



Flood Risk Assessment

Land South of Unit 1, Arunside Industrial Estate
Fort Road, Littlehampton BN17 7QU

Client

Hawksley Ltd & Blastreat Ltd

25 Marlborough Road

Lancing

West Sussex BN15 8TN

Ref: 7069

Date: December 2017

Consulting Engineers

GTA Civils Ltd

Gloucester House

66a Church Walk

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Issue	Issue date	Compiled	Checked
Preliminary Issue	30 November '17	JP	MR
First Issue	05 December '17	JP	MR

Report by: John Pakenham BSc (Hons)

Checked by: Martin Roberts I Eng, ACIWEM, MCIHT

1 Introduction

- 1.1 GTA Civils Ltd. was appointed by Hawksley Ltd & Blastreat Ltd to provide a Flood Risk Assessment (FRA) to accompany the planning application as requested by Arun District Council, in order to achieve Planning Permission for the development of land to the south of Unit 1, Arunside Industrial Estate, Fort Road, Littlehampton BN17 7QU.
- 1.2 This report has been prepared for the Client in relation to the proposed development at the above address and no responsibility is accepted to any third party for all or part of this study in connection with this or any other development.
- 1.3 This report will take the form of a formal Flood Risk Assessment in accordance with the 2012 National Planning Policy Framework (NPPF) and the associated Technical Guidance document, both contained within the 2015 National Planning Practice Guidance (NPPG).

2 Existing Site and Current Flood Conditions

- 2.1 The application site is a vacant area to the south of Unit 1, Arunside Industrial Estate, which is accessed from Fort Road. This area is administered by Arun District Council. The plot's use is industrial (B2) on a site area of 1030m² approximately. Site location maps and an aerial view are shown in Appendix A.
- 2.2 The application site lies approximately 270m north (and northeast) of the meandering River Arun. An unnamed surface water drain is shown on the OS map (but designated as a main river by the EA). This discharges into the River Arun. The stream can be seen in the EA flood map in Appendix B.
- 2.3 A topographic survey of the site was carried out – see Appendix C. The levels range between 3.42m AOD and 3.79m AOD, with the majority of the site lying between 3.6m AOD and 3.7m AOD.
- 2.4 The EA's flood map in Appendix B indicates that the site is in Flood Zone 3 (FZ3) at a high probability (0.5%) of tidal flooding from the River Arun. The site benefits from flood defences by way of a raised defence along the River Arun and a culverted channel drain. The standard of the defence is such that the site is not fully protected up to the '1 in 200 years + climate change' (0.5% +CC) level.
- 2.5 2D Modelling was carried out by the EA to examine the extent of flooding in two scenarios: defended and undefended from the flood source at various nodal points on the site. The EA's model data (see Appendix B) shows the flood depths at nodes closest to the site during a predicted storm event that takes place once every 200 years plus the predicted effects of climate change over the next 60 years (or 0.5% annual probability in 2073). For this storm event, the maximum undefended flood level (at node #1) is 4.29m AOD, and the defended flood 4.05m AOD. This means that, if there were no defences in place, the flood depth may be as high as $4.29 - 3.6 = \mathbf{0.69m}$, with no raising of levels. As the site benefits from these defences it is unrealistic to ignore the defended flood data. As there is no breach model data available in Arun District Council's Strategic Flood Risk Assessment (SFRA), it is necessary to be conservative and use the higher flood depth.
- 2.6 Historical flooding: There are no records of this site flooding according to the SFRA and EA.
- 2.7 The bedrock geology of the site is Chalk (a mix of Lewes Nodular Chalk, Seaford Chalk, Newhaven Chalk and Culver Chalk Formations). The superficial deposits are Raised Marine Deposits (clay, silt sand and gravel). The EA's Groundwater Vulnerability Zone map (Appendix B) shows the site to be lying on a 'Major Aquifer - High'. The site is removed from the nearest Groundwater Source Protection Zone, however. This soil type is likely to be porous and, depending on the water table level, infiltration methods may prove to be feasible.

- 2.8 This current use class for this site is B2. An industrial unit is classified as 'less vulnerable' and is considered appropriate for development in FZ3 according to the NPPF. Below is an Extract of Table 3 of the NPPF which confirms this:

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.

Proposed Development & Surface Water Drainage Strategy

- 3.1 The proposal is to build a new industrial unit, whose roofed area is 629m². The proposed plans are shown in Appendix C. There is 370m² of hardstanding externally with the remaining area left as soft landscaping.
- 3.2 Due to the (probable) favourable geology of the site, a sustainable drainage system comprising an infiltration blanket under the concrete yard is proposed. The car parking bays would be of porous pavings. The sub-base of this system shall extend under the adjacent concrete yard areas. The water from the roof would be routed via distribution tanks placed in the infiltration blankets.
- 3.3 Micro Drainage: For an area of 999m², the blanket has been designed as 360m² x 0.45m deep, with a maximum flood depth of 0.433m, and an assumed infiltration rate to the base and sides of 0.036m/hr (1×10^{-5} m/s). This shall hold the volume of the critical '1 in 100 years plus 40% climate change' storm event and so complies with the NPPG. Refer to Appendix E for the calculation sheets.
- 3.4 Treatment: the filtration qualities of the coarse granular fill is excellent – this stage of treatment complies with CIRIA Guidelines.
- 3.5 The soakaway's calculation must be re-worked prior to finalising the scheme's design, once the soil's actual soakage rate has been determined. This shall be done by carrying out a soakage test in accordance with BRE Digest 365.

4 Flood Risk Mitigation & Conclusion

- 4.1 The site has a 0.5% probability of tidal flooding at a maximum level of 4.29m AOD. The depth of 0.69m would be life threatening, ie unduly hazardous at the peak of the flooding. There will be no safe access to dry land, ie flood zone 1. It is therefore best to travel as early as possible before the extreme extent of the flooding occurs - northwards away from the coast and the River Arun.
- 4.2 It is proposed to offset the flood risk with two separate mitigation measures: resilience and a Flood Warning and Evacuation Plan.
- 4.3 Resilient materials and techniques will be incorporated into the design of the building. There will be waterproof flooring in the form of solid concrete and the walls will be of steel cladding.
- 4.4 The Applicant (business manager) shall implement a Flood Warning and Evacuation Plan, containing items such as the evacuation route and an explanation of the EA's flood warning service. See Appendix E for details of a standard industrial Plan, which has been worded as the First Draft of the Plan needed here.
- 4.5 Flood Warning and Evacuation: Due to the residual risks associated with a breach of the defences along the River Arun, it is recommended that this business registers with the free flood warning service provided by the Environment Agency (called 'Floodline'), in order to facilitate evacuation of the premises prior to floodwaters surrounding the site.
- 4.6 The Manager (or a designated member of staff) should monitor any other developments as regards broadcast information. The TV news channels and local radio stations will augment the EA's warnings in their bulletins. There may be Local Authority Emergency Planning Department vehicles fitted with public address systems (loud hailer) issuing directions from the street.
- 4.7 It should also be noted that prior evacuation will not be possible if the site becomes rapidly inundated following a breach. The plan should also give details of a safe place of refuge above the predicted breach flood level (i.e. at first floor level) where employees can await rescue by the emergency services.
- 4.8 All staff members should be made familiar with the plan's contents that apply to them and what is expected of them if the site is likely to be inundated – ie before the decision is made to evacuate.
- 4.9 The Manager will switch off the building's electricity, gas and water supplies prior to evacuation/flooding.

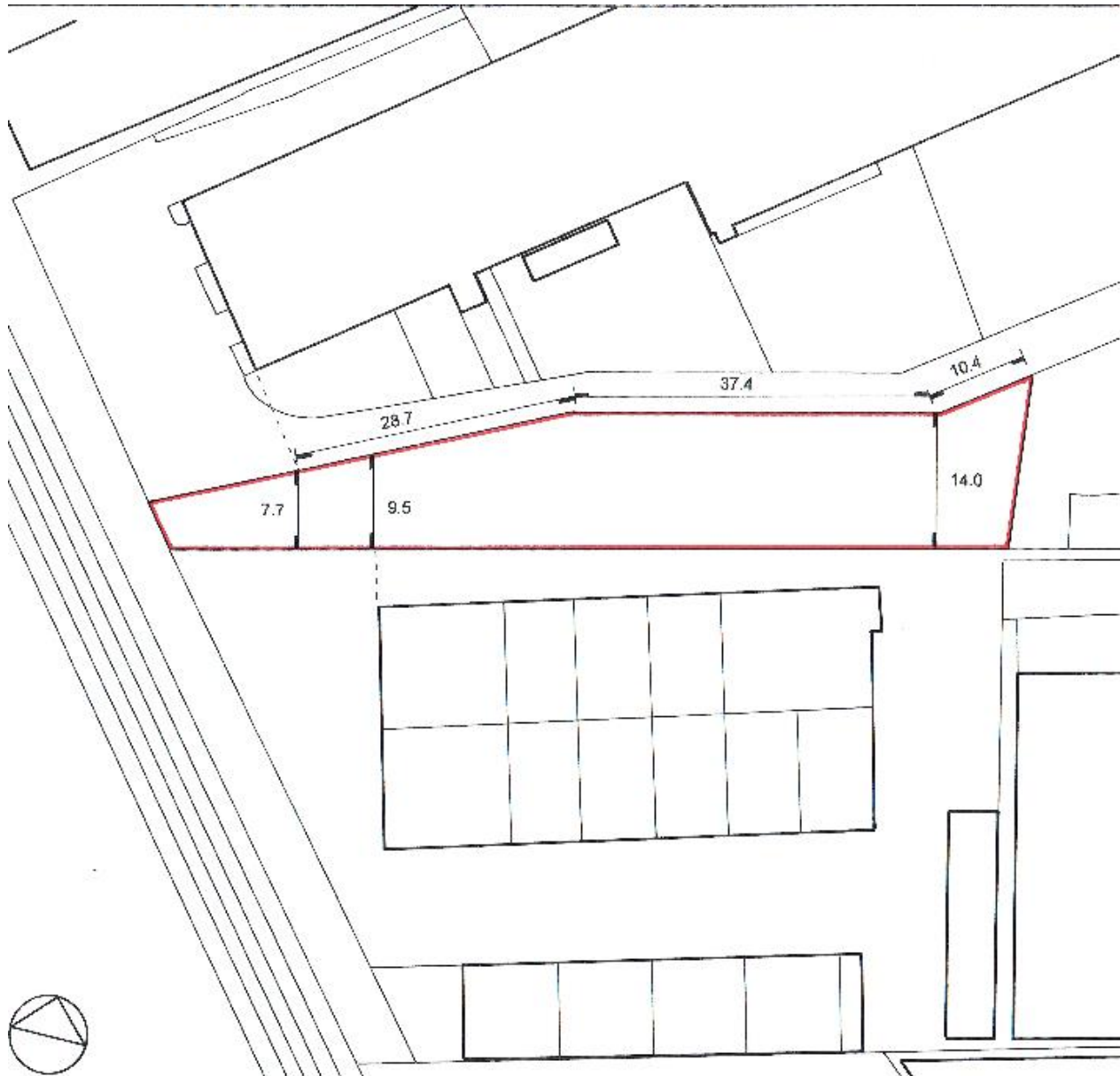
- 4.10 Once these mitigation measures and soakaway are in place, the flood risk profile – both of this unit and of neighbouring sites - will be either reduced or not increased. It is therefore concluded that this development complies fully with the 2012 NPPF and 2015 NPPG.

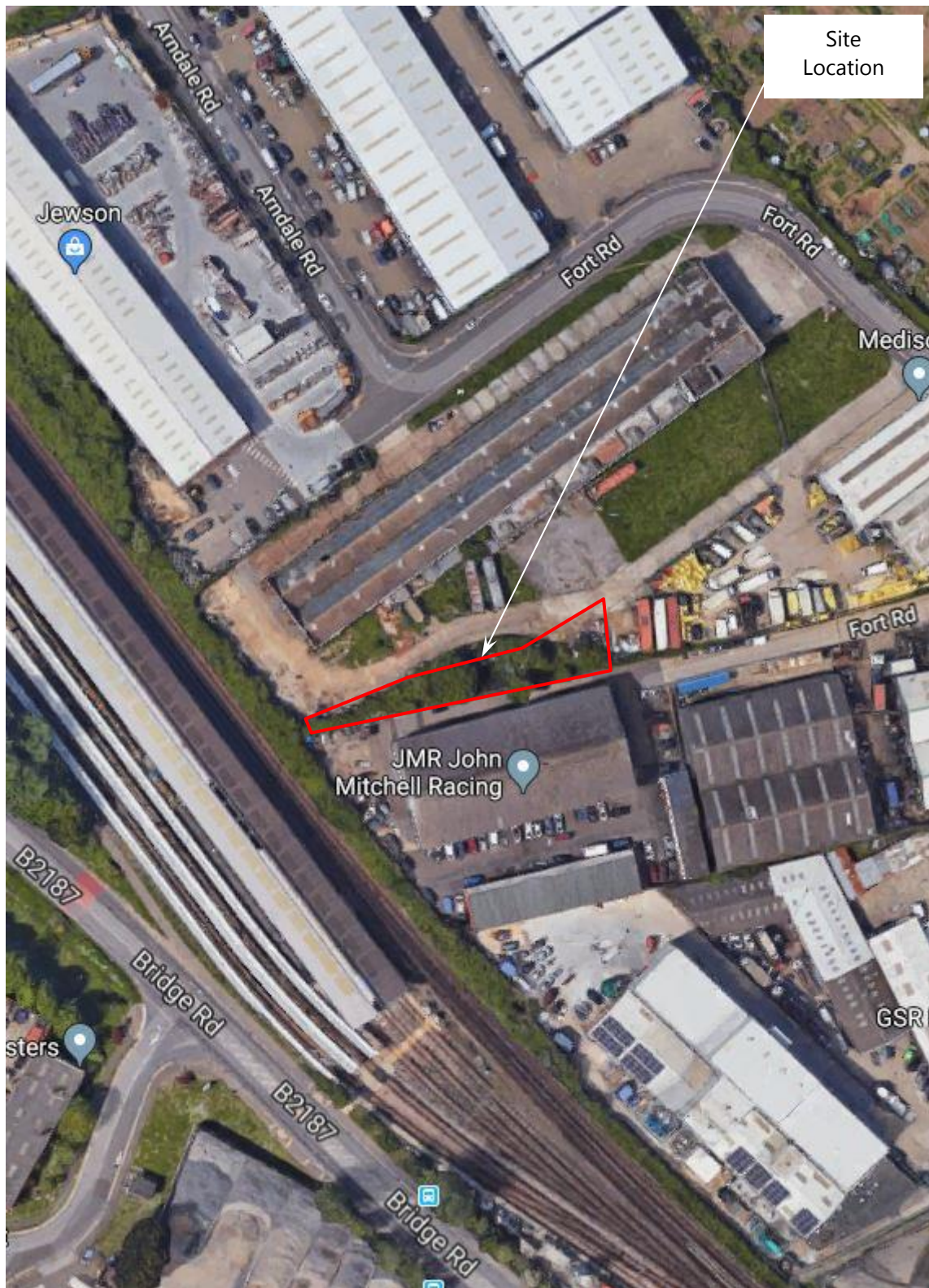
- End of Report -

Appendix A

Site Location Map & Aerial Photo

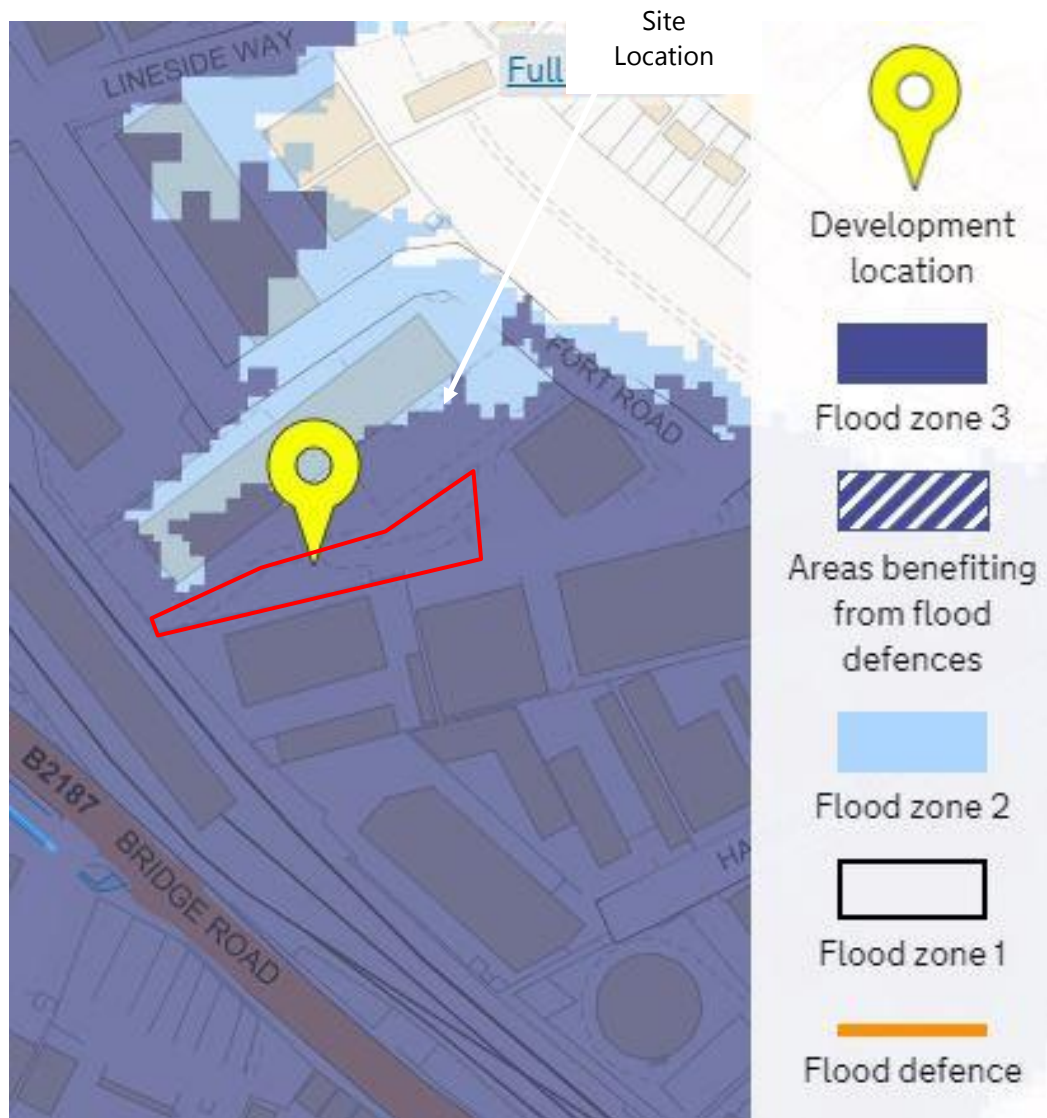






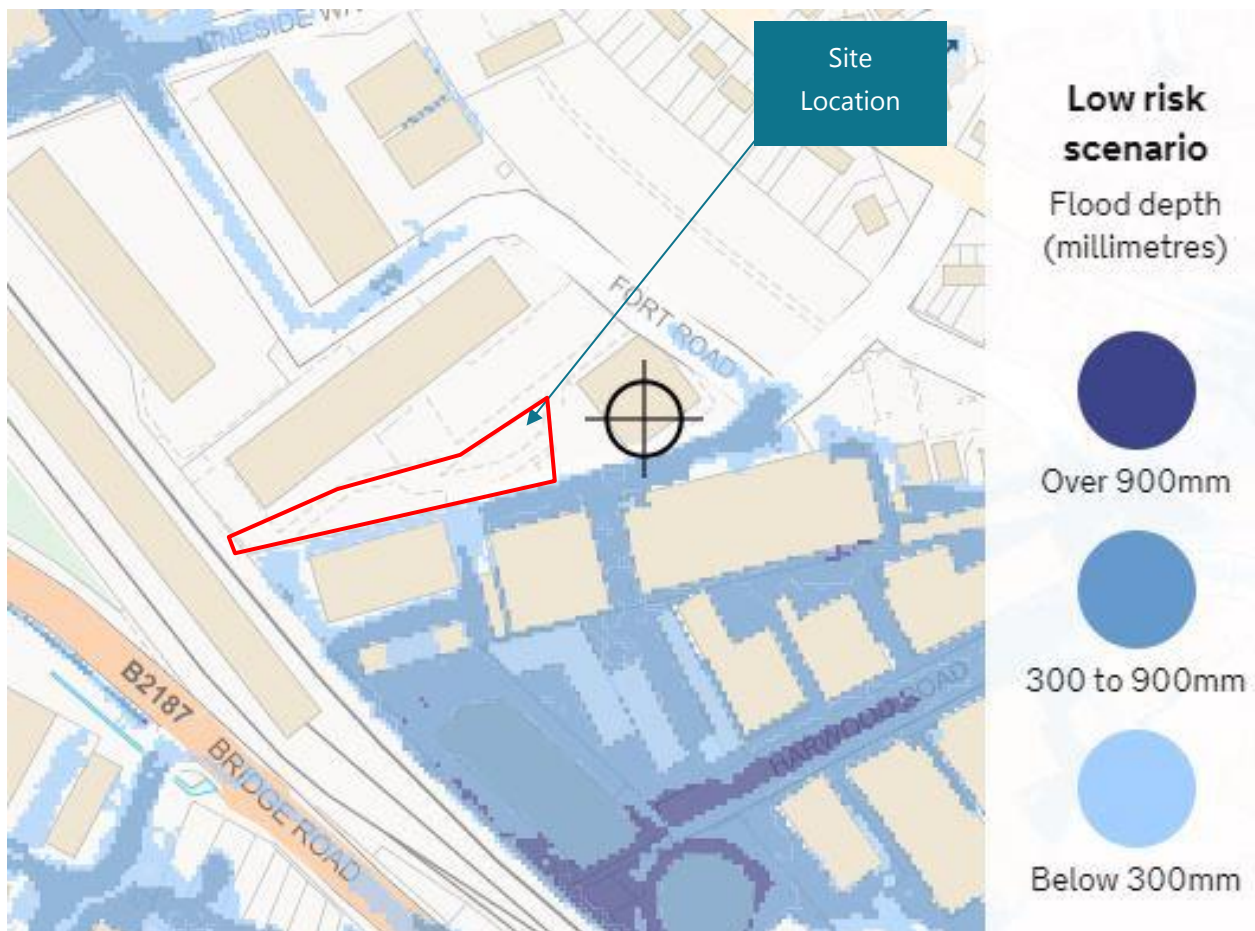
Appendix B

Environment Agency Flood Data



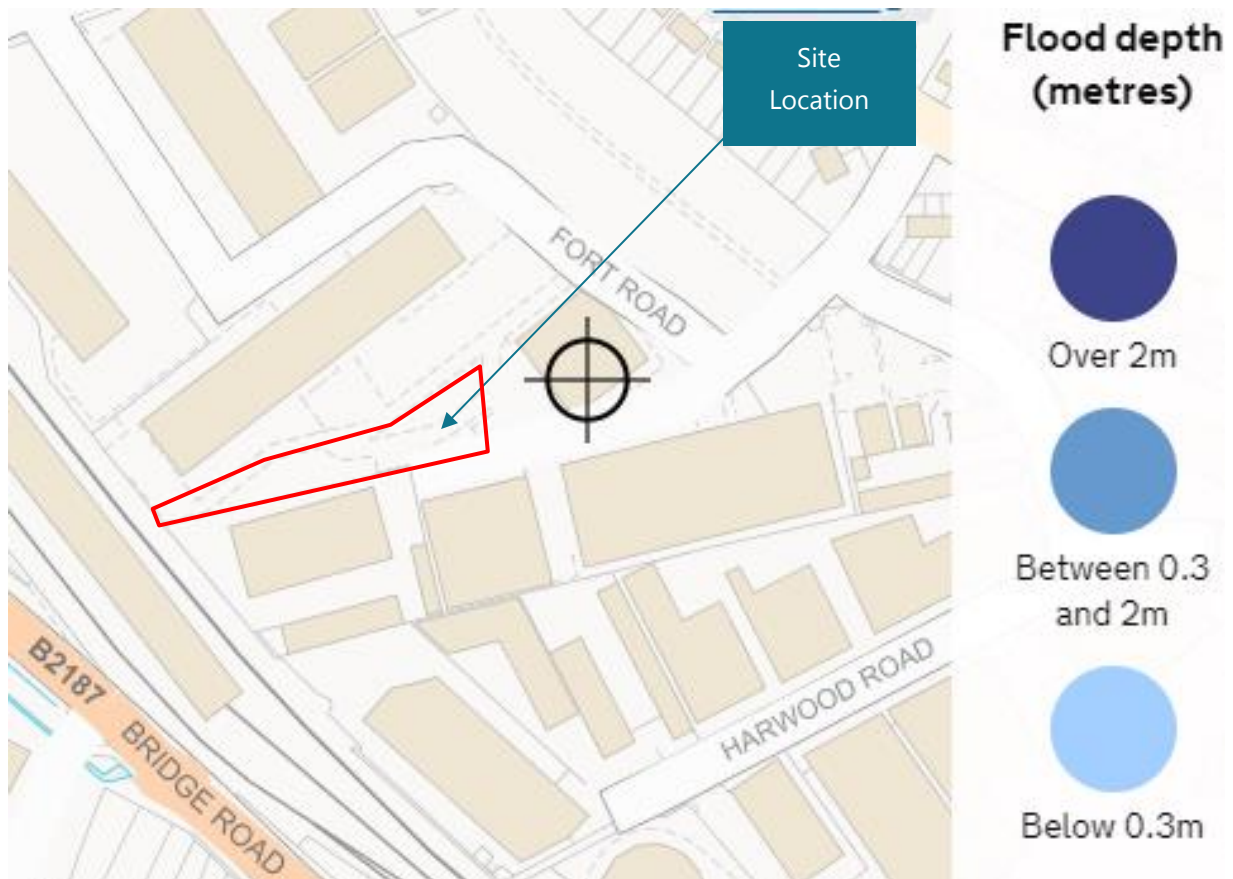
EA's Online Flood Map for Planning (Rivers and Seas)

The site is in tidal Flood Zone 3A



EA's Online Surface Water Flood Depth Map in the 'Low Risk Scenario'
(1 in 1000 years storm event)

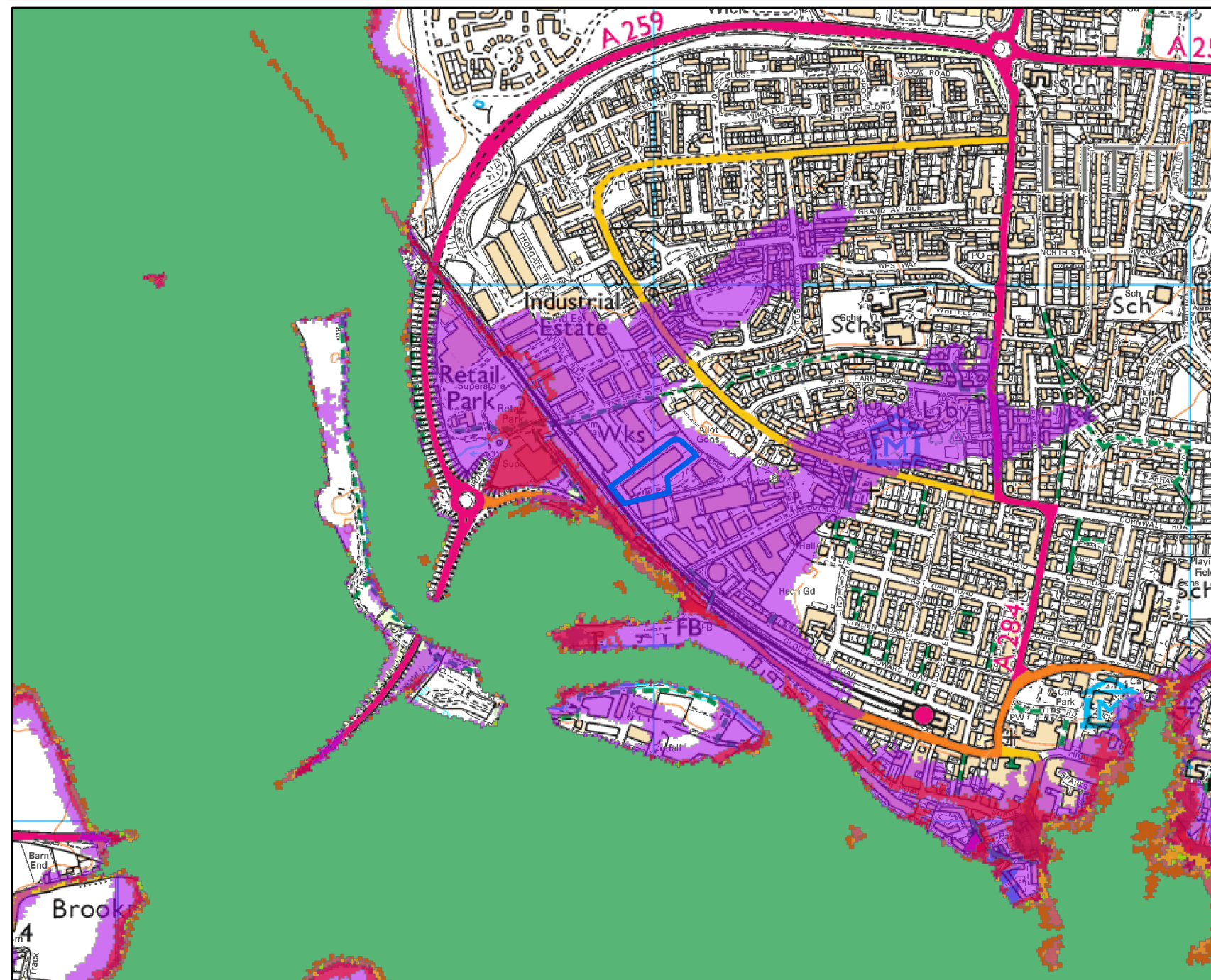
The site is clear of flooding in this extreme event



EA's Online 'Risk of Flooding from Reservoirs' Map

The site is removed from this source of flooding

Modelled Flood Outlines (Un defended Tidal) Map. Centred BN17 7QU. Created 17/10/2017.

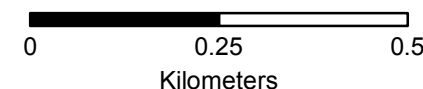


Legend

- Site Boundary
- 20% AEP (Un defended Tidal)
- 5% AEP (Un defended Tidal)
- 3.3% AEP (Un defended Tidal)
- 1.3% AEP (Un defended Tidal)
- 1% AEP (Un defended Tidal)
- 0.5% AEP (Un defended Tidal)
- 0.5% AEP (2070) NPPF (Un defended Tidal)
- 0.5% AEP (2115) NPPF (Un defended Tidal)
- 0.2% AEP (Un defended Tidal)
- 0.1% AEP (Un defended Tidal)

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

Scale: 1:10,000



Modelled Flood Outlines (Defended Tidal) Map. Centred BN17 7QU. Created 17/10/2017.

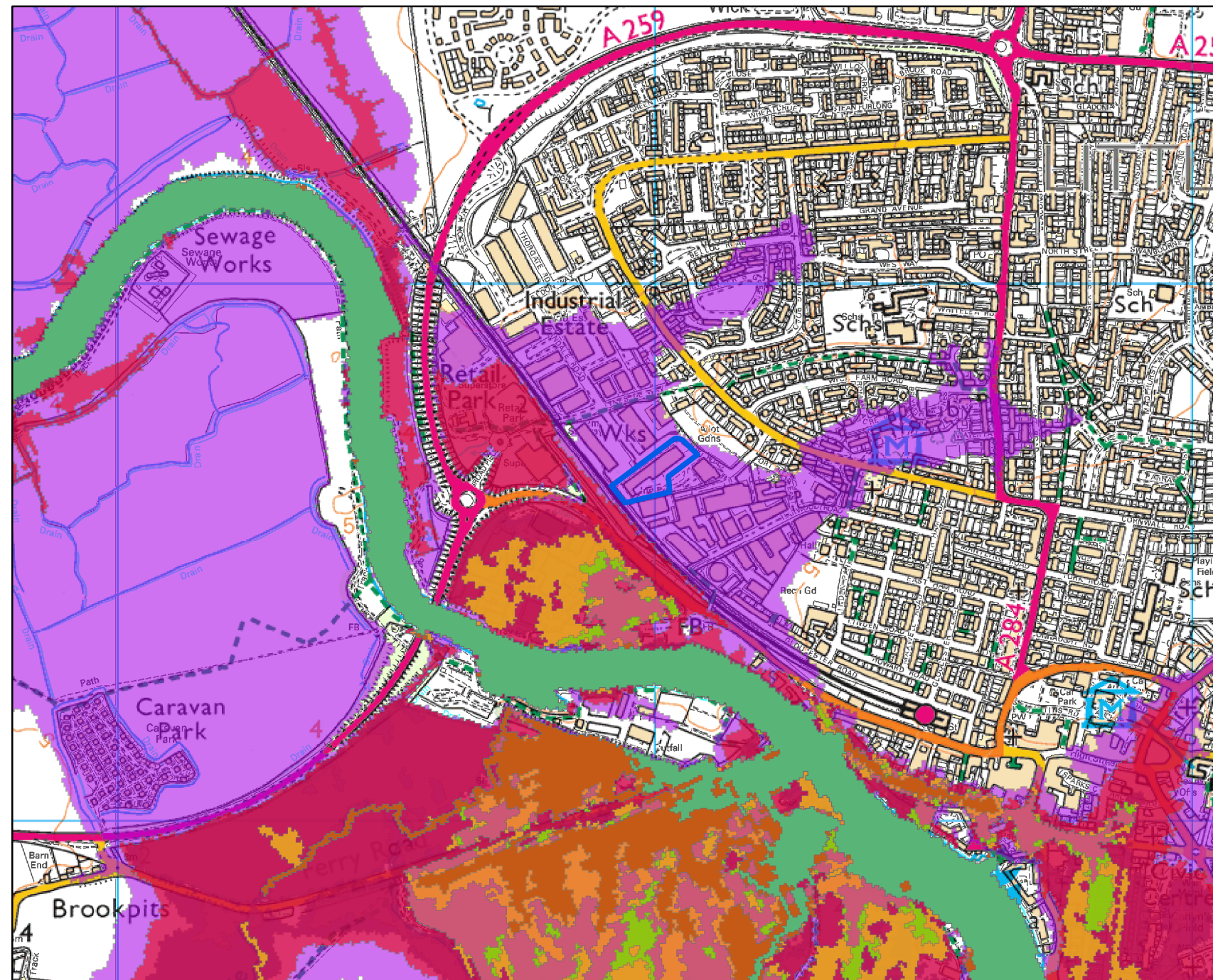
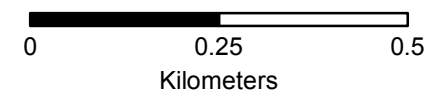


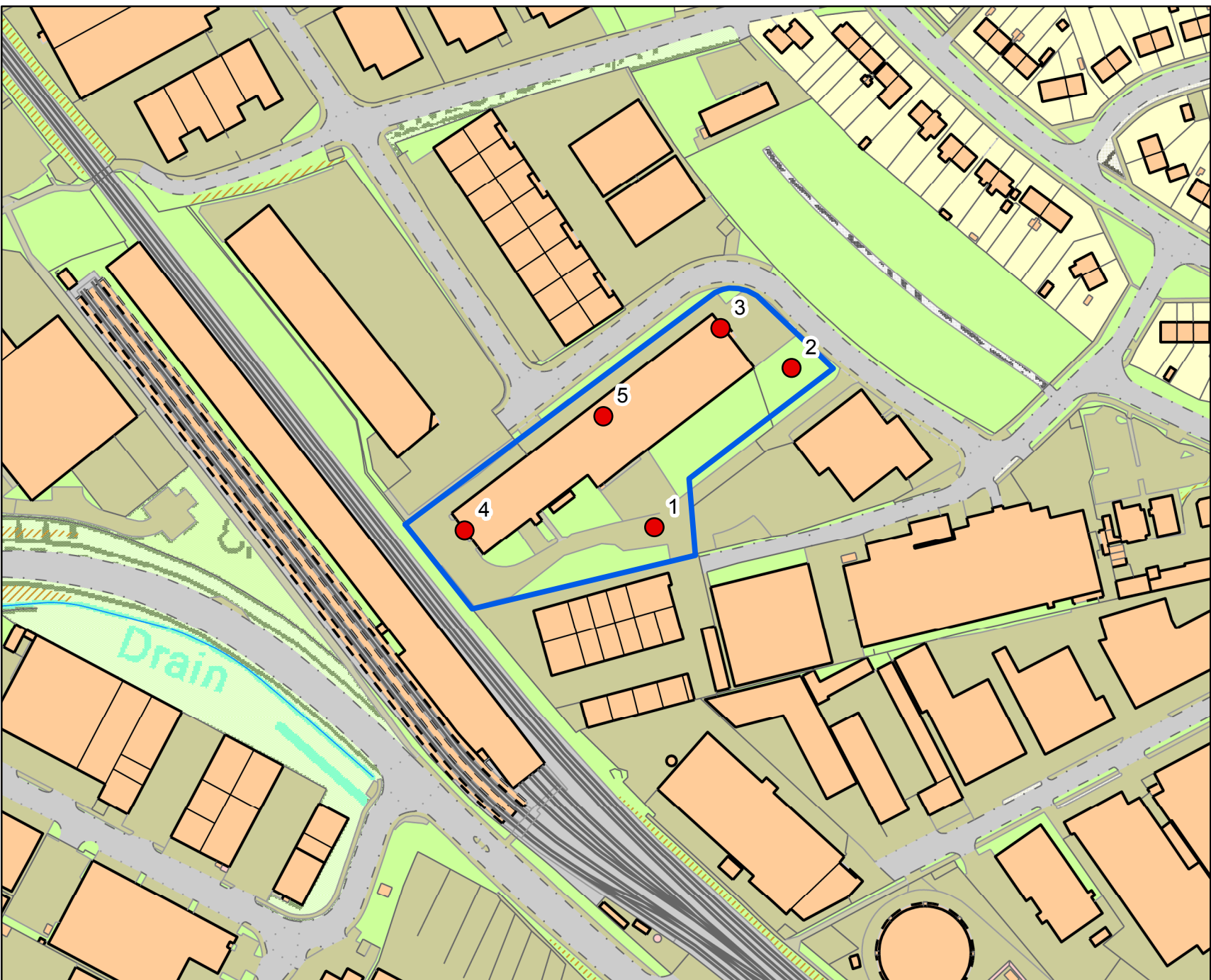
Legend

- Site Boundary
- 20% AEP (Defended Tidal)
- 5% AEP (Defended Tidal)
- 3.3% AEP (Defended Tidal)
- 1.3% AEP (Defended Tidal)
- 1% AEP (Defended Tidal)
- 0.5% AEP (Defended Tidal)
- 0.5% AEP (2070) NPPF (Defended Tidal)
- 0.5% AEP (2115) NPPF (Defended Tidal)
- 0.2% AEP (Defended Tidal)
- 0.1% AEP (Defended Tidal)

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

Scale: 1:10,000

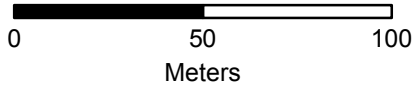




Legend

-  Site Boundary
-  Site Nodes

Scale: 1:2,000



Product 4 Flood Risk Data Requested by: GTA Civils Ltd

Site: Arunside Industrial Estate, Fort Road, Littlehampton BN17 7QU

Table 1: Water Levels: Tidal Undefended

Node Ref	NGR		Modelled Flood Depth in Metres				
			Defended Annual Exceedance Probability				
	Eastings	Northings	5%	0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	502020	102622	N/A	N/A	N/A	4.29	N/A
2	502066	102682	N/A	N/A	N/A	4.28	N/A
3	502040	102697	N/A	N/A	N/A	4.27	N/A
4	501944	102622	N/A	N/A	N/A	4.27	N/A
5	501996	102664	N/A	N/A	N/A	4.27	N/A

Table 2: Water Levels: Tidal Defended

Node Ref	NGR		Modelled Flood Depth in Metres				
			Defended Annual Exceedance Probability				
	Eastings	Northings	5%	0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	502020	102622	N/A	N/A	N/A	4.05	N/A
2	502066	102682	N/A	N/A	N/A	4.04	N/A
3	502040	102697	N/A	N/A	N/A	4.01	N/A
4	501944	102622	N/A	N/A	N/A	4.00	N/A
5	501996	102664	N/A	N/A	N/A	3.99	N/A

Table 3: Water Depth: Tidal Undefended

Node Ref	NGR		Modelled Flood Depth in Metres				
			Defended Annual Exceedance Probability				
	Eastings	Northings	5%	0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	502020	102622	N/A	N/A	N/A	0.61	N/A
2	502066	102682	N/A	N/A	N/A	0.45	N/A
3	502040	102697	N/A	N/A	N/A	0.41	N/A
4	501944	102622	N/A	N/A	N/A	0.55	N/A
5	501996	102664	N/A	N/A	N/A	0.46	N/A

Table 4: Water Depth: Tidal Defended

Node Ref	NGR		Modelled Flood Depth in Metres				
			Defended Annual Exceedance Probability				
	Eastings	Northings	5%	0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	502020	102622	N/A	N/A	N/A	0.37	N/A
2	502066	102682	N/A	N/A	N/A	0.21	N/A
3	502040	102697	N/A	N/A	N/A	0.15	N/A
4	501944	102622	N/A	N/A	N/A	0.28	N/A
5	501996	102664	N/A	N/A	N/A	0.17	N/A

All levels taken from: River Arun to East Head Model

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

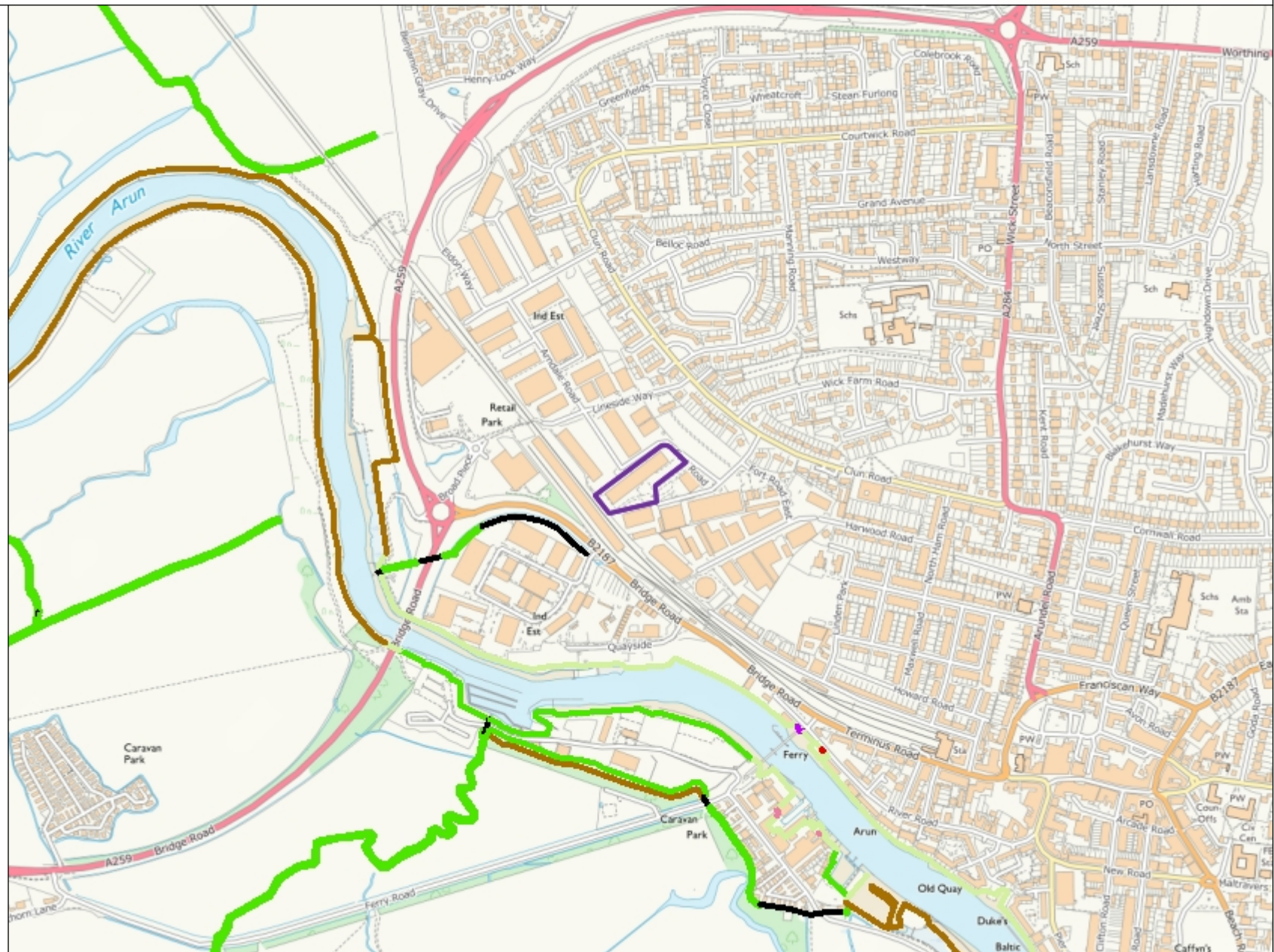
Produced on: 17/10/17

AIMS Flood Defence Map. Centred on BN17 7QU. Created 16/10/17.

Legend

Defences

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

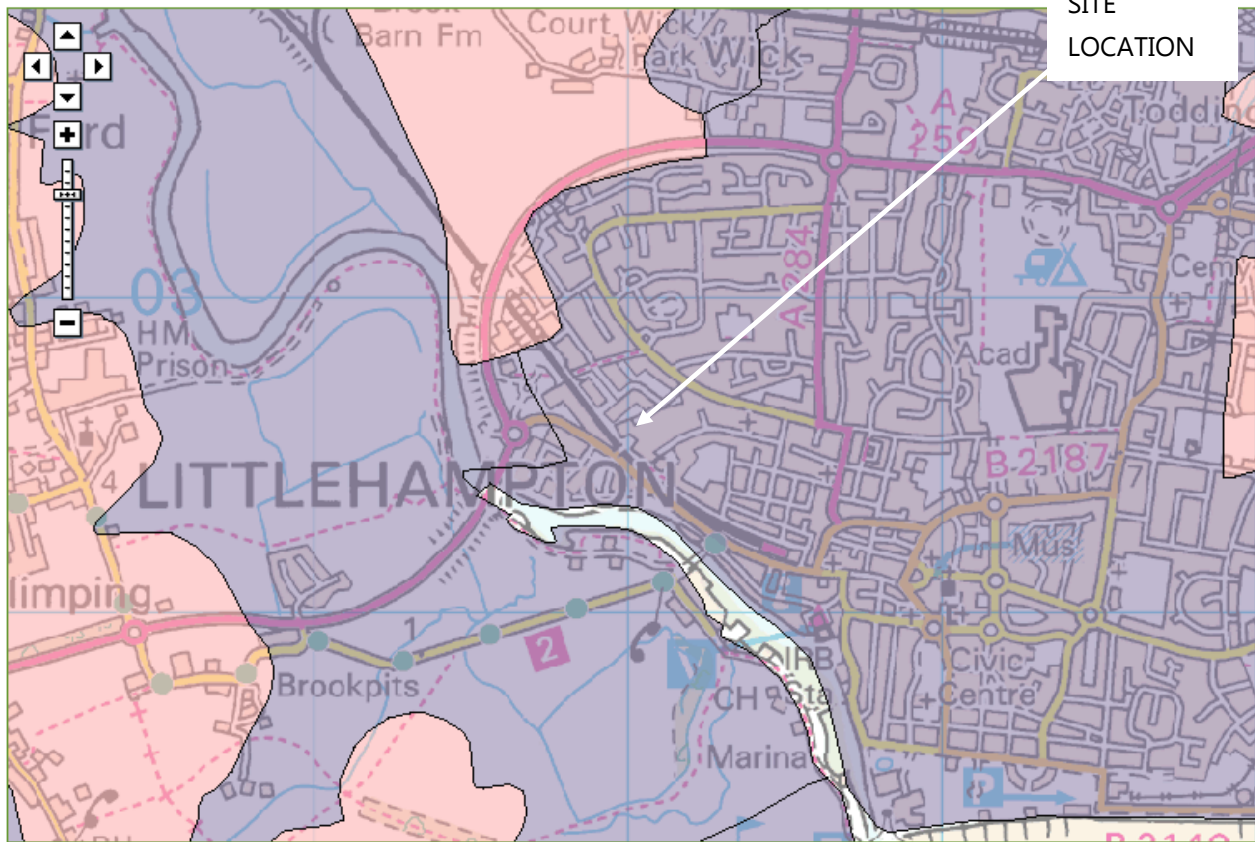


0 100 200 300
Metres

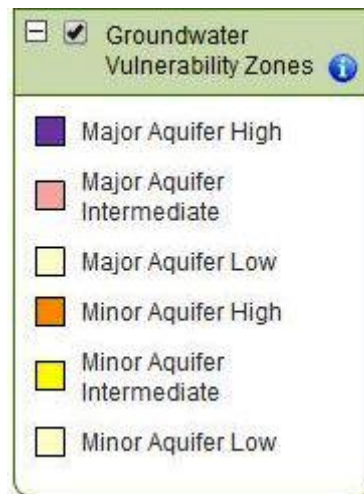


Map of BN17 7QU at scale 1:20,000

Other maps Data search



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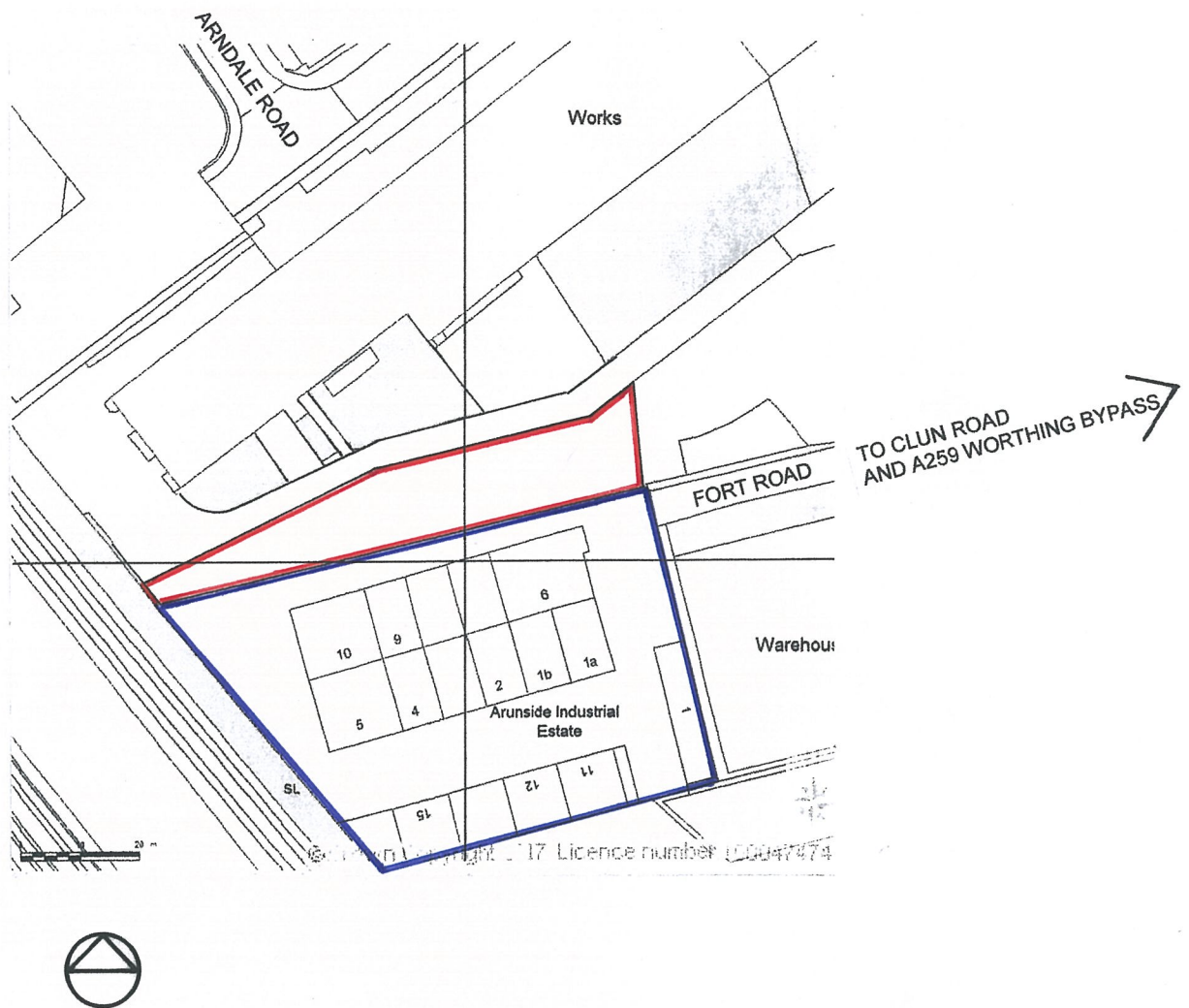


Environment Agency's Online Groundwater Vulnerability Zones Map

The site lies over a 'Major Aquifer High'

Appendix C

Architect's Scheme Drawings



ATELIER CONSULTANTS

phone 07977 070 031

OLD RECTORY COTTAGE, 55C KINGSTON LANE BN42 4SP

e.mail peter@atelierconsultants.co.uk

PROJECT: LAND TO SOUTH OF UNIT 1, ARUNSIDE INDUSTRIAL ESTATE, LITTLEHAMPTON BN17 7QU

CLIENT:

Drawing Title: LOCATION PLAN

Scale: 1:1250 @ A4 **Date:** July 2017

Drawing Number: 113 / P / 001 **Rev.**

EXTERNAL MATERIALS.

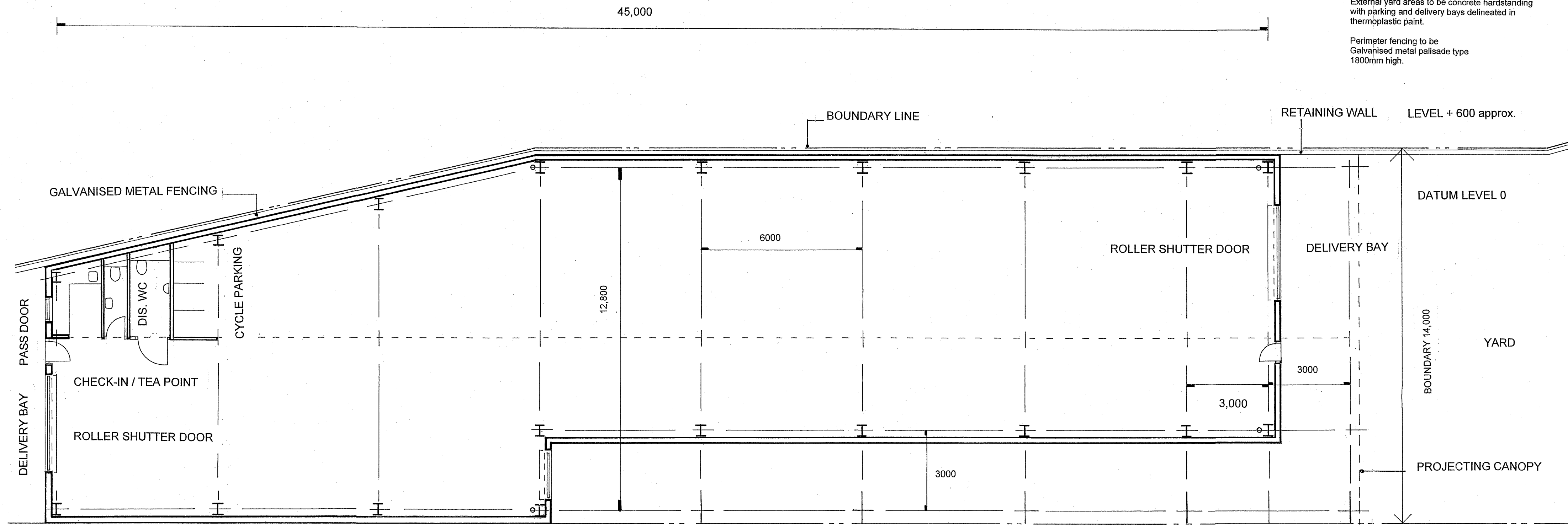
Roof and walls to be clad in Metal Trapezoidal Panels, fixed vertically and with high pre-finished high build polymer coating to colour choice.

Base of walls to be brick plinth.

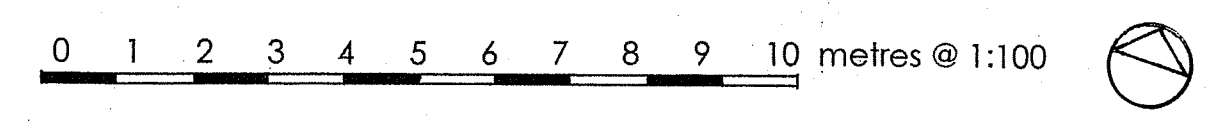
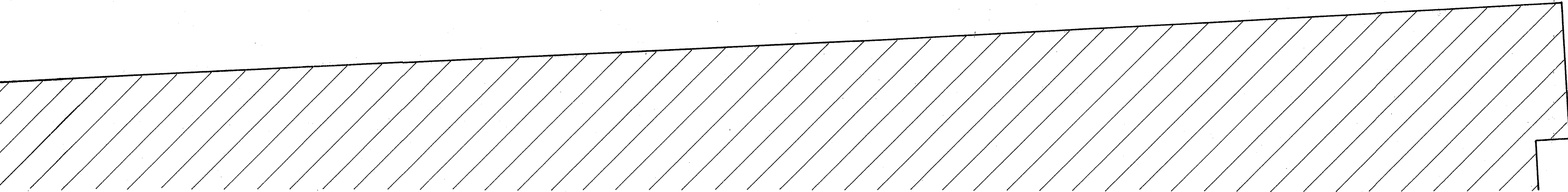
Roller shutter and pass doors to be in matching material.

External yard areas to be concrete hardstanding with parking and delivery bays delineated in thermoplastic paint.

Perimeter fencing to be Galvanised metal palisade type 1800mm high.



PROPOSED PLAN



ATELIER CONSULTANTS
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e.mail peter@atelierconsultants.co.uk

OLD RECTORY COTTAGE, 55C KINGSTON LANE BN42 4SP

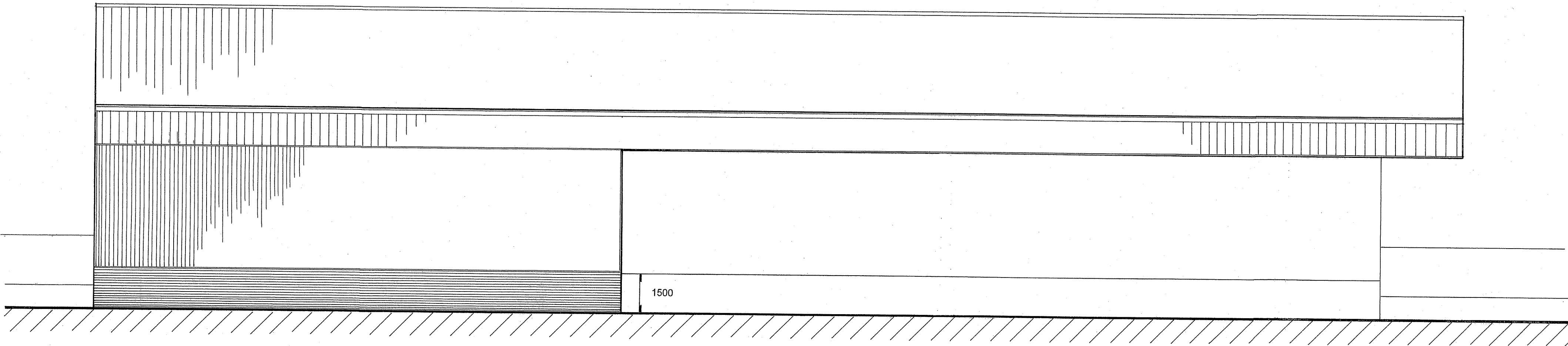
PROJECT: LAND TO SOUTH OF UNIT 1, ARUNSIDE INDUSTRIAL ESTATE, LITTLEHAMPTON BN17 7QU

CLIENT:

Drawing Title: PROPOSED UNIT PLAN

Scale: 1:100 @ A2 **Date:** July 2017

Drawing Number: 113 / P / 005 **Rev.**



SOUTH ELEVATION

EXTERNAL MATERIALS.

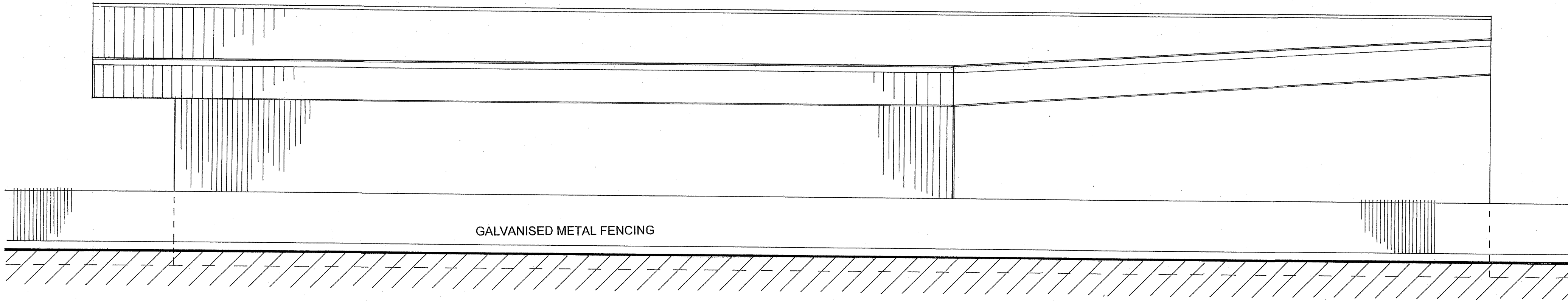
Roof and walls to be clad in Metal Trapezoidal Panels, fixed vertically and with high pre-finished high build polymer coating to colour choice.

Base of walls to be brick plinth.

Roller shutter and pass doors to be in matching material.

External yard areas to be concrete hardstanding with parking and delivery bays delineated in thermoplastic paint.

Perimeter fencing to be Galvanised metal palisade type 1800mm high.



NORTH ELEVATION

GALVANISED METAL FENCING

0 1 2 3 4 5 6 7 8 9 10 metres @ 1:100

ATELIER CONSULTANTS
phone 07977 070 031

OLD RECTORY COTTAGE, 55C KINGSTON LANE BN42 4SP
e.mail peter@atelierconsultants.co.uk

PROJECT: LAND TO SOUTH OF UNIT 1, ARUNSIDE INDUSTRIAL ESTATE, LITTLEHAMPTON BN17 7QU
CLIENT:
Drawing Title: PROPOSED UNIT ELEVATIONS – SHEET 2
Scale: 1:100 @ A2 Date: July 2017
Drawing Number: 113 / P / 007 - Rev.

Appendix D

Micro Drainage Calculations

GTA Civils Ltd				Page 1																																																																																																																																																																																																																			
Gloucester House 66a Church Walk Burgess Hill RH15 9AS		Arunside Ind Est Littlehampton 100 years 40% CC Inf Blanket																																																																																																																																																																																																																					
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Micro Drainage		Source Control 2016.1.1																																																																																																																																																																																																																					
<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 222 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>2.993</td><td>0.193</td><td>1.8</td><td>20.8</td><td>0 K</td></tr><tr><td>30 min Summer</td><td>3.058</td><td>0.258</td><td>1.8</td><td>27.9</td><td>0 K</td></tr><tr><td>60 min Summer</td><td>3.119</td><td>0.319</td><td>1.8</td><td>34.5</td><td>0 K</td></tr><tr><td>120 min Summer</td><td>3.163</td><td>0.363</td><td>1.8</td><td>39.2</td><td>0 K</td></tr><tr><td>180 min Summer</td><td>3.171</td><td>0.371</td><td>1.8</td><td>40.0</td><td>0 K</td></tr><tr><td>240 min Summer</td><td>3.168</td><td>0.368</td><td>1.8</td><td>39.7</td><td>0 K</td></tr><tr><td>360 min Summer</td><td>3.157</td><td>0.357</td><td>1.8</td><td>38.5</td><td>0 K</td></tr><tr><td>480 min Summer</td><td>3.142</td><td>0.342</td><td>1.8</td><td>37.0</td><td>0 K</td></tr><tr><td>600 min Summer</td><td>3.126</td><td>0.326</td><td>1.8</td><td>35.3</td><td>0 K</td></tr><tr><td>720 min Summer</td><td>3.110</td><td>0.310</td><td>1.8</td><td>33.5</td><td>0 K</td></tr><tr><td>960 min Summer</td><td>3.077</td><td>0.277</td><td>1.8</td><td>29.9</td><td>0 K</td></tr><tr><td>1440 min Summer</td><td>3.016</td><td>0.216</td><td>1.8</td><td>23.3</td><td>0 K</td></tr><tr><td>2160 min Summer</td><td>2.941</td><td>0.141</td><td>1.8</td><td>15.3</td><td>0 K</td></tr><tr><td>2880 min Summer</td><td>2.889</td><td>0.089</td><td>1.8</td><td>9.7</td><td>0 K</td></tr><tr><td>4320 min Summer</td><td>2.848</td><td>0.048</td><td>1.7</td><td>5.2</td><td>0 K</td></tr><tr><td>5760 min Summer</td><td>2.838</td><td>0.038</td><td>1.4</td><td>4.1</td><td>0 K</td></tr><tr><td>7200 min Summer</td><td>2.832</td><td>0.032</td><td>1.2</td><td>3.5</td><td>0 K</td></tr><tr><td>8640 min 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Date 29/11/2017 11:42 File Inf blanket 100yrs40CC....		Designed by JP Checked by			
Micro Drainage		Source Control 2016.1.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	3.093	0.293	1.8	31.7	0 K
60 min Winter	3.164	0.364	1.8	39.3	0 K
120 min Winter	3.219	0.419	1.8	45.2	0 K
180 min Winter	3.233	0.433	1.8	46.7	0 K
240 min Winter	3.230	0.430	1.8	46.4	0 K
360 min Winter	3.213	0.413	1.8	44.6	0 K
480 min Winter	3.193	0.393	1.8	42.4	0 K
600 min Winter	3.169	0.369	1.8	39.8	0 K
720 min Winter	3.143	0.343	1.8	37.1	0 K
960 min Winter	3.092	0.292	1.8	31.6	0 K
1440 min Winter	2.998	0.198	1.8	21.4	0 K
2160 min Winter	2.892	0.092	1.8	9.9	0 K
2880 min Winter	2.848	0.048	1.7	5.2	0 K
4320 min Winter	2.835	0.035	1.3	3.8	0 K
5760 min Winter	2.828	0.028	1.0	3.0	0 K
7200 min Winter	2.823	0.023	0.8	2.5	0 K
8640 min Winter	2.820	0.020	0.7	2.2	0 K
10080 min Winter	2.818	0.018	0.6	1.9	0 K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	85.701	0.0	32		
60 min Winter	54.957	0.0	62		
120 min Winter	34.010	0.0	118		
180 min Winter	25.295	0.0	174		
240 min Winter	20.351	0.0	228		
360 min Winter	14.971	0.0	284		
480 min Winter	12.028	0.0	360		
600 min Winter	10.141	0.0	436		
720 min Winter	8.817	0.0	510		
960 min Winter	7.063	0.0	654		
1440 min Winter	5.157	0.0	910		
2160 min Winter	3.757	0.0	1252		
2880 min Winter	2.997	0.0	1472		
4320 min Winter	2.176	0.0	2204		
5760 min Winter	1.731	0.0	2936		
7200 min Winter	1.449	0.0	3672		
8640 min Winter	1.255	0.0	4320		
10080 min Winter	1.111	0.0	5144		
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Appendix E

Flood Warning and Evacuation Plan

1. Background

This building is liable to flood in the event of the River Arun's defences breaching or overtopping. It is possible that there would be only very little warning time given by the EA.

The probable maximum depth from a breach is 0.69m. This would be hazardous to all (categories of) users, ie whether fully able or elderly/disabled.

The emphasis in this Plan is on the Manager of the business heeding the warnings issued by the Environment Agency and local media outlets, and taking appropriate action (and prompt evacuation of the unit as necessary) well in advance of the premises flooding.

This plan shall be part of the Manager's operational documents. It shall be reviewed on a regular basis, e.g. every 3 years until 2024 and then possibly extended to 5 year spans, depending on how much change is needed within the first 6 years.

Any staff acting temporarily as Duty Manager (in the Manager's absence) must be involved during the testing and review of this Plan and assume the responsibilities, albeit temporarily, as if they were the Manager whilst on duty.

2. Warning Arrangements

The Manager shall sign up to the Environment Agency's (free) flood warning system, 'Floodline Warnings Direct'. This is explained on the EA's website:

<https://www.gov.uk/sign-up-for-flood-warnings>.

The possibility of flooding to the property will trigger an automatic 24 warning message to the registered address contact. Although such flood warnings are intended to provide sufficient time to allow evacuation plans to be implemented, the risk here is greater due to breach failures being sudden events. There is a possibility that only approximately 4 hours' notice will be provided.

The registered contact for the site is [INSERT MANAGER'S NAME], and his contact number is

[INSERT MANAGER'S TELEPHONE NUMBER]. His email address is [INSERT MANAGER'S EMAIL ADDRESS]. The Manager is responsible for ensuring that the details in this section are completed with the correct occupant details at the beginning of tenancy/ownership. As soon as a new occupant takes up residency, their details should be recorded by the Manager; who will then update this FWEP accordingly.

In addition to the automated service, further information on the flooding can be obtained by consulting the Environment Agency website (www.environment-agency.gov.uk/flood) and phoning Floodline on 0345 988 1188, selecting option 1 and following further instructions. The site lies within an EA Flood Warning Area. Information given out on these telephone numbers is updated every 15 minutes.

For a local media outlet offering flood information use 1) BBC Radio Sussex broadcast on 95.3 FM, 104.5 FM and 104.8 FM, DAB digital (auto tune or manual tune) and online – or 2) local radio station SpiritFM 96.6 FM, 102.3 FM and 106.6 FM.

3. Flood Warning Codes

If flooding is forecast, warnings are issued using a set of four easily recognisable codes.

Each of the four codes indicates the level of danger associated with the warning. The EA *aims* to issue flood warnings up to 12 hours in advance. A Severe Flood Warning may be issued immediately, with no other warning code preceding it.

The Flood Warning Codes and their meanings are:



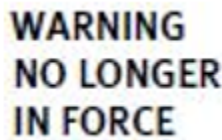
- What it means: Flooding is possible. Be prepared.
- When it's used: two hours to two days in advance of flooding.



- What it means: Flooding is expected. Immediate action required.
- When it's used: Half an hour to one day in advance of flooding.



- What it means: Severe flooding. Danger to life.
- When it's used: When flooding poses a significant threat to life.



- No further flooding is currently expected in your area.
- When it's used: When river and sea conditions return to normal.

4. Action to be Taken on Receipt if Flood Warnings



- What it means: Be prepared to act on your flood plan.
- Call Floodline on 0845 988 1188, select option 1 for up-to-date flooding information.
- Prepare a flood kit of essential items – refer to Section 6.0.
- Monitor local water levels and flood forecast on the EA website.

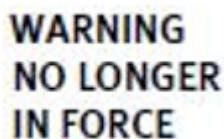


- What it means: Flooding is expected. Immediate action.
- Move valuables, pets to first floor level.
- Turn off gas, electricity and water supplies if safe to do so.

THE PROPERTY MUST BE EVACUATED IF SAFE TO DO SO.



- Co-operate with the emergency services. Call 999 if you are in immediate danger.
- If there are hazardous floodwaters surrounding the site, seek safe refuge at first floor level.



- Be careful. Floodwater may still be around for several days.
- If you've been flooded, ring your insurance company as soon as possible.

5. Preparation for a Flood Event

- Advice to the Manager and any appointed Deputies:
- Because of the probable lack of notice, it is essential that you are well prepared before a flood, as remote this possibility may seem at this time.
- Prepare a list of all your important contacts written in a notebook, and keep it to hand.
- Ensure you know *exactly* how to turn off electricity, gas and water.
- Prepare an Evacuation Action Checklist, this to contain all the items that must be actioned prior to evacuating - such as turning off the utilities and organising transport plus any other important items (people with special needs/medications). If any equipment has to be moved to a higher elevation this should be listed too. This should be part of the Overall Action Checklist, which includes the Recovery procedures.

6. Evacuation and Safe Refuge

The Manager should be able to assess from the EA's and Local Authority Emergency Services' warnings the likely flood warning time, ie how long there is before the building is likely to be inundated. This is likely to be less than 4 hours but this depends on the severity of the defences' failure. Once this is known it will be clear how quickly the evacuation must be carried out.

Once the flood depth reaches and exceeds 0.3m (or 12" = 1 foot) there will be no safe route to dry ground (away from this property).

Well in advance of having to evacuate you are strongly advised to work out which routes would be suitable for you to travel – to the northeast along Manning Road (Fort Road – left along Clun Road – right into Manning Road). Then proceed northwards – away from the coast.

Once the decision has been made to evacuate, the Manager will shut and lock up the premises, once he/she is satisfied that any members of staff and visitors at that time are able to reach dry land.

A car (or other motor vehicle) that is capable of transporting wheel-chair bound people, shall be available to ferry up to 4 people to dry land. Note that this 'target site' must be identified in advance by the Manager. This is to be added to this Plan and thereby included into the review process.

7. When is it Safe to Return?

The responding organisations will be providing updates on the situation and notification when it is safe to return to the building. Follow their advice.

8. Recovery?

The Manager should consider this phase well in advance of a flood. The business's insurance company should be consulted and the building organised with the threat of saline water flooding up to the critical depth (0.69m) in mind.

All other aspects of recovery and clean up should be listed by the Manager as part of the Overall Action Plan.

9. Awareness and Review

This plan shall be part of the Manager's operational documents and treated in a similar way to Fire Risk.

This Plan shall be reviewed on a regular basis, every 3 years between December 2017 and December 2024. The target date of the first review is 1 December 2020 and second review 1 December 2023. Thereafter each review should take place every 5 years. The site's flood risk profile should be assessed using the data available at that time - and the Plan updated to reflect the current standards and policies.



Drainage - Flood Risk - Highways - Transport

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