ASHFIELD
— SOLUTIONS GROUP —

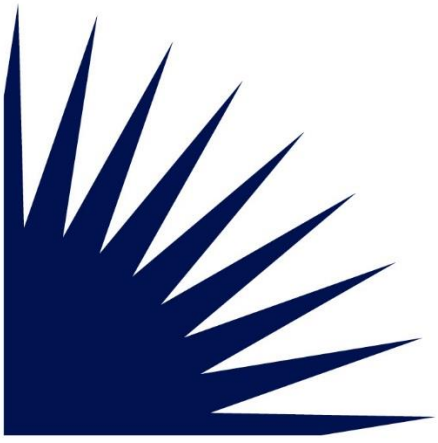
29/09/2017

Ref. 85217-F01

Flood Risk Assessment

158 Bright Road, Lancing, West Sussex, BN15 8LL

Mr Chris Webb



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Cwm Cynon Business Park, Mountain Ash, Rhondda Cynon Taf, CF45 4ER
t: 0845 873 1466 **www.ashfieldsolutions.com**

Document Control

Client	Mr Chris Webb
Report Title	Flood Risk Assessment – 158 Bright Road, Lancing, West Sussex, BN15 8LL
Report Reference	Ref. 85217-F01
Report Status	Final
Prepared by	David Kerr
Checked by	Aaron Jones
Approved by	Chris Marshall
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Distribution

Mr Chris Webb

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Executive Summary

Ashfield Flood Risk Solutions ("Ashfield") was commissioned on 29th August 2017 by Mr Chris Webb ("the client") to undertake a Flood Risk Assessment ("FRA") of a two-dwelling residential apartment building located at 158 Brighton Road in Lancing, West Sussex, BN15 8LL ("the site"). The FRA has been prepared to support a retrospective planning application for the change of use from a single dwelling residential property to a two-dwelling residential apartment building.

The site was initially assessed for fluvial and tidal flood risk, identifying it to be within a Flood Zone 3a associated with the site's proximity to the English Chanel located c. 125m south. Further data was requested from the EA, and a subsequent review of the West Sussex County Council (WSCC) Strategic Flood Risk Assessment was undertaken. Further to this, and based on flood modelling information and guidance available, it was concluded that the site would be susceptible to flooding during the tidal 1 in 200 year (0.5% AEP) flood event, based on the predicted 2115 level.

Flood risk from other sources were identified as being low for groundwater, low for surface water, and negligible for artificial sources and reservoir risk.

To overcome the identified tidal flood risk as part of the retrospective planning application, a stand-alone Flood Warning and Evacuation Plan (FWEP) has been prepared, which accompanies this FRA in (Appendix C. This FWEP is site specific, and outlines all measures required to be undertaken prior to any potential flood event, as well as providing suitable information of how to react to a flood warning, including an evacuation plan.

Based upon the work undertaken to assess the potential flood risk, and provision of sufficient measures to overcome the risk, it is therefore concluded that the planning application can be deemed acceptable in a flood risk context.

1 Introduction

1.1 Authorisation & Context

Ashfield Flood Risk Solutions ("Ashfield") was commissioned on 29th August 2017 by Mr Chris Webb ("the client") to conduct a Flood Risk Assessment ("FRA") to support retrospective planning permission for a two-dwelling residential apartment building located at 158 Brighton Road in Lancing, West Sussex, BN15 8LL ("the site" or "the property").

1.2 Aims and Objectives

This report has been prepared to support a retrospective planning application for a change of use from a single dwelling residential property to a two-dwelling residential apartment building. In this regard, the aim of this report is to address the requirements of the National Planning Policy Framework by:

- Assessing whether the site is likely to be affected by flooding from various sources;
- Providing an assessment of the vulnerability of the property to flooding and it's suitability in relation to the identified flood risks;
- Providing an opinion regarding the likely effects of the site on flooding elsewhere; and,
- Where required, principally presenting flood risk mitigation and drainage measures necessary to ensure that the property and its occupants will be safe, whilst ensuring that flood risk is not increased elsewhere.

1.3 Information Sources

In order to prepare this FRA, the following information sources and general guidance documents have been consulted:

- National Planning Policy Framework (NPPF), Flood Risk and Coastal Change Planning Practice;
- West Sussex County Council (WSCC) Future West Sussex Plan 2015 to 2019;
- WSCC Local Flood Risk Management Strategy (2013);
- WSCC Strategic Environmental Assessment (SEA) (2014);
- WSCC Preliminary Flood Risk Assessment (PRFA 2011);
- WSCC Strategic Flood Risk Assessment (2010);
- Environment Agency (EA) Product 4 Detailed Flood Risk information – received 13th September 2017;
- British Geological Survey (BGS) online GeoIndex Maps and Records – accessed 1st September 2017;
- Google Earth™ Aerial Images – accessed 1st September 2017;
- EA Flood Map for Planning – accessed 1st September 2017; and,
- EA Long Term Flood Risk Information Map – accessed 1st September 2017.

1.4 Repot Limitations

This assessment of flood risk has looked to use the most accurate, up to date flood mapping for the location. The proposed site boundary has been supplied by the client and the assessment of risk is based on this.

This report has been prepared with due care and diligence in accordance with industry best practice and guidance. The conclusions in this report are valid only to the extent that the information provided to Ashfield was accurate and complete at time of receipt.

1.5 Site Location

The site is positioned at XY coordinates 519770, 104168 (nearest postcode BN15 8LL). The site, the location of which is outlined in Drawing 01, occupies an area of 0.04 hectares (ha) and currently comprises a two-dwelling residential apartment building with off-street parking and a shared garden space to the rear. The current site layout is presented in Drawing 02, and Appendix B.

The site is surrounded by residential properties to the north, east and west, and by the Widewater estuarine lagoon to the south. Topographically, the site is built into an embankment that increases in elevation from 2.3mAOD at the front of the property along Brighton Road (north) to a maximum ground level elevation of 4.80mAOD in the centre of the site. The elevation of the site then reduces from the centre of the site to the southern-most boundary with the lagoon, with a minimal elevation of 2.2mAOD.

The nearest surface water feature is the Widewater Lagoon, which boarders the property to the south, with the English Chanel beyond. There are no designed rivers or streams in close proximity to the site.

No site visit has been undertaken by Ashfield as part of this commission, however, a topographic level survey was undertaken by ArchiData on the 13th of September 2017 to better inform this FRA. The results of this survey can be seen in Appendix B. Apart from the capture of on-site topographic data, this report has been prepared using information provided by the Client, requests made to the EA, and available online interactive mapping and aerial images.

2 Flood Risk Evaluation

The following sections analyse each potential flood risk source that are relevant to this assessment in relation to the property's location. Consideration is given to the severity of flood risk to the site as a whole, including, but not limited to, the use of existing flood mapping, high-level local strategic studies and available topographic information. These are referenced throughout.

2.1 Fluvial & Tidal Flood Risk

Fluvial flood risk originates from a watercourse of any size that may affect a site when the channel capacity is exceeded. This type of flooding often occurs following an extreme rainstorm event or a prolonged period of wet weather. Tidal flood risk can affect the coastline as well as estuaries and rivers that are tidally influenced. Flood events often coincide with the tidal regime, high rainfall events or other natural phenomena, which can lead to water levels covering low-lying land or exceeding natural or man-made defences.

The EA *Flood Map for Planning (Rivers and Sea),* which is provided in Drawing 03, divides the floodplain into risk-based categories, and provides an indication of the flood risk for the site. The EA *Flood Map* indicates that the site is located in an area designed Flood Zone 3a (high probability), where the principal flood risk arises from Coastal risk, with the English Chanel being c. 125m directly south of the site.

Further to the information outlined above, Ashfield has also conducted a review of the WSCC *Preliminary Flood Risk Assessment* (2011) and *Local Flood Risk Management Strategy* (2014) to evaluate the flood risk potential from fluvial and tidal sources. This document further indicates that the principal flood risk arises from the English Chanel (tidal risk), and that the site is not located in a river flood plain. These documents further indicate that the site has not been subject to historical flooding from fluvial or tidal sources.

Based on the Product 4 data request to the EA (Appendix A), the site is located in a 0.5% AEP (1 in 200 year) modelled flood outline for 2115 based on a defended tidal scenario. The quoted flood level for this return period on site is 5.05mAOD.

Historically, there is no record of previous flooding events having affected this property. However, the EA records indicate that two previous flood events have affected the area, the first of which occurred in 1960 and was caused by local drainage and surface water. The second flood event occurred in 1992, and was caused by overtopping of the defences on the beach. The nearest recorded area affected by previous flood events is located c. 50m north.

EA records indicate that the site benefits from nearby flood defences comprising a shingle beach, which is designed to offer an estimated standard protection for a 1 in 100 year (1% AEP) flood event.

ⓘ The site is located in an area designated as Flood Zone 3a and is boarded by the Widewater Lagoon to the south with the English Chanel located c. 125m south. The site benefits from nearby flood defences, and there is no record of the site having been subject to historical flooding. Consequently, the level of flood risk from tidal sources is considered **medium**.

2.2 Surface Water Flooding

Surface water flooding occurs when local drainage networks are overwhelmed during an extreme rainfall event, causing water to flow over the surface and following gravity to the lowest point where it often pools. This flood source is increasingly becoming one of the major contributors of flood risk, due to changing weather patterns and increased extreme rainfall events occurring across the UK. This places more pressure than ever on drainage systems that are often overwhelmed during flash flood events, which are normally only designed to take between a 1 in 20 and a 1 in 30 return period event.

When interpreting the surface water flood map information, it needs to be taken into account that surface water mapping is generated from information that is largely high-level. The flood mapping must be correctly interpreted in order to give a fair representation of the site's surface water flood risk and used only as a guide.

Ashfield has conducted a review of the EA *Long Term Flood Risk Information* interactive on-line map, which indicates that site is not located in an area at risk from surface water flooding. The nearest area that is labelled at risk is located c. 50m south within the bounds of the Widewater Lagoon, which is a surface water body, and can therefore be discounted as a risk to the site. The nearest terrestrial area labelled at risk is located behind a residential apartment building 50m north, which following a review of the sites topographical profile using Google Earth™, is at a lower topographical elevation than the site. Consequently, this area at risk of surface water flooding is unlikely to negatively affect the site.

Ashfield has further reviewed the WSCC *Local Flood Risk Management Strategy* (2014) and WSCC *Strategic Environmental Assessment* (2014) which include surface water flood risk evaluation based on EA mapping as discussed above. Further to this, there is no reported surface water risk or incidents discussed as having occurred at or near the site.

ⓘ No surface water flood risk has been identified within the site boundary. The nearest area at risk from surface water flooding is located north of the site in an area situated at a lower topographical elevation. Consequently, the risk of flooding from surface water flooding is considered **negligible**, and is not considered further in this assessment.

2.3 Reservoir Failure

Assessment of risk of a reservoir failure may be interpreted as the extent of flooding that would occur should any reservoir that has a capacity larger than 25,000m^3 suffer a catastrophic failure. Mapping of this nature is described by the Environment Agency as a very worst-case scenario, with a flood event of this type being extremely unlikely to occur.

The EA *Long Term Flood Risk Information* interactive on-line map indicates that the site would not be affected by a catastrophic failure of the nearest reservoir. Additionally, there is no reservoir located within 1km of the site. Therefore, and as defined by the EA, the likely chances of this type of flooding occurring are negligible. No further assessment of this flood risk scenario is provided in this assessment.

ⓘ The site is not located in an area at risk of inundation should a reservoir fail. Consequently, the level of risk from this flood source is **negligible**.

2.4 Groundwater

Flooding from a groundwater source often occurs during or following a period of prolonged wet weather within areas that are low lying underlain by permeable rocks (aquifers). When aquifers are at their maximum holding potential, flooding at surface level can occur from beneath the ground.

A review of the British Geological Survey (BGS) GeoIndex maps indicates that the superficial geology is recorded to consist of relatively low permeability alluvium comprising clay, silt, peat and sand. The bedrock geology is recorded to comprise the Lambeth Group of clay, silt and sand. The Lambeth Group is recorded as a low productivity aquifer. There are no geological faults recorded within 1km of the site.

A review of the BGS GeoIndex Records indicates that there is one borehole record available for review within 250m of the site, which records a superficial geology consistent with that recorded by the GeoIndex mapping. This record does not comment on the potential presence of shallow groundwaters.

Ashfield has further reviewed the WSCC *Local Flood Risk Management Strategy* (2014) and WSCC *Strategic Environmental Assessment* (2014) which comment on areas within the Council Area that are susceptible to flooding from this source. There is no record of the sites locality being susceptible or having been subject to flooding from groundwaters.

ⓘ A review of available BGS GeoIndex maps and records indicates the presence of a superficial geology comprising lower permeability alluvial clays, sands and silts. The single available borehole record does not comment on groundwater observations, and there is no record of a shallow groundwater body being present. A review of the WSCC's *Local Flood Risk Management Strategy* (2014) and *Strategic Environmental Assessment* indicates that the site is not located in an area susceptible to groundwater flooding, and there is no record of historical flooding from this source. Consequently, the level of associated risk is considered **low**.

2.5 Artificial Flood Sources

Flood risk from artificial sources would include the failure of man-made drainage or water supply network. Although the likelihood of such an occurrence is highly unpredictable, it is recommended that any proposed designs for the site take the location of any existing below ground services into account, in order to avoid any inadvertent flooding taking place during the construction phase and in the future.

2.6 Summary

The following table provides a summary of the classification of risk to the site, and any further considerations that are required.

Table 1. Summary of Food Risk to Site

Flood Risk Source	Overall Risk Classification	Additional Considerations
Fluvial & Coastal	Medium	See Section 3.
Surface Water	Negligible	-
Reservoir Failure	Negligible	-
Groundwater	Low	-
Artificial Sources	Low	-

3 Flood Risk in Planning Context

This report has so far evaluated all potential flood risk sources that may affect the site. The following sections describe the identified flood risks in the context of the proposed development and provide recommendations, where required, for the mitigation or reduction of those risks to enable safe development.

3.1 Sequential Test

The Sequential Test is used to steer new development to areas with the lowest probability of flooding. The Sequential Test only applies to sites located within Flood Zones 2 and 3 (flood risk from Rivers and Sea). In this case, the site is located in a Flood Zone 3a, however as the retrospective planning application is classed as a Minor Development (*alterations: development that does not increase the size of buildings e.g. alterations to external appearance*), the Sequential Test does not need to be applied.

3.2 Development Viability

The Environment Agency classifies different types of development according to their perceived vulnerability to flood risk. The proposed development comprises a two-dwelling residential apartment building. Based on the EA vulnerability classification system outlined in Table 3 of the Planning Practice Flood Risk and Coastal Change Guidance[1], the proposed development would be classed as 'More Vulnerable' and is located in a Flood Zone 3. Consequently, an Exception Test is required to evaluate the appropriateness of the proposed development.

3.3 Exception Test

Where flood risk cannot be fully negated, the exception test is required to demonstrate that any resonant risk can be safely managed, and sustainably provide a safe environment for its occupants for the lifetime of the development. The following sections seek to outline these principles, thus providing suitable justification for the development to be permitted.

Flood Risk and Climate Change

Based on the flood risk identified to be present within Section 2.1, which is attributed from Tidal Risk, the 1 in 200 year (0.5% AEP) flood level, based on sea level rise until 2115 is 5.05mAOD. When this is compared to the levels on site, this equates to a predicted depth in excess of 2.00m above the ground floor levels (Ground floor level: 2.22mAOD). Due to the nature of the retrospective planning application being the conversion of an existing property, the raising of existing floors above this level is infeasible, and therefore the residual risk on internal inundation is required to be addressed by other means. The most suitable solution to overcoming the potential danger posed to the occupants of the property would be through the production of a Flood Warning and Evacuation Plan.

[1] https://www.gov.uk/guidance/flood-risk-and-coastal-change#Table-1-Flood-Zones

Flood Warning & Evacuation

This FRA is accompanied by a separate Flood Warning and Evacuation Plan (FWEP), seen in Appendix C, which is specific to this site. Based on the development's location within an area that is susceptible to Coastal flood risk, the FWEP outlines the potential risk, and gives clear instruction of the measures that the occupants need to emplace in preparation for a potential flood event minimising risk to life.

4 Conclusion

This FRA has assessed the risk of flooding from a variety of flood sources, and has identified that the site is located in an area designed Flood Zone 3a, equating to a moderate risk of Coastal flooding associated with the English Chanel located c. 125m south. The risk of flooding from pluvial, surface, groundwater and reservoir flood sources is low to negligible.

The retrospective planning application for the conversion of the property to two standalone flats should be accompanied by an appropriately detailed Flood Warning and Evacuation Plan (FWEP). This has been prepared following the full assessment of flood risk for the site. The implementation of this FWEP shall ensure that:

- The potential flood risk to the site is clearly understood and appreciated by all potential occupants;
- There is a clear plan of action to undertake should a flood warning be issued; and
- The risk to life is minimised, based on the occupant's enhanced understanding of the flood risk.

Therefore, based upon this assessments findings, retrospective planning permission for the proposed conversion of the property is deemed to be acceptable in the context of flood risk.

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INFO@ASHFIELDSOLUTIONS.COM | +44 (0)845 873 1466

Drawings







Legend

Site Boundary

Client

Mr Chris Webb

Project

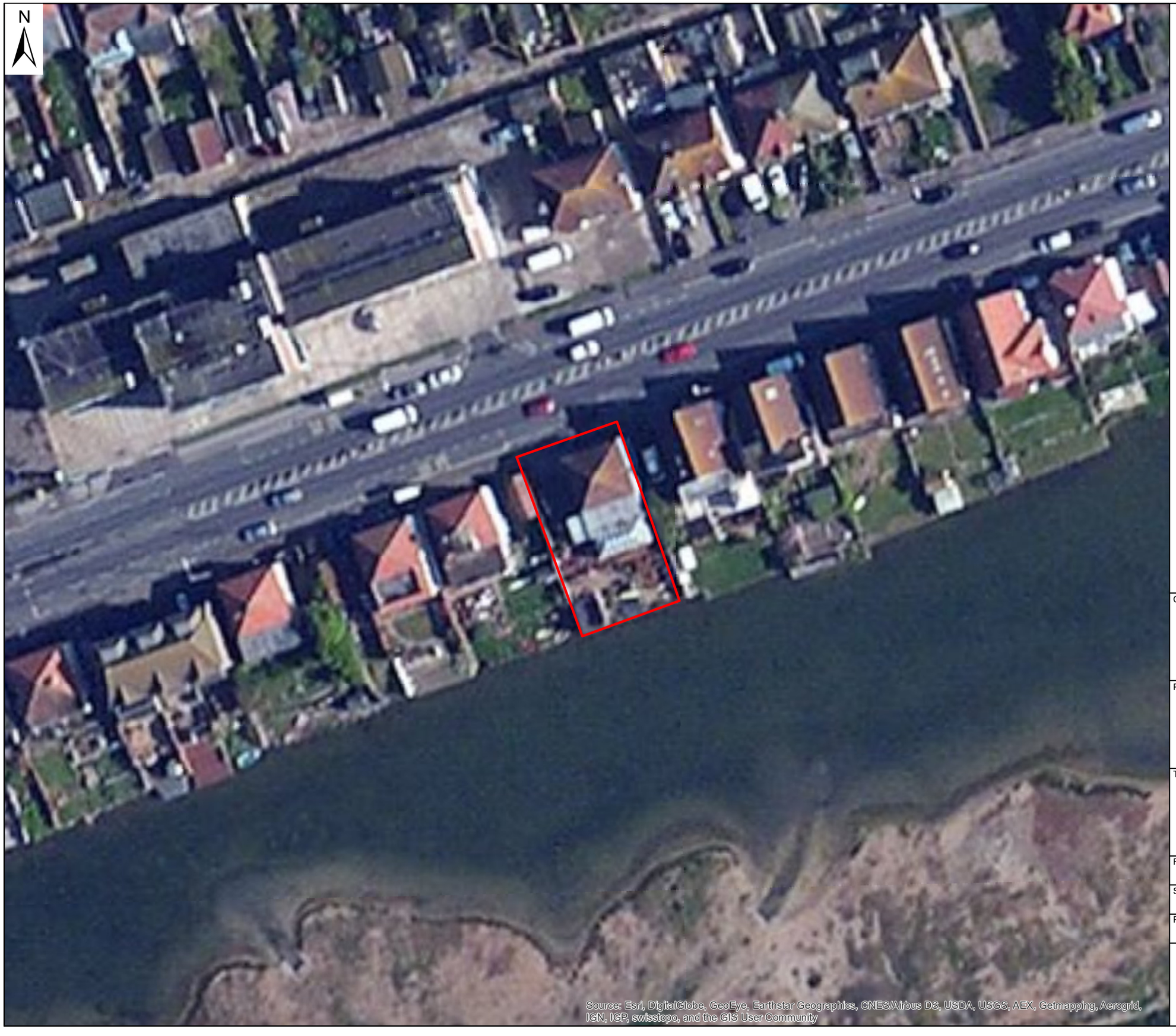
Flood Risk Assessment for
158 Brighton Road

Title

Site Location Plan

Report No.	Drawing No.	Revision
85217-F01	01	-
Scale	Date	Frame Size
As Shown	29/09/2017	A3
Produced by	Drawn by	Approved by
TP	TP	AJ

ASHFIELD FLOOD RISK



Legend

Site Boundary

Client

Mr Chris Webb

Project

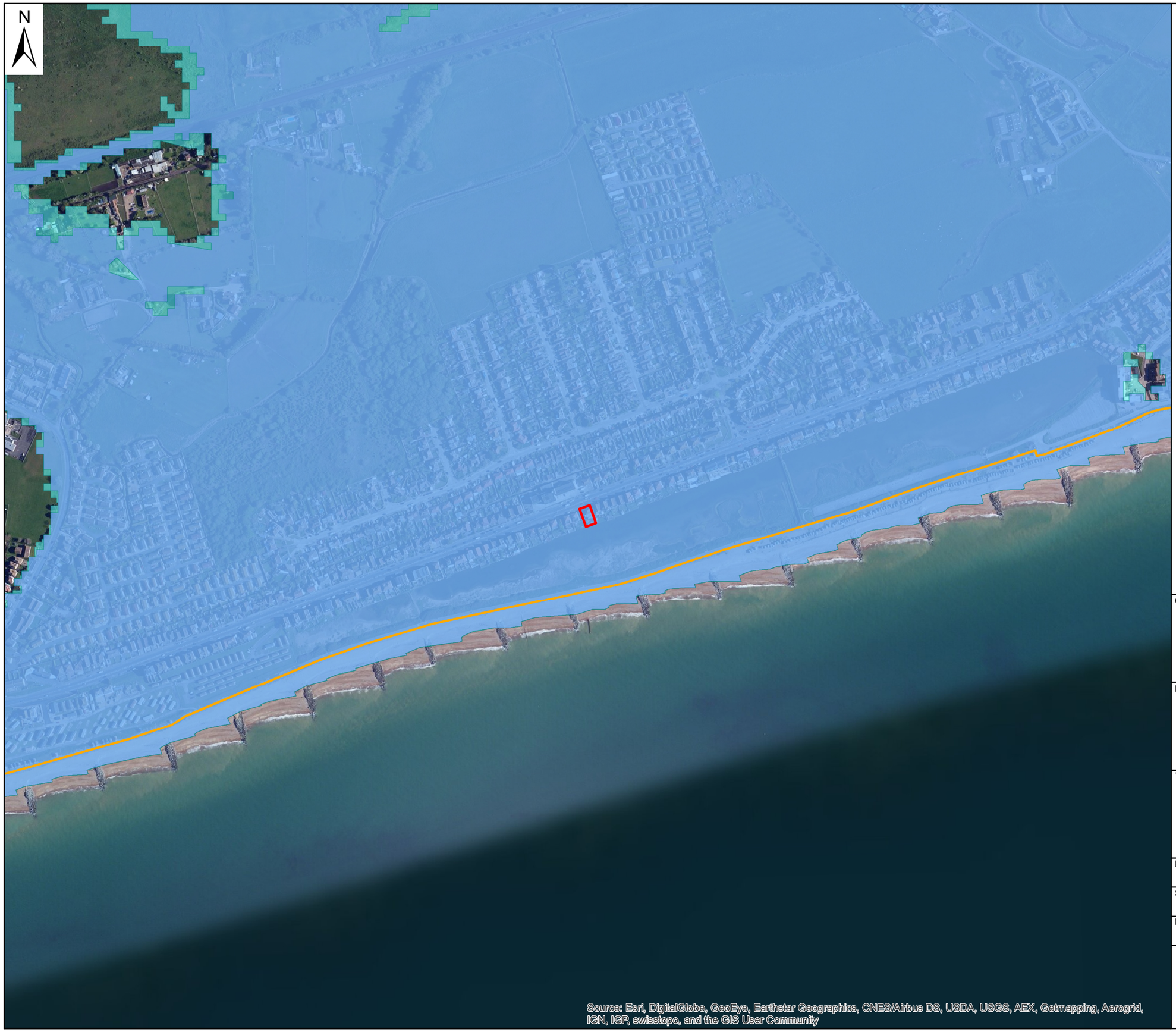
Flood Risk Assessment for
158 Brighton Road

Title

Site Layout Plan

Report No.	Drawing No.	Revision
85217-F01	02	-
Scale	Date	Frame Size
1:500	29/09/2017	A3
Produced by	Drawn by	Approved by
TP	TP	AJ

ASHFIELD
FLOOD RISK



Legend

- Site Boundary
- Flood Zone 2
- Flood Zone 3
- Flood Defences

Client

Mr Chris Webb

Project

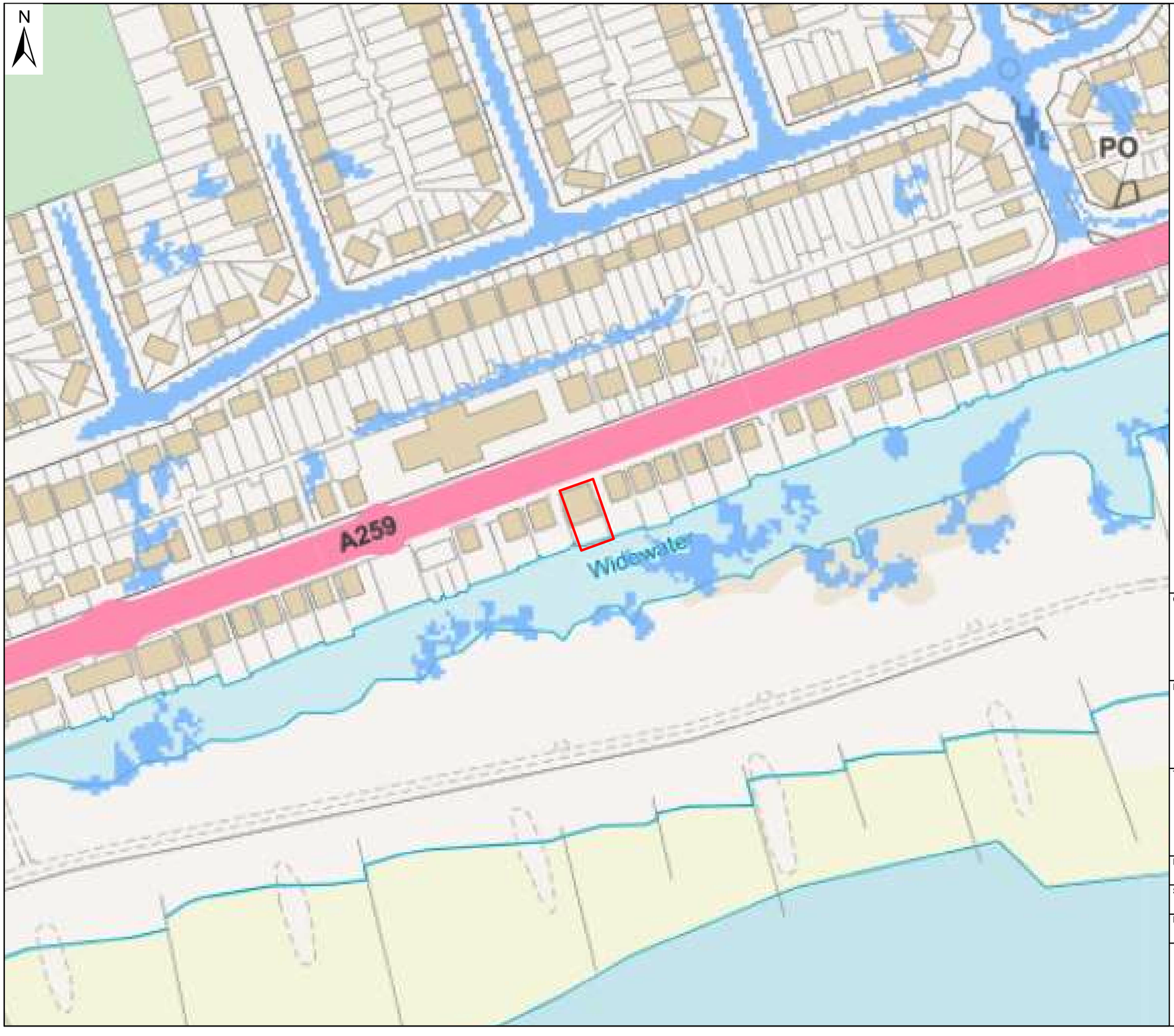
Flood Risk Assessment for
158 Brighton Road

Title

Risk of Flooding from
Fluvial and Tidal

Report No.	Drawing No.	Revision
85217-F01	03	-
Scale	Date	Frame Size
1:5,000	29/09/2017	A3
Produced by	Drawn by	Approved by
TP	TP	AJ

ASHFIELD
FLOOD RISK



Legend

Site Boundary

Flood risk

High

Medium

Low

Very low

Note:
Flood map taken from EA website:
https://flood-warning-information.service.gov.uk
On the 29/09/2017

Client

Mr Chris Webb

Project

Flood Risk Assessment for
158 Brighton Road

Title

Risk of Flooding
from Surface Water

Report No.	Drawing No.	Revision
85217-F01	04	-
Scale	**Date**	**Frame Size**
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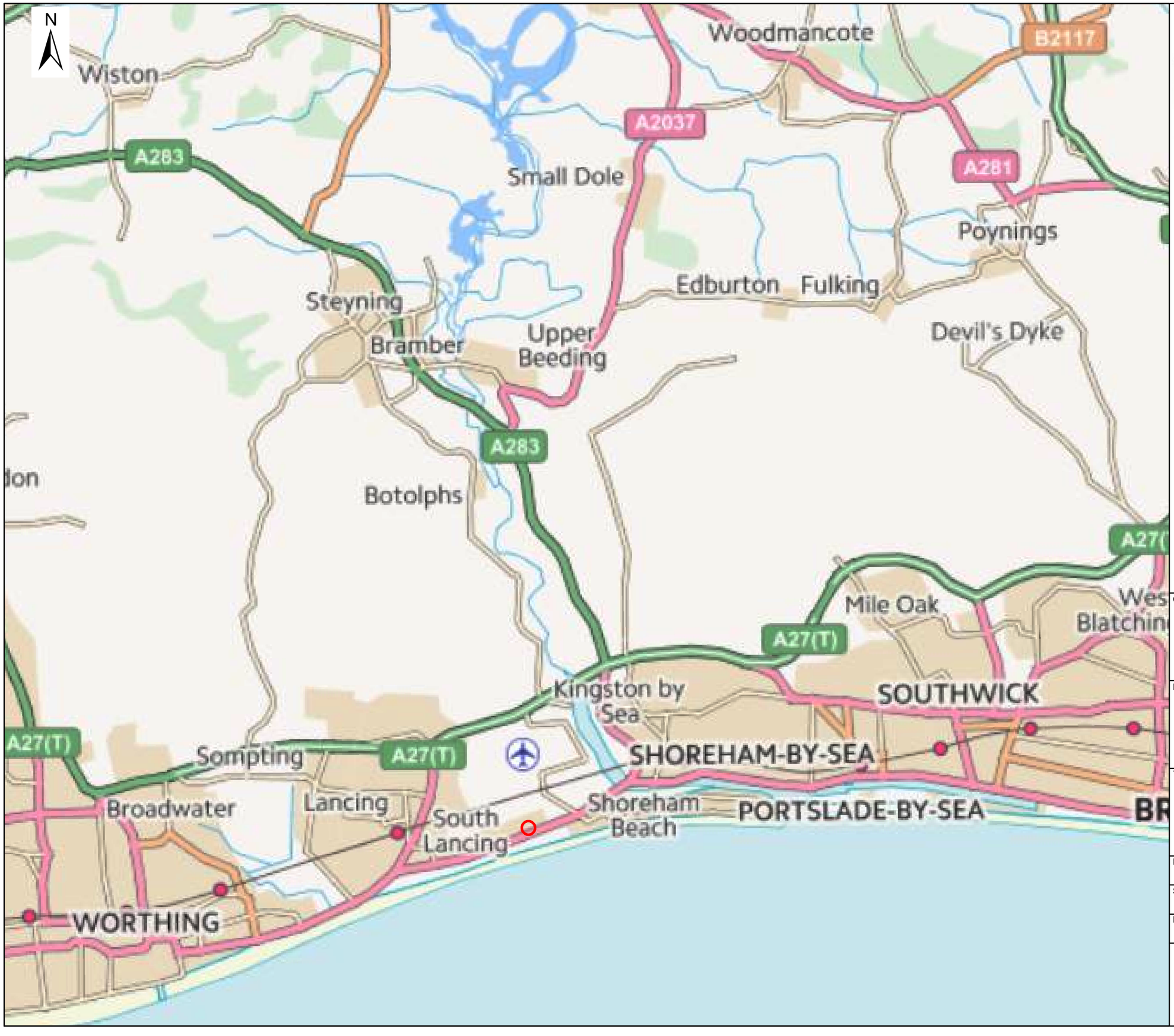
Produced by	**Drawn by**	**Approved by**
TP	TP	AJ

ASHFIELD
FLOOD RISK



Legend

Site Location

Flood risk

Maximum extent of flooding

Flood map taken from the EA website:
https://flood-warning-information.service.gov.uk
On the 29/09/2017

Client

Mr Chris Webb

Project

Flood Risk Assessment for
158 Brighton Road

Title

Risk of Flooding
from Reservoirs

Report No.	Drawing No.	Revision
85217-F01	05	-
Scale	Date	Frame Size
1:50,000	29/09/2017	A3
Produced by	Drawn by	Approved by
TP	TP	AJ

ASHFIELD
FLOOD RISK

Appendices

Appendix A

EA Product 4 (Detailed Flood Risk)

Aaron Jones
Ashfield Solutions
Cwm Cynon Business Centre
Cwm Cynon Business Park
Mountain Ash
Rhondda Cynon
CF45 4ER

Our ref: SSD58747

Date: 13/09/2017

Dear Aaron Jones,

Provision of Product 4 for address: 158 Brighton Road, Lancing, West Sussex, BN15 8LL.

Thank you for your request of 29/08/2017 to use Environment Agency data, Product 4. The information is attached.

The information on Flood Zones in the area relating to this address is as follows:

The property is in an area located within Flood Zone 3 shown on our Flood Map for Planning (Rivers and Sea).

Note - This information relates to the area that the above named property is in and is not specific to the property itself.

Please find attached a copy of the Flood Map for Planning (Rivers and Sea) for the area relating to your address.

Further details about the Environment Agency information supplied can be found on the GOV.UK website:

https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather

If you have requested this information to help inform a development proposal, then you should note the information on GOV.UK on the use of Environment Agency Information for Flood Risk Assessments

https://www.gov.uk/planning-applications-assessing-flood-risk
https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

Following a recent research programme into climate change and the consequent future effects on flood risk, the Environment Agency has updated it's guidance on climate change allowances. The standard climate change allowance of adding 20% to peak river flows (as per previous guidance in the National Planning Policy

Framework), has now changed to 45% for a development proposal of this size. It is possible that our current modelling has under estimated flood risk when taking climate change into consideration. Our advice on potential development on this site will take this issue into consideration.

For further guidance on how climate change could affect flood risk to new development please visit: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Supporting Information

Flood Defences
There are coastal flood defences in the form of a shingle beach. This is designed to offer an estimated standard of protection of 1 in 100 (1%).

Model Information
All flood outlines, levels and depth have been taken from the Arun to Adur Coastal Modelling Scheme, completed in 2012 by JBA Consulting.

Flood History
We hold no record of previous flooding events affecting this property. However, our records do indicate two previous flooding events in the area of the site. The first took place in 1960 and was caused by local drainage and surface water. The second took place in 1992 and was caused by overtopping of the defences on the beach. I recommend contacting Arun District Council for a more comprehensive flood history check.

Please note our records are not comprehensive and may not include all events, you can contact your Local Authority to check if they hold any relevant information regarding your application.

You are encouraged to use and re-use this information freely and flexibly, with only a few conditions. Details of which can be found here:
http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

We respond to requests for recorded information that we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

If you are not satisfied with our response to your request for information you can contact us within 2 calendar months to ask for our decision to be reviewed.

If you have any queries or would like to discuss the content of this letter further please call us on 03708 506506.

Yours faithfully,
Jake Spence
FCRM Officer – PSO West Sussex

Enc. Flood Map for Planning (Rivers and Sea) / Node point locations / Flood levels/depths / Modelled flood outlines / Flood Defence Locations

Flood Defence Locations. Centred BN15 8LL. Created 12/09/2017.

Environment Agency

Legend

- Statutory Main Rivers
- Defences
  - Embankment
  - Wall
  - Flood Gate
  - Demountable Defence
  - Bridge Abutment
  - High Ground
  - Beach
  - Barrier Beach
  - Promenade
  - Quay
  - Cliff
  - Dunes
  - Culvert



0 100 200 300

Metres

N W E S

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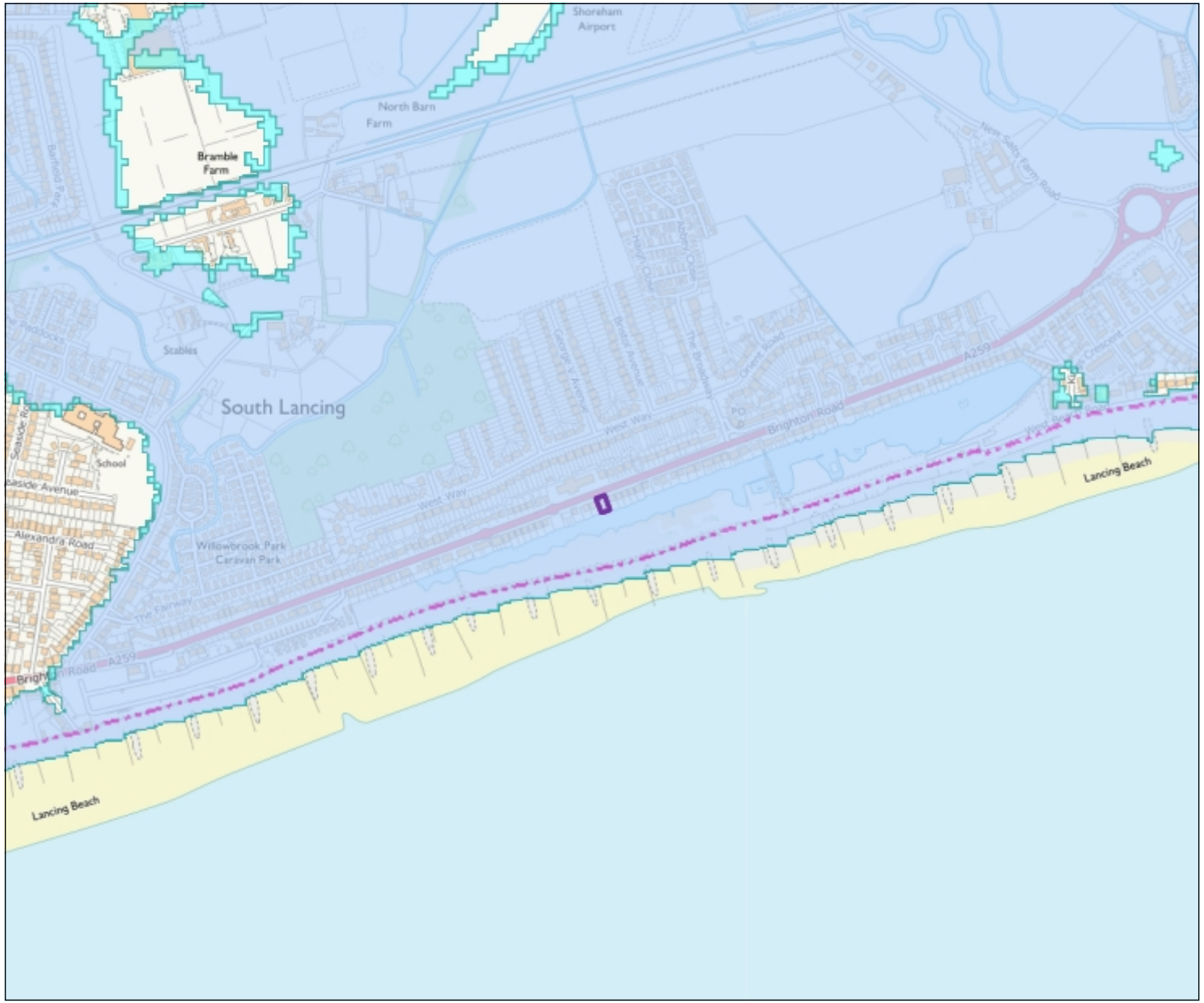
Flood Map for Planning (Rivers and Sea). Centred BN15 8LL. Created 12/09/2017.



Environment Agency

Scale 1: 10,000

N W E S

Flood Map for Planning (Rivers & Sea)

- Sealed Main Rivers
- Defences
- Flood Storage Areas
- Areas benefiting from flood defences
- 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 a 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 or the sea with up to a 1 in 1000 chance of occuring each year.

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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Historical Flood Outlines. Centred BN15 8LL. Created 12/09/2017.

Environment Agency

Legend

- Statutory Main Rivers
- All recorded flood outlines



0 100 200 300

Metres

N W E S

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Product 4 Flood Risk Data Requested by: Aaron Jones

Site: 158 Brighton Road, Lancing, West Sussex, BN15 8LL.

Table 1: Water Levels: Tidal Undefended

	NGR		Modelled Flood Levels in Metres				
			Undefended Annual Exceedance Probability				
Node Reference	Eastings	Northings	5%	0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	519759	104169	3.92	4.24	-	5.41	4.47
2	519771	104174	3.92	4.24	-	5.41	4.47
3	519768	104162	3.92	4.25	-	5.41	4.47
4	519766	104149	3.92	4.25	-	5.41	4.47
5	519778	104152	3.92	4.25	-	5.41	4.47

Table 2: Water Levels: Tidal Defended

	NGR		Modelled Flood Levels in Metres				
			Defended Annual Exceedance Probability				
Node Reference	Eastings	Northings	5%	0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	519759	104169	-	2.42	-	5.05	3.28
2	519771	104174	-	2.42	-	5.05	3.28
3	519768	104162	-	-	-	5.05	3.28
4	519766	104149	-	2.42	-	5.05	3.28
5	519778	104152	-	2.42	-	5.05	3.28

Table 3: Water Depth: Tidal Undefended

	NGR		Modelled Flood Depth in Metres				
			Undefended Annual Exceedance Probability				
Node Reference	Eastings	Northings	5%	0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	519759	104169	1.77	2.09	-	3.26	2.32
2	519771	104174	1.90	2.22	-	3.39	2.45
3	519768	104162	1.29	1.62	-	2.79	1.85
4	519766	104149	1.62	1.95	-	3.11	2.18
5	519778	104152	1.78	2.11	-	3.28	2.34

Table 4: Water Depth: Tidal Defended

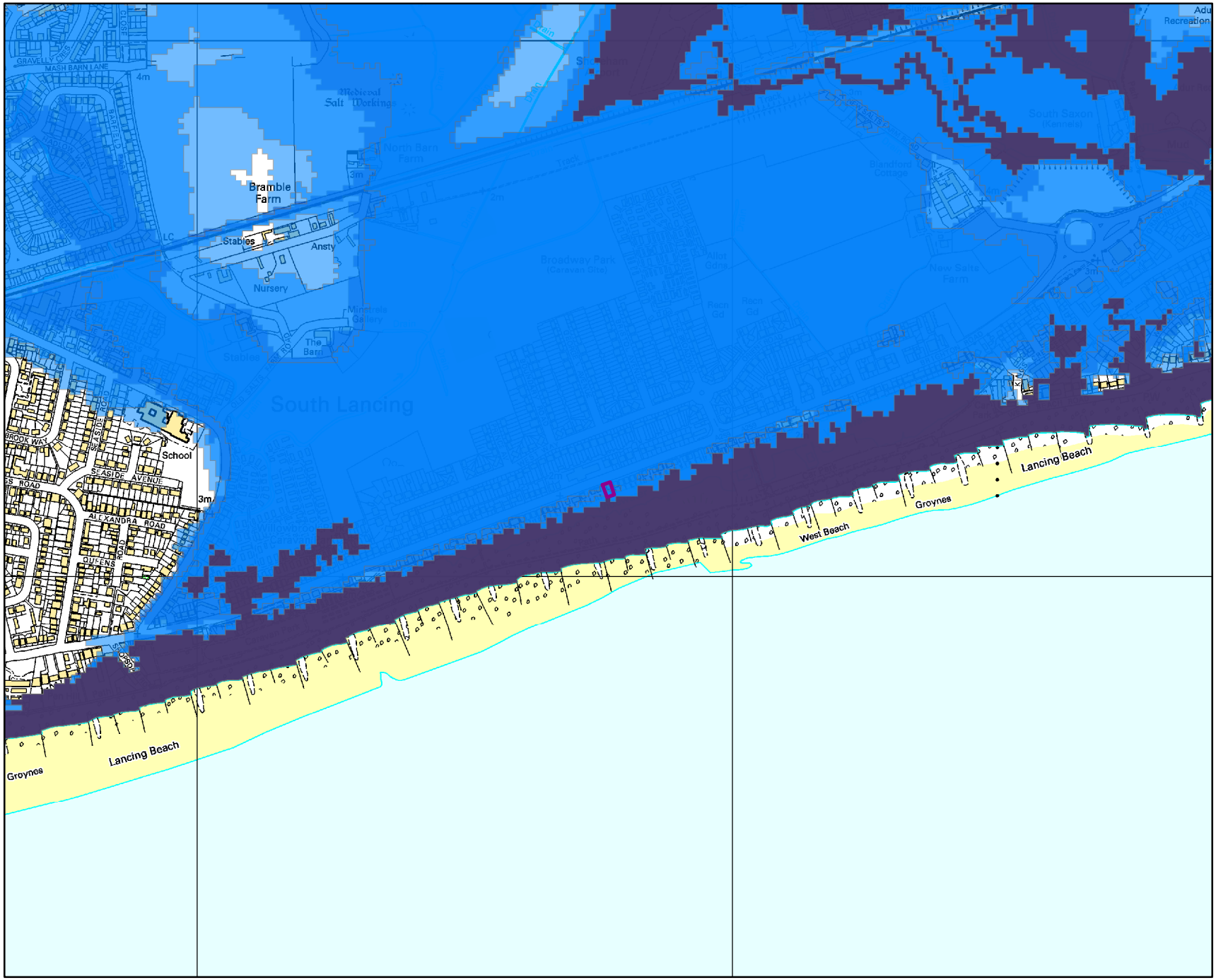
	NGR		Modelled Flood Depth in Metres				
			Defended Annual Exceedance Probability				
Node Reference	**Eastings**	**Northings**	**5%**	**0.5%**	**0.5% (2070)**	**0.5% (2115)**	**0.1%**
1	519759	104169	-	0.27	-	2.90	1.13
2	519771	104174	-	0.40	-	3.03	1.26
3	519768	104162	-	-	-	2.43	0.66
4	519766	104149	-	0.30	-	2.75	0.99
5	519778	104152	-	0.29	-	2.92	1.15

All levels taken from: Arun to Adur Coastal Modelling, completed in 2012 by JBA Consulting

There is no additional information or health warnings for these levels/depths or the model from which they have been produced.

Produced on 13/09/2017

Modelled Flood Outlines (Defended Tidal). Centred BN15 8LL. Created 12/09/2017 (Ref: SSD58747).



Environment Agency

N

Legend

- Site Boundary
- Main River
- 5% AEP (2012) (Defended)
- 0.5% AEP (2012) (Defended)
- 0.5% AEP (2070) (Defended)
- 0.5% AEP (2115) (Defended)
- 0.1% AEP (2012) (Defended)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occuring in any given year.

Scale: 1:10,000

0 0.2 0.4

Kilometers

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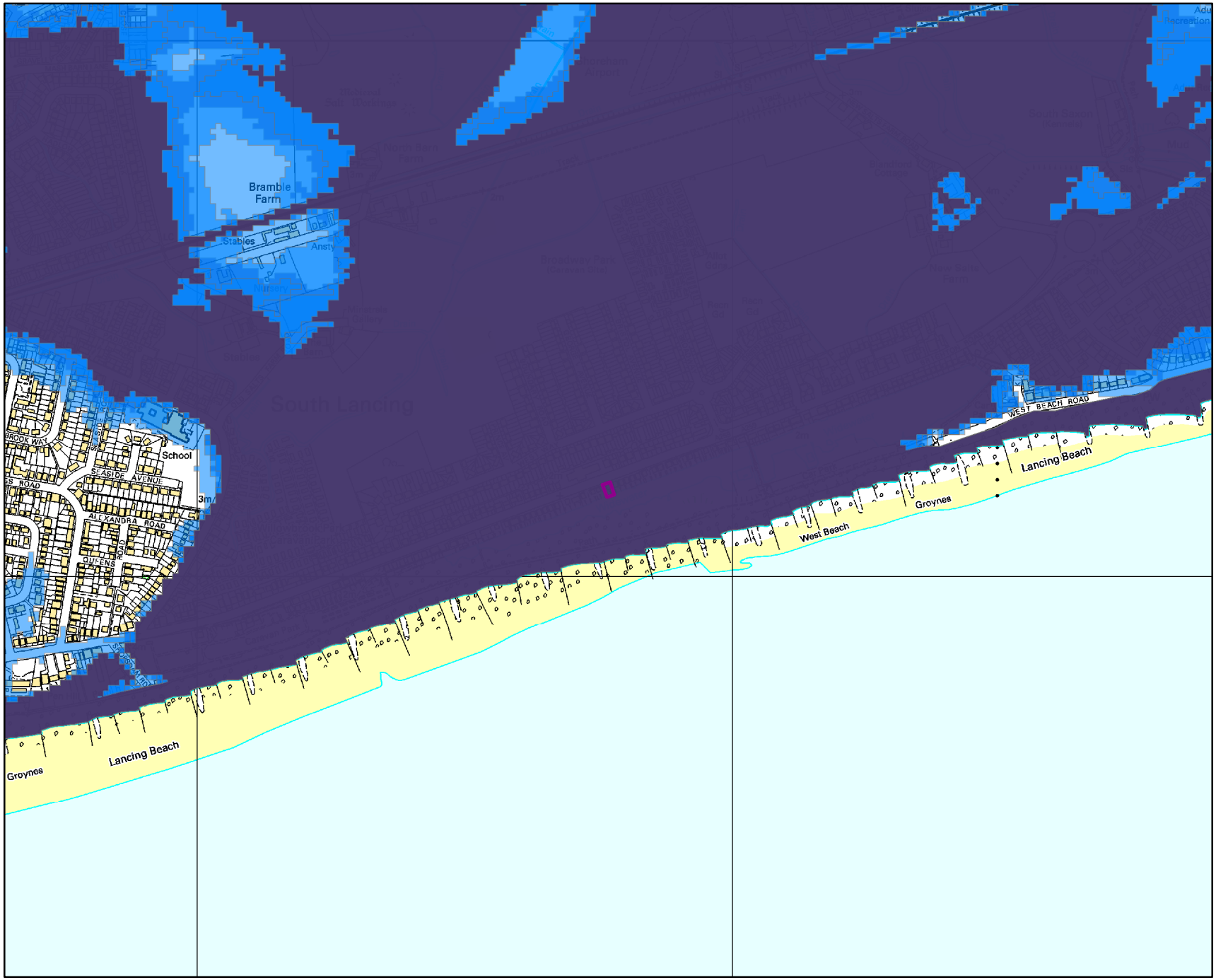
Modelled Flood Outlines (Undefended Tidal). Centred BN15 8LL. Created 12/09/2017 (Ref: SSD58747).



Environment Agency

N

Legend

- Site Boundary
- Main River
- 5% AEP (2012) (Undefended)
- 0.5% AEP (2012) (Undefended)
- 0.5% AEP (2070) (Undefended)
- 0.5% AEP (2115) (Undefended)
- 0.1% AEP (2012) (Undefended)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occuring in any given year.

Scale: 1:10,000

0 0.2 0.4

Kilometers

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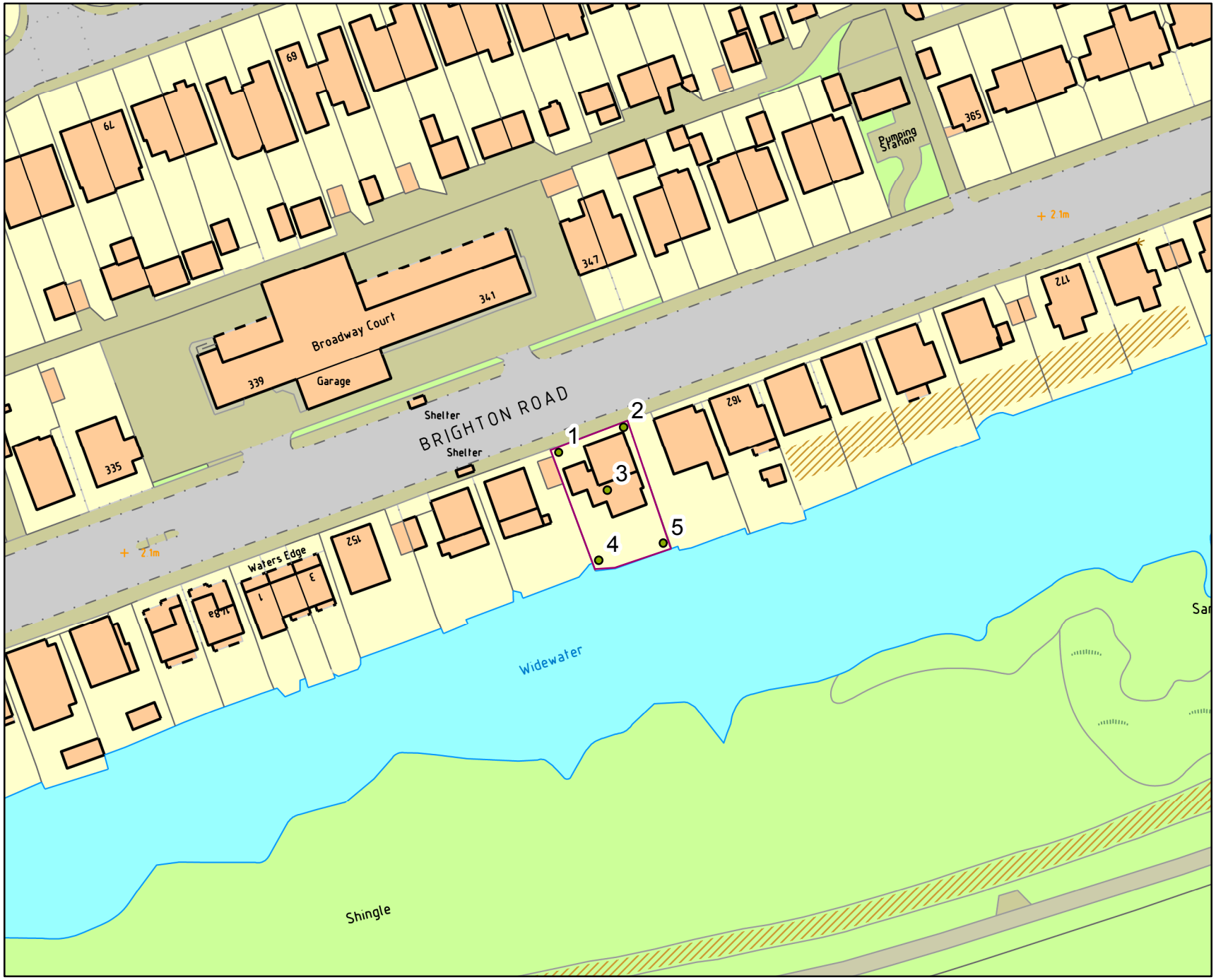
Site Boundary and Node Points. Centred BN15 8LL. Created 27/09/2017 (Ref: SSD58747).



Environment Agency

N

Legend

- Site Nodes
- Site Boundary
- Main River

Scale: 1:1,000

0 0.025 0.05

Kilometers

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Use of Environment Agency Information for Flood Risk 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:-
https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

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.

You should refer to the Environment Agency's Flood Risk Standing Advice, Planning Practice Guidance, and the existing PPS25 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:

https://www.gov.uk/flood-risk-assessment-standing-advice
http://planningguidance.planningportal.gov.uk/
http://www.planningportal.gov.uk/planning/planningpolicyandlegislation/previousenglishpolicy/ppgpps/pps25

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

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment (FRA) where one is required, but does not constitute such an assessment on its own.

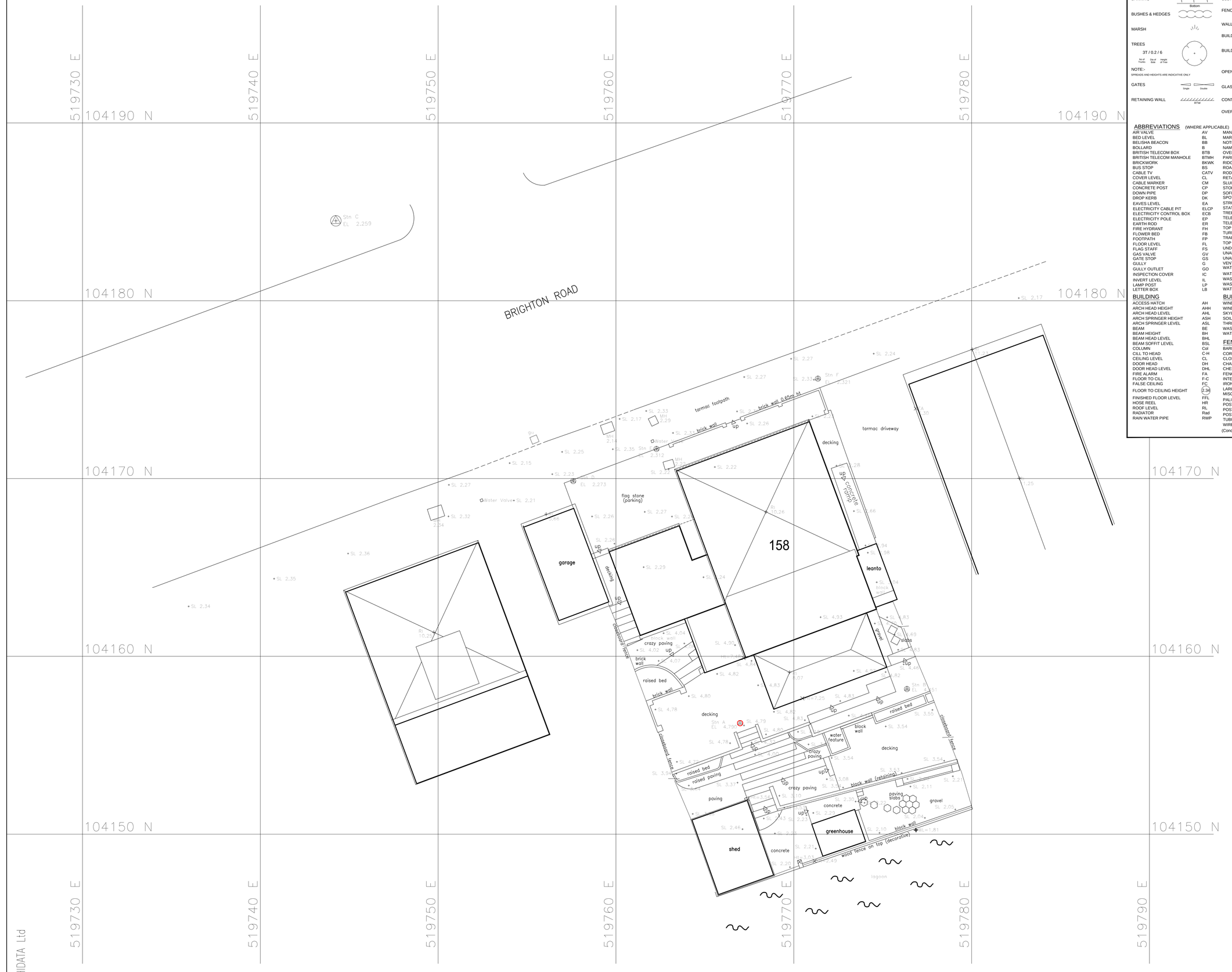
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or overland runoff. The information produced by the local planning authority referred to above may assist here.

3. Where a planning application requires a FRA 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.

Appendix B

Site Topographic Survey



LEGEND

BANKING (Top / Bottom)
BUSHES & HEDGES
MARSH
TREES — 3T / 0.2 / 6 (No of Trunks / Dia of Bole / Height of Tree)
NOTE:- SPREADS AND HEIGHTS ARE INDICATIVE ONLY
GATES (Single / Double)
RETAINING WALL (RTW)
SLOPING MASONRY
FENCE
WALL (Width drawn to scale) 0.23m
BUILDING - SURVEYED
BUILDING - NOT SURVEYED
OPEN SIDED BUILDING
GLASS ROOFED
CONTOURS 25.50
OVERHEAD WIRES

ABBREVIATIONS (WHERE APPLICABLE)

AIR VALVE	AV	MANHOLE	MH
BED LEVEL	BL	MARKER	MKR
BELISHA BEACON	BB	NOTICE BOARD	NB
BOLLARD	B	NAME PLATE	NP
BRITISH TELECOM BOX	BTB	OVERHEAD WIRES	OHW
BRITISH TELECOM MANHOLE	BTMH	PARKING METER	PM
BRICKWORK	BKWK	RIDGE LEVEL	RID
BUS STOP	BS	ROAD SIGN	RS
CABLE TV	CATV	RODDING EYE	RE
COVER LEVEL	CL	RETAINING WALL	RTW
CABLE MARKER	CM	SLUICE VALVE	SV
CONCRETE POST	CP	STOP COCK	SC
DOWN PIPE	DP	SOFFIT LEVEL	SOF
DROP KERB	DK	SPOT LEVEL	SL
EAVES LEVEL	EA	STRUCTURAL SLAB LEVEL	SSL
ELECTRICITY CABLE PIT	ELCP	STATION	STN
ELECTRICITY CONTROL BOX	ECB	TREE STUMP	ST
ELECTRICITY POLE	EP	TELEGRAPH POLE	TP
EARTH ROD	ER	TELEPHONE CALL BOX	TCB
FIRE HYDRANT	FH	TOP OF KERB	TK
FLOWER BED	FB	TURNSTILE	TS
FOOTPATH	FP	TRAFFIC LIGHT	TL
FLOOR LEVEL	FL	TOP OF WALL	TW
FLAG STAFF	FS	UNDERGROUND	UG
GAS VALVE	GV	UNABLE TO LIFT	UTL
GATE STOP	GS	UNABLE TO SURVEY	UTS
GULLY	G	VENT PIPE	VP
GULLY OUTLET	GO	WATER LEVEL	WL
INSPECTION COVER	IC	WATER METER	WM
INVERT LEVEL	IL	WASH OUT	WO
LAMP POST	LP	WASTE PIPE	WP
LETTER BOX	LB	WATER VALVE	WV

BUILDING

ACCESS HATCH	AH	WINDOW CILL LEVEL	WCL
ARCH HEAD HEIGHT	AHH	WINDOW HEAD LEVEL	WHL
ARCH HEAD LEVEL	AHL	SKYLIGHT	SL
ARCH SPRINGER HEIGHT	ASH	SOIL AND VENT PIPE	SVP
ARCH SPRINGER LEVEL	ASL	THRESHOLD LEVEL	THL
BEAM	BE	WASH BASIN	WB
BEAM HEIGHT	BH	WATER TANK	WT
BEAM HEAD LEVEL	BHL		
BEAM SOFFIT LEVEL	BSL		
COLUMN	Col		
CILL TO HEAD	C-H		
CEILING LEVEL	CL		
DOOR HEAD	DH		
DOOR HEAD LEVEL	DHL		
FIRE ALARM	FA		
FLOOR TO CILL	F-C		
FALSE CEILING	FC		
FLOOR TO CEILING HEIGHT	2.34		
FINISHED FLOOR LEVEL	FFL		
HOSE REEL	HR		
ROOF LEVEL	RL		
RADIATOR	Rad		
RAIN WATER PIPE	RWP		

FENCES

BARBED WIRE FENCE	BWF
CORRUGATED IRON FENCE	CIF
CLOSE BOARD FENCE	CBF
CHAIN LINK FENCE	CLF
CHESTNUT PALING FENCE	CPF
FENCE POST	FPO
INTERWOVEN FENCE	IWF
IRON RAILING FENCE	IRF
LARCH LAP FENCE	LLF
MISCELLANEOUS FENCING	Misc.F
PALISADE FENCE	PF
POST AND CHAIN FENCE	PCF
POST AND RAIL FENCE	PRF
POST AND WIRE	PWF
TUBULAR STEEL RAIL	TSRF
WIRE MESH FENCE	WMF

(Concrete Post/Steel Post/Timber Post) (CP/SP/TP)

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NOTES

1. The Survey Grid is on Ordnance Survey Level & Grid.
2. Fences shown are not necessarily legal boundaries.
3. Dimensions should not be scaled. All dimensions should be checked on site before any fabrication / construction.
4. All drainage connections shown are sounded only. They have not been water tested.
5. Copyright of all data produced by ARCHIDATA shall remain with ARCHIDATA unless otherwise specifically agreed.
6. Information provided should not be altered or modified in any way. It should not be used for any purpose other than for which it was intended and should not be issued to other parties without prior agreement of ARCHIDATA.
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10. The tree species have been identified to the best of the surveyors knowledge. They have not been verified by an Arboriculturist and are not guaranteed. If they are important they should be verified. Tree heights are estimated. Trees have been shown diagrammatically (i.e. circular), however, their true shape in plan will be different.
11. Some CAD layers exists with additional information which are turned off.
12. This survey has been carried out to an accuracy consistent scale of 1:100; therefore interrogated dimensions will be within the tolerance associated with this scale. The same accuracies implied by the plottingscale are equally applicable to digital data supplied for CAD. The scale of this drawing should not be changed withour permission.

Note:
Survey is based on OS datum of +4.790 Station A shown ringed in red.

REV	DATE	BY	AMENDMENT

N

TOPO SURVEY

archidata
specialist land and building surveyors
THE DESIGN STUDIO
94 HIGH STREET, STEYNING
WEST SUSSEX BN44 3RD
TEL: (01903) 863225
MOB: (07762) 146343
info@archidata.co.uk
www.archidata.co.uk

CLIENT
Mr Chris Webb

JOB TITLE
158 Brighton Road
Lancing
West Sussex
BN15 8LL

DRAWING TITLE
Topographical Survey

DATE	SCALE-A1 SHEET	DRAWN BY	CHECKED
13.09.2017	1:100	SC	RM

JOB NO.	DRAWING NO.	REVISION
AD17194	1.01	

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SCALE 1:100

TOPOGRAPHICAL SURVEY

Appendix C

Flood Warning and Evacuation Plan

ASHFIELD
— SOLUTIONS GROUP —

29/09/2017

Ref. 85217-F02

Flood Warning & Evacuation Plan

158 Bright Road, Lancing, West Sussex, BN15 8LL

Mr Chris Webb

UNLOCK - SECURE - PROTECT - CREATE

Cwm Cynon Business Park, Mountain Ash, Rhondda Cynon Taf, CF45 4ER
t: 0845 873 1466 **www.ashfieldsolutions.com**

Document Control

Client	Mr Chris Webb
Report Title	Flood Warning Evacuation Plan – 158 Bright Road, Lancing, West Sussex, BN15 8LL
Report Reference	Ref. 85217-F02
Report Status	Final
Prepared by	David Kerr
Checked by	Aaron Jones
Approved by	Chris Marshall
Date of Issue	29/09/2017
Issue Method	PDF

Distribution

Mr Chris Webb

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1.3 Site Description 2
2 Flood Risk Evaluation 3
3 EA Flood Warning 4
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3.2 Flood Information Service 4
3.3 Flood Warnings Registration 4
3.4 EA Flood Warning Codes 4
4. Site Evacuation Plan 7

1 Introduction

Ashfield Flood Risk Solutions ("Ashfield") was commissioned on 29th August 2017 by Mr Chris Webb ("the client") to conduct a Flood Risk Assessment ("FRA") to support retrospective planning permission for a two-dwelling residential apartment building located at 158 Brighton Road in Lancing, West Sussex, BN15 8LL ("the site" or "the property"). This Flood Warning and Evacuation Plan further supports the FRA, of which it exists as an Appendix within.

1.1 Purpose of Report

The overall aim of this FWEP is to provide a site-specific action plan to ensure that any persons/occupants within the site are in a fully informed position regarding the risk of flooding and what actions to carry out should a flood event of significant magnitude occur.

1.2 Limitations

This document is submitted in support of a retrospective planning application for a change of use from a single dwelling residential property to a two-dwelling residential apartment building. Subsequent redevelopment of any of the site will be subject to separate planning applications in due course, and do not form part of this planning application. A separate FWEP should be submitted as part of any further future planning applications.

1.3 Site Description

The site is positioned at XY coordinates 519770, 104168 (nearest postcode BN15 8LL). The site occupies an area of 0.04 hectares (ha) and currently comprises a two-dwelling residential apartment building with off-street parking and a shared garden space to the rear. The site is surrounded by residential properties to the north, east and west, and by the Widewater estuarine lagoon to the south.

2 Flood Risk Evaluation

The following sections provide an evaluation of the risk posed by the key flood risk sources in relation to the site location. Consideration is given to the severity of flood risk to the site as a whole, making use of existing flood mapping, high-level local strategic studies and available topographic information.

Table 1 provides a summary of the classification of risk to the site from all flood sources and indicates where further considerations are required in the context of the proposed development.

Table 1: Flood Risk Summary

Flood Risk Source	Risk Rating	Overall Risk Classification
Fluvial	Negligible	The site is not identified to be affected by fluvial flood risk.
Tidal	Medium	The site is located within Flood Zone 3a, with the ground floor of the property predicted to be below the 1 in 200 year extreme tidal level.
Surface Water	Negligible	The site has not been identified to be at risk, and no historic evidence exists of flooding from this source on site.
Reservoir Failure	Negligible	The Flood Warning Information Service interactive flood map details that the site would not be affected by a catastrophic failure of the nearest reservoir.
Groundwater	Low	The site is not located in an area susceptible to groundwater flooding, and there is no record of historical flooding from this source
Artificial Sources	Low	No risk from artificial sources have been identified on site.

3 EA Flood Warning

3.1 Likelihood of Flooding

As previously discussed, the likelihood of flooding on site is regarded as medium from tidal risk, and therefore, a Flood Warning and Evacuation plan is required.

3.2 Flood Information Service

The Flood Information Service is a live website which provides up to date flood warning information based on postcode locations, using the link: https://flood-warning-information.service.gov.uk/. Furthermore, Floodline can be called to receive up-to-date flooding information through the following number: 0845 988 1188. The postcode for the site is: BN15 8LL

3.3 Flood Warnings Registration

Signing up for the EA Flood Warning Service is required to be undertaken by the occupants of the developments. The service is free, and information is provided through telephone, mobile, email, SMS text message or fax. The information provided through these channels would be based on continually updated information that would also be available through the aforementioned Flood Information Service. Registration for this service can be carried out over the phone (0845 988 1188) or by using the following link: https://www.gov.uk/sign-up-for-flood-warnings

Once registered, warnings will be issued up to five days in advance.

3.4 EA Flood Warning Codes

Flood warnings are issued at differing levels of magnitude, defined as "flood warning codes" based on the latest EA guidance[1]. These codes relate to the level of risk that the site is potentially at, and each one is outlined overleaf.

Disclaimer

Where possible, Ashfield has provided site specific advice that provides an increased level of understanding of what actions may need to be taken for the differing levels of flood warning severity on site. The responsibility of engaging with the correct information providers, and carrying out specific actions that relate to the severity of warning lies with the client or occupants. Information on flood warnings can be sought using the direct links provided within this FWEP.

[1] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/311020/flood_warnings_LIT_5215.pdf

3.4.1 Three Day Forecast

"Be aware. Think ahead. Keep an eye on the weather situation".

Forecasts are updated daily on the Flood Information Service Website and more frequently for situations of increased flood risk. National mapping within this interface will show one of four levels of risk for each county:

- Green = No risk of flooding.
- Yellow = Low risk of flooding.
- Amber = Medium risk of flooding.
- Red = High risk of flooding.

3.4.2 Flood Alert

"Flooding is possible. Be prepared".



A *Flood Alert* shall be issued between two hours and two days in advance depending on the confidence of the prediction methods. This may be triggered by:

- Unusually high predicted tide or surge levels;
- Weather forecast predicting intense rainfall within the vicinity of the site or further upstream;

Site Specific Action

This magnitude of warning should trigger an increased level of awareness on site. Although the likelihood of flooding occurring on site is deemed low, all occupants are recommended to;

- Be made aware that this warning is in place, and be kept informed;
- Be mindful of potential areas of localised water accumulation and report these instances immediately;
- Monitor local water levels;
- Periodic checking of the Flood Information Service should be carried out every two hours to establish whether the Flood Alert has been de-escalated, or escalated to a higher level (Flood Warning or Severe Flood Warning);
- Keep informed of any updates.

3.4.3 Flood Warning

"Flooding is expected. Immediate action required".



Flood Warnings are issued half an hour to one day in advance of potential flooding occurring, depending on the accuracy of the prediction methods. This may be triggered by:

- High tides combined with strong winds;
- Forecasted heavy rainfall within close proximity or upstream of the site;

Site Specific Action

A *Flood Warning* would warrant an increased level of vigilance and include the following recommended actions:

- Ensure that any localised accumulation of water is identified and monitored;
- Ensure that all access and egress routes are still fully passible, and not being encroached by flood water;
- Periodic checking of the Flood Information Service should be carried out every two hours to establish whether the *Flood Warning* has been de-escalated, or escalated to a higher level (*Severe Flood Warning*);

3.4.4 Severe Flood Warning

"Severe flooding. Danger to life".



A *Severe Flood Warning* poses a significant risk to life or significant disruption to local communities or infrastructure. Escalation to this level would be triggered by:

- Actual flooding being identified where it poses significant risk to life;
- Breach of flood defences or failure of a flood barrier;
- Specialised knowledge of the area that warrants its escalation.

Site Specific Action

When a Severe Flood Warning is in place, the following actions are recommended to be undertaken:

- This level of risk warrants that access to site should be avoided, and that all occupants should evacuate or seek higher ground;
- Continual monitoring of the Flood Information Service, as well as local media to understand the potential length and magnitude of the risk;
- Communication directly with the EA;
- The site should not be accessed until confirmation can be sought that the *Severe Flood Warning* has been removed, and further clarification from the emergency services has been given that safe access to site has been restored.

3.4.5 Warning No Longer In Force

"No further flooding is currently expected for your area".

When flood warnings are no longer in force, this means that the risk of flooding has subsided, and no further flooding is expected. This decision will have been triggered through the judgement of professionals and discussions with partners which are in agreement for this to occur.

Site Specific Action

Should flooding have occurred on site, it should be initially evaluated whether access has been fully re-established to site. This should be done in conjunction with the EA, Emergency Services, and any other party that has specialist knowledge of how the property operates.

The scope of this FWEP does not cover any further actions that should be undertaken on site should severe damage have occurred. In this instance, the occupants should work alongside the EA and relevant authorities to establish whether it is safe to access the site.

4. Site Evacuation Plan

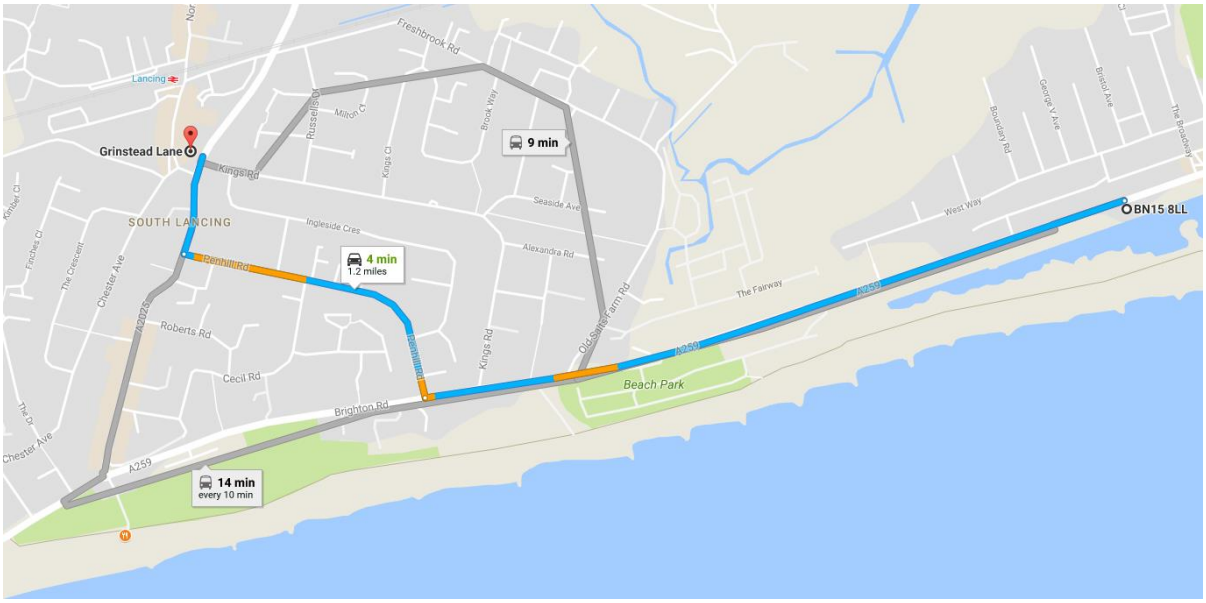
4.1 Introduction

An evacuation plan is required to ensure that a safe egress route has been provided to a safe refuge point should flooding be identified to occur on site or along any important access routes.

4.2 Safe Refuge Point

A safe refuge area is to be established, and not located where potential flooding could occur. Based upon this, it is recommended that the site is evacuated prior to a flood event occurring. Figure 1 below shows the sites location in relation to nearest point of safe refuge, which is not liable to flooding (The Farmers Lancing Public House).

Figure 1. Safe Refuge Point.



The following link can be used to open the above map online:

https://www.google.co.uk/maps/dir/Brighton+Rd,+Lancing+BN15+8LL/50.8258325,-0.3226044/@50.8237526,-0.3170775,16z/am=t/data=!4m8!4m7!1m5!1m1!1s0x487599c00c40ce67:0xa0266d19038cfa1e!2m2!1d-0.2996874!2d50.824935!1m0

Safe Refuge Point Location Description & Address:

The Farmers Lancing Public House, 17 South St, Lancing BN15 8AE

XY Coordinates: 518233, 104262

Access

It is recommended that the refuge point is accessed by vehicle due to the lack of facilities locally and for the protection from the weather.

4.3 Evacuation Procedure

Following the flood warning guidelines seen in section 3, the Evacuation Procedure would be instigated where risk to life is identified. In this instance, all occupants should be informed that the property is to be fully evacuated. All occupants should proceed to the pre-determined egress route to the refuge point. Where the inundation of flooding does not allow sufficient time to vacate the property, alternative refuge should be sought on the first flood of the property. Additionally to this, the emergency services should be contacted to ensure the safety of the occupants has been fully achieved, and await further instruction prior to leaving the safe refuge point.

4.4 Flood Resistance Deployment

Where manually applied flood protection measures are incorporated into the building design, these should be deployed when any *Flood Alert* is issued, and not removed until it has been established that *Warning No Longer In Force*.

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