



Willow Cottage, Herne Lane, Rustington, West Sussex BN16 3EE
[REDACTED]

Tel : [REDACTED]

Fax : [REDACTED]

Proposed Re-development

No.6 Alleyne Way

Elmer Sands, Bognor Regis

West Sussex PO22 6JZ

Flood Risk Assessment

On behalf of

Mr J. Allcard

April 2014
1556-R1

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No. 6 ALLEYNE WAY

ELMER SANDS, WEST SUSSEX PO22 6JZ

PROPOSED RE-DEVELOPMENT

Flood Risk Assessment

1. Background

- 1.1 This report has been produced on behalf of Mr. J Allcard, in support of a Planning Application ref: M/24/14/PL for the re-development of No.6 Alleyne Way, Elmer Sands.
- 1.2 The report concerns flood risk and has been prepared generally in accordance with the Technical Guidance to the National Planning Policy Framework, March 2012.
- 1.3 The drawings supporting this report are as follows:
- Dwg. No. 1556/L1.1 – Location Plan
 - Dwg. No. 1556/P1.1 – Proposed Development
 - Dwg. No. 1556/D1.1 – Drainage Layout Plan

2. The Site

- 2.1 The site is located on the north side of Alleyne Way, close to the southern edge of the Elmer Sands Estate, Middleton-on-Sea. The foreshore lies some 50 metres to the south. It has an area of approximately 510m² on which there is an existing small residential dwelling in a poor state of repair. The OS Grid Reference is SU 9880 0011.
- 2.2 The coastline in this area has the benefit of sea defences maintained by the Environment Agency, comprising timber groynes, rock revetments, earth banks and offshore islands.

3. Topography

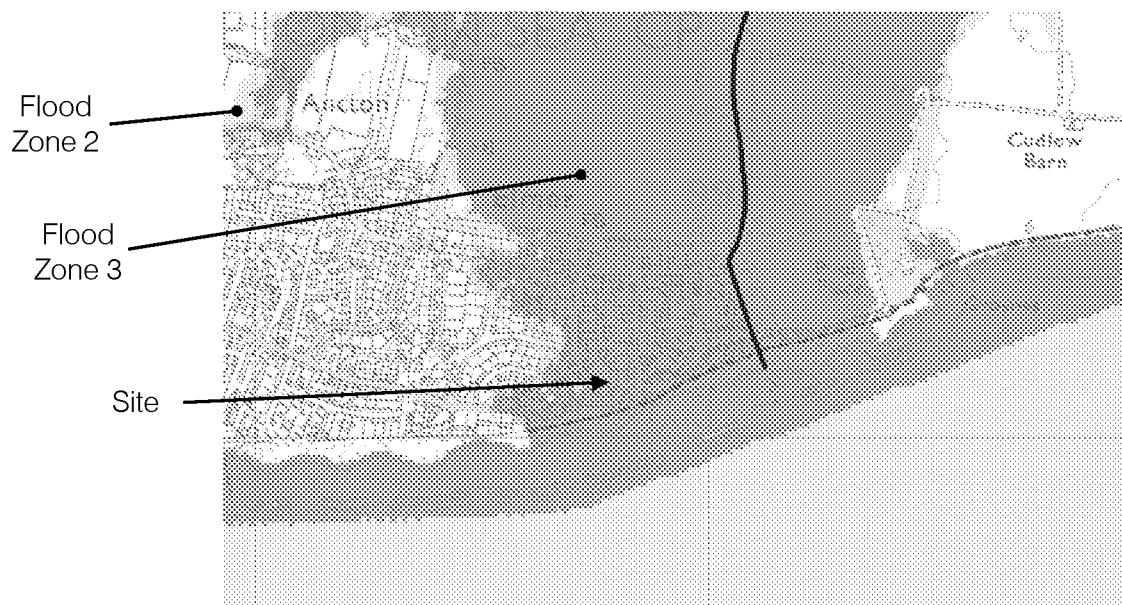
- 3.1 Ground levels on the site are in the region of 3.1 metres above Ordnance Datum (m AOD). The main floor level of the existing building is at 3.793m AOD and is thus around 0.7m above the general surrounding ground level.

4 Proposed Development

- 4.1 The proposed development comprises the demolition of the existing 2-bedroom dwelling and the construction of a new 4-bedroom dwelling on a similar footprint. A garden shed is proposed in the rear garden.
- 4.2 The finished floor level for the new dwelling has not yet been set but we have provided recommendations at the end of this report.

5. Flooding History

- 5.1 The site is shown to lie in Flood Zone 3 on the Environment Agency's flood map as indicated below but with the land benefitting from sea defences along the coastline here.



- 5.2 We have no records of recent flooding incidents affecting the building itself but it is known that this area has flooded in the past from overtopping of the coastal defences. Major improvements to the defences were carried out around 15 years ago to install offshore rock islands and these have helped to reduce wave action and littoral drift. The islands need little maintenance and it is therefore likely that they will be in place for the foreseeable future to help protect the area.
- 5.3 The current Environment Agency prediction for the extreme (1 in 200 year) offshore surge tide level here is 3.9m AOD but this is expected to rise to around 5.0m AOD by the year 2115 due principally to the effects of climate change. This rise in sea level will affect the performance of the offshore islands and will allow greater wave heights to reach the shoreline. Corresponding improvements will therefore be necessary to the islands as well as to the inner defences in order to maintain the current level of protection offered to the area.

6. Foul and Surface Water Drainage

- 6.1 Foul water from the new building will be drained to the public foul water sewer in Alleyne Way via an existing connection. The foul sewers in the area are known to suffer from groundwater infiltration and direct surface water connections. Surcharging and flooding occur from time to time but a replacement dwelling with modern water saving devices is unlikely to generate any additional flow and will therefore have no adverse effect on these problems.
- 6.2 There are no public surface water sewers here and surface water generally drains to soakaways. These perform poorly in the prevailing ground conditions and it is known that some direct connections to the foul drainage system exist. Percolation tests have been carried out generally in accordance with BRE 365. These gave very low results as expected but just suitable for permeable paving and this is recommended for use on the front drive and access areas. Elmer Sands Estate has given permission for the main building to drain to a private surface water drain that runs across the southwest corner of the property as indicated on the Drainage Layout Plan. Results of the permeable paving design in WinDes are included at the end of this report.

7. Conclusions and Recommendations

- 7.1 The site is shown to lie in Flood Zone 3 and a site-specific Flood Risk Assessment has therefore been carried out in accordance with current Technical Guidance to the NPPF.
- 7.2 The Flood Risk Assessment has shown that the proposed replacement dwelling will be sited on land with a ground level of around 3.1m AOD. The current prediction for the 1 in 200 year offshore surge tide level here is 5.0m AOD in the year 2115 and it is therefore important that floor levels are maintained as high as reasonably practicable. A floor level of 3.793m AOD is required in order to provide an equivalent level of protection offered to the existing building and this is the minimum that we would recommend here.
- 7.3 Surface water drainage from the new building will be taken to an existing surface water drain with the permission of Elmer Sands Estate Ltd. The front parking area will drain to permeable paving. Foul drainage will be to the public foul water sewer in Alleyne Way.
- 7.4 Whilst maintaining floor levels at 3.793m AOD would represent no detriment to the existing situation, tidal flood levels are predicted to rise as a result of climate change, the extent of which is uncertain. It is therefore recommended that any new works are designed in accordance with good practice in flood risk areas, employing appropriate flood resistance and resilience measures. Registration with the Environment Agency's Floodline warning system is also advised.

1556-R1

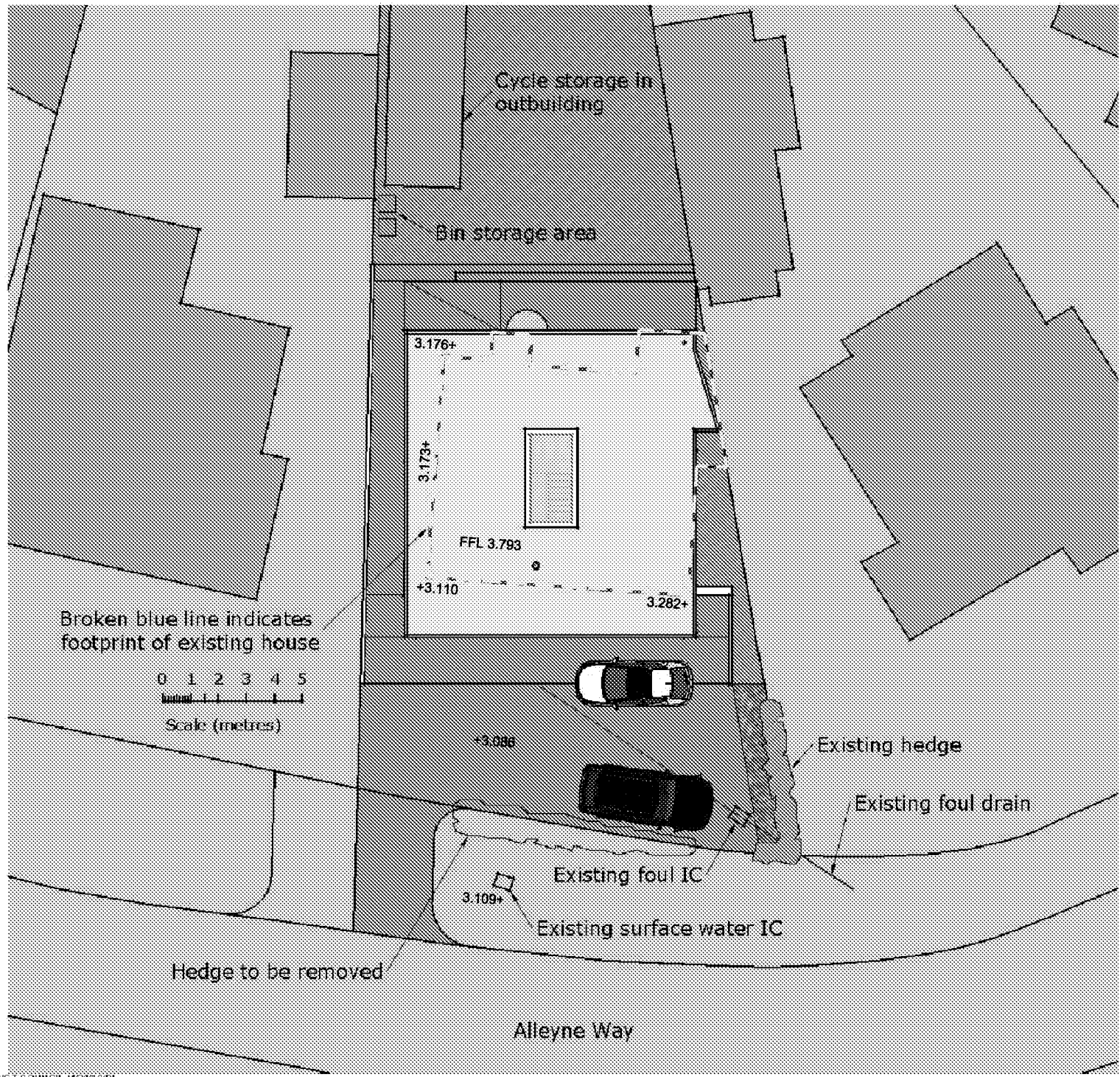


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Robert Clark Associates Ltd
Chartered Civil Engineers
Willow Cottage, Heme Lane
Rustington, West Sussex BN16 3EE
Tel: [REDACTED] Fax: 01903 778967

Client Mr J Allcard					
Project 6 Alleyne Way, Elmer Sands					
-	Original	PC	RTFC	21.4.14	
Rev.	Description	App.	Chk.	Dn.	Date

Title Location Plan			
SU 9880 0011		PO22 6JZ	
Scale 1:1250	At original	A4	© Robert Clark Associates Ltd
Drawing Number	1556/L1.1		
Revision	-		



ARUN DISTRICT COUNCIL M24/15/PL

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 - 3. All dimensions are in millimetres.
 - 4. All dimensions are to be checked on site before work proceeds.
 - 5. Any discrepancies on this drawing, actual or assumed or as related to specialist or consultants drawings, details, etc. are to be reported immediately upon discovery.
 - 6. This is not a working drawing and should not be used as such.



Rev A - Ex footprint added 31/03/14
Replacement House
6 Alleyne Way
Elmer Sands
Middleton PO22 6JZ
Block plan
Scale: 1:200 @ A4
Date: 11/03/14
John Letton RIBA
32 North Street Lewes
East Sussex BN7 2PH
www.johnlettonarchitect.com

-	Original	RTFC	21.4.14
Rev.	Description	Drm.	Date

Project
6 Alleyne Way
Elmer Sands Estate

Client
Mr J Allcard

Drawing Title
Proposed Development

Robert Clark Associates Ltd
Chartered Civil Engineers
Willow Cottage, Herne Lane, Rustington
West Sussex BN16 3EE
Fax: 01903 778967

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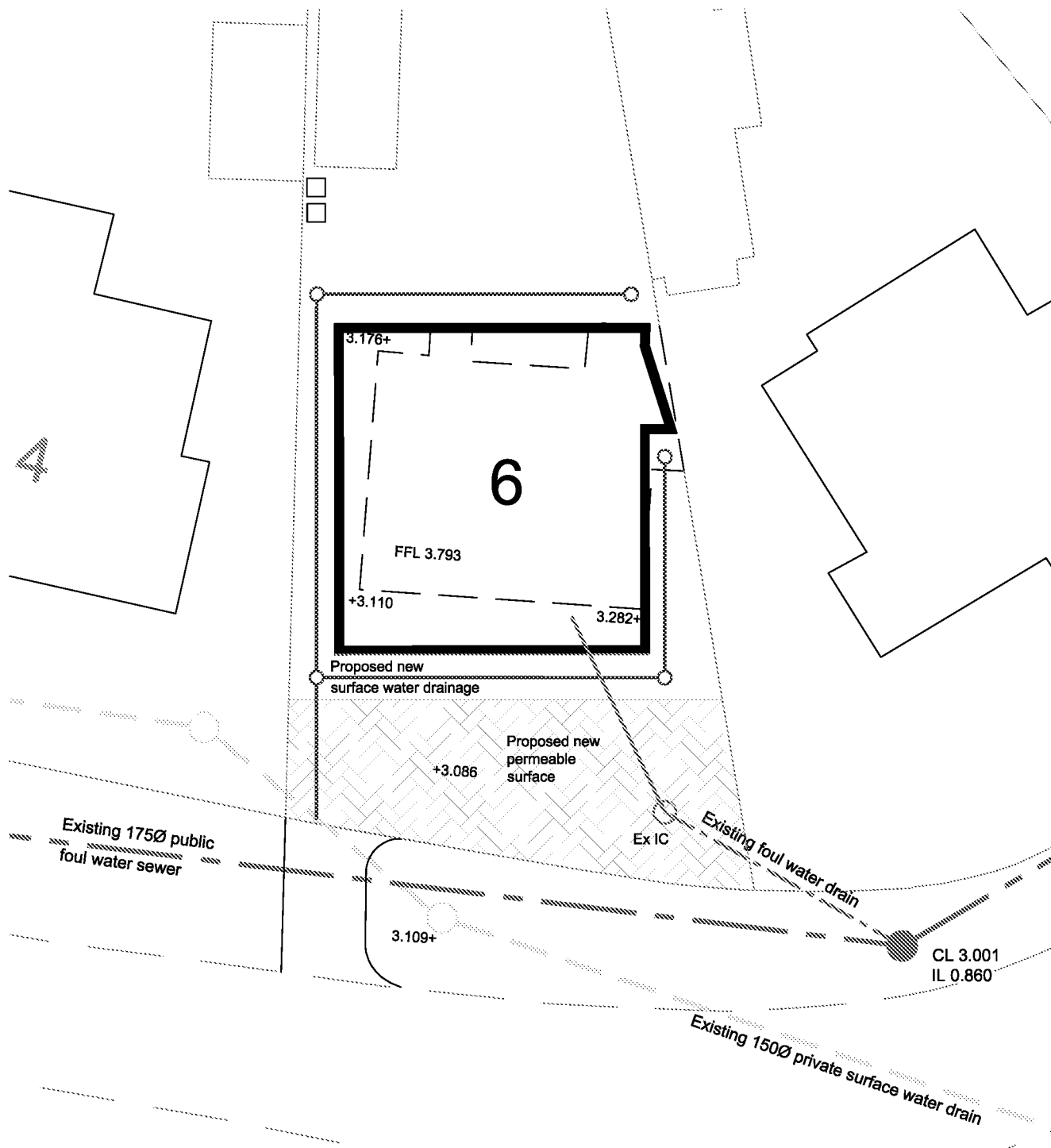
Scale	1:200	At original	A3
Drawing Number	1556/P1.1	Revision	-

Surface Water Drainage Design Notes

The drainage design is based on percolation tests carried out generally in accordance with BRE365 in March 2014.

Shallow percolation tests gave a soil infiltration rate of 1.15×10^{-6} m/s (0.00414 m/hr) which is suitable only for permeable paving. A coarse aggregate drainage layer of at least 190mm will be required to cater for a 1 in 100-year rainfall event with an additional 30% for climate change, without any resultant surface flooding.

Surface water from new roof areas will drain to an existing private surface water drain with the permission of Elmer Sands Estate Ltd



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Client Mr J Allcard					
Project 6 Alleyne Way, Elmer Sands					
-	Original	PC	RTFC	21.4.14	
Rev.	Description	App.	Chk.	Drn.	Date

Title			
Drainage Layout			
Scale 1:200		At original A4	© Robert Clark Associates Ltd
Drawing Number 1556/D1.1			Revision -

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Willow Cottage Herne Lane Rustington BN16 3EE	6 Alleyne Way Elmer Permeable Paving	
Date 21 April 2014	Designed By RTFC	
File permeable paving.SRC	Checked By	
Micro Drainage		Source Control W.11.4

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

Half Drain Time : 573 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	0.1	0.1	0.0683	0.0683	1.3	O K
30 Summer	0.1	0.1	0.0918	0.0918	1.9	O K
60 Summer	0.1	0.1	0.1163	0.1163	2.4	O K
120 Summer	0.1	0.1	0.1398	0.1398	3.0	O K
180 Summer	0.1	0.1	0.1517	0.1517	3.3	O K
240 Summer	0.1	0.1	0.1577	0.1577	3.4	O K
360 Summer	0.1	0.1	0.1632	0.1632	3.6	O K
480 Summer	0.1	0.1	0.1647	0.1647	3.6	O K
600 Summer	0.1	0.1	0.1647	0.1647	3.6	O K
720 Summer	0.1	0.1	0.1637	0.1637	3.6	O K
960 Summer	0.1	0.1	0.1612	0.1612	3.5	O K
1440 Summer	0.1	0.1	0.1528	0.1528	3.3	O K
15 Winter	0.1	0.1	0.0768	0.0768	1.5	O K
30 Winter	0.1	0.1	0.1033	0.1033	2.1	O K
60 Winter	0.1	0.1	0.1313	0.1313	2.8	O K
120 Winter	0.1	0.1	0.1582	0.1582	3.4	O K
180 Winter	0.1	0.1	0.1717	0.1717	3.8	O K
240 Winter	0.1	0.1	0.1792	0.1792	4.0	O K
360 Winter	0.1	0.1	0.1867	0.1867	4.1	O K
480 Winter	0.1	0.1	0.1897	0.1897	4.2	O K
600 Winter	0.1	0.1	0.1897	0.1897	4.2	O K
720 Winter	0.1	0.1	0.1877	0.1877	4.2	O K
960 Winter	0.1	0.1	0.1832	0.1832	4.1	O K
1440 Winter	0.1	0.1	0.1708	0.1708	3.8	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	115.73	19
30 Summer	77.80	33
60 Summer	49.94	64
120 Summer	30.96	122
180 Summer	23.06	182
240 Summer	18.58	242
360 Summer	13.66	360
480 Summer	10.97	456
600 Summer	9.25	506
720 Summer	8.05	570
960 Summer	6.45	694
1440 Summer	4.71	966
15 Winter	115.73	19
30 Winter	77.80	33
60 Winter	49.94	62
120 Winter	30.96	120
180 Winter	23.06	178
240 Winter	18.58	236
360 Winter	13.66	350
480 Winter	10.97	462
600 Winter	9.25	566
720 Winter	8.05	664
960 Winter	6.45	750
1440 Winter	4.71	1054

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Willow Cottage Herne Lane Rustington BN16 3EE	6 Alleyne Way Elmer Permeable Paving	
Date 21 April 2014 File permeable paving.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)	1440		

Time / Area Diagram

Total Area (ha) = 0.008

Time	(mins)	Area
from:	to:	(ha)
0	4	0.008

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Willow Cottage Herne Lane Rustington BN16 3EE	6 Alleyne Way Elmer Permeable Paving	
Date 21 April 2014	Designed By RTFC	
File permeable paving.SRC	Checked By	
Micro Drainage		Source Control W.11.4

Porous Car Park Details

Infil Coef - Base (m/hr)	0.004140	Invert Level (m)	0.000
Membrane Percolation (mm/hr)	1000	Cover Level (m)	0.400
Safety Factor	1.5	Slope (1:x)	500.0
Porosity	0.30	Max Percolation (l/s)	22.2
Length (m)	14.0	Depression Storage (mm)	5
Width (m)	5.7	Evaporation (mm/day)	3