



**create**  
CONSULTING  
ENGINEERS LTD

**BAMPTON HOUSE,  
CHANDLER'S FORD, SO53 2TA  
Flood Risk Assessment and  
Drainage Strategy**

**Client:** Monks Brook House Ltd

**Engineer:** Create Consulting Engineers Limited  
Temple Chambers  
3-7 Temple Avenue  
London  
EC4Y 0HP

Tel: 0207 822 2300  
Email: [enquiries@createconsultingengineers.co.uk](mailto:enquiries@createconsultingengineers.co.uk)  
Web: [www.createconsultingengineers.co.uk](http://www.createconsultingengineers.co.uk)

**Report By:** Sophie Gadsdon BSc (Hons), GradCIWEM

**Reviewed By:** Graham Sinclair, BSc (Hons), MSc, DIC, C.WEM, MCIWEM

**Approved By:** Jonathan Cage, BEng (Hons), MSc, CEng, MICE, MCIHT

**Reference:** SG/CC/P21-2244/01 Rev B

**Date:** April 2021

**BAMPTON HOUSE, CHANDLER'S FORD, SO53 2TA  
Flood Risk Assessment and Drainage Strategy – Revision B**

---

# **BAMPTON HOUSE, CHANDLER'S FORD, SO53 2TA**

## **Flood Risk Assessment and Drainage Strategy**

### **Revision B**

#### **Contents**

- 1.0 Introduction
- 2.0 Sources of Information
- 3.0 Site Setting
- 4.0 Scheme Description
- 5.0 Flood Risk Assessment
- 6.0 Drainage Strategy
- 7.0 Mitigation Measures
- 8.0 Residual Flood Risks and Impacts to Surrounding Areas
- 9.0 Outline Flood Response Plan
- 10.0 Conclusions and Recommendations
- 11.0 References

#### **Figures**

- 3.1 Site Location Plan
- 5.1 Environment Agency Fluvial / Tidal Flood Map
- 5.2 Environment Agency Risk of Flooding from Surface Water Extent Mapping
- 5.3 Environment Agency Surface Water Flood Depth Map 1 in 30 year Event (3.3%)
- 5.4 Environment Agency Surface Water Flood Depth Map 1 in 100 year Event (1%)
- 5.5 Environment Agency Surface Water Flood Depth Map 1 in 1000 year Event (0.1%)
- 6.1 Exceedance Flow Routing

#### **Appendices**

- A. Southern Water Asset Location Search
- B. Environment Agency Modelled Flood Mapping Data and Information

#### **Plans**

- |                    |                                |
|--------------------|--------------------------------|
| T20-P0107-DR-0001A | Topographical Survey           |
| 20-70-00           | Site Plan as Existing          |
| 20-70-00A          | Revised Site and Location Plan |
| 20-70-22           | Proposed Ground Floor Plan     |
| 20-70-25           | Proposed First Floor Plan      |
| 20-70-30           | Proposed Second Floor Plan     |

**Registration of Amendments**

| Revision      | Amendment Details                                              | Revision Prepared By | Revision Approved By |
|---------------|----------------------------------------------------------------|----------------------|----------------------|
| A<br>25.05.21 | Flood levels updated following EA comments                     | GS                   | GS                   |
| B<br>14.06.21 | Report updated following LLFA comments and further EA comments | GS                   | GS                   |
|               |                                                                |                      |                      |

## 1.0 INTRODUCTION

### Brief

- 1.1 Create Consulting Engineers Ltd was instructed by Monks Brook House Ltd to undertake a Flood Risk Assessment (FRA) and drainage strategy to support a prior approval planning application for the proposed change of use from office to residential at Bampton House (formally David Wilson House), Bampton Court, Hursley Road, Chandlers Ford, Eastleigh, SO53 2TA. Works are to include conversion of the building to 7No. one-bed flats on both the ground and first floors, with an additional one-bed flat located on the second floor level roof area.

### Project Context

- 1.2 The Client intends to submit a prior approval planning application to change the use of the ground, first and second floors of Bampton House from B1a (offices) to C3 (residential) to create 15No. one-bed flats. The ground floor of the existing building currently comprises approximately 360.52 m<sup>2</sup>.
- 1.3 Architect's Layouts showing the proposed scheme are included on Drawings 20-70-00, 20-70-00A, 20-70-22, 20-70-25 and 20-70-30.

### Planning Policy Context

- 1.4 The potential consequences of inappropriate development in a flood risk area for occupiers, either of the development or elsewhere, pose significant risks in terms of personal safety and damage to property.
- 1.5 The National Planning Policy Framework<sup>1</sup> (NPPF) includes Government policy on development and flood risk stating that:

*163. When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:*

- a) Within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;*
- b) The development is appropriately flood resistant and resilient;*
- c) It incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;*
- d) Any residual risk can be safely managed; and*

---

<sup>1</sup> Ministry of Housing, Communities & Local Government., 2019. *National Planning Policy Framework (NPPF)*. [Online]. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework-2> [Accessed February, 2021].

- e) *Safe access and escape routes are included where appropriate, as part of an agreed emergency plan.*
- 1.6 The Planning Practice Guidance to the NPPF<sup>2</sup> requires that at the planning stage, the developer should prepare and submit an appropriate FRA to demonstrate how flood risk from all sources of flooding to the development itself and flood risk to others will be managed now and when taking climate change into account.
- 1.7 To comply with the NPPF an FRA must be submitted for planning applications for developments within flood zones 2 and 3 (medium or high risk of fluvial or tidal flooding) and for all developments located in Flood Zone 1 (low risk) which are 1 hectare or greater; which has been identified by the Environment Agency as having critical drainage problems; identified in a strategic flood risk assessment as being at increased flood risk in future; or that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.
- 1.8 An FRA should be appropriate to the scale, nature and location of the development and should identify and assess the risk from all sources of flooding to and from the development and demonstrate how any flood risks will be managed over the lifetime of the development.

#### County Council Policy

- 1.9 Hampshire County Council act as Lead Local Flood Authority (LLFA) for the area and are a statutory consultee for all major developments, which includes the following as defined by The Town and Country Planning (Development Management Procedure) (England) Order 2015<sup>3</sup> :
- The winning and working of minerals or the use of land for mineral-working deposits;
  - Waste development;
  - The provision of dwelling houses where the number of dwelling houses to be provided is 10 or more; or the development is to be carried out on a site having an area of 0.5 hectares or more and it is not known whether the number of dwelling houses to be provided is 10 or more;
  - The provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more; and
  - Development carried out on a site having an area of one hectare or more.

---

<sup>2</sup> Ministry of Housing, Communities & Local Government., 2014. *Planning Practice Guidance (PPG) - Flood Risk and Coastal Change*. [Online]. Available at: <http://planningguidance.planningportal.gov.uk/> (Accessed February, 2021).

<sup>3</sup> gov.uk., 2015. *The Town and Country Planning (Development Management Procedure) (England) Order 2015*. [Online]. Available at: [http://www.legislation.gov.uk/uksi/2015/595/pdfs/uksi\\_20150595\\_en.pdf](http://www.legislation.gov.uk/uksi/2015/595/pdfs/uksi_20150595_en.pdf) (Accessed February 2021).

- 1.10 The LLFA have produced Surface Water and Sustainable Drainage Guidance for Developers, Designers and Planners<sup>4</sup> which provides Developer Advice for Surface Water Drainage Strategies including Information for developers on SuDS principals and application<sup>5</sup> which together include construction standards and provide assistance to developers in creating sustainable drainage systems on their sites as well as the LLFA's consenting policy and various protocols. Hampshire County Council also provide guidance within their Preliminary Flood Risk Assessment (PFRA)<sup>6</sup>, Surface Water Management Plans (SWMP)<sup>7</sup>, Groundwater Management Plan (GWMP)<sup>8</sup> and Local Flood Risk Management Strategy (LFWMS)<sup>9</sup> on development and flood risk.

#### District Council Policy

- 1.11 The Development Plan for the area is the Eastleigh Borough Local Plan (2016-2036)<sup>10</sup>.
- 1.12 The relevant policies contained within the Local Plan are as follows:
- *Policy DM3: Adaptation to climate change*
  - *Policy DM5: Managing Flood Risk*
  - *Policy DM6: Sustainable surface water management and watercourse management*
  - *Policy DM7: Flood defences, land reclamation and coast protection*
- 1.13 As part of work on the Local Plan a Partnership for Urban South Hampshire (PUSH) Strategic Flood Risk Assessment (SFRA) Final Report<sup>11</sup> and Strategic Flood Risk Assessment 2016 Update<sup>12</sup> have been produced which cover the Eastleigh District Council area. Combined with the Eastleigh Surface Water Management Plan<sup>13</sup> and the Hampshire County Council Preliminary Flood Risk Assessment, these documents provide a summary of the flood risks for the local area.

<sup>4</sup> Hampshire County Council. *Reducing flood risk in planning*. [Online]. Available at:

<https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/planning> (Accessed February 2021).

<sup>5</sup> Hampshire County Council., 2018. *Information for developers on SuDS principals and application*. [Online]. Available at:

<https://documents.hants.gov.uk/flood-water-management/SuDSLeafletJune2018v20.pdf> (Accessed February 2021).

<sup>6</sup> Hampshire County Council., 2011. *Hampshire County Council Preliminary Flood Risk Assessment*. [Online]. Available at:

<https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/strategies/Preliminary-Flood-Risk-Assessment> (Accessed February 2021).

<sup>7</sup> Hampshire County Council. *Surface Water Management Plans*. [Online]. Available at:

<https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/strategies/surface-water-management-plans> (Accessed February 2021).

<sup>8</sup> Hampshire County Council., 2013. *Groundwater Management Plan (GWMP) for Hampshire*. [Online]. Available at:

<https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/strategies/Groundwater-Management-Plan> (Accessed February 2021).

<sup>9</sup> Hampshire County Council., 2020. *Local Flood Water Management Strategy*. [Online]. Available at:

<https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/strategies/local-flood-risk-management-strategy> (Accessed February 2021).

<sup>10</sup> Eastleigh Borough Council., 2018. *Eastleigh Borough Local Plan (2016-2036)* [Online]. Available at:

<https://www.eastleigh.gov.uk/media/3484/final-local-plan-document-june-2018-print.pdf> (Accessed February 2021).

<sup>11</sup> Atkins., 2007. *Partnership for Urban South Hampshire Strategic Flood Risk Assessment*. [Online]. Available at:

<https://www.eastleigh.gov.uk/media/3455/push-flood-risk-assessment-2007.pdf> (Accessed February 2021).

<sup>12</sup> Eastern Solent Coastal Partnership Project Manager., 2016. *Strategic Flood Risk Assessment 2016 Update*. [Online]. Available at:

<https://www.eastleigh.gov.uk/media/3456/push-flood-risk-assessment-update-2016.pdf> (Accessed February 2021).

<sup>13</sup> Hampshire County Council., 2012. *Eastleigh Surface Water Management Plan*. [Online]. Available at:

<https://documents.hants.gov.uk/flood-water-management/EastleighSWMPReport.pdf> (Accessed February 2021).

- 1.14 These documents have been utilised as part of this assessment and are referenced where applicable throughout this report.

#### Climate Change

- 1.15 Climate change has important implications for the assessment and management of flood risk. The NPPF requires that climate change is considered when making an assessment of flood risk posed to future development.
- 1.16 Climate change has the potential to affect all identified sources of flooding at the site. The likely impacts of climate change include increased severity of rainfall events as well as wetter winters leading to higher groundwater levels and increased frequency and severity of surface water flooding.
- 1.17 The influence of climate change on flood levels has been taken into account by the flood levels assessed as part of this report with further details included in Chapter 5, although confirmation is being sought from the Environment Agency with regards the level of climate change included.

#### **Objectives**

- 1.18 The following specific objectives were set by Create Consulting Engineers Ltd after a review of the available data:
- To assess the suitability of the scheme in relation to all sources of flooding;
  - To assess the flood risk posed by the scheme once it is complete and operational;
  - To suggest any necessary mitigation measures in order to reduce any residual risks to acceptable levels; and
  - To prepare a suitable and policy compliant drainage strategy.

#### **Constraints and Limitations**

- 1.19 The copyright of this report is vested in Create Consulting Engineers Ltd and the Client, DMT Developments Ltd on behalf of Rivendale Homes Ltd. The Client, or their appointed representatives, may copy the report for purposes in connection with the development described herein. It shall not be copied by any other party or used for any other purposes without the written consent of Create Consulting Engineers Ltd or the Client.
- 1.20 Create Consulting Engineers Ltd accepts no responsibility whatsoever to other parties to whom this report, or any part thereof, is made known. Any such other parties rely upon the report at their own risk.

- 
- 1.21 The flood risk assessment addresses the flood risk posed to and from the proposed development, the extent of which is shown by the site boundary, as indicated by the location plan attached with this report.
- 1.22 This report has been undertaken with the assumption that the Site will be developed in accordance with the currently identified proposals (see Section 4.1) without significant change. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the Site.
- 1.23 Create Consulting Engineers Ltd has endeavoured to assess all information provided to them during this appraisal. The report summarises information from a number of external sources and cannot offer any guarantees or warranties for the completeness or accuracy or information relied upon. Information from third parties has not been verified by Create Consulting Engineers Ltd unless otherwise stated in this report.
- 1.24 The revised Construction (Design and Management) Regulations 2015 (CDM Regulations) came into force on April 2015 to update certain duties on all parties involved in a construction project, including those promoting the development. One of the designer's responsibilities is to ensure that the client organisation, in this instance DMT Developments Ltd on behalf of Rivendale Homes Ltd, is made aware of their duties under the CDM Regulations. Further information on the CDM Regulations is provided in the client guide and is available at [www.hse.gov.uk/pubns/indg411.pdf](http://www.hse.gov.uk/pubns/indg411.pdf). It has been assumed for the purposes of this assessment that the lead designer will be responsible for advising the Client.
- 1.25 The approach to this FRA and Drainage Strategy follows the ethos of the CDM Regulation, inasmuch as during the assessment process the proposed development is considered and any foreseeable associated health and safety flood risks are identified. It is then considered how these flood risks can be eliminated, or mitigations identified to reduce or control them. The outcome of this assessment process is presented in this report. While preparing this Drainage Strategy no other major health and safety risks have been identified.

## 2.0 SOURCES OF INFORMATION

- 2.1 The information contained in this report is based on a review of existing information and consultation with interested parties.

### Records Review

- 2.2 Key reports and websites reviewed as part of this study are listed in Table 2.1 below.

| Document/Website                                                                                                                                                                       | Author/Publisher                                   | Date                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------------|
| Fluvial/Tidal Flood Maps, Surface Water, and Reservoir Flood Mapping – <a href="https://flood-warning-information.service.gov.uk">https://flood-warning-information.service.gov.uk</a> | Environment Agency (EA)                            | Accessed February 2021 |
| Groundwater Mapping (Magic Map) - <a href="https://magic.defra.gov.uk/magicmap.aspx">https://magic.defra.gov.uk/magicmap.aspx</a>                                                      | DEFRA                                              | Accessed February 2021 |
| Hampshire County Council Preliminary Flood Risk Assessment                                                                                                                             | Hampshire County Council                           | 2011                   |
| Groundwater Management Plan for Hampshire                                                                                                                                              | Hampshire County Council                           | 2013                   |
| Local Flood Water Management Strategy                                                                                                                                                  | Hampshire County Council                           | 2020                   |
| Eastleigh Surface Water Management Plan                                                                                                                                                | Hampshire County Council                           | 2012                   |
| Eastleigh Borough Local Plan (2016-2036)                                                                                                                                               | Eastleigh Borough Council                          | 2018                   |
| Partnership for Urban South Hampshire Strategic Flood Risk Assessment                                                                                                                  | Atkins                                             | 2007                   |
| Strategic Flood Risk Assessment 2016 Update                                                                                                                                            | Eastern Solent Coastal Partnership Project Manager | 2016                   |
| Architect layout plans (Drawings 20-70-00, 20-70-00A, 20-70-22, 20-70-25 and 20-70-30)                                                                                                 | Primmer Olds B.A.S – Chartered Surveyors           | 2020                   |
| Southern Water Asset Plans (included as Appendix A)                                                                                                                                    | Southern Water                                     | February 2021          |
| EA Modelled Flood Mapping Data and Information                                                                                                                                         | EA                                                 | December 2020          |

**Table 2.1: Key Information Sources**

### Consultation

- 2.3 The agencies and individuals consulted as part of this exercise to obtain records or seek input to the proposals as part of this FRA are listed in Table 2.2 and key records are included in the appendices.

| Consultee                                   | Form of Consultation    | Topics Discussed and Actions Agreed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Southern Water Developer Services Team      | Request for Asset Plans | <p>Asset plans were requested in order to inform the drainage strategy.</p> <p>The asset plans (Appendix A), dated 22<sup>nd</sup> February 2021 do not show foul or surface water assets in the vicinity of the Site. Potable water supply mains are however shown to be in the vicinity of the Site.</p> <p>Foul and surface water assets are not shown within the section of Hursley Road immediately to the east of the Site, however, it is assumed that a private drainage network exists and connects the Site to the public network in the surrounding area. Possible connections include either a 600 mm foul gravity sewer located to the north of the Site, past Monk's Brook, beneath the hardstanding and crossing Hursley Road in a north easterly direction. Another potential connection point is a 375 mm foul gravity sewer crossing beneath Hursley Road to the south east of the Site, prior to the roundabout, flowing in a north easterly direction. Surface water is assumed currently to drain to Monk's Brook.</p> <p>A 6 inch water main is located in Hursley Road to the east of the Site.</p> |
| Environment Agency Customers and Engagement | Meeting on 5 March 2021 | <p>The Draft Flood Risk Assessment was discussed, and the following points agreed:</p> <ul style="list-style-type: none"> <li>• No formal flood modelling is expected of the applicant, instead the higher central and upper end climate change factors should be applied to the flood levels provided.</li> <li>• No floodplain compensation is required given there are no significant external changes.</li> <li>• Further details of the proposed level alarm should be provided in the mitigation strategy.</li> <li>• A definitive list of mitigation measures proposed should be included in the final report given the nature of the application.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**Table 2.2: List of Parties Consulted****Site Walkover**

- 2.4 A site walkover has not been undertaken as it is not necessary for the purposes of this assessment.

**Site Investigation**

- 2.5 No intrusive site investigation has been carried out for the purposes of this assessment as it is proposed that the surface water drainage system remains as existing.

### 3.0 SITE SETTING

#### Site Location

- 3.1 The Site comprises the existing building Bampton House, Bampton Court, Hursley Road, Chandlers Ford, Eastleigh, SO53 2TA, with associated parking area and landscaping immediately to the south east. The Site is approximately 30.0 m to the north of Chandler's Ford Station, located at approximate National Grid Reference 443267E, 120676N.
- 3.2 The location of the Site is shown in Figure 3.1.

#### Description of Site and Surroundings

- 3.3 The Site is located within a mixed residential, light industrial and retail area. Mixed residential and retail properties border the Site to the north (beyond Monk's Brook) and east. A railway line is located directly adjacent to the western Site boundary, with a mix of light industrial, retail and residential properties located beyond this to the south and west of the Site. Flexford Reserve is also located north west of the Site.
- 3.4 The topographic survey, included with this report on Drawing T20-P0107-DR-0001A, summarises elevations in the area of the Site. The Site generally falls towards the north west of the Site from 22.42 mAOD along the south eastern boundary to 21.83 mAOD at the north western boundary of the Site. The minimum known finished floor level (FFL) is set at approximately 22.0 mAOD for the step located on the frontage of the building.

#### Hydrological Setting

##### Surface Watercourses

- 3.5 Monk's Brook runs parallel to the north western Site boundary, approximately 8.1 m from the existing building at its closest point. Monk's Brook is largely an open watercourse but culverted in areas, and runs beneath Hursley Road to the north east of the Site. Monk's Brook drains into the River Itchen approximately 5.30 km south of the Site.

##### Artificial Waterbodies

- 3.6 There are no artificial waterbodies located within the Site vicinity. The closest in relation to the Site are two ponds located approximately 1.0 km to the west and Hiltingbury Lakes approximately 1.30 km to the north east.

---

### Ground Conditions

- 3.7 BGS mapping<sup>14</sup> shows the bedrock geology at the Site to be comprised of the Wittering Formation - Sand, Silt and Clay. Superficial Deposits of Alluvium - Clay, Silt, Sand and Gravel are recorded across the whole Site.
- 3.8 A BGS borehole record (SU42SW97), located approximately 227.0 m to the north east of the Site recorded Alluvium Clay to 1.40 m below ground level (bgl) with Sand and Gravel below to 2.65 mbgl. Wittering Formation Silt was recorded to 3.09 mbgl with Sand below to 4.50 mbgl and underlain by Clay to 7.10 mbgl and Sand to the end of the borehole at 10.50 mbgl.
- 3.9 A second BGS borehole record (SU42SW38/C), located approximately 147.0 m south east of the Site recorded Clay to a depth of 1.50 mbgl, underlain by Gravel to 3.00 mbgl. Sand was recorded between 3.00 mbgl and 4.40 mbgl with Clay below to the end of the borehole at 6.00 mbgl.

### Groundwater

- 3.10 The Site does not lie within any Groundwater Source Protection Zones, as identified by the online EA mapping<sup>15</sup>.
- 3.11 Groundwater was encountered in the BGS boreholes at 2.90, 3.20 and 6.10 mbgl (SU42SW97) and 1.7 mbgl (SU42SW38/C).

---

<sup>14</sup> British Geological Survey (BGS) Onshore GeoIndex., 2020. *DiGMapGB-50 Bedrock Geology and Superficial Deposits & Borehole Records*. [Online]. Available at: [www.bgs.ac.uk/geoindex](http://www.bgs.ac.uk/geoindex) (Accessed February, 2021).

<sup>15</sup> Department for Environment and Rural Affairs (DEFRA) Magic Website., 2019. [Online]. *Environment Agency Source Protection Zones (Merged)*. Available at: <https://magic.defra.gov.uk/MagicMap.aspx> (Accessed February, 2021).

---

## 4.0 SCHEME DESCRIPTION

### The Scheme

- 4.1 The Client has submitted a prior approval application to change the use of the ground, first and second floors of Bampton House from B1a (offices) to C3 (residential) to create 15No. one-bed flats.
- 4.2 Architect's Layouts showing the proposed scheme are included on Drawings 20-70-00, 20-70-00A, 20-70-22, 20-70-25 and 20-70-30.
- 4.3 These note the inclusion of four additional cycle parking stands (in addition to the four already present) on the north western part of the site between the main building and watercourse. These will be the open hoop type of stand and will provide no further flow impedance compared to the existing scenario.

### Proposed Land use Vulnerability Classification

- 4.4 The development is proposed to include residential which is defined as a 'more vulnerable' use according to the NPPF while its previous use as offices was 'less vulnerable'.
- 4.5 Although the Site is located within Flood Zone 3 (as noted in Chapter 5 below), given that the development involves a change of use the Sequential and Exception Tests will not need to be undertaken for the purposes of the proposed development.

## 5.0 FLOOD RISK ASSESSMENT

### Scope of Work

5.1 The scope of this FRA was refined to meet the brief outlined in Chapter 1 of this report and considers the following:

- The suitability of the scheme in relation to all sources of flooding taking into account climate change where relevant;
- The flood risk posed by the scheme once it is complete and operational; and
- Any necessary mitigation measures in order to reduce any residual risks to acceptable levels.

5.2 The approach to this Flood Risk Assessment is consistent with the NPPF and associated Technical Guidance and the requirements of local planning policy.

### Flood Risk to the Proposed Development

#### Flood Risk from Fluvial & Tidal Sources

5.3 The Site is located within the Environment Agency's (EA) mapped Flood Zone 2, as shown in Figure 5.1, which is described within the NPPF Technical Guidance as having between a 1 in 100 and a 1 in 1000 year (1% - 0.1%) probability of flooding from the rivers or the sea in any one year. A minor section in the northern corner of the Site, slightly overlapping the boundary, is shown to be the EA's Flood Zone 3, as shown in Figure 5.1, which is described within the NPPF Technical Guidance 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.

5.4 The EA has provided modelled flood depths and levels (Appendix B) for the Site with associated mapping, for the 1 in 100 year (1%) and 1 in 1000 year (0.1%) events, in order to allow an assessment of the risk posed to the Site as a result of flooding occurring from Monk's Brook. The data supplied provides flood levels for a number of points surrounding the existing building which give an indication of the anticipated flood depths in this area. It is crucial to note, the data provided by the EA does not include climate change.

5.5 Table 5.1 summarises the water levels and potential flood depths during the 1% and 0.1% events in the north western area of the Site, surrounding the existing building.

| Point | Ground Level (mAOD) | Water Surface Level (mAOD) |                | Water Depth (m) |                |
|-------|---------------------|----------------------------|----------------|-----------------|----------------|
|       |                     | 1 in 100 Year              | 1 in 1000 year | 1 in 100 Year   | 1 in 1000 year |
| 1     | 21.62               | 21.93                      | 22.27          | 0.31            | 0.65           |
| 2     | 21.84               | 22.15                      | 22.35          | 0.31            | 0.51           |
| 3     | 22.44               | 22.66                      | 22.85          | 0.22            | 0.41           |
| 4     | 21.99               | 22.20                      | 22.34          | 0.21            | 0.35           |
| 5     | 22.19               | 22.35                      | 22.43          | 0.16            | 0.24           |
| 6     | 21.94               | 22.07                      | 22.30          | 0.13            | 0.36           |

**Table 5.1: Water Depths & Levels for the Site provided by the EA (Appendix B).**

5.6 Given the FFL available for the step on the frontage of the building is approximately 22.0 mAOD, it is indicated that flood depths on the ground floor during the 1 in 100 year event hold the potential to reach 130 mm (based on the presented depth for Point 6). however, if Point 3 was taken as reference flood levels could reach up to 660 mm. It is clear therefore that there is a significant variance in flood levels as presented by the Environment Agency which would realistically not occur in reality.

5.7 When considering the higher central (45%) and upper end (105%) climate change allowances, and applying these to flood depths as requested by the EA in the meeting summarised in Table 2.2 these could make depths on the ground floor up to 190 mm for the 45% event and 270 mm for the 105% event (when applying to the presented depth of 130 mm above from Point 6). Depths could be greater if other points are used however Point 6 is directly on the step to the front of the building so has been used as a point of reference here. A full summary based on the EA provided depths and node points is included in Table 5.2 below for the 1 in 100 year event.

| Point | Ground Level (mAOD) | Water Surface Level (mAOD) |                       | Water Depth (m)     |                       |
|-------|---------------------|----------------------------|-----------------------|---------------------|-----------------------|
|       |                     | 1 in 100 Year + 45%        | 1 in 1000 year + 105% | 1 in 100 Year + 45% | 1 in 1000 year + 105% |
| 1     | 21.62               | 22.07                      | 22.26                 | 0.45                | 0.64                  |
| 2     | 21.84               | 22.29                      | 22.48                 | 0.45                | 0.64                  |
| 3     | 22.44               | 22.76                      | 22.89                 | 0.32                | 0.45                  |
| 4     | 21.99               | 22.29                      | 22.42                 | 0.30                | 0.43                  |
| 5     | 22.19               | 22.42                      | 22.52                 | 0.23                | 0.33                  |
| 6     | 21.94               | 22.13                      | 22.21                 | 0.19                | 0.27                  |

**Table 5.2: Estimated Flood Levels with Climate Change Enhancements.**

5.8 A Review of the SFRA<sup>11</sup> and 2016 Update<sup>12</sup> confirms that mapping presenting information relating to flood risk and historic records from this source has been produced in the form of 'Output Packages', hosted on a web-based GIS mapping system. Nonetheless, the web address provided is currently not available to access. The PFRA<sup>6</sup> also shows no available historic flooding records for the Site.

- 5.9 Appropriate flood resilience measures for the flood risks posed are included in Table 7.1 along with a strategy of safe dry escape from the building in Section 9.0.

#### Flood Risk from Surface Water Flooding

##### *Surface Water Flood Mapping*

- 5.10 The EA Surface Water Flood Mapping (Figure 5.2) suggests that the entirety of the Site is at a 'low' risk of surface water flooding. Minor areas to the east of the Site, within Hursley Road, are shown to be at a 'medium' risk and the area surrounding Monk's Brook to the north is shown to be at a 'high' risk of surface flooding. However, the 'high' risk extent for Monk's Brook extends north and only borders the Site, possibly due to the elevations for the area decreasing to the north along Hursley Road.
- 5.11 Flood depths across the Site remain below 150 mm for the 'high' (Figure 5.3) and 'medium' (Figure 5.4) risk events, with minor areas to the north east, within Hursley Road, reaching up to 600 mm in the 'medium' risk event. Flood depths for the 'low' (Figure 5.5) risk event are recorded to be between 300-900 mm towards the south east of the Site, reaching up to 1200 mm to the south of the existing building adjacent to the Site entrance. This appears to be a result of the depths recorded over 1200 mm on Hursley Road to the east of the Site.
- 5.12 Appropriate flood resilience measures in order to minimise the impact of surface water flooding are included in Table 7.1.

#### Flood Risk from Artificial Waterbodies

- 5.13 There are no artificial waterbodies located within the Site vicinity. The closest in relation to the Site are two ponds located approximately 1.0 km to the west and Hiltingbury Lakes approximately 1.30 km to the north east. EA mapping<sup>16</sup> indicates that the Site is not at risk of flooding from reservoirs.
- 5.14 The Site is therefore considered to be at a low risk of flooding from artificial water bodies and therefore this source is not considered further in this report.

---

<sup>16</sup> Environment Agency., 2020. *Risk of Flooding from Reservoirs - Maximum Flood Extent (Web Mapping Service)*. [Online]. Available at: <https://data.gov.uk/dataset/44b9df6e-c1d4-40e9-98eb-bb3698ecb076/risk-of-flooding-from-reservoirs-maximum-flood-extent-web-mapping-service> (Accessed February, 2021).

---

### Flood Risk from Groundwater

- 5.15 DEFRA Groundwater Vulnerability Mapping<sup>17</sup> published by the EA, shows the Site lies within the 'Medium' zone, with 'Soluble Rock Risk'. This is defined as areas that offer some groundwater protection (intermediate between high and low vulnerability).
- 5.16 The Site is underlain by Secondary A bedrock and superficial aquifers<sup>18</sup> defined by the Environment Agency as permeable strata capable of supporting water supplies at a local rather than strategic scale and in some cases forming an important source of base flow to rivers.
- 5.17 Groundwater was encountered in the BGS boreholes at 2.90, 3.20 and 6.10 mbgl (SU42SW97) and 1.7 mbgl (SU42SW38/C).
- 5.18 Given the depth of groundwater encountered, and the location of the Site within an area where there is potential for groundwater flooding to occur, the risk of groundwater flooding would be considered to be moderate to low. However, as the proposal is for the internal conversion of an existing building only, there will be no below ground works and it is assumed that appropriate waterproofing has been included previously within any substructure design, it is considered that groundwater flooding does not pose a risk. Therefore, the risk of flooding from this source is not considered further in this report.

### Flood Risk from Public Sewers

- 5.19 A Southern Water Asset Location Search is included in Appendix A. No foul or surface water assets are shown within the section of Hursley Road to the east of the Site, however, it is assumed that a private drainage network exists and connects the Site to the public network in the surrounding area. Possible connections include either a 600 mm foul gravity sewer located to the north of the Site, past Monk's Brook, beneath the hardstanding and crossing Hursley Road in a north easterly direction. Another potential connection point is a 375 mm VC (Vitrified Clay) foul gravity sewer crossing beneath Hursley Road to the south east of the Site, prior to the roundabout, flowing in a north easterly direction. Surface water is assumed currently to drain to Monk's Brook.
- 5.20 The risk of flooding from public/private sewers is considered to be low. Sewer flooding from blockage of internal building drainage as well as the Southern Water network is, however, a residual risk managed by the design of the Site drainage and regular inspection and maintenance of the public and private sewer network. The flood risk associated with this source may also increase over time due to the effects of climate change.

---

<sup>17</sup> Department for Environment and Rural Affairs (DEFRA) Magic Website., 2017. [Online]. Groundwater Vulnerability Map. Available at: <https://magic.defra.gov.uk/MagicMap.aspx> (Accessed February, 2021).

<sup>18</sup> Department for Environment and Rural Affairs (DEFRA) Magic Website., 2010. [Online]. *Environment Agency Aquifer Designation Data*. Available at: <https://magic.defra.gov.uk/MagicMap.aspx> (Accessed February, 2021).

---

### Flood Risk from Water Mains

- 5.21 Southern Water potable water supply assets are included in Appendix A. A 6 inch water CI (Cast Iron) water main is located in Hursley Road to the east of the Site, beneath the eastern footway.
- 5.22 Flood risk from this source is considered to be a residual risk with the main threat being from any work carried-out on or impacting the onsite water pipes during any buildings works. Flooding from this source poses a residual risk to the proposed development.

### Flood History

- 5.23 EA mapping indicates no records of historical flooding affecting the Site.
- 5.24 Review of the SFRA<sup>11</sup> and 2016 Update<sup>12</sup> confirms that mapping presenting information relating to historic flood records has been produced in the form of 'Output Packages', hosted on a web-based GIS mapping system. Nonetheless, the web address provided is currently not available to access, and therefore will need to be assessed at detailed design stage. The PFRA<sup>6</sup> and GWMP<sup>8</sup> also show no available historic flooding records for the Site.
- 5.25 Further review of the SWMP<sup>13</sup> however, does confirm that there have been a number of incidents within the parish of Chandlers Ford associated with Monk's Brook. Nevertheless, works have been undertaken on a number of areas and the Site vicinity is not included with the roads noted to be at greatest risk, as the cause of flooding appears to be most commonly located at culverted sections or where debris has blocked gullies.

## **6.0 DRAINAGE STRATEGY**

### **Existing Foul Water Drainage**

- 6.1 As the Site is currently brownfield in nature, formerly used as offices, it is assumed that there is an existing private foul water drainage network present onsite. It is assumed that this network drains into the public Southern Water foul gravity sewer network either to the north, past Monk's Brook, in Hursley Road or to the south east, again in Hursley Road.

### **Proposed Foul Water Drainage Strategy**

- 6.2 It is proposed that the existing private foul drainage system be reused, and the assumed existing connection to the Southern Water foul gravity sewer network at either of the locations mentioned above in Hursley Road. The foul water system should be surveyed at the detailed design stage to ensure any upgrades and amendments due to the change in internal layout can be made as required.
- 6.3 Given the change in use from offices to residential it is expected that the foul water use will change, therefore, a Pre-Planning Enquiry will be required to be submitted to Southern Water at the detailed design stage in order to confirm sewer capacity.

### **Existing Surface Water Drainage**

- 6.4 It is assumed that surface water currently drains into Monk's Brook, immediately north east of the Site.

### **Proposed Surface Water Drainage Strategy**

- 6.5 Given the proposals are for internal changes only, and therefore the impermeable area of the Site will remain as existing, following conversion the surface water flow regime will not change (in terms of both volume and rate of runoff). It is therefore proposed that the surface water drainage strategy for the Site remains as existing.
- 6.6 The existing onsite drainage system should be inspected prior to detailed design to ensure any upgrades and amendments due to the change in internal layout can be made as required.

### **Drainage Impact from the Proposed Development**

- 6.7 There will be a marginal change in the foul water runoff rates, and no change to the surface water runoff from the Site, however, due to the scale of the development these changes are unlikely to have a significant impact on the local public sewer network. A Pre-Planning Enquiry will need to be submitted to Southern Water at the detailed design stage in order to confirm that there is sufficient capacity to take this increase in foul water flows from the Site.

---

### **Exceedance Flow Routing**

- 6.8 When considering a local drainage system failure and the impact this could have on the proposed ground floor properties it is clear from a review of the topographic survey that ground levels generally fall away from the building.
- 6.9 All inspection chambers and gullies associated with the building drainage for Bampton House are located on the northern, eastern and western sides of the building. These locations are the points from which a surcharge would occur in the event of the drainage system becoming blocked or overwhelmed. Minimum cover levels are 21.76 mAOD for a manhole positioned to the north east of the building, therefore this would be the first manhole to surcharge with all over manholes generally being below the floor level of the building (22.04 mAOD).
- 6.10 Consider flow routing from the points of surcharge levels to the north of the building fall (from circa 21.8 mAOD) towards the north east and subsequently Monks Brook as well as out into the Adjacent Road (at circa 21.5 mAOD). Levels to the east of the building also fall (from 21.9 mAOD) into the adjacent road with the car parking area falling (from 22.4 mAOD) towards the entrance point and again out into the adjacent road. Whilst parts of the car park sit slightly higher than the building finished floor level there is a clear flow corridor out of the site entrance point and away from the building into the adjacent Road and subsequently Monks Brook.
- 6.11 Full details of the site levels showing the above is included on Drawing T20-P0107-DR-0001A, attached, with flow directions summarised on Figure 6.1.

## 7.0 MITIGATION MEASURES

7.1 Table 7.1 sets out appropriate mitigation measures to minimise the identified flood risks.

| Type of Flooding                                                                       | Issue                                                                                                                                                                                                   | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Justification                                           | Residual Risk * |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------|
| Fluvial flooding                                                                       | The Site is located within the EA's Flood Zone 3 and information provided by the EA suggest the building could be flooded by between 130 and 660 mm of water during the 1 in 100 year event.            | <ul style="list-style-type: none"> <li>All residents and the management of the building should subscribe to the EA flood warning service</li> <li>A strategy of prior escape will be implemented, as detailed in Section 9.0, to avoid occupants being trapped within the building. Should evacuation not occur however or if a rapid onset of flood water is encountered the upper floors of the building do however act as a safe dry refuge above the flood waters in the event that it cannot be safely evacuated in advance of flooding.</li> <li>A Flood warning alarm will also be installed to warn of rising flood levels (associated with level monitoring on Monk's Brook) to provide a secondary warning mechanism for escape. This will be formed of a water level probe attached to the side of the building (within a suitable enclosure) adjacent to Monk's Brook which will be triggered essentially when water starts to rise against the building, therefore acting as a final line of defence as above.</li> <li>Flood resistance measures will be installed on all access points to the building, including doorways, air bricks and any other openings where water could ingress. These will include flood barriers which will be installed to the industry standard of 600 mm, self-closing air bricks and suitable coverings for any other openings. Flood barriers will be installed as required by building management and will be regularly tested in line with manufacturer guidance.</li> <li>The scheme will also include the following flood resilience measures: <ul style="list-style-type: none"> <li>Electrical wiring feeding low level points and switches should drop from the ceiling rather than be fed from floor level. Switches and points should be raised as high as reasonably practicable and within Building Regulations standards;</li> <li>Use of concrete or hard surfaced floors rather than timber or soft coverings. Or use of waterproof floor coverings with appropriate sealing such as Aquastep;</li> <li>PVC windows and external finishes should be used if any windows etc. are to be replaced;</li> <li>Use of plastic or metal alternatives to chipboard or MDF, where possible;</li> <li>Underfloor services using ferrous metals will be avoided where practicable;</li> <li>Inclusion of liquid DPMs over floor screeds; and,</li> <li>Use of full cell insulation in all new walls and floors instead of fibre.</li> <li>Water resistant coatings for external walls</li> <li>Partition walls should be constructed such that replacement is not required following a flood event</li> </ul> </li> <li>Regular inspection of local flood defences, control structures and culverts by the Environment Agency.</li> </ul> | Will ensure the consequences of flooding are minimised. | High            |
| Flooding from surface water runoff – overland flow and extreme rainfall                | The Site is at moderate to low risk of surface water flooding with flood depths not recorded for the 'high' and 'medium' risk events, but certain areas reaching up to 1200 mm in the 'low' risk event. | <ul style="list-style-type: none"> <li>Implement the flood resilience measures mentioned above for the proposed ground floor flats; and</li> <li>Necessary upgrades to the current drainage will be determined, undertaken and agreed with Southern Water and Building Control as necessary at the detailed design stage.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Will ensure the consequences of flooding is minimised.  | Low             |
| Flooding from surface and foul water – sewer blockage/surcharging and intense rainfall | Blockages or surcharges in the Site drainage or the public/private sewer network in the Site vicinity may result in flooding of the Site.                                                               | <ul style="list-style-type: none"> <li>Ensure routine inspection and maintenance of both the on-site and offsite drainage systems the Site management, Eastleigh District Highways and Southern Water;</li> <li>A management plan for the maintenance of drainage assets should be prepared and agreed with appropriate authorities as part of the detailed design. This should ensure routine inspection and maintenance of both the foul and surface water drainage systems by the Site management and/or any adopting body and Southern Water;</li> <li>A drainage survey should be undertaken to confirm the route and condition of any existing site drainage to inform the need for any upgrades to the network.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Will ensure the risk of flooding is minimised.          | Low             |
| Flooding from onsite water mains                                                       | Flooding of the onsite water supply and distribution system as a result of a burst pipe may result in flooding of the building internally.                                                              | <ul style="list-style-type: none"> <li>Routine inspection of the Site and public water supply and distribution system by the Site owner and Southern Water.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Will ensure the risk of flooding is minimised.          | Low             |

| Type of Flooding                                                          | Issue                                                                                                      | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                   | Justification                                  | Residual Risk * |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------------|
| Increased flood risk to surrounding properties as a result of the scheme. | The development of the Site will increase foul water flows in the local Southern Water Foul Sewer network. | <ul style="list-style-type: none"><li>Confirm foul water connection point with Southern Water at the detailed design stage;</li><li>Routine inspection and maintenance of assets by Southern Water and relevant private drainage company; and</li><li>Seek confirmation from Southern Water that there is sufficient capacity within the Southern Water network to take the foul water flows from the Site.</li></ul> | Will ensure the risk of flooding is minimised. | Low             |

**Table 7.1: Mitigation Measures**

\*Following adoption of the mitigation measures

## **8.0 RESIDUAL FLOOD RISKS AND IMPACTS TO SURROUNDING AREAS**

### **Residual Risks**

- 8.1 In addition to the remaining risk of fluvial flooding a number of residual risks have been identified, associated with extreme rainfall, public/private sewers, Site drainage, and water supply pipes.
- 8.2 As long as the public/private sewer networks, Site drainage/water supply infrastructure are regularly inspected and maintained by relevant authorities then the residual risk will be minimised.

### **Impact to Flood Risk of Surrounding Areas**

- 8.3 Given the flood risk present on Site and the mitigation measures detailed in Table 7.1 it is considered that the development of the Site will not increase the risk of flooding in other areas surrounding the Site.

## 9.0 OUTLINE FLOOD EVACUATION PLAN

9.1 The following summarises the flood warning system and sets out the recommended procedures for responding to flood warnings and for evacuation in the unlikely event of flooding of the site:

- All residents should have a pre-prepared Flood Kit as outlined (see paragraph 9.2) and should be prepared for refuge in the event evacuation cannot be carried out due to rapid onset of flood waters.
- Site occupants and management should monitor the online EA flood warnings both online and through signing up to the EA flood warning service whereby telephone messages are provided by the EA to warn occupants of any impending floods. The EA flood warning system is shown in Table 9.1 and its interpretation for this Site is as follows:
  - When the flood warnings reach 'Flood Alert' (details of the EA flood warning system included in Table 9.1 below) all occupants of the Site should be notified of the potential for flooding by the EA and told to prepare for evacuation of the Site. Building Management should also provide a second warning to occupants to prepare for evacuation.
  - When the warning level changes to 'Flood Warning' all occupants of the Site should evacuate and leave the Site via Hursley Road to the south east, then Bournemouth Road to the south west away from the flood zone. As part of this vehicles should be removed from Site, if it proves safe to do so, so as they do not act as a hazard if flood waters were to progress onto the Site. Again Building management should manage this process to ensure all occupants are removed from the site.
- Building management should, if safe to do so, isolate all gas, electricity and water supplies to the Site before evacuation of the occupants to the nearest evacuation shelter at a location to be advised by the Local Emergency Planning Officer.
- If flood waters have progressed on to the Site and the water is fast moving all occupants should not progress through the flood waters. Instead they should take refuge within the buildings on upper floors in shared spaces.
- On receipt of severe warning, occupants are advised to remain in the building as above.
- Should the flood alarms mentioned in Table 7.1 be activated, the above procedure should be instigated, although it is proposed to set the trip level such that sufficient time for an evacuation will be available.
- If taking refuge all occupants should remain in contact with the emergency services by phone and cooperate with any instructions issued. As long residents make themselves known to the emergency services they will be rescued.
- Occupants should not turn services such as gas supplies back on again until the service provider confirms it is safe to do so.

| Flood Alert Category                                                                                      | What it Means                                   | When it is Used                                 |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| <br>Flood Alert          | Flooding is possible, be prepared               | Two hours to two days in advance of flooding    |
| <br>Flood Warning        | Flooding is expected, immediate action required | Half an hour to one day in advance of flooding  |
| <br>Severe Flood Warning | Danger to life                                  | When flooding poses significant threat to life  |
| Warnings No Longer in Force                                                                               | No further flooding expected in your area       | When river conditions begin to return to normal |

**Table 9.1: Environment Agency flood warning system. Images courtesy of the Environment Agency website.**

#### Flood Kit

9.2 In the event of an evacuation all residents should have a pre-prepared Flood Kit when the Environment Agency's warnings reach 'Flood Alert'. This could include the following:

- A copy of the Flood Response Plan (to be formalised at a later stage)
- Passports
- Insurance policies
- Toiletries
- Asthma and respiratory aids
- Home and car keys
- Change of clothes
- Supplies for babies and small children
- First aid kit
- Mobile phone and charger together with phone numbers for the emergency services and the EA Floodline
- Prescribed medication
- Driving licenses
- Mobility aids
- Warm clothing
- Pet supplies

9.3 As well as this all residents should be prepared for a period of refuge and therefore should keep the following property:

- A copy of this Flood Risk Response Plan
- Non-perishable food to last for 48 hours (and suitable can opener)
- Drinking water to last 48 hours
- Gas stove
- Battery/wind-up torch and radio
- Spare batteries
- Candles and matches
- First aid kit

9.4 All residents should keep the Flood Response Plan together with their Flood Kit and emergency supplies in an easily accessible location.

## **10.0 CONCLUSIONS AND RECOMMENDATIONS**

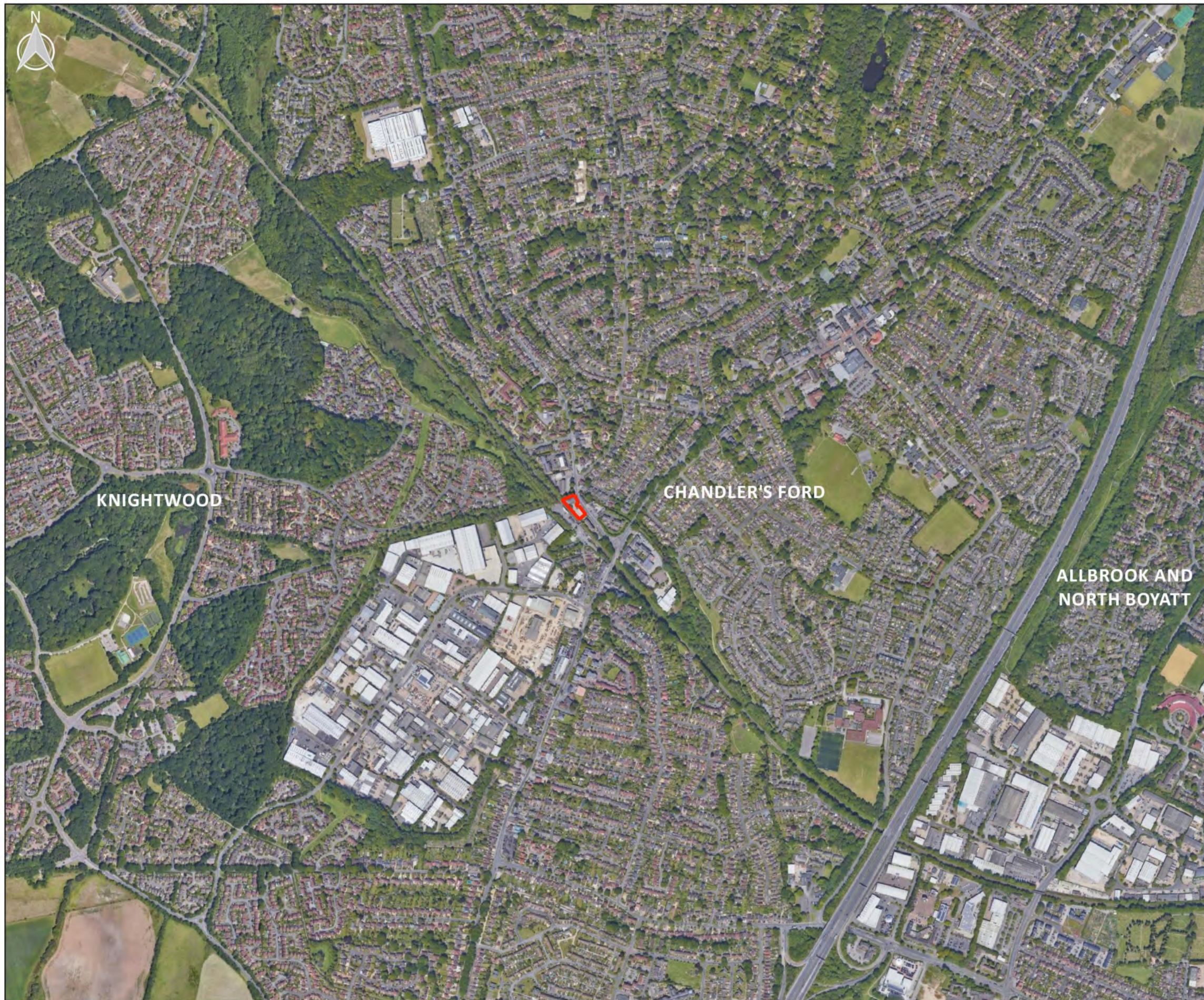
- 10.1 Based on our understanding of the Site setting and the development proposals, it is considered that the risk of flooding from fluvial sources is high whilst all other sources generally pose a low risk. A number of residual risks have been identified, associated with extreme rainfall, public/private sewers, Site drainage, and water supply pipes. The mitigation measures provided in Table 7.1 should be adhered to in order to ensure the risk of flooding posed to the Site remains is minimised, and the development can be operated safely and without significantly increasing flood risk elsewhere.
- 10.2 We recommend that the assessment of the fluvial and residual risks should be reviewed by Site owners as new flood risk information becomes available, and the flood risk associated with adjacent sewers may also increase over time in the area due to climate change.

## 11.0 REFERENCES

- i. Atkins., 2007. *Partnership for Urban South Hampshire Strategic Flood Risk Assessment*. [Online]. Available at: <https://www.eastleigh.gov.uk/media/3455/push-flood-risk-assessment-2007.pdf> (Accessed February 2021).
- ii. British Geological Survey (BGS) Onshore GeoIndex., 2020. *DiGMapGB-50 Bedrock Geology and Superficial Deposits & Borehole Records*. [Online]. Available at: [www.bgs.ac.uk/geoindex](http://www.bgs.ac.uk/geoindex) (Accessed February, 2021).
- iii. Department for Environment and Rural Affairs (DEFRA) Magic Website., 2010. [Online]. *Environment Agency Aquifer Designation Data*. Available at: <https://magic.defra.gov.uk/MagicMap.aspx> (Accessed February, 2021).
- iv. Department for Environment and Rural Affairs (DEFRA) Magic Website., 2019. [Online]. *Environment Agency Source Protection Zones (Merged)*. Available at: <https://magic.defra.gov.uk/MagicMap.aspx> (Accessed February, 2021).
- v. Department for Environment and Rural Affairs (DEFRA) Magic Website., 2017. [Online]. *Groundwater Vulnerability Map*. Available at: <https://magic.defra.gov.uk/MagicMap.aspx> (Accessed February, 2021).
- vi. Eastleigh Borough Council., 2018. *Eastleigh Borough Local Plan (2016-2036)* [Online]. Available at: <https://www.eastleigh.gov.uk/media/3484/final-local-plan-document-june-2018-print.pdf> (Accessed February 2021).
- vii. Eastern Solent Coastal Partnership Project Manager., 2016. *Strategic Flood Risk Assessment 2016 Update*. [Online]. Available at: <https://www.eastleigh.gov.uk/media/3456/push-flood-risk-assessment-update-2016.pdf> (Accessed February 2021).
- viii. Environment Agency., 2020. *Risk of Flooding from Reservoirs - Maximum Flood Extent (Web Mapping Service)*. [Online]. Available at: <https://data.gov.uk/dataset/44b9df6e-c1d4-40e9-98eb-bb3698ecb076/risk-of-flooding-from-reservoirs-maximum-flood-extent-web-mapping-service> (Accessed February, 2021).
- ix. gov.uk., 2015. *The Town and Country Planning (Development Management Procedure) (England) Order 2015*. [Online]. Available at: [http://www.legislation.gov.uk/ukxi/2015/595/pdfs/ukxi\\_20150595\\_en.pdf](http://www.legislation.gov.uk/ukxi/2015/595/pdfs/ukxi_20150595_en.pdf) (Accessed February 2021).
- x. Hampshire County Council., 2012. *Eastleigh Surface Water Management Plan*. [Online]. Available at: <https://documents.hants.gov.uk/flood-water-management/EastleighSWMPReport.pdf> (Accessed February 2021).

- 
- xi. Hampshire County Council., 2013. *Groundwater Management Plan (GWMP) for Hampshire*. [Online]. Available at: <https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/strategies/Groundwater-Management-Plan> (Accessed February 2021).
  - xii. Hampshire County Council., 2011. *Hampshire County Council Preliminary Flood Risk Assessment*. [Online]. Available at: <https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/strategies/Preliminary-Flood-Risk-Assessment> (Accessed February 2021).
  - xiii. Hampshire County Council., 2018. *Information for developers on SuDS principals and application*. [Online]. Available at: <https://documents.hants.gov.uk/flood-water-management/SuDSLeafletJune2018v20.pdf> (Accessed February 2021).
  - xiv. Hampshire County Council., 2020. *Local Flood Water Management Strategy*. [Online]. Available at: <https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/strategies/local-flood-risk-management-strategy> (Accessed February 2021).
  - xv. Hampshire County Council. *Reducing flood risk in planning*. [Online]. Available at: <https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/planning> (Accessed February 2021).
  - xvi. Hampshire County Council. *Surface Water Management Plans*. [Online]. Available at: <https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/strategies/surface-water-management-plans> (Accessed February 2021).
  - xvii. Ministry of Housing, Communities & Local Government., 2019. *National Planning Policy Framework (NPPF)*. [Online]. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2> [Accessed February, 2021].
  - xviii. Ministry of Housing, Communities & Local Government., 2014. *Planning Practice Guidance (PPG) - Flood Risk and Coastal Change*. [Online]. Available at: <http://planningguidance.planningportal.gov.uk/> (Accessed February, 2021).
  - xix. Ministry of Housing, Communities & Local Government., 2014. *Site Specific Flood Risk Assessment Checklist*. [Online]. Available at: <https://www.gov.uk/guidance/flood-risk-and-coastal-change#Site-Specific-Flood-Risk-Assessment-checklist-section> (Accessed February 2021).

## FIGURES



NOTES:

1. BASED ON SITE REDLINE AS SHOWN WITHIN DRAWING 20/70/00A (REVISED SITE AND LOCATION PLAN) AND GOOGLE EARTH IMAGERY (ACCESSED FEBRUARY, 2021).

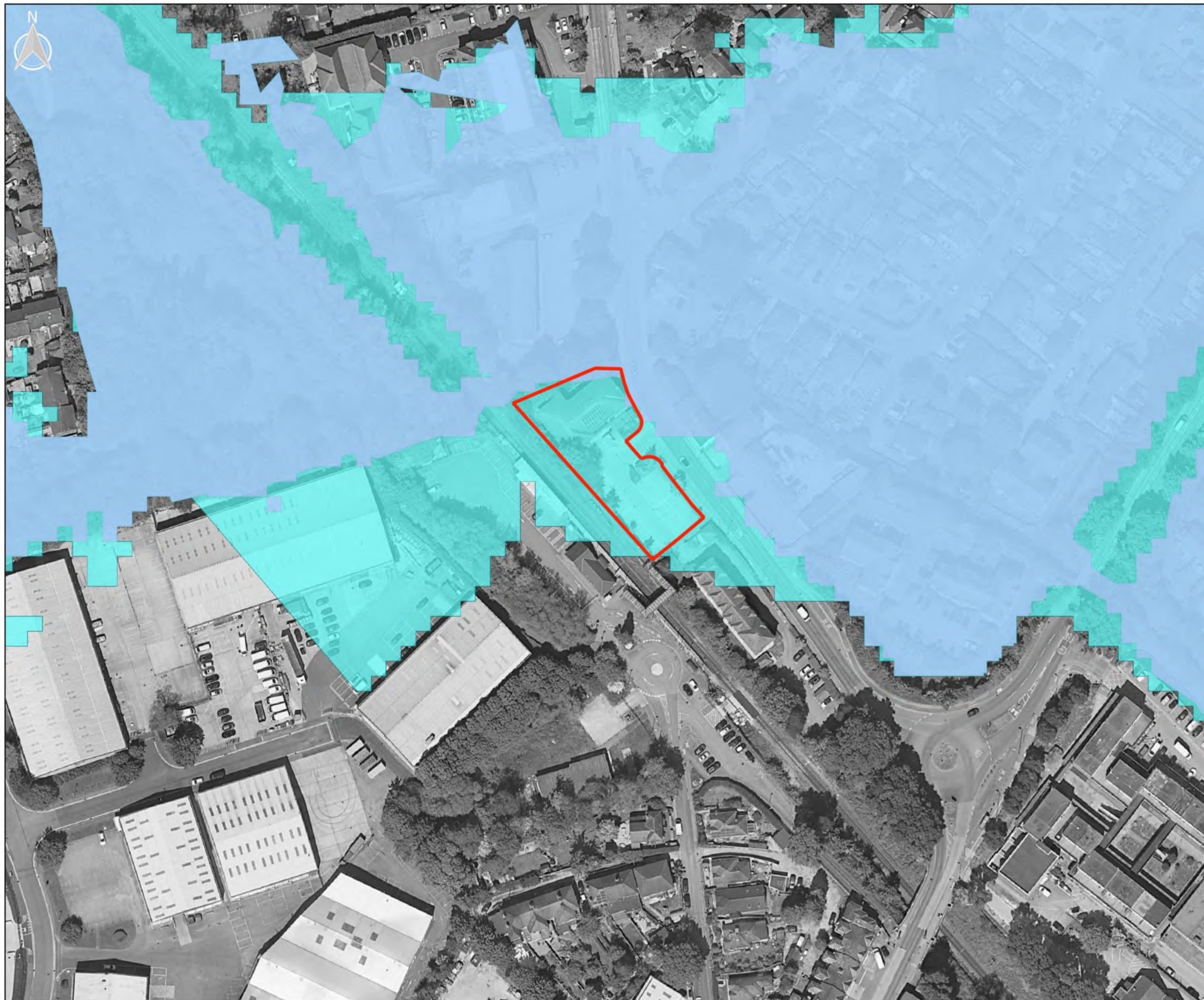
KEY:

 SITE LOCATION

FIGURE TITLE:

3.1 SITE LOCATION PLAN

**create**  
CONSULTING ENGINEERS LTD



NOTES:

1. BASED ON ENVIRONMENT AGENCY (EA) DATA  
ACCESSED VIA THE DEFRA DATA SERVICES PLATFORM  
AND GOOGLE EARTH IMAGERY (ACCESSED FEBRUARY,  
2021).

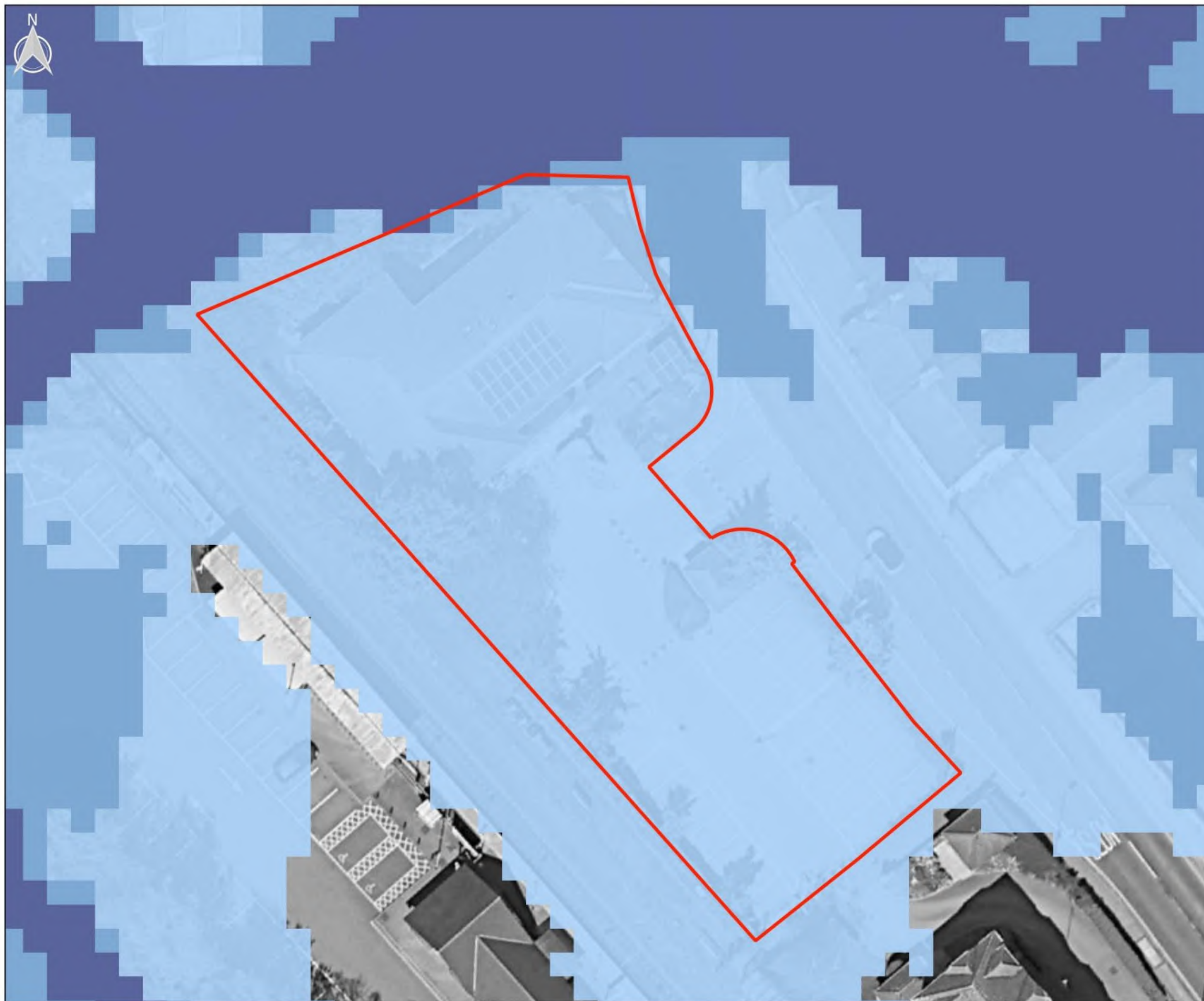
KEY:

- SITE LOCATION
- FLOOD ZONE 1
- FLOOD ZONE 2
- FLOOD ZONE 3

FIGURE TITLE:

5.1 ENVIRONMENT AGENCY FLUVIAL / TIDAL FLOOD  
ZONE MAP FOR PLANNING

**create**  
CONSULTING ENGINEERS LTD



NOTES:

1. BASED ON ENVIRONMENT AGENCY (EA) DATA  
ACCESSED VIA THE DEFRA DATA SERVICES PLATFORM  
AND GOOGLE EARTH IMAGERY (ACCESSED FEBRUARY,  
2021).

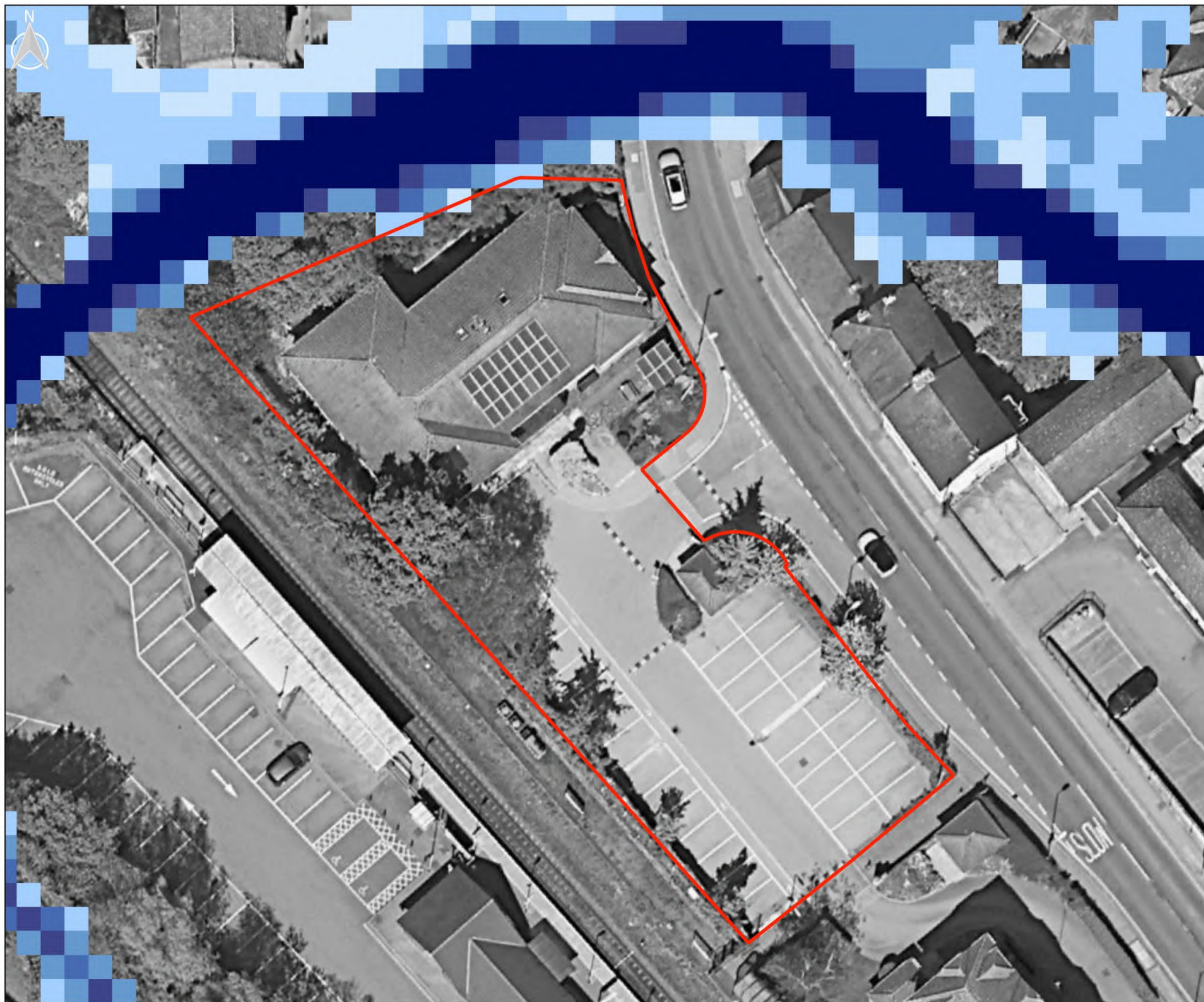
KEY:

-  SITE LOCATION
-  HIGH (3.3%)
-  MEDIUM (1%)
-  LOW (0.1%)
-  VERY LOW (<0.1%)

FIGURE TITLE:

5.2 ENVIRONMENT AGENCY RISK OF FLOODING FROM  
SURFACE WATER EXTENT MAPPING

**create**  
CONSULTING ENGINEERS LTD



NOTES:

1. BASED ON ENVIRONMENT AGENCY (EA) DATA  
ACCESSED VIA THE DEFRA DATA SERVICES PLATFORM  
AND GOOGLE EARTH IMAGERY (ACCESSED FEBRUARY,  
2021).

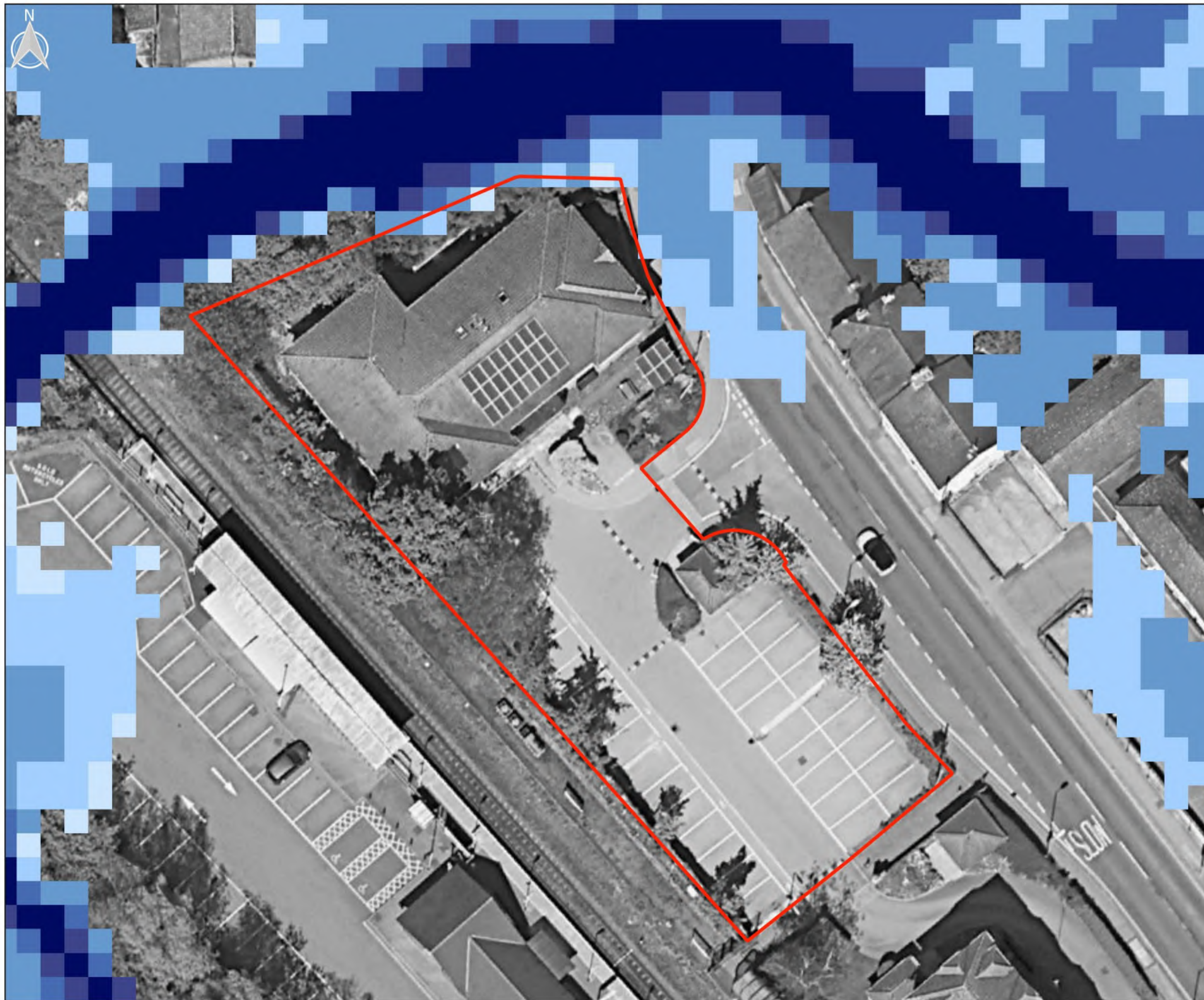
KEY:

|  |               |
|--|---------------|
|  | SITE LOCATION |
|  | BELOW 150 mm  |
|  | 150-300 mm    |
|  | 300-600 mm    |
|  | 600-900 mm    |
|  | 900-1200 mm   |
|  | OVER 1200 mm  |

FIGURE TITLE:

5.3 ENVIRONMENT AGENCY SURFACE WATER  
FLOOD DEPTH MAP 1 IN 30 YEAR EVENT (3.3%)

**create**  
CONSULTING ENGINEERS LTD



NOTES:

1. BASED ON ENVIRONMENT AGENCY (EA) DATA  
ACCESSED VIA THE DEFRA DATA SERVICES PLATFORM  
AND GOOGLE EARTH IMAGERY (ACCESSED FEBRUARY,  
2021).

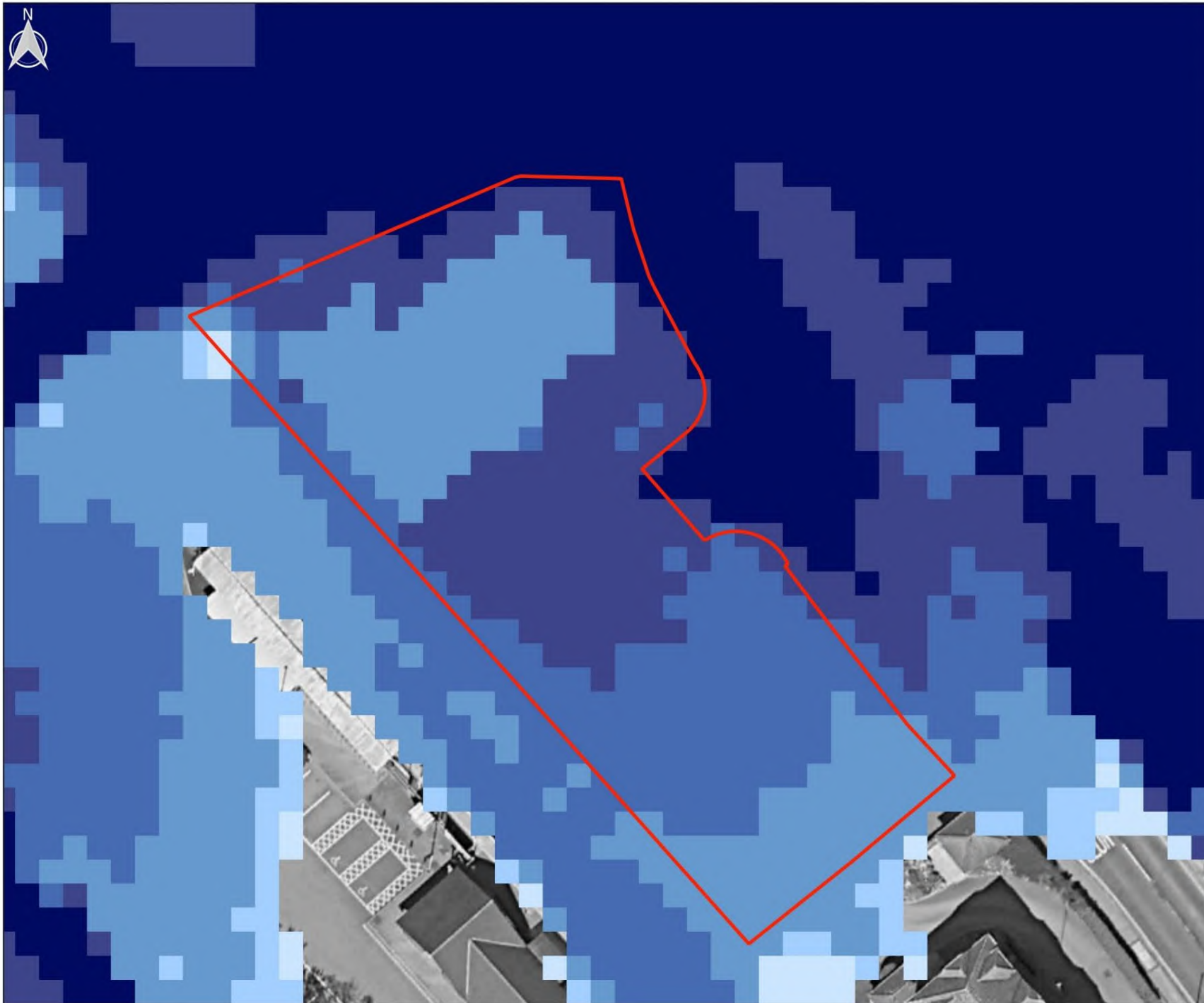
KEY:

|  |               |
|--|---------------|
|  | SITE LOCATION |
|  | BELOW 150 mm  |
|  | 150-300 mm    |
|  | 300-600 mm    |
|  | 600-900 mm    |
|  | 900-1200 mm   |
|  | OVER 1200 mm  |

FIGURE TITLE:

5.4 ENVIRONMENT AGENCY SURFACE WATER  
FLOOD DEPTH MAP 1 IN 100 YEAR EVENT (1%)

**create**  
CONSULTING ENGINEERS LTD



NOTES:

1. BASED ON ENVIRONMENT AGENCY (EA) DATA  
ACCESSED VIA THE DEFRA DATA SERVICES PLATFORM  
AND GOOGLE EARTH IMAGERY (ACCESSED FEBRUARY,  
2021).

KEY:

|  |               |
|--|---------------|
|  | SITE LOCATION |
|  | BELOW 150 mm  |
|  | 150-300 mm    |
|  | 300-600 mm    |
|  | 600-900 mm    |
|  | 900-1200 mm   |
|  | OVER 1200 mm  |

FIGURE TITLE:

5.5 ENVIRONMENT AGENCY SURFACE WATER  
FLOOD DEPTH MAP 1 IN 1000 YEAR EVENT (0.1%)

**create**  
CONSULTING ENGINEERS LTD



NOTES:

1. BASED ON SITE REDLINE AS SHOWN WITHIN DRAWING 20/70/00A (REVISED SITE AND LOCATION PLAN) AND GOOGLE EARTH IMAGERY (ACCESSED JUNE, 2021).

KEY:

□ SITE LOCATION

← FLOW ROUTE

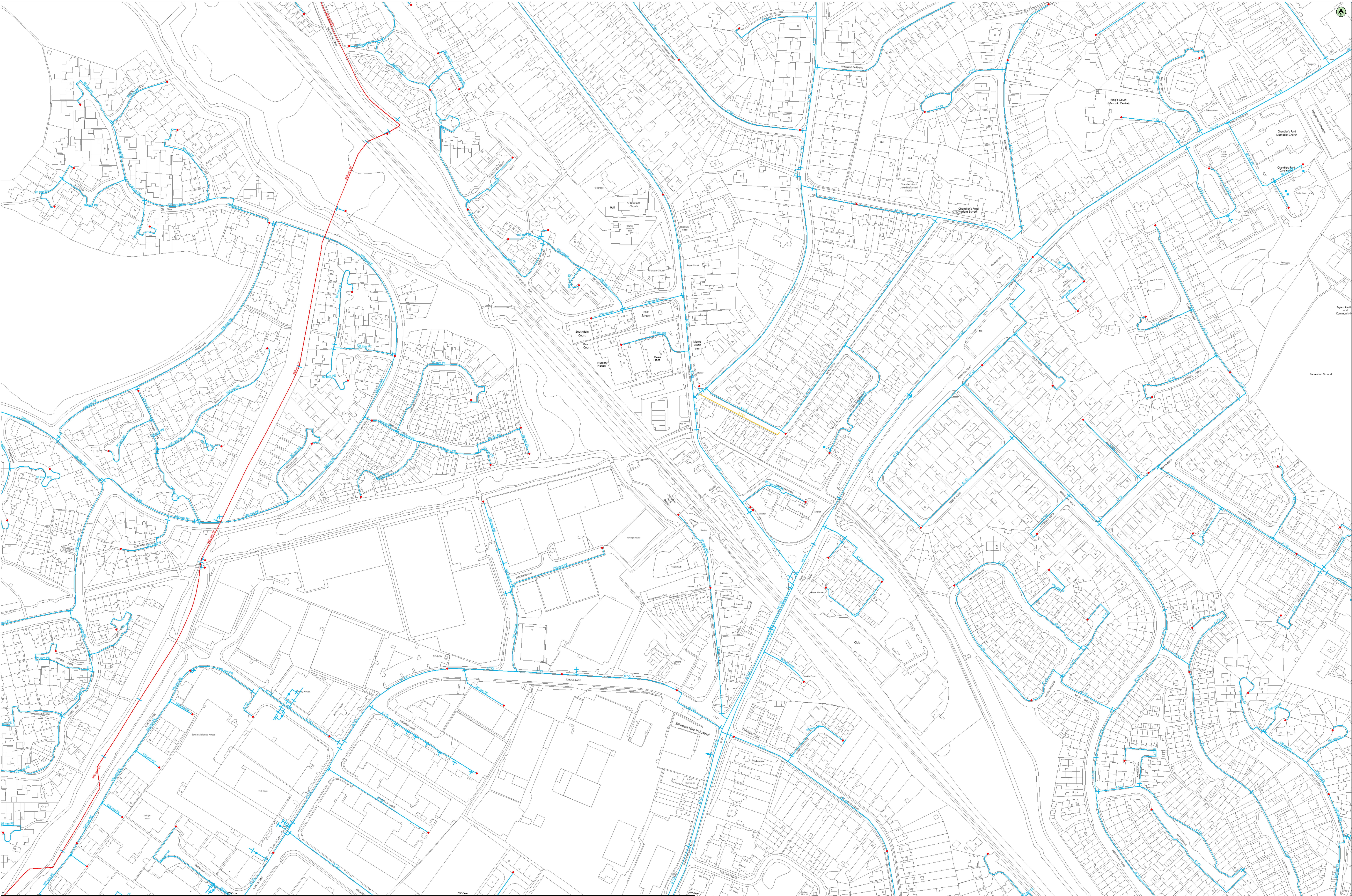
FIGURE TITLE:

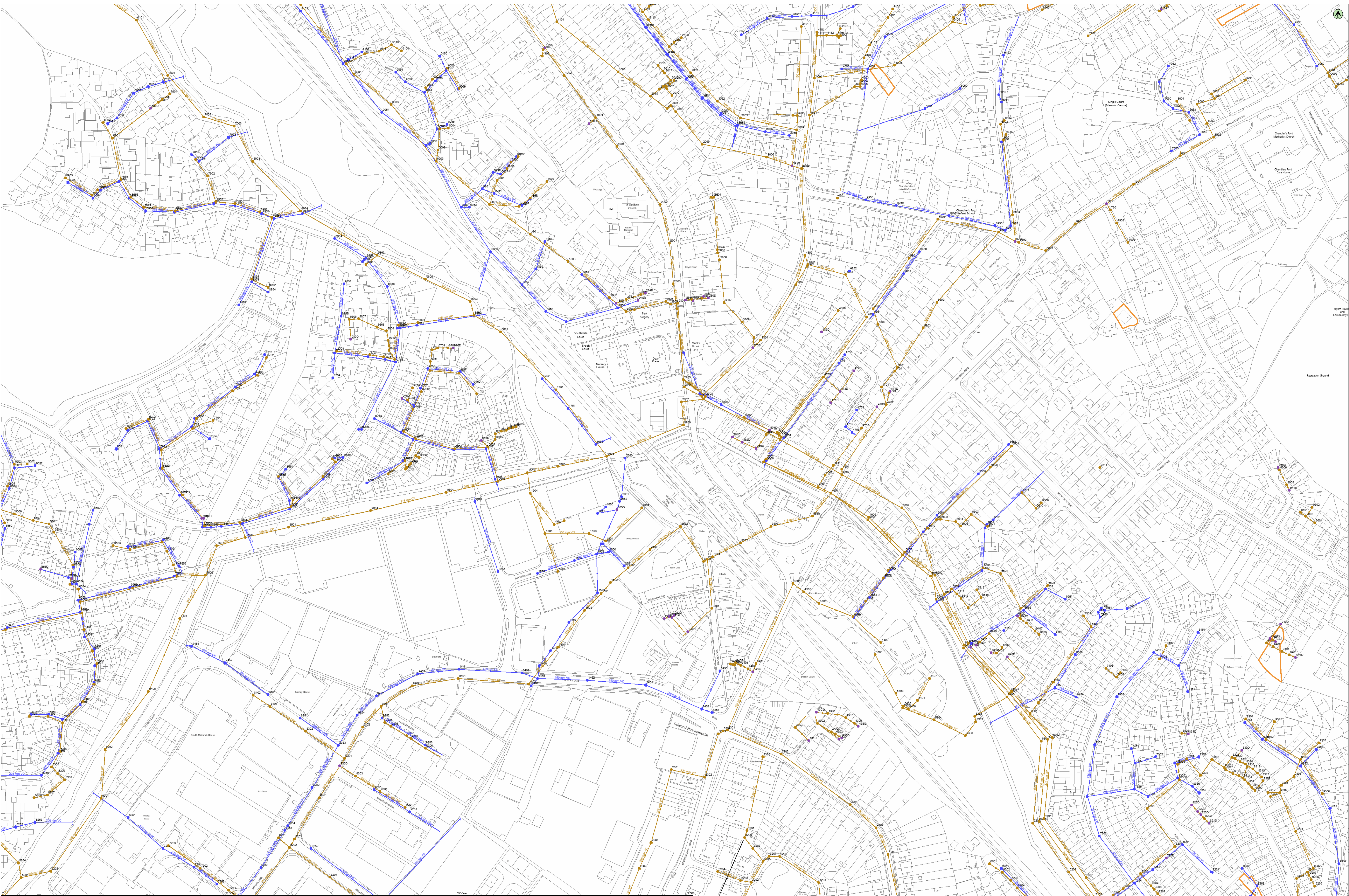
6.1 EXCEEDANCE FLOW ROUTES

**create**  
CONSULTING ENGINEERS LTD

## **APPENDICES**

## **APPENDIX A**

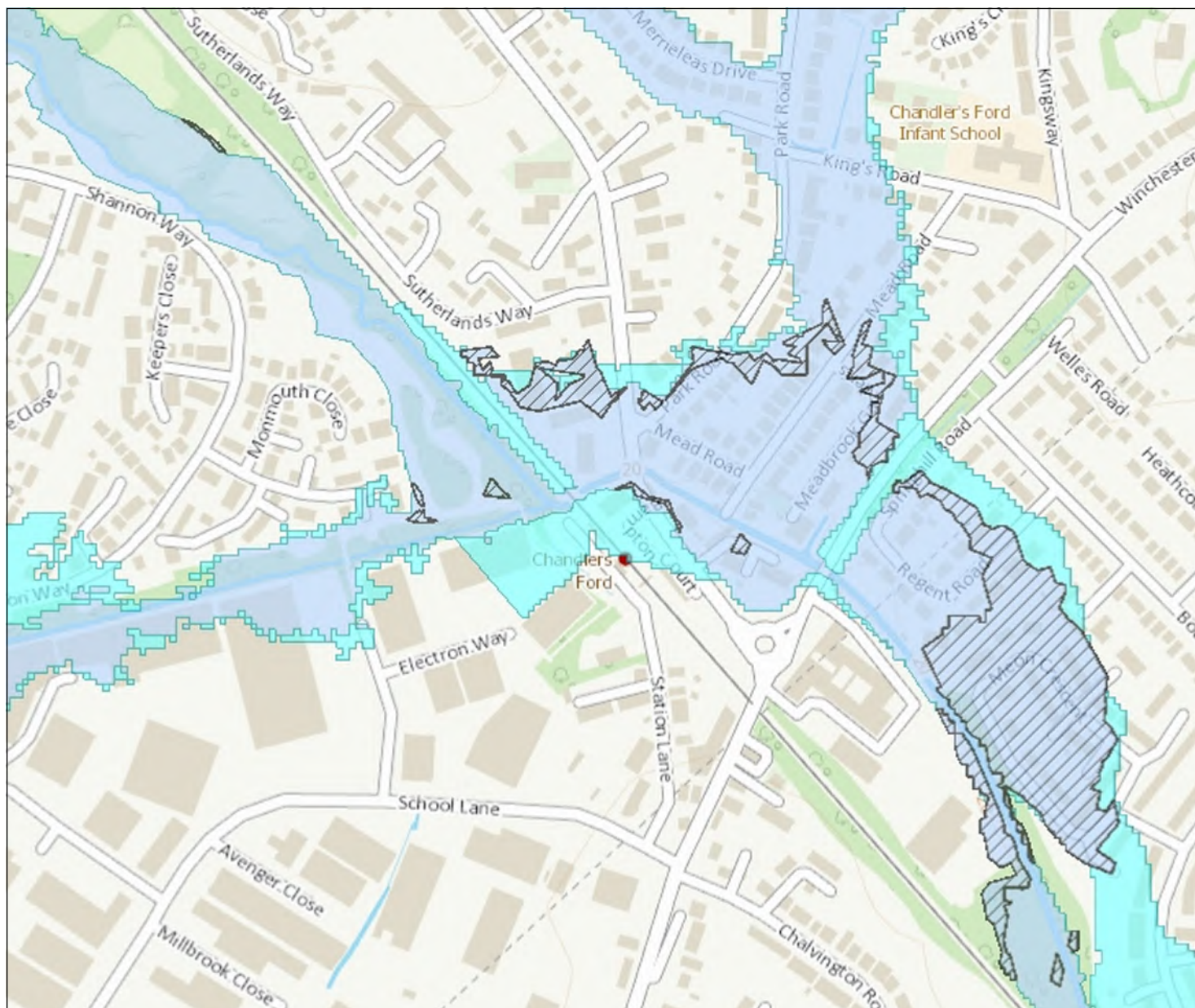




| Manhole Reference | Liquid Type | Cover Level | Invert Level | Depth to Invert | Manhole Reference | Liquid Type | Cover Level | Invert Level | Depth to Invert | Manhole Reference | Liquid Type | Cover Level | Invert Level | Depth to Invert | Manhole Reference | Liquid Type | Cover Level | Invert Level | Depth to Invert | Manhole Reference | Liquid Type | Cover Level | Invert Level | Depth to Invert | Manhole Reference | Liquid Type | Cover Level | Invert Level | Depth to Invert | Manhole Reference | Liquid Type | Cover Level | Invert Level | Depth to Invert |       |  |  |
|-------------------|-------------|-------------|--------------|-----------------|-------------------|-------------|-------------|--------------|-----------------|-------------------|-------------|-------------|--------------|-----------------|-------------------|-------------|-------------|--------------|-----------------|-------------------|-------------|-------------|--------------|-----------------|-------------------|-------------|-------------|--------------|-----------------|-------------------|-------------|-------------|--------------|-----------------|-------|--|--|
| 0001              | F           | 30.25       | 27.40        | 0.00            | 3405              | F           | 0.00        | 0.00         | 5514            | F                 | 0.00        | 0.00        | 7905         | F               | 23.68             | 21.67       | 9801        | F            | 22.60           | 0.00              | 6453        | S           | 24.45        | 22.47           | 9653              | S           |             |              |                 | 23.04             | 0.00        | 9653        | S            | 23.04           | 0.00  |  |  |
| 0002              | F           | 29.25       | 26.40        | 0.00            | 3406              | F           | 0.00        | 0.00         | 5515            | F                 | 0.00        | 0.00        | 7906         | F               | 27.86             | 26.06       | 9802        | F            | 22.60           | 0.00              | 6454        | S           | 24.45        | 22.47           | 9654              | S           |             |              |                 | 22.95             | 22.10       | 9654        | S            | 22.95           | 22.10 |  |  |
| 0003              | F           | 31.07       | 28.57        | 0.00            | 3407              | F           | 0.00        | 0.00         | 5516            | F                 | 0.00        | 0.00        | 8001         | F               | 42.83             | 0.00        | 9803        | F            | 22.72           | 0.00              | 6454        | S           | 24.29        | 22.56           | 9753              | S           |             |              |                 | 23.26             | 0.00        | 9753        | S            | 23.26           | 0.00  |  |  |
| 0004              | F           | 31.10       | 29.01        | 0.00            | 3400              | F           | 0.00        | 0.00         | 5517            | F                 | 0.00        | 0.00        | 8002         | F               | 44.09             | 0.00        | 9804        | F            | 22.84           | 0.00              | 6454        | S           | 22.19        | 21.31           | 9754              | S           |             |              |                 | 22.96             | 0.00        | 9754        | S            | 22.96           | 0.00  |  |  |
| 0006              | F           | 33.78       | 31.12        | 0.00            | 3501              | F           | 26.96       | 0.00         | 5601            | F                 | 20.17       | 18.30       | 8003         | F               | 44.44             | 43.11       | 9805        | F            | 0.00            | 0.00              | 6455        | S           | 24.32        | 22.68           | 9755              | S           |             |              |                 | 22.93             | 0.00        | 9755        | S            | 22.93           | 0.00  |  |  |
| 0007              | F           | 33.54       | 31.70        | 0.00            | 3502              | F           | 21.60       | 19.10        | 5601            | F                 | 24.34       | 22.58       | 8004         | F               | 44.23             | 0.00        | 9806        | F            | 0.00            | 0.00              | 6455        | S           | 22.09        | 20.62           | 9756              | S           |             |              |                 | 23.20             | 0.00        | 9756        | S            | 23.20           | 0.00  |  |  |
| 0401              | F           | 24.33       | 22.21        | 0.00            | 3503              | F           | 20.91       | 18.75        | 5602            | F                 | 20.04       | 16.37       | 8005         | F               | 44.20             | 0.00        | 9807        | F            | 0.00            | 0.00              | 6550        | S           | 24.03        | 0.00            | 9757              | S           |             |              |                 | 23.04             | 0.00        | 9757        | S            | 23.04           | 0.00  |  |  |
| 0601              | F           | 22.58       | 19.08        | 0.00            | 3504              | F           | 22.70       | 19.58        | 5602            | F                 | 27.11       | 25.45       | 8006         | F               | 44.47             | 43.56       | 9808        | F            | 0.00            | 0.00              | 6551        | S           | 23.70        | 21.72           | 9758              | S           |             |              |                 | 22.94             | 0.00        | 9758        | S            | 22.94           | 0.00  |  |  |
| 0602              | F           | 22.23       | 18.75        | 0.00            | 3505              | F           | 26.38       | 25.10        | 5602            | F                 | 0.00        | 0.00        | 8007         | F               | 44.94             | 43.96       | 9809        | F            | 0.00            | 0.00              | 6551        | S           | 23.67        | 22.38           | 9759              | S           |             |              |                 | 23.12             | 0.00        | 9759        | S            | 23.12           | 0.00  |  |  |
| 0603              | F           | 22.25       | 18.40        | 0.00            | 3601              | F           | 20.46       | 16.66        | 5603            | F                 | 27.42       | 25.25       | 8008         | F               | 44.82             | 44.13       | 9800        | F            | 0.00            | 0.00              | 6552        | S           | 23.86        | 21.92           | 9750              | S           |             |              |                 | 0.00              | 0.00        | 9750        | S            | 0.00            | 0.00  |  |  |
| 0604              | F           | 22.29       | 18.58        | 0.00            | 3602              | F           | 20.71       | 18.57        | 5604            | F                 | 0.00        | 0.00        | 8011         | F               | 0.00              | 0.00        | 9810        | F            | 0.00            | 0.00              | 6552        | S           | 20.93        | 19.78           | 9760              | S           |             |              |                 | 22.91             | 0.00        | 9760        | S            | 22.91           | 0.00  |  |  |
| 0605              | F           | 0.00        | 0.00         | 0.00            | 3603              | F           | 20.75       | 18.49        | 5604            | F                 | 26.46       | 24.11       | 8103         | F               | 32.01             | 0.00        | 0051        | S            | 30.04           | 27.27             | 6553        | S           | 20.28        | 18.88           | 9761              | S           |             |              |                 | 22.85             | 0.00        | 9761        | S            | 22.85           | 0.00  |  |  |
| 0606              | F           | 0.00        | 0.00         | 0.00            | 3604              | F           | 20.49       | 18.57        | 5605            | F                 | 0.00        | 0.00        | 8201         | F               | 25.84             | 23.94       | 0054        | S            | 31.16           | 28.07             | 6553        | S           | 23.96        | 21.94           | 9763              | S           |             |              |                 | 22.99             | 0.00        | 9763        | S            | 22.99           | 0.00  |  |  |
| 0600              | F           | 0.00        | 0.00         | 0.00            | 3605              | F           | 20.47       | 17.37        | 5606            | F                 | 25.27       | 22.38       | 8202         | F               | 23.28             | 20.57       | 0055        | S            | 31.22           | 28.44             | 6554        | S           | 23.49        | 21.89           | 9801              | S           |             |              |                 | 23.59             | 0.00        | 9801        | S            | 23.59           | 0.00  |  |  |
| 0701              | F           | 22.95       | 20.53        | 0.00            | 3606              | F           | 0.00        | 0.00         | 5607            | F                 | 24.75       | 22.80       | 8202         | F               | 0.00              | 0.00        | 0056        | S            | 33.19           | 31.55             | 6555        | S           | 23.95        | 22.66           | 9853              | S           |             |              |                 | 22.67             | 0.00        | 9853        | S            | 22.67           | 0.00  |  |  |
| 0702              | F           | 22.79       | 20.90        | 0.00            | 3607              | F           | 0.00        | 0.00         | 5609            | F                 | 24.95       | 23.18       | 8202         | F               | 0.00              | 0.00        | 0057        | S            | 33.72           | 31.91             | 6556        | S           | 23.98        | 22.76           | 9854              | S           |             |              |                 | 22.88             | 0.00        | 9854        | S            | 22.88           | 0.00  |  |  |
| 0703              | F           | 0.00        | 0.00         | 0.00            | 3600              | F           | 0.00        | 0.00         | 5701            | F                 | 21.55       | 19.20       | 8203         | F               | 0.00              | 0.00        | 0058        | S            | 33.47           | 32.26             | 6557        | S           | 23.81        | 22.92           | 9855              | S           |             |              |                 | 22.89             | 0.00        | 9855        | S            | 22.89           | 0.00  |  |  |
| 0704              | F           | 0.00        | 0.00         | 0.00            | 3610              | F           | 0.00        | 0.00         | 5801            | F                 | 22.58       | 20.86       | 8204         | F               | 26.14             | 24.16       | 0150        | S            | 33.97           | 32.35             | 6558        | S           | 0.00         | 0.00            | 9856              | S           |             |              |                 | 22.61             | 0.00        | 9856        | S            | 22.61           | 0.00  |  |  |
| 0705              | F           | 0.00        | 0.00         | 0.00            | 3620              | F           | 0.00        | 0.00         | 5802            | F                 | 23.79       | 21.96       | 8200         | F               | 0.00              | 0.00        | 0451        | S            | 24.25           | 22.87             | 6550        | S           | 0.00         | 0.00            | 9858              | S           |             |              |                 | 22.68             | 0.00        | 9858        | S            | 22.68           | 0.00  |  |  |
| 0706              | F           | 0.00        | 0.00         | 0.00            | 3701              | F           | 20.47       | 18.60        | 5803            | F                 | 24.48       | 20.64       | 0452         | S               | 0.00              | 0.00        | 0452        | S            | 23.93           | 0.00              | 6551        | S           | 25.89        | 24.74           | 9859              | S           |             |              |                 | 22.66             | 0.00        | 9859        | S            | 22.66           | 0.00  |  |  |
| 0707              | F           | 0.00        | 0.00         | 0.00            | 3702              | F           | 20.64       | 18.78        | 5901            | F                 | 25.42       | 23.55       | 8220         | F               | 0.00              | 0.00        | 0551        | S            | 22.47           | 21.32             | 6552        | S           | 20.70        | 19.57           | 9860              | S           |             |              |                 | 22.84             | 0.00        | 9860        | S            | 22.84           | 0.00  |  |  |
| 0708              | F           | 0.00        | 0.00         | 0.00            | 3700              | F           | 0.00        | 0.00         | 6001            | F                 | 31.39       | 30.72       | 8230         | F               | 0.00              | 0.00        | 0651        | S            | 22.02           | 20.79             | 6552        | S           | 24.26        | 23.31           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 0709              | F           | 0.00        | 0.00         | 0.00            | 3710              | F           | 0.00        | 0.00         | 6001            | F                 | 24.74       | 22.80       | 8301         | F               | 25.32             | 23.05       | 0652        | S            | 22.22           | 20.68             | 6555        | S           | 23.00        | 21.55           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 0700              | F           | 0.00        | 0.00         | 0.00            | 3801              | F           | 21.59       | 19.44        | 6002            | F                 | 24.90       | 23.02       | 8301         | F               | 37.85             | 36.35       | 0653        | S            | 22.56           | 20.76             | 6751        | S           | 26.37        | 24.45           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 0801              | F           | 21.78       | 19.08        | 0.00            | 3802              | F           | 22.72       | 0.00         | 6002            | F                 | 31.58       | 30.91       | 8302         | F               | 24.79             | 23.29       | 0654        | S            | 22.27           | 20.64             | 6752        | S           | 26.30        | 24.29           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 0802              | F           | 21.90       | 19.16        | 0.00            | 3805              | F           | 26.57       | 24.73        | 6003            | F                 | 31.71       | 31.14       | 8302         | F               | 32.74             | 31.64       | 0751        | S            | 22.89           | 21.54             | 6950        | S           | 26.39        | 27.21           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 0803              | F           | 22.05       | 19.30        | 0.00            | 3806              | F           | 19.30       | 0.00         | 6004            | F                 | 31.76       | 31.01       | 8303         | F               | 21.52             | 20.87       | 0804        | S            | 22.94           | 21.74             | 6951        | S           | 26.39        | 27.21           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 0901              | F           | 24.27       | 22.31        | 0.00            | 3807              | F           | 0.00        | 0.00         | 6000            | F                 | 0.00        | 0.00        | 8304         | F               | 31.55             | 29.54       | 0851        | S            | 21.83           | 20.63             | 6951        | S           | 24.81        | 22.81           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 0902              | F           | 26.02       | 24.48        | 0.00            | 3808              | F           | 0.00        | 0.00         | 6101            | F                 | 24.50       | 21.90       | 8305         | F               | 0.00              | 0.00        | 0852        | S            | 22.75           | 21.62             | 6952        | S           | 24.62        | 22.68           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 0903              | F           | 26.89       | 25.25        | 0.00            | 3809              | F           | 0.00        | 0.00         | 6105            | F                 | 26.65       | 25.31       | 8306         | F               | 27.62             | 24.99       | 0853        | S            | 23.09           | 21.00             | 6952        | S           | 30.22        | 28.32           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 0904              | F           | 26.52       | 25.39        | 0.00            | 3810              | F           | 0.00        | 0.00         | 6201            | F                 | 21.44       | 19.48       | 8308         | F               | 0.00              | 0.00        | 0950        | S            | 23.87           | 21.44             | 6953        | S           | 24.37        | 23.16           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 0905              | F           | 27.55       | 26.80        | 0.00            | 3902              | F           | 23.27       | 20.53        | 6202            | F                 | 21.24       | 19.16       | 8309         | F               | 0.00              | 0.00        | 0951        | S            | 25.40           | 23.28             | 6954        | S           | 25.09        | 23.34           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 0906              | F           | 27.72       | 27.24        | 0.00            | 3903              | F           | 23.26       | 20.98        | 6203            | F                 | 21.15       | 19.04       | 8309         | F               | 0.00              | 0.00        | 0953        | S            | 24.26           | 22.11             | 6955        | S           | 25.30        | 23.73           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 1001              | F           | 29.87       | 27.72        | 0.00            | 3904              | F           | 27.76       | 27.01        | 6204            | F                 | 21.23       | 18.99       | 8300         | F               | 0.00              | 0.00        | 0954        | S            | 25.37           | 23.72             | 6956        | S           | 24.49        | 22.64           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 1002              | F           | 31.74       | 0.00         | 0.00            | 3905              | F           | 27.76       | 27.06        | 6205            | F                 | 21.15       | 16.01       | 8310         | F               | 0.00              | 0.00        | 0955        | S            | 26.74           | 25.13             | 7050        | S           | 44.32        | 42.74           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 1003              | F           | 25.70       | 24.10        | 0.00            | 3906              | F           | 23.70       | 23.10        | 6206            | F                 | 19.25       | 0.00        | 8311         | F               | 0.00              | 0.00        | 0956        | S            | 26.02           | 24.94             | 7051        | S           | 24.22        | 23.10           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 1004              | F           | 0.00        | 0.00         | 0.00            | 3910              | F           | 23.41       | 20.90        | 6207            | F                 | 19.85       | 15.93       | 8312         | F               | 0.00              | 0.00        | 0957        | S            | 26.98           | 26.25             | 7051        | S           | 43.97        | 42.81           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 1000              | F           | 0.00        | 0.00         | 0.00            | 4001              | F           | 23.84       | 20.84        | 6208            | F                 | 20.44       | 16.61       | 8313         | F               | 0.00              | 0.00        | 1452        | S            | 25.23           | 0.00              | 7052        | S           | 23.91        | 23.01           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 1101              | F           | 26.70       | 24.70        | 0.00            | 4002              | F           | 24.73       | 21.01        | 6301            | F                 | 21.45       | 19.15       | 8314         | F               | 0.00              | 0.00        | 1453        | S            | 22.63           | 0.00              | 7052        | S           | 24.79        | 43.01           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 1102              | F           | 31.75       | 30.09        | 0.00            | 4003              | F           | 24.03       | 22.33        | 6301            | F                 | 20.29       | 17.01       | 8315         | F               | 0.00              | 0.00        | 1454        | S            | 23.09           | 0.00              | 7053        | S           | 24.02        | 22.60           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 1103              | F           | 32.40       | 31.39        | 0.00            | 4004              | F           | 24.02       | 21.86        | 6302            | F                 | 24.36       | 20.90       | 8316         | F               | 0.00              | 0.00        | 1455        | S            | 23.65           | 0.00              | 7053        | S           | 42.65        | 0.00            |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 1100              | F           | 31.65       | 29.80        | 0.00            | 4005              | F           | 24.08       | 21.86        | 6302            | F                 | 20.56       | 17.14       | 8317         | F               | 0.00              | 0.00        | 1456        | S            | 23.99           | 0.00              | 7251        | S           | 26.39        | 24.09           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 1401              | F           | 22.99       | 0.00         | 0.00            | 4006              | F           | 24.21       | 22.50        | 6303            | F                 | 20.68       | 0.00        | 8318         | F               | 0.00              | 0.00        | 1457        | S            | 0.00            | 0.00              | 7252        | S           | 25.88        | 23.84           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |
| 1402              | F           | 23.98       | 21.84        | 0.00            | 4007              | F           | 24.08       | 21.75        | 6304            | F                 | 21.75       | 16.12       | 8319         | F               | 0.00              | 0.00        | 1550        | S            | 0.00            | 0.00              | 7252        | S           | 20.00        | 18.33           |                   |             |             |              |                 |                   |             |             |              |                 |       |  |  |

## **APPENDIX B**

# Flood Map for Planning (Rivers and Sea) - Centred on Bampton House, Chandler's Ford, SO53 2TA Hampshire - Created 18 December 2020



1: 5,000

0 Metres 125



## Flood Map for Planning (Rivers & Sea)

- Defences
- Flood Storage Areas
- Areas benefiting from flood defences
- Flood Zone 3
- Flood Zone 2

### Flood Map Areas (assuming no defences)

**Flood Zone 3** shows the area that could be affected by flooding:

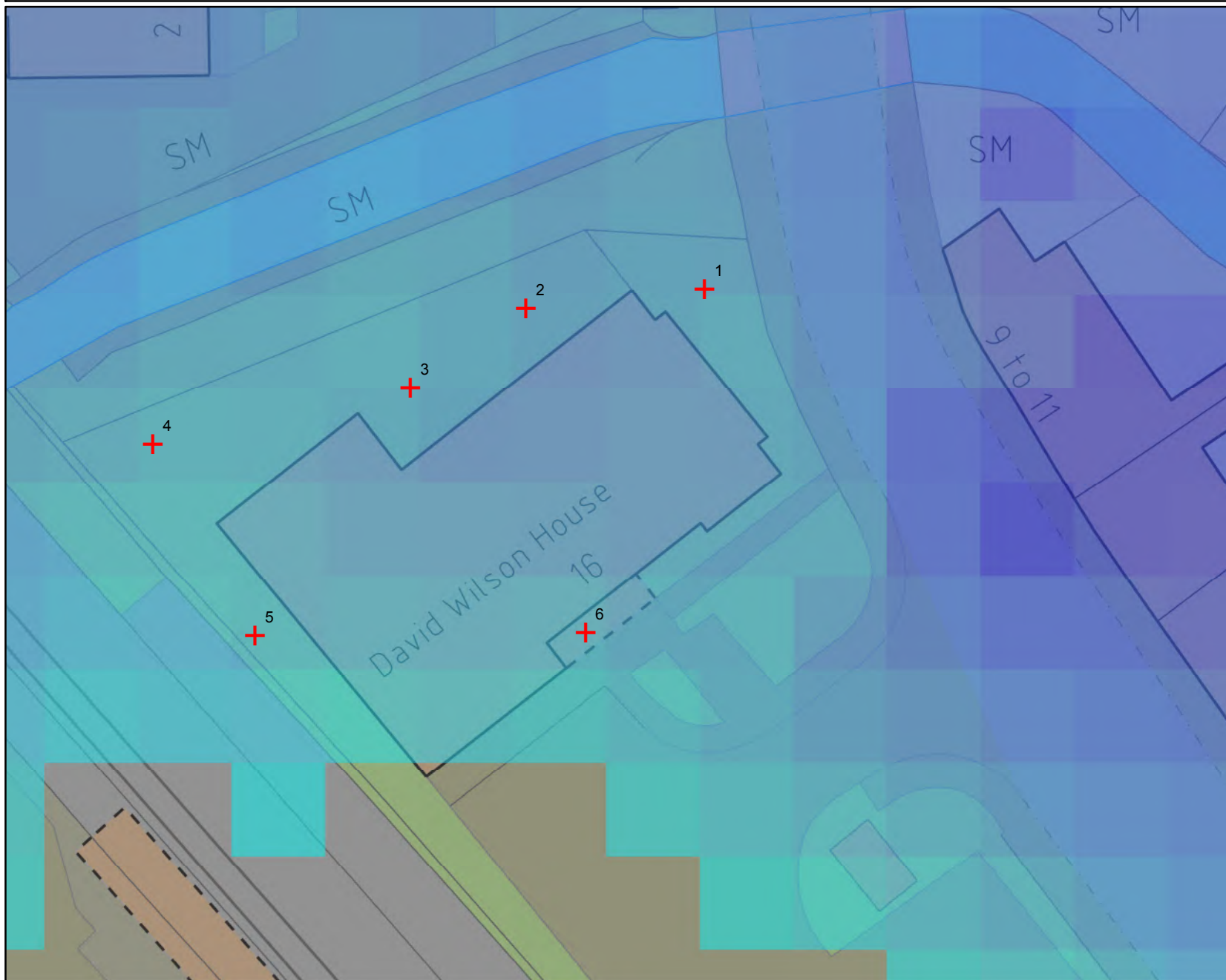
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

**Flood Zone 2** shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

## **JFLOW - Appendix**

- Our work to produce Flood Zones followed a 10 year programme which delivered more detailed mapping for 821 locations. However, in order to complete Flood Zones we needed national coverage, hence a generalised approach was used to provide this national coverage within the time available, to fill the gaps between the 821 locations where we had more detailed information. The Flood Zones are therefore not as accurate as we would normally specify for river modelling, but they do provide an adequate indication of the extent of flood risk such that developers can consider flooding as part of their proposals to ensure they are not unknowingly putting additional lives at risk. This is the purpose for which the Flood Zones were produced.
- Neither water depths nor water levels were outputs that were specified when we commissioned this generalised modelling for Flood Zones. Whilst the modelling process does provide some information on depth of water, it would have been possible to produce the flood extents without storing the water depth values, since water depth is only a 'by-product' of the calculation process. As the JFLOW modelling method was developed, tested and reviewed for production of the Flood Zone extents only, we currently have no information on the accuracy of the water depth data.
- The models were run using a Digital Terrain Model (DTM) with a 5m x 5m grid. However the DTM grids were generalised to between 5m and 100m (depending on the type of model and location, for reasons such as processing speed). Fluvial modelling produced depth data which can be processed using the DTM to provide water level data. However the differing grid sizes means that there is a significant potential for inaccuracy in producing level data, because of the DTM generalisation.
- Therefore because of the nature of the model and the DTM, in many cases it will not be possible to confidently assess whether or not a site is above the resulting water level. This is because there are further inherent uncertainties in the depth calculation and within the DTM itself
- Depth or level outputs from the National Generalised Modelling (JFLOW) are only suitable to be used for decision making at a broad catchment or Shoreline Management Plan coastal cell scale (or larger).
- **They are not suitable for use in site specific Flood Risk Assessments or Strategic Flood Risk Assessments and must not normally be used for these studies. However, where in exceptional circumstances Nationalised Generalised Modelling outputs are requested to be used for anything other than at a broad catchment or Shoreline Management Plan coastal cell scale further verification must be undertaken. As part of this verification the outputs must be proven to be suitable and appropriate bearing in mind the conclusions the user wishes to draw from them and this use must be agreed in writing by the local Environment Agency staff.**
- If any agreement is given by the Environment Agency in pursuance of the above, the User accepts and agrees that such agreement by the Environment Agency that that National Generalised Modelling outputs are suitable for a particular use does not imply agreement that the proposals are appropriate or that the Environment Agency has no further comment on flood risk, rather that following verification the User has proven that the outputs are suitable to help assess the flood risk in the particular circumstances.
- Any assessment of Flood Risk undertaken must be appropriate for the decisions that need to be based upon it, consider the risks and also take into account any limitations of the data used
- Please read the enclosed Notice and be aware that the Environment Agency does not guarantee that this data is suitable for your purposes.
- **The consultants employed to deliver JFLOW Flood Zones to the Environment Agency were Jeremy Benn Associates (JBA). I should make you aware that JBA will not release information that either is owned by the Environment Agency or based upon Environment Agency information as they are not licensed to do so. You will need to request any information you require from the Environment Agency.**
- Information provided relates solely to flood risk issues and is based on the best available information to date in the Environment Agency. If further information becomes available to the Environment Agency (on flood risk issues or on other environmental issues which affect a FRA) or policy changes, we reserve the right to comment further or to supply further information or to amend information sent.
- If this information is supplied in connection with a flood risk assessment of development proposals and any material amendments made thereto at any stage prior to the submission of a planning application, the User should be aware of the need to consult the Environment Agency further

# Levels Map - Centred on Bampton House, Chandlers Ford, Hampshire - Created 18 December 2020



## Legend

Location Points

### 1 in 100 Year Flood Level

Value

High : 1.8771  
Low : 0

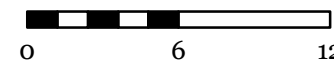
### ham\_lidar

Value

High : 219.8  
Low : -20.4957

1:300

\*when printed at A4.



Metres



Environment Agency copyright and / or database rights 2020. All rights reserved. C Crown Copyright and database right. All rights reserved. Environment Agency, 100026380, 2020.

**Contact Us:** National Customer Contact Centre, PO BOX 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)

## Water Depths & Levels for Bampton House, Chandler's Ford

| Point | Water Depth (Metres)                               |                                                       | Water Surface Level (mAOD*)                        |                                                       | Ground Level |
|-------|----------------------------------------------------|-------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------|--------------|
|       | 1% Annual Probability/1 in 100 Year (Flood Zone 3) | 0.1% Annual Probability/1 in 1000 Year (Flood Zone 2) | 1% Annual Probability/1 in 100 Year (Flood Zone 3) | 0.1% Annual Probability/1 in 1000 Year (Flood Zone 2) |              |
| 1     | 0.31                                               | 0.65                                                  | 21.93                                              | 22.27                                                 | 21.62        |
| 2     | 0.31                                               | 0.51                                                  | 22.15                                              | 22.35                                                 | 21.84        |
| 3     | 0.22                                               | 0.41                                                  | 22.66                                              | 22.85                                                 | 22.44        |
| 4     | 0.21                                               | 0.35                                                  | 22.20                                              | 22.34                                                 | 21.99        |
| 5     | 0.16                                               | 0.24                                                  | 22.35                                              | 22.43                                                 | 22.19        |
| 6     | 0.13                                               | 0.36                                                  | 22.07                                              | 22.30                                                 | 21.94        |

\* Levels in metres above Ordnance Datum Newlyn