

BOKLOK

LAND TO THE SOUTH OF LITTLEHAMPTON ACADEMY

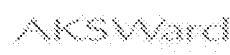
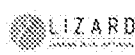
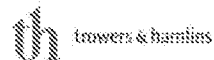
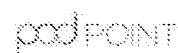
Flood Risk Assessment Part 1

DOC: LTH-AKSW-XX-XX-RP-001

March 2021



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AKSWard

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CONSTRUCTION CONSULTANTS

Land South of Littlehampton Academy

Flood Risk Assessment

Prepared for
BoKlok UK

March 2021

Job №: S208134

Report: LTH-AKSW-XX-XX-RP-001

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Contents

1.0	Introduction.....	1
2.0	Policy & Guidance	2
3.0	Development Site Details	4
4.0	Flood Probability and Hazard	6
5.0	Flood Risk Management.....	11
6.0	Safe Access/Egress Arrangements.....	12
7.0	Conclusion.....	13

Figures

- Figure 1 – Ordnance Survey Mapping – Source: Bing Maps
- Figure 2 – Flood Zones
- Figure 3 – River Catchment Plan. Source: Environment Agency
- Figure 4 – Fluvial Flood Map
- Figure 5 - Surface Water Flood Flow Direction Map

Appendices

- Appendix A Flood Zones
- Appendix B Survey Maps and Historic Information
- Appendix C Flood Information
- Appendix D Proposed Site Plans

Revision	Amendments	Prepared By	Checked	Date
P01	Preliminary issue	GT	DD	26.02.21
P02	Minor Amendments	CR	GT	08.03.21

1.0 Introduction.

- 1.1 The site is located at grid reference TQ 03316 02621 and is bounded by residential housing to the east, Littlehampton Academy to the north, Rosemead Park and residential housing to the south and Fitzalan Road to the west.
- 1.2 AKS Ward have been commissioned by BoKlok UK to undertake a Flood Risk Assessment to support the erection of 80 houses and 32 flats with their associated car parking and hard and soft landscaping areas.
- 1.3 The site is located within Flood Zone 1 'land assessed as having a low annual probability of rivers or sea flooding in any year.'

The closest watercourse to the existing site is the River Arun approximately 877m to the South West.

The contents of this FRA describe the assessment of the proposals and the implications of the proposed development on flood risk. The FRA has been prepared following guidance provided in the National Planning Policy Framework (February 2019) and the Planning Practice Guidance to the National Planning Policy Framework (October 2018).

A planning application is being submitted and this assessment seeks to provide the level of detail necessary to demonstrate that the potential effects of flood risk (to the proposal) have been addressed by identifying the source and probability of flooding to the application site, including effects of climate change;

- Determining the consequences of flooding to and from the proposed development proposal and advising on the how this will be managed, if necessary; and
- Demonstrating the flood risk issues described in this assessment are compliant with the relevant guidance

The scope of data available is summarised in this report and in the associated plans (attached within appendices). An assessment of areas potentially at risk from flooding has been undertaken and the proposed building has been examined with regards to its potential to increase flood risk both on and off site. This FRA supports the construction of the proposed building to demonstrate that flood risk has been given material consideration throughout the development process and the proposed building should not be restricted at this site due to flood risk.

2.0 Policy & Guidance

2.1 Flood & Water Management Act, 2010

Combined with the Flood Risk Regulations 2009, (which enact the EU Floods Directive in England and Wales) the Act places significantly greater responsibility on Local Authorities to manage and lead on local flooding issues. The Act and The Regulations together raise the requirements and targets Local Authorities need to meet, including:

- Playing an active role leading Flood Risk Management;
- Development of Local Flood Risk Management Strategies (LFRMS);
- Implementing requirements of Flood and Water Management legislation;
- Preparation of preliminary flood risk assessments and flood risk management plans; and
- Development and implementation of drainage and flooding management strategies;

The Flood and Water Management Act also clarifies three key areas that influence development:

- Sustainable Drainage Systems (SuDS) - the Act makes provision for a national standard to be prepared on SuDS, and developers will be required to obtain local authority approval for SuDS in accordance with the standards, likely with conditions;
- Flood risk management structures - the Act enables the EA and local authorities to designate structures such as flood defences or embankments owned by third parties for protection if they affect flooding or coastal erosion. A developer or landowner will not be able to alter, remove or replace a designated structure or feature without first obtaining consent; and
- Permitted flooding of third-party land - The EA and local authorities have the power to carry out work which may cause flooding to third party land where the works are deemed to be in the interest of nature conservation, the preservation of cultural heritage or people's enjoyment of the environment or of cultural heritage

2.2 National Planning Policy Framework (NPPF) February 2019

In determining an approach for the assessment of flood risk for the proposal there is a need to review the policy context. Government Guidance requires that consideration be given to flood risk in the planning process. The National Planning Policy Framework was issued in February 2019 and outlines the national policy on development and flood risk assessment.

The Framework states that the inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere.

The essence of NPPF is that:

- Local Plans should be supported by Strategic Flood Risk Assessment and develop policies to manage flood risk from all sources, taking advice from the Environment Agency and other relevant flood risk management bodies, such as lead local flood authorities and internal drainage boards;
- Policies in development plans should outline the consideration, which will be given to flood issues, recognising the uncertainties that are inherent in the prediction of flooding and that flood risk is expected to increase as a result of climate change;
- Planning authorities should apply the precautionary principle to the issue of flood risk, using a risk-based search sequence to avoid such risk where possible and managing it elsewhere;
- The vulnerability of a proposed land use should be considered when assessing flood risk;

- Use opportunities offered by new developments to reduce the causes and impacts of flooding;
- Planning authorities should recognise the importance of functional floodplains, where water flows or is held at times of flood and avoid inappropriate development on undeveloped and undefended floodplains; and
- The concept of Flood Risk Reduction, particularly in circumstances where development has been sanctioned on the basis of the “Exception Test”.

2.3 Planning Practice Guidance

The Planning Practice Guidance provides additional guidance to local planning authorities to ensure the effective implementation of the planning policy set out in the National Planning Policy Framework on development in areas at risk of flooding.

The document provides supporting information on:

- The application of the sequential approach and Sequential and Exception Tests;
- Measures to reduce flood risk to acceptable levels;
- How to manage residual risks; and
- Guidance on how to take climate change into account

2.4 DEFRA Sustainable Drainage Systems March 2015

This document is to be read in conjunction with NPPF and PPG to ensure that a sustainable approach to surface water drainage is utilised to minimise the flow off sites and utilise infiltration where possible.

2.5 The Strategic Flood Risk Assessment (SFRA)

The SFRA is a planning tool that will assist the councils in their selection and development of sustainable site allocations away from vulnerable flood risk areas. The assessment focuses on the existing site allocations, but also sets out the procedure to be followed when assessing additional sites for development in the future. The SFRA will assist the council to make the spatial planning decisions required to inform the forthcoming Local Development Frameworks (LDF).

A Strategic Flood Risk Assessment was completed by Mott MacDonald for Medway Council in 2006. Its purpose was to identify areas at risk of flooding and provide a detailed assessment of the nature and risk of flooding in the areas likely to accommodate significant growth.

A Strategic Flood Risk Assessment (SFRA) was prepared by JBA Consulting in November 2016 to assess flood risks in Arun District Council areas, and in particular the flood risks associated with areas being considered for future development. Having reviewed the SFRA report, the site and its immediate surroundings are not specifically mentioned.

2.6 Local Development Plan

The Arun Local Plan 2011 – 2031 (July 2018) includes policy W DM2 Flood Risk. This requires developments to take account of the National Planning Policy Guidance, the latest Environment Agency flood risk maps and the Council's Strategic Flood Risk Assessment. There are also requirements for items to be included in the Flood Risk Assessment. These requirements have been adhered to in preparing this report.

3.0 Development Site Details

3.1 Development Description & Location

The site is located at grid reference TQ 03316 02621 and is bounded by residential housing to the east, Littlehampton Academy to the north, Rosemead Park and residential housing to the south and Fitzalan Road to the west.

The site is predominantly a brownfield site (former school site) with a total area of approximately 2.37 Ha and includes the remains of the school site with an impermeable area of approximately 2,350m².

The proposed development involves the erection of 80 dwellings and 1 apartment block with their associated car parking and hard and soft landscaping areas.

Plans of the proposed development can be found in Appendix D.

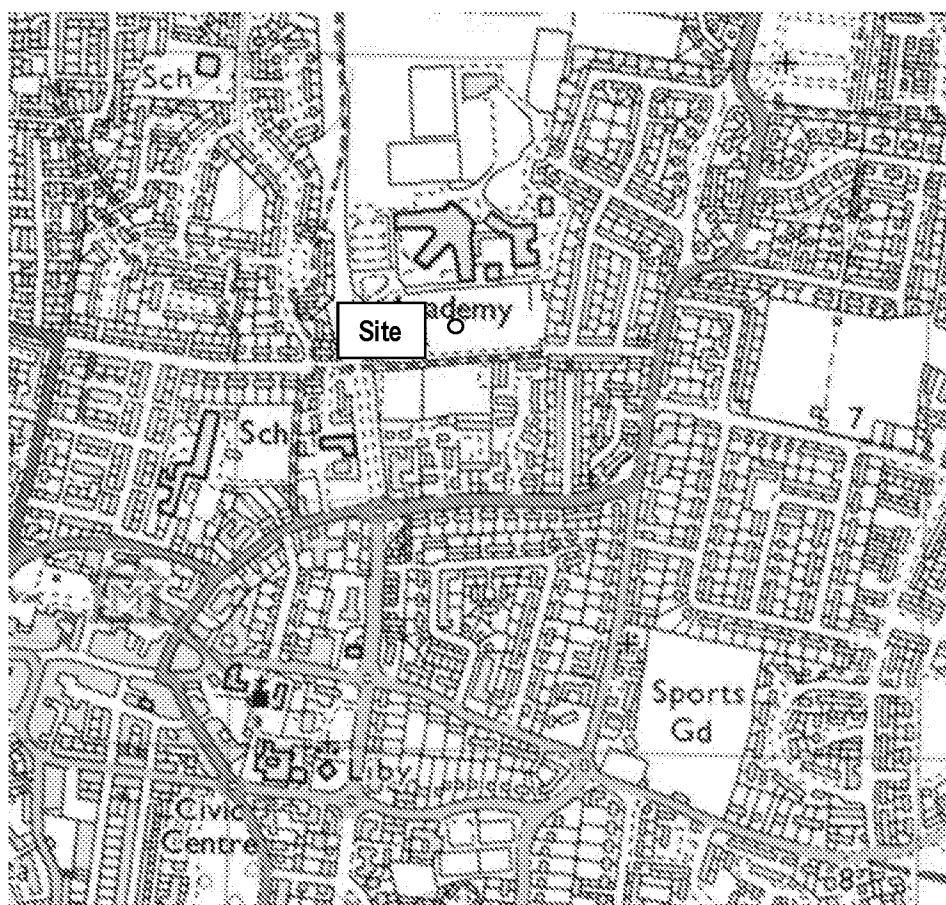


Figure 1 – Ordnance Survey Mapping – Source: Bing Maps

3.2 Vulnerability Classification

The site is located within Flood Zone 1 'land assessed as having low probability of rivers or sea flooding in any year.'

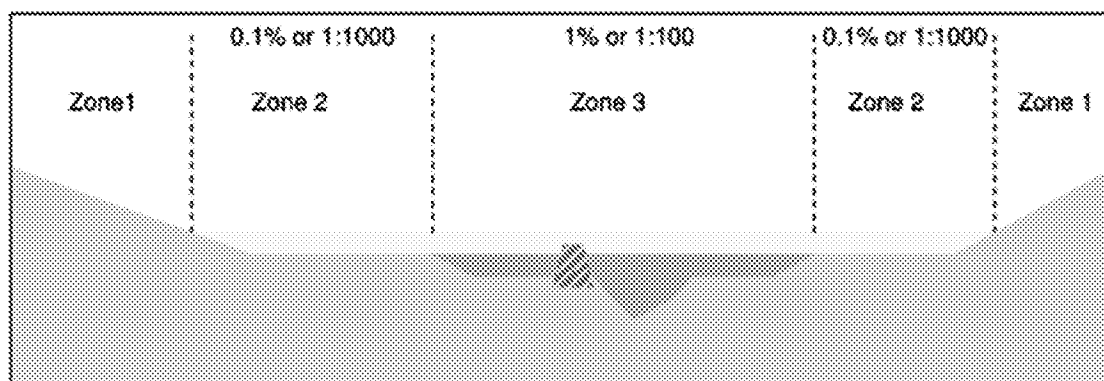


Figure 2 – Flood Zones

The Environment Agency's flood zone map is provided in Appendix C.

The development is considered to fall under the classification of 'more vulnerable' land use based on the Environment Agency Flood risk assessments: climate change allowances Guidance 2017.

A topographical survey to OSBM has been carried out which confirms the site levels fall across the site from 8.00 AOD in the South - South-East to 6.90m AOD to the North-North East. There are existing spoil heaps on the site artificially raising the levels up to approximately 11.77m AOD.

3.3 Site Drainage

There is no remaining existing drainage serving the site although the previous school on the site would have been connected to the public sewer system. The ground conditions are impermeable clay over structureless chalk. Water monitoring has been carried out which confirms a high water table within the chalk strata which results in infiltration not being viable on the site.

Existing topographical survey can be found in Appendix B.

4.0 Flood Probability and Hazard

4.1 Catchment Background

The Lower Arun operational catchment stretches from Littlehampton to Pulborough. It includes the tidal river Arun, a transitional waterbody, and its freshwater tributaries.

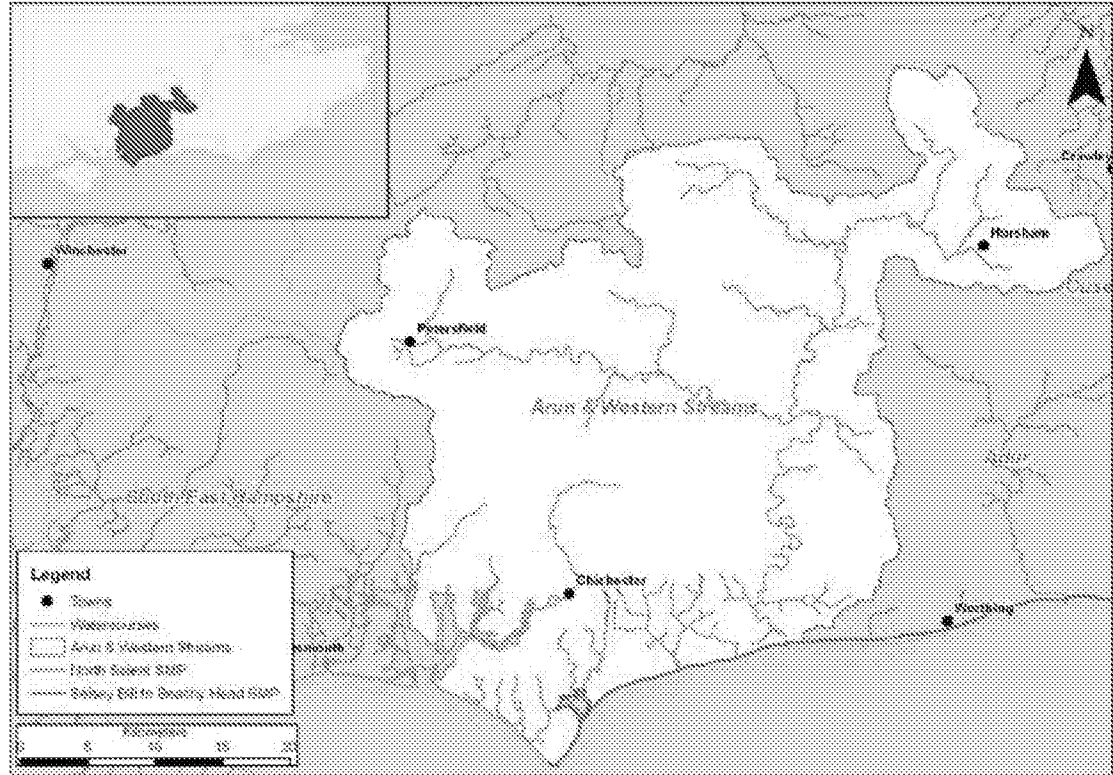


Figure 3 – River Catchment Plan. Source: Environment Agency

4.2 Local Geology

Site investigation reports have confirmed that the site is underlain with made ground from the previous school including large stockpiles of made ground over predominantly clay terrace deposits over a structureless chalk.

Infiltration tests have been carried out and determined that the terrace deposits are not viable for infiltration of surface water. Ground water levels have been recorded at 4.40m BGL within the upper layers of the chalk therefore a 1m freeboard to the groundwater level cannot be achieved on this site.

Depth from (m)	Depth To (m)	Soil Type	Description
0.0	0.30 / 0.40	TOPSOIL	Light brown to light orangish brown locally reworked slightly gravelly silty clayey TOPSOIL. Gravel is fine to sized rounded flint and occasional brick, chalk, mortar and concrete.
0.0	0.25 / 0.50	MADE GROUND (non-stockpile areas)	Light brown to orangish brown sandy gravelly clayey MADE GROUND. Gravels of brick, concrete, asphalt, sub angular to sub rounded flint. Wire noted in TP1. Black ashy gravelly fill noted in TP2, possible remnant blacktop surface. TP1-TP3, TP5, WS1A-C, WS2-WS5
0.0	0.75-1.0	MADE GROUND (Stockpile areas)	Grass over light brown to brown sandy clayey slightly gravelly MADE GROUND. Gravels of rounded to sub rounded, sub angular flint, chalk coarse brick and concrete, occasional whole brick. TP6 refused on a concrete obstruction at 0.70 m. A length of electrical cable in TP8 at 0.50 m. A layer of rotted wood chippings in TP10 at 0.70-0.75 m TP4, TP6-TP12
0.75/1.50	1.50/2.50	MADE GROUND (Stockpile areas)	Soft dark brown greyish to dark grey slightly gravelly clay MADE GROUND. Slight organic odour (pest or burnt organics). Gravels of rounded to sub-rounded flint. Occasional fine to medium brick gravel. Rare woven plastic membrane or plastic netting, plastic tile fragments and rubber seals noted. TP10-TP12
0.25/0.5	1.1/3.0	CLAY	Soft to firm brown becoming orangish brown CLAY and pale brown becoming orange brown gravelly sandy CLAY occasionally mottled orange. Gravel is fine to coarse sub angular to sub rounded flint. Sand is fine to medium grained.
1.3/1.8	2.35/4.10	SAND	Medium dense orange brown to orange or yellowish orange slightly clayey gravelly SAND. Sand is fine to coarse grained. Gravel is fine to coarse sub rounded to sub angular flint.
2.4/2.7	4.10/6.0	CHALK	Soft off white mottled pale orange gravelly SILT or silty GRAVEL (structureless CHALK HEAD) WS2-WS5

4.3 Historical Flooding

A review of historic flooding was carried out. No historic flood incidents have been recorded by the Environment Agency (EA).

4.4 Flood Zone

Flood zones describe the extent of flooding that would occur on the basis that no flood defences were in existence. They also describe the extent to which land under scrutiny is afforded protection by the presence of defences. The definition of Flood Zones is provided in the EA Flood risk assessments: climate change allowances.

4.5 Sources of Flooding – Flood Risk

The NPPF describes potential sources of flooding. It is necessary to consider the risk of flooding from all sources within an FRA. This section provides a review of flooding from land, sewers, groundwater and artificial sources, in addition to rivers.

4.5.1 Fluvial Flood Risk

A review of the flood extents from the SFRA and historical flood data indicate that the site is located in flood zone 1 and has not flooded. The site is therefore NOT considered to be at risk of fluvial flooding.

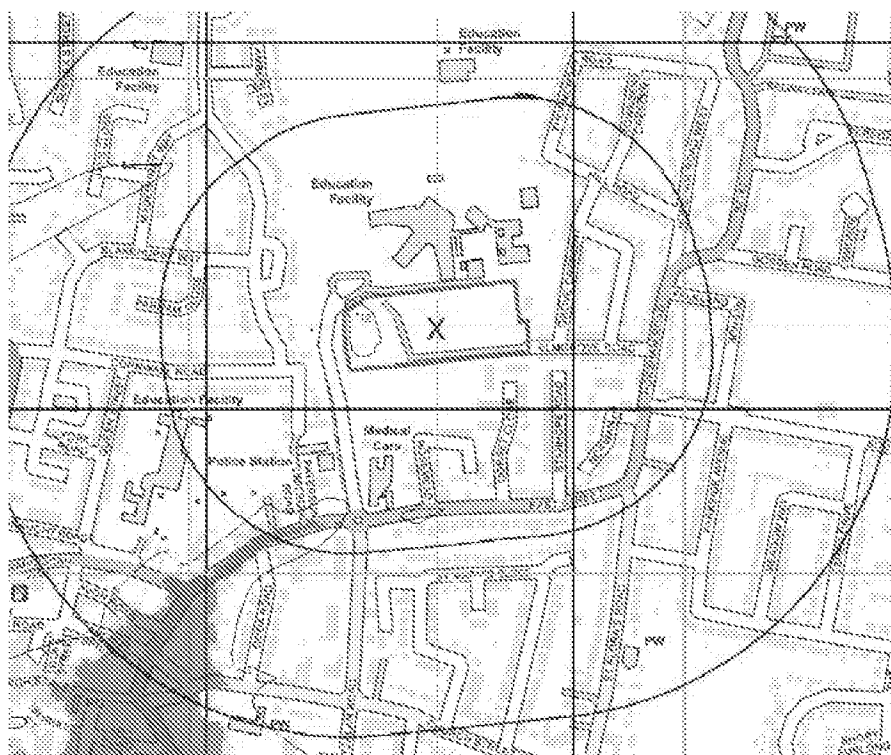


Figure 4 – Fluvial Flood Map

4.5.2 Tidal Flood Risk

Tidal flooding occurs when a high astronomical tide and storm (tidal surge) exceeds the level of coastal land or coastal flood defences. Tidal flooding can also be caused by 'tide locking' of rivers or estuaries. Tide locking prevents a river from discharging into the sea, causing 'backing up' and resulting in tidal/fluvial flooding.

The site is not located within an area considered to be at risk from tidal flooding.

4.5.3 Flood Risk from Surface Water & Overland Flow

Flooding from land can be caused by rainfall being unable to infiltrate into the natural ground or enter the drainage systems due to blockage, or flows being above design capacity. This can then result in (temporary) localised ponding and flooding. The natural topography and location of buildings / structures can influence the direction and depth of water flowing off impermeable and permeable surfaces.

The topographical survey confirms that existing ground levels fall to the north east corner of the site. The Envirocheck surface water flood maps show that the surface water flood flow paths follow the same route. The site is therefore considered to be at low risk of surface water flooding with only minimal flow paths in the 1 in 1000 year storm event which are contained within the site.

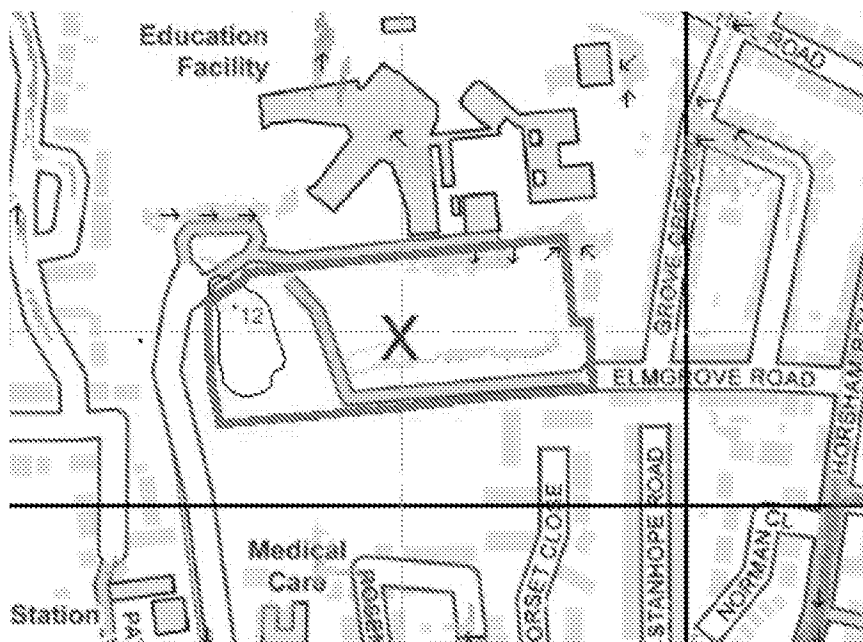


Figure 5 - Surface Water Flood Flow Direction Map

It is therefore concluded that the proposed buildings will have a **LOW** risk of surface water flooding and will not increase the risk of surface water flooding to surrounding areas.

4.5.4 Flood Risk from Groundwater

Envirocheck BGS Flood Data indicates that there is limited potential for groundwater flooding in the general area. Ground water monitoring on the site recorded ground water circa 4m below ground level.

The floor level of the proposed building will follow the existing ground levels. Generally, the finished floor levels will be raised above existing ground levels. All external areas will fall away from the building towards soft landscaping.

Therefore, the risk of groundwater flooding is deemed to be **LOW**.

4.5.5 Flood Risk from Sewers

Surface water flooding as a result of sewer blockages, failures or insufficient capacity has the potential to contribute significant flood risk in urban areas. This is due to the rapid run off rates associated with urban land use and the volume of water that flows into the sewer systems in relatively short periods of time. No sewers have been identified on the site by the topographical survey or utilities surveys.

The proposed development has been designed to ensure there is no increased flood risk to the site and surrounding areas for all storm events up to and including 100 year plus 40% climate change storm event. Refer to separate Drainage Strategy for detailed surface water design and modelling.

It is concluded that there is a **LOW** risk of sewer flooding to the development.

4.5.6 Flood Risk from Artificial Sources

Artificial sources of flooding include reservoirs, canals, lakes and mining abstraction.

The site is located outside the extent of flooding from reservoirs.

It is therefore concluded that overall, the site is at low risk of flooding from artificial sources.

5.0 Flood Risk Management

5.1 Principles of Flood Risk Management

NPPF requires a precautionary approach to be undertaken when making land use planning decisions regarding flood risk. This is partly due to the considerable uncertainty surrounding flooding mechanisms and how flooding may respond to climate change. It is also due to the potentially devastating consequences of flooding to the people and property affected.

Flood risk is a combination of the probability of flooding and the consequences of flooding. Hence 'managing flood risk' involves managing either, the probability of flooding or the consequences of flooding, or both.

NPPF requires flooding from tidal, fluvial, overland, surface water & sewerage and from groundwater to be considered. The flood risk management measures discussed in this section are based on the sources of flooding identified in Section 4 that are considered to pose a risk to the development proposals.

5.2 Flood Risk Management

Section 4 identified the sources of flooding that require investigating to ensure that the risk to the building is an acceptable level in compliance with NPPF:

- Managing surface water

5.2.1 Managing Surface Water

The proposed surface water drainage will not increase the flood risk on or off the site and will be attenuated and discharged at a controlled rate into the public sewer system.

The SuDS features proposed for the site include permeable block paving for private car parking, bioretention areas, and cellular attenuation tanks.

Runoff from the buildings and paved areas will fully utilise the SuDS features for storage and also to meet water quality levels in line with current CIRIA guidance. Full details are provided in the drainage strategy.

The design of the system will be based on the Modified Rational Method and Building Regulations Part H. The surface water drainage will be designed with no flooding for all 30 year events and all flood water contained within the site for all events up to and including the 100 year plus 40% climate change. This design philosophy is in accordance with CIRIA guidance and the SuDS Manual.

6.0 Safe Access/Egress Arrangements

- 6.1 Demonstrating safe access and egress is available for the site for the development lifetime is a key factor in demonstrating compliance with the NPPF. This requires site occupants to be able to safely access and exit the building in design flood conditions. Vehicular access to allow the emergency services to safely reach the development during design flood conditions is also normally required.

The site is located in flood zone 1, therefore safe access and egress can be achieved.

6.2 Flood Resilience and Resistance

The site is located flood zone 1 therefore the buildings do not require any additional flood resilience or resistance measures.

7.0 Conclusion

- The existing site has never flooded.
- The proposed development is at low risk of fluvial flooding.
- The proposed site is at low risk of surface water flooding.
- The proposed development will not increase the risk of flooding on or off site.
- The proposed development will utilise SuDS drainage techniques for the discharge of surface water on site which will minimise flood risk and improve water quality.

Appendix A

Flood Zones

Table 1: Flood zones

(Note: These flood zones refer to the probability of river and sea flooding, ignoring the presence of defences)

Zone 1 - low probability

Definition

This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

Appropriate uses

All uses of land are appropriate in this zone.

Flood risk assessment requirements

For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a flood risk assessment. This need only be brief unless the factors above or other local considerations require particular attention.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage systems².

Zone 2 - medium probability

Definition

This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year.

Appropriate uses

Essential infrastructure and the water-compatible, less vulnerable and more vulnerable uses, as set out in table 2, are appropriate in this zone. The highly vulnerable uses are *only* appropriate in this zone if the Exception Test is passed.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development, and the appropriate application of sustainable drainage systems.

Zone 3a - high probability

Definition

This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

Appropriate uses

The water-compatible and less vulnerable uses of land (table 2) are appropriate in this zone. The highly vulnerable uses should not be permitted in this zone.

The more vulnerable uses and essential infrastructure should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

In this zone, developers and local authorities should seek opportunities to:

- reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems;

- relocate existing development to land in zones with a lower probability of flooding; and
- create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage.

Zone 3b - the functional floodplain

Definition

This zone comprises land where water *has* to flow or be stored in times of flood.

Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. But land which would flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood in an extreme (0.1%) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

Appropriate uses

Only the water-compatible uses and the essential infrastructure listed in table 2 that has to be there should be permitted in this zone. It should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows; and
- not increase flood risk elsewhere.

Essential infrastructure in this zone should pass the Exception Test.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

In this zone, developers and local authorities should seek opportunities to:

- reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems;
- relocate existing development to land with a lower probability of flooding.

Table 2: Flood risk vulnerability classification

Essential infrastructure • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly vulnerable • Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use³. • Installations requiring hazardous substances consent⁴. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as “essential infrastructure”)⁵.
More vulnerable • Hospitals. • Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste⁶. • Sites used for holiday or short-let caravans and camping, <i>subject to a specific warning and evacuation plan</i>.⁷
Less vulnerable • Police, ambulance and fire stations which are <i>not</i> required to be operational during flooding.

restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in “more vulnerable”, and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do <i>not</i> need to remain operational during times of flood. • Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).
Water-compatible development • Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, <i>subject to a specific warning and evacuation plan</i>.

Notes to table 2:

- This classification is based partly on Department for Environment, Food and Rural Affairs and Environment Agency research on *Flood Risks to People (FD2321/TR2)*⁸ and also on the need of some uses to keep functioning during flooding.
- Buildings that combine a mixture of uses should be placed into the higher of the relevant classes of flood risk sensitivity. Developments that allow uses to be distributed over the site may fall within several classes of flood risk sensitivity.
- The impact of a flood on the particular uses identified within this flood risk vulnerability classification will vary within each vulnerability class. Therefore, the flood risk management infrastructure and other risk mitigation measures needed to ensure the development is safe may differ between uses within a particular vulnerability classification.

Table 3: Flood risk vulnerability and flood zone ‘compatibility’

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	✗	✗	✗

Key: ✓ Development is appropriate.
 ✗ Development should not be permitted.

Notes to table 3:

This table does not show:

- the application of the Sequential Test which guides development to Flood Zone 1 first, then Zone 2, and then Zone 3;
- flood risk assessment requirements; or
- the policy aims for each flood zone.

Appendix B

Survey Maps and Historic Information



SEWER RECORDS

Node	Cover	Invert	Size	Material	Shape
0001X	8.54	4.38	225	CP	CIRC
0501X	8.08	8.43	225	VC	CIRC
0502X	8.08	8.87	225	VC	CIRC
0801X	7.48	1.76	450	CP	CIRC
0701X	6.54	2.03	450	CP	CIRC
0702X	7.21	1.88	450	CP	CIRC
0801X	5.12	2.25	450	CP	CIRC
0802X	5.08	2.29	450	CP	CIRC
0803X	5.8	2.17	450	CP	CIRC
0901X		4.81	225	CP	CIRC
0802X	5.32	4.14	225	VC	CIRC
0903X			UNK	VC	CIRC
0904X			UNK	VC	CIRC
1401X	7.45	1.37	525	CP	CIRC
1501X	7.95	1.82	525	CP	CIRC
1902X	7.97	8.5	500	CP	CIRC
1503X	7.95	8.58	525	CP	CIRC
1503X	7.95	8.45	450	BAC	CIRC
1505X	8.31	1.49	525	CP	CIRC
1508X	8.12	8.12	525	BAC	CIRC
1807X	7.83	8.08	525	BAC	CIRC
1701X	7.08	5.49	150	CP	CIRC
1901X			UNK	VC	CIRC
2400X	7.574	8.144	150	PVC	CIRC
2401X	8.032	5.802	150	PVC	CIRC
2501X	7.98	8.01	525	BAC	CIRC
3401X	8.85	8.16	150	VC	CIRC
3501X	8.02	5.4	525	BAC	CIRC
4001X	7.46	5	225	VC	CIRC
4405X	7.54	5.76	225	VC	CIRC
4408X		7.38	150	VC	CIRC
4418X	10.19	8.29	150	VC	CIRC
4410X			225	VC	CIRC
4428X	8.13	7.12	150	VC	CIRC
4480X	7.8	8.74	150	VC	CIRC
44C8X	8.22	7.18	150	VC	CIRC
4400X	8.27	7.55	150	VC	CIRC
44EDX	7.81	8.73	150	VC	CIRC
44JDX	8.32	7.83	150	VC	CIRC
44KDX	7.95	7.28	150	VC	CIRC
4502X	8.23		525	BAC	CIRC
4503X	8.4	8.46	225	VC	CIRC
4508X	8.58	8.94	225	VC	CIRC
4511X	10.38	8.78	150	VC	CIRC
4512X	8.32	6.61	225	VC	CIRC
4513X	10.47	8.82	150	VC	CIRC
4514X			150	VC	CIRC
4515X			UNK	UNK	CIRC
4516X			UNK	UNK	CIRC
4517X			UNK	UNK	CIRC
451DX			225	VC	CIRC
452DX			525	BAC	CIRC
453DX	8.45	7.41	150	VC	CIRC
454DX	8.47		150	VC	CIRC
454DX	8.55	7.5	150	VC	CIRC
458DX	8.77	7.78	150	VC	CIRC
45CDX	8.84		150	VC	CIRC
45DDX	8.98	7.41	150	VC	CIRC
45EDX	8.82		150	VC	CIRC
4608X			UNK	UNK	UNK
460DX			UNK	UNK	CIRC
4618X			UNK	UNK	CIRC
461DX			UNK	UNK	UNK
462DX			UNK	UNK	UNK
463DX			UNK	UNK	CIRC
464DX			UNK	UNK	UNK
4701X			UNK	UNK	CIRC
4801X	7.22	5.94	225	VC	CIRC
4802X	7.87	3.88	225	VC	CIRC
4803X	7.18	4.18	225	VC	CIRC
4804X			225	VC	CIRC
4805X			225	VC	CIRC
4806X			225	VC	CIRC
5411X	8.51	1.88	900	CP	EGG
543DX	7.78	7.08	150	VC	CIRC
544DX	7.78		150	VC	CIRC
544DX	7.97	7.39	150	VC	CIRC
548DX	8.33	7.47	150	VC	CIRC
54CDX	8.24		150	VC	CIRC
54EDX	8.23	7.43	150	VC	CIRC
5501X	8.7	4.08	525	BAC	CIRC
5507X	8.88	1.75	900	CP	EGG
5508X	8.54	6.24	225	VC	CIRC
5509X	8.51	4.58	525	BAC	CIRC
5509X			UNK	UNK	UNK
550DX			UNK	UNK	UNK
5510X			UNK	UNK	UNK
5512X			UNK	UNK	UNK
5513X			UNK	UNK	UNK

001

002

003

004

NOTES
SURVEY IS BASED ON OS GRID SYSTEM
ORIGINATING FROM STATION 18
@ E 503176.950, N 102631.059, RL 7 748
Main area of field is very undulating seeded spot.

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Appendix C

Flood Information

EA/NRW Flood Data Map (1:10,000)

General

- △ Specified Site
- △ Specified Buffer(s)
- X Bearing Reference Point

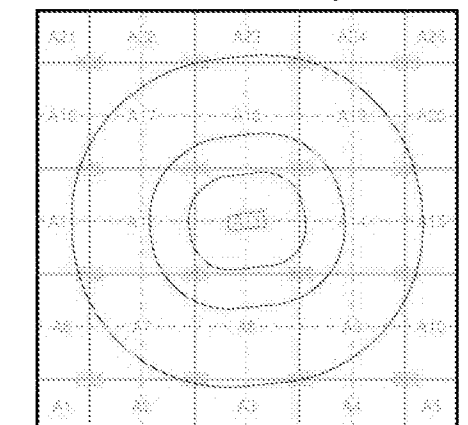
Flood Data

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- ▨ Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Contours (height in metres)

- Standard Contour
- Master Contour
- Spot Height
- MLW Mean Low Water
- MHW Mean High Water

EA/NRW Flood Data Map - Slice A

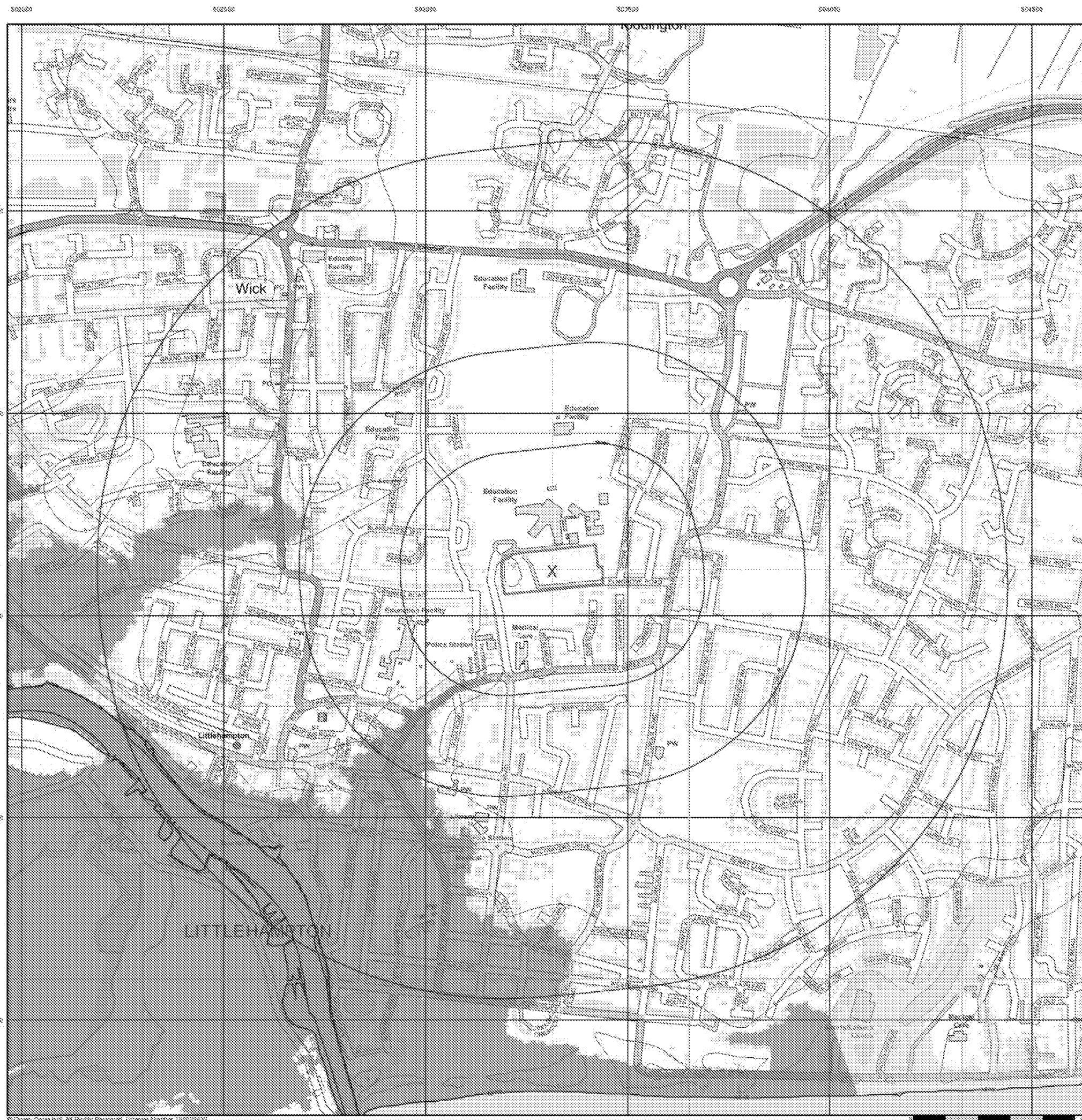


Order Details

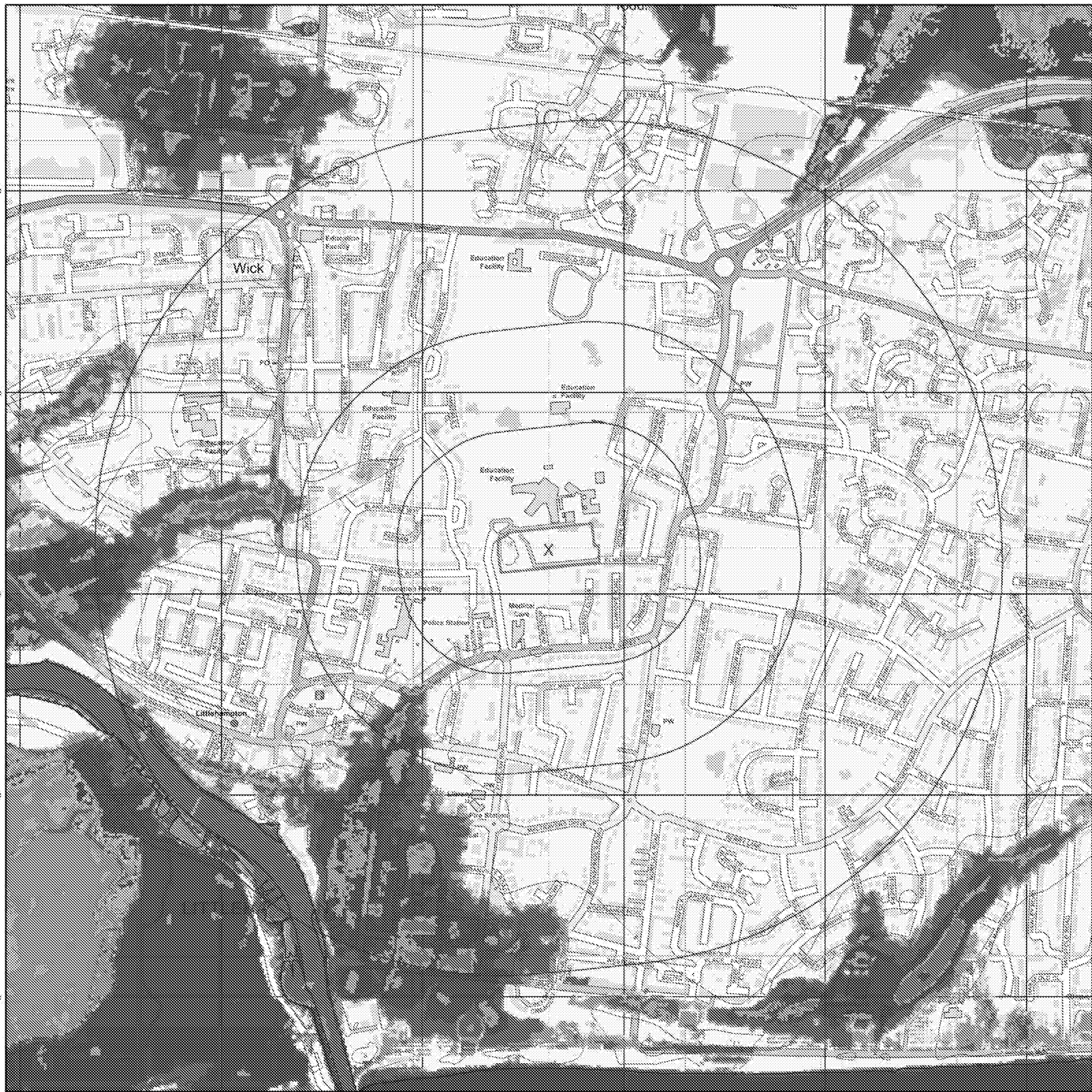
Order Number: 274030400_1_1
 Customer Ref: S208134
 National Grid Reference: 503310, 102610
 Slice: A
 Site Area (Ha): 2.37
 Search Buffer (m): 1000

Site Details

Littlehampton, Fitzalan Road, LITTLEHAMPTON, BN17 6FE



502000 502500 503000 503500 504000 504500



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JBA 75 Year Return Flood Map (Undefended) (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

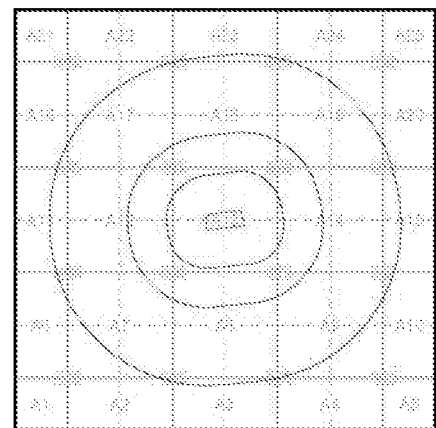
Modelled Flood Depth

Pluvial Depth	Fluvial Depth	Coastal Depth
0.1m	0.01m - 0.05m	0.01m - 0.05m
0.1m - 0.3m	0.05m - 0.1m	0.05m - 0.1m
0.3m - 1m	0.1m - 0.3m	0.1m - 0.3m
>1m	0.3m - 1m	0.3m - 1m
	>1m	>1m

Contours (height in metres)

- Standard Contour Mean Low Water
- Master Contour Mean High Water
- Spot Height

JBA 75 Year Return Flood Map (Undefended) - Slice A



Order Details

Order Number: 274030400_1_1
 Customer Ref: S208134
 National Grid Reference: 503310, 102610
 Slice: A
 Site Area (Ha): 2.37
 Search Buffer (m): 1000

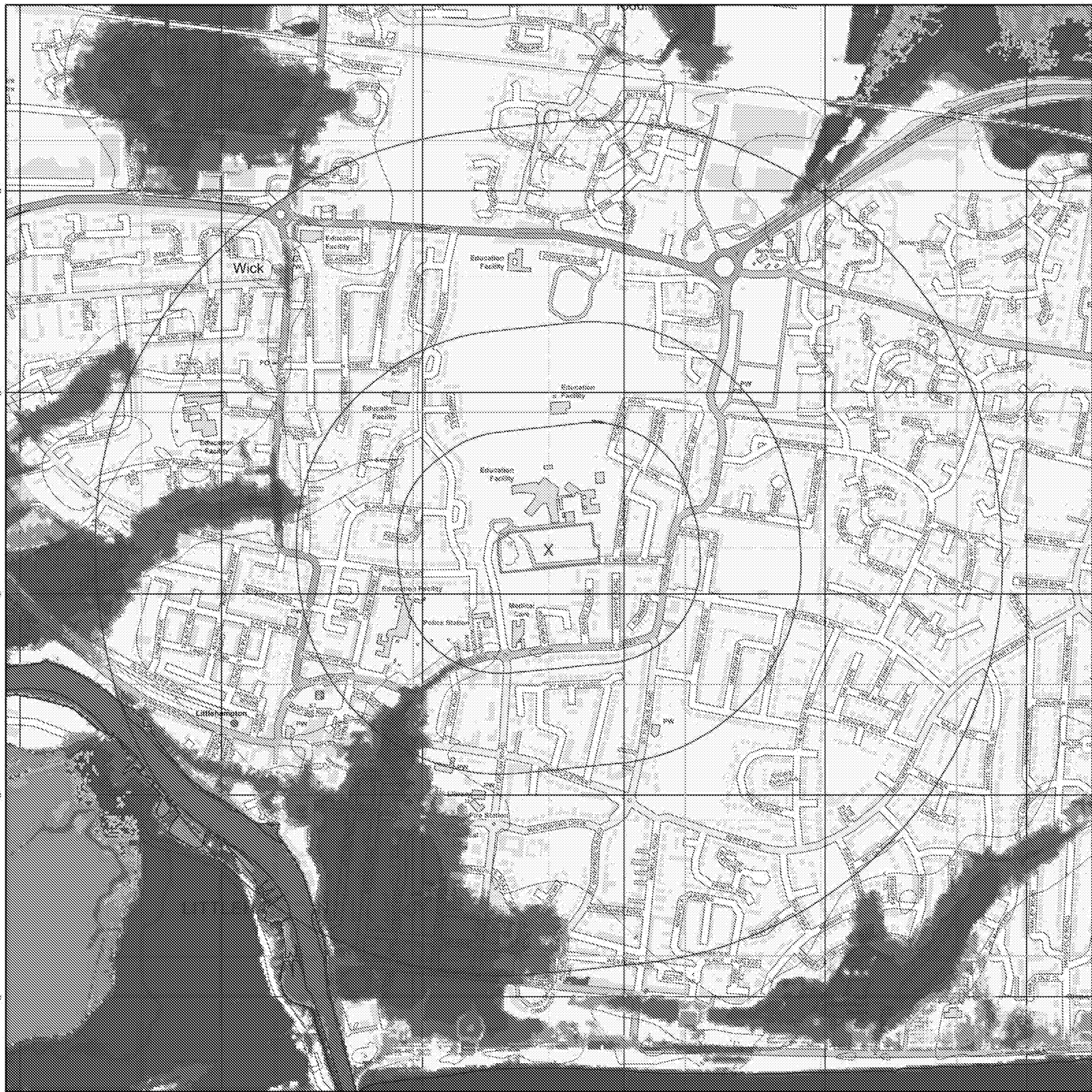
Site Details

Littlehampton, Fitzalan Road, LITTLEHAMPTON, BN17 6FE

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502000 502500 503000 503500 504000 504500



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JBA 100 Year Return Flood Map (Un defended)
(1:10,000)

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

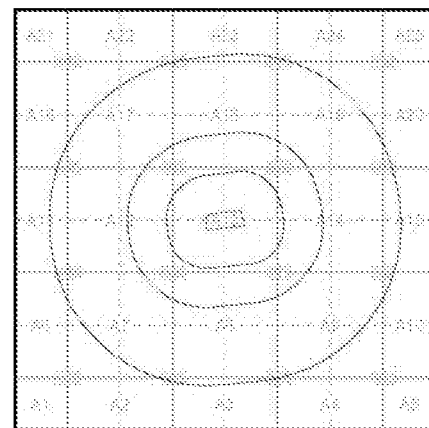
Modelled Flood Depth

Fluvial Depth	Coastal Depth
0.01m - 0.05m	0.01m - 0.05m
0.05m - 0.1m	0.05m - 0.1m
0.1m - 0.3m	0.1m - 0.3m
0.3m - 1m	0.3m - 1m
>1m	>1m

Contours (Height in metres)

- Standard Contour
- Master Contour
- Spot Height
- Mean Low Water
- Mean High Water

JBA 100 Year Return Flood Map (Un defended) - Slice A



Order Details

Order Number: 274030400_1_1
Customer Ref: S208134
National Grid Reference: 503310, 102610
Slice: A
Site Area (Ha): 2.37
Search Buffer (m): 1000

Site Details

Littlehampton, Fitzalan Road, LITTLEHAMPTON, BN17 6FE

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JBA 200 Year Return Flood Map (Un defended) (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

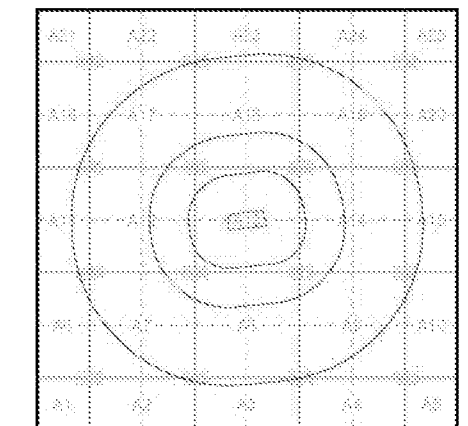
Modelled Flood Depth

Pluvial Depth	Fluvial Depth	Coastal Depth
0.1m	0.01m - 0.05m	0.01m - 0.05m
0.1m - 0.3m	0.05m - 0.1m	0.05m - 0.1m
0.3m - 1m	0.1m - 0.3m	0.1m - 0.3m
>1m	0.3m - 1m	0.3m - 1m
	>1m	>1m

Contours (height in metres)

- Standard Contour
- Master Contour
- Spot Height
- Mean Low Water
- Mean High Water

JBA 200 Year Return Flood Map (Un defended) - Slice A



Order Details

Order Number: 274030400_1_1
 Customer Ref: S208134
 National Grid Reference: 503310, 102610
 Slice: A
 Site Area (Ha): 2.37
 Search Buffer (m): 1000

Site Details

Littlehampton, Fitzalan Road, LITTLEHAMPTON, BN17 6FE



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**JBA 1000 Year Return Flood Map (Undefended)
(1:10,000)**

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

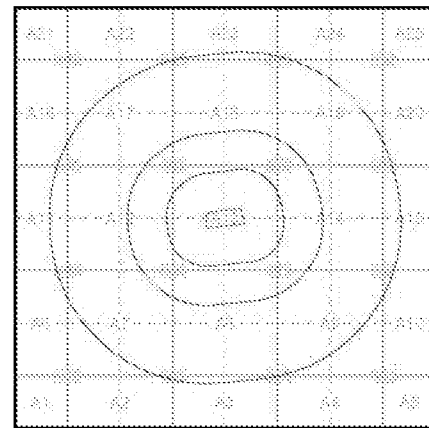
Modelled Flood Depth

Pluvial Depth	Fluvial Depth	Coastal Depth
0.1m	0.01m - 0.05m	0.01m - 0.05m
0.1m - 0.3m	0.05m - 0.1m	0.05m - 0.1m
0.3m - 1m	0.1m - 0.3m	0.1m - 0.3m
>1m	0.3m - 1m	0.3m - 1m
	>1m	>1m

Contours (height in metres)

- Standard Contour
- Master Contour
- Spot Height
- Mean Low Water
- Mean High Water

**JBA 1000 Year Return Flood Map (Undefended) -
Slice A**



Order Details

Order Number: 274030400_1_1
Customer Ref: S208134
National Grid Reference: 503310, 102610
Slice: A
Site Area (Ha): 2.37
Search Buffer (m): 1000

Site Details

Littlehampton, Fitzalan Road, LITTLEHAMPTON, BN17 6FE

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