Proposed Commercial Development
Daedalus Park (Site B South)
Solent Enterprise Zone
Lee-on-the-Solent
Hampshire

Flood Risk Assessment

Revision 0: March 2017
R-FRA-T7634AA-05-0

Northampton Office
Cedar Barn, White Lodge,
Walgrave,
Northampton,
NN6 9PY

T: 01604 781811
F: 01604 781999
E: mail@jppuk.net
W: jppuk.net

Proposed Commercial Development
Daedalus Park (Site B South)
Solent Enterprise Zone
Lee-on-the-Solent
Hampshire

Flood Risk Assessment

JPP Consulting Ltd., Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY
T: 01604 781811 F: 01604 781999 E: mail@jppuk.net W: jppuk.net

Report Reference R-FRA-T7634AA-05-0
Date Revision 0: March 2017

Report Originators

Prepared by



Marc Nightingale
Technician
marc.nightingale@jppuk.net

Reviewed by



Martin Andrews MEng (Hons) CEng MICE MCIHT
Associate
martin.andrews@jppuk.net

Revision	Date	Description	Prepared	Reviewed
0	6th March 2017	Initial Report	Marc Nightingale	Martin Andrews

Contents

1.0 Introduction 4

1.1 Background 4
1.2 Objectives 4
1.3 Reference Documents 5

2.0 Description and history of the site and development proposals 6

2.1 Location and description of the site 6
2.2 History of the Site 6
2.3 Proposed Development 6
2.4 Geology of the site and ground investigation data 6
2.5 Development proposals and flood risk vulnerability 7

3.0 Flood Risk 8

3.1 Fluvial / Tidal Flooding 8
3.2 Flooding from Surface Water 10
3.3 Flooding from Groundwater 11
..... 11
3.4 Flooding from Sewers 12
3.5 Flooding from Reservoirs, Canals and Other Artificial Sources 12
3.6 Historic Flooding 13
3.7 Flood Risk Vulnerability and Flood Zone Compatibility 13
3.8 Access and Egress 13
3.9 Flood Compensation 13

4.0 Management of Surface Water 14

4.1 Current Conditions 14
4.2 Surface Water Drainage Outfalls 14
4.3 Infiltration Systems 14
4.4 Watercourses / Main River 14
4.5 Sewers 14

5.0 Proposed Drainage Strategy 15

5.1 Surface Water Drainage Strategy 15
5.2 Foul Water Drainage Strategy 15
5.3 Overland flows 15

6.0 Maintenance 16

6.1 Surface Drainage Maintenance 16
6.2 Foul Drainage Maintenance 16

7.0 Conclusions 17

Appendices

Appendix A ..... **A**

Site Location Plan ..... A
Forum Architecture drawing no. 15011-51-P2 ..... A

Appendix B ..... **B**

Topographic Site Plan ..... B
Forum Architecture drawing no. 15011-52-P2 ..... B

Appendix C ..... **C**

Proposed Site Plan C
Forum Architecture drawing no. 15011-55-P5 C

1.0 Introduction

1.1 Background

1.1.1 This report is a Flood Risk Assessment which has been prepared by JPP Consulting Limited on behalf of Mildren Construction Limited to support a full planning application for a proposed commercial development. The benefit of this report is limited to our instructing Client.

1.1.2 The proposed commercial development is located at Site B South, Daedalus Park, Solent Enterprise Zone, Lee-on-the-Solent, as shown on the location plan in Figure 1.1 below and enclosed in Appendix A. The National Grid Reference for the site is E456190 N101460. The proposed development has a total area of 0.713ha (7,130m^2).

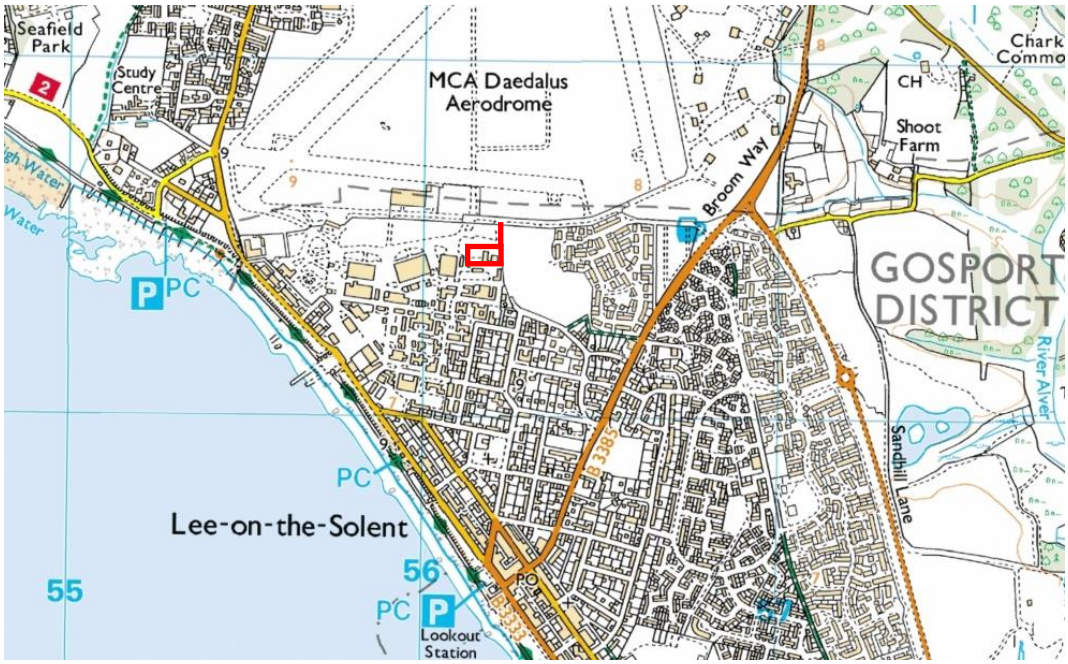


Figure 1.1 Site Location Plan

1.2 Objectives

1.2.1 The objective of this report is to advise interested parties in the development to the potential risk of flooding and management of surface water from a drainage perspective. The report both assesses flood risk and describes a strategy to drain the site is respect of surface water drainage.

1.2.2 This report has been prepared to support an application for a detailed planning consent.

1.3 Reference Documents

1.3.1 This report has been prepared with reference to the following publications:

- Department for Communities and Local Government (March 2012), National Planning Policy Framework
- Department for Communities and Local Government (March 2014), Planning Practice Guidance 'Flood Risk and Coastal Change'
- Department for Environment, Food and Rural Affairs (March 2015), Non-statutory technical standards for sustainable drainage systems
- Environment Agency (September 2013), Climate Change Allowances for Planners: Guidance to support the National Planning Policy Framework
- Environment Agency (October 2013), Delivering benefits through evidence: Rainfall runoff management for developments
- HM Government (2010), The Building Regulations (2010), Drainage and Waste Disposal, Approved Document H, The NBS, Newcastle Upon Tyne
- Wilson, Bray, Cooper (2004), Sustainable drainage systems: Hydraulic, structural and water quality advise, C609, CIRIA, London
- Woods-Ballard et al (2007), The SUDS Manual, C697, CIRIA, London
- CIRIA Report C624 Development and flood risk
- National SUDS Working Group (2004), Interim Code of Practice for Sustainable Drainage Systems
- Institute of Hydrology (1999), Flood Estimation Handbook, Institute of Hydrology, Wallingford
- BS EN 752:2008 Drain and sewer systems outside buildings. Hydraulic design and environmental considerations
- BS 8533:2011 Assessing and managing flood risk in development – Code of Practice
- CIRIA Report C635 Designing for exceedance in urban drainage – good practice

2.0 Description and history of the site and development proposals

2.1 Location and description of the site

2.1.1 The proposed commercial development is located at Daedalus Park, Solent Enterprise Zone, Lee-on-the-Solent, as shown on the location plan in Figure 1.1 and indicated as Site B South on the plan enclosed in Appendix A. The proposed development is bound by Daedalus Aerodrome and proposed commercial development (Site B North) to the north, approved commercial development (Site A) to the east and existing commercial development to the south and south-west.

2.2 History of the Site

2.2.1 The proposed development site has previously been developed. The buildings have since been demolished and the site is currently vacant. The existing site layout is shown on the plan enclosed in Appendix B.

2.3 Proposed Development

2.3.1 The proposed development, identified as Site B South, forms part of the new Solent Enterprise Zone. Site A, located adjacent to the eastern boundary was granted planning permission on 21st October 2015, Gosport Borough Council planning reference 15/00247/FULL.

2.3.2 The proposed commercial development will comprise 5 units with approximately 2,751m^2 Gross internal Area, with associated parking. The proposed development layout is shown on the plans enclosed in Appendix C.

2.4 Geology of the site and ground investigation data

2.4.1 A geotechnical investigation was completed for the approved commercial development located at Site A to the east. This investigation site identified the underlying geology of the adjacent site to comprise Made Ground at depths of 0.2m to 1.3m overlying River Terrace Deposits. Groundwater was found at depths of 2.2m to 3.2m. Due to the contaminants in the Made Ground and a relatively high water table, infiltration was assumed to not be viable at Site A.

2.4.2 Due to the close proximity of the sites, this reports assumes the geology, water table level and infiltration potential of Site B to be similar to that of Site A. A detailed design study of Site B may identify areas where infiltration can be used. However, this assessment will assume that infiltration is not viable, a worst case assessment.

2.5 Development proposals and flood risk vulnerability

2.5.1 With reference to Table 2 of Planning Practice Guidance to the National Planning Policy Framework, the proposed commercial development would be classified as Less Vulnerable.

2.5.2 An extract from Table 2 of the PPG for Flood Risk and Coastal Change in replicated below in Table 2.1 with the proposed development type highlighted.

Flood Risk Vulnerability Classification	
Vulnerability	**Development Types**
More Vulnerable	Police, ambulance and fire stations which are not required to be operational during flooding.
	Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; **offices**; **general industry**, **storage and distribution**; non-residential institutions not included in the 'More Vulnerable' class; 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 not 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.
Source: Planning Practice Guidance - 2014	

Table 2.1

3.0 Flood Risk

3.1 Fluvial / Tidal Flooding

3.1.1 An extract of the Environment Agency's Flood Map for Planning (Rivers and Sea) is provided below in Figure 3.1. The flood map was extracted from the Environment Agency's website on the 17th October 2016. The approximate application site boundary is shown in red. The map indicates that the development site is located within Flood Zone 1 (Low Probability) and as such, the report considers the development to be in Flood Zone 1 and at a low risk of flooding from rivers or the sea.

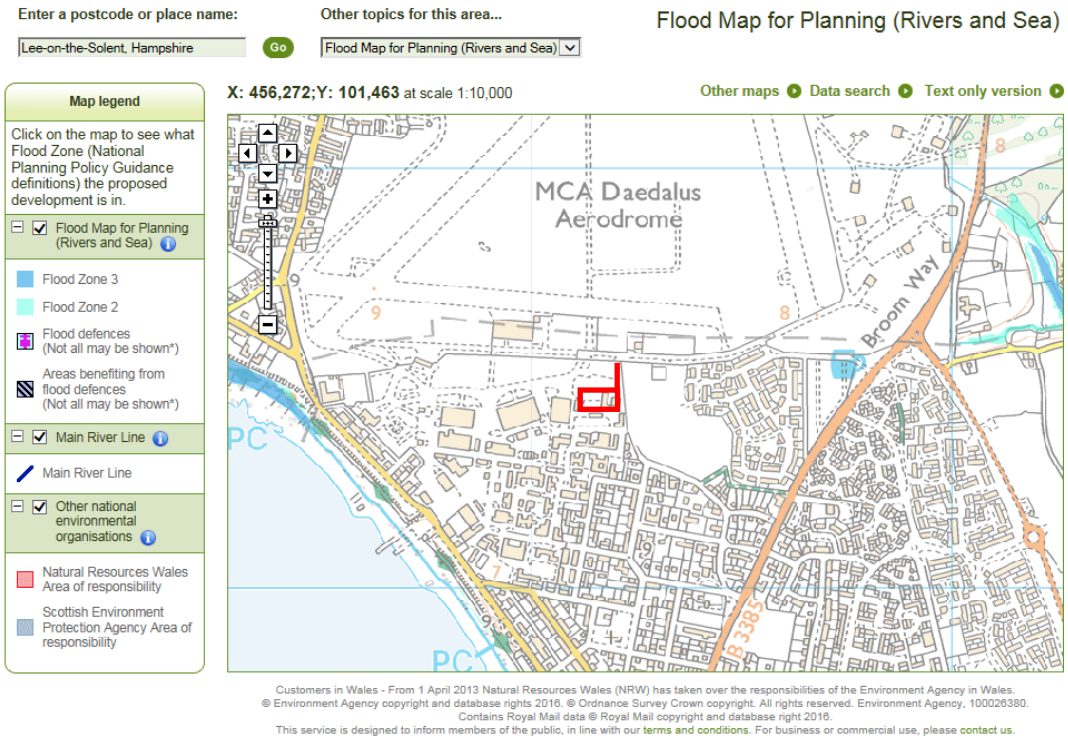


Figure 3.1 Flood Map for Planning (Rivers and Sea)
Source: Environment Agency website 17th October 2016

3.1.2 Table 3.1 is a copy of Table 1 from Planning Practice Guidance for 'Flood Risk and Coastal Change' to the National Planning Policy Framework which defines Flood Zones. The proposed development, which is located within Flood Zone 1, is assessed as having a less than 1 in 1,000 annual probability of river or sea flooding in any year.

Flood Zone	
Flood Zones	**Definition**
Zone 1: Low Probability	**Land having less than 1 in 1,000 annual probability of river or sea flooding.**
Zone 2: Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.
Zone 3a: High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.
Zone 3b: The Functional Floodplain	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
Source: Planning Practice Guidance - 2014	

Table 3.1

3.2 Flooding from Surface Water

3.2.1 An extract of the Environment Agency map 'Risk of Flooding from Surface Water' is provided below in Figure 3.2. The approximate application site boundary is shown in red. The majority of the site is shown to be located in an area of very low (less than 1 in 1,000) risk of surface water flooding in a given year.

3.2.2 A small portion of the site is shown to be located in an area of low (1 in 100 to 1 in 1,000) risk of surface water flooding in a given year. This area of surface water flooding is located in the south-west corner of the site and is distinct localised flooding. In addition, a small portion of the site is shown to be located in an area of medium (1 in 30 to 1 in 100) and high (greater than 1 in 30) risk of surface water flooding in a given year. This area of surface water flooding is located in the north-east corner of the site. The maps are of a low quality and are probably based on mapping data pre-development of the enterprise zone. Thus, it is difficult to ascertain exactly how much of the site is affected and whether the site is still affected following the development of the enterprise zone. The proposed development will design levels in the site to ensure that surface water does not adversely affect the development.

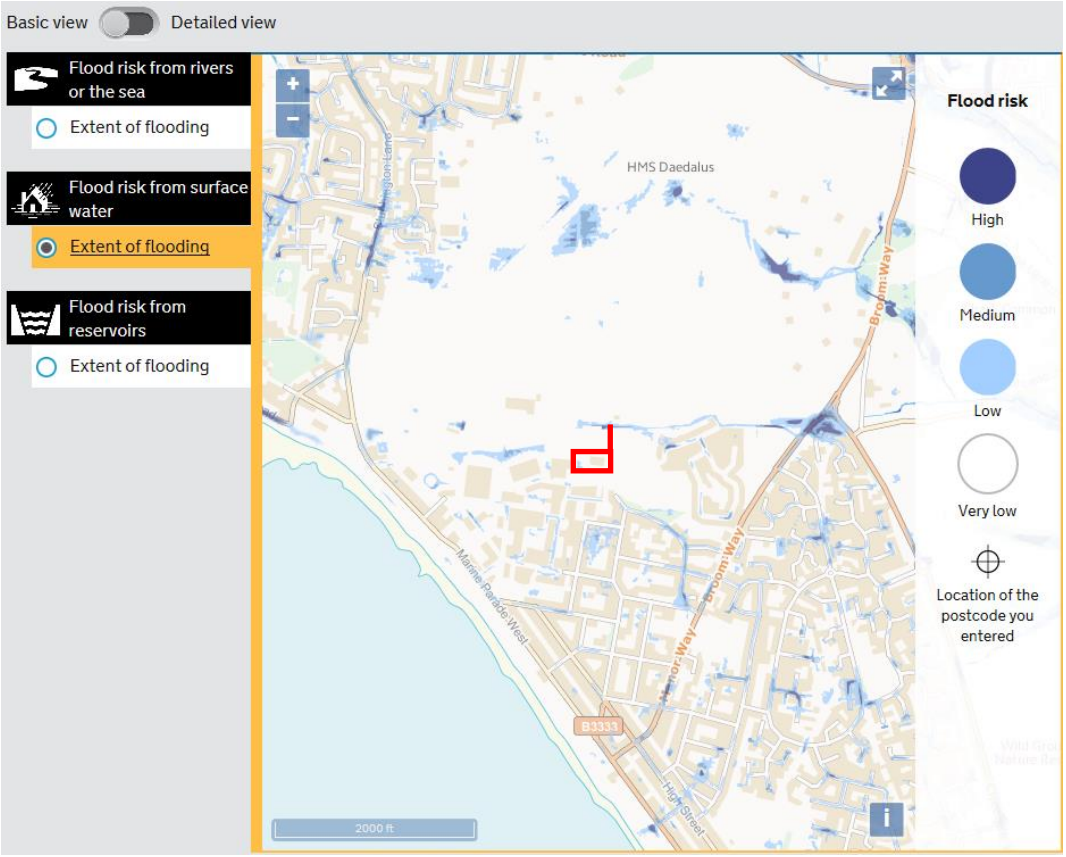


Figure 3.2 Flood Risk from Surface Water
Source: Environment Agency website – 17th October 2016

3.3 Flooding from Groundwater

3.3.1 From information provided on the Environment Agency's website, see Figure 3.3 and Figure 3.4 below, the site appears to be underlain by a Secondary A aquifer in both the superficial deposits and bedrock layer. We are not aware of any flooding on site caused by groundwater. We would therefore consider the probability of flooding on the site from groundwater to be low.

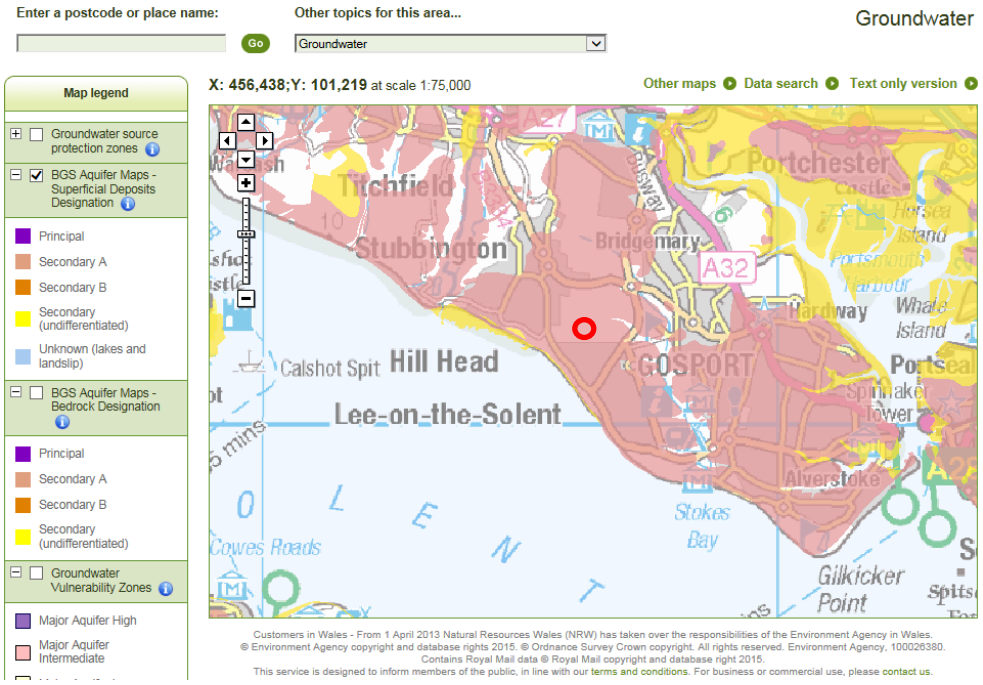


Figure 3.3 Groundwater – Superficial Designation
Source: Environment Agency website – 17th October 2016

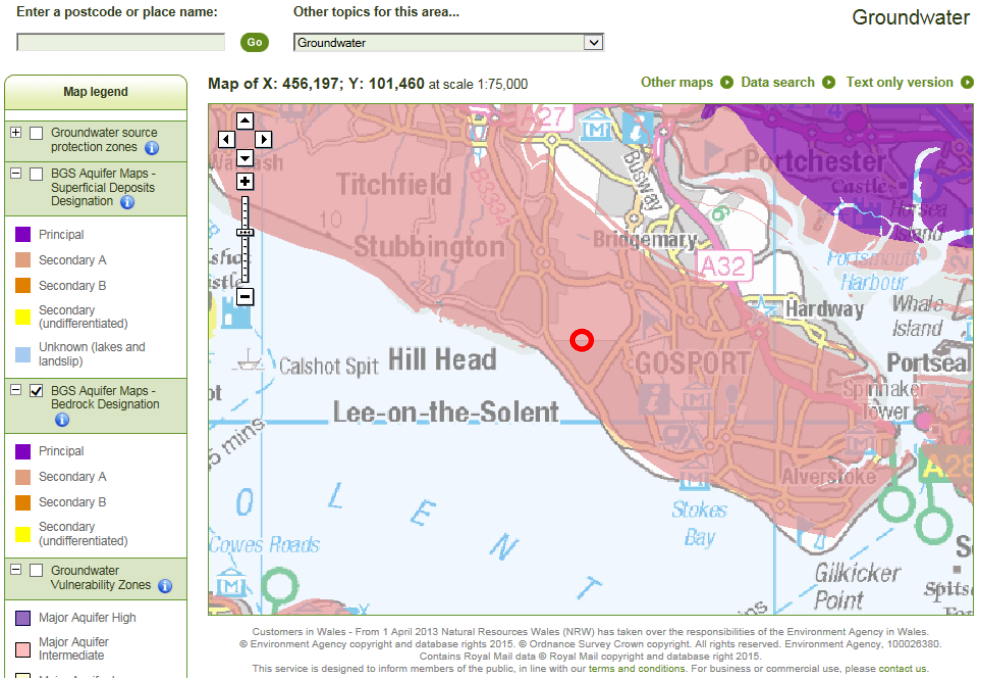


Figure 3.4 Groundwater – Bedrock Designation
Source: Environment Agency website – 17th October 2016

3.4 Flooding from Sewers

3.4.1 We are not aware of any sewers located within the site application boundary. We do not have any records of sewer flooding within the vicinity of the proposed development.

3.4.2 We therefore do not consider the risk of flooding from sewers to be a significant risk to the proposed development.

3.5 Flooding from Reservoirs, Canals and Other Artificial Sources

3.5.1 We are not aware of any canals or artificial water sources that may results in flooding of this site.

3.5.2 An extract of the Environment Agency map 'Risk of Flooding from Reservoirs' us provided below in Figure 3.5. It can be seen that the proposed development, approximately shown in red, is not at risk of flooding from reservoirs.

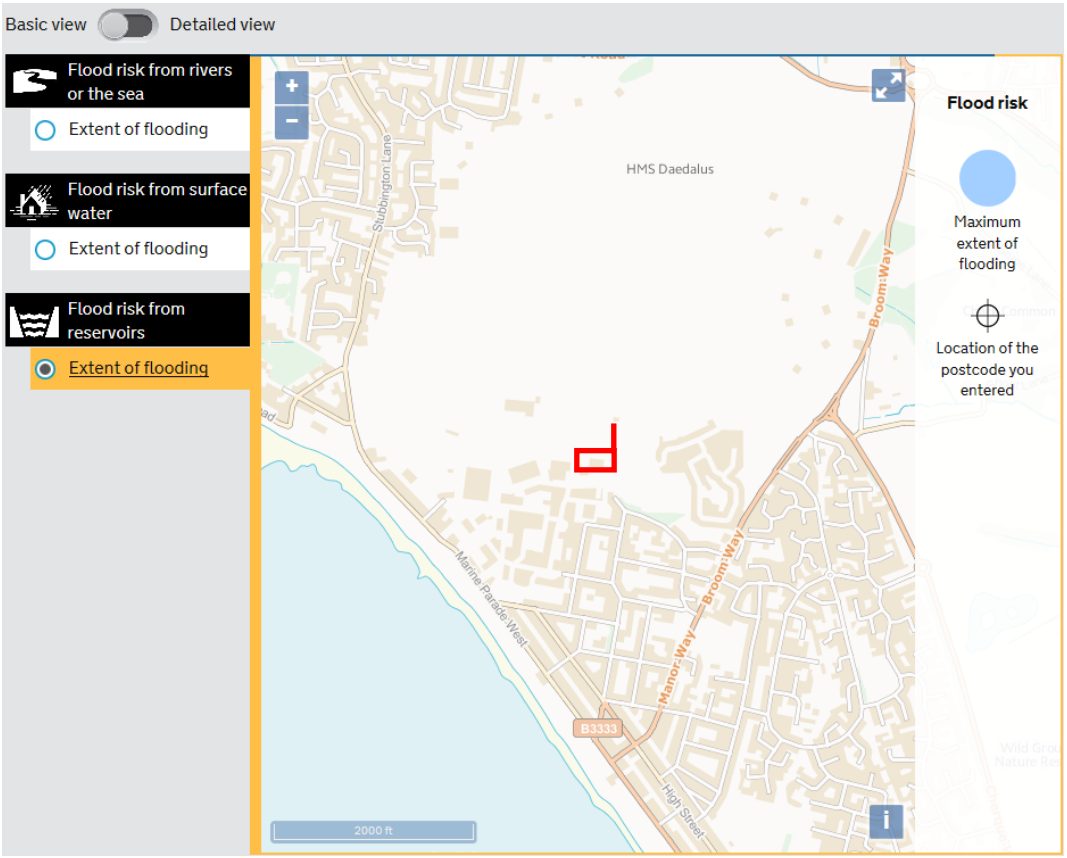


Figure 3.5 Risk of Flooding from Reservoirs
Source: Environment Agency website – 17th October 2016

3.5.3 It can therefore be concluding that the risk of flooding from reservoirs is low.

3.6 Historic Flooding

3.6.1 We do not have any records showing historic flood events within the vicinity of the site.

3.7 Flood Risk Vulnerability and Flood Zone Compatibility

3.7.1 Based on the above assessment of the site being located in Flood Zone 1 and classified as a Less Vulnerable development, and with reference to Table 3.2 (Planning Practice Guidance for *'Flood Risk and Coastal Change'* to the National Planning Policy Framework, Table 3), the proposed development of this site would be considered "appropriate". A copy of Table 3 is presented below highlighting the above. Neither a sequential or exception test will be required.

Table 3 –Flood Risk Vulnerability and Flood Zone Compatibility

Flood risk vulnerability classification	Essential infrastructure	Water compatibility	Highly vulnerable	More vulnerable	Less vulnerable
Zone1	✓	✓	✓	✓	✓
Zone 2:	✓	✓	Exception test required	✓	✓
Zone 3a	Exception test required	✓	X	Exception test required	✓
Zone 3b	Exception test required	✓	X	X	X

✓ = Development is appropriate X = Development should not be permitted

Source: Planning Practice Guidance - 2014

Table 3.2

3.8 Access and Egress

3.8.1 Access and egress to and from this site in the event of flooding will be via the proposed development's access road which will allow users of the development to move to higher ground.

3.9 Flood Compensation

3.9.1 Flood compensation measures will not be required for this site as it is located within Flood Zone 1.

4.0 Management of Surface Water

4.1 Current Conditions

4.1.1 The proposed development site is currently an unoccupied site where the existing buildings have been demolished. The site was previously positively drained although the exact extent of drainage and discharge location is not known. The existing site layout is shown on the topographical survey included in Appendix B. The current site comprises impermeable and permeable areas.

4.2 Surface Water Drainage Outfalls

4.2.1 It is a requirement of The Building Regulations (2010), Drainage and Water Disposal, Approved Document H, to dispose of surface water collected by a development in the following list of priorities: -

- Infiltration systems where ground conditions permit
- To watercourses
- To sewers

4.2.2 Each of these is considered separately below.

4.3 Infiltration Systems

4.3.1 The geology of the site is detailed in Section 2.3 above. Infiltration techniques are unlikely to be viable due to the contaminated Made Ground and high water table. A full and detailed assessment of the site will be completed to confirm if areas of the development can utilise infiltration.

4.4 Watercourses / Main River

4.4.1 There are no watercourses located within or adjacent to the boundary of the proposed development.

4.5 Sewers

4.5.1 Surface water from the proposed development will drain to the sewer located within the approved new Airfield Perimeter Road to the north of the site, which has been designed to accept surface water from the development.

5.0 Proposed Drainage Strategy

5.1 Surface Water Drainage Strategy

5.1.1 Surface water from the proposed development will freely discharge to the surface water sewer located within the Airfield Perimeter Road to the north and north-west of the development site. This sewer has been constructed by Hampshire County Council to serve the proposed development site. The newly installed sewer outfalls to the sea, hence, it does not require any attenuation in line with DEFRA's Non-statutory technical standards for sustainable drainage systems.

> "**S1.** Where the drainage system discharges to a surface water body that can accommodate uncontrolled surface water discharges without any impact on flood risk from that surface water body (e.g. the sea or a large estuary) the peak flow control Standards (**S2** and **S3**) and volume control technical standards (**S4** to **S6**) need not apply."

5.1.2 This new sewer within the Airfield Perimeter Road has been design to accommodate unrestricted flow from the development site, hence, attenuation is not required within the development site. Therefore the proposed development will discharge unrestricted into this new sewer. As set out above flow restriction is not required as the sewer outfalls to the sea.

5.1.3 A drawing showing the indicative locations of the connection points to the new sewer is shown in Appendix C. The onsite drainage will be designed to ensure that sewers will not flood for all events up to and including the 1 in 100 year event plus climate change.

5.1.4 All surface water flows from the development will pass through a bypass separator providing adequate treatment.

5.2 Foul Water Drainage Strategy

5.2.1 Foul water from Site B will connect into the Site A foul water network, which is pumped and ultimately connects to an existing sewer located to the south of the site.

5.3 Overland flows

5.3.1 Proposals are to design the surface water drainage to accommodate the 1 in 100 year storm event taking into account the predicted future effects of climate change (40% increase in intensity). Clearly there is a risk of this storm event being exceeded, albeit this risk is considered very low. In such an event the proposed drainage systems will become overwhelmed and overland flows could occur. Overland flows will be directed to follow the path that overland flows currently follow.

6.0 Maintenance

6.1 Surface Drainage Maintenance

6.1.1 The drainage system will be designed to minimise maintenance requirements, however, a full maintenance scheme will be established for those elements not being offered for adoption. The various areas will be maintained as set out in Table 6.1 below.

Maintenance Areas – Surface Water	
Aspect	**Maintainer**
Drains	Business Occupier
SUDS	Business Occupier
Sewers	Southern Water

Table 6.1

6.2 Foul Drainage Maintenance

6.2.1 The drainage system will be designed to minimise maintenance requirements, however, a full maintenance scheme will be established for those elements not being offered for adoption. The various areas will be maintained as set out in Table 6.2 below.

Maintenance Areas – Foul Water	
Aspect	**Maintainer**
Drains	Business Occupier
Sewers	Southern Water

Table 6.2

7.0 Conclusions

7.1 The proposed commercial development is located at Daedalus Park, Solent Enterprise Zone, Lee-on-the-Solent. The proposed development is bound by Daedalus Aerodrome and proposed commercial development (Site B North) to the north, approved commercial development (Site A) to the east and existing commercial development to the south and south-west.

7.2 The proposed development, identified as Site B South, forms part of the new Solent Enterprise Zone. Site A, located adjacent to the eastern boundary was granted planning permission on 21st October 2015, Gosport Borough Council planning reference 15/00247/FULL. The proposed commercial development will comprise 12 units with approximately 1,232m^2 Gross External Area, with associated parking.

7.3 Surface water will discharge unrestricted to the sewer within the Airfield Perimeter Road located to the north and north-west of the site. The connection to the sewer will be made via the proposed access to the north of the site.

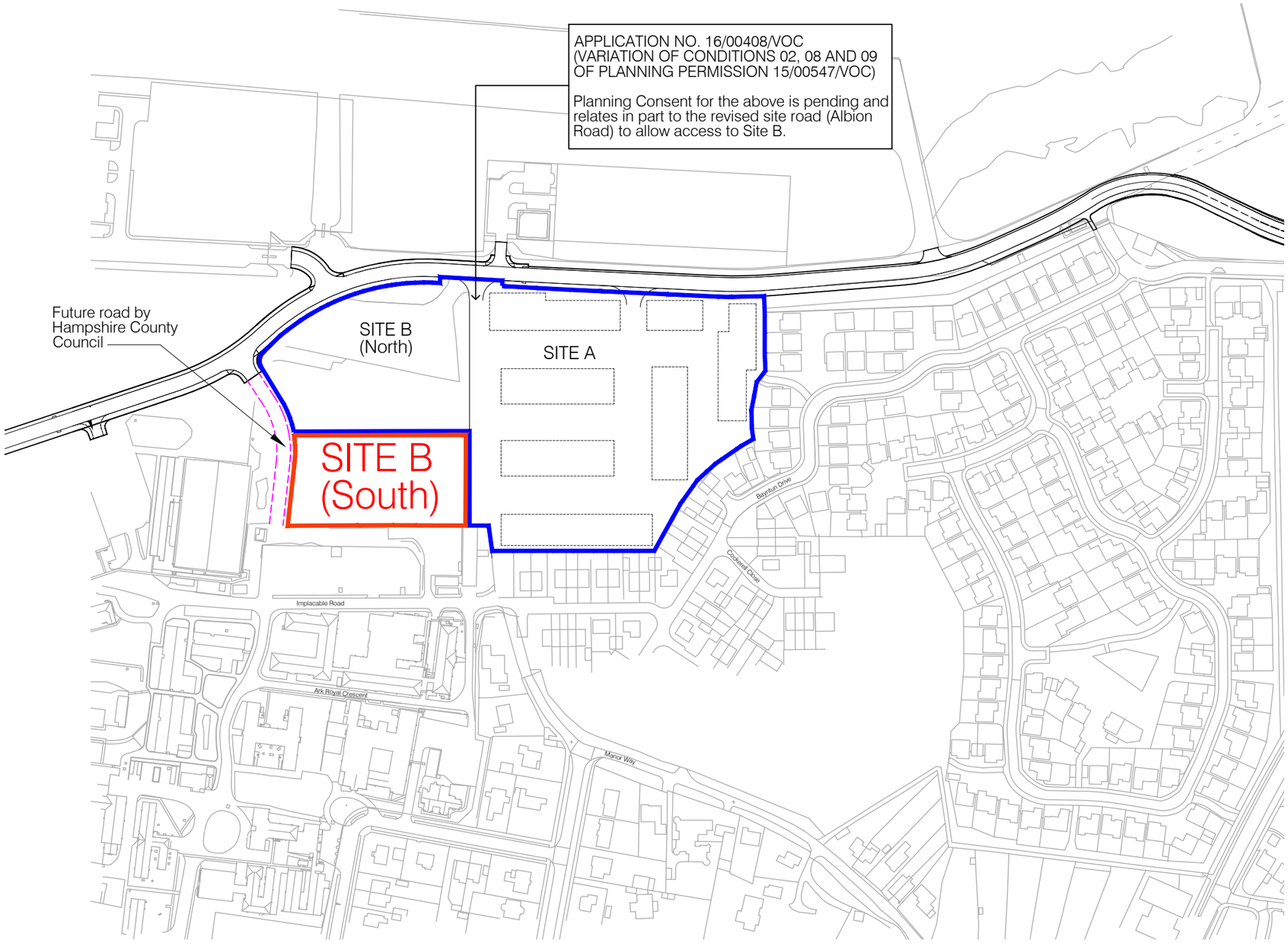
7.4 Foul water from Site B will connect into the Site A foul water network, which is pumped and ultimately connects to an existing sewer located to the south of the site.

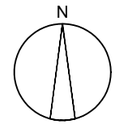
Appendix A

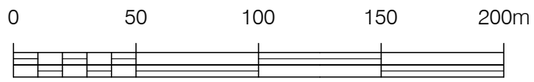
Site Location Plan

Forum Architecture drawing no. 15011-51-P2

HMS DAEDALUS AIRFIELD







Scale Bar 1:2500

P2	PLANNING ISSUE	TG/06.03.17	AB/06.03.17
P1	Original Issue	PR/18.10.16	TG/18.10.16
No	Revision	Dwn / Date	Chk / Date

Scaled dimensions are not to be used for construction
Contractor to check all dimensions and report omissions and errors to the Architect

PLANNING

Forum Architecture Ltd
Studio 52
Basepoint
Andersons Road
Southampton, Hampshire
SO14 5FE
Tel 023 8068 2095
www.forumarchitecture.co.uk
E-mail: mail@forumarchitecture.co.uk

FORUM architecture

CLIENT
Tidebank UK Ltd

PROJECT
Deadalus Park, Site B (South)

DRAWING TITLE
Location Plan

PROJECT NO.	DRAWING NO.	REV.	SCALE
15011	51	P2	1:2500 @ A3

Appendix B

Topographic Site Plan

Forum Architecture drawing no. 15011-52-P2

HM Coastguard

HMS Daedalus Airfield

APPLICATION NO. 16/00408/VOC
(VARIATION OF CONDITIONS 02, 08 AND 09 OF PLANNING PERMISSION 15/00547/VOC)

Planning Consent for the above is pending and relates in part to the revised site road (Albion Road) to allow access to Site B.

DSA Test Centre

ROLLER GATE

ROLLER GATE

FOOTPATH

AIRFIELD PERIMETER SECURITY FENCE HT 2.8m

TARMAC PERIMETER ROAD

GATES

GRASS

AIRFIELD PERIMETER SECURITY FENCE HT 2.8m

TARMAC PERIMETER ROAD

Site B (North)

Site A

Outline of buildings approved under Planning Ref: 15/00247/FULL

Future road by Hampshire County Council

Planning Application Red Line Boundary

Site B (South)

HARDCORE

STOCK PILE

RIDGE 18.73

EAVES 16.69

PIPES

ROOT LINE

C/L FENCE

DRAINAGE CHANNEL

CONCRETE BASE

DUCT

SVP

C. BASE

FOOTPATH

CONCRETE

TARMAC

GRASS

EGL 7.78 EGL 7.88 EGL 7.66 EGL 7.87 EGL 7.78 EGL 7.71 EGL 7.64 EGL 7.82 EGL 7.88 EGL 7.86 EGL 7.96 EGL 7.93 EGL 7.89 EGL 7.88 EGL 7.83 EGL 7.84 EGL 8.01 EGL 7.90 EGL 7.88 EGL 8.11 EGL 8.29 EGL 7.90 EGL 8.06 EGL 7.97 EGL 8.02 EGL 8.17 EGL 8.25 EGL 8.50 EGL 7.97 EGL 7.99 EGL 8.18 EGL 8.81 EGL 8.83 EGL 8.83

Notes

0 10 20 30 40m

Scale Bar 1:500

N

P2	Planning Application	AB/06.03.17	TG/06.03.17
P1	Initial Issue	PR/18.10.16	TG/18.10.16
No	Revision	Dwn / Date	Chk / Date

Scaled dimensions are not to be used for construction

Contractor to check all dimensions and report omissions and errors to the Architect

Forum Architecture Ltd
Studio 52
Basepoint
Andersons Road
Southampton, Hampshire
SO14 5FE

tel: 023 8068 2095
w: forumarchitecture.co.uk
e: mail@forumarchitecture.co.uk

FORUM architecture

DRAWING TITLE
Topographic Site Plan

CLIENT
Tidebank UK Ltd

PROJECT
Daedalus Park, Site B (South)

DRAWING STATUS
PLANNING

PROJECT NO.	DRAWING NO.	REV.	SCALE
15011	52	P2	1:500@A1

Appendix C

Proposed Site Plan

Forum Architecture drawing no. 15011-55-P5

HM Coastguard

HMS Daedalus Airfield

APPLICATION NO. 16/00408/VOC
(VARIATION OF CONDITIONS 02, 08 AND 09 OF PLANNING PERMISSION 15/00547/VOC)

Planning Consent for the above is pending and relates in part to the revised site road (Albion Road) to allow access to Site B.

I/COM
RS
MCA access
I/COM
SIGN
RS
RS
RS

New Airfield perimeter road

SS

A1 A2 A3 A4 A5 A6 A7
Albion

B1 B2 B3
Bulwark

C1
C2
C3
C4
Centaur

Connection to existing storm water sewer

Site B (North)

Albion Road

D1 D2 D3 D4
Diligence

Site A

F1
F2
F3
F4
Fearless

E1 E2 E3
Eagle

Proposed storm water drainage route

Future road by Hampshire County Council

2m landscaping zone

3no Cycle hoops

Site B (South)

62 parking spaces
(incl. 4no. DP spaces)

R

H-12 H-11 H-10 H-9 H-8 H-7 H-6 H-5 H-4 H-3 H-2 H-1
Hermes

SITE A Foul drainage

G1-G4 G5 G6
Glorious

Bayntun Drive

Foul water drainage

Planning Application red line boundary

Existing foul mains sewer

Implacable Road

Notes

0 10 20 30 40m

Scale Bar 1:500

N

P5	Planning Application	AB/06.03.17	TG/06.03.17
P4	Minor amendments	PR/19.10.16	TG/19.10.16
P3	HGV turning position relocated	PR/19.10.16	TG/19.10.16
P2	Drainage added	PR/18.10.16	TG/18.10.16
P1	Original Issue	PR/13.10.16	TG/13.10.16
No	Revision	Dwn / Date	Chk / Date

Scaled dimensions are not to be used for construction

Contractor to check all dimensions and report omissions and errors to the Architect

Forum Architecture Ltd
Studio 52
Basepoint
Andersons Road
Southampton, Hampshire
SO14 5FE

tel: 023 8068 2095
w: forumarchitecture.co.uk
e: mail@forumarchitecture.co.uk

FORUM architecture

DRAWING TITLE
Site Plan South

CLIENT
Tidebank UK Ltd

PROJECT
Daedalus Park, Site B (South)

DRAWING STATUS
PLANNING

PROJECT NO.	DRAWING NO.	REV.	SCALE
15011	55	P5	1:500@A1