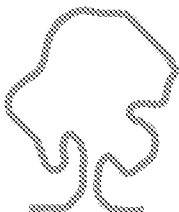


MR DUGGIN

**LAND AT FONTWELL AVENUE, ALDINGBOURNE,
WEST SUSSEX**

Flood Risk Assessment

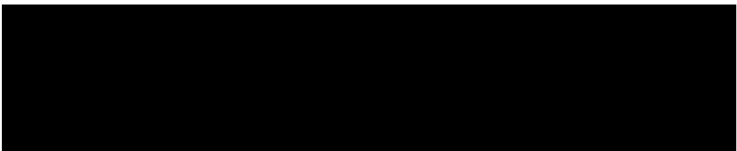
March 2014



eas ltd

Environmental Assessment Services Ltd

REPORT DATA SHEET

Requirement	Data
Report Ref:	Rodway/FontwellAv/FRA
Date	March 2014
Client	Mr Duggin
Report type	Flood Risk Assessment
Purpose	Submission to Planning
Revisions	-
Prepared by	Eur Ing Malcolm McKemey BSc (Hons), CEng, CEnv, MICE, MIEAust, MCIWEM, MIEEnvSc Signed 
Approved by	James Mumford MA, CEng, CEnv, CArb, FICE, FCIArb Signed 

MR DUGGIN

LAND AT FONTWELL AVENUE, ALDINGBOURNE, WEST SUSSEX

Flood Risk Assessment

March 2014

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2. THE PROPOSED DEVELOPMENT
3. EXISTING FLOOD RISK
4. SEQUENTIAL TEST
5. RISK TO OCCUPIERS
6. IMPACT ON FLOOD RISK ELSEWHERE
7. FLOODING FROM OTHER SOURCES
8. RESIDUAL FLOOD RISKS
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MR DUGGIN

LAND AT FONTWELL AVENUE, ALDINGBOURNE, WEST SUSSEX

Flood Risk Assessment

March 2014

1. BACKGROUND

- 1.1 It is proposed to build three dwellings on the land to the north of Oaktrees residence on Fontwell Avenue in Aldingbourne.
- 1.2 The plan area of the site is approximately 0.6 ha. The Ordnance Survey map reference for the centre of the site is SU 9450 0575. The approximate average site elevation is + 13.3 m OD. See Figures 1 and 2 in Appendix A for the site location and proposed site development plan.
- 1.3 The site comprises a field to the north of Oaktrees and south of Westfield House, on the west side of Fontwell Avenue. No watercourses cross the site. The nearest watercourse appears to be the Barnham Rife, some 200 m to the south of the site. The Environment Agency (EA) flood map for this location (available online) shows the western part of the site, mainly in the proposed garden area with some overlap where the houses are proposed, to lie within Flood Zone 2. The rest of the site lies within Flood Zone 1 (low risk of flooding). See Appendix B.
- 1.4 As the proposed development is shown to impinge on an area shown as being in Flood Zone 2, a Flood Risk Assessment as set out in the National Planning Policy Framework (NPPF) and its Technical Guidance (TG) of March 2012 is required to support the planning application for the proposed development.

2. THE PROPOSED DEVELOPMENT

- 2.1 The proposed development comprises 3 No. four-bedroom detached two-storey houses with paved parking areas, access driveways and gardens. See Andrew Fuller Associates Drawing No. 12435/02 Rev A in Appendix C.

3. EXISTING FLOOD RISK

- 3.1 Flood risk mapping covering the site and provided by the EA is included in Appendix B. The flood mapping (available online) shows the western half of the site to lie within Flood Zone 2, with the eastern half in Flood Zone 1. The proposed housing may be partially impacted by Flood Zone 2, but the access roads and parking will be in Flood Zone 1. Flood Zone 2 is defined in the TG to the NPPF as:

“Land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% - 0.1%)... in any year”.

- 3.2 The area is covered by Arun District Council’s 2008 Strategic Flood Risk Assessment (SFRA), which includes specific recommendations for the Bognor Regis, Littlehampton, Worthing and Barnham areas. According to the SFRA, there do not appear to be any records of the site being flooded. See Historic Flood Events Map in Appendix D.
- 3.3 Parts of the eastern half of the site appear to be at risk from surface water flooding for a 1 in 200 year rainfall event. See EA map in Appendix D.
- 3.4 The site is not at risk from actual or residual flooding from rivers or sea, or risk from breach, or from fluvial or tidal flooding with climate change. See SFRA maps in Appendix D.

4. SEQUENTIAL TEST

- 4.1 Buildings used for dwelling houses are classified as ‘More Vulnerable’ in Table 2 of the TG to the NPPF.
- 4.2 Table 3 of the TG states that development classified as ‘More Vulnerable’ is appropriate for Flood Zones 1 and 2.
- 4.3 The purpose of the Sequential Test is to guide vulnerable development towards Flood Zone 1, and away from Flood Zones 2 and 3.
- 4.4 In this case, the locations of the houses are shown to be partly in Flood Zone 1 and partly in Flood Zone 2.
- 4.5 Confirmation of the level of Flood Zone 2 from the flood model for this location has been sought from the Environment Agency, as the extent of Flood Zone 2 shown on the flood map does not accord with ground levels measured at the site. The flood map appears to indicate that the western side of the site is lower than the eastern side, however, the topographical survey shows the reverse to be the case, with the lowest part of the site in the southeast corner. See Figure 3. A response is awaited.

- 4.6 If the proposed locations of (parts of) the houses lie within Flood Zone 2, and similar windfall development sites are available in areas of lower flood risk within the Aldingbourne area, the Sequential Test will probably not be satisfied. However, the Arun District Council *Strategic Housing Land Availability Assessment (SHLAA) Update 2012: Broad Locations and Windfall* states there are “no specific identified greenfield sites [windfall] promoted through the SHLAA at Aldingbourne”. On this basis, the Sequential Test would appear to be satisfied.
- 4.7 It is for the Local Planning Authority to apply the Sequential Test. It will not be necessary to apply the Exception Test in this case.

5. RISK TO OCCUPIERS

- 5.1 According to the flood map, the residents in the proposed houses would remain safe, even in the event of an extreme flood and there would be pedestrian access to land in Flood Zone 1 straight outside their front doors. The adjacent highway (Fontwell Avenue) is also shown to be in Flood Zone 1.
- 5.2 There should be no significant risk to occupiers as long as the lowest finished floor level for the proposed house is, at least, 300 mm above the predicted flood level. In the absence of a confirmed flood level and based on the existing topography at the site a lowest (habitable space) floor level of +13.5 m OD should be satisfactory.
- 5.3 The surface water 1 in 200 year return period flood event map from the Arun District Council SFRA suggests some impingement on the site in the southeast corner. However, the main flood flow is shown on the adjacent highway, which is around 300 mm lower than the lowest part of the site at this location.

6. IMPACT ON FLOOD RISK ELSEWHERE

- 6.1 The possible impacts of the proposed scheme on flood risk elsewhere are identified as follows:

Impact on the volume of the flood plain

- 6.2 Flood Zone 2 is not considered part of the functional flood plain. If the proposed dwellings are to be located partially within Flood Zone 2, the impact on the flood plain would be minimal and it would be quite easy to provide this volume of compensation by slightly lowering the garden level towards the southern edge of the site or providing permeable voids beneath the houses.

Effect of the increased impermeable area

- 6.3 The roofs and driveways/parking areas in the proposed development will increase the impermeable areas of the site and will reduce the time of concentration for run-off from the site. This could exacerbate flooding downstream from the site.

- 6.4 Accelerated run-off due to increase in impermeable area is normally addressed by draining to attenuation storage and releasing the water at a flow rate no greater than that generated by the site in a greenfield condition. Alternatively, surface water may be discharged to soakaway (which is considered the most sustainable (SUDS) solution, but which relies on the site being on suitably permeable geology).
- 6.5 In this case, the British Geological Survey shows the site to lie on Late Pleistocene Valley Gravel, which should be a suitable medium for soakaway drainage. It will be necessary to carry out soakage tests at the site to verify this option.

7. FLOODING FROM OTHER SOURCES

- 7.1 The principal source of flood risk at the site is identified as fluvial flooding from the tributary of the Barnham Rife to the south and this has been taken account of in the EA flood model. Some surface water flood risk affecting the southeast corner of the site has been suggested in the SFRA, although the topography would suggest that the surface water would run off on to Fontwell Avenue.
- 7.2 There is no record of risk of flooding at the site from sources other than those mentioned above.

8. RESIDUAL FLOOD RISKS

- 8.1 The principal residual flood risks are identified as follows:

Flooding exceeding the design flood event

- 8.2 The design flood event for a site is usually the 1 in 100 year return period (plus an allowance for climate change) flood level. In this case, the EA flood map would indicate that the site lies above this level.
- 8.3 The EA flood map shows the western part of the site within Flood Zone 2. This represents the 1 in 100 to 1 in 1,000 annual probability of fluvial flooding (1% - 0.1%) in any year. However, from the topographical survey of the site, it is apparent that any standing water on the western part of the site would flow off to the south and east and mainly flow on to Fontwell Avenue. The same pattern would be anticipated to be repeated with more extreme/higher flood levels until the water level was higher than the site ground level, at which point most of the surrounding area within Flood Zone 1 would also be inundated.

9. SUMMARY

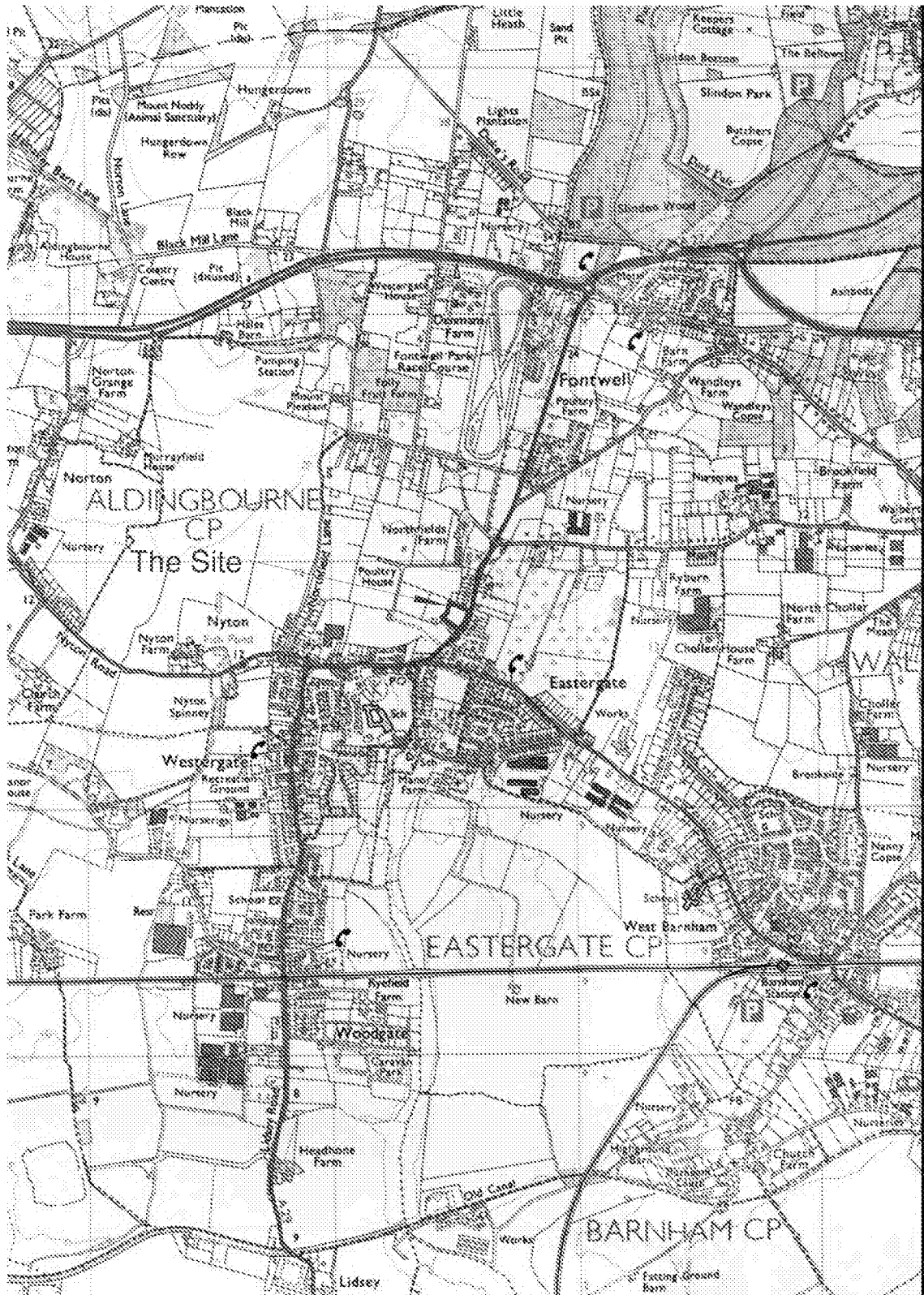
- 9.1 It is proposed to construct 3 No. four-bedroom detached two-storey houses with garages, and access drives from Fontwell Avenue to the east.

- 9.2 According to the Environment Agency online flood mapping, the eastern half of the site lies within Flood Zone 1, with the western half in Flood Zone 2. As the western half of the site is, in fact, higher than the eastern half, it appears that the flood model may not fit well with the existing topography at the site and immediate vicinity. See Figure 3. Confirmation of the 1 in 100 and 1000 year return period flood levels from the EA flood model has been requested.
- 9.3 From the EA flood model, it appears that only the western edge of the two southern houses would sit in Flood Zone 2, with Unit 1 at the northern edge of the site most likely completely within Flood Zone 1.
- 9.4 Where the proposed houses fall within Flood Zone 1, the location is deemed appropriate for the proposed development and the Sequential Test is satisfied.
- 9.5 Where the houses fall within Flood Zone 2, the location is deemed appropriate for the proposed development but the Sequential Test may not be satisfied if there are alternative sites available for the same development in Flood Zone 1 within the area. However, according to Arun District Council's *Strategic Housing Land Availability Assessment Update 2012: Broad Locations and Windfall* there are no windfall sites within the Aldingbourne area highlighted for this type of development. On this basis, it would appear that the Sequential Test is satisfied. There is no requirement to apply the Exception Test.
- 9.6 Lowest habitable room finished floor levels should be some 300 mm above the design flood level. As the design flood level is uncertain at this location, a precautionary lowest finished floor level of +13.5 m OD has been recommended.
- 9.7 The risks to occupiers in the event of a flood should not be severe as they should be safe within their houses and should have pedestrian access to areas in Flood Zone 1 directly outside their front doors.
- 9.8 Some surface water flood risk has been indicated as impinging on the south east corner of the site within the ADC SFRA. However, the local topography would indicate that any surface water at this location would run off in to Fontwell Avenue.

★ ★ ★ ★ ★ ★ ★

APPENDIX A

Figures



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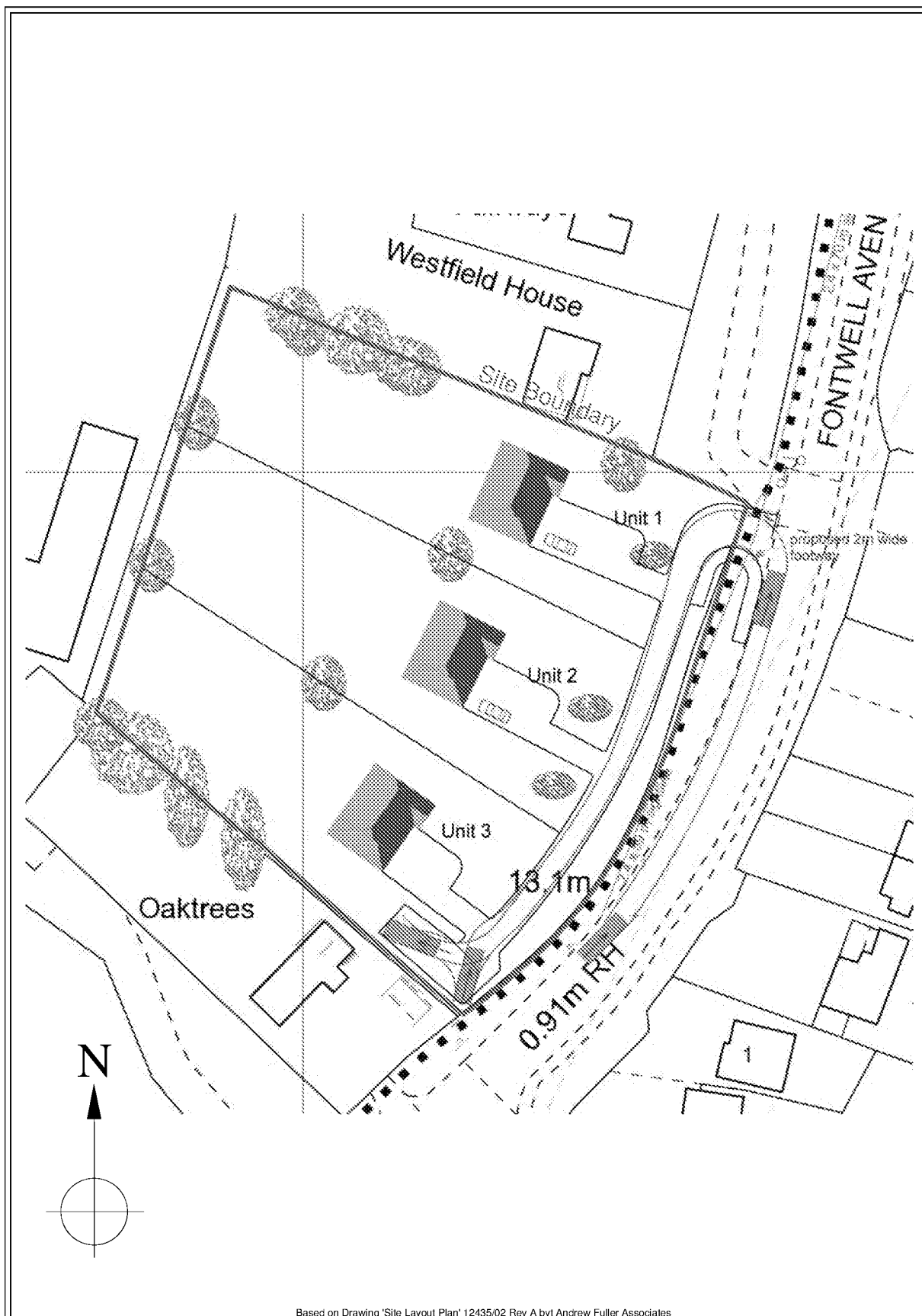
MR DUGGIN

Scale 1:25000

LAND AT FONTWELL AVENUE, ALDINGBOURNE, WEST SUSSEX

Figure 1: Site Location

March 2014



Based on Drawing 'Site Layout Plan' 12435/02 Rev A by Andrew Fuller Associates



MR DUGGIN

LAND AT FONTWELL AVENUE, ALDINGBOURNE, WEST SUSSEX

Not to Scale

Figure 2: Proposed Site Development Plan

March 2014



Based on the Andrew Fuller Associates Land Survey Plan Drawing No. 12435/01 of June 2013

Based on Drawing 'Site Layout Plan' 12435/02 Rev A by Andrew Fuller Associates



MR DUGGIN
LAND AT FONTWELL AVENUE, ALDINGBOURNE, WEST SUSSEX

Scale as Shown

Figure 3: Site Level Contours Plan

March 2014

APPENDIX B

Environment Agency Flood Plain Map

Enter a postcode or place name:

Aldingbourne, West Sussex

Other topics for this area...

Flood Map for Planning (Rivers and Sea)

Flood Map for Planning (Rivers and Sea)

Map legend

Click on the map to see what Flood Zone (National Planning Policy Guidance definitions) the proposed development is in.

 Flood Map for Planning (Rivers and Sea) 

 Flood Zone 3

 Flood Zone 2

 Flood defences (Not all may be shown)

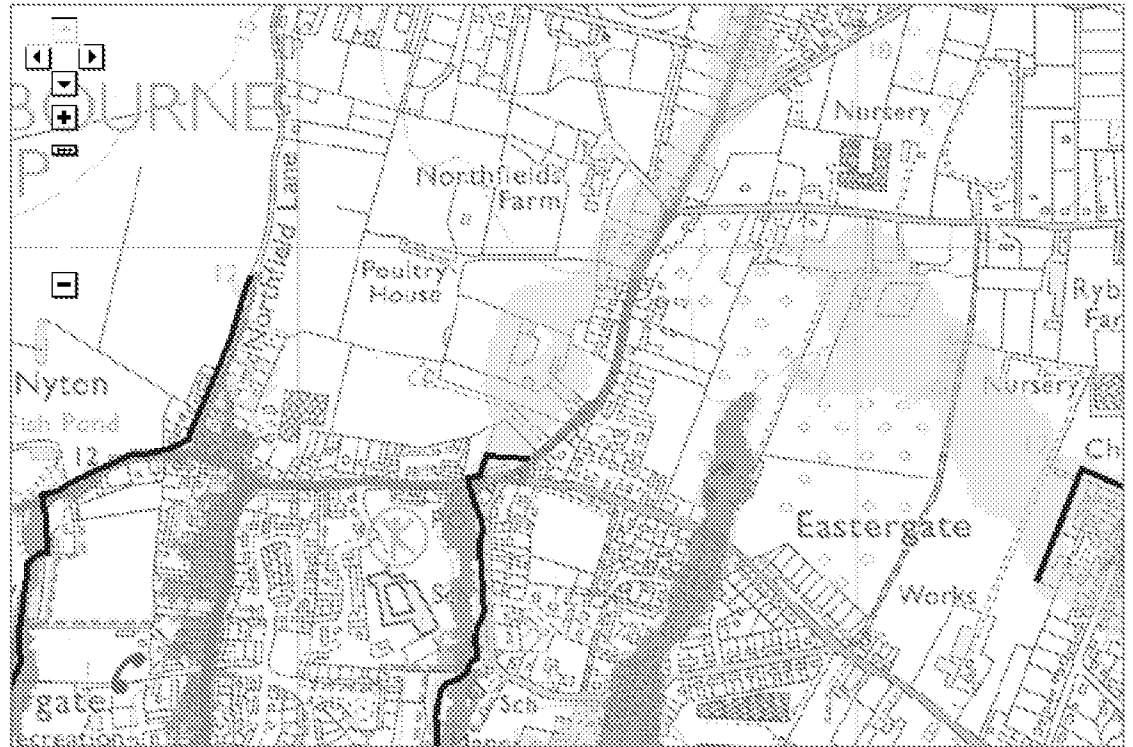
 Areas benefiting from flood defences (Not all may be shown)

 Main rivers

X: 494,484;Y: 105,770 at scale 1:10,000

Data search

Text only version



Customers in Wales - From 1 April 2013 Natural Resources Wales (NRW) has taken over the responsibilities of the Environment Agency in Wales.

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This service is designed to inform members of the public, in line with our terms and conditions. For business or commercial use, please contact us.

More about flooding:

Understanding the Flood Map for Planning (Rivers and Sea)

A more detailed explanation to help you understand the flood map shown above.

Current flood warnings

We provide flood warnings online 24 hours a day. Find out the current flood warning status in your local area.

*** Legend information:** Flood defences and the areas benefiting from them are gradually being added through updates. Please contact your local environment agency office for further details.

Follow us: [YouTube](#) [Twitter](#) [Flickr](#) [Facebook](#)

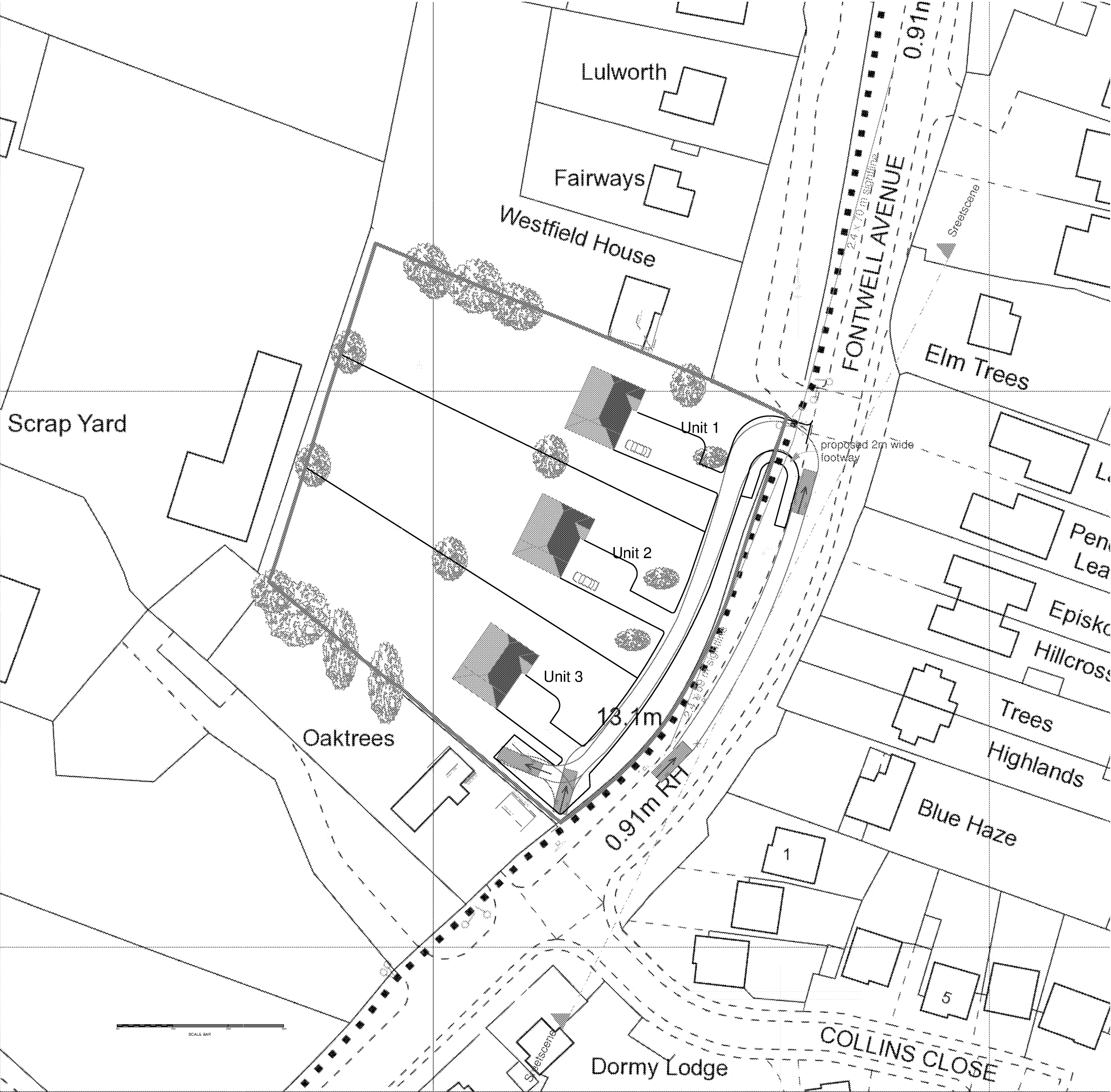
Author: The Environment Agency | enquiries@environment-agency.gov.uk

Last updated: 26th February 2014

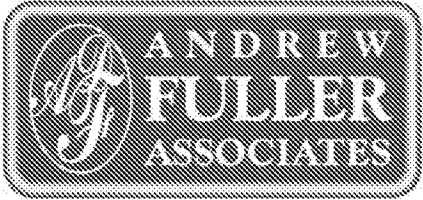
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APPENDIX C

Architect's Drawings of the Proposed Development



Revisions
A Sept 13 Update



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Norton Studio, School Lane
Arundel, West Sussex
BN18 9EP

tel: 01903 885444
email: info@andrewfuller.co.uk
www.andrewfuller.co.uk

Job Title
Land at Fontwell Avenue

Client
Mike Duggins

Drawing Name
Site Layout Plan

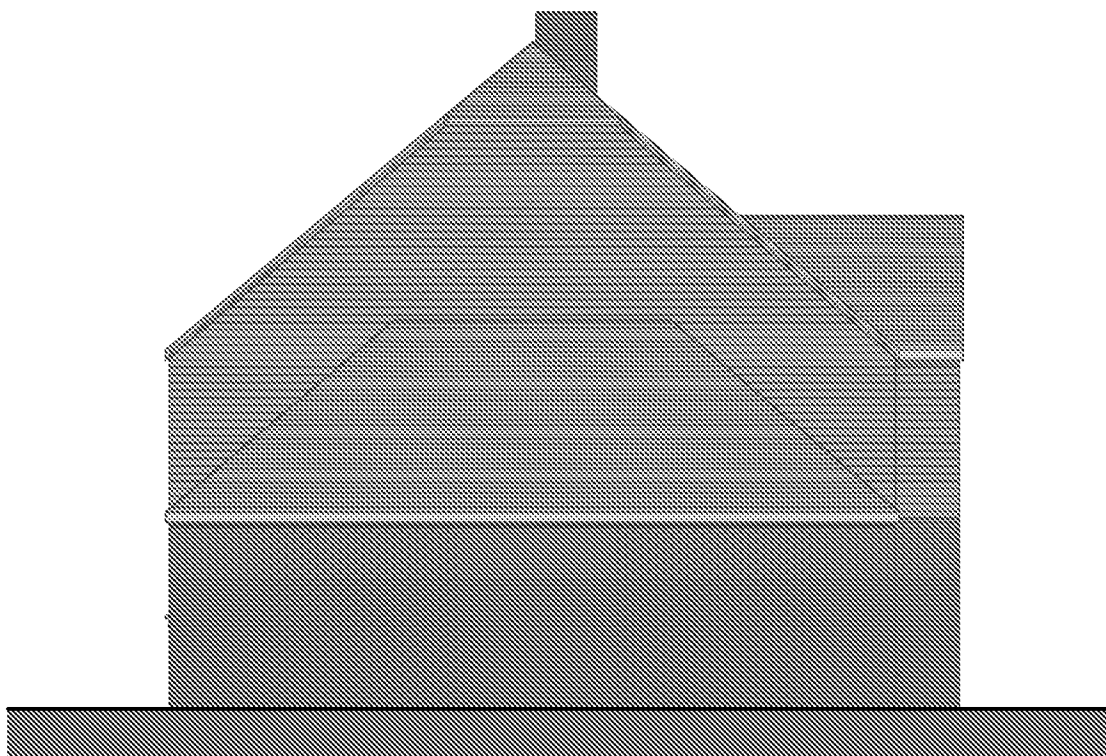
Drawing Status
Planning

Drawn by AF Date June 13

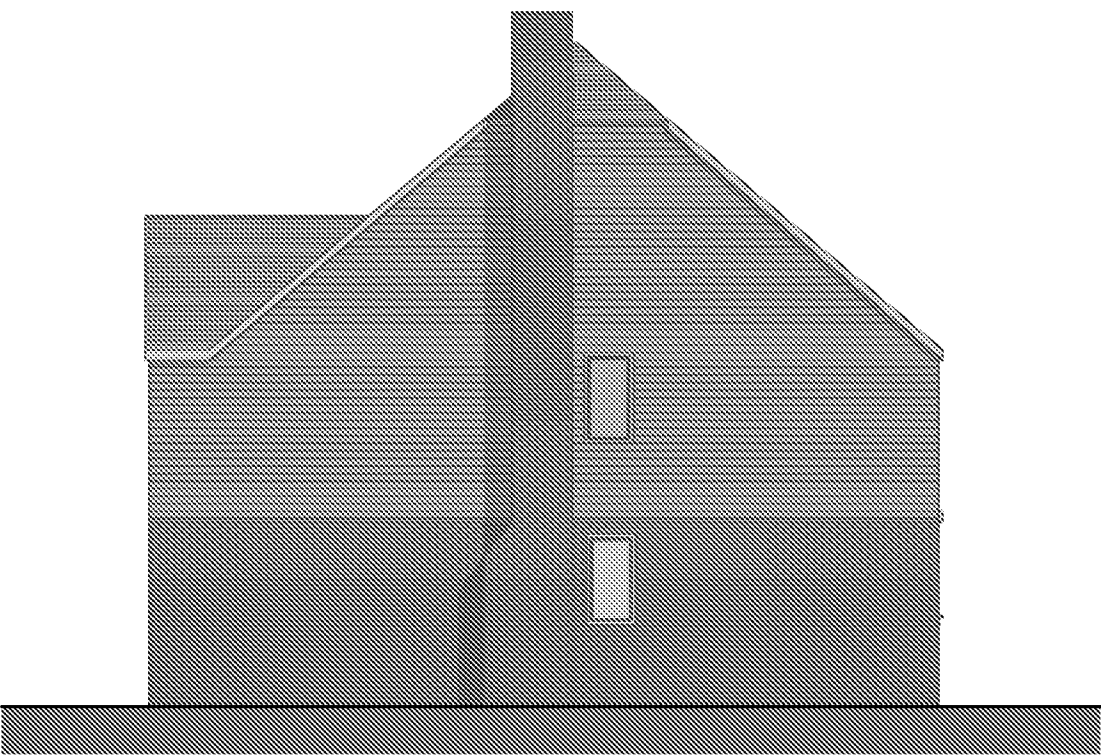
Checked by Date

Drawing Scale
1:500 at A2

Drawing No Status Revision
12435/ 02 A



SIDE ELEVATION



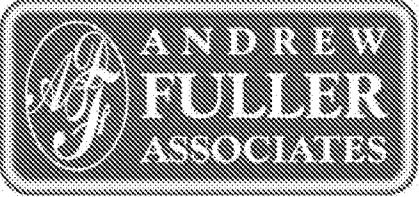
SIDE ELEVATION



FRONT ELEVATION



REAR ELEVATION



ANDREW FULLER ASSOCIATES

Chartered Surveyors

Norton Studio, School Lane
Arundel, West Sussex
BN18 9DR
tel: 01903 665444
email: info@a-fuller.co.uk
www.andrewfuller.co.uk

Job Title

Land at Fontwell Avenue

Client

Mike Duggins

Drawing Name

House Type - The Arundel Elevations

Drawing Status

Planning

Drawn by

AF

Date

June 13

Checked by

Date

Drawing Scale

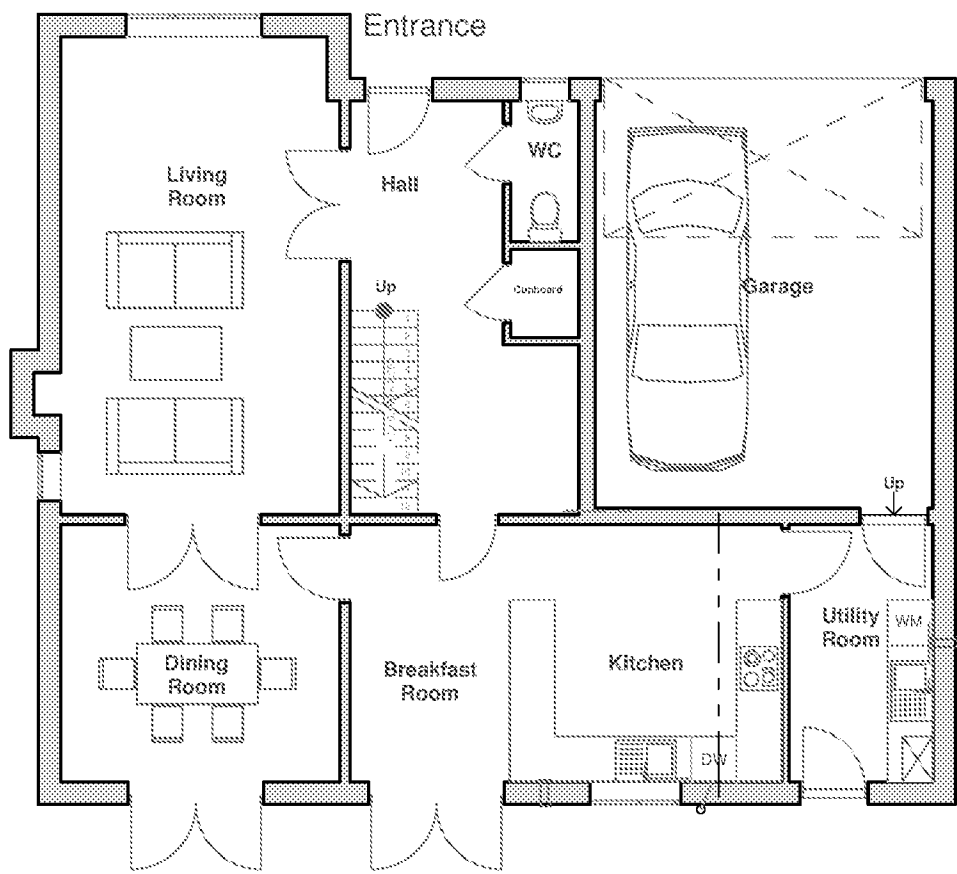
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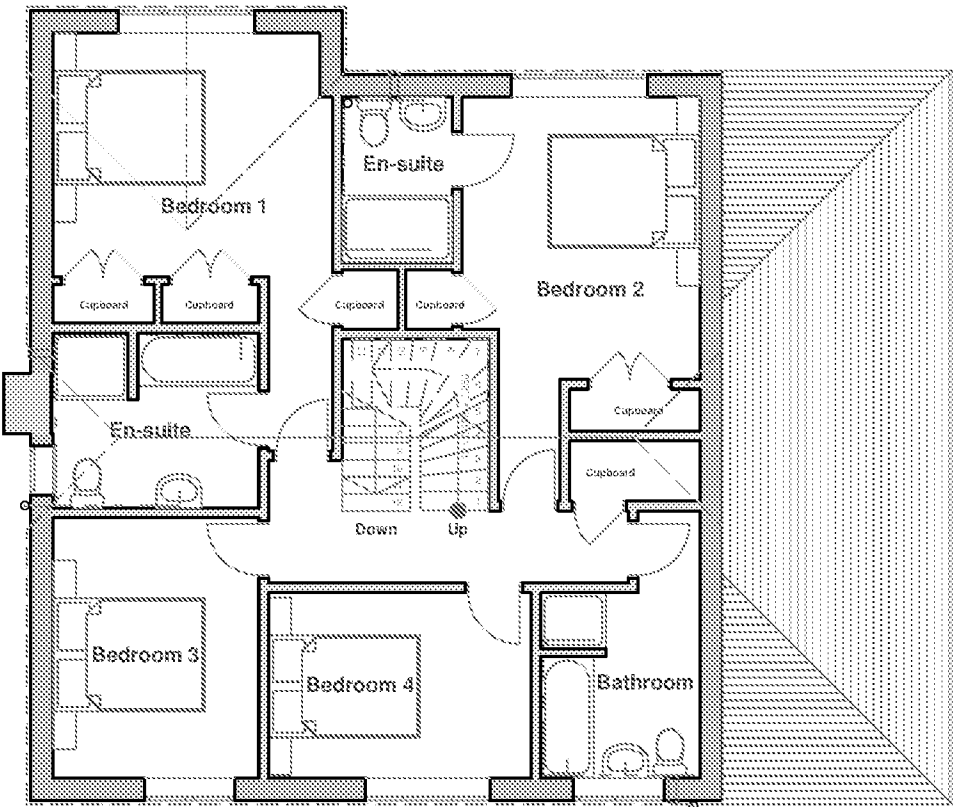
Status

Revision

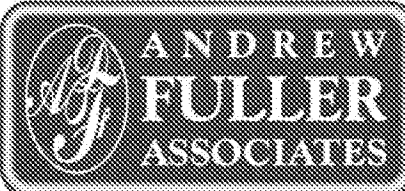
12435/ 03



Ground Floor



First Floor



ANDREW FULLER ASSOCIATES

Chartered Surveyors

Norton Studio, School Lane
Arundel, West Sussex
BN18 9DR

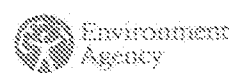
tel: 01903 865444
email: info@a-fuller.co.uk
www.andrewfuller.co.uk

Job Title	Land at Fontwell Avenue		
Client	Mike Duggins		
Drawing Name	House Type - The Arundel Plans		
Drawing Status	Planning		
Drawn by	AF	Date	June 13
Checked by		Date	
Drawing Scale	1:100 at A2		
Drawing No	Status	Revision	
12435/	04		

APPENDIX D

EA and SFRA Flood Risk Maps

Aldingbourne, Westergate & Eastergate



Legend

- Surface Water Flood Map
1 in 200 yr rainfall event
- Rivers and Sea Flood Map
1 in 100 year river event,
1 in 200 year sea event

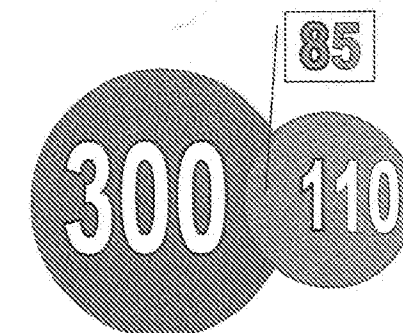
River obstructions

- ARTIFICIAL
- NATURAL
- UNKNOWN

River network

- Primary River
- Secondary River
- Tertiary River
- D/S of High Water Mark
- D/S of Seaward Extension
- Lake / Reservoir
- Canal
- Extended Culvert (> 50m)
- Canal Tunnel
- Underground River (inferred)
- Underground River (local knowledge)

Numbers of properties at risk from
surface water vs. rivers and sea



N

ARUN DISTRICT COUNCIL

0.5

1

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Notes:

The Arun SFRA is a strategic assessment of flooding. Users of the SFRA should be aware of this when interpreting the information presented. The user is directed to the SFRA reports which outline the uncertainties associated with the studies. Particular attention is drawn to the following:

- Flood extent boundaries are not considered definitive. Land adjacent to these areas may also be at risk.
- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.

Arun District Council SFRA

Map H - Historic Flood Events



CAPITA SYMONDS

Legend

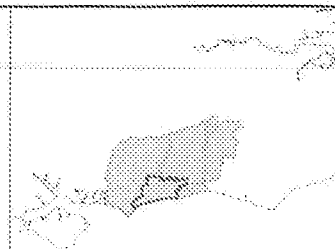
— Arun District Boundary

Historic Flood Events - Points

- Coastal
- Tidal
- Fluvial
- Surface Water
- Sewer
- Failure
- Unknown

Historic Flood Events - Areas

- Coastal
- Tidal
- Fluvial
- Surface Water
- Unknown



0 2 4
Kilometres

Scale at A3: 1:80,000

Date: 31/01/2008

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Map_H100r



Notes:

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Arun District Council SFRA

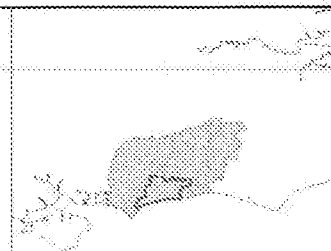
Map A1-F - Actual and Residual Risk of Flooding from Rivers



CAPITA SYMONDS

Legend

- Arun District Boundary
- Actual Defended Fluvial Flood Risk (1% AEP, 2006)
- Residual Defended Fluvial Flood Risk (0.1% AEP, 2006)



0 2 4
Kilometres

Scale at A3: 1:50,000

Date: 31/01/2006

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Map_A1-F.wor



Notes:

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Arun District Council SFRA

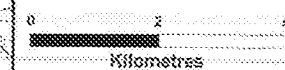
Map F1-F - Fluvial Flood Zone Extents



CAPITA SYMONDS

Legend

- Arun District Boundary
- Zone 3b Fluvial Extent (defences)
- Zone 3a Fluvial Extent (no defences)
- Zone 2 Fluvial Extent (no defences)



Scale at A3: 1:80,000

Date: 31/01/2008

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Map_F1-F_v01



Notes:

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- Flood extent boundaries are not considered definitive. Land adjacent to these areas may also be at risk.
- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.

Arun District Council SFRA

Map L - Areas Prone to Flooding from the Land



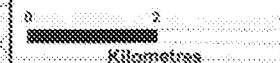
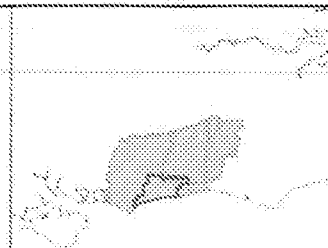
CAPITA SYMONDS

Legend

- Arun District Boundary
- Main River
- Historic Surface Water Flooding Area
- Point

Risk of Flooding from Land

- Low to Medium
- Medium to High
- Urban

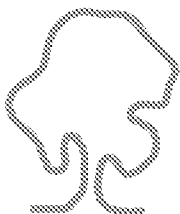


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Map L.wor



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