Bridge Farm
Meath Green Lane
Horley
Surrey
RH6 8JA

office@stripeuk.com
www.stripeuk.com
01293 850794

QA HOSPITAL MSCP PORTSMOUTH, COSHAM, PORTSMOUTH, PO6 3LY

FLOOD RISK ASSESSMENT

Client	Noviniti			
Project No.	J1708			
Project Title	QA Hospital MSCP Portsmouth			
Document Title	Flood Risk Assessment			
Version	**Status**	**Author**	**Approved by**	**Date of Issue**
1	Initial Issue	AJ	DB	28.01.2021

Contents

Appendices

1.0 Introduction

1.1.1 Noviniti is planning a proposed development on the site at QA Hospital MSCP Portsmouth, Cosham, Portsmouth, PO6 3LY.

1.1.2 Stripe Consulting has been instructed to produce a Flood Risk Assessment under National Planning Policy Framework (NPPF) to support the Planning Application.

1.1.3 This report aims to demonstrate whether the development is at risk of any form of flooding.

1.1.4 The general limitations of this assessment are that:

- Several data sources have been used in compiling this report. Whilst Stripe Consulting believe them to be trustworthy; it is unable to guarantee the accuracy of the information that has been provided by others.
- This report is based on information available at the time of preparation. There is potential for further information to become available, which may create a need to modify conclusions drawn in this report.

2.0 Location of Site

2.1.1 The site is off Harvey Road in Portsmouth. A location plan is enclosed in **Appendix A**.

2.1.2 The Local Authority is Portsmouth City Council.

3.0 Site Description

3.1 Existing Site

3.1.1 The existing site is the car park serving Queen Alexandra Hospital. A topographical survey has been commissioned for the site and can be found in **Appendix B**.

3.2 Existing Geology

3.2.1 The geology of the site has been ascertained by reference to the 1:50,000 British Geological Survey website. The data provided on the website indicates the bedrock and superficial drift geology for the site.

3.2.2 The strata of the site (bedrock geology) comprises chalk formation, described as follows:

"Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) - Chalk. Sedimentary Bedrock formed approximately 72 to 94 million years ago in the Cretaceous Period. Local environment previously dominated by warm chalk seas. These sedimentary rocks are shallow-marine in origin. They are biogenic and detrital, generally comprising carbonate material (coccoliths), forming distinctive beds of chalk."

3.2.3 The strata of the site (superficial drift) head, described as follows:

"Head - Clay, Silt, Sand and Gravel. Superficial Deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by subaerial slopes (U). These sedimentary deposits are subaerial in origin. They are detrital, comprising coarse- to fine- grained materials, forming down-slope layers and fans of accumulated material."

3.3 Hydrogeology Setting

3.3.1 The Environment Agency (EA) mapping service, as provided by Magic Map, indicates the aquifer designation for the bedrock and superficial drift geology and the groundwater vulnerability in the area. The mapping, as included at **Appendix C**, provide the following information for the site:

Geology Map	Site Description
Aquifer Designation (Bedrock)	Principal
Aquifer Designation (Superficial Drift)	Secondary (undifferentiated)
Groundwater Vulnerability	Medium / High
Groundwater Source Protection Zone	None

3.4 Hydrology

3.4.1 The nearest strategic watercourse is Portsmouth Harbour, located 1.5km to the south of the site.

4.0 Proposed Development

4.1.1 The proposal is for a new multi-storey car park (MSCP) on the site. A proposed site plan in included at **Appendix D**.

5.0 Flooding Information

5.1.1 As set out in the National Planning Policy Framework (NPPF), 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. For these purposes:

- "areas at risk of flooding" means land within Flood Zones 2 and 3; or land within Flood Zone 1 which has critical drainage problems, and which has been notified to the local planning authority by the Environment Agency;
- "flood risk" means risk from all sources of flooding - including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources.

5.1.2 Flooding information for Planning from the Environment Agency (EA) has indicated the site is located within Flood Zone 1, as found in the map at **Appendix E**.

5.1.3 As the site is within Flood Zone 1, no further data was required from the Environment Agency.

5.1.4 As part of the data capture, data and mapping from the Portsmouth Strategic Flood Risk Assessment (SFRA) was sought. This will be included and references in the relevant sections below.

6.0 Flood Risk

6.1.1 The data on the EA's website in their updated mapping, shows the site has a "very low" risk of flooding.

6.1.2 The EA confirmed that the proposed development site is located in Flood Zone 1 for Planning.

6.1.3 According to Table 2 of National Planning Policy Framework (NPPF), the development, being a car park, is classed as 'less vulnerable'.

6.1.4 According to NPPF Table 3 'Flood Risk Vulnerability and Flood Zone Compatibility', the development should be permitted.

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.

6.2 Sequential Test

6.2.1 Local Planning Authorities (LPA) are encouraged to take a risk-based approach to proposals for development in or affecting flood risk areas through the application of the Sequential Test and the objectives of this test are to steer new development away from high risk areas towards those at lower risk of flooding.

6.2.2 However, in some areas where developable land is in short supply, there can be an overriding need to build in areas that are at risk of flooding. In such circumstances, the application of the Sequential Test is used to ensure that the lower risk sites are developed before the higher risk ones.

6.2.3 NPPF (PPG25) states that the Sequential Test should be applied at all stages of the planning process and the starting point is generally the Environment Agency's flood zone maps.

6.2.4 These maps and the associated information are intended for guidance and cannot provide details for individual properties. They do not consider other considerations such as existing flood defences, alternative flooding mechanisms and detailed site-based surveys. They do, however, provide high level information on the type and likelihood of flood risk in any area of the country.

6.2.5 The site is within Flood Zone 1 and so does not require a sequential test assessment.

6.3 Exception Test

6.3.1 The Exception Test is an additional test to be applied by decision-makers following application of the Sequential Test. The Exception Test has two elements as shown below, both of which must be satisfied for development in a flood risk area to be considered acceptable.

6.3.2 The Exception Test is only appropriate for use when there are large areas in Flood Zones 2 and 3, where the Sequential Test alone cannot deliver acceptable sites, but where some continuing development is needed for wider sustainable development reasons, considering the need to avoid social or economic blight and the need for essential civil infrastructure to remain operational during floods.

6.3.3 For the Exception Test to be passed:

- It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA; and,
- A site-specific FRA must demonstrate that the development will be safe for its lifetime, without increasing flood risk elsewhere and, where possible, reducing flood risk overall.

6.3.4 The site does not require an exception test in accordance with NPPF.

6.4 Fluvial Flooding Risk

6.4.1 The Environment Agency flood information indicates no risk from fluvial sources on the site.

6.5 Historic Flood Data

6.5.1 The Environment Agency have no information indicating that the site was flooded historically from fluvial sources.

6.5.2 The Portsmouth SFRA, via the PfSH Webmaps service, has no information indicating that the site was flooded historically from fluvial sources.

6.6 Groundwater

6.6.1 Groundwater flooding is caused by the emergence of water originating from sub-surface permeable strata. A ground water flood event results from a rise in ground water level, sufficient for the water table to intersect the ground surface and inundate low lying land. Groundwater floods may emerge from either a single point or diffuse locations.

6.6.2 The underlying strata throughout the area and investigations into the SFRA geology data suggest that there is a risk of groundwater emergence which is likely to relate to the geology of the area. However, groundwater flooding risks are often highly localised, and dependent upon geological interfaces between permeable and impermeable subsoils. Therefore, sustainable construction techniques for surfacing will minimise any potential groundwater risk.

6.6.3 The Portsmouth SFRA, via the PfSH Webmaps service, has no information indicating that the site is in an elevated area of groundwater emergence and indicates the site is within an area of high bedrock permeability.

6.7 Flooding from Sewers

6.7.1 Flooding from sewers can occur because of different reasons; if sewers are blocked during the heavy rainfalls, or if a sewer cannot provide adequate capacity, then flooding can cause a large amount of damage.

6.7.2 The Portsmouth SFRA, via the PfSH Webmaps service, has no information indicating that the site was flooded historically from artificial sources.

6.8 Flooding from Reservoirs

6.8.1 Reservoir flooding is extremely unlikely to happen. There has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers. As the enforcement authority for the Reservoirs Act 1975 in England, the Environment Agency ensures that reservoirs are inspected regularly, and essential safety work is carried out.

6.8.2 However, in the unlikely event that a reservoir dam failed, a large volume of water would escape at once and flooding could happen with little or no warning. If the site is within a risk area, plans should be made for safe evacuation and escape. Residents may need to evacuate immediately, know the safest route to safety, and be ready to follow the advice of emergency services.

6.8.3 The EA data indicates that the site is at no risk from reservoir flooding.

6.9 Surface Water Flooding

6.9.1 Overland flow / surface water flooding typically arise because of intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems. It can run quickly off land and result in localised flooding.

6.9.2 The Environment Agency has produced illustrative mapping (Flood Map for Surface Water) relating to flooding risks from surface water. They are classified as Flood Hazard Maps for the purpose of the Flood Risk Regulations 2009. These maps are the next generation on from the previous "Area Susceptible to Surface Water Flooding" maps, which are contained within the SFRA.

6.9.3 The EA maps show high resolution image and indicative flow paths for pluvial events. The maps are based on coarse level data and indicate ridges, valleys and flat spots where water would collect. Typically, the flow paths follow valleys, rivers and watercourses.

6.9.4 The surface water maps and the associated information are intended for guidance only and cannot provide details for individual properties. They do, however, provide high level information and indicate areas in which surface water flooding issues should be investigated further. The risk categories are classified as follows:

- Very low probability of flooding – This zone is assessed as having less than a 1 in 1000 annual probability of surface water flooding.
- Low probability of flooding – This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of surface water flooding.
- Medium probability of flooding - This zone comprises land assessed as having between a 1 in 30 and 1 in 100 annual probability of surface water flooding.
- High probability of flooding – This zone is assessed as having greater than a 1 in 30 annual probability of surface water flooding.

6.9.5 A review of the EA mapping indicates there is no risk of surface water flooding to the site.

7.0 Route of Escape

7.1.1 In an extreme storm event, there is not likely to be flood water on site and safe escape can be achieved via the main access to site.

7.1.2 It is not envisaged that there would be any problem for access of emergency vehicles in an extreme storm event as there is no flood depth unless the extreme storm scenario occurs. Emergency vehicles may operate in depths of 0.5m with velocity of 5 metres per second (with some operating at depths of 1m).

7.1.3 The Planning Authority must be in consultation with the emergency services as to the appropriate access and safe routes for the site during an extreme storm event, in accordance with Section 13.S3.3 of the FRA Guidance for New Developments. Emergency Response Plans for the local area are available on the council website and would require updating for the proposed residence. It is not envisaged that there will be any additional burden on emergency services during a flood event.

7.1.4 General Evacuation Advice:

- Avoid walking or driving through flood water, as only 150mm of fast flowing flood water is able to knock a person over and 600mm is able to float a car. Flooding can cause manhole covers to come off, leaving hidden dangers.
- Do not walk on sea defences or riverbanks.
- Take care or avoid crossing bridges when water levels are high.
- Take care crossing culverts as they are dangerous when flooded.
- Look out for other hazards such as fallen power lines and trees.
- Keep Children away from flood water.
- Wash hands thoroughly if you come into contact with flood water as it may be contaminated with sewage.
- Always follow the advice provided at the time by the Emergency Services. The Emergency Services may direct you to a Local Authority Evacuation Centre, which has been specially prepared for people being evacuated from their homes. Free food and bedding is provided, however spare clothing should be taken, essential medication and any baby care products should an infant be involved in the evacuation.

8.0 Flood Compensation

8.1.1 The site is not within a Flood Zone for planning so there is no statutory requirement to assess the requirement for flood compensation.

9.0 Summary and Conclusions

9.1.1 Noviniti is planning a proposed development on the site at QA Hospital MSCP Portsmouth, Cosham, Portsmouth, PO6 3LY.

9.1.2 Stripe Consulting has been instructed to produce a Flood Risk Assessment under National Planning Policy Framework (NPPF) to support the Planning Application.

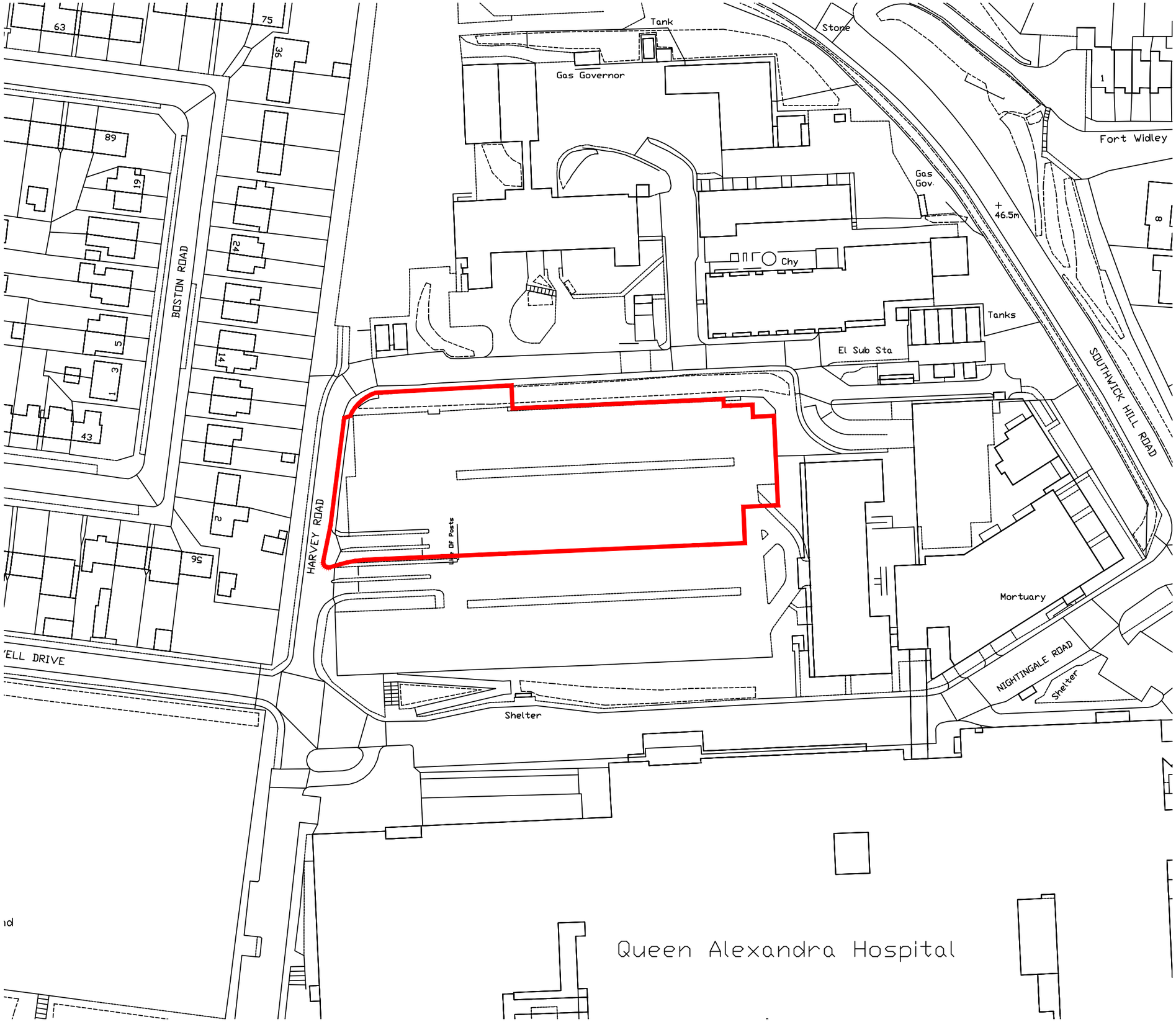
9.1.3 The Environment Agency mapping indicates that the site is within Flood Zone 1 and has a very low risk of fluvial flooding.

9.1.4 All other sources of flooding for the site have been investigated and shown to be of minimal or no risk.

9.1.5 The proposed development is appropriate and sustainable in the terms as set out in NPPF.

Appendix A

Location Plan



Notes:

1. Do not scale from this drawing.
2. All dimensions are in millimeters unless noted otherwise.
3. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings.

Rev	Rev Date	Revision Description	Drawn	Check'd	Apprv'd
P01	25.01.21	Initial Issue	AJ	DB	RH

Stripe Consulting Ltd.
Bridge Farm
Meath Green Lane
Horley
Surrey
RH6 8JA

Web: www.stripeuk.com
Tel: 01293 850 794
Email: office@stripeuk.com

Client
QA HOSPITAL TRUST

Project
QA HOSPITAL MSCP
PORTSMOUTH

Title
LOCATION PLAN

Purpose
FOR INFORMATION

Issue Date
25.01.2021

DO NOT SCALE

Job Number	Scale	Revision	Original Size
J1708	1:1000	P01	A3

Drawing Number
J1708-A20312-0100

Appendix B

Topographical Survey

A Ground Penetrating Radar (GPR) survey was conducted at Queen Alexandra Hospital, North Car Park, Cosham, Portsmouth. The survey objective was to search for evidence of buried services and other features. The survey used a GSSI Dual Frequency Radar in conjunction with 300 MHz and 800MHz antennae, giving a maximum depth penetration of roughly 1.3 m and 0.8 metres respectively.

Most ground conditions contain electrically contrasting layers, which produce reflection events on the GPR profiles. Features such as soil or fill boundaries provide the background signals around unusual features such as pipes or voids. Processing and interpretation procedures are designed to separate the reflections into various target categories, and then map the different reflection types on to a plan diagram. This process involves the interpretation of each individual radar profile, followed by an areal interpretation of all the radar profiles. Features identified across several profiles are interpolated in areas where the data is well constrained. The confidence levels placed on a plan interpretation depend on the spacing of the survey grid. A target must be intersected by at least one radar profile to be detected. Ideally, the profile spacing should allow any target to be intersected by several profiles. Consequently, the survey line spacing is selected to provide a good indication of site conditions at a reasonable cost and allow for available access.

The data interpretation identified five significant categories of reflection targets which are described below.

i) Possible pipe/service

A GPR profile either orthogonal or at a high angle to a length of pipe or service typically produces a steeply curved or hyperbolic reflection of moderate amplitude, which should be discernible against background reflections. The service position is located at the apex of the hyperbola. At low angles of intersection between survey lines and pipe tracks, the resultant planar reflection response is more ambiguous and can be difficult to identify. The plan interpretation shows the position of the interpreted pipe tracks. Possible services has been detected only by GPR.

ii) Possible high void ratio ground

Possible high void ratio ground appears on the GPR data as dense zones of high amplitude reflections, in some cases displaying evidence of pulse ringing. A characteristic chaotic structure is evident caused by complex interference between numerous small, high amplitude reflections. These reflection characteristics are generally indicative of loose, high void ratio ground.

iii) Possible structure

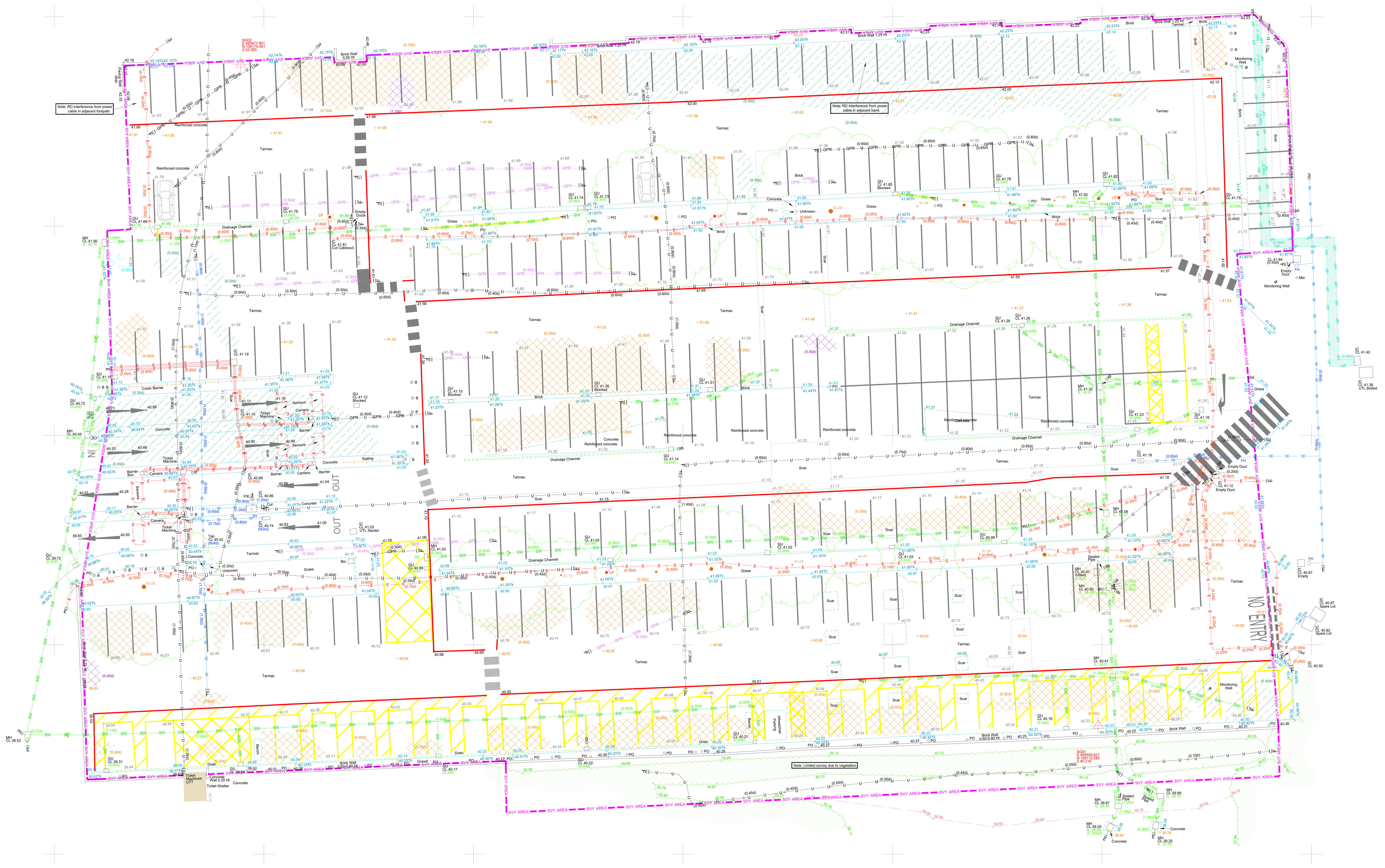
This reflection category consists of moderate to high amplitude, well defined reflections, typically with planar top surfaces and clearly defined margins usually characterised by edge scattering.

iv) Anomalous ground

Areas identified as anomalous ground generally appear as zones of moderate amplitude, irregular, reflections with broken layering. In some cases, there is evidence of a slightly chaotic internal structure, resulting from interaction between individual reflections. Anomalous ground can be caused localised disturbance of the ground or by discrete variations in ground composition.

v) Anomalous layer

Anomalous layers occur as fairly amplitude, planar, sub-horizontal reflections with little or no evidence of edge scattering. The anomalous layering is underlain by irregular, broken moderate to high amplitude reflections sometimes displaying a more chaotic internal structures suggestive of loose ground.



SHEET LAYOUT

Sheet 01

Note:
Information added from post processed GPR

- (0.40d) Possible service
- Possible high void ratio ground
- Possible structure
- Anomalous ground
- Anomalous layer

Rev	Notes	Drawn	Date

Notes:

Survey is referenced to OS Grid and Level Datum.

SUMO SERVICES Ltd
8 HAYWARD BUSINESS CENTRE
NEW LANE
HAVANT
HAMPSHIRE
PO9 2NL
TEL: 0845 456 1104
www.sumoservices.com

Title: Utility Mapping - SUMO+ Topographical Survey

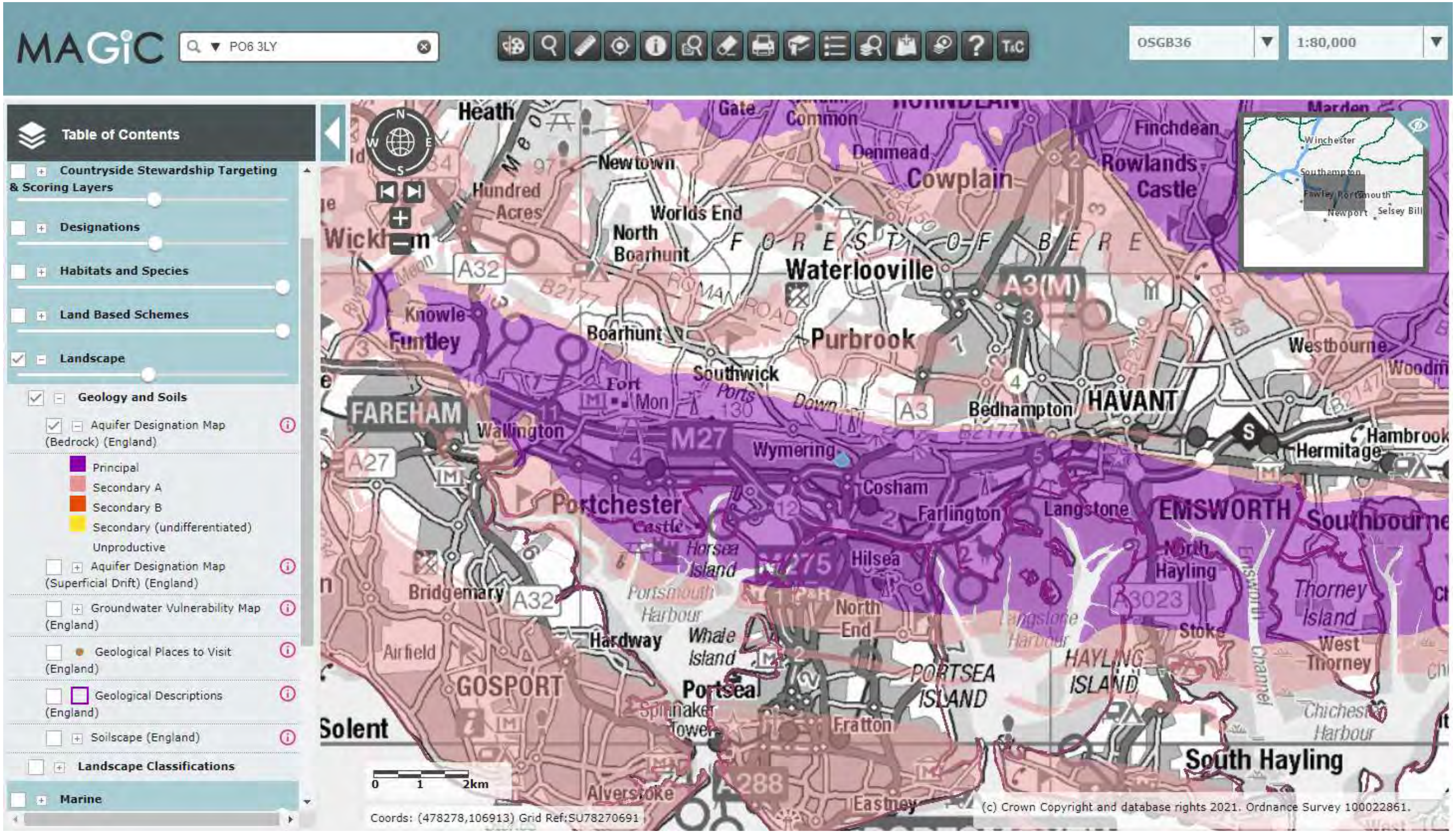
Client: Concept Building Services (Southern) Ltd

Project: Queens Alexandra Hospital, *North Car Park*, off Harvey Road, Cosham, Portsmouth.

Date Completed:	09/02/2020	Post Code:	PO6 3LY
Surveyed:	MW,SG,SW,KHH	Scale:	1/200 (A0 Sheet)
Drawn:	MWS,MUK		
Checked:	MW,SG,KHH,SW		
Job No:	Sheet 01	Dwg No: SOR017014	Rev:

Appendix C

Magic Map Geology Information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PO6 3LY
OSGB36
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Secondary B
Secondary (undifferentiated)
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Finchdean
Waterlooville
FOREST OF BERE
Knowle
Funtley
Boarhunt
Purbrook
Westbourne
Southwick
FAREHAM
Wallington
Fort Widley
M27
Wymering
Bedhampton
HAVANT
Hambrook
Hermitage
Cosham
Farlington
Langstone
EMSWORTH
Southbourne
Portchester
Castle
Horsea Island
Hilsea
North Hayling
Thorney Island
Bridgemary
Portsmouth Harbour
North End
Langstone Harbour
A3023
West Thorney
Hardway
Whale Island
Stoke
Airfield
GOSPORT
Portsea
PORTSEA ISLAND
HAYLING ISLAND
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Fratton
Solent
South Hayling
Alverstoke
Eastney
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A27
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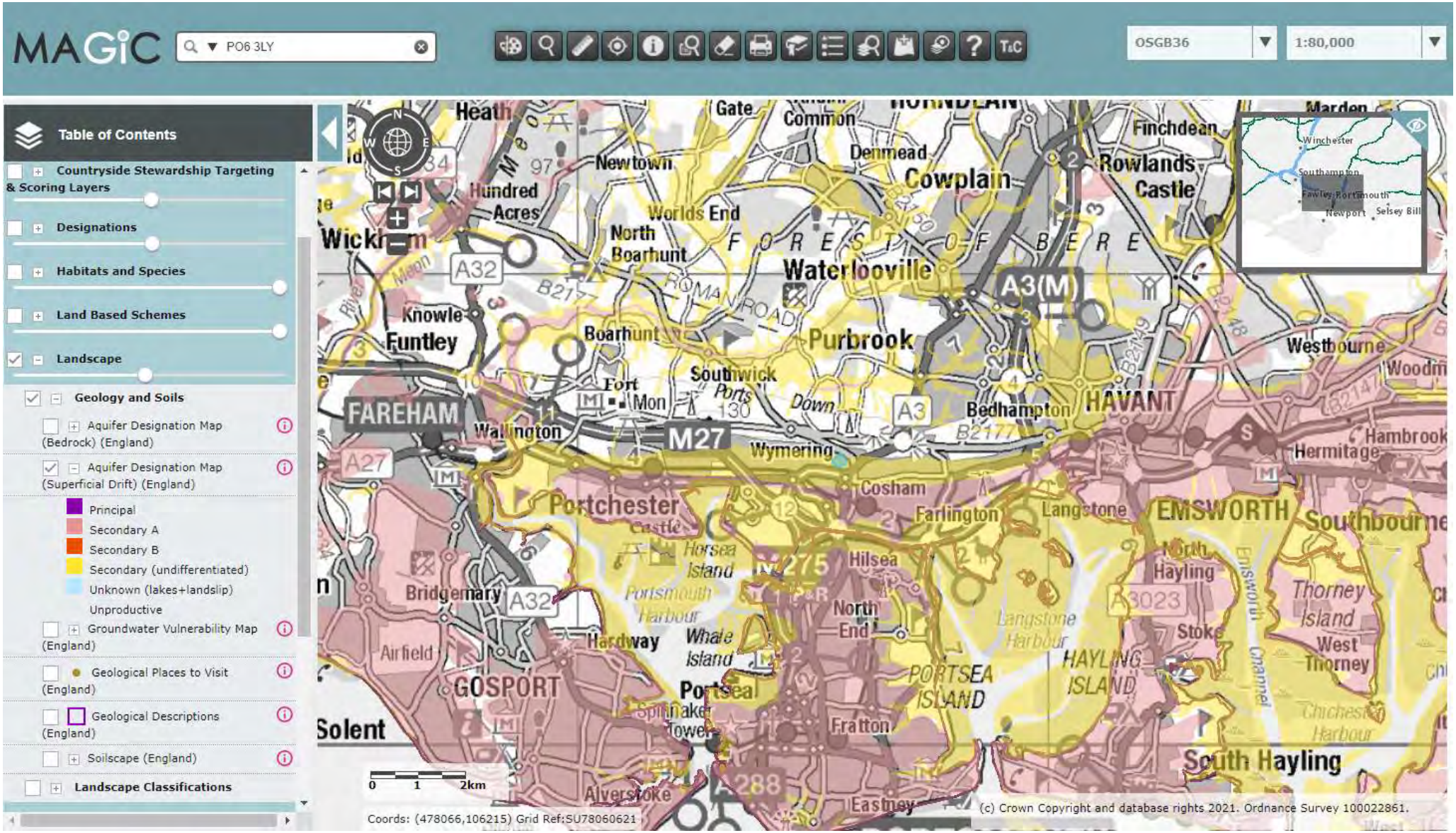
(c) Crown Copyright and database rights 2021. Ordnance Survey 100022861.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A32
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Purbrook
Westbourne
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Southwick
Ports Down
FAREHAM
Wallington
M27
A3
Bedhampton
HAVANT
Wymering
Hermitage
A27
Cosham
Portchester
Farlington
Langstone
EMSWORTH
Southbourne
Horsea Island
Hilsea
North Hayling
Bridgemary
A32
Portsmouth Harbour
North End
A3023
Thorney Island
Stoke
Hardway
Whale Island
Langstone Harbour
HAYLING ISLAND
West Thorney
Airfield
GOSPORT
Portsea
PORTSEA ISLAND
Solent
Fratton
South Hayling
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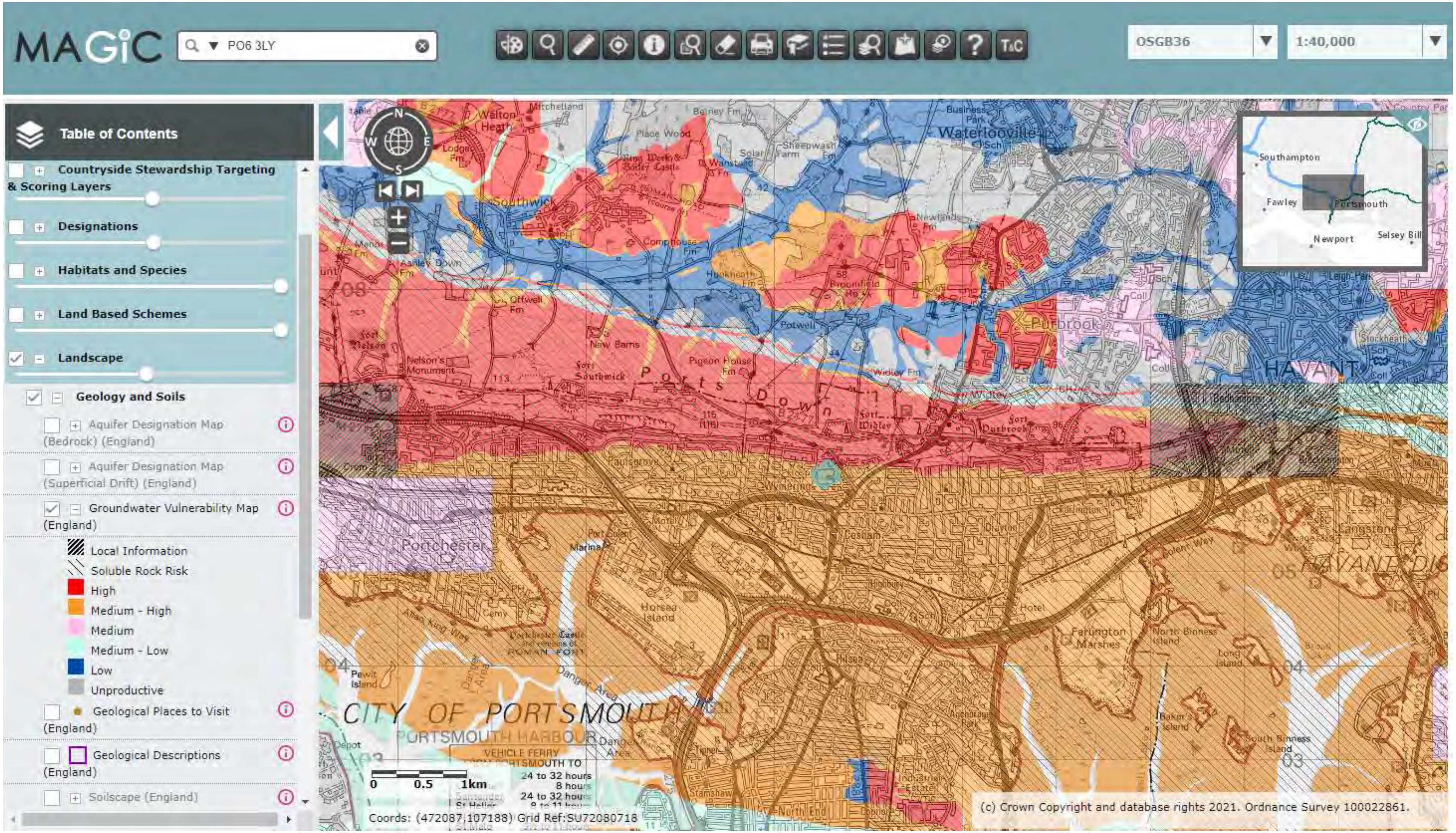
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Fawley
Portsmouth
Newport
Selsey Bill
Waterlooville
Southwick
Purbrook
HAVANT
Portchester
CITY OF PORTSMOUTH
PORTSMOUTH HARBOUR
0 0.5 1km
Coords: (472087,107188) Grid Ref:SU72080718
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Appendix D

Proposed Site Plan

NOTES:

1. Do not scale from this drawing.

2. All dimensions are in millimeters unless noted otherwise.

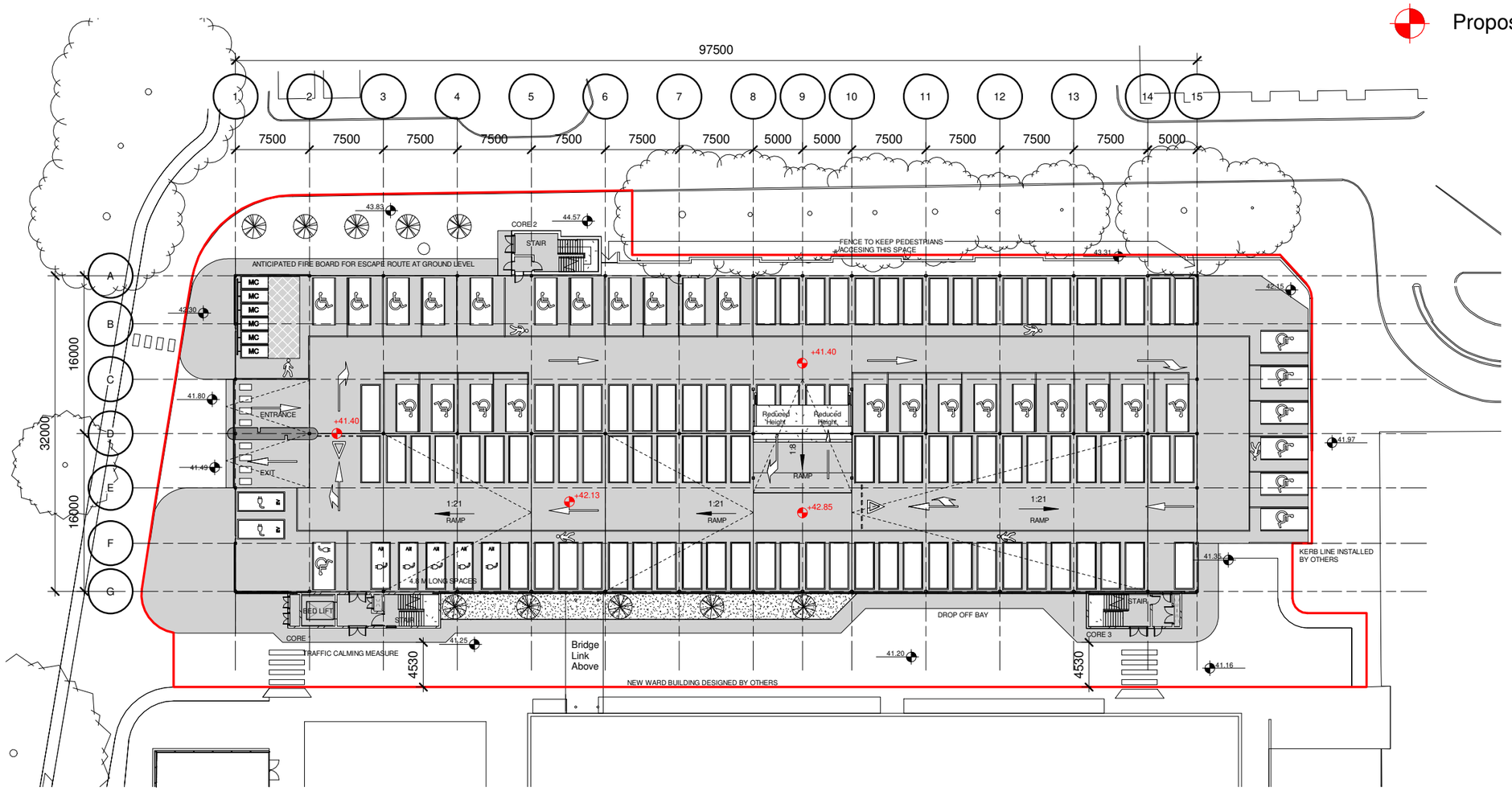
3. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings.

Legend

Existing levels

Proposed levels

N



00 GA - Ground Floor Plan

1 : 500

0 5 10 20 30 40 50

PARKING BAY SCHEDULE						
Level	Standard	Disabled	Disabled EV	EV	Motorcycle	TOTAL
Ground Floor	91	30	1	7	6	129
LEVEL 01	135	-	-	-	-	135
LEVEL 02	137	-	-	-	-	137
LEVEL 03	140	-	-	-	-	140
TOTAL	503	30	1	7	6	541

Project: QA HOSPITAL MSCP PORTSMOUTH

Reference: Ground Floor Plan

Draftsman	Control	Authorisation
MY	VV	CPB

Phase: Preliminary

Client: Noviniti

Scale: 1:500 @ A3

Ballast Nedam Parking
3rd Floor
70 Gracechurch Street
London
EC3V 0HR
United Kingdom
Tel: +31 (0)30 285 30 30
E-mail: office@bnparking.co.uk

Ballast Nedam

Date: 26/01/2021 Version P01

Project Number: 0039

Drawing Number: J1708-STRIPE-XX-00-DR-AX-90002

ext. rev: int. rev:

Appendix E

Environment Agency Flood Map

Flood map for planning

Your reference	Location (easting/northing)	Created
A20312	**465570/106054**	**15 Jan 2021 12:49**

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

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
A20312

Location (easting/northing)
465570/106054

Scale
1:2500

Created
15 Jan 2021 12:49

- Selected point
- Flood zone 3
- Flood zone 3: areas bene tting from ood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 20 40 60m