration(s) (mins)	15,	30,	60,	120,	180,	240,	360,	480,	600,	720,	960,	1440,	2160,	2880,	4320,	
													5760,	7200,	8640,	10080
Return Period(s) (years)													1, 30, 100			
Climate Change (%)													0, 0, 40			

						Water Flooded					Maximum	Pipe	
	US/MH					US/CL	Level	Volume	Flow /	Maximum	Velocity	Flow	
PN	Name		Event			(m)	(m)	(m³)	Cap.	Vol (m³)	(m/s)	(l/s)	Status
S1.000	S1	15 minute	1 year	Summer	I+0%	63.500	62.608	0.000	0.07	0.002	0.4	0.4	OK
S1.001	S2	15 minute	1 year	Summer	I+0%	63.500	62.533	0.000	0.23	0.015	0.5	1.1	OK
S1.002	S3	15 minute	1 year	Summer	I+0%	63.500	62.503	0.000	0.24	0.010	0.5	1.2	OK
S1.003	S4	15 minute	1 year	Summer	I+0%	63.500	62.449	0.000	0.31	0.017	0.6	1.6	OK
S1.004	S5	15 minute	1 year	Summer	I+0%	64.180	62.401	0.000	0.35	0.018	0.6	1.8	OK
S1.005	S6	15 minute	1 year	Summer	I+0%	64.180	62.376	0.000	0.60	0.068	0.4	1.8	OK
S2.000	S7	15 minute	1 year	Summer	I+0%	64.350	62.560	0.000	0.20	0.004	0.5	1.0	OK
S2.001	S8	15 minute	1 year	Summer	I+0%	64.350	62.507	0.000	0.29	0.017	0.6	1.5	OK
S2.002	S9	15 minute	1 year	Summer	I+0%	64.280	62.439	0.000	0.32	0.019	0.6	1.8	OK
S2.003	S10	15 minute	1 year	Summer	I+0%	63.520	62.358	0.000	0.47	0.023	0.7	2.5	OK

Odyssey		Page 13
Tuscany House White Hart Lane Basingstoke RG21 4AF	Former Woodley Arms Waldeck Street, Reading	
Date 26/06/2023 15:32 File 23-095 Woodley Arms.MDX	Designed by AK Checked by	
Micro Drainage	Network 2020.1.3	

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

PN	US/MH Name	Event	US/CL (m)	Water Flooded			Flow / Cap.	Maximum Vol (m³)	Maximum Velocity (m/s)	Pipe Flow (l/s)	Status
				Level (m)	Volume (m³)						
S3.000	S11	15 minute 1 year Summer I+0%	64.350	62.405	0.000	0.14	0.003	0.5	0.8	OK	
S3.001	S12	15 minute 1 year Summer I+0%	64.350	62.330	0.000	0.19	0.014	0.5	1.1	OK	
S4.000	S13	15 minute 1 year Summer I+0%	62.750	62.370	0.000	0.09	0.002	0.4	0.5	OK	
S4.001	S14	15 minute 1 year Summer I+0%	63.600	62.315	0.000	0.13	0.009	0.5	0.7	OK	
S3.002	S15	15 minute 1 year Summer I+0%	63.600	62.247	0.000	0.33	0.056	0.6	1.8	OK	
S1.006	S16-soakaway	2880 minute 1 year Summer I+0%	63.600	60.661	0.000	0.00	9.816	0.0	0.0	SURCHARGED	

Odyssey		Page 15
Tuscany House White Hart Lane Basingstoke RG21 4AF	Former Woodley Arms Waldeck Street, Reading	
Date 26/06/2023 15:32 File 23-095 Woodley Arms.MDX	Designed by AK Checked by	
Micro Drainage	Network 2020.1.3	

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

PN	US/MH Name	Event	US/CL (m)	Water Flooded		Flow / Cap.	Maximum Vol (m³)	Maximum Velocity (m/s)	Pipe Flow (l/s)	Status
				Level (m)	Volume (m³)					
S3.000	S11	15 minute 30 year Summer I+0%	64.350	62.421	0.000	0.35	0.006	0.6	1.9	OK
S3.001	S12	15 minute 30 year Summer I+0%	64.350	62.352	0.000	0.52	0.026	0.7	2.9	OK
S4.000	S13	15 minute 30 year Summer I+0%	62.750	62.381	0.000	0.21	0.004	0.6	1.1	OK
S4.001	S14	15 minute 30 year Summer I+0%	63.600	62.333	0.000	0.37	0.018	0.7	2.1	OK
S3.002	S15	15 minute 30 year Summer I+0%	63.600	62.282	0.000	0.89	0.113	0.8	4.9	OK
S1.006	S16-soakaway	1440 minute 30 year Summer I+0%	63.600	61.209	0.000	0.00	20.047	0.0	0.0	SURCHARGED

Odyssey		Page 16											
Tuscany House White Hart Lane Basingstoke RG21 4AF				Former Woodley Arms Waldeck Street, Reading									
Date 26/06/2023 15:32 File 23-095 Woodley Arms.MDX				Designed by AK Checked by									
Micro Drainage				Network 2020.1.3									
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed</u>													
<u>Simulation Criteria</u>													
Areal Reduction Factor 1.000				Manhole Headloss Coeff (Global) 0.500				MADD Factor * 10m³/ha Storage 2.000					
Hot Start (mins) 0				Foul Sewage per hectare (l/s) 0.000				Inlet Coeffiecient 0.800					
Hot Start Level (mm) 0				Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000									
Number of Input Hydrographs 0				Number of Offline Controls 0				Number of Time/Area Diagrams 0					
Number of Online Controls 1				Number of Storage Structures 1				Number of Real Time Controls 0					
<u>Synthetic Rainfall Details</u>													
Rainfall Model				FSR M5-60 (mm) 18.700 Cv (Summer) 1.000									
Region England and Wales				Ratio R 0.400 Cv (Winter) 1.000									
Margin for Flood Risk Warning (mm) 150.0				DTS Status ON				Inertia Status OFF					
Analysis Timestep				Fine DVD Status OFF									
Profile(s)				Summer and Winter									
Duration(s) (mins)				15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080									
Return Period(s) (years)				1, 30, 100									
Climate Change (%)				0, 0, 40									

Odyssey		Page 17
Tuscany House White Hart Lane Basingstoke RG21 4AF	Former Woodley Arms Waldeck Street, Reading	
Date 26/06/2023 15:32 File 23-095 Woodley Arms.MDX	Designed by AK Checked by	
Micro Drainage	Network 2020.1.3	

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

PN	US/MH Name	Event	US/CL (m)	Water Flooded		Flow / Cap.	Maximum Vol (m³)	Maximum Velocity (m/s)	Pipe Flow (l/s)	Status
				Level (m)	Volume (m³)					
S3.000	S11	15 minute 100 year Summer I+40%	64.350	62.466	0.000	0.63	0.013	0.7	3.4	OK
S3.001	S12	15 minute 100 year Summer I+40%	64.350	62.435	0.000	0.89	0.067	0.8	4.9	SURCHARGED
S4.000	S13	15 minute 100 year Summer I+40%	62.750	62.433	0.000	0.36	0.012	0.6	2.0	OK
S4.001	S14	15 minute 100 year Summer I+40%	63.600	62.420	0.000	0.62	0.054	0.7	3.4	SURCHARGED
S3.002	S15	15 minute 100 year Summer I+40%	63.600	62.389	0.000	1.48	0.287	1.0	8.1	SURCHARGED
S1.006	S16-soakaway	960 minute 100 year Winter I+40%	63.600	62.056	0.000	0.00	35.874	0.0	0.0	SURCHARGED

APPENDIX C

WRD Report No. 70728

SOAKAWAY DESIGN TO BRE DIGEST 365

THE FOLLOWING INFORMATION HAS BEEN PROVIDED BY THE CLIENT:

PERCOLATION TESTS BASED UPON 300 x 300 x 300 OF.

TEST (1)	= 90 MINS	} (75% TO 78%)
(2)	= 135 MINS	
(3)	= 195 MINS	

∴ 210 MINS AVERAGE

DESIGN BASED UPON 10 YEAR RETURN

$$V_{p75.75} = 0.3 \times 0.3 \times 0.3 \times 0.5 = 0.0135 \text{ m}^3$$

$$a_{p50} = 0.3 \times 0.3 \times 4 \times 0.5 = 0.18 \text{ m}^3$$

$$t_{p75.75} = 12600 \text{ SECONDS}$$

$$\therefore f = \frac{0.0135}{0.18 \times 12600} = 5.95 \times 10^{-6} \text{ m/s}$$

$$\text{AREA TO BE DRAINED} = \text{BLOCK (A)} + \text{BLOCK (B)} = 212 \text{ m}^2 + 238 \text{ m}^2 = 450 \text{ m}^2$$

CONSIDER AQUACELL OR SIMILAR

TOTAL SIZE = 6 x 6 x 1 m DR. BELOW IL IL
OR
(11 x 3 x 1 m TO SUIT SIZE)

CANV ASS

SCARAWAY CANS

$$ASSO = 4 \left(6 \times \frac{1}{2} \right) = 12 m^2$$

OUTFALL BASED ON

$$12 \times 5.95 \times 10^{-6} \times \text{DURATION}$$

$$= 7.14 \times 10^{-5} \times \text{DURATION}$$

RESULTS BASED ON FEM MODELING FOR
SIZE, FOR DESIGN RAINFALL

$$S = 6 \times 6 \times 1 = 36 m^2$$

DURATION MIN.	RAINFALL MM	INFLOW M ²	OUTFLOW M ²	STORAGE M ²
15	11.18	5.	0.064	4.93
30	14.58	6.56	0.12	6.44
120	24.56	11	0.81	10.49
240	31.77	14.29	1.028	13.76
360	36.9	16.6	1.54	15.06
420	39.06	17.87	1.79	15.78
480	41.03	18.46	2.05	16.41
630	45.34	20.4	2.69	17.71
780	48.58	21.86	3.34	18.52
930	50.75	22.83	3.98	18.85
1080	52.67	23.7	4.62	19.08
1230	54.4	24.48	5.26	19.22



Job No.: 70728
Date: Feb '25

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Page/Number: 3

SCAKAWAY CANN

	1380	55.91	25.18	5.91	19.27
	1530	57.42	25.85	6.55	19.28
*	1680	58.76	26.44	7.19	19.25
	1830	60.02	27	7.83	19.17
	1980	61.2	27.54	8.48	19.06

CAND USE

SCARAWAY COW

TIME TO HALF EMPTY :

$$= \frac{19.75 \times 0.5}{12 \times 7.14 \times 10^{-5}} = 3.2 \text{ HOURS}$$

3.2 < 24 HOURS ∴ OK



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Date: FEB '23		

GENERAL NOTES:-

All Structural Engineers Drawings and details are to be read in conjunction with all other relevant Architects, Specialists and Engineers drawings and specifications.

For setting out refer to Architects drawings, do not scale from the Structural Engineers Drawings, use figured dimensions only. All dimensions are to be checked on site any discrepancies are to be notified to the Engineer.

All works are to be in accordance with the Building Regulations and current British Standards.

SOAKAWAY TO BE AQUACEL OR SIMILAR APPROVED,
SIZE - 6x6x1m OR 11x3x1m (TO SUIT SITE)



* SOAKAWAY TO
BE POSITIONED
MIN. 5M
AWAY FROM
BUILDINGS,
AN WORKS
TO BUILDING
CONTROL
APPROVAL,
SOAKAWAY
1M BELOW
INVERT
LEVEL

* ALL
DRIVEWAY 64.60
AREAS TO
BE 164.7
PERMEABLE

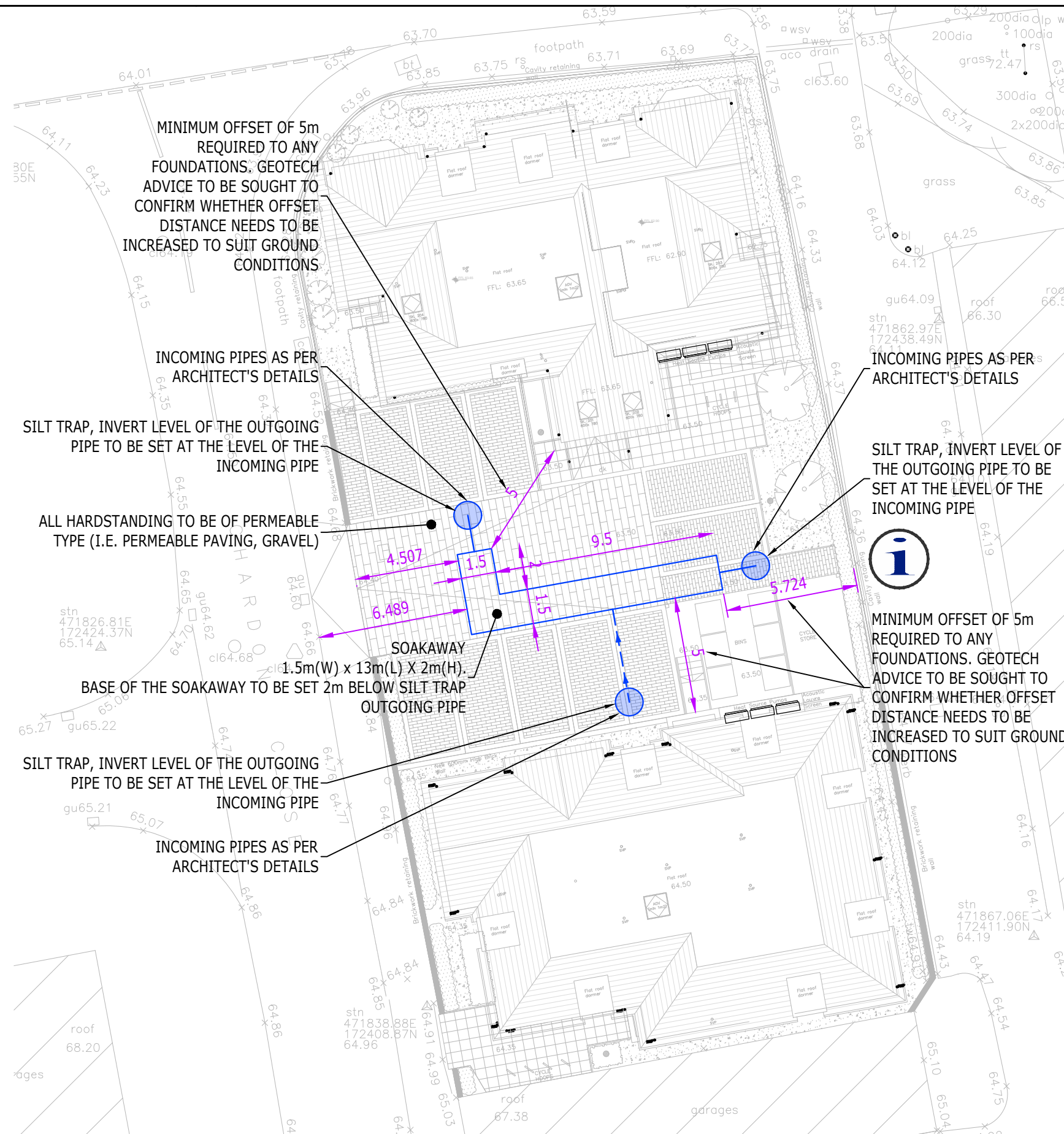
CLOSE

APPENDIX D

Soakaway Design Drawing and Calculations

ABNORMAL OR UNUSUAL RESIDUAL RISKS
ASSOCIATED WITH THE DESIGN OUTCOMES
SHOWN ON THIS DRAWING MAYBE INDICATED BY
MEANS OF THE FOLLOWING SYMBOLS.

- | | |
|---|--|
|  | INDICATES A RESIDUAL RISK
REQUIRING A COMPULSORY ACTION. |
|  | INDICATES A RESIDUAL RISK FOR
INFORMATION. |
|  | INDICATES A RESIDUAL RISK
REQUIRING A PROHIBITIVE ACTION. |
|  | INDICATES A RESIDUAL RISK AS A
WARNING. |

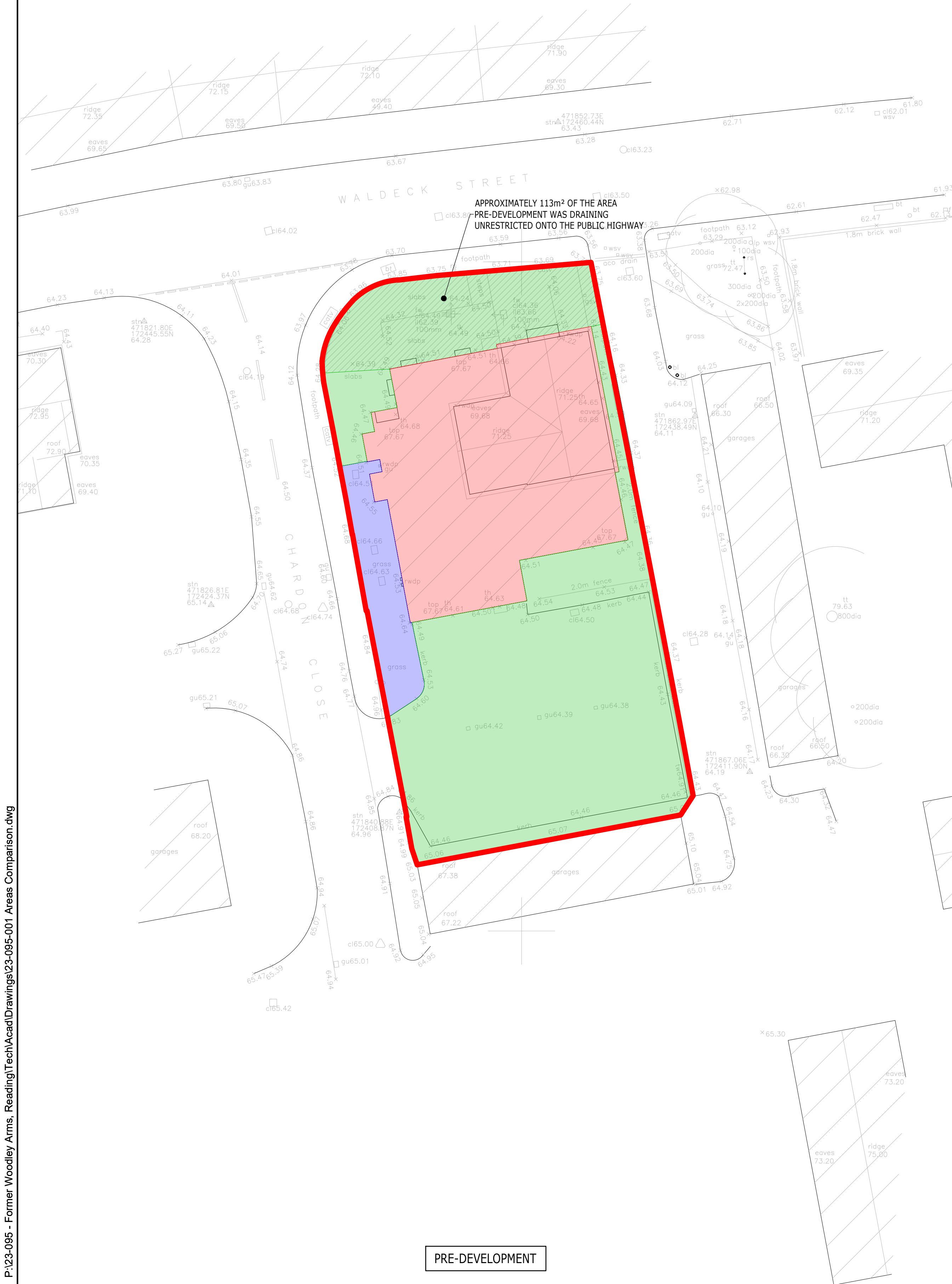
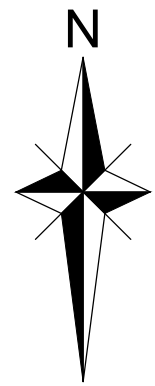


1. CDM REGULATIONS 2015
- (i) IN COMPLIANCE WITH CDM 2015 ODYSSEY HAS FOLLOWED IT'S DESIGN RISK MANAGEMENT PROCESS FOR HAZARD ELIMINATION AND RISK REDUCTION IN DEVELOPING THE ODYSSEY DESIGNS SHOWN ON THIS DRAWING.
- (ii) THERE IS A RETAINING WALL PLANNED FOR THE EASTERN BOUNDARY OF THE SITE. RETAINING WALL MIGHT BE CONSTRUCTED AT THE TIME OF SOAKAWAY INSTALLATION. ANY OTHER RESIDUAL RISKS ARE THOSE THAT WOULD NORMALLY BE EXPECTED BY COMPETENT PERSONS OR CONTRACTORS WITH NECESSARY SKILLS KNOWLEDGE AND EXPERIENCE TO BE ENGAGED ON WORK OF THIS NATURE OR TYPE.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELATED DRAWINGS ISSUED BY THE ARCHITECT AND ENGINEER.
3. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS SHOWN IN METRES UNLESS NOTED OTHERWISE.
4. SOAKAWAY IS TO CATER FOR THE ROOF OF THE TWO BLOCKS OF FLATS - COMBINED ROOF AREA TAKEN AS 452 m².
5. ALL HARDSTANDING AREAS ASSUMED TO BE OF A PERMEABLE TYPE, I.E. PERMEABLE PAVING, GRAVEL SURFACE (OR SIMILAR) AND THEREFORE WILL NOT CONTRIBUTE SURFACE WATER RUN-OFF TO THE SOAKAWAY.
6. DESIGN STORM - 1 IN 100 YRS + 40% (CLIMATE CHANGE).
7. SOIL INFILTRATION RATE TAKEN AS $f=5.95 \times 10^{-6}$ m/s - AS PER THE REPORT '70728' BY WRD (DATED FEB 23).
8. REFER TO MICRODRAINAGE DOCUMENT REF.'23-095 SOAKAWAY_FORMER WOODLEY ARMS, WALDECK STREET, READING' FOR SOAKAWAY CALCULATIONS.
9. ALL CHAMBERS/MANHOLES IMMEDIATELY UPSTREAM OF A SOAKAWAY TO INCORPORATE SILT TRAP.
10. UNLESS SPECIFIED OTHERWISE ALL SURFACE WATER DRAINAGE PIPES TO BE 100mm DIA WITH MINIMUM GRADIENT OF 1/100.
11. ALL DRAINAGE DETAILS (I.E. PIPE LAYOUT, SIZE, LEVELS) AS PER ARCHITECT'S DETAILS.
12. ALL RWP'S TO HAVE RODDING ACCESS.
13. CONTRACTOR TO SURVEY FOR AND LOCATE THE POSITION AND DEPTH OF ALL SERVICES ACROSS THE SITE BEFORE COMMENCING ANY WORKS.
14. STATUTORY SERVICE DIVERSION WORKS - IF DEEMED NECESSARY - TO BE AGREED WITH THE APPROPRIATE STATUTORY UNDERTAKER.
15. ALL HARDSTANDING AREAS ASSUMED TO BE OF A PERMEABLE TYPE, I.E. PERMEABLE PAVING, GRAVELY SURFACE OR SIMILAR AND THEREFORE WILL NOT CONTRIBUTE SURFACE WATER RUN-OFF TO THE SOAKAWAY.

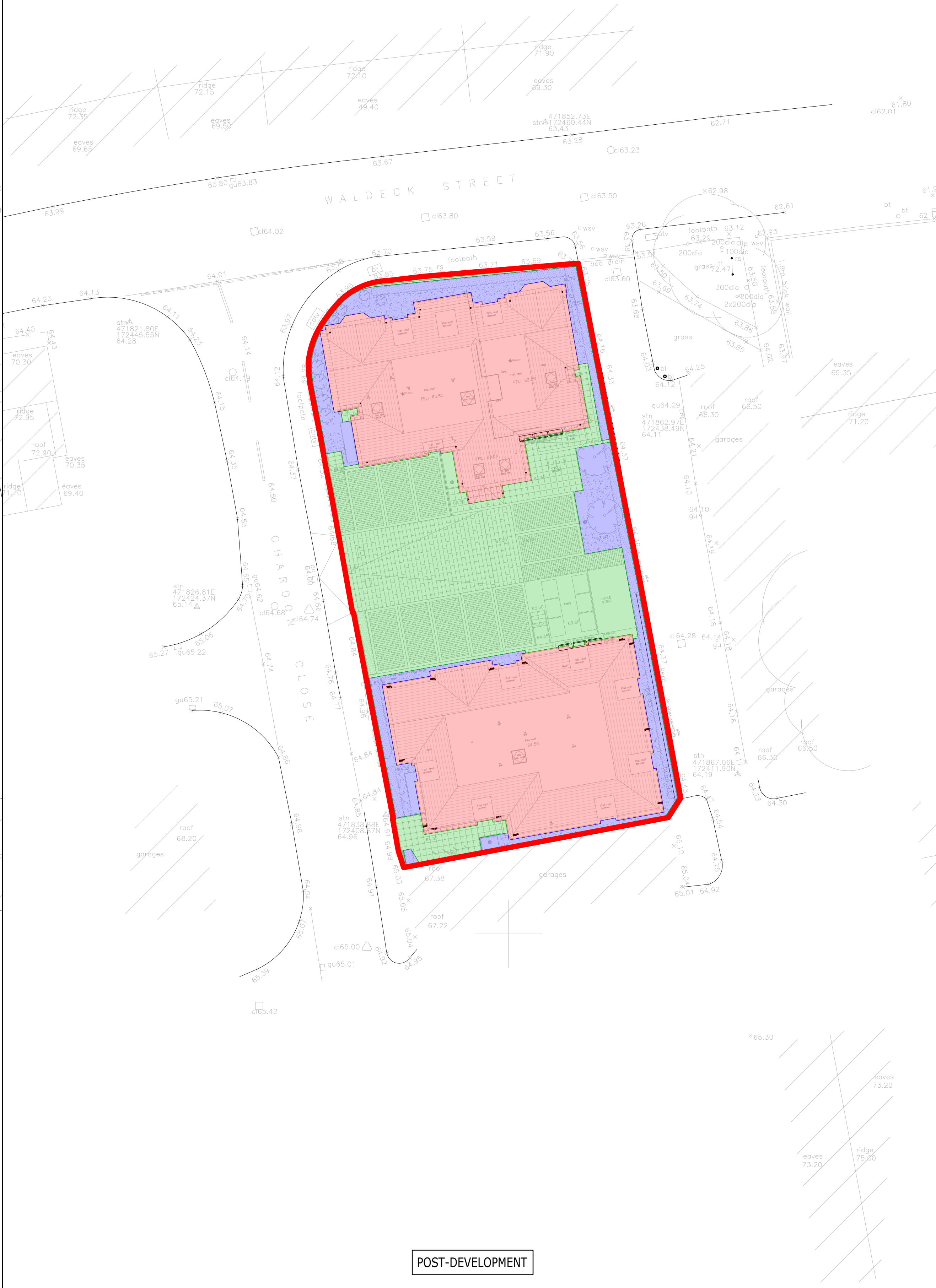
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APPENDIX E

'Pre' and 'Post-development' Areas Comparison Drawing



PRE-DEVELOPMENT



POST-DEVELOPMENT

NOTES		
KEY ROOF AREA SOFT LANDSCAPE / GRAVEL SURFACE IMPERMEABLE HARD LANDSCAPE IMPERMEABLE HARD LANDSCAPE WITH RUN-OFF ONTO PUBLIC HIGHWAY SITE BOUNDARY		
ITEM	AREAS (m²)	
	PRE DEVELOPMENT	POST DEVELOPMENT
ROOF	302	452
OTHER IMPERMEABLE HARDSTANDING	546	326
GRAVEL SURFACE / SOFT LANDSCAPE	55	125

Rev	Amendments	Dm	Chk App Date
Unit 1 Packhall Farm Dore Lane Romey Hampshire SO51 1QU Telephone: 01794 637900 E: info@odysseyconsult.co.uk W: www.odysseyconsult.co.uk			
Job Title			
FORMER WOODLEY ARMS WALDECK ST, READING			
Drawing Title			
AREAS COMPARISON			
Client			
KJ PARKER			
Scale	Date	Designed	
1:200 @A1	JUL 23	AK	
Drawn	Checked	Approved	
AK	SW	SW	
Job No	Drawing No	Rev	
23-095	23-095-001	-	