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Development at 179-181 Brighton Road Worthing

Flood Risk Assessment

Client:

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REVISION HISTORY

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ABBREVIATIONS

AEP:	Annual exceedance probability
AOD:	Above Ordnance Datum
BGS:	British Geological Survey
CCA:	Climate change allowance
CDA:	Critical drainage area
FRA:	Flood risk assessment
HMO:	House in multiple occupation
LLFA:	Lead Local Flood Authority
LPA:	Local Planning Authority
NGR:	National Grid Reference
NYCC:	North Yorkshire County Council
OS:	Ordnance Survey
OWC:	Ordinary watercourse
PPG:	Planning Practice Guidance
SFRA:	Strategic Flood Risk Assessment

1.0 INTRODUCTION

1.1. JOC Consultants Ltd is instructed by Vitae Investments Ltd, (the client), to prepare this flood risk assessment report in connection with a loft conversion to create a one bedroom flat in the HMO at 179-181 Brighton Road, Worthing. The report refers to flood and topographical data obtained in 2023 for a development at 6 Winsor Road, approximately 105 metres from the site, which was promoted by the client and which received planning permission in March 2024 under the reference AWDM/1017/23 with no objection from the Environment Agency.

1.2. References in this report to "the site" are references to the site that is the subject of the planning application. Specific references to sources of information used in the report are shown in square brackets and are listed in section 11 and the appendices follow thereafter.

1.3. In the preparation of this FRA report, JOC Consultants Ltd has relied on published information, flood data published by the Environment Agency and information provided by the Client and JOC Consultants Ltd accepts no liability for the accuracy or adequacy of that information or for the consequences of any changes to or re-assessment of that information in the future.

1.4. This report is prepared specifically for the Client and the report may not be used for any purpose other than for the purposes stated in paragraph 1.1 above and it may not be assigned to any third party without our written permission.

2.0 THE REQUIREMENT FOR A FLOOD RISK ASSESSMENT

2.1. The requirement for a flood risk assessment arises from paragraph 173 of the NPPF which states:

'Where appropriate, applications should be supported by a site-specific flood-risk assessment', and footnote 59 states:

'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'.

3.0 OBJECTIVES

3.1. The objectives of a site-specific flood risk assessment are stated in paragraph 020 of the Planning Practice Guidance for flood risk and coastal change. The guidance states the objectives are to establish:

- *'whether the development is likely to be affected by current or future flooding from any source;*
- *whether it will increase flood risk elsewhere;*
- *whether the measures proposed to deal with these effects are appropriate;*
- *the evidence for the local planning authority to apply (if necessary) the Sequential Test, and;*
- *whether the development will be safe and pass the Exception Test, if applicable'*.

4.0 PLANNING POLICY ON FLOOD RISK

4.1 National Policy

4.1.1. National Planning Policy in relation to flood risk is set out in the National Planning Policy Framework (NPPF) [1].

4.2 Local Policy

4.2.1. Local policy is defined in the Worthing Local Plan 2023, adopted on 28th March 2023 [2]. Policy DM20 defines the criteria that must be satisfied if planning permission is to be granted to applications for development in areas at risk of flooding. The policy states:

'The flood risk assessment should be proportional to the degree of flood risk and appropriate to the scale, nature and location of the development.'

4.2.2. Local policy on development and flood risk is informed by the Level 1 and Level 2 Strategic Flood Risk Assessment (SFRA), [3]. Reference to the SFRA is made in subsequent sections of this report.

4.2.3. Also relevant to this FRA is the Draft Local Flood Risk Management Strategy 2021 – 2026 [4] produced by the West Sussex County Council Lead Local Flood Authority.

4.3 Planning Practice Guidance

4.3.1. In addition to national and local policy, the Planning Practice Guidance for Flood Risk and Coastal Change [5] provides advice to planning authorities to assist them when considering planning applications in areas at risk of flooding. The Environment Agency Standing Advice [6] also provides guidance in connection with flood risk assessments.

4.3.2. This report has been prepared with reference to the above guidance.

5.0 LOCATION AND DESCRIPTION OF THE SITE

5.1. The site, known as Wolsey Hotel, is located at 179-181 Brighton Road, and is shown outlined in red in Figure 1, following page 21. The coordinates at the approximate centre of the site are: 516052, 102804.

5.2. The building, shown in the photograph[1] below, is a former hotel but is now used as a house in multiple occupation (HMO).

[1] © Google 2024

5.3. Access to the building is from Brighton Road.

5.4. The gross site area amounts to approximately 0.04ha.

5.5. The site is within the Environment Agency flood warning or alert area: *Coastal area of Rustington to Shoreham*.

5.6. A topographical survey was carried out for a development in Windsor Road in 2023, but its results are also relevant to this site. The survey shows:

- Brighton Road (the A259) falls from west to east, to a low point of 4.90m opposite number 199 Brighton Road. The road level opposite the site is 5.27m AOD.
- The sea front ground level opposite the site is 5.36m.
- The shingle beach level opposite the site is approximately 6.03m AOD.

5.7. The topographical survey plan is provided in Appendix A.

5.8. The kerb level shown in the above photograph is approximately at the same level as the crown of the road, (5.27m AOD), and there is a slight rise in level between the kerb and the front doors of the building, estimated to be no more than 100mm. The threshold level is estimated to be 150mm above the path level, so the ground floor/ level of the building is estimated to be 5.52m AOD.

5.9. The floor to ceiling height on a building of this age and style is likely to be approximately 2.4m and there would be at least 200mm between the upper floor and the ceiling below. This leads to the conclusion that the floor level of the loft conversion would be approximately 5.2m above the ground floor level, so the floor level in the loft is estimated to be at least 10.72m AOD.

6.0 THE DEVELOPMENT

6.1. Planning permission is being sought for a loft conversion to create a one bedroom flat within the HMO, as shown in the development plans in Appendix B.

6.2. The vulnerability classification of the development is **More Vulnerable** in accordance with Annex 3 of the NPPF.

7.0 FLOOD RISK

7.1 Design flood level

7.1.1. In accordance with paragraph 002 of the Planning Practice Guidance for flood risk and coastal change, the Design Flood Level is the 0.5% AEP tidal flood level at the site, including an allowance for climate change over the lifetime of the development. Events which exceed this are assessed as residual risks in section 8.3 of this report. The estimated Design Flood Level is provided in paragraph 7.13.8 below.

7.2 Sources of information

7.2.1. Fluvial and tidal flood risk has been assessed with reference to the following sources of information:

- Adur and Worthing Level 1 and Level 2 SFRA July 2020
- River Arun Modelling Study Final Report, JBA Consulting March 2017
- Topographical survey
- Environment Agency Product 4 and Product 8 data
- Ordnance survey map data
- Current Flood map for planning
- Current fluvial and tidal risk map
- Current surface water flood maps
- Current reservoir flood risk map.

7.3 Flood zone

7.3.1. The Flood Map for Planning in Appendix C shows the site to be in flood zone 3. The Flood Map for Planning disregards flood defences.

7.4 Environment Agency flood data

7.4.1. The Environment Agency flood data was requested in 2023 for a development at 6 Windsor Road, Worthing and the data is also applicable to this site. The data set is provided in Appendix D.

7.5 Existing flood defences

7.5.1. The SFRA Appendix J1 map shows no flood defences opposite the site, but it is evident from the topographical survey that high ground at the sea front provides protection from tidal flooding.

7.5.2. The AIMS Flood Defences map in Appendix D shows no defences in the vicinity of the site. The Environment Agency letter dated 29th September 2023 however refers to the presence of flood defences in the form of a sand and shingle beach, maintained by the local authority. This is not consistent with the AIMS map. The defences appear to comprise a raised shingle beach which is slightly higher than the Brighton Road (A259), as shown on the topographical survey plan.

7.6 History of Flooding

7.6.1. There is no specific evidence available of the site being affected by previous flood events. Parts of West Sussex however, including Worthing, were affected by flooding which resulted from a rainfall event, the AEP of which was less than 0.5%, in June 2021. Details of the flooding are provided in the West Sussex County Council report of the event [7].

7.6.2. The Recorded Flood Outlines map in Appendix D shows the site is not withing an area where flooding has been recorded in the past. There is no evidence of the site having been affected by flooding from the sea.

7.7 Risk of tidal or fluvial flooding

7.7.1. The tables of flood levels and depths in Appendix D are taken from the Arun to Adur Coastal Modelling Study, 2012. This data however is superseded by the 2017 update of the model. Moreover, the data is anomalous:

- No flooding is indicated in the undefended scenario but *is* indicated in the defended scenario – this does not make sense.
- The 0.5% AEP defended flood levels *reduce* in the future – this is contrary to climate change predictions of sea level rise and again, does not make sense.

7.7.2. Accordingly, there can be no confidence in the accuracy or reliability of the supplied data.

7.7.3. Table 2.1 in the River Modelling Study 2017 [8] shows peak sea level data at Worthing, (see Appendix E). In a 0.5% AEP event, the still water level at Littlehampton is 4.16m AOD. The

topographical survey however, shows the sea front to be at an elevation between 5.36m AOD and 5.59m AOD, but falls to 4.90m AOD to the east of Windsor Road. The beach level is in the range 5.76m to 6.06m AOD. It is therefore evident that the site is not at risk from the 0.5% AEP still water sea level.

7.7.4. The fluvial and tidal risk map in Appendix F shows the site to be in an area at a 'Low' risk of flooding. This is flooding that is predicted to occur, on average, with an annual probability in the range 0.1% to 1% (once in 100 years to once in 1,000 years).

7.8 Risk of surface water flooding

7.8.1. The surface water flood maps in Appendix G show:

- a 'High risk' of surface water flooding in Brighton Road opposite the site;
- no flooding within the curtilage of the site;
- depths less than 300mm in rainfall events having an AEP of 3.3% or more;
- depths in the range 300mm to 900mm in rainfall events having an AEP of 3.3% or less.

7.8.2. Comparison of the modelled levels shown on the surface water flood maps with the photograph[2] below demonstrates that the modelled depths are implausible. The maps show no flooding within the curtilage of the site, which is evidently no more than approximately 50mm above the road level at the boundary, so flood depths in the road are unlikely to exceed 50mm. In a high intensity rainfall event, there would be surface water overland flow eastward along Brighton Road.

[2] © Google 2024

7.9 Risk of sewer flooding

7.9.1. Sewer flooding can occur when the capacity of the sewerage system is exceeded or when there is a blockage, causing the flow to back-up and the water level to rise upstream. This type of flooding is related to surface water flooding as the runoff from intense rainfall can exceed the flow capacity of the system. Sewers normally have capacity to contain the runoff from rainfall events with an annual probability of 3.3% or more, and any flooding usually occurs at the lowest gullies or manholes on the system.

7.9.2. The risk of this type of flooding in Brighton Road is assessed to be low to medium.

7.10 Risk of groundwater flooding

7.10.1. Groundwater flooding of land occurs when the water table rises above the ground surface or enters basements and is typically associated with permeable rock such as chalk and low-lying valley areas. The Long Term flood risk data states that groundwater flooding in the vicinity of the site is ‘unlikely’.

7.11 Risk of flooding from reservoirs and canals

7.11.1. The Environment Agency flood map for reservoirs shows the site is not within an area that would be affected due to the uncontrolled release of water from reservoirs (see Appendix H).

7.11.2. The site is not at risk of flooding from canals.

7.12 Effect of the development on flood risk

7.12.1. The change of use will result in no loss of floodplain storage and will have no effect on the risks of fluvial or tidal flooding in the wider area.

7.12.2. The change of use will not increase the existing impermeable area of the site and will not have any effect on surface water run-off rates or volumes. It will not therefore have any effect on the risk off surface water flooding in the wider area.

7.12.3. The development will have no effect on the risks of flooding from sewerage, groundwater, reservoirs or canal sources.

7.13 Effects of climate change

7.13.1. Climate change must be considered over the expected lifetime of the HMO. Paragraph 026 of the Planning Practice Guidance recommends a lifetime of 100 years for residential use, so climate change must be considered up to 2123

7.13.2. Table 2-1 of the 2017 River Arun Modelling Study report, which is reproduced in Appendix E, provides design peak sea levels at Worthing. These are:

- 0.5% AEP (2017) 4.16m AOD
- 0.1% AEP (2017): 4.35m AOD

7.13.3. Current guidance on the application of climate change allowances was issued in February 2016 and updated on 27th May 2022 [9]. The guidance recommends that flood risk assessments should assess the higher central (70th percentile) and the upper end (95th percentile) sea level rise allowances. Worthing is in the South East river basin and the relevant sea level rises at Worthing, based on the 1991 to 2000 epoch are shown in Table 6.1 below.

Table 7.1: Climate change effects on sea level at Littlehampton						
Allowance		2000 – 2035	2036 - 2065	2066 - 2095	2096 – 2125	Cumulative rise to 2125
		mm	mm	mm	mm	m
70th percentile	Per annum	5.7	8.7	11.6	13.1	1.20
	Per epoch	200	261	348	393	
95th percentile	Per annum	6.9	11.3	15.8	18.2	1.60
	Per epoch	242	339	474	546	

0.5% AEP sea level

7.13.4. The 70th and 95th percentile estimates of the future 0.5% AEP sea levels are shown in Table 7.2 below.

Table 7.2: Predicted 0.5% AEP sea levels at Worthing				
Year	Duration (years)	Predicted Sea Level		Remarks
		70th percentile	95th percentile	
2017	0	4.16	4.16	
2035	18	4.26	4.28	
2065	30	4.52	4.62	
2083	18	4.73	4.91	Min. sea front level: 4.90m AOD
2095	30	4.87	5.10	
2124	28	5.25	5.63	

7.13.5. The future 0.5% AEP_95th percentile sea level does not exceed the minimum sea front level until after 2082.

0.1% AEP sea level

7.13.6. The 70th and 95th percentile estimates of the future 0.1% AEP sea levels are shown in Table 7.3 below.

Table 7.3: Predicted 0.1% AEP sea levels at Worthing

Year	Duration (years)	Predicted Sea Level		Remarks
		70th percentile	95th percentile	
2017	0	4.35	4.35	
2035	18	4.45	4.47	
2065	30	4.71	4.81	
2071	6	4.78	4.91	Min. sea front level: 4.90m AOD
2095	30	5.06	5.29	
2124	28	5.44	5.82	

7.13.7. The future 0.1% AEP_95th percentile sea level does not exceed the minimum sea front level until after 2070.

7.13.8. If the Design Flood Level is taken to be the 0.5% AEP 70th percentile sea level in 2124, (5.25m AOD), it is evident that the existing ground floor level at the premises, estimated to be of 5.52m AOD, (see paragraph 5.8 above) is 270mm above the Design Flood Level.

7.13.9. Climate change is predicted to increase peak rainfall intensities by up to 45% in the 2070s epoch. This will increase the frequency and extent of surface water flooding in the Adur and Ouse Management Catchment, in which the site is located.

7.14 Hazard assessment

7.14.1. The Hazard Map in Appendix D shows the site to be within the ‘yellow’ area which indicates ‘Danger for some’.

8.0 RECOMMENDATIONS FOR FLOOD RISK MANAGEMENT

8.1 Tidal flood risk

8.1.1. The current Environment Agency Standing Advice for vulnerable developments is that finished floor levels should be the higher of 600mm above the:

- average ground level of the site;
- adjacent road level to the building; or
- estimated river or sea flood level.

8.1.2. The ground level within the site is estimated to be in the range 5.27m to 5.37m AOD, so the average ground level may be taken to be 5.32m AOD for the purposes of this FRA.

8.1.3. The adjacent road level is 5.27m AOD and the 0.5% AEP 70th percentile sea level at Worthing in 2124 is predicted to be 5.25m AOD. It is therefore evident that the finished floor level of the loft conversion, at 10.72m AOD, would be more than 600mm above each of the above criteria.

8.1.4. The finished floor level will provide at least 5.47m of freeboard above the Design flood Level.

8.1.5. It is recommended that residents in the proposed development are advised to register with the free flood warning service provided by the Environment Agency.

Safe access and egress

8.1.6. The existing ground floor level, estimated to be 5.52m AOD, provides 270mm of freeboard above the design flood level and Brighton Road is 20mm above the design flood level, so dry access and egress will be possible during the design flood.

8.1.7. It is recommended that an emergency flood response action plan is prepared for the development and displayed within the property. This should identify the actions to be taken in response to a major flood warning and the evacuation route to a safe area.

8.2 Surface water flood risk

8.2.1. As noted in paragraph 7.8.2 above, surface water flooding in Brighton Road is unlikely to exceed 50mm and is likely to be contained between the kerbs in the highway, so no recommendations are made in respect of this type of flooding.

8.3 Residual flood risks

8.3.1. Residual risks are those that remain after the implementation of the flood risk management measures to mitigate the risk from the Design Flood. These include the risk of an event greater than the design flood event; the risk of a breach in the flood defences; and the risk that the flood defences might not be raised in the future in response to climate change.

Events which exceed the design flood event

8.3.2. The predicted 0.5% AEP 95th percentile sea level in 2124 is 5.63m AOD, which would be 110mm above the ground floor level, but this risk does not arise until after 2082 at the earliest.

8.3.3. The predicted 0.1% AEP 95th percentile sea level in 2124 is 5.82m AOD, as stated in Table 7.3 above. This would be 300mm above the ground floor level, but the risk does not arise until after 2070 at the earliest. The finished floor level of the loft conversion would be 4.90m above this flood level.

8.3.4. These residual risks can be managed in the future by the installation of water exclusion barriers at entrances and over air bricks.

Breach and overtopping events

8.3.5. The Environment Agency states in its covering email dated 29th September 2023, which supplied the flood data (see Appendix D), that it *'does not hold any breach or overtopping depth grid data for the Arun to Adur Coastal Modelling (2012)';* from which it is inferred that breach and overtopping was not a perceived risk at the time, otherwise it would have been prudent to model these scenarios.

8.3.6. If the raised shingle beach were to be denuded in the design storm (0.5% AEP 70th percentile), the sea level would be 5.25m AOD before it could progress inland as shown in Table 7.2 above and flooding in Brighton Road would not occur until after 2095. The existing ground floor level would be 0.27m above the flood level.

8.3.7. In a 0.1% AEP 95th percentile event, a breach in the shingle beach flood defence could potentially result in flooding of the ground floor of the building to a depth of 300mm, but only after 2070. Prior to this date the sea level would not exceed the ground floor level.

9.0 THE EXCEPTION TEST

9.1 The Exception Test

9.1.1. The NPPF states at paragraph 160 that, for the Exception Test to be passed, it should be demonstrated that:

- the development would provide wider sustainability benefits to the community that outweigh flood risk; and
- the development will be safe for its lifetime, taking into account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

9.1.2. The development is in a sustainable location with local amenities and transport links within walking distance. It will provide much needed housing accommodation in Worthing and it is therefore considered that, given the relative finished floor level of the loft conversion floor and future sea levels, the risks of flooding are outweighed by the benefits that the development will bring to the local area. It therefore is considered that the development passes this part of the test.

9.1.3. Provided that future sea level rise is not significantly more than current predictions, the flood risk management recommendations in section 8.0 will ensure the development will be safe for its lifetime; and as the development will have no effect on flood levels, there will be no increase in flood risk elsewhere. Accordingly, it is considered that the proposed change of use passes the second part of the Exception test.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 Conclusions

10.1.1. The use of the proposed loft conversion for residential accommodation places the site in the 'More Vulnerable' category, in accordance with Annex 3 of the NPPF.

10.1.2. The site is in flood zone 3, but is protected by high ground between it and the sea which reduces the annual probability of the sea front being exceeded to less than 0.1% in the present day. Predicted sea levels in the future do not exceed the minimum sea front level until after

2082 in the 0.5% AEP_95th percentile event and not until after 2070 in the 0.1% AEP_95th percentile event.

10.1.3. The estimated existing ground floor level is 0.27m above the 0.5% AEP_70th percentile sea level in 2124 but 0.11m below the 0.5% AEP_95th percentile sea level in 2124.

10.1.4. The estimated existing ground floor level is 0.08m above the 0.1% AEP_70th percentile sea level in 2124 but 0.3m below the 0.1% AEP_95th percentile sea level in 2124. The finished floor level of the loft conversion would be at least 10.72m AOD, which is 4.90m above the 0.1% AEP 95th percentile sea level in 2124.

10.1.5. In the event of overtopping or breach of the raised shingle beach, flooding in Brighton Road would not occur until after 2095 in the design event and not until after 2070 in a 0.1% AEP 95th percentile sea level event.

10.1.6. The site is at a 'very low' risk of surface water (pluvial) flooding, but there is a high risk of shallow overland flow in Brighton Road.

10.1.7. The risks of sewer flooding and groundwater flooding are assessed to be low.

10.1.8. The site is not at risk from an uncontrolled release of water from reservoirs or canals.

10.1.9. Climate change is predicted to increase sea levels by up to 1.47m during the lifetime of the development. The effect of climate change on peak rainfall intensity is predicted to be up to 45% during the lifetime of the development. This will increase the frequency and extent of surface water flooding in the area.

10.1.10. Provided that the flood risk management recommendations in section 8 of this report are implemented, the development will be safe for its lifetime. The development is in a sustainable location and contributes to the need for housing accommodation for people in Worthing. It is therefore considered that the risks of flooding are outweighed by the need for housing accommodation of the type provided by the development. Accordingly, it is considered that the change of use passes the Exception Test.

10.2 Recommendations

10.2.1. It is recommended that the flood risk management measures stated in section 8 of this report are implemented when required in the future.

11.0 REFERENCES

1. National Planning Policy Framework. Department for Communities and Local Government. September 2023.

2. Worthing Local Plan, adopted on 28th March 2023.

3. Adur and Worthing Level 1 and Level 2 Strategic Flood Risk Assessment, July 2020.

4. Draft Local Flood Risk Management Strategy 2021 – 2026, West Sussex County Council.

5. Planning Practice Guidance: Flood Risk and Coastal Change. Updated 25th August 2022. Department for Levelling Up, Housing and Communities and Ministry of Housing and Local Government.

6. Preparing a flood risk assessment - Standing Advice, Environment Agency, 1st April 2012, updated 22nd July 2024.

7. Report on June 2012 flood event, West Sussex County Council, November 2012.

8. River Arun Modelling Study Final Report, JBA Consulting March 2017.

9. Flood risk assessments: climate change allowances. Environment Agency, 19th February 2016, updated 10th May 2022.

79-181 Brighton Road, Worthing, BN11 2EX

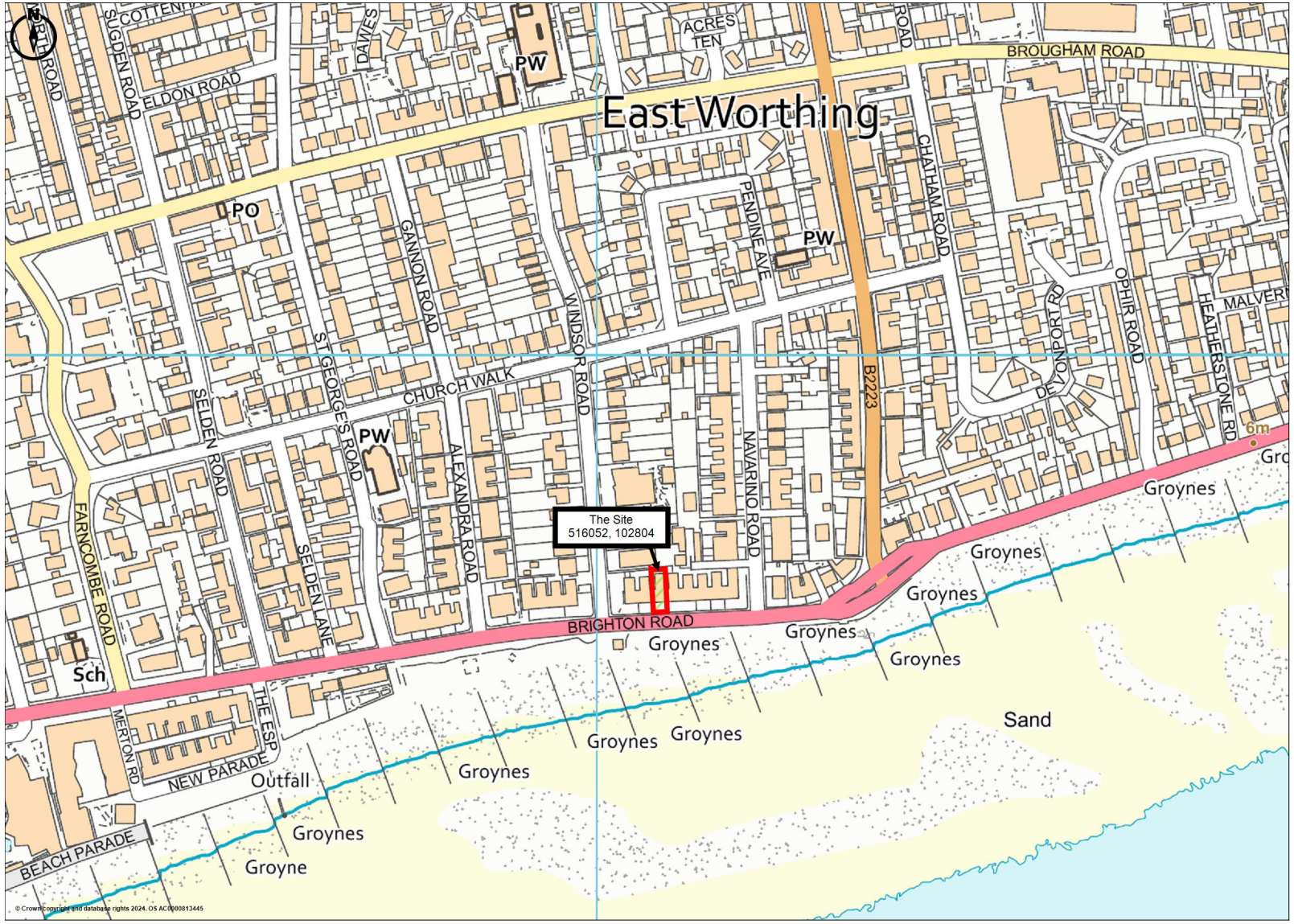
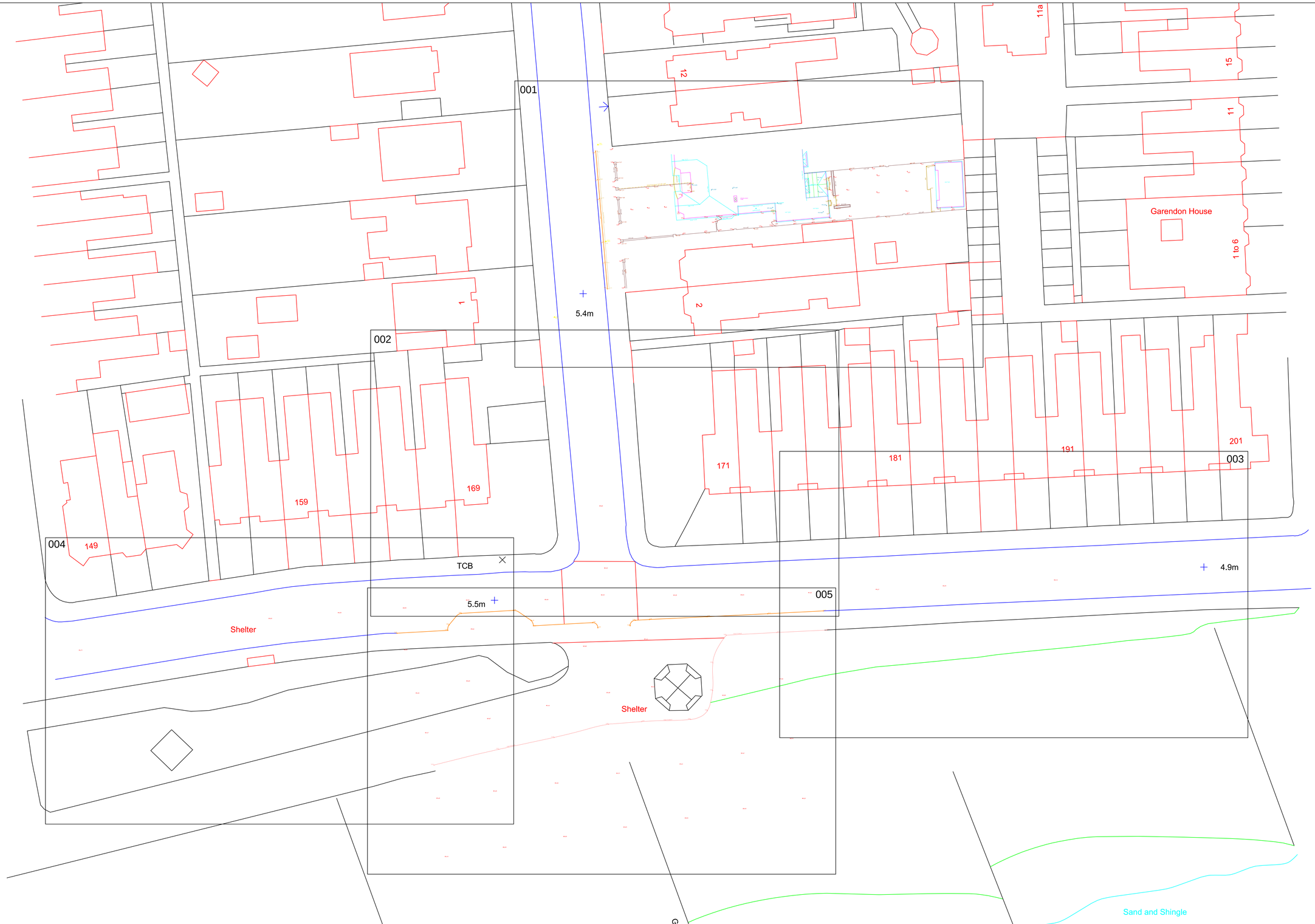


Figure 1: Location Plan

APPENDIX A

Topographical Survey Plan



NOTES
SURVEY IS BASED ON OS GRID SYSTEM
ORIGINATING FROM STATION 1
@ E 515996.636, N 102826.855, RL 5.464

Every effort has been made to survey the area as indicated. Where detail is inaccessible or obscured from view it has been deemed unable to survey.

LAYER INFORMATION

0	EMPTY
Bank	Downhill bank arrows
Bottom of Bank	Bottom of bank line
BT	Telecom box and manholes
Buildinglines	Building outline
Edge of Concrete	Edge of concrete surface
Edge of Road	Edge of road surface
Edge of Steps	Edge of steps
Fenceline	Guardrails, fence and Boundary lines
Flow	Waste water flow
Footpath	Edge of footpath or surface changes
Gardenline	Edge of lawns,flower beds and garden surface changes
Gully	Gully and drain types
Gully	Water drainage
Hedgeline	Edges of significant hedges
Kerbline	Front kerbline
Lamp Post	Lamp pots and lighting
Manhole	Manhole covers and drainers
Overhead Cables	Overhead cables and utility poles
Plant	Significant ventilation and external plant
Road Markings	Road markings and text
Roofline	Ridges, eaves, hips and valley lines
Scrubline	Edges of dense or overgrown foliage
Sign Post	Sign posts and street signs
Spotlevels	Point elevations
Survey Info text	Survey information text
Survey Stations	GPS reference survey stations
Text	Notation
Top and Back of Kerb	Top and back line of kerb
Top of Bank	Top line of bank
Trees	Trees, bore and spread
Unclassified Structure	Other structures
Wall	Walls

Line types and Symbols

Building Lines
Rooflines
Top & Back of Kerb — 100.40
Edge of Surface / Footpath — 100.40
Edge of Road — 100.40
Edge of Concrete — 100.40
Top of bank — 100.40
Bottom of bank — 100.40
Fence / Handrail
Overhead Cables

Garden Line
Scrub Line — Scrub
Gullies / Waste Water — Gully 100.19; SVP; SWP; RWP
Man holes & Flow — dia:80; MH; CL:100.40; IL:99.40; dia:100
Trees
Spot Levels — 100.40

Road Markings
Hedge Line — Hedge
Walls — tw 100.40; pier ht 100.40
Steps — 100.00; 100.00; 100.00
Plant — Plant
Gates — Gate

Control Stations

Co-ordinates in OSGB

Point Number	Easting	Northing	Elevation	Description
Stn1	515996.636	102826.855	5.464	HILTI NAIL
Stn2	516005.544	102839.950	5.407	HILTI NAIL
Stn3	516004.170	102850.705	5.443	HILTI NAIL

Orientation: North

Rev.	Date	Description

Client: Joc consultants ltd

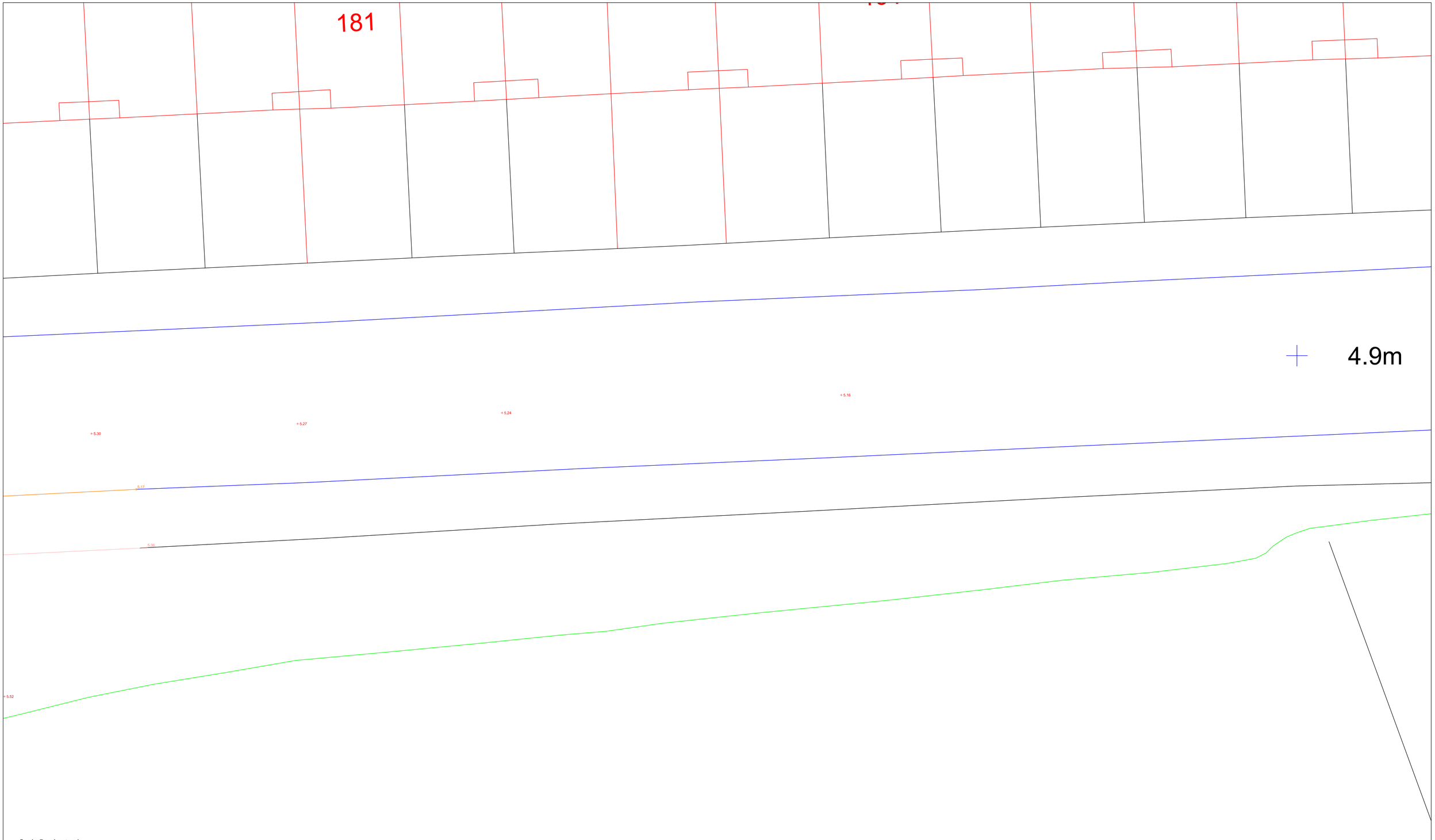
Drawing Title: Layout

Scale: NTS
Date: 07/09/23
Surveyed by: AR
Drawn: MB
Checked: SE

SeSurveying

Job Title: 6 Windsor Road, Worthing, BN11 2LX

Job No.: 006 09 23
Drawing No.: Layout
Rev.: -



NOTES
SURVEY IS BASED ON OS GRID SYSTEM
ORIGINATING FROM STATION 1
@ E 515996.636, N 102826.855, RL 5.464

Every effort has been made to survey the area as indicated. Where detail is inaccessible or obscured from view it has been deemed unable to survey.

LAYER INFORMATION

0	EMPTY
Bank	Downhill bank arrows
Bottom of Bank	Bottom of bank / slope
Build	Building, steps and manholes
Buildinglines	Building outline
Edge of Concrete	Edge of concrete surface
Edge of Road	Edge of road surface
External Steps	External Step lines
Fenceline	Fence, hedge line and Boundary lines
Flow	Waste water flow
Footpath	Edge of footpath or surface changes
Gardenline	Edge of lawns,flower beds and garden surface changes
Gate	Gates and swing lines
Gully	Waste gullies
Hedgeline	Edges of significant hedges
Kerbline	Front kerbline
Lamp Post	Lamp post and lighting
Manhole	Manhole and utility covers
Overhead Cables	Overhead cables and utility poles
Plant	Significant ventilation and external plant
Road Markings	Significant road marking
Roofline	Edges of roofs, ridges and valley lines
Scrubline	Edges of dense scrub/grown foliage
Sign Post	Sign posts and street signs
Spotlevels	Point elevations
Spotlevels text	Point elevations text
Survey Stations	Control and reference survey stations
Text	Notation
Top and Back of Kerb	Top and back line of kerb
Top of Bank	Top line of bank
Tree	Tree bore and spread
Unidentified Structure	Other structures
Wall	Walls

Line types and Symbols

Building Lines
Rooflines — 100.40
Top & Back of Kerb — 100.40
Edge of Surface / Footpath — 100.40
Edge of Road — 100.40
Edge of Concrete — 100.40
Top of bank — 100.40
Bottom of bank — 100.40
Fence / Handrail
Overhead Cables

Garden Line
Scrub Line — Scrub
Gullies / Waste Water — GullV 100.19; SVP; SWP; RWP
Man holes & Flow — dia:80; CL:100.40; IL:99.40; dia:100
Trees
Spot Levels — 100.40

Road Markings
Hedge Line — Hedge
Walls — tw 100.40; pier ht 100.40
Steps — 100.00; 100.20; 100.40; 100.60
Plant — Plant
Gates — Gate

Control Stations

Co-ordinates in OSGB

Point Number	Easting	Northing	Elevation	Description
Stn1	515996.636	102826.855	5.464	HILTI NAIL
Stn2	516005.544	102835.956	5.497	HILTI NAIL
Stn3	516004.170	102856.705	5.443	HILTI NAIL

Orientation

North

Rev.	Date	Description

Client: Joc consultants ltd

SeSurveying

Drawing Title: Topographical Survey P3/5

Job Title: 6 Windsor Road, Worthing, BN11 2LX

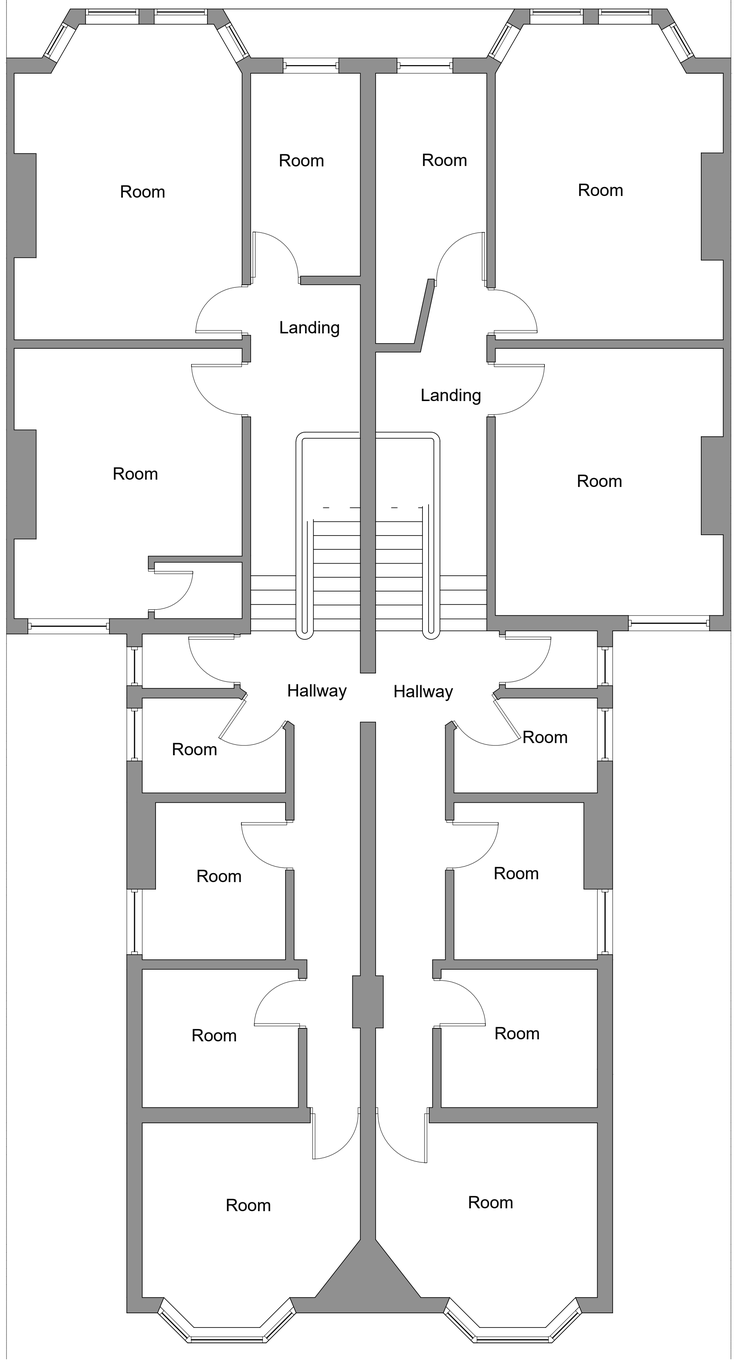
Scale	Date	Drawn	Job No.	Drawing No.	Rev.
1:100 @ A1	07/09/23	MB	006 09 23	003	-
	Surveyed by: AR	Checked: SE			

APPENDIX B

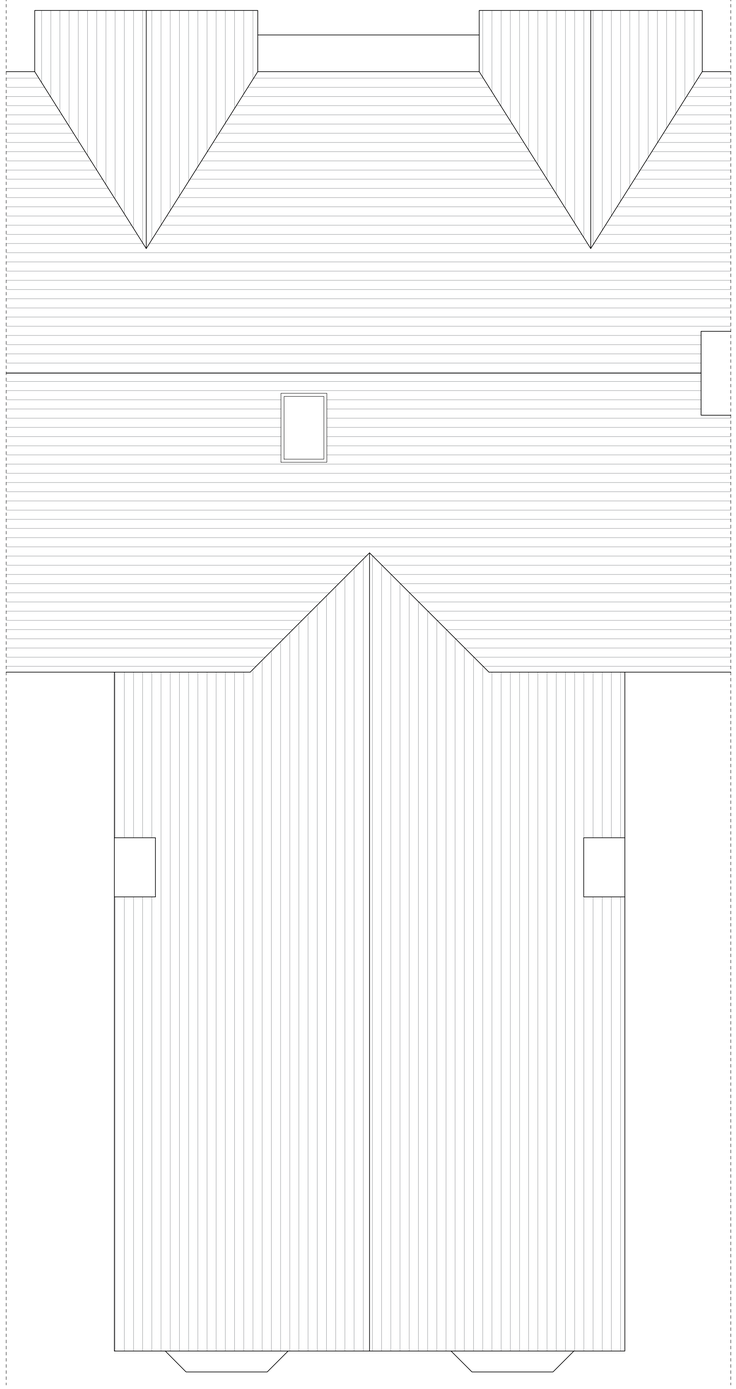
Development plans

General Notes

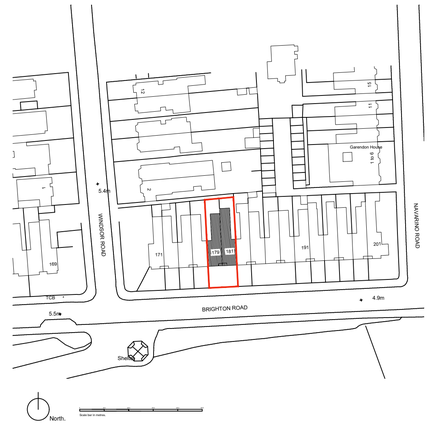
1. All dimensions are to be checked onsite. Do not scale from these drawings.
2. Structural information on drawings is shown for quick reference only. Refer to Structural Engineers drawings and calculations for construction information.
3. Building Regulations compliance is the responsibility of the contractor.



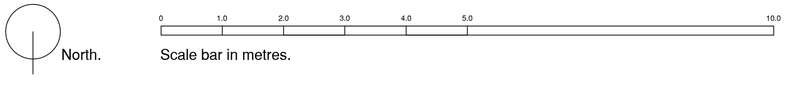
Existing First Floor Plan 1:50



Existing Roof Plan 1:50



Location Plan 1:1250



Rev Date Description

Puzzle Architecture.

puzzlearchitecture.co.uk
contact@puzzlearchitecture.co.uk

CIAT CHARTERED PRACTICE

Planning

Drawing Ref
Existing Floor Plans and Location Plan

Project
Wolsey Hotel, Worthing
Proposed Loft Conversion

Project No		Drawing No	Rev
WH01		**001**	
Drawn	Checked	Scale	Date
LC	LC	See details	25.04.24

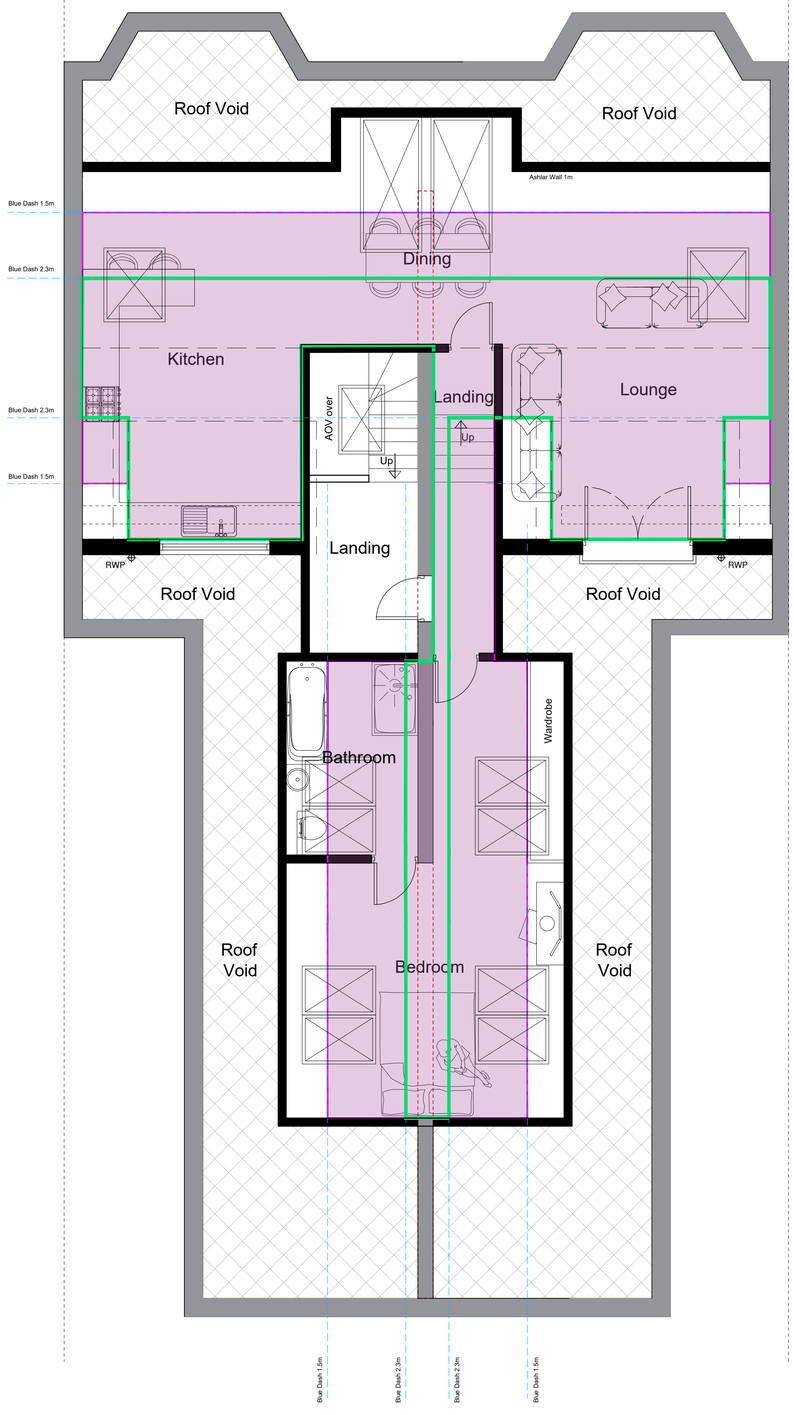
General Notes

1. All dimensions are to be checked onsite. Do not scale from these drawings.
2. Structural information on drawings is shown for quick reference only. Refer to Structural Engineers drawings and calculations for construction information.
3. Building Regulations compliance is the responsibility of the contractor.

Key - Areas

Area above 2.3m
Total: 40.5m2

Total Floor Area Over 1.5m: 76m2



Proposed Second Floor Plan 1:50

North.

0 1.0 2.0 3.0 4.0 5.0 10.0

Scale bar in metres.

Rev	Date	Description

Puzzle Architecture.

puzzlearchitecture.co.uk
contact@puzzlearchitecture.co.uk

CIAT CHARTERED PRACTICE

Planning

Drawing Ref
Proposed Floor Plan Areas

Project
Wolsey Hotel, Worthing
Proposed Loft Conversion

Project No		Drawing No	Rev
WH01		**200**	
Drawn	Checked	Scale	Date
LC	LC	1:50 @ A1	03.07.24

APPENDIX C

Flood Map for Planning

Flood map for planning

Your reference	Location (easting/northing)	Created
<Unspecified>	**516052/102808**	**12 Aug 2024 9:02**

Your selected location is in flood zone 3, an area with a high probability of flooding.

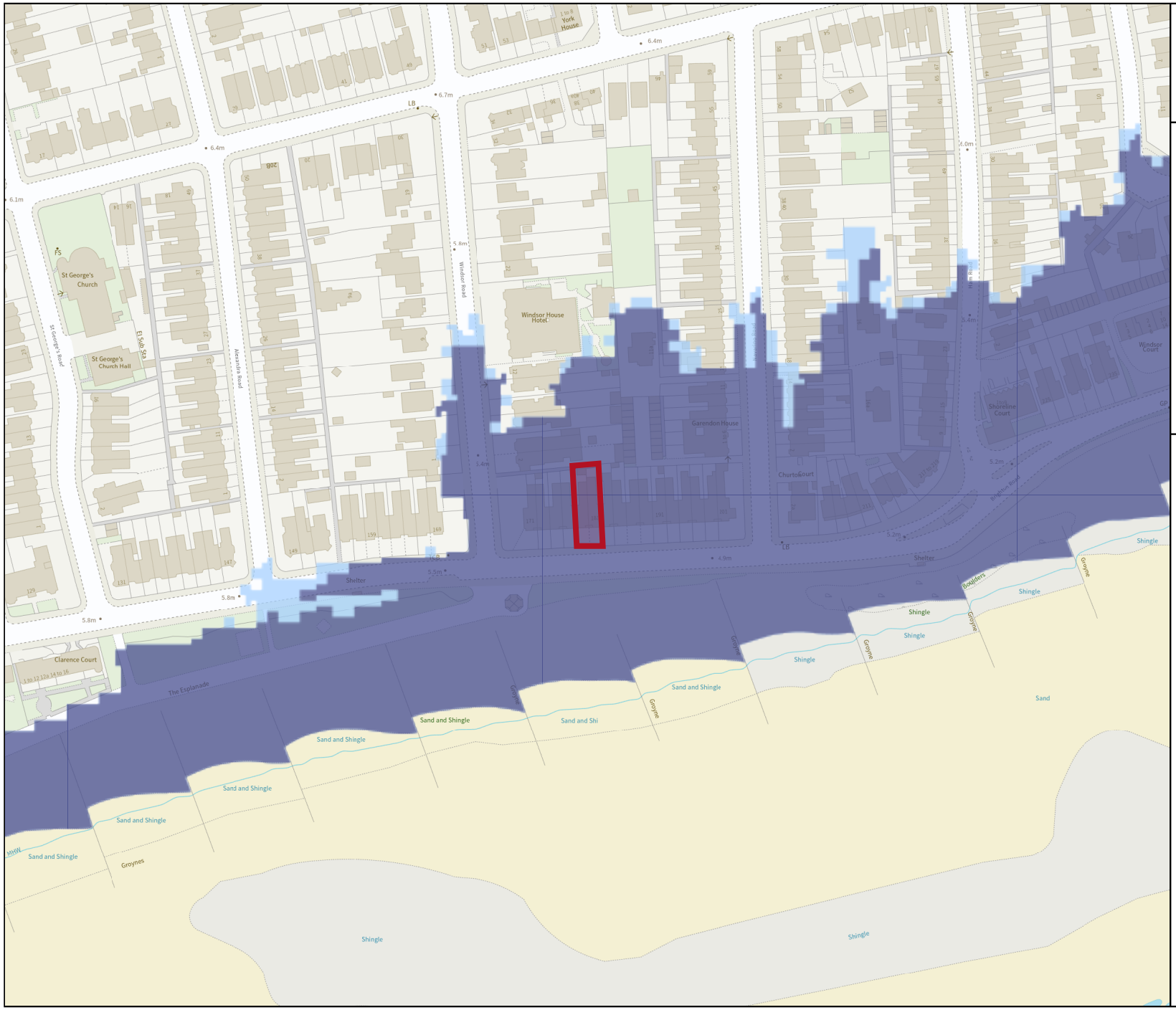
This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see www.gov.uk/guidance/flood-risk-assessment-standing-advice)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.



Environment Agency

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
516052/102808

Scale
1:2500

Created
12 Aug 2024 9:02

- Selected area
- Flood zone 3
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 20 40 60m

APPENDIX D

Environment Agency flood data

John O'Connor

From: PSO West Sussex <PSOWestSussex@environment-agency.gov.uk>
Sent: 29 September 2023 14:41
To: john@jocconsultants.co.uk
Cc: SSD Enquiries
Subject: RE: SSD327216 - Product 4 & 8 Data - 6 Windsor Road, Worthing, BN11 2LX
Attachments: Product 4 & 8 Data.zip

Dear John,

Thank you for your Product 4 & 8 data request for **6 Windsor Road, Worthing, BN11 2LX.** Please see the attached Product data.

Unfortunately we do not hold any breach/overtopping depth grid data for the Arun to Adur Coastal Modelling (2012).

For FRA and pre-planning advice please see attached 'FRA Advisory Text' and 'SSD Pre-app advice note September 2019'.

For information on flooding from other sources such as surface water please contact the Lead Local Flood Authority, West Sussex County Council.

Guidance on climate change allowances and how to use them in Flood Risk Assessments can be found here.

For future reference, detailed flood information and maps can be viewed using the Long Term Flood Risk Information service and Flood Map for Planning service. Flood and Coastal Risk Management asset information, and details of all planned maintenance activities can be viewed using the Asset Management Service.

If you have any further queries about this request, please do not hesitate to contact us at psowestsussex@environment-agency.gov.uk.

Kind regards,

Amy O'Donnell (*she/her*)
Partnership and Strategic Overview West Sussex, Solent and South Downs
Environment Agency | Guildbourne House, Chatsworth Road, Worthing, West Sussex, BN11 1LD
PSOWestSussex@environment-agency.gov.uk

From: John O'Connor <john@jocconsultants.co.uk>
Sent: 01 September 2023 15:35
To: SSD Enquiries <SSDEnquiries@environment-agency.gov.uk>
Subject: 6 Windsor Road, Worthing, BN11 2LX

Good afternoon,

Please see our letter attached requesting flood data for the above site.

Kind regards,

John O'Connor
Director

joc consultants ltd

Park Farm House
Leathley Lane
Leathley
Otley
LS21 2JU

Tel: 0113 284 2838
www.jocconsultants.co.uk

John O'Connor
JOC Consultants Ltd
Park Farm House
Leathley Lane
Leathley
Otley
LS21 2JU

Our ref: SSD327216
Date: 29/09/2023

Dear John O'Connor,

Enquiry Regarding Product 4 for Flood Risk Assessment for 6 Windsor Road, Worthing, BN11 2LX.

Thank you for your enquiry which was received on 01 September 2023.

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 site is in an area located within Flood Zones 1, 2 and 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 frontage is maintained by the Local Authority.

Model Information
The model used was the Arun to Adur Coastal Modelling, completed by JBA Consulting in 2012.

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 Flood Authority, **West Sussex County Council** or the Local Authority, **Worthing District Council** for a more comprehensive flood history check.

FRA advisory text

Name	Product 4
Description	Detailed Flood Risk Assessment Map for **6 Windsor Road, Worthing, BN11 2LX.**
Licence	Open Government Licence
Information Warnings	The flood risk data provided is based on existing EA hydraulic models with an allowance for climate change. Please note the climate change allowances provided are not up to date. These were updated on 27 July 2021. You should refer to 'Flood risk assessments: climate change allowances' for the most up to date allowances. You will need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.
Information Warning - OS background mapping	*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.*
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. Contains Ordnance Survey data © Crown copyright 2020 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,

Amy O'Donnell
Partnership and Strategic Overview West Sussex, Solent and South Downs
Environment Agency | Guildbourne House, Chatsworth Road, Worthing, West Sussex, BN11 1LD

Use of Environment Agency Information for Flood Risk Assessments

Important

The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:

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

We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.

We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:

https://www.gov.uk/flood-risk-assessment-standing-advice
http://planningguidance.planningportal.gov.uk/

You should also consult the Strategic Flood Risk Assessment or other relevant materials 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 surface water runoff. Information produced by the local planning authority referred to above may assist here.

3. Where a planning application requires an FRA and this is not submitted or is deficient, the Environment Agency may raise an objection.

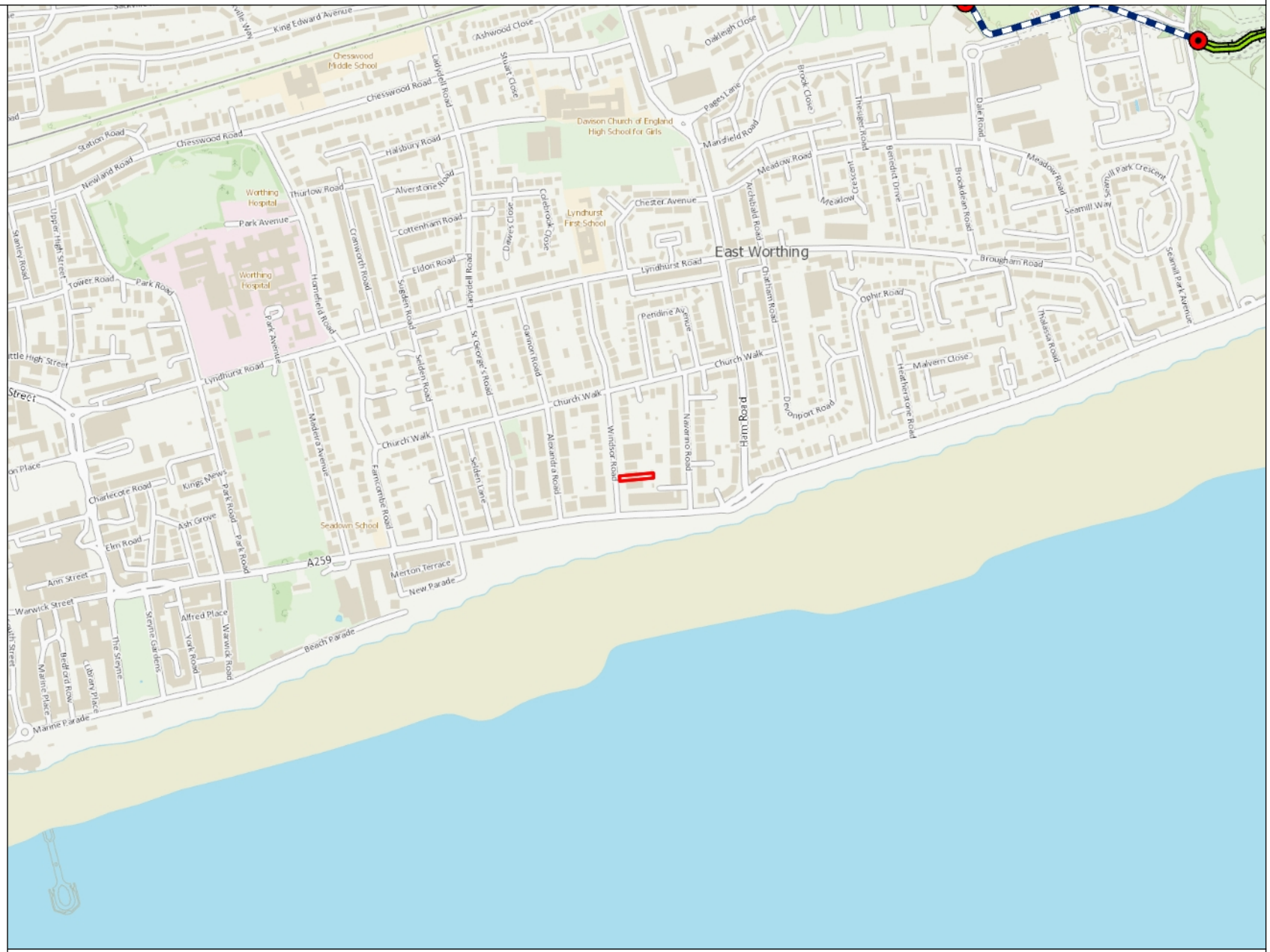
AIMS Flood Defences. Centred BN11 2LX. Created 29/09/2023.

Environment Agency

Legend

Please see page 2 for asset symbology

- Stilling Well
- Water Baffles
- Water Distribution Pipeline
- Well
- Stilling Well
- Water Baffles
- Water Distribution Pipeline
- Well

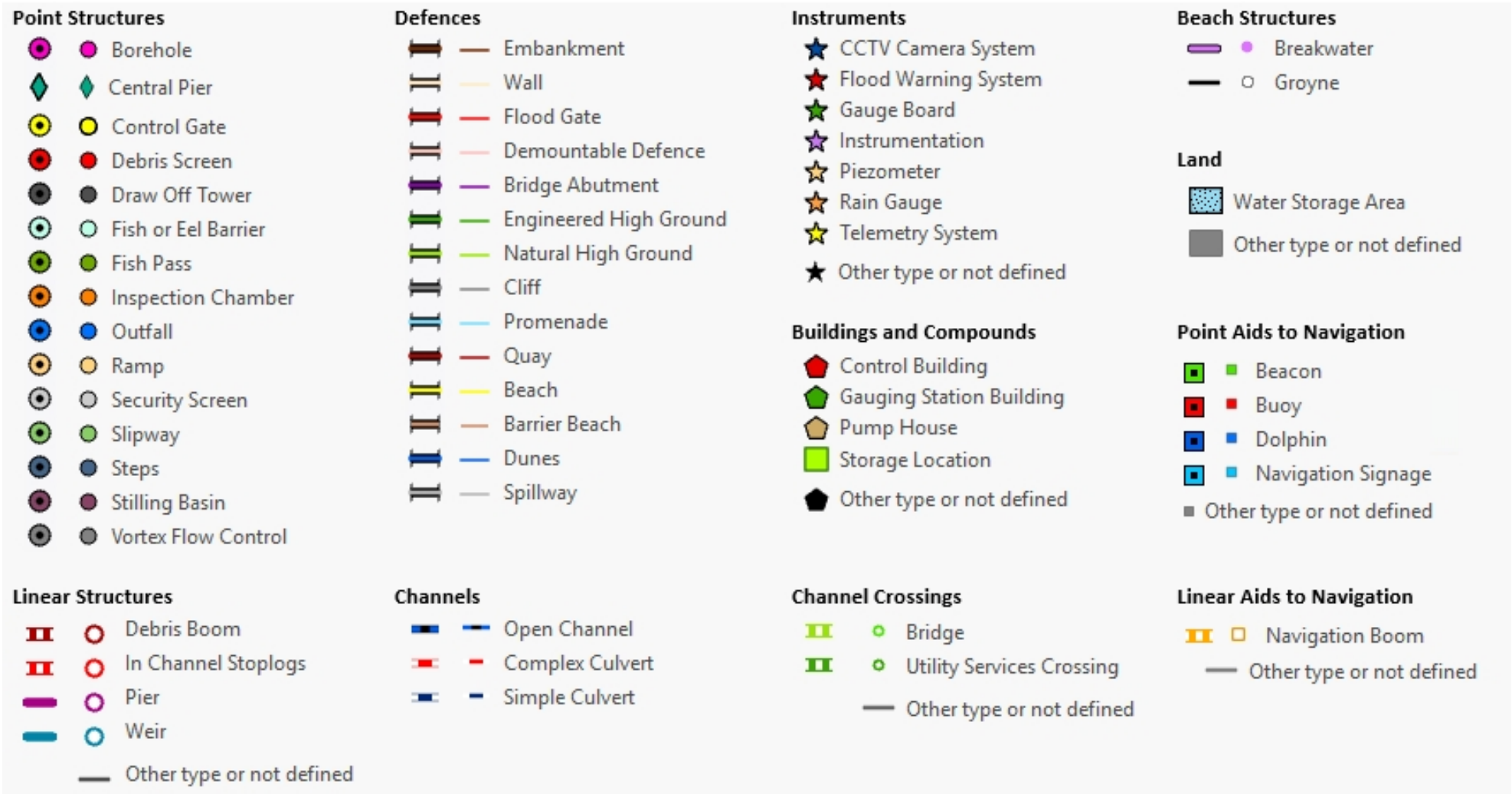


1: 10,000

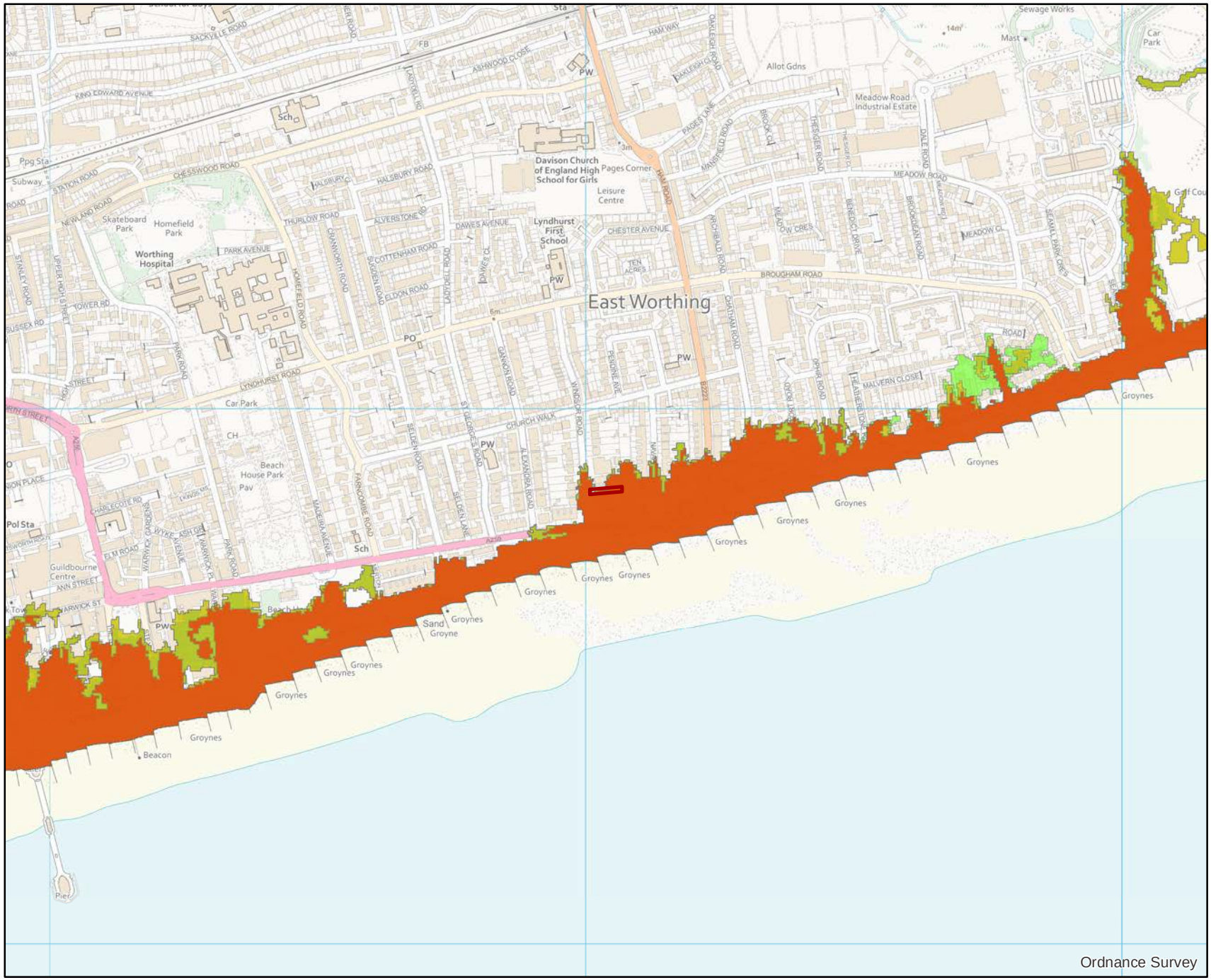
0 250

Metres

N W E S


Point Structures
Borehole
Central Pier
Control Gate
Debris Screen
Draw Off Tower
Fish or Eel Barrier
Fish Pass
Inspection Chamber
Outfall
Ramp
Security Screen
Slipway
Steps
Stilling Basin
Vortex Flow Control
Defences
Embankment
Wall
Flood Gate
Demountable Defence
Bridge Abutment
Engineered High Ground
Natural High Ground
Cliff
Promenade
Quay
Beach
Barrier Beach
Dunes
Spillway
Instruments
CCTV Camera System
Flood Warning System
Gauge Board
Instrumentation
Piezometer
Rain Gauge
Telemetry System
Other type or not defined
Buildings and Compounds
Control Building
Gauging Station Building
Pump House
Storage Location
Other type or not defined
Beach Structures
Breakwater
Groyne
Land
Water Storage Area
Other type or not defined
Point Aids to Navigation
Beacon
Buoy
Dolphin
Navigation Signage
Other type or not defined
Linear Structures
Debris Boom
In Channel Stoplogs
Pier
Weir
Other type or not defined
Channels
Open Channel
Complex Culvert
Simple Culvert
Channel Crossings
Bridge
Utility Services Crossing
Other type or not defined
Linear Aids to Navigation
Navigation Boom
Other type or not defined

Modelled Flood Outlines (Defended Tidal). Centred BN11 2LX. Created 29/09/2023.



Environment Agency

N

Legend

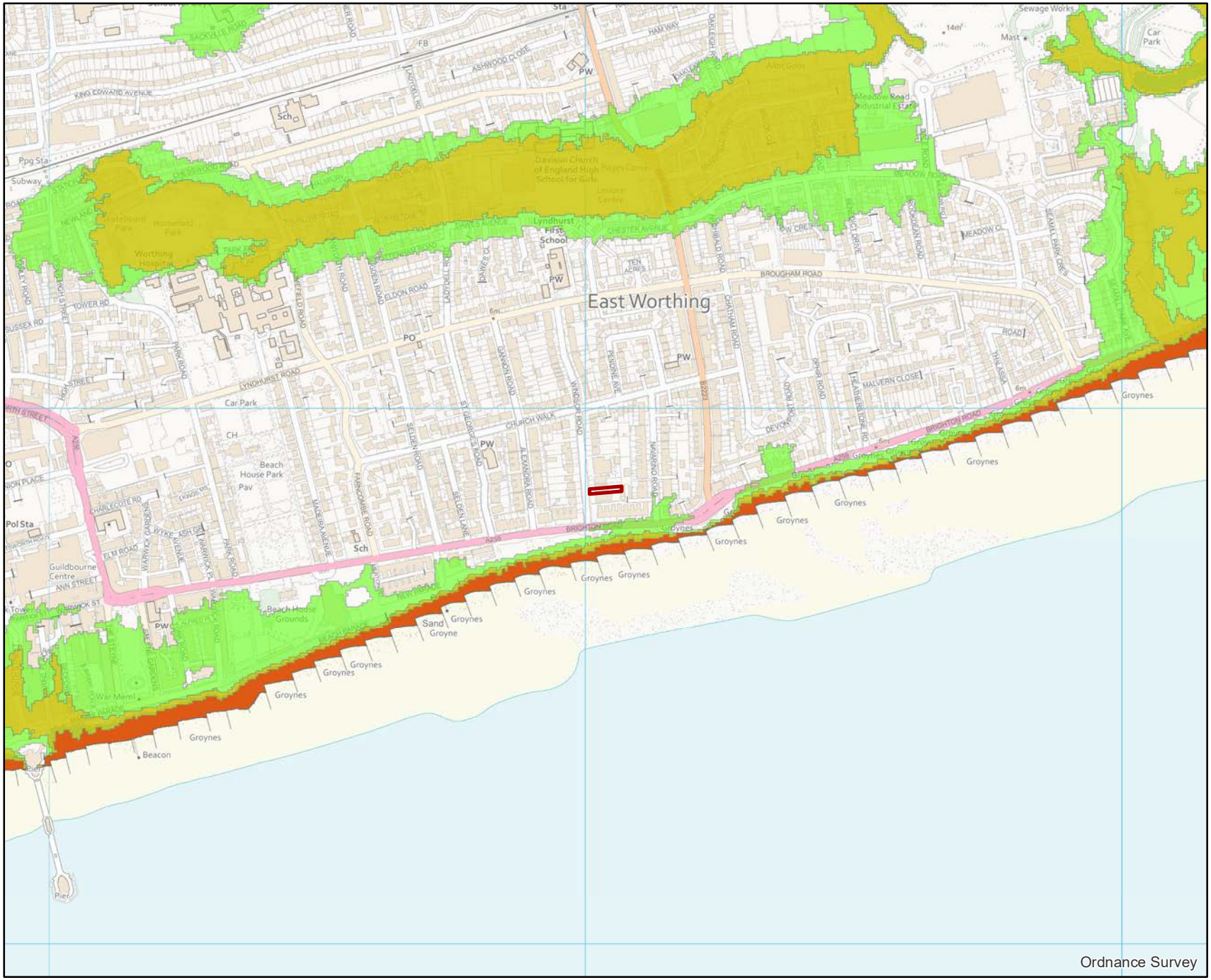
- Site Boundary
- 0.5% AEP (2012) (Defended)
- 0.5% AEP (2070) (Defended)
- 0.5% AEP (2115) (Defended)
- 0.1% AEP (2012) (Defended)

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

Scale: 1:10,000

0 0.225 0.45
Kilometers

Modelled Flood Outlines (Undefended Tidal). Centred BN11 2LX. Created 29/09/2023.



Environment Agency

N

Legend

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

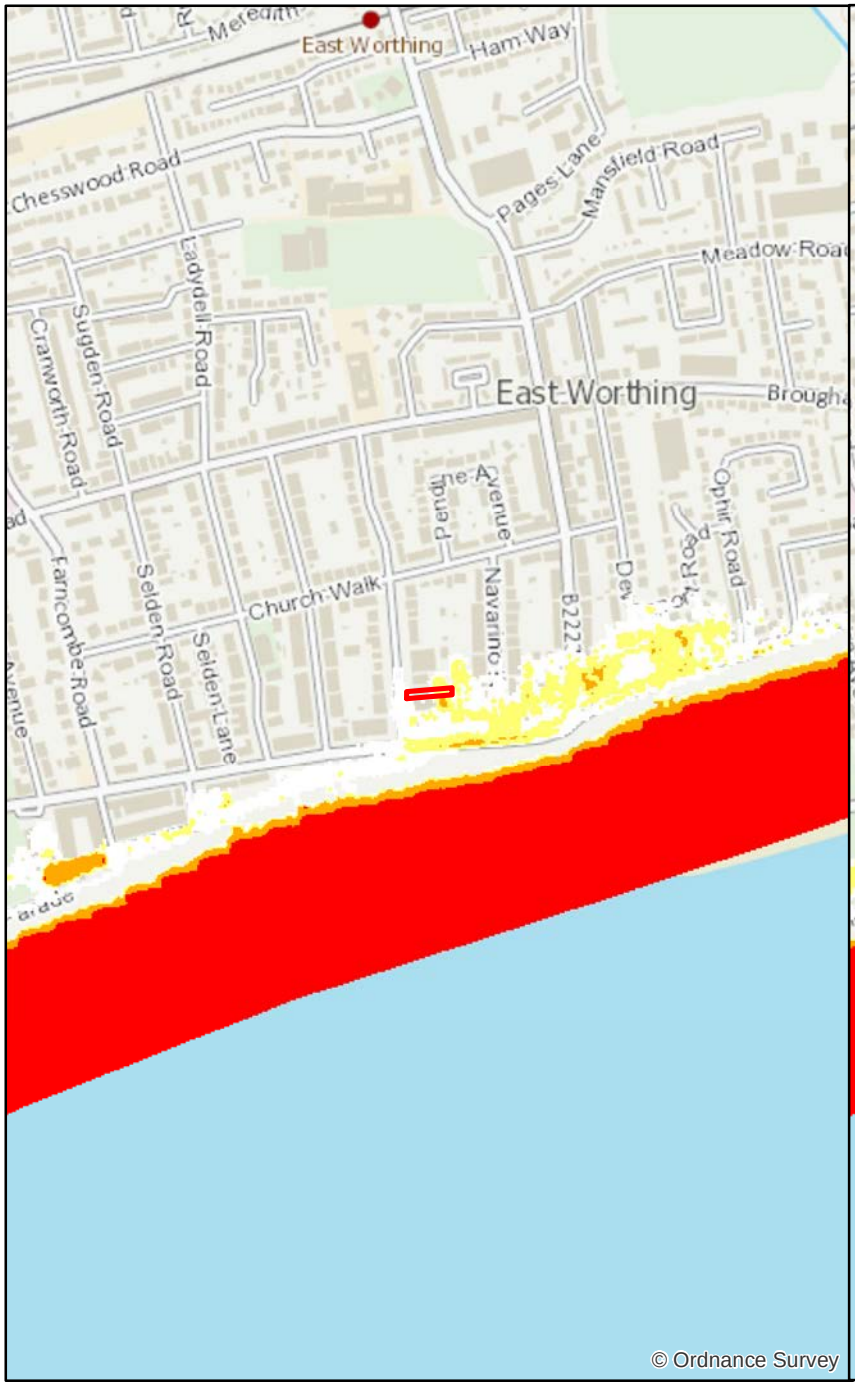
Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000

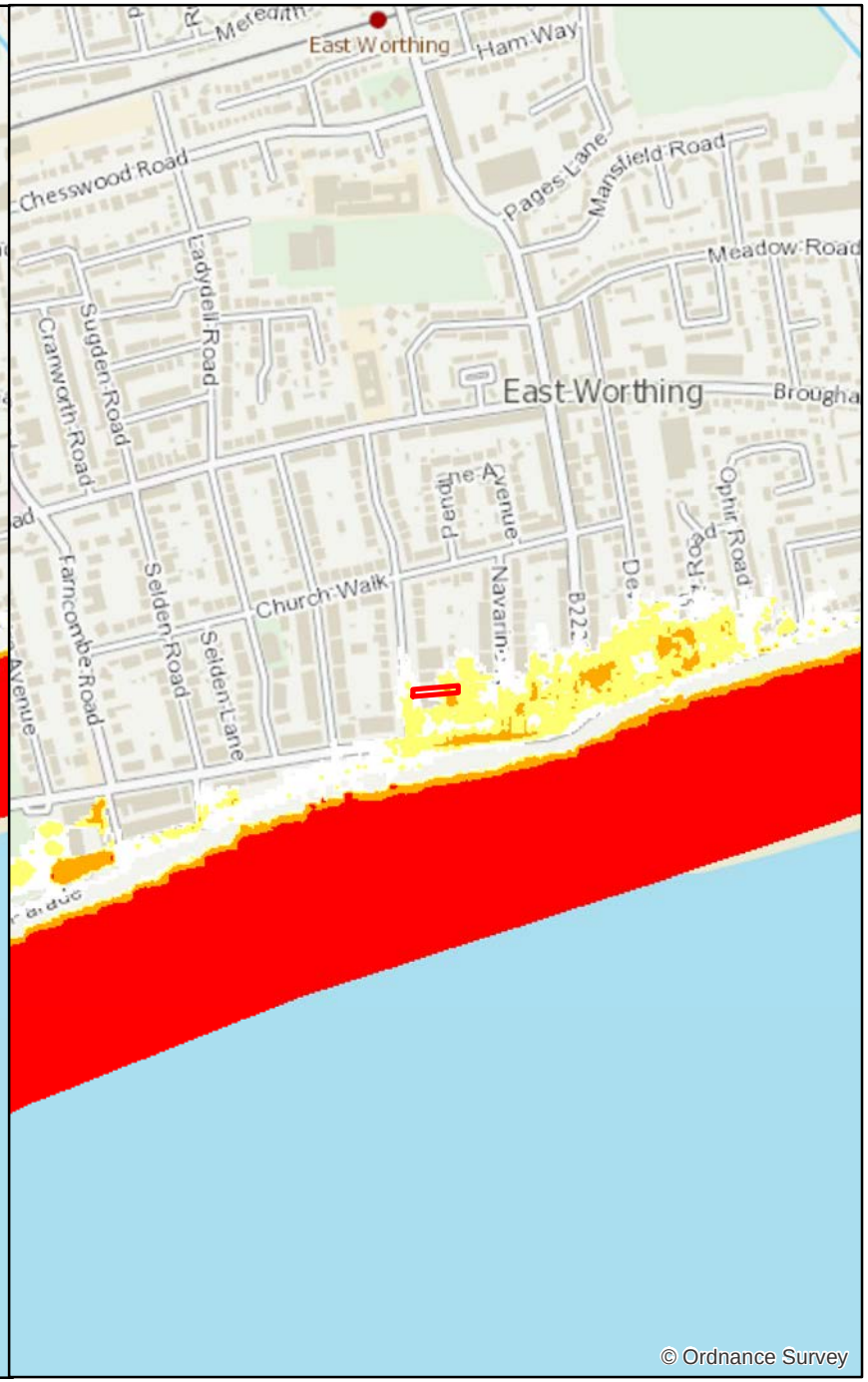
0 0.225 0.45
Kilometers

Hazard Mapping. Centred BN11 2LX. Created 29/09/2023.

1%



0.1%



Environment Agency

N

Legend

- Site Boundary
- Very Low Hazard
- Danger for some - Includes children, the elderly and infirm
- Danger for most - Includes the general public
- Danger for all - Includes the emergency services

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

Scale: 1:10,000

0 0.225 0.45
Kilometers

APPENDIX E

Extract from the 2017 River Arun Modelling Study Report: Table 2-1

- 0.315 to take the 2016 levels to 2065 projections
- 0.739m to take the 2016 levels to 2115 projections

The design peak sea levels for all events considered in the study are provided in Table 2-1.

Event (AEP)	Littlehampton (mAOD)	Worthing (mAOD)
50%	3.48	3.65
20%	3.57	3.74
10%	3.64	3.81
5%	3.72	3.89
4%	3.74	3.91
3.30%	3.76	3.93
2%	3.82	3.99
1.30%	3.86	4.04
1%	3.89	4.07
1% + CC 2115	4.63	4.81
0.50%	3.98	4.16
0.5%+ CC 2115	4.72	4.90
0.10%	4.18	4.35
0.1% + CC 2115	4.92	5.09

Table 2-1: Peak extreme sea levels from CFB and UKCP09

2.2.2 Wave overtopping

As part of the 2012 Arun to Adur modelling study conducted by JBA, wave overtopping rates were determined along the coastline. The methodology is discussed in detail in the original report[2] and is therefore only summarised here. It involved:

- Wave transformation modelling of representative offshore events;
- Determination of wave overtopping rates using EurOtop methods;
- Determination of AEP for overtopping rates.

From the previous study overtopping hydrographs were estimated for the 20%, 5%, 1.33%, 1% 0.5%, 0.5% + CC and 0.1% + CC AEP events. To develop overtopping hydrographs for the additional events in this study, these data were used as a means of interpolation using the following procedure.

- Fit equation to 2012 peak overtopping rates;
- Interpolate peak rates for additional events;
- Scale existing hydrographs based on interpolated peak.

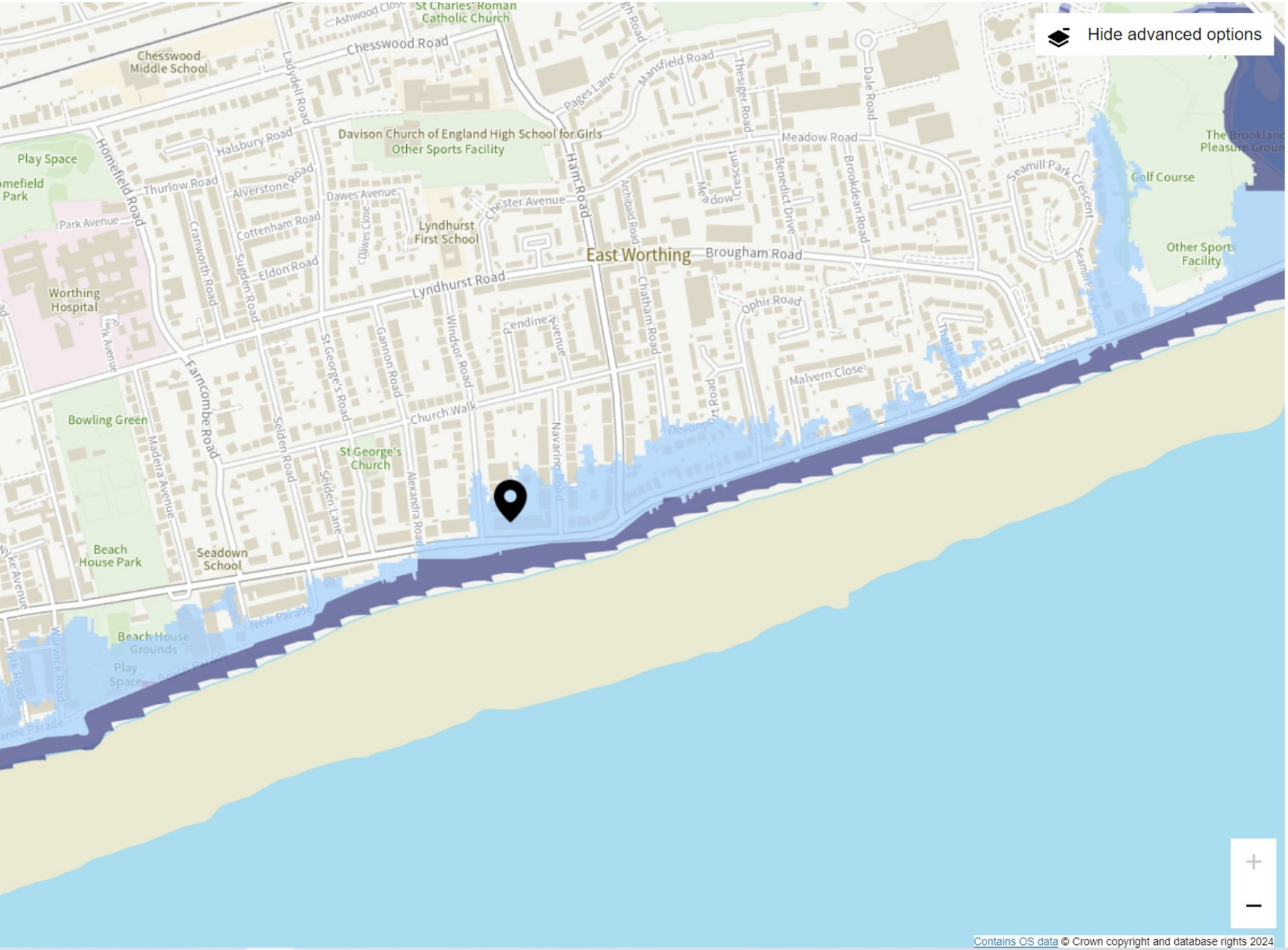
An example of an estimation of the 2% overtopping hydrograph is provided in Figure 2-4 and Figure 2-5.

The equation used for interpolation was determined by assessing the fit of the relevant equations available in Microsoft Excel. The best-fit to the existing peak data was then use to estimate the peak overtopping rates for the additional events.

2 Environment Agency (2012) Arun to Adur Flood Modelling. JBA Consulting

APPENDIX F

Fluvial and tidal risk map



Key

Surface water

- ○ Extent
- ○ Depth
- ○ Velocity

Rivers and the sea

- ◉ Extent
- High risk
  More than 3.3% chance each year
- Medium risk
  Between 1% and 3.3% chance each year
- Low risk
  Between 0.1% and 1% chance each year
- Very low risk
  Less than 0.1% chance each year

Reservoirs

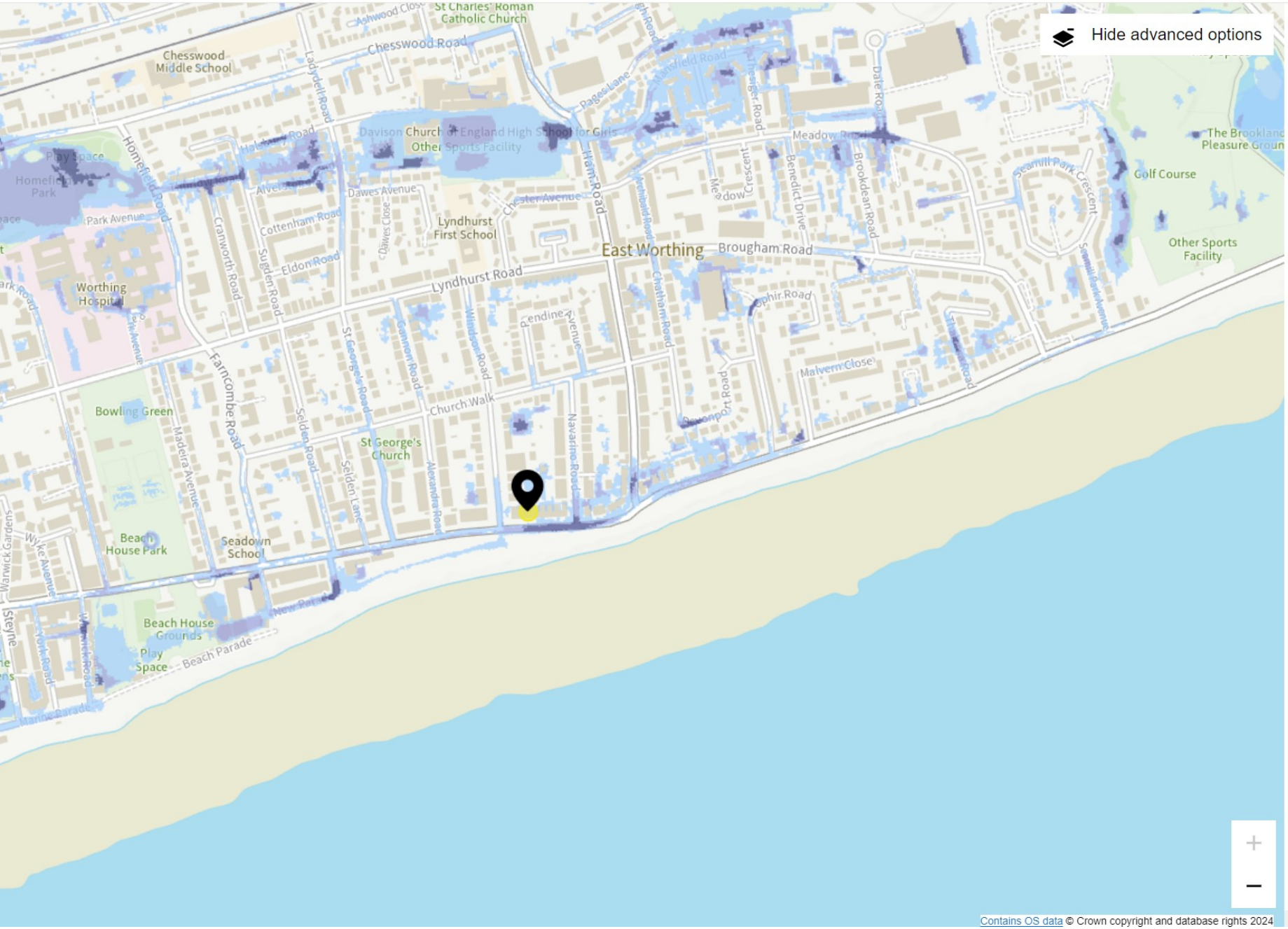
- ○ Extent

Map details

- ☑ Show flooding
- ☑ Selected address

APPENDIX G

Surface water flood maps



Key

Surface water

- (•) Extent
- High risk
  More than 3.3% chance each year
- Medium risk
  Between 1% and 3.3% chance each year
- Low risk
  Between 0.1% and 1% chance each year
- ( ) Depth
- ( ) Velocity

Rivers and the sea

- ( ) Extent

Reservoirs

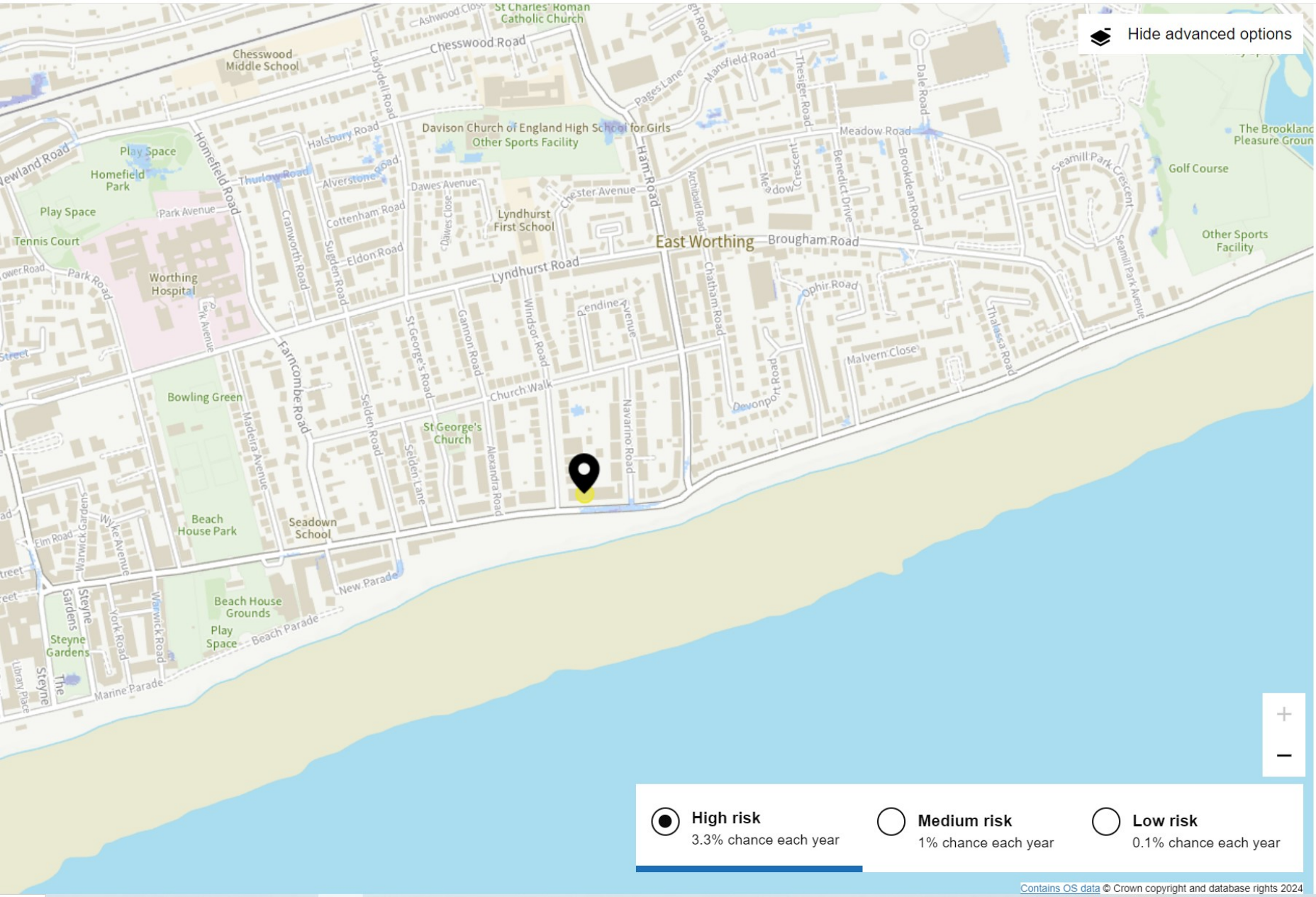
- ( ) Extent

Map details

- [x] Show flooding
- [x] Selected address
- 15m boundary

Pause to updates of flood risk data

We have paused updates to


Hide advanced options
Chesswood Middle School
Chesswood Road
St Charles' Roman Catholic Church
Ladydell Road
Pages Lane
Mansfield Road
Thesiger Road
Dale Road
Meadow Road
Davison Church of England High School for Girls
Other Sports Facility
Homefield Park
Play Space
Tennis Court
Park Avenue
Homefield Road
Thurlow Road
Halsbury Road
Alverstone Road
Dawes Avenue
Dawes Close
Chester Avenue
Lyndhurst First School
Ham Road
Archibald Road
Meadow Crescent
Benedict Drive
Brookdean Road
Seamill Park Crescent
Golf Course
The Brooklands Pleasure Ground
Other Sports Facility
East Worthing
Brougham Road
Lyndhurst Road
Cranworth Road
Cottenham Road
Sudeley Road
Eldon Road
Worthing Hospital
Park Road
Park Avenue
Farncombe Road
St George's Road
Gannon Road
Windsor Road
Grendine Avenue
Chatham Road
Ophir Road
Malvern Close
Thalassa Road
Devonport Road
Church Walk
Bowling Green
Madeira Avenue
Selden Road
Selden Lane
St George's Church
Alexandra Road
Navarino Road
Beach House Park
Seadown School
Elm Road
Warwick Gardens
Wilkie Avenue
Steyne Gardens
York Road
Warwick Road
Beach House Grounds
Play Space
New Parade
Beach Parade
Marine Parade
Library Place
The Steyne
Key
Surface water
Extent
Depth
Above 90cm
30cm to 90cm
Below 30cm
Velocity
Rivers and the sea
Extent
Reservoirs
Extent
Map details
Show flooding
Selected address
15m boundary
Pause to updates of flood risk data
We have paused updates to information about flood risk from rivers and the sea and surface water while we get ready for new data.
High risk
3.3% chance each year
Medium risk
1% chance each year
Low risk
0.1% chance each year
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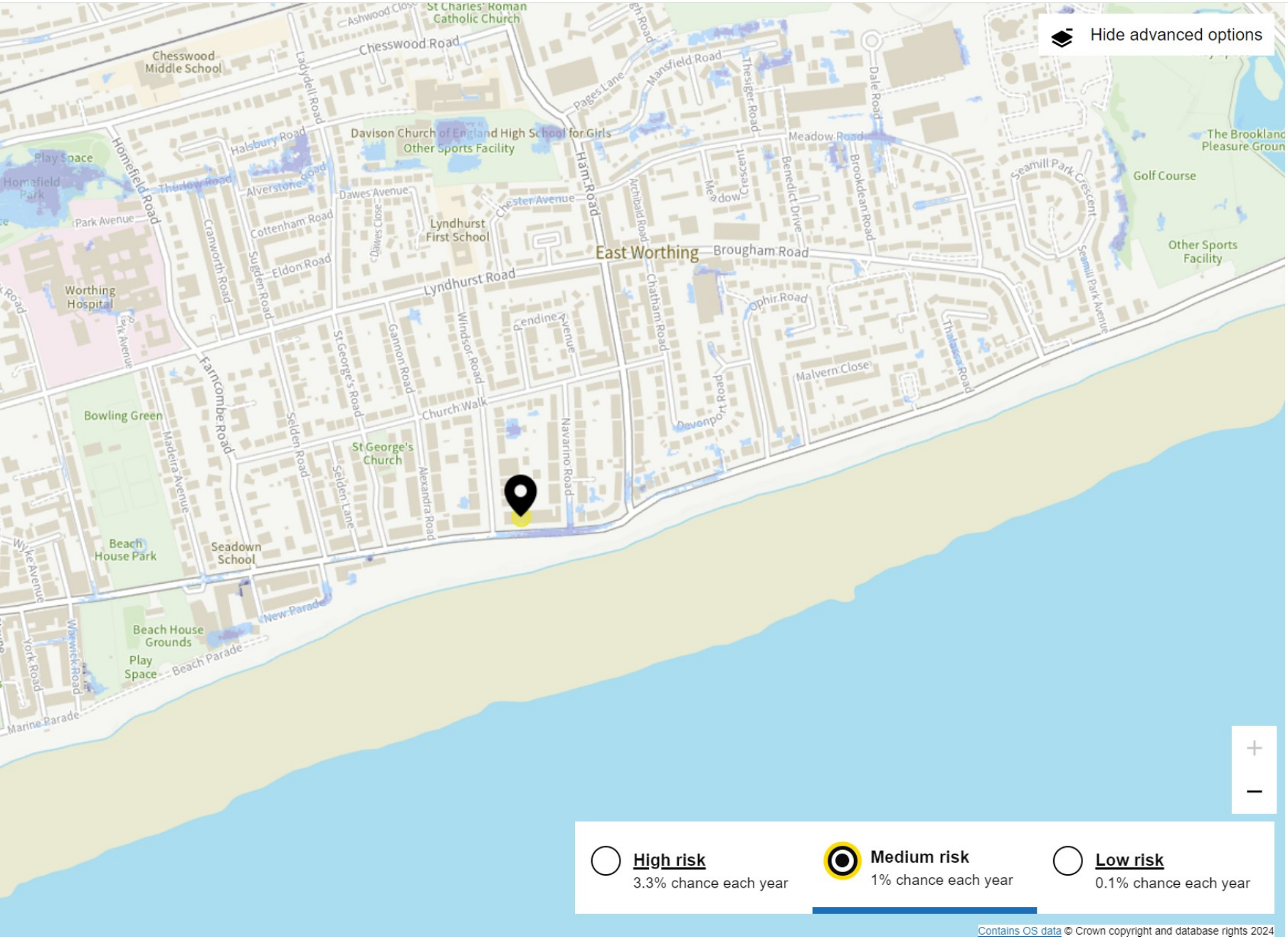


Key

Surface water

- ○ Extent
- ◉ Depth
  - Above 90cm
  - 30cm to 90cm
  - Below 30cm
- ○ Velocity

Rivers and the sea

- ○ Extent

Reservoirs

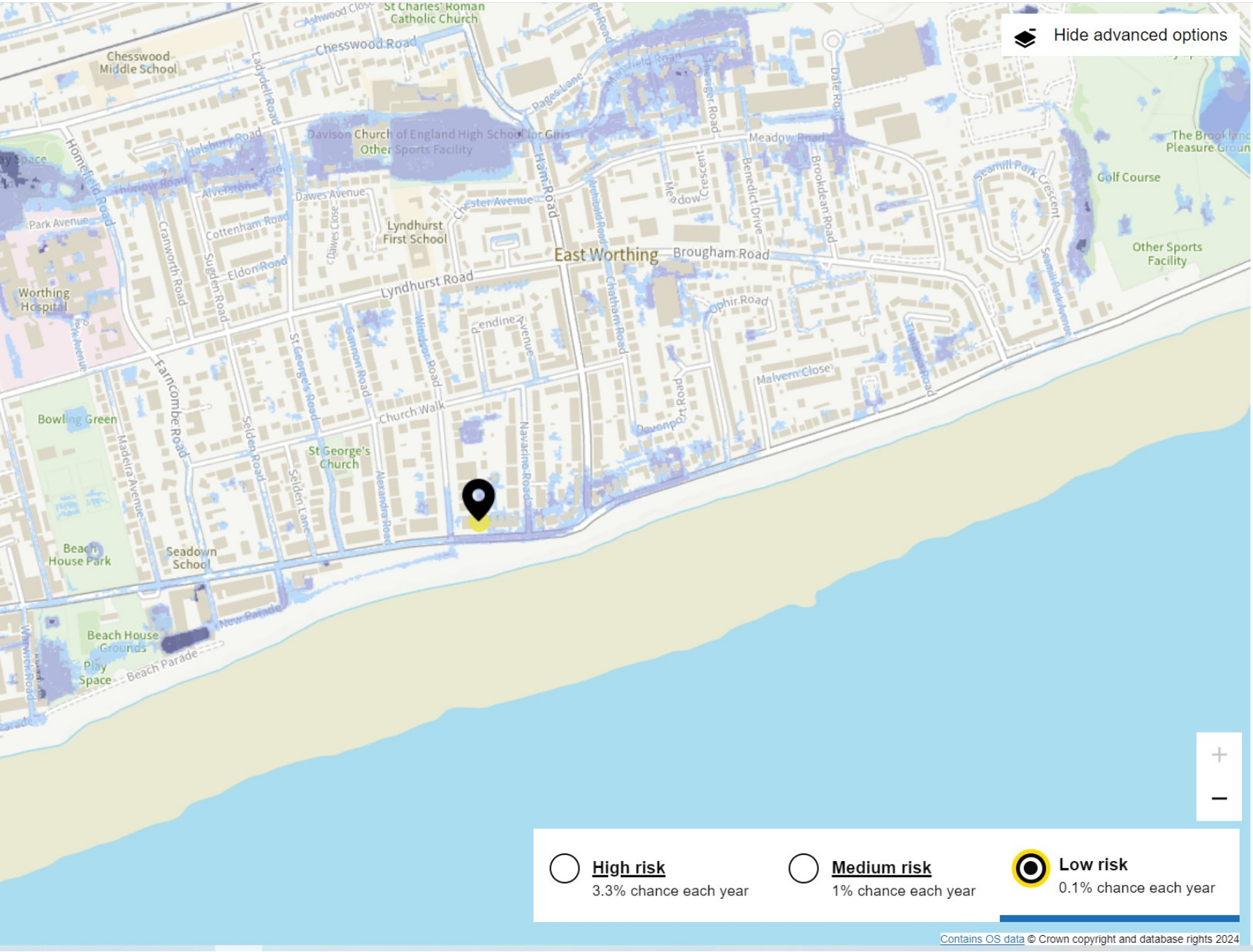
- ○ Extent

Map details

- ☑ Show flooding
- ☑ Selected address
- 15m boundary

Pause to updates of flood risk data

We have paused updates to information about flood risk from rivers and the sea and surface water while we get ready for new data.



High risk
3.3% chance each year

Medium risk
1% chance each year

Low risk
0.1% chance each year

Key

Surface water

- ○ Extent
- ◉ Depth
  - Above 90cm
  - 30cm to 90cm
  - Below 30cm
- ○ Velocity

Rivers and the sea

- ○ Extent

Reservoirs

- ○ Extent

Map details

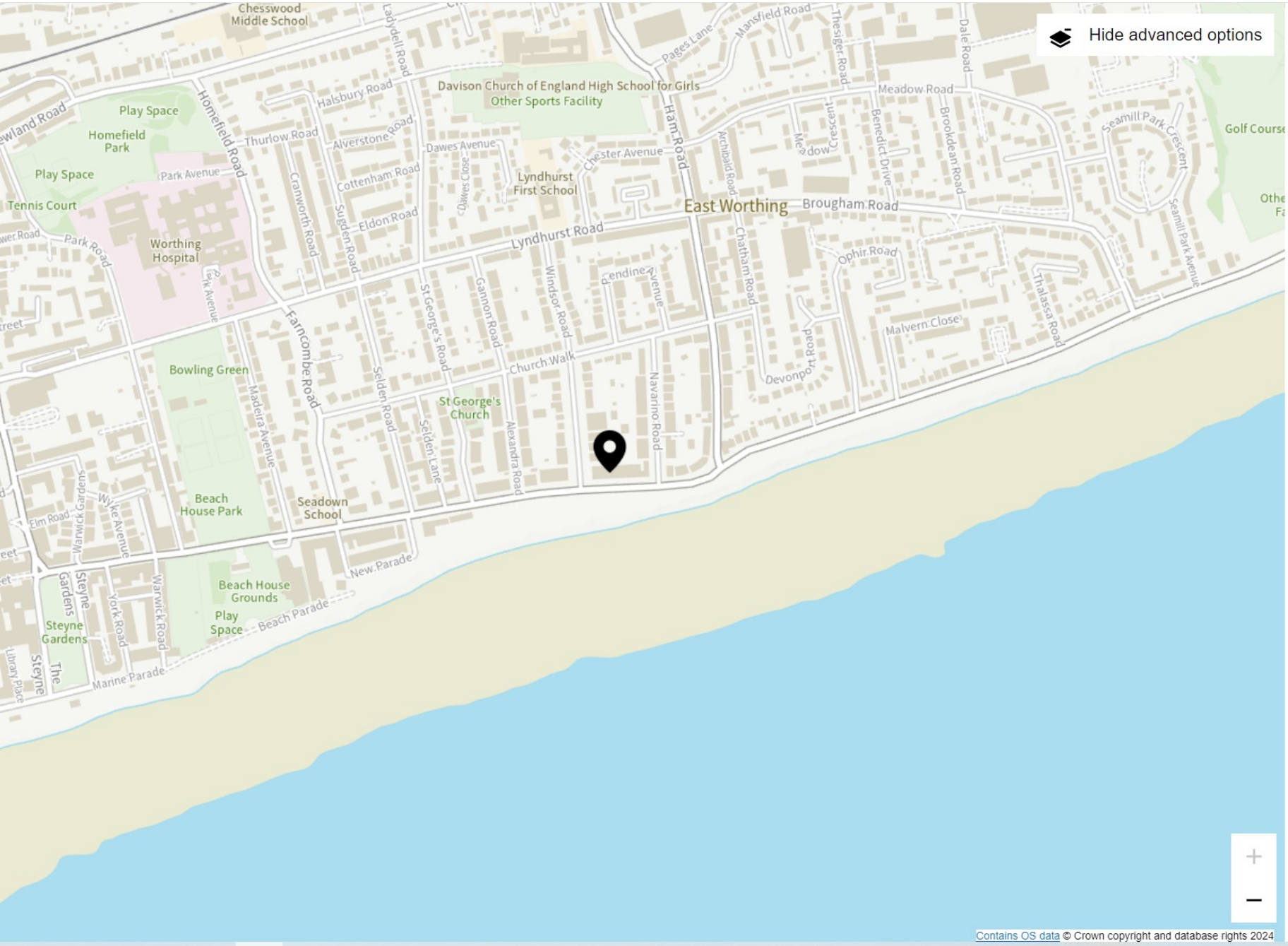
- ☑ Show flooding
- ☑ Selected address
- 15m boundary

Pause to updates of flood risk data

We have paused updates to information about flood risk from rivers and the sea and surface water while we get ready for new data.

APPENDIX H

Reservoirs flood map



Key

Surface water

- ○ Extent
- ○ Depth
- ○ Velocity

Rivers and the sea

- ○ Extent

Reservoirs

- ◉ Extent
- When river levels are normal
- When there is also flooding from rivers

Map details

- ☑ Show flooding
- ☑ Selected address

Pause to updates of flood risk data

We have paused updates to information about flood risk from rivers and the sea and surface water while we get ready for new data.

End of Report