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DRAFT

Flood Risk Assessment

Proposed development at

131A Sea Road, East Preston

On behalf of

Mr & Mrs Steel

July 2019

Document History and Status

Project Number 23023

Date	Version	Prepared By	Reviewed By	Approved By
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1 Non Technical Summary

- 1.1 This Flood Risk Assessment has been undertaken in accordance with the National Planning Policy Framework on behalf of Mr & Mrs Steel in support of a Planning Application for a change of use of an existing storage building to a residential dwelling and relocation of existing mobile caravans on land east of Sea Road, East Preston.
- 1.2 This Assessment is to be read in conjunction with all planning, architectural and other reports that accompany the Planning Application for the proposed development.
- 1.3 The Environment Agency flood data indicates that the proposed development is located within Flood Zone 3.
- 1.4 Topographic survey information confirms the site is located in Flood Zone 3 and is at risk from tidal flooding. The site is not at risk from fluvial flooding or at risk of flooding from overland flows or groundwater.
- 1.5 The Environment Agency flood modelling indicates that the future predicted 1 in 200 flood level for the year 2115 is 5.82m AOD. The finished floor level of the dwelling is 5.67m AOD.
- 1.6 Foul water and surface water runoff will be discharged in the same manner as the former use.

2 Planning Policy Context

2.1 National Planning Policy Framework

2.1.1 The National Planning Policy Framework was updated in February 2019.

2.1.2 With regard to planning and flood risk paragraph 163 of the NPPF states that :when determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment.

Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
- b) the development is appropriately flood resistant and resilient;
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
- d) any residual risk can be safely managed; and
- e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.~

2.1.3 With regard to minor developments the NPPF states that :applications for some minor development and changes of use (reference footnote 51) should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 50.~

2.1.4 Footnote 50 reads :a site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.)~

2.1.5 Footnote 51 reads :this includes householder development, small non-residential extensions (with a footprint of less than 250m²) and changes of use; except for changes of use to a caravan, camping or chalet site, or to a mobile home or park home site, where the sequential and exception tests should be applied as appropriate.~

2.2 Lead Local Flood Authority

2.2.1 West Sussex County Council became a Lead Local Flood Authority under the Flood and Water Management Act 2010 and was given a series of new responsibilities to coordinate the management of local flood risk.

2.2.2 As part of their role West Sussex County Council has commissioned and produced the following documents:

- ¿ Strategic Flood Risk Assessment - January 2010
- ¿ Preliminary Flood Risk Assessment - May 2011
- ¿ Local Flood Risk Management Strategy - May 2014

The above documents have been reviewed in the preparation of this report.

2.3 Arun District Council

2.3.1 Arun District Council has commissioned and produced the following documents:

- ¿ Combined Level 1 and Level 2 Strategic Flood Risk Assessment - Final Report - November 2016

2.3.2 The above document has been reviewed in the preparation of this report.

2.4 Local Planning Policy

2.4.1 The Arun Local Plan 2011-2031 was adopted on 18 July 2018

2.4.2 The following policies are of specific relevance to this Flood Risk Assessment:

Policy W DM2 Flood Risk states that development in areas at risk from flooding, identified on the latest Environment Agency flood risk maps and the Council's Strategic Flood Risk Assessment (SFRA), will only be permitted where all of the following criteria have been satisfied:

- a. The sequential test in accordance with the National Planning Policy Guidance has been met.
- b. A site specific Flood Risk Assessment demonstrates that the development will be safe, including access and egress, without increasing flood risk elsewhere and reduce flood risk overall.
- c. The sustainability benefits to the wider community are clearly identified.
- d. The scheme identifies adaptation and mitigation measures.
- e. Appropriate flood warning and evacuation plans are in place; and

- f. New site drainage systems are designed to take account of events which exceed the normal design standard i.e. consideration of flood flow routing and utilising temporary storage areas.

The reports prepared as part of the criteria above must take into account contingency allowances, taking climate change into account as set out in Flood Risk Assessments: climate change allowances section of the NPPG.

In locations where strategic flood defence or resilient and resistant construction measures are necessary within the site itself, proposals will be required to demonstrate how measures have been incorporated as an intrinsic part of the scheme in a manner which is compatible with the latest Strategic Flood Risk Assessment.

All development proposals must take account of relevant Surface Water Management Plans, Catchment Flood Management Plans and related Flood Defence Plans and strategies such as the Lower Tidal River Arun Strategy

The council may require financial contributions from development on sites where measures to address flood risk or to improve the environmental quality of watercourses have been identified by these Plans and Strategies.

3 Existing Site

3.1 Site Location

3.1.1 The development site is located on the Coastal Caravan Park at 131A Sea Road, East Preston at Ordnance Survey reference TQ 071 015. The nearest postcode is BN16 1PD.



Image 1: Site Location

3.1.2 A copy of the site location plan is located in Appendix 1 at the rear of this report.

3.2 Site Description

3.2.1 The site is approximately 400m² in area and is occupied in part by a storage building serving the Coastal Caravan Park and in part by up to 12 mobile caravans.

3.2.2 The site specific topographical survey confirms the existing ground levels are at their highest point to the northeast boundary of the site at a level of approximately 5.7m AOD.

3.2.3 The site slopes towards the southeast where the lowest point of the site is at a level of approximately 5.0m AOD.

3.2.4 The site is bounded to the north by residential properties, to the east and south by the Coastal Caravan Park and to the west by Sea Road.

3.2.5 The site is located 100m north of the coast and there are no existing watercourses in the immediate vicinity.

3.2.6 A copy of the existing site layout plan is located in Appendix 2 at the rear of this report.

3.3 Existing Drainage

3.3.1 It is assumed that the surface water runoff from the existing building is discharged into the onsite foul sewer network.

3.3.2 Foul drainage is discharging into the public foul sewer located beneath Sea Road to the east of the site.

3.3.3 A copy of the sewer records is located in Appendix 3 at the rear of this report.

3.4 Geology and Groundwater

3.4.1 British Geological Survey borehole information indicates a variety of clay underlain by sand, gravel and chalk layers in the wider locality.

3.4.2 The borehole logs confirm that approximately 1.8m of clay is overlying a presence of 6.1m of sand and gravel over the underlying chalk strata.

3.4.3 The online 'Magic Map' available from Defra confirms that the site is located above a major aquifer classified as having a high vulnerability.

3.4.4 Groundwater monitoring undertaken at Coastal Caravan Site between January and March 2017 identifies the ground water level varies between 0.64m - 2.2m below ground level.

3.4.5 A copy of the geological borehole data is located in Appendix 4 at the rear of this report.

4 Flood Zone and Flood History

4.1 Flood Zone

4.1.1 The Environment Agency Product 4 mapping indicates that the site is located in Flood Zone 3 and is at risk of tidal flooding.

4.2 Flood Defences

4.2.1 The site is located within an area benefiting from flood defences in the form of a sand and shingle beach maintained by Arun District Council.

4.2.2 The coastal flood risk management policy in this area is 'Hold the Line - Sustain', which includes the maintaining and replacement of groynes when they reach the end of their residual life. Arun District Council's long term strategy in this area is for the construction of a new sea wall, which is currently planned for the year 2060.

4.3 Flood History

4.3.1 Environment Agency

4.3.1.1 The Environment Agency maps of historic flood incidents do not show any historic flooding records at the proposed development site.

4.3.2 West Sussex County Council

4.3.2.1 Neither the Strategic Flood Risk Assessment dated January 2010, Preliminary Flood Risk Assessment dated May 2011, nor the Local Flood Risk Management Strategy dated May 2014 identify any specific flood incidents in the immediate vicinity of the site

4.3.3 Arun District Council

4.3.3.1 The Strategic Flood Risk Assessment dated August 2016 does not identify any specific flood related incidents within the vicinity of the site.

4.3.3.2 Arun District Council confirm the proposed development site is at risk of surface water flooding however they do not hold any records of historic flooding from surface water or land drainage recorded at the proposed development site.

4.3.4 Copies of Flood Maps and Correspondence are located in Appendix 5 at the rear of this report.

5 Flooding Potential

5.1 Tidal Flooding and Protection

- 5.1.1 The site is located 100m from the coast and is within Flood Zone 3.
- 5.1.2 The Environment Agency predicted tidal flood levels for the current 1:200 year event is 5.78m AOD and the predicted future year 2115 1:200 tidal event is 5.82m AOD.
- 5.1.3 Site specific topographic information shows the southeast section of the site at approximately 5.0m AOD rising across the site to 5.5m AOD in the vicinity of the proposed dwelling increasing in level to approximately 5.7m AOD on the northern edge of the site.
- 5.1.4 A copy of the Site Topographic Plan for the site is located in Appendix 6 at the rear of this report.

5.2 Fluvial Flooding

- 5.2.1 The area of the proposed site is not at risk of fluvial flooding from anything less extreme than a 1:1,000 year flood event.

5.3 Groundwater Flooding

- 5.3.1 The Arun District Council Strategic Flood Risk Assessment Groundwater Map confirms the site being located in an area with 25 - 50% chance of flooding.
- 5.3.2 Groundwater monitoring undertaken at Coastal Caravan Site between January and March 2017 identified groundwater level variations between 0.64m - 2.2m below ground level.
- 5.3.3 There is no indication in any of the West Sussex County Council Flood documents including the Preliminary Flood Risk Assessment, Strategic Flood Risk Assessment and the Local Flood Risk Management Strategy or other available flood maps of groundwater flooding affecting the site.

5.4 Overland Flow

- 5.4.1 The Environment Agency maps identify the northern parts of the site to be at low risk of flooding from overland surface water with the southern parts being at a medium risk. Low and medium risk flood depths are shown to be below 300mm across the site.
- 5.4.2 The locations identified are however minimal and all are isolated with no apparent flow route.

5.5 Flood Routing

- 5.5.1 The natural route for flood waters to dissipate should any ever occur on the site is towards the sea at the southeast site boundary.

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6 Development Proposals

6.1 Description

6.1.1 The development proposal is for a change of use of the former dinghy pen on the southern edge of the caravan site and conversion of the boat store / sail loft to a single residential dwelling. The vulnerability classification changes for both elements of the scheme from Less Vulnerable to More Vulnerable.

6.1.2 There will be no increase in impermeable area as a result of the development proposals.

6.1.3 A copy of the proposed site layout plan is attached at Appendix 7 at the rear of this report.

6.2 Finished Floor Levels

6.2.1 Ground floor finished levels of the dwelling are set at 5.67m AOD.

7 Safe Development

7.1 Flood Zone Compatibility

7.1.1 The site is located in Flood Zones 3.

7.1.2 With reference to the Technical Guidance to the National Planning Policy Framework the following sections are of relevance:

ð Table 2: Flood Risk Vulnerability Classification

Residential Development and mobile caravans are classified as More Vulnerable

ð Table 3: Flood Risk Vulnerability and Flood Zone Compatibility

More Vulnerable development is appropriate in Flood Zones 1 and 2

7.1.3 :More Vulnerable~ development in Flood Zone 3a is required to undertake the Exception Test for all major developments. However, current NPPF policy states that :applications for some minor development and changes of use (reference footnote 51) should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 50.~ As such the use of the Sequential and Exception Test are not considered as being applicable to the development.

7.1.4 The proximity to the coastline as a result of the re-configuration of the mobile caravan will only move a distance 10m closer to the coastline. Ground levels in this area are approximately 5.0m AOD matching levels under the existing configuration.

7.1.5 The mobile caravans associated with the Coastal Caravan Park are currently all located within Flood Zone 3. The reconfiguration of the caravans with therefore create no change to the sites flood risk. No additional caravans are to be kept within the boundary of the site.

7.1.6 Ground floor finished levels of the proposed dwelling are set at 5.67m AOD. This places the proposed dwelling below the future predicted 1 in 200 flood level for the year 2115 which is 5.82m AOD.

7.2 Safety during flood events

7.2.1 Proposed new dwelling

- 7.2.1.1 The residual risk of the site is to be safely managed and mitigated by the owner of the new dwelling who is accepting of the required management of ongoing flood risks and hazards for the new dwelling.
- 7.2.1.2 To assist in the management of flood risk and response at the site the owner of the new dwelling will sign up to the Environment Agency's flood warning service.
- 7.2.1.3 As documented in the Arun District Council Level 1 SFRA dated August 2016 due consideration has been given to minimising the flood risk of the development by planning development sequentially across the site with the new dwelling located in the lowest flood risk area of the site.
- 7.2.1.4 The introduction of mitigation measures is proposed as a last resort after a site based sequential approach for the conversion of the boat store / sail loft.
- 7.2.1.5 It is proposed to install 750mm temporary flood barriers on entrances to the new dwelling on receipt of a flood warning for flood events adding to the properties flood resilience. As documented in the Arun District Council Level 1 SFRA dated August 2016 demountable defences are not normally considered an acceptable form of flood protection for a new development they can be appropriate where there is existing development in the floodplain.
- 7.2.1.6 The owner of the new dwelling will have sole responsibility for erecting, maintaining and replacing all temporary measures associated within the site.
- 7.2.1.7 Where viable and appropriate the retrofitting of flood resistance and resilience measures to the development are to be implemented by the owner of the new dwelling in accordance with Building Regulations Approved Document C and best practice methods from 'Improving the Flood Performance of New Buildings - Flood Resilient Construction, Communities and Local Government, Defra and the Environment Agency', dated May 2007.
- 7.2.1.8 All service entry points including service meters and electrical sockets are to be placed above 5.82m AOD as far as reasonably practicable.

- 7.2.1.9 Wherever viable all electrical switchgear is to be located a minimum of 300mm above 5.82m AOD predicted future year 1:200 year flood level.
- 7.2.1.10 External protection will be provided to brickwork and weak points identified such as air bricks or cable ducts. Water resilient measures such as automatic air bricks and appropriate water-resistant foam will be used to reduce the risk of water ingress. Non-return valves should be used on any sewer outlets to minimise the risk of foul entering the building should the sewer network become overloaded.
- 7.2.1.11 As the site is susceptible to tidal flooding the time period that the site is to be affected by tidal inundation is foreseeable and will be acted upon by the site owner on receipt of a warning. As the threat is from tidal flooding and peak tide heights, the tidal flood event is likely to subside within 2 to 4 hours of the peak high tide.
- 7.2.1.12 Based on Environment Agency modelled flood levels the maximum flood depth within the vicinity of the new dwelling is not expected to exceed 300mm above existing ground levels during the future predicted 1:200 year flood event. Access and egress to the new dwelling can therefore be maintained. The site is anticipated to remain accessible to emergency vehicles during a tidal flood event.

7.3 Site Evacuation Plan

- 7.3.1 Should the owner of the site choose not to evacuate the new dwelling on receipt of a flood warning flood resilient measures will be put in place. During a major flood event the first floor of the property could become a safe haven.
- 7.3.2 It is recommended the site area consisting of the caravans are evacuated on receipt of an early flood warning via a dedicated evacuation route as part of the site's flood emergency and evacuation plan.
- 7.3.3 Given the site's tidal flood risk and the proposed managed onsite evacuation procedure it would be anticipated that sufficient warning would be received to relocate mobile caravans away from the coastline via Sea Road.
- 7.3.4 A specific flood emergency and evacuation plan will be developed where requested by the Local Planning Authority in coordination with the Local Authority's Emergency Planning Department to ensure the use of best practice methodologies aligning the plan with those already active in this area of the district.

7.4 Risk to Others

- 7.4.1 The volume of displacement features such as properties and caravans located in the tidal floodplain will remain and there will be no increase in the resultant flood risk.
- 7.4.2 The number of mobile caravans to be used on the site will remain as existing.
- 7.4.3 The residual risk of sewer flooding from this development for the foreseeable future is unaltered.

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8 Conclusions

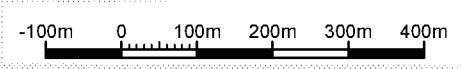
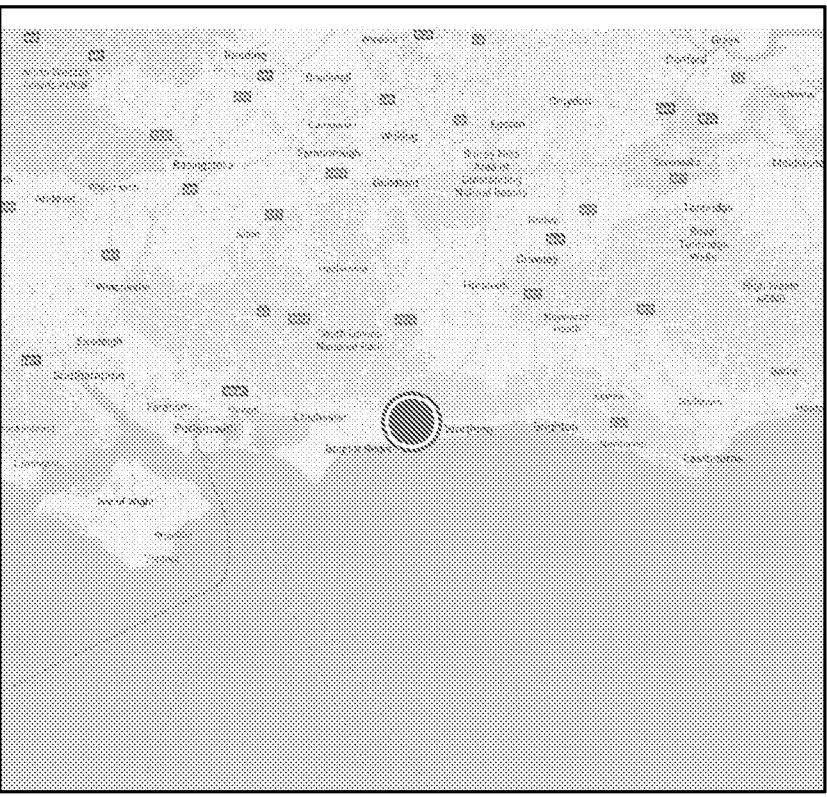
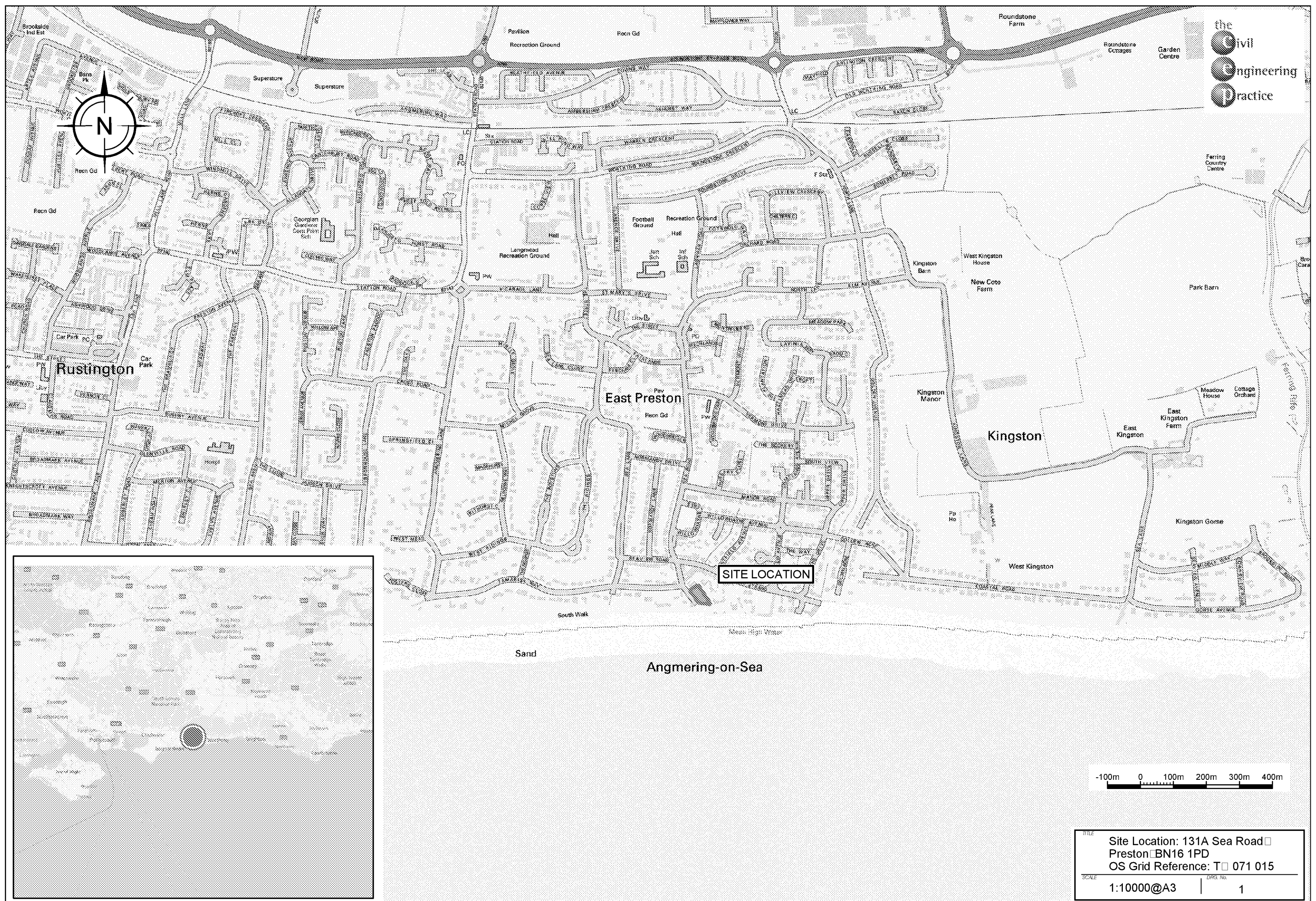
- 8.1 The site is located within Flood Zone 3 and is at risk from tidal flooding.
- 8.2 The site is not at risk from any other source of flooding and there is no recorded history of flooding at the site.
- 8.3 The proposed development will not increase offsite flood risk.
- 8.4 All existing caravans currently onsite are located in Flood Zone 3. The reconfiguration of the existing caravans using additional land in the southern section of the site will not increase the flood risk at the site with flood risk being managed as at present.
- 8.5 The Environment Agency flood modelling indicates that the future predicted 1 in 200 flood level for the year 2115 is 5.82m AOD. The Finished Floor Level of the proposed dwelling is 5.67m AOD.
- 8.6 The dwelling will incorporate flood resilient measures and temporary protection measures to protect against tidal flood events. Implementation of flood resilient mitigation measures for the dwelling will be the responsibility of and managed by the owner.
- 8.7 With recommended flood resilient measures in place the proposed dwelling is safe, suitable, sustainable and appropriate in this location with regards to flood risk planning.

9 List of Appendices, Images and Tables

Appendix 1	Site Location Plan
Appendix 2	Existing Site Layout Plan
Appendix 3	Sewer Records
Appendix 4	BGS Geological Borehole Records
Appendix 5	Flood Maps and Correspondence
Appendix 6	Site Topographic Plan
Appendix 7	Proposed Site Layout Plan
Image 1	Site Location

Appendix 1

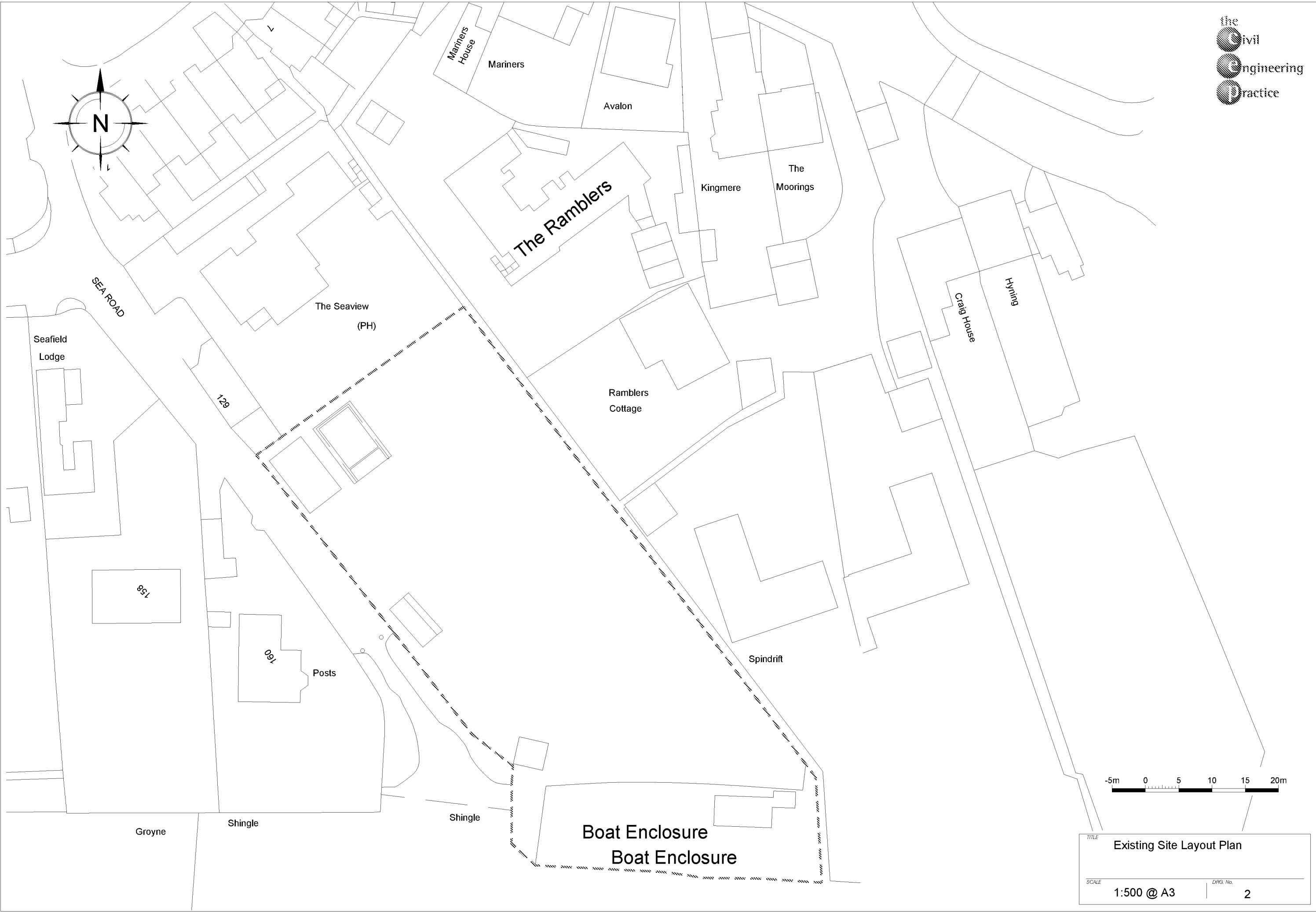
Site Location Plan



TITLE	
Site Location: 131A Sea Road □	
Preston □ BN16 1PD	
OS Grid Reference: T □ 071 015	
SCALE	DWG. No.
1:10000@A3	1

Appendix 2

Existing Site Layout Plan



Appendix 3

Sewer Records

101751



TQ0701NW



**Southern
Water**

ARUN DISTRICT COUNCIL EP/180/18/PL
E07A06

SEWER RECORDS PAGE 2 OF 2

Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape
0501X	6.07	2.02	175	VC	CIRC	4501X	6.37	3.75	225	VC	CIRC												
0502X	6.03	2.33	200	VC	CIRC	9504X	6.04	5.29	225	VC	CIRC												
0503X	6.14	5.25	225	VC	CIRC	9601X	5.85	2.85	150	VC	CIRC												
0604X	6.16	3.59	150	VC	CIRC	9602X	5.79	1.89	225	VC	CIRC												
0605X	6.07	3.22	175	VC	CIRC	9604X			100	PE	CIRC												
0701X	6.29	4.09	150	VC	CIRC	9605X			100	PE	CIRC												
0702X	6.55	3.56	200	VC	CIRC	9606X			100	PE	CIRC												
0703X			UNK	UNK	UNK	9607X			100	PE	CIRC												
1501X	5.29	3.31	175	VC	CIRC	960DX			100	PE	CIRC												
1502X	5.87	4.92	225	VC	CIRC	9701X	5.92	2.22	225	VC	CIRC												
1503X	5.69	2.71	225	VC	CIRC																		
1601X	5.72	4.9	225	VC	CIRC																		
1602X	5.86	4.84	225	VC	CIRC																		
1603X	5.98	4.74	225	VC	CIRC																		
1604X	6.05	3.6	150	VC	CIRC																		
1605X	6.07	4.92	225	VC	CIRC																		
1606X	5.76	3.01	175	VC	CIRC																		
1608X			UNK	UNK	CIRC																		
1609X			UNK	UNK	CIRC																		
160DX	6.06	4.8	225	VC	CIRC																		
160FX			225	VC	CIRC																		
1610X			150	VC	CIRC																		
1611X			150	VC	CIRC																		
1612X			150	VC	CIRC																		
1613X			UNK	UNK	UNK																		
1615X			UNK	UNK	UNK																		
1616X			150	VC	CIRC																		
1618X			UNK	UNK	CIRC																		
1628X			UNK	UNK	CIRC																		
1638X			UNK	UNK	CIRC																		
1648X			UNK	UNK	UNK																		
164DX			UNK	UNK	UNK																		
1701X	6.39	5.04	150	VC	CIRC																		
1702X	6.48	5.86	150	VC	CIRC																		
1703X	6.48	5.75	150	VC	CIRC																		
1704X			100	VC	CIRC																		
1705X			100	VC	CIRC																		
1706X			100	VC	CIRC																		
1707X			150	VC	CIRC																		
1708X			150	VC	CIRC																		
1709X			UNK	UNK	CIRC																		
1708X			150	VC	CIRC																		
1710X			150	VC	CIRC																		
1711X			UNK	UNK	UNK																		
1711Y			UNK	UNK	UNK																		
172DX			UNK	UNK	UNK																		
173DX			UNK	UNK	UNK																		
2601X	6.08		225	VC	CIRC																		
2602X	5.82	4.82	225	VC	CIRC																		
260DX			225	VC	CIRC																		
2703X	6.61	5.79	150	VC	CIRC																		
271DX			UNK	UNK	CIRC																		
3501X	6.23	4.1	225	VC	CIRC																		
3502X			UNK	UNK	CIRC																		
3503X			UNK	UNK	CIRC																		
3504X			UNK	UNK	CIRC																		
3505X			UNK	UNK	CIRC																		
350DX			UNK	UNK	CIRC																		
351DX			UNK	UNK	CIRC																		
352DX			225	VC	CIRC																		
354DX			UNK	UNK	CIRC																		
35ADX			UNK	UNK	CIRC																		
3601X	6.72	4.29	225	VC	CIRC																		
360DX			UNK	UNK	CIRC																		
3701X	6.48	5.23	150	VC	CIRC																		

LINE STYLES / COLOURS

Brown

----- Foul

----- Foul Syphon Sewer

----- Foul Vacuum Main

----- Foul Rising Main

----- Combined

----- Combined Syphon Sewer

----- Combined Rising Main

----- Lateral Drain

----- Building Over Agreement Area

----- Treated Effluent

----- Sludge

----- Sewer Catchment

----- Section 104 Area

----- Surface Water

----- Surface Water Rising Main

----- Private

----- Access Shaft

----- Decommissioned

MATERIALS

AK Alkaline

BAC Bonded Asbestos Cement

BRD Bricks (Common)

BRE Brick (Engineering)

CC Concrete Box Culvert

CI Cast Iron

CO Concrete (In-Situ)

CP Concrete (Pre-Cast)

CSB Concrete Segments (bolted)

CSU Concrete Segments (unbolted)

DI Ductile Iron

GRD Glass Reinforced Concrete

GRP Glass Reinforced Plastic

MAC Masonry in regular Courses

MAR Masonry in random Courses

PE Polyethylene

PF Pitch Fibre

PP Polypropylene

PVC Polyvinyl Chloride

RPM Reinforced Plastic Matrix

SI Spun Iron

ST Steel

VC Vertifluid Clay

XXX Other

ZZZ Unknown

LEGEND - SEWERS

Manhole (SW)

Manhole (F&C)

Lamp hole (SW)

Lamp hole (F&C)

Pumping Station (SW)

Pumping Station (F&C)

Side entry manhole (SW)

Side entry manhole (F&C)

Blind shaft (SW)

Blind shaft (F&C)

Ejector station (SW)

Ejector station (F&C)

Watertight door (SW)

Watertight door (F&C)

Flushing ch. Min-e (SW)

Flushing ch. Min-e (F&C)

Flushing ch. No-e (SW)

Flushing ch. No-e (F&C)

Demonstration Chamber

Washout (SW)

Washout (F&C)

Rodding Eye (SW)

Rodding Eye (F&C)

Gauging point (SW)

Gauging point (F&C)

Intercept chamber (SW)

Intercept chamber (F&C)

Storm Tank (SW)

Storm Tank (F&C)

Vortex chamber (SW)

Vortex chamber (F&C)

Label ellipse

Dummy/S24 manhole

Backdrop manhole

Other (s)

Other

Change In sewer (s)

Change In sewer

Rafflux valve

Flap valve

Cascade

Anode

Valve

Closed Valve

Air Valve

Hatch box (SW)

Hatch box (F&C)

Direction arrow

Emptying valve

Catchpit

Demiboards

Storm Overflow

Balancing Pond

SHAPES (S)

A Arched

B Barrel

C Circular

E Egg

H Horseshoe

R Rectangular

S Square

T Trapezoidal

U U Shape

X Other

NODE REFERENCING SYSTEM

1st digit: hundred metre easting identifier

2nd digit: hundred metre northing identifier

3rd digit: sewer type identifier

4th digit: next sequential node

Drawn by: gujskew

Title: 295136_Sea Road Preston

Date: 30/05/2018



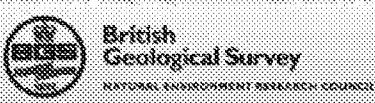


WARNING: SAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement

ARUN DISTRICT COUNCIL EP/180/18/PL

Appendix 4
BGS Geological Borehole Data



Geology of Britain viewer

Try the Beta version of our 3D Geology of Britain viewer



More BGS map viewers

Current
Geology

3D
Models

Borehole
Scans

Earthquake
Timeline

Borehole Scans

Click on a borehole to view scan.

Borehole depth

- 0 - 10m
- 10 - 30m
- 30m+
- Unknown
- Confidential or Restricted

[More on boreholes](#)

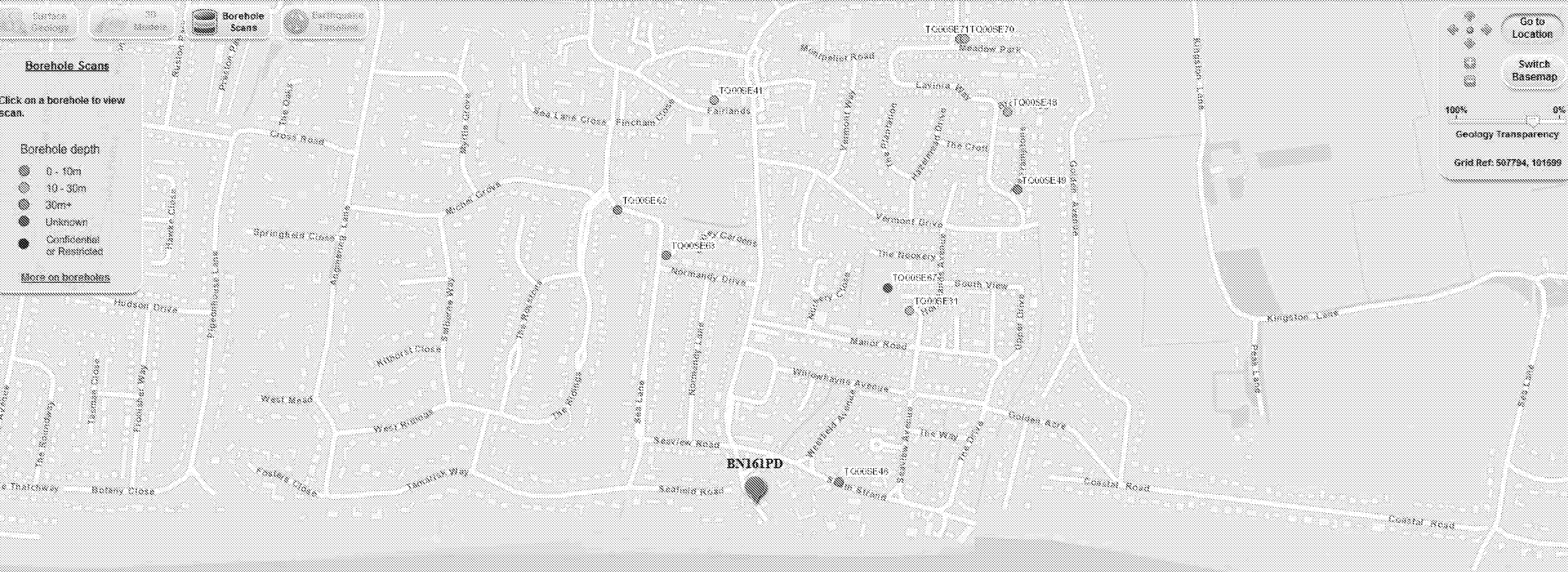
Go to
Location

Switch
Basemap

100%0%

Geology Transparency

Grid Ref: 507794, 101699



WELL BORING at *Angmering-on-Sea*
Geol. map 1 in. map New Series
Made by
Sunk feet. Bored feet.
Communicated by
Height above Ordnance Datum
Yield
Quality (with copy of analysis on separate sheet)

TQ 00 SE 146
County *West Sussex*
Date *30.10.18*

Rest level of water

24

Published in

TQ 073 016

GEOLOGICAL FORMATION.

NATURE OF STRATA.

of Sussex.

DEPTH.
Feet. Inches. Feet. Inches.

page 46 vol 18

Drift { *Clay* } *Bridport*
Upper Chalk { *Sand and gravel* } *Brighton Ravine Beach* 6 8 6 8
Chalk and flint 130 20 150

R.L.W. 11 ft. down. Yield 2214 g. p. hour. Lined.
Lined 8 in. tubes 43 ft.

Information for Messrs. Duke and Ockenden Ltd.

Angmering-on-Sea—Map N.S.G. 332.

18. SOUTH STRAND WATERWORKS, 1 mile S.E. of Angmering railway station. 1905. Ht. above O.D. about 20 ft. Map 6.09 63 S.E.

		Thickness	Depth	
		Ft.	Ft.	
U.C.F. M.C.F.	Drift { Clay ...	6	6	1.8
	{ Sand and gravel ...	14	20	6.1
	Upper Chalk Chalk and flint ...	130	150	25.7
R.L.W. 11 ft. down. Yield, 2214 g. p. hour. tested. Lined 8 in. tubes to 43 ft. Information from Messrs. Duke and Ockenden, Ltd.				

75NEE

No trace. ? 1941.

DATA Bank

TQ073 016

TQ000/160

332/24 South Strand Waterworks, Angmering-on-Sea. (Disused)

W.S.S. III, p. 46. Surface +c.20. Lining tubes: 43 x 8 in from surface.

R.W.L. +c.9. Yield 2,314 g.p.h. (test). Bando, 1925.

Drift	...	...	...	20	20
UCK)					
PACK)	...	...	...	130	150

Drift	{ clay	6	6
	{ Sand & gravel	14	20
UCK	{		
PACK	{ Chalk & flint	130	150



Norwest Holst Soil Engineering Ltd.

Borehole No.

2

Contract No. F5316

BOREHOLE LOG

Sheet 1 of 1

Location: Sea Lane

Client: Arun District Council

Method of Boring: Percussion

Diameter of Borehole: 150 mm

Chainage:

Ground Level: m.A.O.D.

Date: 17/8/82

TQ 00 SE 63

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/P.O.D. %	Daily Progress
MADE GROUND: Dark brown sandy CLAY.		1.30					
Firm brown sandy CLAY.		2.20					
Soft to firm pale brown silty CLAY with chalk and flint gravel.		4.00					

Type of Sample

- ☒ S.P.T. ☒ Undisturbed
☒ C.P.T. ☒ Vane
☐ Jar ☐ Water
☐ Bulk ☐ Piezometer

Remarks (Observations of Ground Water etc.)

Borehole dry.

RECORD OF WELL (SHAFT OR BORE)

At ~~the~~ S.W. Sussex Tennis Club. T0000103
Town or Village. Angmering-on-Sea County Sussex A.B.
Exact site ~~marked on town map in file 1047~~

Exact site _____

in parish of

Level of ground surface above sea-level (O.D.).....ft. If well starts below ground surface, state how far.....ft.

Shaft _____ ft., diameter _____ ft. Bore _____ ft. Diameter of bore: at top _____ ins.; at bottom $\frac{7}{8}$ ins.

Details of permanent lining tubes (internal diameters preferred)..... 12 x 4 1/2 in.

A. T. 0342 0191

Water struck at depths of (feet)

Rest-level of water ^{below} ~~above~~ top of well 7 feet. Suction at _____ feet. Yield on _____ hours' ^{days} test.

720 gallons per hour (with pump of capacity g.p.h.); depressing water level to feet

below top. Time of recovery.....hrs. Amount normally pumped daily.....g.p.h. for.....hours.

Quality (attach copy of analysis if available)

Sunk by U.S. Navy for Mr. W. H. H. H. H. H. Date of well 1936

Information from _____

[illegible]

For Sources use only:

Date received 5/2/4	C.S.M. Office File No. 647	Site marked on 1" map (use symbol) 
------------------------	----------------------------------	---

Appendix 5

Flood Maps and Correspondence

Mike Glasgow
The Civil Engineering Practice
11 Tungsten Building
George Street, Fishersgate
West Sussex
BN41 1RA

Our ref: SSD72209
Your ref:
Date: 29/01/2018

Dear Mike

Enquiry regarding Product 4 for Flood Risk Assessment (FRA)

Thank you for your enquiry which was received on the 19th of January 2018.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004. 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 as 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 as it is influenced by factors such as the height of door steps, air bricks or the height of surrounding walls. We do not have access to this information and is not currently used in our flood modelling.

Flood Zone definitions can be found at www.gov.uk/guidance/flood-risk-and-coastal-change#Table-1-Flood-Zones

Flood Defences

There are flood defences in the form of a Sand and Shingle Beach. This is maintained by Arun District Council. Please contact Arun District council for any more information regarding this defence.

Model Information

The model used was the Arun to Adur Flood Model which was completed in 2012 by JBA Consulting.

Flood History

We hold no record of previous flooding events affecting this site.

Please note our records are not comprehensive and may not include all events. I recommend contacting the Lead Local Flooding Authority, **West Sussex County Council** or the Local Authority, **Arun District Council** for a more comprehensive flood history check.

FRA advisory text

Name	Product 4
Description	Detailed Flood Risk Assessment Map for ...
Licence	Open Government Licence
Information Warnings	<i>No information warnings available</i>
Information Warning - OS background mapping	<i>The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.</i>
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. Contains Ordnance Survey data © Crown copyright 2017 Ordnance Survey 100024198.

Data Available Online

Many of our flood datasets are available online:

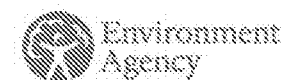
- [Flood Map For Planning \(Flood Zone 2, Flood Zone 3 ,Flood Storage Areas, Flood Defences, Areas Benefiting from Defences\)](#)
- [Risk of Flooding from Rivers and Sea](#)
- [Historic Flood Map](#)
- [Current Flood Warnings](#)

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Yours sincerely,

Maurice Ntege
FCRM Officer, PSO West Sussex Team

Flood Map for Planning (Rivers and Sea). Centred on BN16 1PD. Created on 29/01/2018



Scale 1: 10,000



Flood Map for Planning (Rivers & Sea)

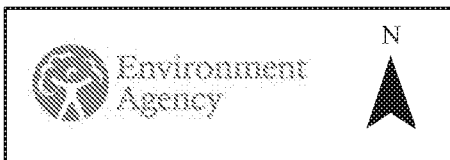
- Sealed Main Rivers
- Defences
- Flood Storage Areas
- ▣ Areas benefiting from flood defences
- ▨ Flood Zone 3
- ▩ Flood Zone 2

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 occurring each year.



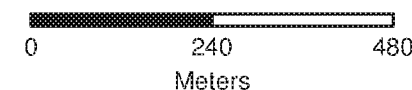
Legend

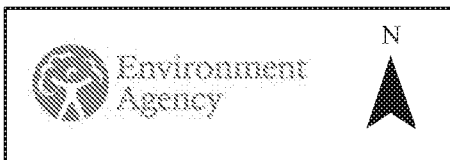
- Main River
- Site Boundary
- 0.5% AEP (2012) (Defended)
- 0.5% AEP (2070) (Defended)
- 0.5% AEP (2115) (Defended)

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

Climate Change (CC) extent based on an increase of 20% in river flows.

Scale: 1:10,000





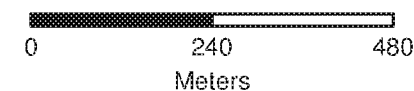
Legend

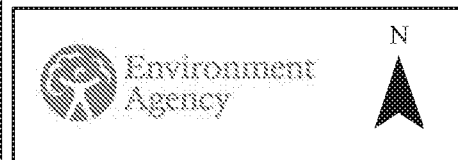
- Main River
- Site Boundary
- 0.1% AEP (2012) (Defended)
- 0.1% AEP (2115) (Defended)

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

Climate Change (CC) extent based on an increase of 20% in river flows.

Scale: 1:10,000



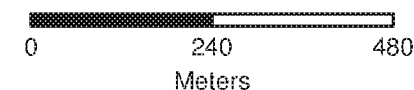


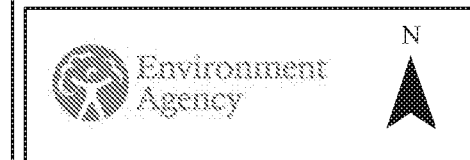
Legend

- Main River
- Site Boundary
- 20% AEP (2012) (Defended)
- 5% AEP (2012) (Defended)
- 1.3% AEP (2012) (Defended)
- 1% AEP (2012) (Defended)

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

Scale: 1:10,000





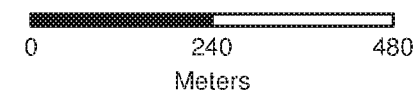
Legend

- Main River
- Site Boundary
- 5% AEP (2012) (Undefended)
- 1.3% AEP (2012) (Undefended)
- 0.5% AEP (2012) (Undefended)
- 0.5% AEP (2070) (Undefended)
- 0.5% AEP (2115) (Undefended)
- 0.1% AEP (2012) (Undefended)
- 0.1% AEP (2115) (Undefended)

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

Climate Change (CC) extent based on an increase of 20% in river flows.

Scale: 1:10,000

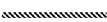




Environment
Agency



Legend

-  Site Nodes
-  Main River
-  Site Boundary

Scale: 1:1,000



Product 4 Flood Risk Data Requested by: The Civil Engineering Practice
Site: Coastal caravan Park, East Preston BN16 1PD
Table 1: Water Levels: Tidal Undefended

Node Ref	NGR		Modelled Flood Levels in Metres				
	Eastings	Northings	Undefended Annual Exceedance Probability				
			5%	1.3%	0.5%	0.5% (2115)	0.1%
1	507218	101499	-	-	-	5.15	-
2	507209	101531	-	-	-	-	-
3	507170	101540	-	-	-	-	-
4	507184	101568	-	-	-	-	-

Table 2: Water Levels: Tidal Defended

Node Ref	NGR		Modelled Flood Levels in Metres							
	Eastings	Northings	Defended Annual Exceedance Probability							
			20%	5.0%	1.3%	1.0%	0.5%	0.5% (2115)	0.1%	0.1% (2115)
1	507218	101499	5.69	5.74	5.77	5.77	5.78	5.82	5.80	5.80
2	507209	101531	5.69	5.74	5.77	5.77	5.78	5.82	5.80	5.80
3	507170	101540	5.69	5.74	5.77	5.77	5.78	5.82	5.80	5.80
4	507184	101568	5.69	5.74	5.77	5.77	5.78	5.82	5.80	5.80

Table 3: Water Depths: Tidal Undefended

Node Ref	NGR		Modelled Flood Depths in Metres				
	Eastings	Northings	Undefended Annual Exceedance Probability				
			5%	1.3%	0.5%	0.5% (2115)	0.1%
1	507218	101499	-	-	-	0.08	-
2	507209	101531	-	-	-	-	-
3	507170	101540	-	-	-	-	-
4	507184	101568	-	-	-	-	-

Office Address: Guildbourne House, Chatsworth Road, Worthing BN11 1LD.

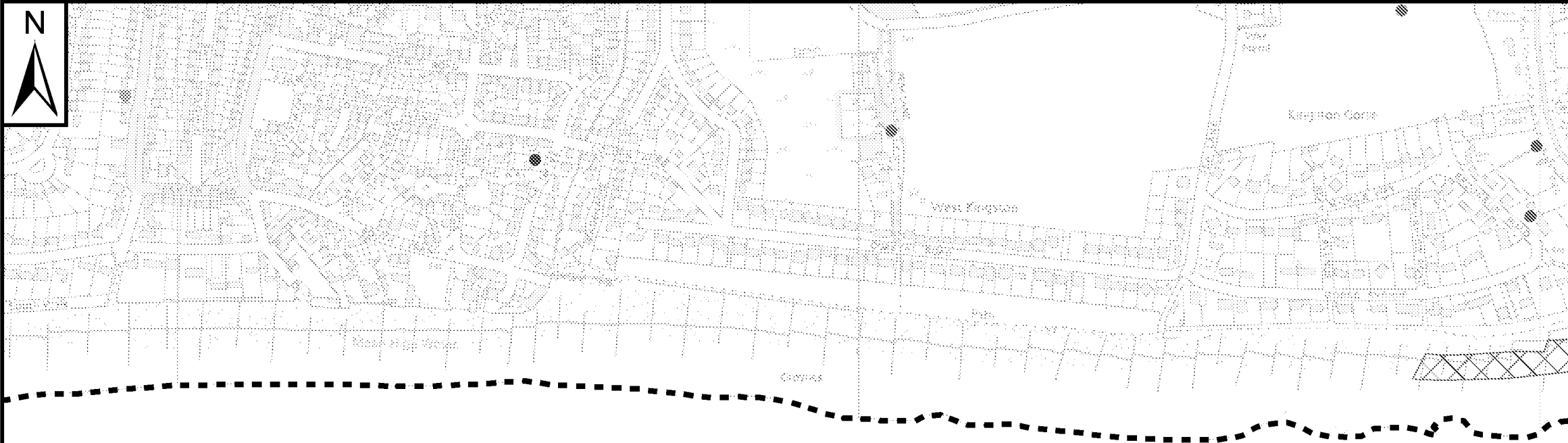
Table 4: Water Depths: Tidal Defended

Node Ref	NGR		Modelled Flood Depths in Metres							
	Eastings	Northings	Defended Annual Exceedance Probability							
			20%	5.0%	1.3%	1.0%	0.5%	0.5% (2115)	0.1%	0.1% (2115)
1	507218	101499	0.46	.052	0.54	0.55	0.56	0.59	0.57	0.57
2	507209	101531	0.45	0.51	0.53	0.54	0.55	0.58	0.56	0.56
3	507170	101540	0.32	0.37	0.40	0.40	0.41	0.44	0.43	0.43
4	507184	101568	0.25	0.31	0.33	0.33	0.34	0.38	0.36	0.36

All levels taken from: Arun to Adur Flood Model

Produced on: 29/01/2018

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



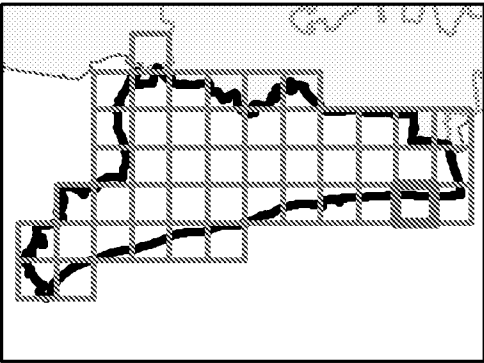
Notes

The Historic Flooding Map shows the recorded incidents and flood outlines provided by Arun District Council, West Sussex County Council, Southern Water and Environment Agency. Historical flood extent was obtained from the Environment Agency

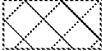
Flooding incidents provided have been categorised based upon the details provided in the records. Unknown flood points could not be determined from the information provided, and therefore could be from a number of sources.

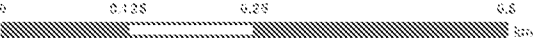
Please note that not all historical records may be shown on this map, and that it is therefore advised you contact Arun District Council for updated information post 2015.

Key Plan



Legend

-  Arun District SFRA boundary
-  Historic flood outline
- Source of flooding
-  Pluvial
-  Coastal
-  Tidal
-  Surface Water
-  Future
-  Unknown



REF	Date	Comments
A	June 2015	-
B		
C		

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ARUN DISTRICT COUNCIL LEVEL 1 SFRA: APPENDIX H HISTORIC FLOODING RECORDS

Sheet No: 15 of 48 Index Number: ADC_15

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**WEST SUSSEX COUNTY COUNCIL
FLOOD RISK MANAGEMENT**

DATE: 31st May 2018

FROM: Kevin Brook

TO: The Civil Engineering Practice

FAO: Nathan Shields

SUBJECT: LLFA Flood Risk info: 131A Sea Road, East Preston, West Sussex

Current surface water flood risk based on uFMfSW for 30year and 100year events:	Moderate risk
Comments: Current uFMfSW mapping generally shows the site to be at moderate risk from surface water flooding. Higher risk is shown to be at the south of the site and to the west on the carriageway on Sea Road. This risk is based on modelled data only and should not be taken as meaning that the site will/will not definitely flood in these events. Any existing surface water flow paths across the site must be maintained. Reason: NPPF paragraph 103 states – ‘When determining planning applications, local planning authorities should ensure flood risk is not increased elsewhere..’	

Current ground water flood risk based on ESI groundwater mapping:	Moderate risk
Comments: The proposed development is shown to be at moderate risk from groundwater flooding based on the ESI maps. This risk is based on modelled data only and should not be taken as meaning that the site will/will not suffer groundwater flooding. Where the intention is to dispose of surface water via infiltration / soakaway, these should be shown to work through an appropriate assessment carried out under BRE Digest 365.	

Records of any ordinary watercourses or culverted watercourses within or in close vicinity to the site:	Yes
Comments: Current Ordnance Survey mapping shows a culverted ordinary watercourse running through the proposed development site. Local or field boundary ditches, not shown on Ordnance Survey mapping, may exist around and across the site. If present these should be maintained and highlighted on future development plans.	

If works are undertaken within, under, over or up to an Ordinary Watercourse, even if this is temporary, an Ordinary Watercourse Consent (OWC) may need to be applied for from the District Council. Future maintenance and access of a watercourse must be considered during the design and planning process.

Records of any historic flooding within the confines of the proposed site:

No

Comments:

We do not have any records of historic flooding within the confines of the proposed site. This should not be taken that this site has never suffered from flooding, only that it has never been reported to the LLFA.

Kevin Brook
Flood Risk Management Team

From: Paul Cann [REDACTED]
Sent: 16 May 2018 14:58
To: [REDACTED]
Cc: Kevin Macknay; Laura Gibbons; Karl McLaughlin
Subject: RE: 23023 - 131A Sea Road, Preston - Flood Information
Attachments: pvqzq4vkvgmuorduau351tds_2.pdf

Hi Nathan

As you are no doubt aware, the site in question is low lying and is located within flood zone 2 and 3, based upon an undefended coastline.

The site is also shown to be in the surface water flood zone, as you would expect.

More detailed information is available by consulting our Strategic Flood Risk Assessment. See link below;

<https://www.arun.gov.uk/planning-policy-flood-risk>

Please note that a culverted watercourse runs around the site perimeter – see enclosed plan. Its location will need to be verified by yourselves and early discussion is required in order that suitable easements/access can be agreed within any proposed development layout. Please note that your client may have some responsibility for its maintenance as a riparian landowner, depending on its location/land ownership.

I have no records of flooding from surface water or land drainage, however, your own investigations will need to verify if flooding has occurred in the past. I have copied in WSCC (the lead local flood authority) who may hold records.

Our coastal engineers will respond direct to you in respect to any historical sea overtopping, etc.

Any queries, please let me know.

Regards

Paul Cann
Senior Engineer (Drainage & Coastal)

Paul Cann | Senior Engineer (Drainage & Coastal), Engineering Services, Arun District Council | Location: First Floor, Arun Civic Centre, Maltravers Road, Littlehampton, BN17 5LF

Internal: 37819 | External: +44 (0) 1903 737819 | Fax: +44 (0) 1903 716019 | E-mail: Paul.Cann@arun.gov.uk

Arun is Working in Partnership with Chichester District Council

Visit Arun's web site at <http://www.arun.gov.uk/> and www.chichester.gov.uk



Save the environment - think before you print

From: [REDACTED]
Sent: 14 May 2018 14:50

To: Planning
Cc: [REDACTED]
Subject: 23023 - 131A Sea Road, Preston - Flood Information

Good afternoon,

We are currently working on a proposed residential development at the above site.

Can you please provide us with any flooding information (including historic flooding) you may hold?

I attach a location plan for your reference.

The site is at OS reference TQ 071 015 and the nearest post code is BN16 1PD.

Please do not hesitate to contact me if you require any additional information.

Many thanks

Nathan Shields

[REDACTED]

The Civil Engineering Practice
11 Tungsten Building
George Street
Fishersgate
West Sussex
BN41 1RA

[REDACTED]

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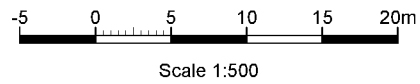
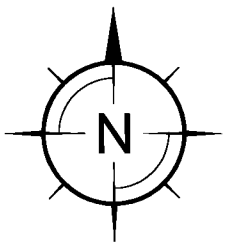
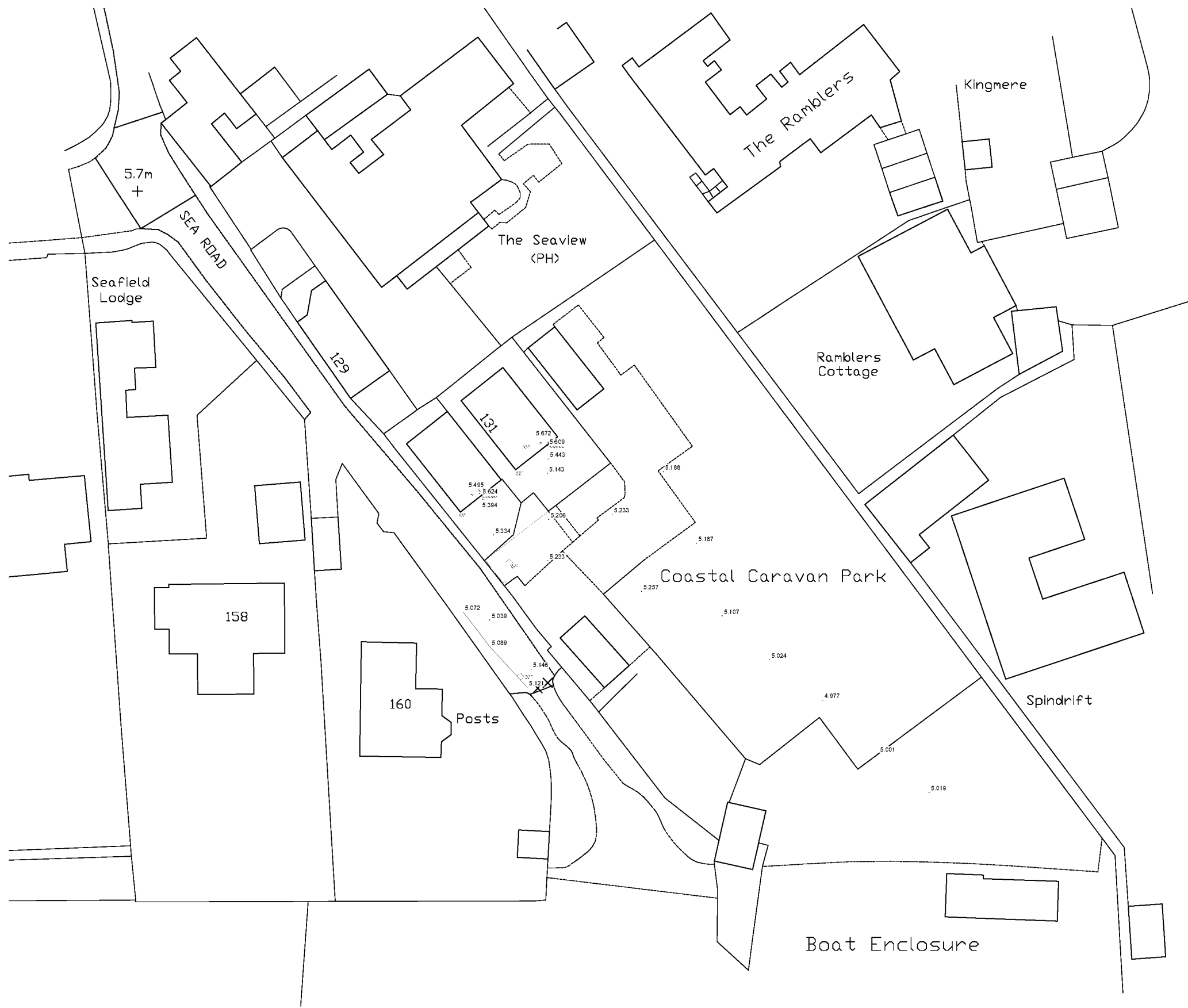
<http://www.arun.gov.uk>

NLPG UPRN 100062237016
DX 57406 Littlehampton

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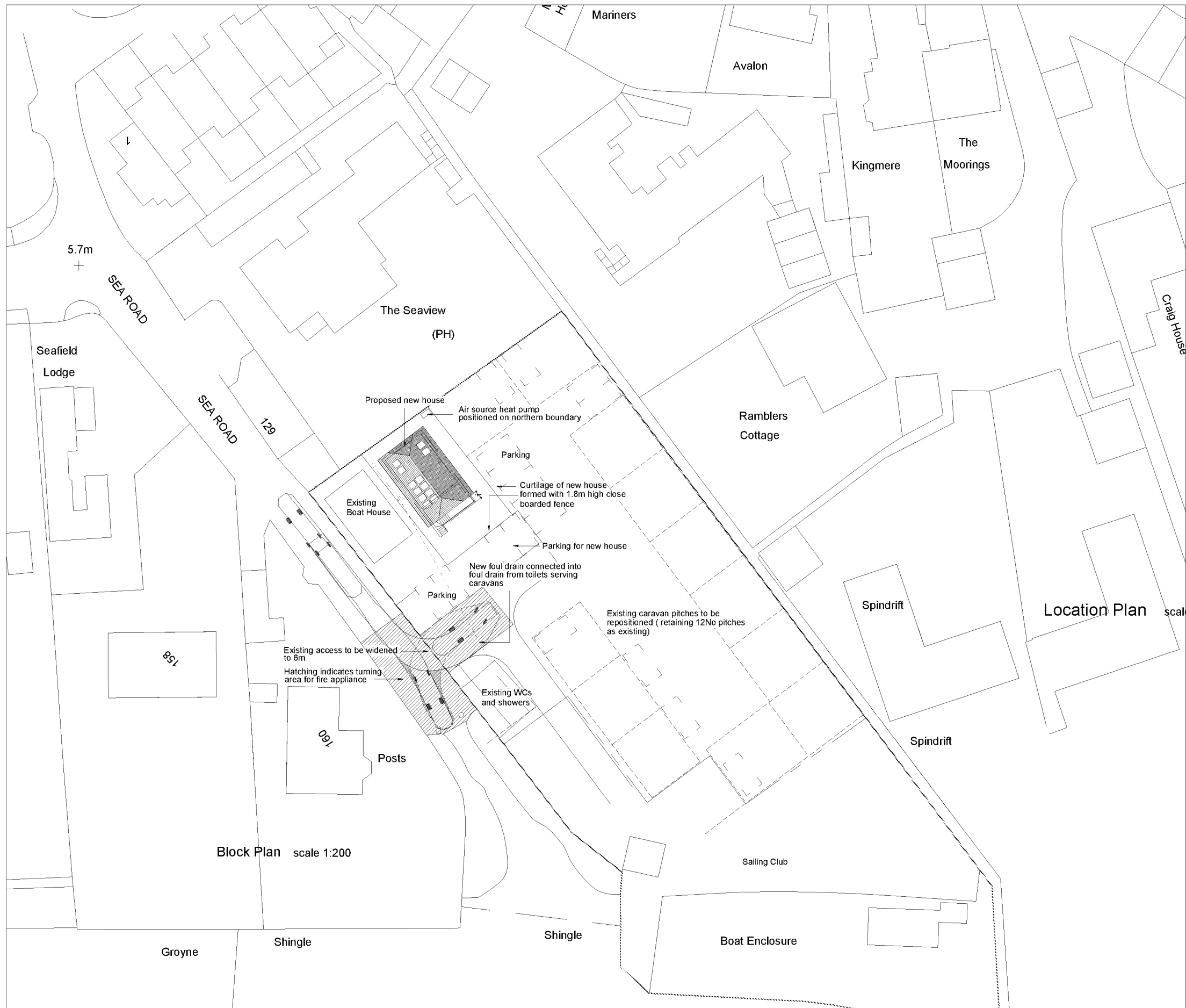
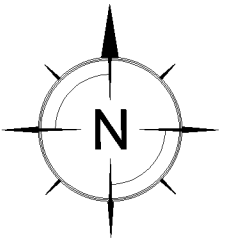
Appendix 6

Site Topographic Plan



TITLE Topographical Survey	
SCALE 1:500 @ A3	DRG. No. 3

Appendix 7
Proposed Site Layout Plan



Block Plan scale 1:200

Location Plan scale



TITLE	
Proposed Site Layout Plan	
SCALE	DRG. No.
1:500 @ A3	4