



Proposed Residential Development

Land at Broadmark Lane

Rustington

West Sussex

Foul and Surface Water Drainage Strategies
and Flood Risk Assessment

On behalf of

Ormond Ltd

August 2010
1363-R1

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LAND AT BROADMARK LANE

RUSTINGTON

WEST SUSSEX

PROPOSED RESIDENTIAL DEVELOPMENT

**Foul and Surface Water Drainage Strategy
and Flood Risk Assessment**

1. Background

- 1.1 This report has been produced on behalf of Ormond Ltd in support of a detailed planning application for residential development at 2/4 Broadmark Lane and 18 Vernon Close, Rustington.
- 1.2 The report presents outline foul and surface water drainage strategies for the site to support the application, together with a brief Flood Risk Assessment.
- 1.3 The drawings supporting this report are as follows:
- Drawing No. 1363/SKD1 – Existing Drainage Layout
 - Drawing No. 1363/SKD2 – Proposed Drainage Layout

2. The Site

- 2.1 The site is located on the west side of Broadmark Lane, opposite the rear access to Somerfield's foodstore and immediately to the north of Vernon Close. The OS Grid Reference is TQ 0538 0219.
- 2.2 The area of the site is 0.155 hectares. It currently comprises three detached bungalows: two fronting Broadmark Lane and one fronting Vernon Close. The area is generally residential with the main Rustington shopping centre lying immediately to the north, comprising retail parades on both sides of The Street.

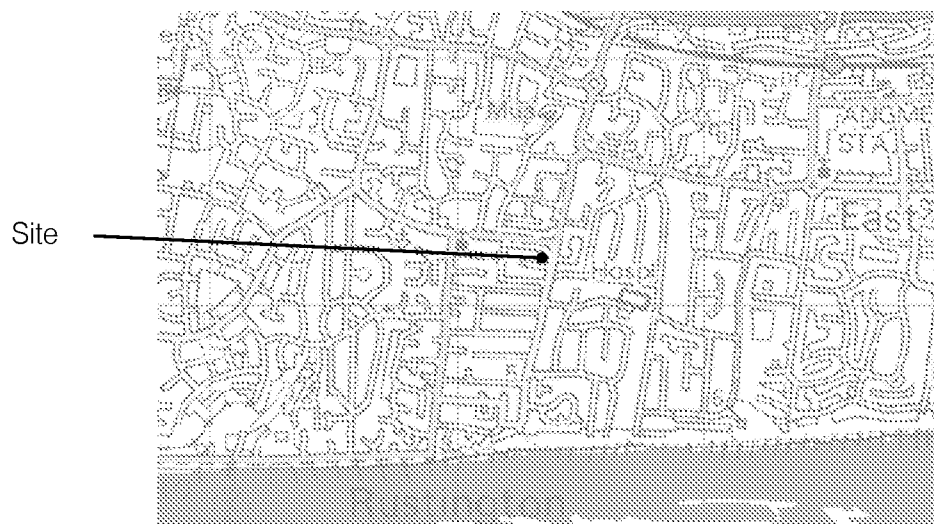
- 2.3 Foul water from the three existing dwellings drains through a shared private sewer that drains to the rear of the properties south to connect to a private sewer in Vernon Close. This sewer runs in the front gardens of properties on the south side of Vernon Close and we were informed that it drains east to the public sewer in Broadmark Lane, although this was not confirmed on site.
- 2.4 Surface water from the properties mostly drains to soakaways but part of the roof to No. 2 Broadmark Lane, measuring 55 sq.m, was found to be connected to its foul water drains. It is suspected that part of the roof to No. 4 Broadmark Lane also connects to its foul water drains but this was not confirmed. The soakaways were not evident within the properties and are assumed to comprise rubble-filled structures located in both the front and rear gardens.

3 Proposed Development

- 3.1 The proposed development comprises the demolition of the three existing dwellings and the construction of a single block of up to 15 flats together with associated access, parking provision and landscaping.

4. Flood Mapping

- 4.1 The site is indicated to lie within Flood Zone 1 on the Environment Agency's Flood Map, as reproduced below, indicating that the site is not at risk from tidal or fluvial flooding.



- 4.2 There are no other sources of flooding at the site and the concern is therefore only to ensure that the development does not result in flooding at the site itself, nor increase the risk of flooding elsewhere.

5. Topography

- 5.1 Ground levels on the site are fairly consistent and in the region of 7metres Above Ordnance Datum (m AOD).

6. Ground Conditions

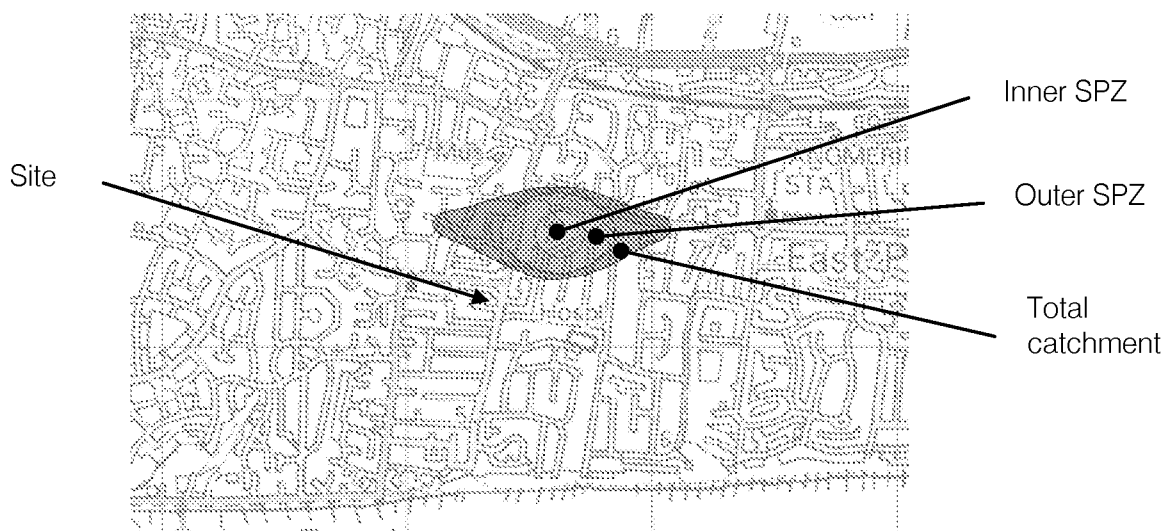
- 6.1 Trial holes were excavated on 17 August 2010 and these revealed consistent ground conditions across the site, comprising clayey sands to around 1.2m below ground level turning to sandy clays and becoming damp at 2.5m. Below this the ground became more variable but generally comprised slightly sandy clays with occasional sand lenses. Water was found at 3.2m rising to 2.9m.
- 6.2 Percolation tests carried out at 0.64m depth gave a soil infiltration rate of 6.46×10^{-6} metres/ second (0.023256 metres/hour), whilst those at 1.20m depth gave a much reduced rate of 1.63×10^{-6} metres/ second (0.005868 metres/hour).
- 6.3 Percolation testing in machine excavated test pits to BRE 365 will be required in due course in order to confirm the soil infiltration rates to be used for detailed design.

7. Surface Water Drainage Strategy

- 7.1 There are no watercourses or public surface water sewers in the immediate area and flows from the existing development drain predominantly to soakaways but partly to the foul drainage system – see paragraph 2.4 above.
- 7.2 The surface water drainage design is based on a combination of SUDS features comprising permeable pavements and traditional concrete ring soakaways. With the shallow-depth soil infiltration rate given in paragraph 6.2 above, permeable pavements with a 350mm thick stone layer will drain just over twice their own surface area, so that some roof areas can be incorporated. This is achieved with the use of interlinked conventional soakaways, comprising perforated concrete rings with a minimum of 500mm of granular surround that will be contiguous with the permeable pavement stone layer where present to achieve the necessary water flow. The soakaways have been sized as 2.0m deep units to keep the base

well above the groundwater level found. They have been designed using the lower soil infiltration rate of 1.63×10^{-6} metres/ second.

- 7.3 MicroDrainage calculations for the permeable pavements and for the concrete ring soakaways are included at the end of this report. Whilst further testing to BRE 365 is required, the design presented here is considered to be robust and caters for the 1 in 100 year rainfall event with an additional 30% for climate change, without any resultant surface flooding.
- 7.4 The site does not lie within a groundwater source protection zone (SPZ), as shown on the Environment Agency map below, indicating that there should be no restriction on the use of soakaways on the site:



8. Foul Water Drainage

- 8.1 The existing buildings drain to a private foul water sewer in Vernon Close – see paragraph 2.3 above. Whilst this connection could be retained for some flows, it is recommended that the connection is sealed and a new connection made directly to the public sewer as shown. If, following detailed design, the public foul water sewer is found to be insufficiently deep at the point of connection shown, then a connection into Broadmark Lane may be required, where the sewer is over 3 metres deep.
- 8.2 The re-development will remove at least 55 sq.m of roof area from the existing foul flows and the peak flow from this is equivalent to the peak foul flow from around 16 new dwellings. It is therefore not expected that Southern Water will have any objection to the development, nor to a new foul connection to the public sewer.

9. Conclusions

- 9.1 This drainage strategy has been produced in support of a planning application for residential development on land off Broadmark Lane, Rustington.
- 9.2 Site inspections and testing have revealed consistent ground conditions across the site but with percolation rates that varied with depth. It has nevertheless been shown that SUDS features such as permeable pavements combined with conventional soakaways can successfully be used for surface water drainage.
- 9.3 A direct connection of surface water from part of the roof of No. 2 Broadmark Lane to its foul drain has been found. Re-development of the site would remove this flow and Southern Water Services Ltd are therefore unlikely to raise any objection to the increased foul flow that the development would generate.
- 9.4 We conclude that suitable foul and surface water drainage strategies have been presented here that will enable this development to proceed with a low risk of flooding to the site and without increasing the risk of flooding elsewhere.

1363-R1/RTFC

Robert Clark Associates		Page 1
Willow Cottage Herne Lane Rustington BN16 3EE	Broadmark Lane Permeable Pavement 1 Rear car park	
Date 31 August 2010	Designed By RTFC	
File Permeable car park 1.SRC	Checked By	
Micro Drainage	Source Control W.11.4	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 268 minutes

Storm Duration (mins)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
15 Summer	1.1	1.1	6.6523	0.1522	13.9	O K
30 Summer	1.1	1.1	6.7027	0.2027	18.8	O K
60 Summer	1.1	1.1	6.7512	0.2512	23.6	O K
120 Summer	1.1	1.1	6.7897	0.2897	27.4	O K
180 Summer	1.1	1.1	6.8007	0.3007	28.5	FLOOD RISK
240 Summer	1.1	1.1	6.8007	0.3007	28.4	FLOOD RISK
360 Summer	1.1	1.1	6.7952	0.2952	27.9	O K
480 Summer	1.1	1.1	6.7867	0.2867	27.1	O K
600 Summer	1.1	1.1	6.7772	0.2772	26.1	O K
720 Summer	1.1	1.1	6.7667	0.2667	25.1	O K
960 Summer	1.1	1.1	6.7452	0.2452	23.0	O K
1440 Summer	1.1	1.1	6.7037	0.2037	18.9	O K
2160 Summer	1.1	1.1	6.6493	0.1493	13.6	O K
2880 Summer	1.1	1.1	6.6063	0.1063	9.4	O K
4320 Summer	1.1	1.1	6.5568	0.0568	4.6	O K
5760 Summer	0.9	0.9	6.5438	0.0437	3.3	O K
7200 Summer	0.8	0.8	6.5373	0.0372	2.7	O K
8640 Summer	0.7	0.7	6.5323	0.0322	2.2	O K
10080 Summer	0.6	0.6	6.5288	0.0287	1.8	O K
15 Winter	1.1	1.1	6.6718	0.1717	15.8	O K
30 Winter	1.1	1.1	6.7287	0.2287	21.4	O K
60 Winter	1.1	1.1	6.7852	0.2852	26.9	O K
120 Winter	1.1	1.1	6.8317	0.3317	31.5	FLOOD RISK
180 Winter	1.1	1.1	6.8477	0.3477	33.0	FLOOD RISK
240 Winter	1.1	1.1	6.8507	0.3507	33.3	FLOOD RISK
360 Winter	1.1	1.1	6.8412	0.3412	32.4	FLOOD RISK
480 Winter	1.1	1.1	6.8302	0.3302	31.3	FLOOD RISK
600 Winter	1.1	1.1	6.8162	0.3162	30.0	FLOOD RISK

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	115.73	18
30 Summer	77.80	33
60 Summer	49.94	62
120 Summer	30.96	122
180 Summer	23.06	180
240 Summer	18.58	220
360 Summer	13.66	280
480 Summer	10.97	344
600 Summer	9.25	410
720 Summer	8.05	480
960 Summer	6.45	616
1440 Summer	4.71	880
2160 Summer	3.43	1256
2880 Summer	2.74	1612
4320 Summer	1.99	2248
5760 Summer	1.58	2944
7200 Summer	1.32	3672
8640 Summer	1.15	4408
10080 Summer	1.02	5136
15 Winter	115.73	18
30 Winter	77.80	32
60 Winter	49.94	62
120 Winter	30.96	118
180 Winter	23.06	176
240 Winter	18.58	230
360 Winter	13.66	306
480 Winter	10.97	372
600 Winter	9.25	448

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Willow Cottage Herne Lane Rustington BN16 3EE	Broadmark Lane Permeable Pavement 1 Rear car park	
Date 31 August 2010	Designed By RTFC	
File Permeable car park 1.SRC	Checked By	
Micro Drainage		Source Control W.11.4

Summary of Results for 100 year Return Period (+30%)

Storm Duration (mins)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
720 Winter	1.1	1.1	6.8007	0.3007	28.4	FLOOD RISK
960 Winter	1.1	1.1	6.7677	0.2677	25.2	O K
1440 Winter	1.1	1.1	6.7032	0.2032	18.9	O K
2160 Winter	1.1	1.1	6.6218	0.1218	10.9	O K
2880 Winter	1.1	1.1	6.5658	0.0658	5.5	O K
4320 Winter	0.9	0.9	6.5408	0.0407	3.0	O K
5760 Winter	0.7	0.7	6.5328	0.0327	2.2	O K
7200 Winter	0.6	0.6	6.5273	0.0272	1.7	O K
8640 Winter	0.5	0.5	6.5238	0.0237	1.3	O K
10080 Winter	0.4	0.4	6.5208	0.0207	1.0	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
720 Winter	8.05	524
960 Winter	6.45	672
1440 Winter	4.71	950
2160 Winter	3.43	1316
2880 Winter	2.74	1612
4320 Winter	1.99	2208
5760 Winter	1.58	2976
7200 Winter	1.32	3672
8640 Winter	1.15	4408
10080 Winter	1.02	5136

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Willow Cottage Herne Lane Rustington BN16 3EE	Broadmark Lane Permeable Pavement 1 Rear car park	
Date 31 August 2010 File Permeable car park 1.SRC	Designed By RTFC Checked By	
Micro Drainage	Source Control W.11.4	

Rainfall Details

Region	ENG+WAL	Cv (Summer)	0.750	Summer Storms	Yes
Return Period (years)	100	Cv (Winter)	0.840	Winter Storms	Yes
M5-60 (mm)	19.000	Shortest Storm (mins)	15	Climate Change %	+30
Ratio-R	0.350	Longest Storm (mins)	10080		

Time / Area Diagram

Total Area (ha) = 0.075

Time	(mins)	Area
from:	to:	(ha)
	0	4
		0.075

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Willow Cottage Herne Lane Rustington BN16 3EE	Broadmark Lane Permeable Pavement 1 Rear car park	
Date 31 August 2010	Designed By RTFC	
File Permeable car park 1.SRC	Checked By	
Micro Drainage		Source Control W.11.4

Porous Car Park Details

Infil Coef - Base (m/hr)	0.023256	Invert Level (m)	6.500
Membrane Percolation (mm/hr)	1000	Cover Level (m)	7.000
Safety Factor	2.0	Slope (1:x)	1000.0
Porosity	0.30	Max Percolation (l/s)	90.6
Length (m)	20.0	Depression Storage (mm)	5
Width (m)	16.3	Evaporation (mm/day)	3

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Willow Cottage Herne Lane Rustington BN16 3EE	Broadmark Lane Permeable Pavement 2 Access drive	
Date 31 August 2010	Designed By RTFC	
File Permeable car park 2.SRC	Checked By	
Micro Drainage	Source Control W.11.4	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 264 minutes

Storm Duration (mins)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
15 Summer	0.2	0.2	6.6463	0.1462	2.4	O K
30 Summer	0.2	0.2	6.6962	0.1962	3.3	O K
60 Summer	0.2	0.2	6.7447	0.2447	4.1	O K
120 Summer	0.2	0.2	6.7827	0.2827	4.7	O K
180 Summer	0.2	0.2	6.7942	0.2942	4.9	O K
240 Summer	0.2	0.2	6.7947	0.2947	4.9	O K
360 Summer	0.2	0.2	6.7892	0.2892	4.9	O K
480 Summer	0.2	0.2	6.7817	0.2817	4.7	O K
600 Summer	0.2	0.2	6.7722	0.2722	4.6	O K
720 Summer	0.2	0.2	6.7617	0.2617	4.4	O K
960 Summer	0.2	0.2	6.7407	0.2407	4.0	O K
1440 Summer	0.2	0.2	6.6992	0.1992	3.3	O K
2160 Summer	0.2	0.2	6.6458	0.1458	2.4	O K
2880 Summer	0.2	0.2	6.6038	0.1038	1.7	O K
4320 Summer	0.2	0.2	6.5553	0.0553	0.8	O K
5760 Summer	0.2	0.2	6.5433	0.0433	0.6	O K
7200 Summer	0.1	0.1	6.5368	0.0367	0.5	O K
8640 Summer	0.1	0.1	6.5318	0.0317	0.4	O K
10080 Summer	0.1	0.1	6.5283	0.0282	0.4	O K
15 Winter	0.2	0.2	6.6658	0.1657	2.7	O K
30 Winter	0.2	0.2	6.7222	0.2222	3.7	O K
60 Winter	0.2	0.2	6.7782	0.2782	4.7	O K
120 Winter	0.2	0.2	6.8242	0.3242	5.5	FLOOD RISK
180 Winter	0.2	0.2	6.8402	0.3402	5.7	FLOOD RISK
240 Winter	0.2	0.2	6.8432	0.3432	5.8	FLOOD RISK
360 Winter	0.2	0.2	6.8342	0.3342	5.6	FLOOD RISK
480 Winter	0.2	0.2	6.8237	0.3237	5.4	FLOOD RISK
600 Winter	0.2	0.2	6.8102	0.3102	5.2	FLOOD RISK

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	115.73	18
30 Summer	77.80	33
60 Summer	49.94	62
120 Summer	30.96	122
180 Summer	23.06	180
240 Summer	18.58	218
360 Summer	13.66	278
480 Summer	10.97	342
600 Summer	9.25	410
720 Summer	8.05	478
960 Summer	6.45	616
1440 Summer	4.71	880
2160 Summer	3.43	1252
2880 Summer	2.74	1588
4320 Summer	1.99	2248
5760 Summer	1.58	2944
7200 Summer	1.32	3672
8640 Summer	1.15	4408
10080 Summer	1.02	5136
15 Winter	115.73	18
30 Winter	77.80	32
60 Winter	49.94	62
120 Winter	30.96	118
180 Winter	23.06	176
240 Winter	18.58	230
360 Winter	13.66	300
480 Winter	10.97	370
600 Winter	9.25	446

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Willow Cottage Herne Lane Rustington BN16 3EE	Broadmark Lane Permeable Pavement 2 Access drive	
Date 31 August 2010 File Permeable car park 2.SRC	Designed By RTFC Checked By	
Micro Drainage	Source Control W.11.4	

Summary of Results for 100 year Return Period (+30%)

Storm Duration (mins)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
720 Winter	0.2	0.2	6.7947	0.2947	5.0	O K
960 Winter	0.2	0.2	6.7622	0.2622	4.4	O K
1440 Winter	0.2	0.2	6.6982	0.1982	3.3	O K
2160 Winter	0.2	0.2	6.6178	0.1178	1.9	O K
2880 Winter	0.2	0.2	6.5633	0.0633	1.0	O K
4320 Winter	0.1	0.1	6.5403	0.0402	0.6	O K
5760 Winter	0.1	0.1	6.5323	0.0322	0.4	O K
7200 Winter	0.1	0.1	6.5268	0.0267	0.4	O K
8640 Winter	0.1	0.1	6.5233	0.0232	0.3	O K
10080 Winter	0.1	0.1	6.5208	0.0207	0.2	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
720 Winter	8.05	522
960 Winter	6.45	672
1440 Winter	4.71	940
2160 Winter	3.43	1300
2880 Winter	2.74	1588
4320 Winter	1.99	2208
5760 Winter	1.58	2936
7200 Winter	1.32	3680
8640 Winter	1.15	4408
10080 Winter	1.02	5136

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Willow Cottage Herne Lane Rustington BN16 3EE	Broadmark Lane Permeable Pavement 2 Access drive	
Date 31 August 2010 File Permeable car park 2.SRC	Designed By RTFC Checked By	
Micro Drainage	Source Control W.11.4	

Rainfall Details

Region	ENG+WAL	Cv (Summer)	0.750	Summer Storms	Yes
Return Period (years)	100	Cv (Winter)	0.840	Winter Storms	Yes
M5-60 (mm)	19.000	Shortest Storm (mins)	15	Climate Change %	+30
Ratio-R	0.350	Longest Storm (mins)	10080		

Time / Area Diagram

Total Area (ha) = 0.013

Time	(mins)	Area
from:	to:	(ha)
0	4	0.013

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Willow Cottage Herne Lane Rustington BN16 3EE	Broadmark Lane Permeable Pavement 2 Access drive	
Date 31 August 2010	Designed By RTFC	
File Permeable car park 2.SRC	Checked By	
Micro Drainage		Source Control W.11.4

Porous Car Park Details

Infil Coef - Base (m/hr)	0.023256	Invert Level (m)	6.500
Membrane Percolation (mm/hr)	1000	Cover Level (m)	7.000
Safety Factor	2.0	Slope (1:x)	1000.0
Porosity	0.30	Max Percolation (l/s)	15.9
Length (m)	11.9	Depression Storage (mm)	5
Width (m)	4.8	Evaporation (mm/day)	3

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Willow Cottage Herne Lane Rustington BN16 3EE	Broadmark Lane Concrete ring soakaways 3No x 1.5 dia. x 2m deep	
Date 31 August 2010 File Concrete ring soakaways.SRC	Designed By RTFC Checked By	
Micro Drainage	Source Control W.11.4	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 4274 minutes

Storm Duration (mins)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
15 Summer	0.0	0.0	5.4757	0.4757	4.6	O K
30 Summer	0.0	0.0	5.6388	0.6388	6.1	O K
60 Summer	0.0	0.0	5.8183	0.8183	7.8	O K
120 Summer	0.0	0.0	6.0098	1.0098	9.7	O K
180 Summer	0.0	0.0	6.1228	1.1228	10.7	O K
240 Summer	0.0	0.0	6.2008	1.2008	11.5	O K
360 Summer	0.0	0.0	6.3117	1.3117	12.5	O K
480 Summer	0.0	0.0	6.3922	1.3922	13.3	O K
600 Summer	0.0	0.0	6.4537	1.4537	13.9	O K
720 Summer	0.0	0.0	6.5032	1.5032	14.4	O K
960 Summer	0.0	0.0	6.5762	1.5762	15.1	O K
1440 Summer	0.0	0.0	6.6642	1.6642	15.9	O K
2160 Summer	0.0	0.0	6.7222	1.7222	16.5	O K
2880 Summer	0.0	0.0	6.7382	1.7382	16.6	O K
4320 Summer	0.0	0.0	6.7542	1.7542	16.8	O K
5760 Summer	0.0	0.0	6.7557	1.7557	16.8	O K
7200 Summer	0.0	0.0	6.7472	1.7472	16.7	O K
8640 Summer	0.0	0.0	6.7337	1.7337	16.6	O K
10080 Summer	0.0	0.0	6.7167	1.7167	16.4	O K
15 Winter	0.0	0.0	5.5327	0.5327	5.1	O K
30 Winter	0.0	0.0	5.7158	0.7158	6.8	O K
60 Winter	0.0	0.0	5.9168	0.9168	8.8	O K
120 Winter	0.0	0.0	6.1308	1.1308	10.8	O K
180 Winter	0.0	0.0	6.2578	1.2578	12.0	O K
240 Winter	0.0	0.0	6.3452	1.3452	12.9	O K
360 Winter	0.0	0.0	6.4697	1.4697	14.1	O K
480 Winter	0.0	0.0	6.5602	1.5602	14.9	O K
600 Winter	0.0	0.0	6.6297	1.6297	15.6	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	115.73	19
30 Summer	77.80	34
60 Summer	49.94	64
120 Summer	30.96	124
180 Summer	23.06	184
240 Summer	18.58	244
360 Summer	13.66	364
480 Summer	10.97	484
600 Summer	9.25	602
720 Summer	8.05	722
960 Summer	6.45	962
1440 Summer	4.71	1442
2160 Summer	3.43	2160
2880 Summer	2.74	2624
4320 Summer	1.99	3328
5760 Summer	1.58	4088
7200 Summer	1.32	4896
8640 Summer	1.15	5712
10080 Summer	1.02	6552
15 Winter	115.73	19
30 Winter	77.80	34
60 Winter	49.94	64
120 Winter	30.96	122
180 Winter	23.06	182
240 Winter	18.58	242
360 Winter	13.66	360
480 Winter	10.97	478
600 Winter	9.25	596

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Willow Cottage Herne Lane Rustington BN16 3EE	Broadmark Lane Concrete ring soakaways 3No x 1.5 dia. x 2m deep	
Date 31 August 2010	Designed By RTFC	
File Concrete ring soakaways.SRC	Checked By	
Micro Drainage	Source Control W.11.4	

Summary of Results for 100 year Return Period (+30%)

Storm Duration (mins)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
720 Winter	0.0	0.0	6.6852	1.6852	16.1	O K
960 Winter	0.0	0.0	6.7682	1.7682	16.9	O K
1440 Winter	0.0	0.0	6.8692	1.8692	17.9	FLOOD RISK
2160 Winter	0.0	0.0	6.9402	1.9402	18.6	FLOOD RISK
2880 Winter	0.0	0.0	6.9637	1.9637	18.8	FLOOD RISK
4320 Winter	0.0	0.0	6.9657	1.9657	18.8	FLOOD RISK
5760 Winter	0.0	0.0	6.9567	1.9567	18.7	FLOOD RISK
7200 Winter	0.0	0.0	6.9327	1.9327	18.5	FLOOD RISK
8640 Winter	0.0	0.0	6.9027	1.9027	18.2	FLOOD RISK
10080 Winter	0.0	0.0	6.8687	1.8687	17.9	FLOOD RISK

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
720 Winter	8.05	714
960 Winter	6.45	944
1440 Winter	4.71	1410
2160 Winter	3.43	2076
2880 Winter	2.74	2712
4320 Winter	1.99	3412
5760 Winter	1.58	4320
7200 Winter	1.32	5256
8640 Winter	1.15	6136
10080 Winter	1.02	7056

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Willow Cottage Herne Lane Rustington BN16 3EE	Broadmark Lane Concrete ring soakaways 3No x 1.5 dia. x 2m deep	
Date 31 August 2010	Designed By RTFC	
File Concrete ring soakaways.SRC	Checked By	
Micro Drainage		Source Control W.11.4

Rainfall Details

Region	ENG+WAL	Cv (Summer)	0.750	Summer Storms	Yes
Return Period (years)	100	Cv (Winter)	0.840	Winter Storms	Yes
M5-60 (mm)	19.000	Shortest Storm (mins)	15	Climate Change %	+30
Ratio-R	0.350	Longest Storm (mins)	10080		

Time / Area Diagram

Total Area (ha) = 0.021

Time	(mins)	Area
from:	to:	(ha)
	0	4
		0.021

Robert Clark Associates		Page 4
Willow Cottage Herne Lane Rustington BN16 3EE	Broadmark Lane Concrete ring soakaways 3No x 1.5 dia. x 2m deep	
Date 31 August 2010	Designed By RTFC	
File Concrete ring soakaways.SRC	Checked By	
Micro Drainage		Source Control W.11.4

Lined Soakaway Details

Infil Coef - Base (m/hr)	0.000000	Pit Multiplier	1.7
Infil Coef - Sides (m/hr)	0.005868	Number Required	3
Safety Factor	2.0	Invert Level (m)	5.000
Porosity	0.30	Cover Level (m)	7.000
Ring Diameter (m)	1.5		



-	Original	RTFC	31.8.10
Rev.	Description	Dm.	Date

Project

Land at Broadmark Lane
Rustington

Client

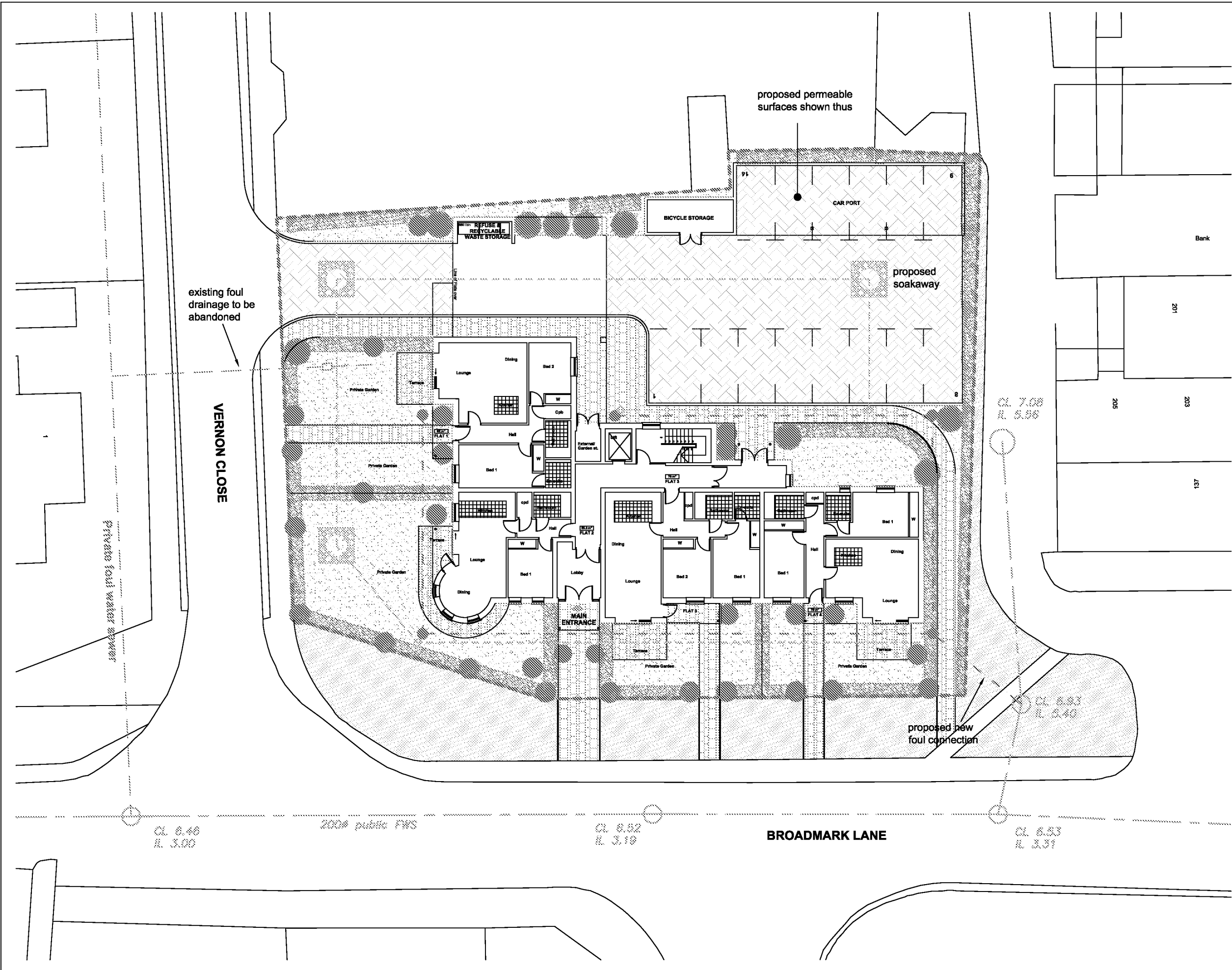
Ormond Ltd

Drawing
Title

Existing Drainage Layout

Robert Clark Associates Ltd
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-	Original	RTFC	31.8.10
Rev.	Description	Dm.	Date

Project

Land at Broadmark Lane
Rustington

Client

Ormond Ltd

Drawing
Title

Proposed Drainage Layout

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