

1. Description

This Flood Risk Assessment (FRA) has been prepared in support of a planning application for a new dwelling at Tamarisk Way, Willowhayne Estate, West Sussex, BN16 2TE.

A location plan and an aerial image are included in Appendix A.

The site is a 0.5Ha (1.24 acre) parcel of relatively flat garden land enclosed by tall fences and existing perimeter planting that is not visible to the general public. Residential properties surround the site on the north, west and east.

A topographical survey of the site has been carried out and is included in Appendix B.

The majority of the site has an average level of approximately 6.0 AOD.

The proposed development is for the construction of one new dwelling on garden land that will utilise the existing access to the site. The existing levels of the access to the site range from 6.07 to 6.32 AOD.

The application site was identified as being in Flood Zone 1 and not categorised by the Environment Agency (EA) to be at risk of flooding when substantially similar application proposals were submitted in April 2014 (application EP/58/14/PL).

The Environment Agency subsequently amended their mapping and in addition to being located within Flood Zone 1 the application site is now depicted as including scattered areas of Zones 2 and 3.

2. Application of Sequential Test

In accordance with the NPPF the risk-based "Sequential Test" should first be applied to steer new development into areas of lower probabilities of flooding.

The following sections of this report demonstrate that the site's location is suitable for the proposed development of one dwelling and that the low level of flood risk to the site can be safely managed.

Accordingly it is considered that the requirements of the NPPF to undertake a risk based analysis have been met and that the site can reasonably be considered to be an appropriate location for a single dwelling.

3. EA Estimated Flood Levels and Depths

Estimated flood levels and depths for the application site have been obtained from the EA. The information was provided by the EA on 24th October 2014 and is included in Appendix C.

The results are taken from the EA TUFLOW model "2012 Arun to Adur".

4. Tidal Risk

Flood defences

Coastal protection is offered by Local Authority maintained shingle beaches. The EA have provided information that indicates that the effective crest height adjacent to the site is 6.08m AOD (see Appendix C).

It should also be noted that the length of the southern boundary of the application site is bounded by a low masonry wall. The top of the wall is at 6.36m AOD and is built off of land that varies in height from 5.93m AOD to 6.06m AOD.

As the highest predicted Tidal level provided by the EA is 6.07m AOD [0.1% AEP [1 in 1000yr] it is therefore considered unlikely that the application site will be significantly affected by tidal flooding.

The information taken from the EA TUFLOW model "2012 Arun to Adur" indicates that at Node Points 1 and 2 tidal flood depths of 0.02m and 0.08m (i.e. 20mm and 80mm have been predicted during a 0.5% AEP [1 in 200yr] flood. These figures include an allowance for Climate Change [2115].

Node point 3 lies in a land depression that has a lower level than the remainder of the site and will be investigated and culverted in conjunction with the Local Authority's Drainage and Coastal Engineer.

Node point 4 lies outside the site boundary.

It is therefore reasonable to consider that the application site is at low risk of any significant Tidal Flooding.

5. Fluvial Risk

From rivers and streams.

There are no rivers and streams within the immediate vicinity of the site therefore it is considered that the site's risk of fluvial flooding can reasonably be regarded as very low.

6. Pluvial Risk

From rainfall on the surface.

Pluvial flooding is defined as local flooding in areas not normally associated with natural or manmade watercourses that results from rainfall generated overland flow, before the run-off enters any watercourse or sewer.

It is usually associated with high intensity rainfall events but can also occur with lower intensity rainfall or melting snow, where the ground is saturated, frozen or developed resulting in overland flow and ponding in depressions in the topography.

The site's proximity to the coastline, together with the Environment Agency's confirmation that they have no records of previous flood events affecting the site and the landowner's lack of knowledge of any previous pluvial flooding occurring on the application site suggest that the risk of pluvial flooding can reasonably be regarded as low.

Examination of the Environment Agency's Map that depicts the Risk of Flooding from Surface Water (see Appendix C) confirms that the site is substantially located in a zone that is categorised as having a "very low" risk of flooding from surface water with a small area being identified as having a "low" risk of flooding.

7. Risk of rising groundwater

From rainfall on the surface

This type of flooding occurs when water levels underneath the ground rise above normal levels. Prolonged heavy rainfall soaks into the ground and can cause the ground to become saturated. This results in rising groundwater levels which leads to flooding above ground.

The site's proximity to the coastline, together with the Environment Agency's confirmation that they have no records of previous flood events affecting the site and the landowner's lack of knowledge of any previous groundwater flooding occurring on the application site suggest that the risk of groundwater flooding can reasonably be regarded as low.

8. Sewer flooding

Flooding from sewers can occur when a sewer is overwhelmed by heavy rainfall, becomes blocked, is damaged or is of inadequate capacity. This is mostly applicable to combined and surface water sewers.

During the course of the consideration of the previous planning application (EP/58/14/PL) no representations were received from statutory consultees or local residents that raised any concerns about the adequacy of the existing drainage system to accommodate the one additional dwelling proposed.

The application proposals include the discharge of surface water to soakaways. The Environment Agency's confirmation that they have no records of previous flood events affecting the site and the landowner's lack of knowledge of any previous sewer flooding on the application site suggest that the risk of pluvial flooding can reasonably be regarded as very low.

9. Risks from Reservoirs, Canals, Lakes or Artificial Sources

There are no canals, lakes or reservoirs in the immediate vicinity of the application site. Therefore the probability of flooding from artificial sources can be considered to be low.

10. Summary of Site Specific Flood Risk Assessment

From the above it can be reasonably concluded that tidal flooding is the main source of flood risk to the site.

11. Proposed Mitigation Measures

As can be seen in section 3 above the Environment Agency have recently identified that parts of the application site are at a low risk of a small amount of tidal flooding (i.e. during the 0.1% AEP [1 in 1000yr] tidal event and the 0.5% AEP [1 in 200yr] + CCA event).

The applicant therefore wishes to confirm that the proposals include the following mitigation measures,

- 1 Ensuring that a masonry boundary wall that runs along the entire southern boundary with a height that exceeds the maximum tidal level predicted by the EA by 290mm is maintained as it is likely to provide some protection against tidal flooding, which by its nature, is likely to be of a short duration as tidal levels subside.
- 2 The proposed finished floor level of the new dwelling is proposed to be located at a minimum level of 6.350m AOD.

In accordance with discussions with the EA the proposed minimum floor level has a 300mm freeboard above the maximum predicted 0.5% AEP [1 in 200yr] +CC flood level provided by the EA of 6.05m at node point 1 which is located on the southern boundary
- 3 As the TUFLOW model outputs predict maximum flood depths in relevant locations of 30mm or 160mm (0.1% AEP) or 20mm or 80mm (0.5% AEP+CC) it is considered safe for site users to remain within their property should such a flood event occur as it will be situated above the predicted flood levels.
- 3 The levels of the existing access to the application site are significantly higher than the predicted maximum tidal flood level and will not be reduced in order that a safe pedestrian/vehicular access/egress route from the site will continue to be available for use in an emergency.

This Flood Risk Assessment contains Environment Agency information © Environment Agency and database right.

List of Appendices

A Location Plan
Aerial image

B Topographical survey

C Information provided by the EA on 24th October 2014
All centred on Little fosters, East Preston (Ref: SSD/5191/PC)

Covering letter from the EA dated 24.10.14

2012 Arun to Adur TUFLOW Model Outputs

Flood Map for Planning

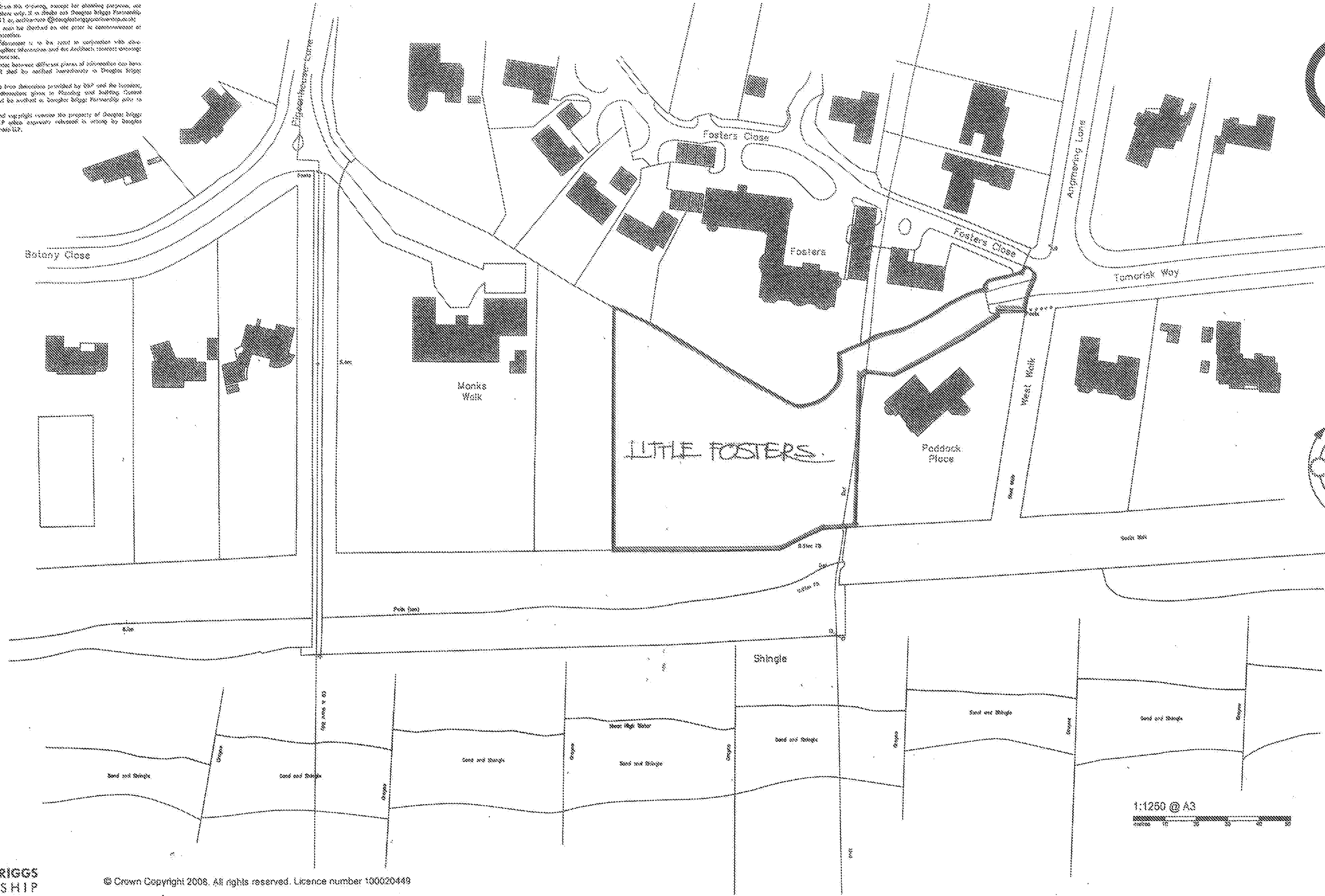
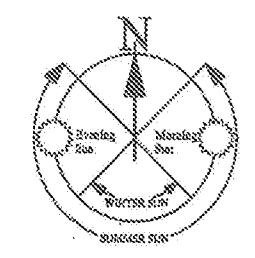
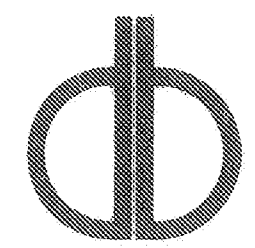
Effective Crest Heights of Local Authority Maintained Shingle Defences

Risk of flooding from surface water

Appendix A

Location Plan

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 0 10 20 30 40 50
 metres

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PARTNERSHIP

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 ARCHITECTURE
 AND
 TOWN PLANNING

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LITTLE FOSTERS
 A
 NEW DWELLING
 AT
 TAMARISK WAY, WILLOWHAYNE ESTATE WEST SUSSEX

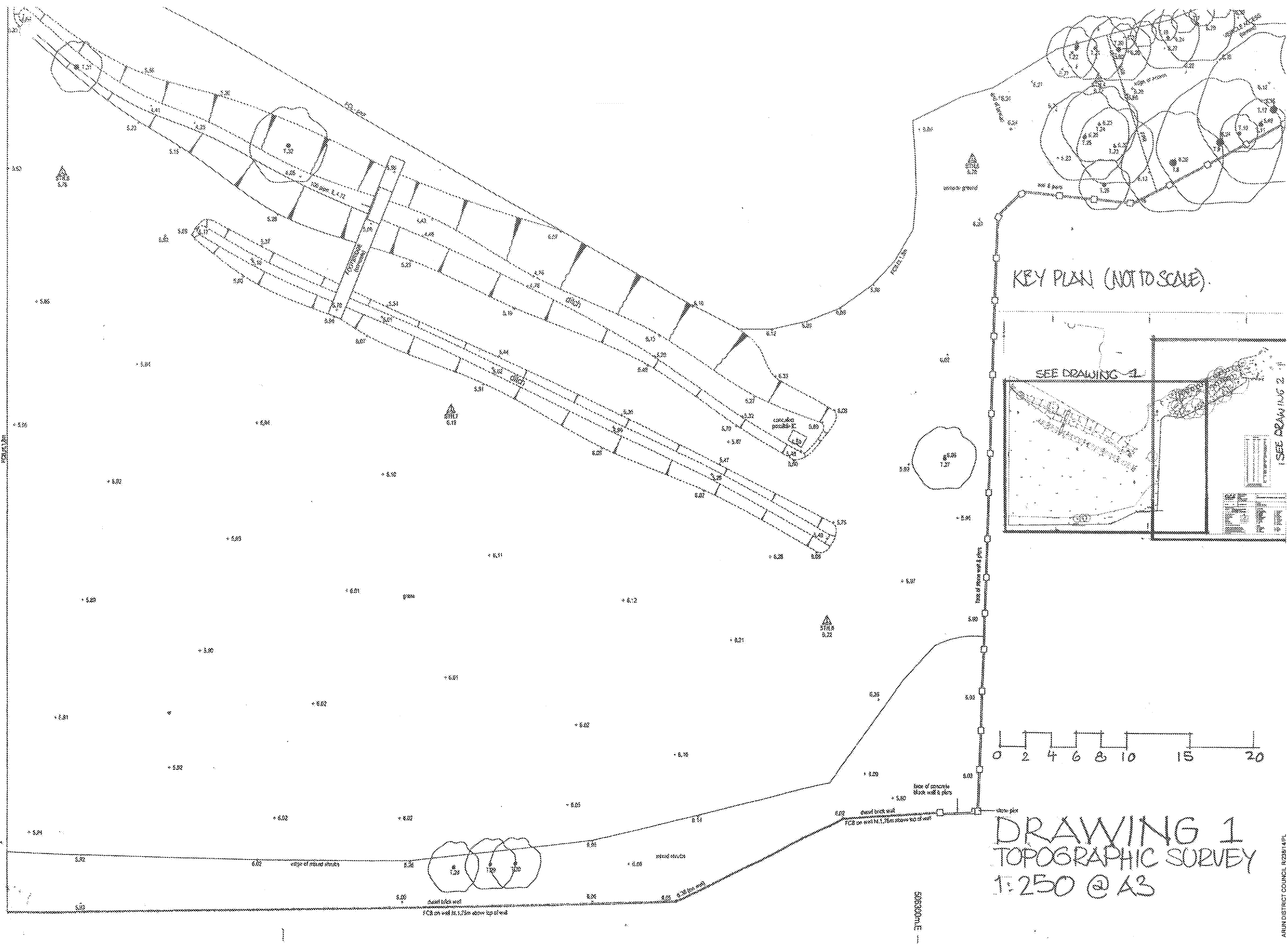
LOCATION PLAN
 FEBRUARY 2013
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 4112-01



Aerial Image

Appendix B

Topographic Survey



Appendix C

Information provided by the EA on 24th October 2014
All centred on Little fosters, East Preston (Ref: SSD/5191/PC)

Covering letter from the EA dated 24.10.14
2012 Arun to Adur TUFLOW Model Outputs
Flood Map for Planning
Effective Crest Heights of Local Authority Maintained Shingle Defences
Risk of flooding from surface water

Alex Hall
Douglas Briggs Partnership
Flint Barns
Harn Farm
Bosham
West Sussex
PO18 8EH

Our ref: SSD/5191/PC
Your ref:
Date: 24/10/2014

Dear Alex

Provision of Product 4 for Little Fosters, Tamarisk Way, East Preston

Thank you for your request to use Environment Agency data. The information is attached.

If you have requested this information to help inform a development proposal, then you should note the detail in the attached advisory text on the use of Environment Agency Information for Flood Risk Assessments / Flood Consequence Assessments.

Supporting Information

This information is provided subject to the enclosed notice, which you should read.

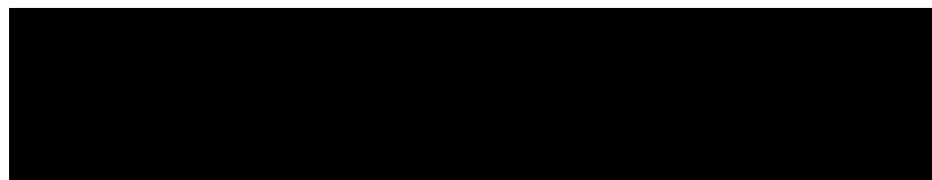
Flood Defences

Coastal protection is offered by Local Authority maintained shingle beaches. Please see the attached map for estimated effective crest heights. For further details I recommend you contact Arun District Council.

Flood History

We do not have any records of previous flood events affecting this area.

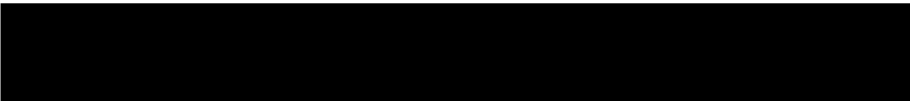
For a more comprehensive flood history I would suggest also contacting Arun District Council.



If you have any queries or would like to discuss the content of this letter further please don't hesitate to contact me.

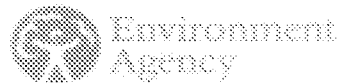
Yours faithfully

Jon Denman
FCRM Officer
Partnership and Strategic Overview Team – West Sussex



Enc. Detailed FRA/FCA Map, Flood Levels and extents
[Standard Notice]

Standard Notice [not for use with Special Data, Personal Data or unlicensed 3rd party rights]



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Use of Environment Agency Information for Flood Risk / Flood Consequence Assessments

Important

If you have requested this information to help inform a development proposal, then we recommend that you undertake a formal pre-application enquiry using the form available from our website:-

<http://www.environment-agency.gov.uk/research/planning/33580.aspx>

Depending on the enquiry, we may also provide advice on other issues related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In **England**, you should refer to the Environment Agency's Flood Risk Standing Advice and PPS25 and its associated Practice Guide for information about what flood risk assessment is needed for new development in the different flood zones. These documents can be accessed via:

<http://www.environment-agency.gov.uk/research/planning/82587.aspx>

<http://www.communities.gov.uk/publications/planningandbuilding/pps25floodrisk>

<http://www.communities.gov.uk/publications/planningandbuilding/pps25practiceguide>

You should also consult the Strategic Flood Risk Assessment produced by your local planning authority.

In **Wales**, you should refer to TAN15 for information about what flood consequence assessment is needed for new development in the different flood zones

<http://new.wales.gov.uk/splash.jsessionid=BylGTfGZthmB0t2vhp6hS1Gc81LXvZzB3Ylczf20Xn7LK3zKOnMkl9818252507?org=/topics/planning/policy/tans/tan15/>

You should also consult the Strategic Flood Consequence Assessment if one has been produced by your local planning authority.

In both **England and Wales** you should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk / Consequence Assessment (FRA / FCA) where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as

groundwater or overland runoff. The information produced by the local planning authority referred to above may assist here.

3. Where a planning application requires a FRA / FCA and this is not submitted or deficient, the Environment Agency may well raise an objection.
4. For more significant proposals in higher flood risk areas, we would be pleased to discuss details with you ahead of making any planning application, and you should also discuss the matter with your local planning authority.

2012 Arun to Adur TUFLOW Model Outputs Centred on Little Fosters, East Preston - Created 24/10/2014 [Ref: SSD/5191/PC]



Node Point	Easting	Northing	TIDAL Depths taken from 2012 TUFLOW model [m]			
			DEFENDED			
			1.33% AEP [1in75yr]	0.5% AEP [1in200yr]	0.1% AEP [1in1000yr]	0.5% AEP [1in200yr] +CC [2115]
1	506261	101475	0.01	0.02	0.03	0.02
2	506239	101495	0.06	0.08	0.16	0.08
3	506260	101520	1.19	1.25	1.34	1.25
4	506291	101522	Null	0.05	0.15	0.05

Node Point	Easting	Northing	TIDAL Levels taken from 2012 TUFLOW model [mAOD]			
			DEFENDED			
			1.33% AEP [1in75yr]	0.5% AEP [1in200yr]	0.1% AEP [1in1000yr]	0.5% AEP [1in200yr] +CC [2115]
1	506261	101475	6.04	6.05	6.07	6.05
2	506239	101495	5.97	5.98	6.07	5.98
3	506260	101520	5.92	5.97	6.07	5.97
4	506291	101522	Null	5.97	6.07	5.97



Environment Agency

Legend

+ Node Point
1

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*when printed at A4.

0 30 60
Meters



Flood Map for Planning Centered on Little Fosters, East Preston

- Created 24/10/2014 [Ref: SSD/5191/PC]



Environment
Agency

Legend

-  Flood Zone 3
-  Flood Zone 2

Flood Map Areas (assuming no defences)

Flood Zone 3

Shows the area that could be affected by flooding:
- from the sea with an 1 in 200 or greater chance of happening each year.
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2

Shows the extent of an extreme flood from rivers of the sea with up to a 1 in 1000 chance of occurring each year.

1:10,000 *

*when printed at A4.

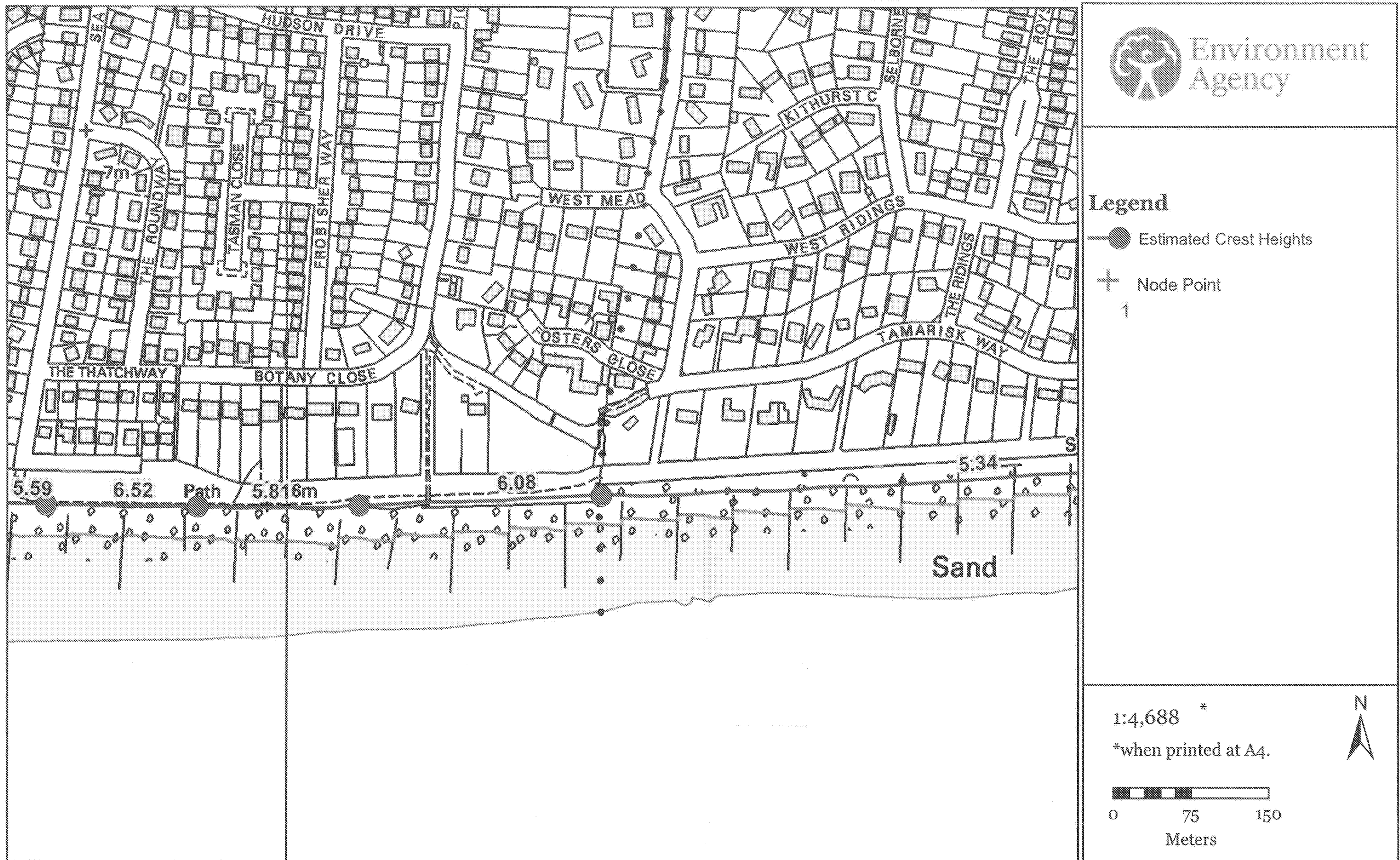


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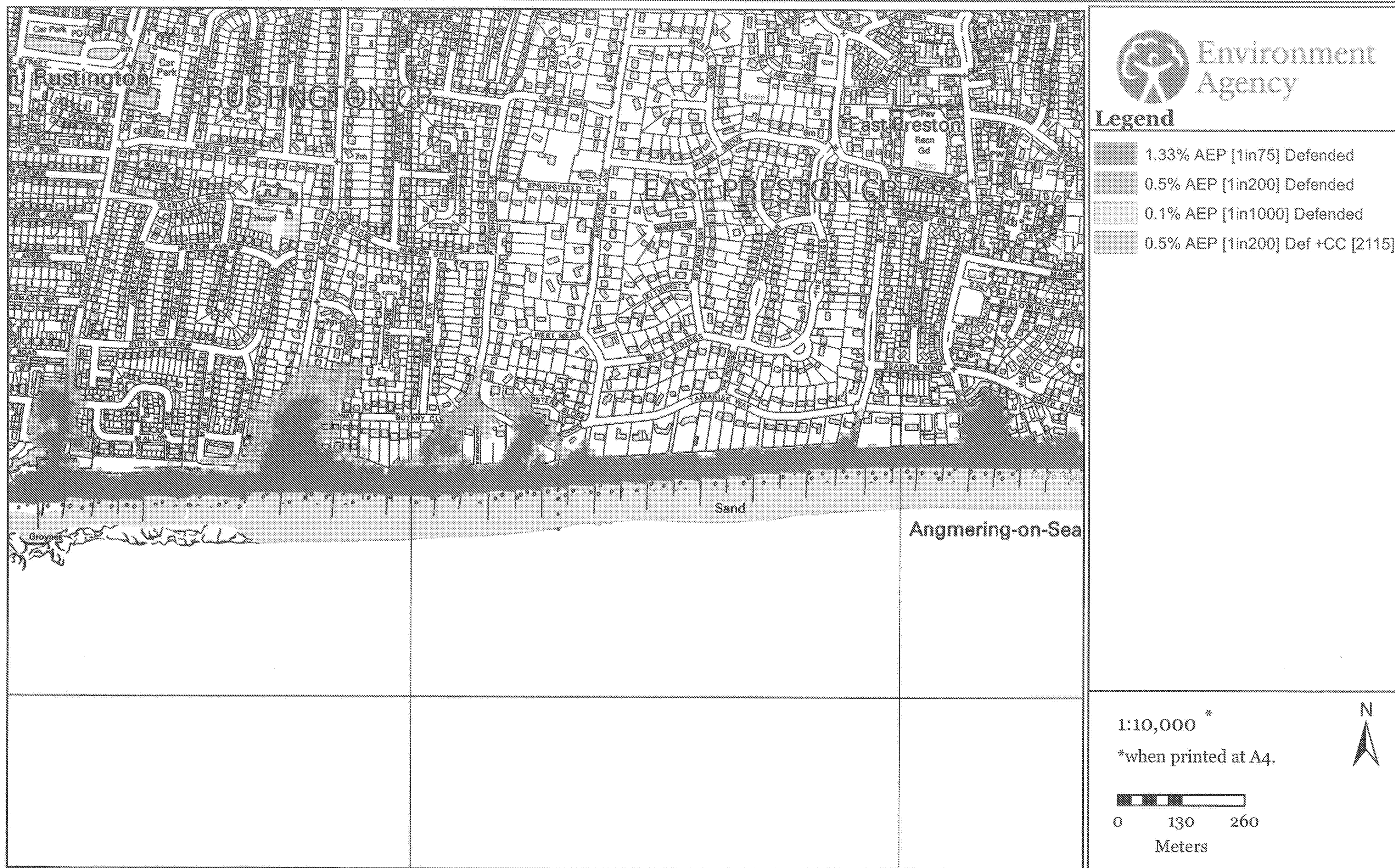


Effective Crest Heights of Local Authority Maintained Shingle Defences Centred on Little Fosters, East Preston

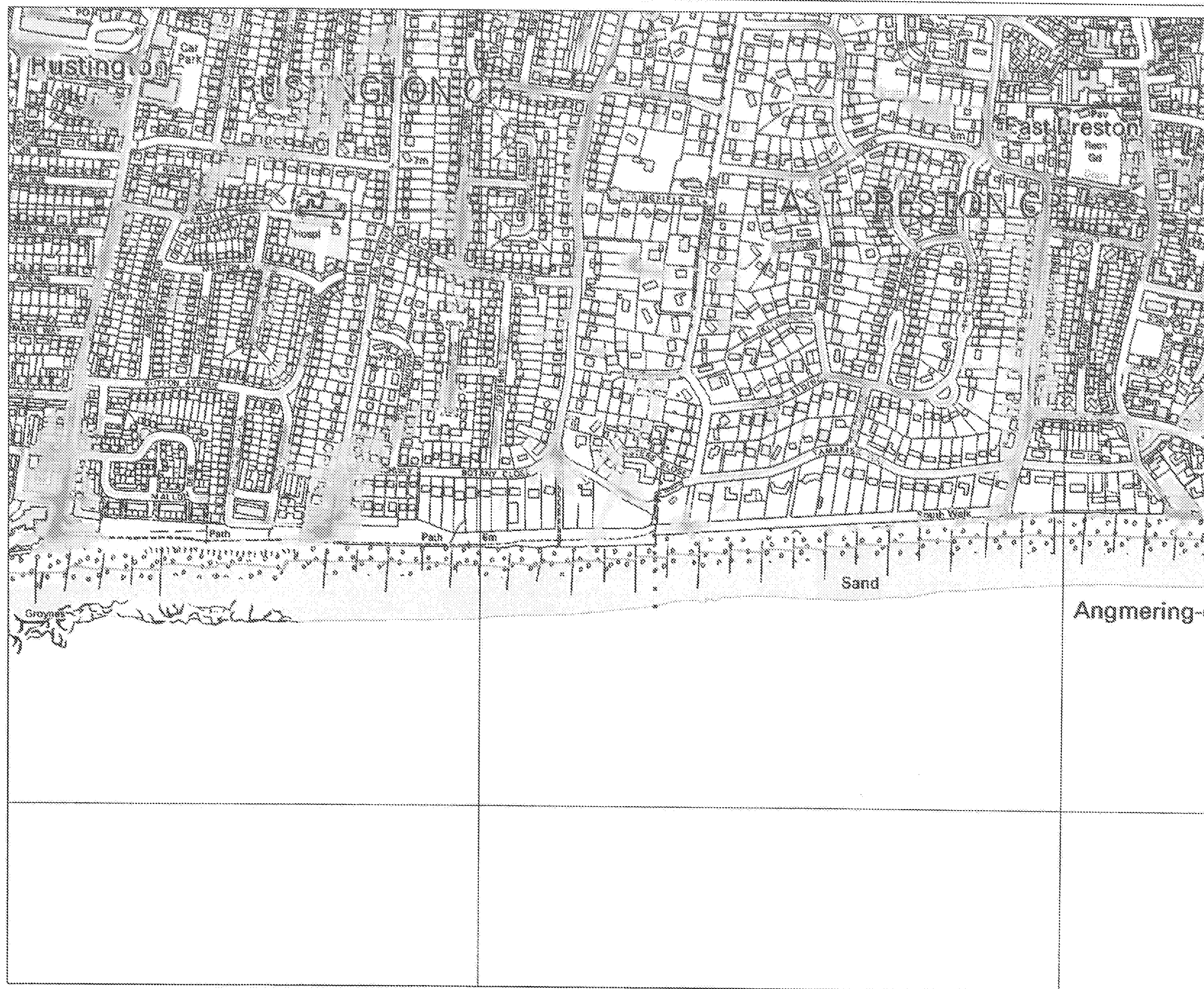
- Created 24/10/2014 [Ref: SSD/5191/PC]



2012 Arun to Adur TUFLOW Model Outputs Centred on Little Fosters, East Preston
 - Created 24/10/2014 [Ref: SSD/5191/PC]



Risk of flooding from Surface Water



Scale 1:10,000



Likelihood of flooding from Surface Water

- High
- Medium
- Low
- Very Low

Likelihood of flooding from Surface Water

- High: Greater than or equal to 1 in 30 (3.3%) chance in any given year
- Medium: Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance in any given year
- Low: Less than 1 in 100 (1%) but greater than or equal to 1 in 1,000 (0.1%) chance in any given year
- Very Low: Less than 1 in 1,000 (0.1%) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on our website.

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