

# Flood Risk Assessment

Land South of Saltmarsh Lane  
Hayling Island, PO11 0JT

for

Hayling Island Builders Ltd

A21078

October 2021

**Flood Risk Assessment**  
**Land South of Saltmarsh Lane**  
**for**  
**Hayling Island Builders Ltd**

| Revision | Date of issue | Comments      | Prepared By | Checked By |
|----------|---------------|---------------|-------------|------------|
| 1.0      | 29.07.2021    | Initial Issue | AJ          | DB         |
| 2.0      | 14.10/2021    | Layout Change | AJ          | DB         |
|          |               |               |             |            |
|          |               |               |             |            |
|          |               |               |             |            |

**Should you have any queries relating to this document please contact:**

Andy Johnson  
Patrick Parsons  
Satelliet House  
2 Nexus Park  
Lysons Avenue  
Ash Vale  
GU12 5QE

T: +44 (0) 1276 700 400

E: [andy.johnson@patrickparsons.co.uk](mailto:andy.johnson@patrickparsons.co.uk)

## Executive Summary

| Description                                                                                                                                                                                                                                                        |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Patrick Parsons has been instructed by Hayling Island Builders Ltd, to produce a Flood Risk Assessment under National Planning Policy Framework (NPPF) to support the Planning Application for the site at Land South of Saltmarsh Lane, Hayling Island, PO11 0JT. |                                       |
| Flood Risk Assessment                                                                                                                                                                                                                                              |                                       |
| Coastal:<br>Fluvial:<br>Pluvial:<br>Groundwater:<br>Other sources:                                                                                                                                                                                                 | Zone 1<br>Zone 1<br>Low<br>Low<br>Low |
| Flood Resilience Measures                                                                                                                                                                                                                                          |                                       |
| None required.                                                                                                                                                                                                                                                     |                                       |
| Conclusions                                                                                                                                                                                                                                                        |                                       |
| The site is not at risk of any forms of flooding.                                                                                                                                                                                                                  |                                       |

## Contents

|     |                               |    |
|-----|-------------------------------|----|
| 1.0 | Introduction.....             | 1  |
| 2.0 | Location of Site .....        | 1  |
| 3.0 | Site Description.....         | 2  |
| 4.0 | Proposed Development.....     | 3  |
| 5.0 | Flooding Information.....     | 3  |
| 6.0 | Flood Risk.....               | 4  |
| 7.0 | Route of Escape .....         | 9  |
| 8.0 | Flood Compensation.....       | 9  |
| 9.0 | Summary and Conclusions ..... | 10 |

## Appendices

|            |                                             |
|------------|---------------------------------------------|
| Appendix A | Location Plan                               |
| Appendix B | Topographical Survey                        |
| Appendix C | Magic Map Geology Information               |
| Appendix D | Site Plan                                   |
| Appendix E | Environment Agency Flood Map (For Planning) |
| Appendix F | Environment Agency Surface Water Flood Map  |
| Appendix G | Hazard Technical Note                       |

## 1.0 Introduction

- 1.1.1 Hayling Island Builders Ltd is planning a proposed development on the site at Land South of Saltmarsh Lane, Hayling Island, PO11 0JT.
- 1.1.2 Patrick Parsons has been instructed by Hayling Island Builders Ltd, to produce a Flood Risk Assessment under National Planning Policy Framework (NPPF) to support the Planning Application.
- 1.1.3 This report aims to demonstrate whether the development is at risk of any form of flooding.
- 1.1.4 The general limitations of this assessment are that:
  - Several data sources have been used in compiling this report. Whilst Patrick Parsons believe them to be trustworthy; it is unable to guarantee the accuracy of the information that has been provided by others.
  - This report is based on information available at the time of preparation. There is potential for further information to become available, which may create a need to modify conclusions drawn in this report.

## 2.0 Location of Site

- 2.1.1 The site is located south of Saltmarsh Lane in Hayling Island. A location plan is enclosed in **Appendix A**.
- 2.1.2 The Local Authorities are Havant Borough Council and Hampshire County Council.

## 3.0 Site Description

### 3.1 Existing Site

- 3.1.1 The existing site is the parcel of land to the south of Saltmarsh Lane. A topographical survey has been commissioned for the site and can be found in **Appendix B**.

### 3.2 Existing Geology

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

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

*“London Clay Formation - Clay, Silt and Sand. Sedimentary Bedrock formed approximately 48 to 56 million years ago in the Palaeogene Period. Local environment previously dominated by deep seas. These sedimentary rocks are marine in origin. They are detrital and comprise coarse- to fine-grained slurries of debris from the continental shelf flowing into a deep-sea environment, forming distinctively graded beds.”*

- 3.2.3 The strata of the site (superficial drift) comprises River Terrace Deposits, described as follows:

*“River Terrace Deposits (undifferentiated) - Sand, Silt and Clay. Superficial Deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by rivers (U). These sedimentary deposits are fluvial in origin. They are detrital, ranging from coarse- to fine-grained and form beds and lenses of deposits reflecting the channels, floodplains and levees of a river or estuary (if in a coastal setting).”*

### 3.3 Hydrogeology Setting

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

| Geology Map                             | Site Description |
|-----------------------------------------|------------------|
| Aquifer Designation (Bedrock)           | Unproductive     |
| Aquifer Designation (Superficial Drift) | Secondary A      |
| Groundwater Vulnerability               | Medium / Low     |
| Groundwater Source Protection Zone      | None             |

## 4.0 Proposed Development

- 4.1.1 The proposal is for 60 No. new residential units. A proposed site plan is included at **Appendix D**.

## 5.0 Flooding Information

- 5.1.1 As set out in the National Planning Policy Framework (NPPF), inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. For these purposes:
- “areas at risk of flooding” means land within Flood Zones 2 and 3; or land within Flood Zone 1 which has critical drainage problems, and which has been notified to the local planning authority by the Environment Agency;
  - “flood risk” means risk from all sources of flooding - including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources.
- 5.1.2 Flooding information for Planning from the Environment Agency (EA) has indicated the site is located within Flood Zone 1, as found in the map at **Appendix E**.
- 5.1.3 As the site is within Flood Zone 1, no further data was required from the Environment Agency.
- 5.1.4 As part of the data capture, data and mapping from the Havant Strategic Flood Risk Assessment (SFRA) was sought. This will be included and references in the relevant sections below.

## 6.0 Flood Risk

- 6.1.1 The data on the EA's website in their updated mapping, shows the site has a "very low" risk of flooding.
- 6.1.2 The EA confirmed that the proposed development site is located in Flood Zone 1 for Planning.
- 6.1.3 According to Table 2 of National Planning Policy Framework (NPPF), the development, being residential, is classed as 'more vulnerable'.
- 6.1.4 According to NPPF Table 3 'Flood Risk Vulnerability and Flood Zone Compatibility', the development should be permitted.

**Table 3: Flood risk vulnerability and flood zone 'compatibility'**

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

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

## **6.2 Sequential Test**

- 6.2.1 Local Planning Authorities (LPA) are encouraged to take a risk-based approach to proposals for development in or affecting flood risk areas through the application of the Sequential Test and the objectives of this test are to steer new development away from high risk areas towards those at lower risk of flooding.
- 6.2.2 However, in some areas where developable land is in short supply, there can be an overriding need to build in areas that are at risk of flooding. In such circumstances, the application of the Sequential Test is used to ensure that the lower risk sites are developed before the higher risk ones.
- 6.2.3 NPPF (PPG25) states that the Sequential Test should be applied at all stages of the planning process and the starting point is generally the Environment Agency's flood zone maps.
- 6.2.4 These maps and the associated information are intended for guidance and cannot provide details for individual properties. They do not consider other considerations such as existing flood defences, alternative flooding mechanisms and detailed site-based surveys. They do, however, provide high level information on the type and likelihood of flood risk in any area of the country.
- 6.2.5 The site is within Flood Zone 1 and so does not require a sequential test assessment.

## **6.3 Exception Test**

- 6.3.1 The Exception Test is an additional test to be applied by decision-makers following application of the Sequential Test. The Exception Test has two elements as shown below, both of which must be satisfied for development in a flood risk area to be considered acceptable.
- 6.3.2 The Exception Test is only appropriate for use when there are large areas in Flood Zones 2 and 3, where the Sequential Test alone cannot deliver acceptable sites, but where some continuing development is needed for wider sustainable development reasons, considering the need to avoid social or economic blight and the need for essential civil infrastructure to remain operational during floods.
- 6.3.3 For the Exception Test to be passed:
  - a. It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA; and,
  - b. A site-specific FRA must demonstrate that the development will be safe for its lifetime, without increasing flood risk elsewhere and, where possible, reducing flood risk overall.
- 6.3.4 The site does not require an exception test in accordance with NPPF.

## **6.4 Fluvial Flooding Risk**

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

## **6.5 Historic Flood Data**

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

## **6.6 Groundwater**

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

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

6.6.3 The Havant PUSG SFRA SFRA indicates that the site is within an area with low permeability but does not identify any historic groundwater flood incidents.

## **6.7 Flooding from Sewers**

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

6.7.2 The Havant SFRA has no information indicating the site has been flooded by artificial sources historically.

## **6.8 Flooding from Reservoirs**

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

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

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

## 6.9 Surface Water Flooding

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

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

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

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

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

6.9.5 A review of the EA mapping, as included at **Appendix F**, indicates there is some risk of surface water flooding to the site.

6.9.6 An assessment of the "medium" risk scenario (up to 1 in 100-year event), indicates that there would be some flood water on the site. The water appears to be highly localised and shallow.

6.9.7 The worst-case hazard rating (up to 1 in 100-year event) for the site can be refined and calculated using the formulae in the guidance document in **Appendix G**.

6.9.8 The flood Hazard Rating (HR) is based primarily on consideration to the direct risks of people exposed to floodwaters and is expressed below.

$$HR = d (v + n) + DF$$

$$HR = 0.300 \times (0.25 + 0.5) + 0.5$$

$$d = \text{Depth of water (m)}$$

$$v = \text{Velocity of water (m/s)}$$

$$HR = 0.725$$

$$n = \text{constant taken as } 0.5$$

6.9.9 The guidance document provides details of the potential risk to occupants of the site as per the table below:

| Thresholds for Flood Hazard Rating<br>$H = d \times (v + 0.5) + DF$ |             | Degree of Flood Hazard | Description                                                                                      |
|---------------------------------------------------------------------|-------------|------------------------|--------------------------------------------------------------------------------------------------|
| FD2321                                                              | FD2320      |                        |                                                                                                  |
| <0.75                                                               | <0.75       | Low                    | <b>Caution</b> - "Flood zone with shallow flowing water or deep standing water"                  |
| 0.75 - 1.25                                                         | 0.75 - 1.25 | Moderate               | <b>Dangerous for some (i.e. children)</b> - "Danger: Flood zone with deep or fast flowing water" |
| 1.25 - 2.5                                                          | 1.25 - 2.0  | Significant            | <b>Dangerous for most people</b> - "Danger: flood zone with deep fast flowing water"             |
| >2.5                                                                | >2.0        | Extreme                | <b>Dangerous for all</b> - "Extreme danger: flood zone with deep fast flowing water"             |

6.9.10 The worst possible flood hazard from surface water based on this calculation is "Low". This indicates that there is a hazard level of "Caution", from potential shallow water, which should not prevent any occupants from escaping.

## 7.0 Route of Escape

- 7.1.1 In an extreme storm event, there is not likely to be flood water on site and safe escape can be achieved via the main access to site.
- 7.1.2 It is not envisaged that there would be any problem for access of emergency vehicles in an extreme storm event as there is no flood depth unless the extreme storm scenario occurs. Emergency vehicles may operate in depths of 0.5m with velocity of 5 metres per second (with some operating at depths of 1m).
- 7.1.3 The Planning Authority must be in consultation with the emergency services as to the appropriate access and safe routes for the site during an extreme storm event, in accordance with Section 13.S3.3 of the FRA Guidance for New Developments. Emergency Response Plans for the local area are available on the council website and would require updating for the proposed residence. It is not envisaged that there will be any additional burden on emergency services during a flood event.
- 7.1.4 General Evacuation Advice:
- Avoid walking or driving through flood water, as only 150mm of fast flowing flood water is able to knock a person over and 600mm is able to float a car. Flooding can cause manhole covers to come off, leaving hidden dangers.
  - Do not walk on sea defences or riverbanks.
  - Take care or avoid crossing bridges when water levels are high.
  - Take care crossing culverts as they are dangerous when flooded.
  - Look out for other hazards such as fallen power lines and trees.
  - Keep Children away from flood water.
  - Wash hands thoroughly if you come into contact with flood water as it may be contaminated with sewage.
  - Always follow the advice provided at the time by the Emergency Services. The Emergency Services may direct you to a Local Authority Evacuation Centre, which has been specially prepared for people being evacuated from their homes. Free food and bedding is provided, however spare clothing should be taken, essential medication and any baby care products should an infant be involved in the evacuation.

## 8.0 Flood Compensation

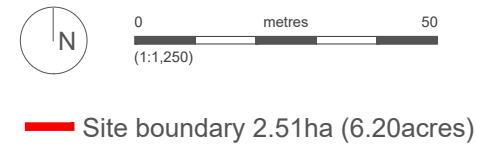
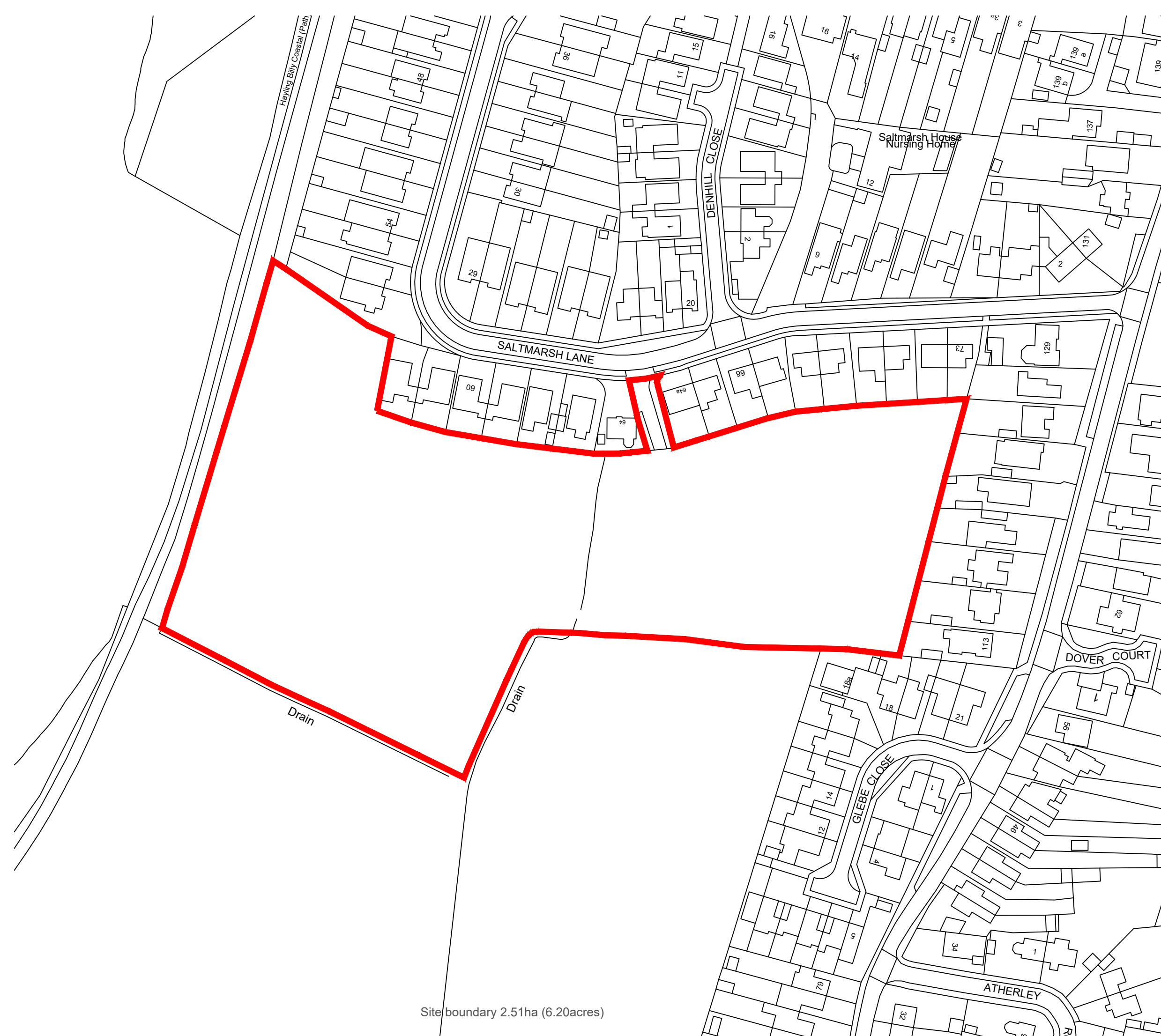
- 8.1.1 The site is not within a Flood Zone for planning so there is no statutory requirement to assess the requirement for flood compensation.

## **9.0 Summary and Conclusions**

- 9.1.1 Hayling Island Builders Ltd is planning a proposed development on the site at Land South of Saltmarsh Lane, Hayling Island, PO11 0JT.
- 9.1.2 Patrick Parsons has been instructed by Hayling Island Builders Ltd, to produce a Flood Risk Assessment under National Planning Policy Framework (NPPF) to support the Planning Application.
- 9.1.3 The Environment Agency mapping indicates that the site is within Flood Zone 1 and has a very low risk of fluvial flooding.
- 9.1.4 All other sources of flooding for the site have been investigated and shown to be of minimal or no risk.
- 9.1.5 The proposed development is appropriate and sustainable in the terms as set out in NPPF.

## Appendix A

### Location Plan



Site boundary 2.51ha (6.20acres)

Project  
Land South of Saltmarsh Lane

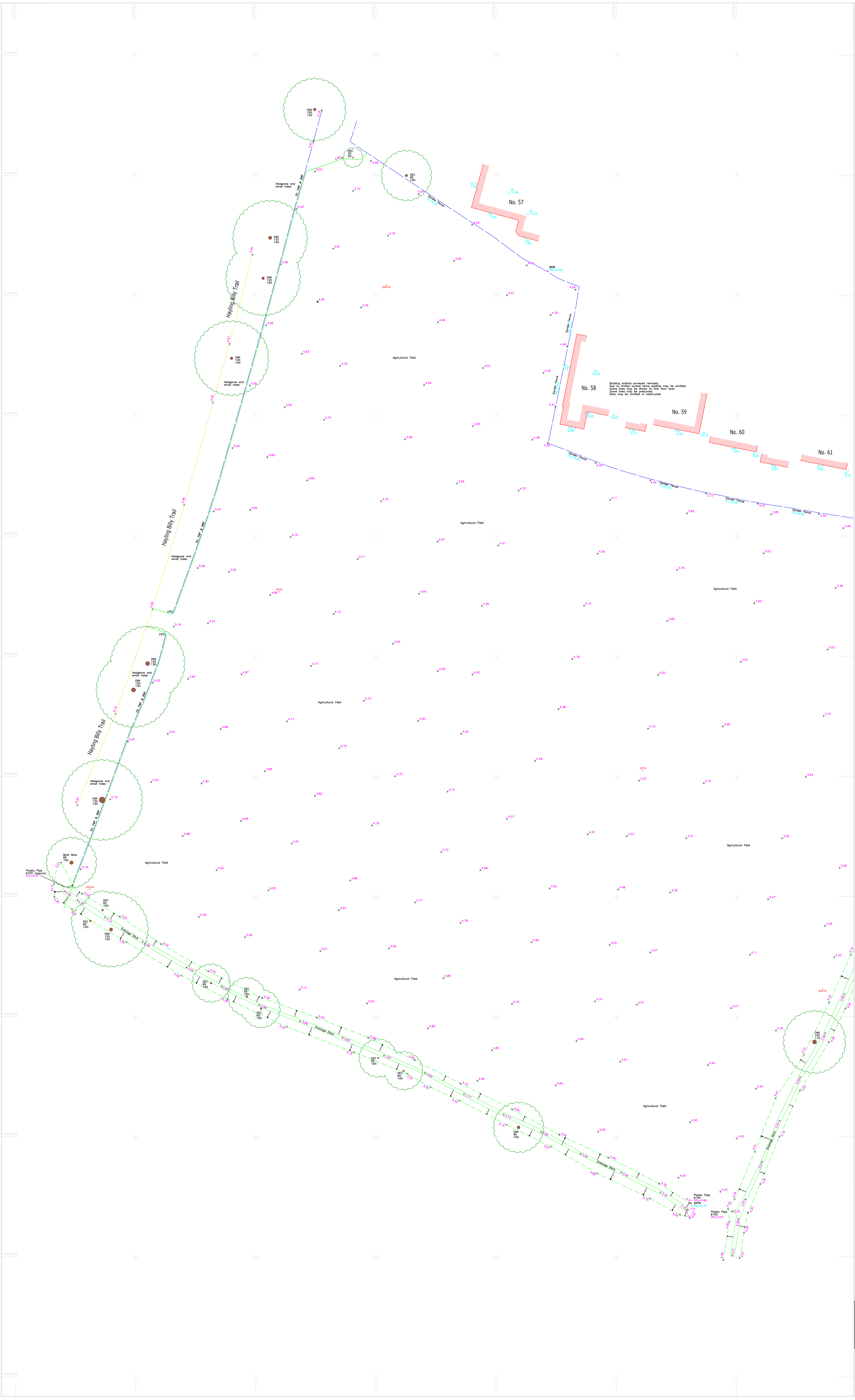
Drawing Title  
Site Location Plan

|            |               |          |          |
|------------|---------------|----------|----------|
| Date       | Scale         | Drawn by | Check by |
| 08/03/2021 | 1:1,250 at A3 | ML       | SR       |
| Project No | Drawing No    | Revision |          |
| 1240       | 001           | -        |          |

Mosaic

## Appendix B

### Topographical Survey



## Notes

- The survey grid is a local grid, coincident with Ordnance Survey National Grid at 35 TN.
- Surveyed boundary features are not necessarily legal boundaries.
- Dimensions should not be scaled. All dimensions should be checked on site before any fabrication / construction.
- Copyright of all data produced by Technics Group shall remain with Technics Group unless otherwise specifically agreed.
- Information provided should not be altered or modified in any way. It should not be used for any purpose other than for which it was intended and should not be issued to other parties without prior agreement of Technics Group.
- Technics Group cannot accept responsibility for any damage to computer systems which may result from viruses which may be contained in the data provided.
- If the AutoCAD drawing is being read by any system other than AutoCAD it should be checked against a hard copy. Technics Group cannot accept liability for omissions.
- All utilities have been identified to the best of the surveyors knowledge. The correct identification of the utility types can not be 100% guaranteed, therefore these should be independently verified prior to use in any design and building works.
- External levels are surveyed to lowest of position.

## Level Datum

ALL LEVELS ARE ORTHOMETRIC HEIGHTS RELATED TO OSBM15 GPS DATUM, COMPUTED USING LEICA SMARTNET RTK NETWORK.

## Topo Key

| STREET FURNITURE   | LEVELS & DEPTHS    | INSPECTION CHAMBERS |
|--------------------|--------------------|---------------------|
| AL Alder           | AL Alder           | AL Alder            |
| BE Beech           | BE Beech           | BE Beech            |
| CH Cherry          | CH Cherry          | CH Cherry           |
| CO Cornus          | CO Cornus          | CO Cornus           |
| CY Cypress         | CY Cypress         | CY Cypress          |
| DE Deciduous       | DE Deciduous       | DE Deciduous        |
| EU Eucalyptus      | EU Eucalyptus      | EU Eucalyptus       |
| FR Fruit           | FR Fruit           | FR Fruit            |
| HA Hawthorn        | HA Hawthorn        | HA Hawthorn         |
| HB Hornbeam        | HB Hornbeam        | HB Hornbeam         |
| HC Horse Chestnut  | HC Horse Chestnut  | HC Horse Chestnut   |
| HL Holly           | HL Holly           | HL Holly            |
| HZ Hazel           | HZ Hazel           | HZ Hazel            |
| LA Larch           | LA Larch           | LA Larch            |
| LB Laburnum        | LB Laburnum        | LB Laburnum         |
| LM Lime            | LM Lime            | LM Lime             |
| LO Lonicera        | LO Lonicera        | LO Lonicera         |
| LU Laurel          | LU Laurel          | LU Laurel           |
| MA Maple           | MA Maple           | MA Maple            |
| MG Magnolia        | MG Magnolia        | MG Magnolia         |
| MS Norway Spruce   | MS Norway Spruce   | MS Norway Spruce    |
| PI Pine            | PI Pine            | PI Pine             |
| PR Privet          | PR Privet          | PR Privet           |
| PL Plane           | PL Plane           | PL Plane            |
| RH Rhododendron    | RH Rhododendron    | RH Rhododendron     |
| RO Rowan           | RO Rowan           | RO Rowan            |
| SAP Sallow         | SAP Sallow         | SAP Sallow          |
| SL Silver Birch    | SL Silver Birch    | SL Silver Birch     |
| SCN Sweet Chestnut | SCN Sweet Chestnut | SCN Sweet Chestnut  |
| SHR Shrub          | SHR Shrub          | SHR Shrub           |
| ST Shrub           | ST Shrub           | ST Shrub            |
| SY Sycamore        | SY Sycamore        | SY Sycamore         |
| WB Willow          | WB Willow          | WB Willow           |
| WG Wallingford     | WG Wallingford     | WG Wallingford      |
| WIL Willow         | WIL Willow         | WIL Willow          |
| WN Walnut          | WN Walnut          | WN Walnut           |
| PL Plane           | PL Plane           | PL Plane            |

## Symbology

|             |             |         |         |                      |                |
|-------------|-------------|---------|---------|----------------------|----------------|
| Single Gate | Double Gate | Banking | Step Up | Diameter shown in mm | Survey Station |
| Single Gate | Double Gate | Banking | Step Up | Diameter shown in mm | Survey Station |
| Single Gate | Double Gate | Banking | Step Up | Diameter shown in mm | Survey Station |
| Single Gate | Double Gate | Banking | Step Up | Diameter shown in mm | Survey Station |
| Single Gate | Double Gate | Banking | Step Up | Diameter shown in mm | Survey Station |

## Trees

| SPECIES ABBREVIATION | SPECIES ABBREVIATION | SPECIES ABBREVIATION |
|----------------------|----------------------|----------------------|
| AL Alder             | HL Holly             | RH Rhododendron      |
| BE Beech             | HZ Hazel             | RO Rowan             |
| CH Cherry            | LA Larch             | SAP Sallow           |
| CO Cornus            | LB Laburnum          | SL Silver Birch      |
| CY Cypress           | LM Lime              | SCN Sweet Chestnut   |
| DE Deciduous         | LO Lonicera          | SHR Shrub            |
| EU Eucalyptus        | LU Laurel            | ST Shrub             |
| FR Fruit             | MA Maple             | SY Sycamore          |
| HA Hawthorn          | MG Magnolia          | WB Willow            |
| HB Hornbeam          | MS Norway Spruce     | WG Wallingford       |
| HC Horse Chestnut    | PI Pine              | WIL Willow           |
|                      | PR Privet            | WN Walnut            |
|                      | PL Plane             |                      |

- NOTES:
- The tree species have been identified to the best of the surveyors knowledge. They have not been verified by an arborist and are not guaranteed. If they are important they should be verified.
  - The heights are estimated.
  - A CAD layer exists with the full tree canopies intact which is turned off.
  - Trees with bole diameters below the specified minimum size may not have been surveyed.
  - Multiple sizes are indicative.

| NAME  | Easting    | Northing   | Height |
|-------|------------|------------|--------|
| 15TN  | 471352.889 | 100208.049 | 4.516  |
| 25TN  | 471352.177 | 100211.211 | 4.295  |
| 35TN  | 471352.177 | 100211.211 | 4.295  |
| 45TN  | 471352.889 | 100208.049 | 4.516  |
| 55TN  | 471352.889 | 100208.049 | 4.516  |
| 65TN  | 471352.889 | 100208.049 | 4.516  |
| 75TN  | 471352.889 | 100208.049 | 4.516  |
| 85TN  | 471352.889 | 100208.049 | 4.516  |
| 95TN  | 471352.889 | 100208.049 | 4.516  |
| 105TN | 471352.889 | 100208.049 | 4.516  |

CLIENT

Hayling Island Builders Limited

SITE

Parcel 2  
Land South of Saltmarsh Lane  
Hayling Island PO11 0JT

DRAWING TITLE

Topographical Survey

PROJECT NUMBER

SP21219

DRAWING NUMBER

SD21219-01

DATE

Mar 2021

SURVEYED BY

CJ

DRAWN BY

CJ

CHECKED BY

CJ

SCALE

1:200

SHEET SIZE

A0

SHEET

3 OF 4

Technics

Geospatial Consultant - Surveys

Technics Group  
Technics House  
Marrow Business Park  
Guildford  
Surrey, GU4 7WA

T: 01483 230 080  
E: info@technicsgroup.com  
W: technicsgroup.com

ICCS

INTEGRATED SURVEILLANCE

CONSTRUCTION



## Appendix C

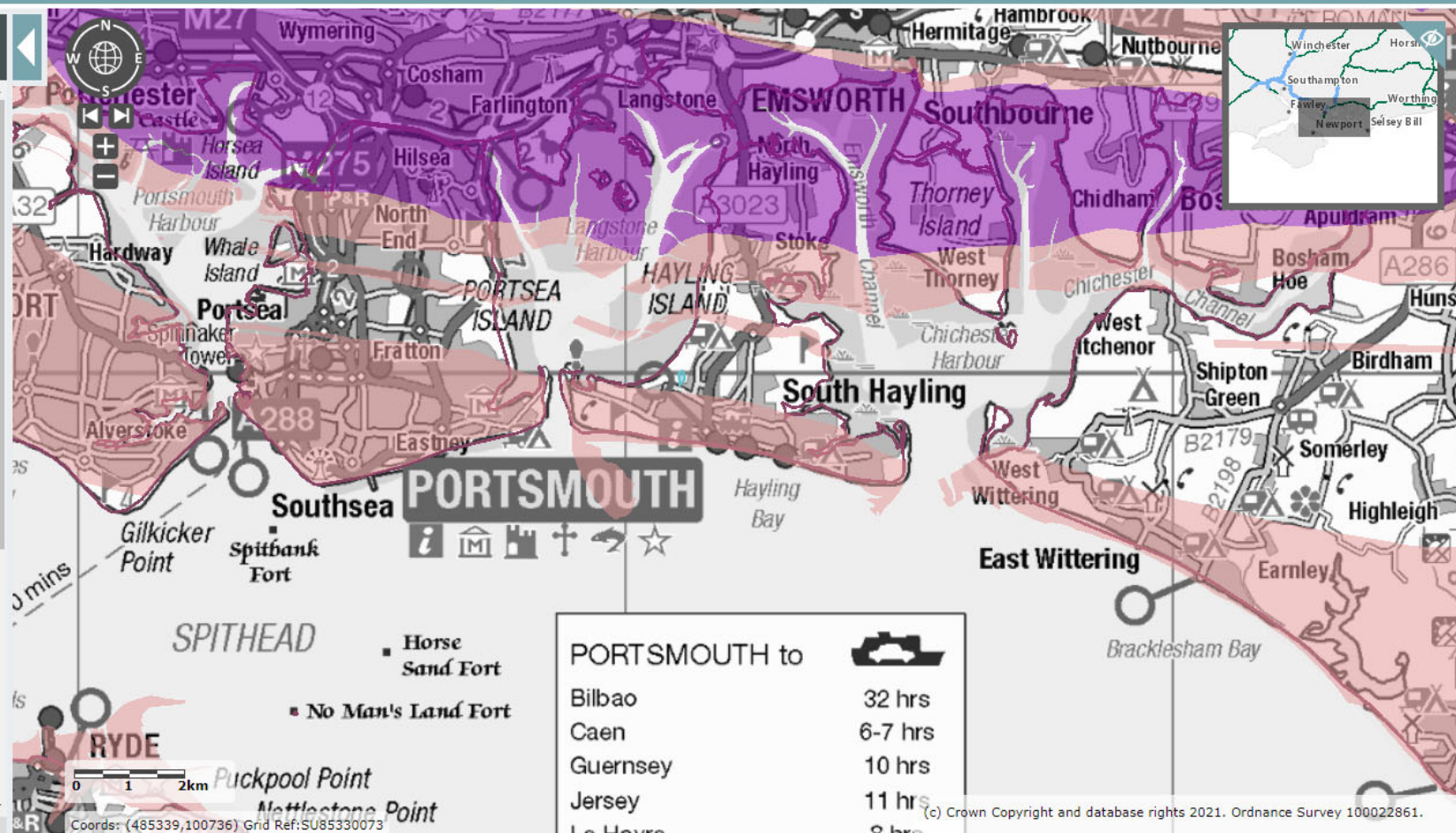
### Magic Map Geology Information

## Table of Contents

- ☐ Access
- ☐ Administrative Geographies
- ☐ Countryside Stewardship Targeting & Scoring Layers
- ☐ Designations
- ☐ Habitats and Species
- ☐ Land Based Schemes
- ☒ Landscape

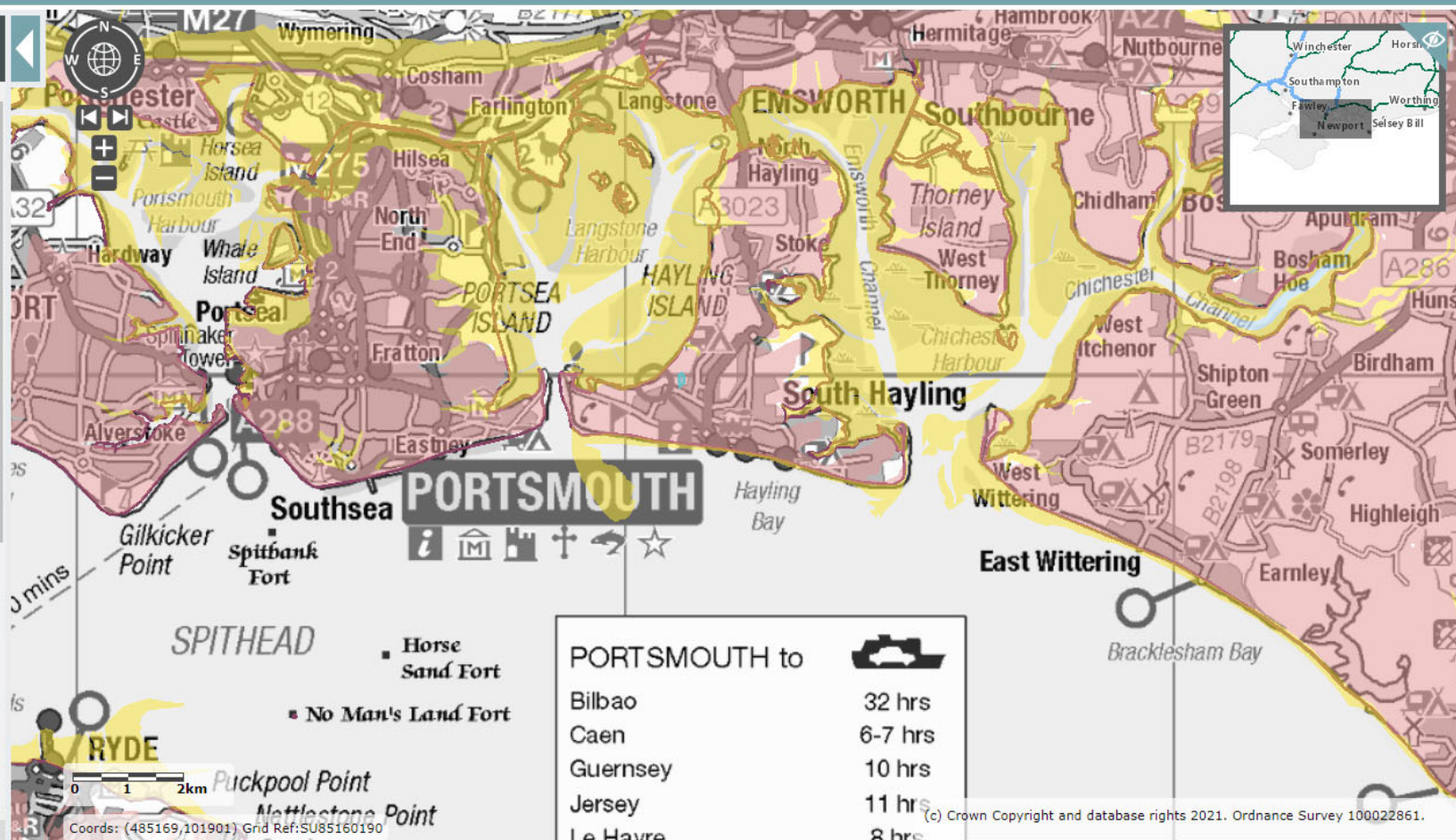
☒ Geology and Soils☒ Aquifer Designation Map (Bedrock) (England)

- Principal
- Secondary A
- Secondary B
- Secondary (undifferentiated)
- Unproductive

☐ Aquifer Designation Map (Superficial Drift) (England)☐ Groundwater Vulnerability Map (England)☐ Geological Places to Visit (England)☐ Geological Descriptions

## Table of Contents

- ☐ Access
- ☐ Administrative Geographies
- ☐ Countryside Stewardship Targeting & Scoring Layers
- ☐ Designations
- ☐ Habitats and Species
- ☐ Land Based Schemes
- ☒ Landscape
- ☒ Geology and Soils
  - ☐ Aquifer Designation Map (Bedrock) (England)
  - ☒ Aquifer Designation Map (Superficial Drift) (England)
  - ☐ Principal
  - ☐ Secondary A
  - ☐ Secondary B
  - ☐ Secondary (undifferentiated)
  - ☐ Unknown (lakes+landslip)
  - ☐ Unproductive
  - ☐ Groundwater Vulnerability Map (England)
  - ☐ Geological Places to Visit (England)



## Table of Contents

☐ Countryside Stewardship Targeting & Scoring Layers☐ Designations☐ Habitats and Species☐ Land Based Schemes☒ Landscape☒ Geology and Soils☐ Aquifer Designation Map (Bedrock) (England)☐ Aquifer Designation Map (Superficial Drift) (England)☒ Groundwater Vulnerability Map (England)

Local Information

Soluble Rock Risk

High

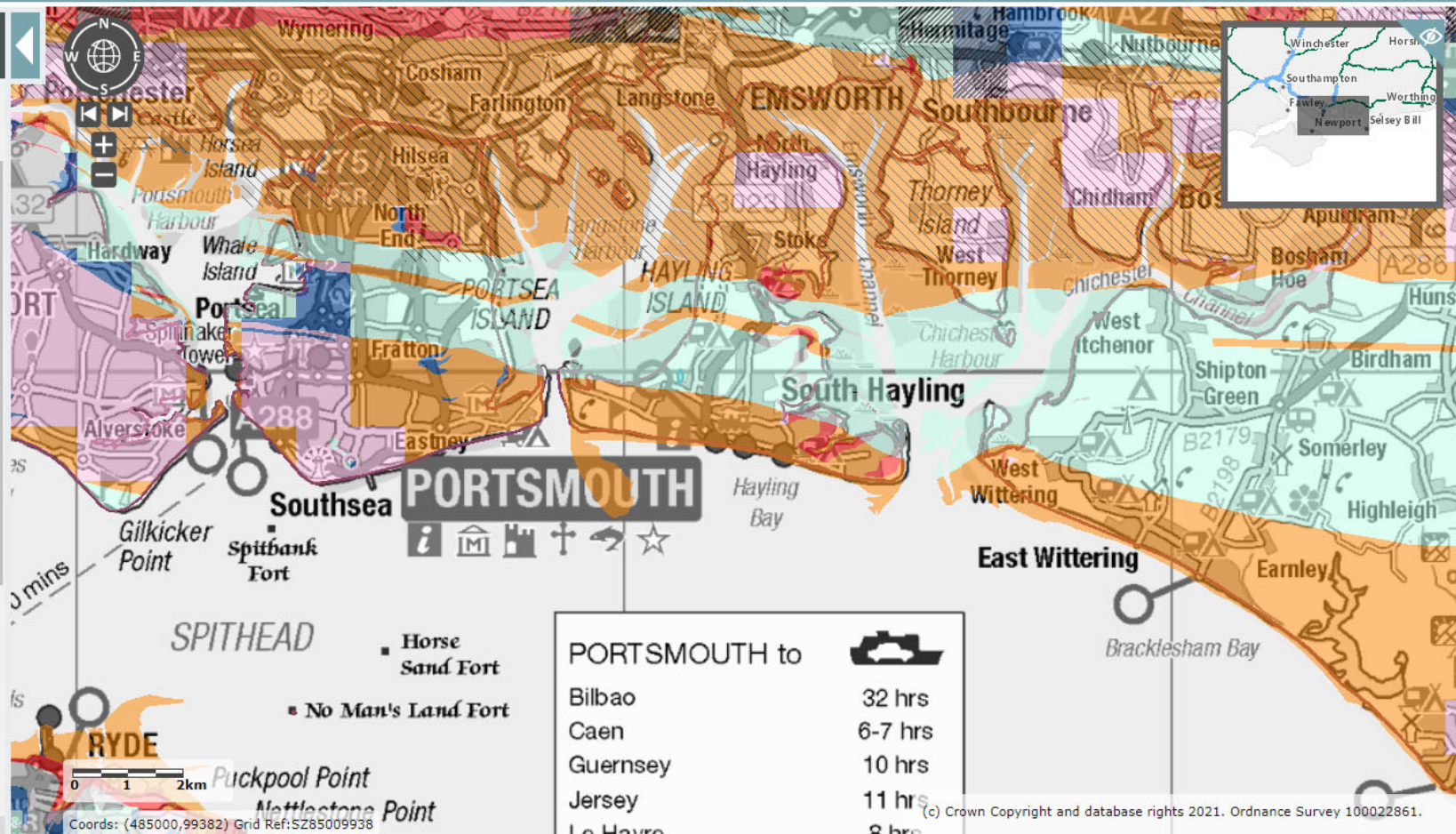
Medium - High

Medium

Medium - Low

Low

Unproductive

☐ Geological Places to Visit (England)☐ Geological Descriptions (England)

## PORTSMOUTH to

|          |         |
|----------|---------|
| Bilbao   | 32 hrs  |
| Caen     | 6-7 hrs |
| Guernsey | 10 hrs  |
| Jersey   | 11 hrs  |
| Le Havre | 8 hrs   |

(c) Crown Copyright and database rights 2021. Ordnance Survey 100022861.

## Appendix D

### Site Plan



0 50  
metres  
(1:1,250)

Site boundary 2.51ha (6.20acres)

Project  
Land South of Saltmarsh Lane

Drawing Title  
Illustrative Masterplan

|                    |                        |                |                   |
|--------------------|------------------------|----------------|-------------------|
| Date<br>07/10/2021 | Scale<br>1:1,250 at A3 | Drawn by<br>CT | Check by<br>SR/ML |
| Project No<br>1240 | Drawing No<br>005      | Revision<br>E  |                   |

Mosaic

## Appendix E

### Environment Agency Flood Map (For Planning)

# Flood map for planning

Your reference  
**A21079**

Location (easting/northing)  
**471268/100215**

Created  
**24 Mar 2021 12:57**

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

## This means:

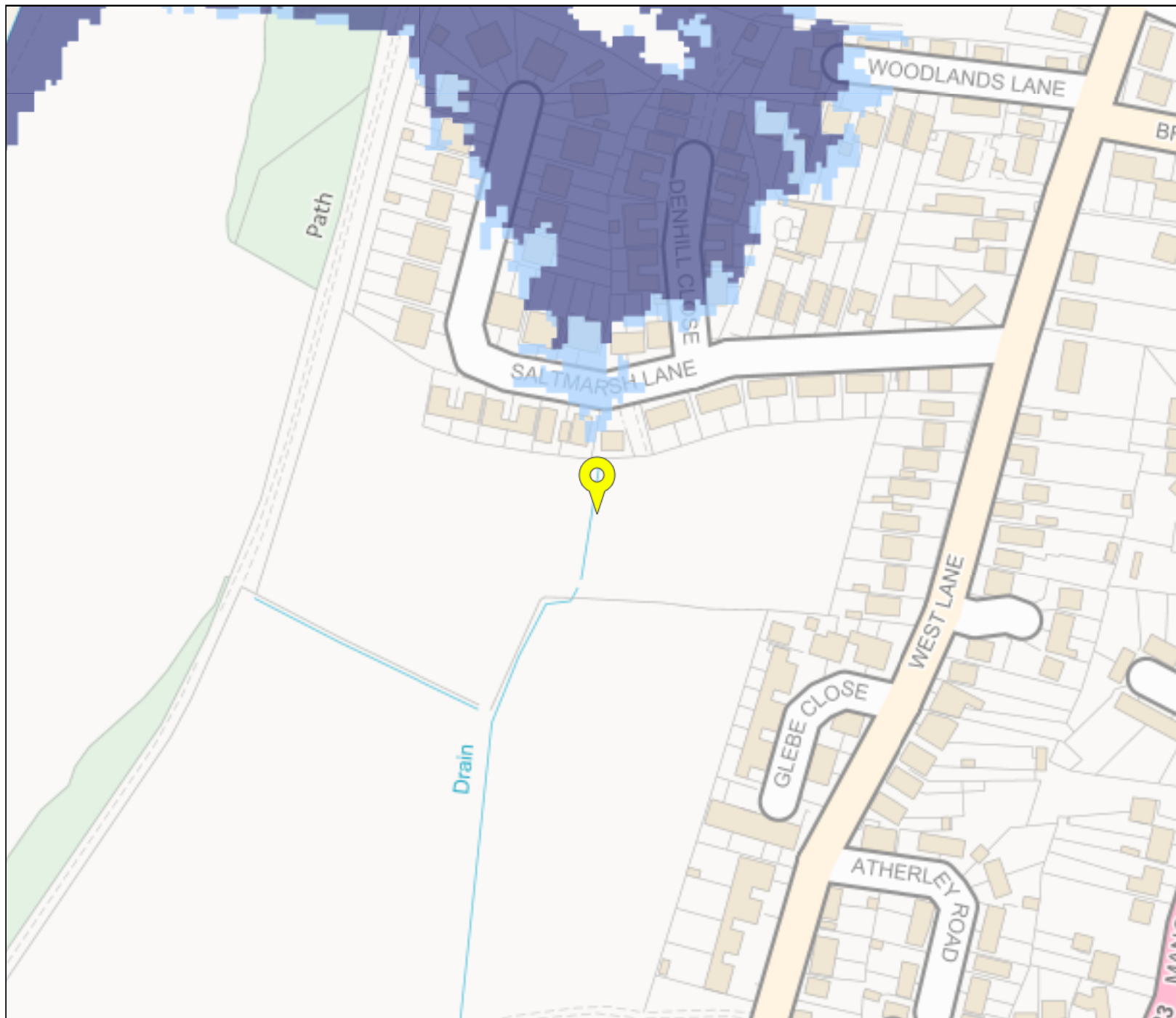
- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage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

## Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

The Open Government Licence sets out the terms and conditions for using government data.  
<https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>



## Flood map for planning

Your reference

**A21079**

Location (easting/northing)

**471268/100215**

Scale

**1:2500**

Created

**24 Mar 2021 12:57**

-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefitting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area

0 20 40 60m

## Appendix F

### Environment Agency Surface Water Flood Map

## Flood risk

Extent of flooding

## Location

Enter a place or postcode



Extent of flooding from surface water

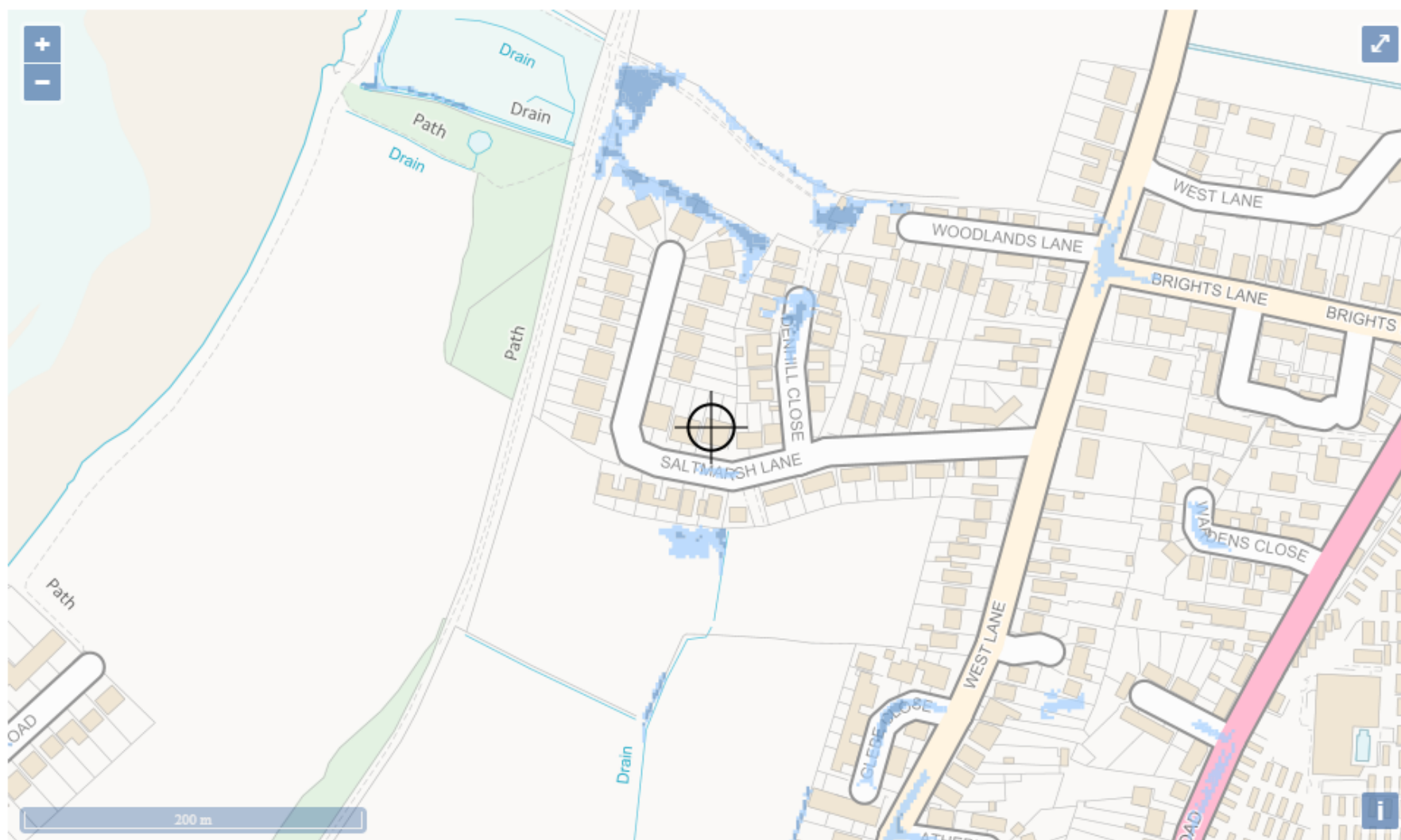
● High ● Medium ● Low ○ Very low ⊕ Location you selected

Flood risk

Medium risk: depth

Location

Enter a place or postcode



Surface water flood risk: water depth in a medium risk scenario

Flood depth (millimetres)

Over 900mm 300 to 900mm Below 300mm Location you selected

## Appendix G

### Hazard Technical Note

**SUPPLEMENTARY NOTE ON FLOOD HAZARD RATINGS AND THRESHOLDS**  
**FOR DEVELOPMENT PLANNING AND CONTROL PURPOSE**  
**– Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1.**

Suresh Surendran and Geoff Gibbs (Environment Agency),  
Steven Wade and Helen Udale-Clarke (HR Wallingford)  
May 2008

**Introduction**

This document is a supplementary note to reconcile information provided in the ‘Flood Risks to People Methodology’ (FD2321/TR1<sup>1</sup>) and the ‘Framework and Guidance for Assessing and Managing Flood Risk for New Development’ (FD2320/TR2<sup>2</sup>) reports about the Flood Hazard Rating. It has been produced because both PPS25 in England and TAN15 in Wales require that people should be appropriately safe around new development. The document emphasises that for FRAs and FCAs at all levels to inform development allocations and proposals the simplified approach of FD2320 with regard to flood hazard rating should be used rather than the approach in FD2321. Although the final version of FD2321/TR1 post-dates FD2320/TR2, the work presented actually pre-dates the guidance in FD2320/TR2. This supplementary guidance is issued for those involved in development planning and control and to clarify the detail or difference of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1.

FD2321/TR1 was a research project based on the detailed literature review and analysis of empirical evidence related to flood hazard, derived mainly from theoretical assumptions and some basic laboratory experiments. Factors that affected flood hazard and vulnerability were combined in a form of multi-criteria analysis that was used to identify the hot-spots and broadly estimate the probability of people seriously harmed and fatalities during the event of a flood. The multi-criteria method was calibrated to actual events, validated using data from seven flood events and shown to work well. The FD2321 (Risk to people) methodology illustrates the fundamental concepts and demonstrate how the approach could be used for different applications - it did not set a policy for flood hazard thresholds.

*(Nevertheless there are a number of assumptions used in the FD2321 methodology, particularly with respect to the impact of debris and people’s behaviour during flood events. There is a requirement for further research to collate more evidence on flood hazard, particularly the impacts of debris, and vulnerability in order to refine assumptions made in the flood hazard calculations, flood hazard thresholds and risks to people guidance. The study recommend more laboratory and field based tests on the impact of physical water quality aspect such as debris, mudflow; chemical and biological water quality that cause seriously harm or fatalities to people.)*

---

<sup>1</sup> Defra and Agency (2006) *The Flood Risks to People Methodology*, Flood Risks to People Phase 2, FD2321 Technical Report 1, HR Wallingford et al. did the report for Defra/EA Flood and Coastal Defence R&D Programme, March 2006.

([http://sciencesearch.defra.gov.uk/Document.aspx?Document=FD2321\\_3436\\_TRP.pdf](http://sciencesearch.defra.gov.uk/Document.aspx?Document=FD2321_3436_TRP.pdf))

<sup>2</sup> Defra and Agency (2005) *Framework and Guidance for Assessing and Managing Flood Risk for New Development*, Flood Risk Assessment Guidance for New Development, FD2320 Technical Report 2, HR Wallingford et al. did the report for Defra/EA Flood and Coastal Defence R&D Programme, October 2005. ([http://sciencesearch.defra.gov.uk/Document.aspx?Document=FD2320\\_3364\\_TRP.pdf](http://sciencesearch.defra.gov.uk/Document.aspx?Document=FD2320_3364_TRP.pdf))

FD2320/TR2 (FRA guidance for new development) provides guidance that is a specific interpretation of the methodology developed under FD2321, within the context of development planning and control. Based on FD2320 consultation workshops, the project board (key users and experts) advised the project team to provide a simple methodology. Due to uncertainties and limitations related to estimating risks to people, FD2320 adopted a precautionary approach, particularly with respect to the selection of debris factors and flood hazard thresholds

### **Risk to People (Ninj)**

$$\mathbf{Ninj} = \mathbf{Nz} \times \mathbf{Flood\ Hazard\ Rating} \times \mathbf{Area\ Vulnerability} \times \mathbf{People\ Vulnerability}$$

where,

Ninj (Risk to People) = number of injuries within a particular hazard ‘zone’;

Nz = number of people within the hazard zone (at ground/basement level);

Flood Hazard Rating = HR = function of flood depth/velocity (within the hazard zone being considered) and debris factor;

Area Vulnerability = function of effectiveness of flood warning, speed of onset of flooding and nature of area (including types of buildings); and

People Vulnerability = function of presence of people who are very old and/or infirm/disabled/long-term sick

### **Flood Hazard Rating (HR) and thresholds**

The revised ‘hazard rating’ expression based primarily, on consideration to the direct risks of people exposed to floodwaters.

$$\mathbf{HR} = \mathbf{d} \times (\mathbf{v} + \mathbf{n}) + \mathbf{DF}$$

where, HR = (flood) hazard rating;

d = depth of flooding (m);

v = velocity of floodwaters (m/sec); and

DF = debris factor ( 0, 0.5, 1 depending on probability that debris will lead to a hazard)

n = a constant of 0.5

This final revised Flood Hazard Rating formula from the Flood Risks to People project is presented on page 10 (section 3.5) of FD2321/TR1. The formula is identical in both FD2320 and FD2321 reports.

Based on Table 3.2 of FD2321, the Figure 3.2 of FD2321 illustrates the “Hazard to People Classifications” as a function of depth, velocity and debris factor. Such categorisation and the look-up table with flood hazard threshold could be useful for a range of application as an initial indication of Risks to People.

In this case (Figure 3.2 of FD2321) the calculation takes a debris factor as zero

$$(\mathbf{HR} = \mathbf{d} \times (\mathbf{v} + \mathbf{0.5}) + \mathbf{0}).$$

However FD2321 strongly recommends the use of the debris factor and the formulas described in the Guidance Document for further calculation. The Table 3.1 of FD2321/TR1 (Table 1 of this note) suggests appropriate debris factors for different depths, velocities and the dominant land use.

Table 1: Guidance on debris factors for different flood depths, velocities and dominant land uses. (Source FD2321 Table 3.1):

| Depths (d)          | Pasture/Arable | Woodland | Urban |
|---------------------|----------------|----------|-------|
| 0 to 0.25 m         | 0              | 0        | 0     |
| 0.25 to 0.75 m      | 0              | 0.5      | 1     |
| d>0.75 m and/or v>2 | 0.5            | 1        | 1     |

### **The way that Flood Hazard Rating and thresholds have been presented in Table 13.1 in FD2320/TR2 compared to Figure 3.2 of FD2321/TR1**

A concern was raised in the FD2320 consultation workshops and by the FD2320 Project Board during discussions on FD2321, that the methodology was complex and the results presented in the Figure 3.2 of FD2321 were not reflecting the potential risk to people (as this table was of hazard rating for different depths and velocity without debris). There was a need for further work to include debris, area vulnerability and people vulnerability aspects. They requested a simpler single table to represent the risk to people.

For example Figure 3.2 of FD2321 did not reflect the fact that there is a risk from drowning even at low depths and velocities. In reality FD2321/TR1 recognises this but only in the subsequent “people vulnerability” calculation (risk to children, old, sick and disable). For still water up to 1.25m depth, the Figure 3.2 of FD2321/TR1 assumes that there is low hazard, if there are no debris or vulnerable group. However to avoid further calculation, but include the vulnerability aspect the Table 13.1 of FD2320 for still water with the depths between 0.25–1.25m were reclassified as “danger to some”, which was felt to be more appropriate for development planning and control, where users may make use of flood hazard without completing the more complex full calculations including people and area vulnerability.

Similarly Figure 3.2 of FD2321/TR1 shows that at the depth of 0.25m, if there is no debris then up to the flow velocity of 2.0 m/sec there would be low hazard. However FD2321/TR1 suggests the usage of an appropriate debris factor dependent on depth, velocity and the dominant land use. To make the process simpler (whatever the land use), FD2320/TR2 includes a default debris factor. In the Table 13.1 of FD2320/TR2 a debris factor of 0.5 has been applied for depths less than and equal to 0.25m and a debris factor of 1.0 has been used for depths greater than 0.25m. Therefore, in the Table 13.1 of FD2320/TR2 at the depth of 0.25m, up to the flow velocity of 0.30 m/sec is treated as low hazard.

Table 3.2 of FD2321/TR1 (Table 2 of this note) provides thresholds for classifying the hazard to people. In the FD2321/TR1 report the threshold between “danger for most” and “danger for all” is 2.5 and it was used as an initial indication of Risk to People (further calculation is recommended using the formulas). However as there is no further analysis in FD2320 but the Project Board decided that the threshold between “danger for most” and “danger for all” should be more precautionary and a Flood Hazard Rating of 2.0 is selected as a key threshold. i.e. In FD2321 the threshold for “danger for all” is 2.5 and it lowered to 2.0 in FD2320. Therefore, the Flood Hazard Rating between 2.0 to 2.5 in FD2320 is not classified as it is in FD2321.

Table 2: Hazard to People (Source Table 3.2 in FD2321/TR1)

| Thresholds for Flood Hazard Rating<br>$H = d \times (v + 0.5) + DF$ |             | Degree of Flood Hazard | Description                                                                                      |
|---------------------------------------------------------------------|-------------|------------------------|--------------------------------------------------------------------------------------------------|
| FD2321                                                              | FD2320      |                        |                                                                                                  |
| <0.75                                                               | <0.75       | Low                    | <b>Caution</b> - "Flood zone with shallow flowing water or deep standing water"                  |
| 0.75 - 1.25                                                         | 0.75 - 1.25 | Moderate               | <b>Dangerous for some (i.e. children)</b> - "Danger: Flood zone with deep or fast flowing water" |
| 1.25 - 2.5                                                          | 1.25 - 2.0  | Significant            | <b>Dangerous for most people</b> - "Danger: flood zone with deep fast flowing water"             |
| >2.5                                                                | >2.0        | Extreme                | <b>Dangerous for all</b> - "Extreme danger: flood zone with deep fast flowing water"             |

The final difference between Table 13.1 in FD2320/TR2 and Figure 3.2 of FD2321/TR1 is the use of smaller increments of depth, so that lower depths are presented more fully in FD2320/TR2. This was felt to be more helpful for identifying what might be judged as acceptable depending on site specific circumstances.

### Conclusions

Table 13.1 of FD2320 and Figure 3.2 of FD2321 look very similar but there are significant differences (see Table 3 of this paper). Either Table/Figure can be used as the basis for assessing the risks to people associated with different flood depths velocities and debris factors.

Table 3: comparison of Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1

|                                                             | In Table 13.1 of FD2320/TR2                                                                                                      | In Figure 3.2 of FD2321/TR1                                                                                                                      |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| The depths above 0.25m                                      | Danger for some, most or all                                                                                                     | For still water, up to 1.25m the hazard is low (In addition to hazard rating further calculation to include vulnerability aspect is recommended) |
| Debris factor                                               | Debris factor of 0.5 has been applied for depths $\leq 0.25m$ and a debris factor of 1.0 has been used for depths $\geq 0.25m$ . | In this case a Debris factor of zero applied (in addition to this further calculation is recommended using debris factor and the formulas)       |
| HR Thresholds for "Dangerous for all" hazard classification | >2.0 (precautionary due to uncertainties and to avoid further calculation as FD2321)                                             | >2.5                                                                                                                                             |
| Increments of depth                                         | Small increments at lower depths                                                                                                 | Every 0.25 m                                                                                                                                     |

Table 13.1 of FD2320/TR2 is a simple method applies the precautionary principle and uses suitable assumptions (so that there is no need for further calculations) for application in the development planning and control context (see Table 4 of this paper - an extended version of table 13.1).

**This table is recommended for development planning and control use.**

**Table 4 – Hazard to People Classification using Hazard Rating ( $HR = d \times (v + 0.5) + DF$ ) for (Source Table 13.1 of FD2320/TR2 - Extended version)**

| HR                              | Depth of flooding - d (m)   |                             |                             |                                                                 |                             |                             |                             |                             |                             |                             |                             |                             |                             |
|---------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------------------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
|                                 | DF = 0.5                    |                             |                             |                                                                 | DF = 1                      |                             |                             |                             |                             |                             |                             |                             |                             |
| Velocity<br>v (m/s)             | 0.05                        | 0.10                        | 0.20                        | 0.25                                                            | 0.30                        | 0.40                        | 0.50                        | 0.60                        | 0.80                        | 1.00                        | 1.50                        | 2.00                        | 2.50                        |
| 0.0                             | 0.03 + 0.5 =<br><b>0.53</b> | 0.05 + 0.5 =<br><b>0.55</b> | 0.10 + 0.5 =<br><b>0.60</b> | 0.13 + 0.5 =<br><b>0.63</b>                                     | 0.15 + 1.0 =<br><b>1.15</b> | 0.20 + 1.0 =<br><b>1.20</b> | 0.25 + 1.0 =<br><b>1.25</b> | 0.30 + 1.0 =<br><b>1.30</b> | 0.40 + 1.0 =<br><b>1.40</b> | 0.50 + 1.0 =<br><b>1.50</b> | 0.75 + 1.0 =<br><b>1.75</b> | 1.00 + 1.0 =<br><b>2.00</b> | 1.25 + 1.0 =<br><b>2.25</b> |
| 0.1                             | 0.03 + 0.5 =<br><b>0.53</b> | 0.06 + 0.5 =<br><b>0.56</b> | 0.12 + 0.5 =<br><b>0.62</b> | 0.15 + 0.5 =<br><b>0.65</b>                                     | 0.18 + 1.0 =<br><b>1.18</b> | 0.24 + 1.0 =<br><b>1.24</b> | 0.30 + 1.0 =<br><b>1.30</b> | 0.36 + 1.0 =<br><b>1.36</b> | 0.48 + 1.0 =<br><b>1.48</b> | 0.60 + 1.0 =<br><b>1.60</b> | 0.90 + 1.0 =<br><b>1.90</b> | 1.20 + 1.0 =<br><b>2.20</b> | 1.50 + 1.0 =<br><b>2.55</b> |
| 0.3                             | 0.04 + 0.5 =<br><b>0.54</b> | 0.08 + 0.5 =<br><b>0.58</b> | 0.15 + 0.5 =<br><b>0.65</b> | 0.19 + 0.5 =<br><b>0.69</b>                                     | 0.23 + 1.0 =<br><b>1.23</b> | 0.30 + 1.0 =<br><b>1.30</b> | 0.38 + 1.0 =<br><b>1.38</b> | 0.45 + 1.0 =<br><b>1.45</b> | 0.60 + 1.0 =<br><b>1.60</b> | 0.75 + 1.0 =<br><b>1.75</b> | 1.13 + 1.0 =<br><b>2.13</b> | 1.50 + 1.0 =<br><b>2.50</b> | 1.88 + 1.0 =<br><b>2.88</b> |
| 0.5                             | 0.05 + 0.5 =<br><b>0.55</b> | 0.10 + 0.5 =<br><b>0.60</b> | 0.20 + 0.5 =<br><b>0.70</b> | 0.25 + 0.5 =<br><b>0.75</b>                                     | 0.30 + 1.0 =<br><b>1.30</b> | 0.40 + 1.0 =<br><b>1.40</b> | 0.50 + 1.0 =<br><b>1.50</b> | 0.60 + 1.0 =<br><b>1.60</b> | 0.80 + 1.0 =<br><b>1.80</b> | 1.00 + 1.0 =<br><b>2.00</b> | 1.50 + 1.0 =<br><b>2.50</b> | 2.00 + 1.0 =<br><b>3.00</b> | 2.50 + 1.0 =<br><b>3.50</b> |
| 1.0                             | 0.08 + 0.5 =<br><b>0.58</b> | 0.15 + 0.5 =<br><b>0.65</b> | 0.30 + 0.5 =<br><b>0.80</b> | 0.38 + 0.5 =<br><b>0.88</b>                                     | 0.45 + 1.0 =<br><b>1.45</b> | 0.60 + 1.0 =<br><b>1.60</b> | 0.75 + 1.0 =<br><b>1.75</b> | 0.90 + 1.0 =<br><b>1.90</b> | 1.20 + 1.0 =<br><b>2.20</b> | 1.50 + 1.0 =<br><b>2.50</b> | 2.25 + 1.0 =<br><b>3.25</b> | 3.00 + 1.0 =<br><b>4.00</b> | 3.75 + 1.0 =<br><b>4.75</b> |
| 1.5                             | 0.10 + 0.5 =<br><b>0.60</b> | 0.20 + 0.5 =<br><b>0.70</b> | 0.40 + 0.5 =<br><b>0.90</b> | 0.50 + 0.5 =<br><b>1.00</b>                                     | 0.60 + 1.0 =<br><b>1.60</b> | 0.80 + 1.0 =<br><b>1.80</b> | 1.00 + 1.0 =<br><b>2.00</b> | 1.20 + 1.0 =<br><b>2.20</b> | 1.60 + 1.0 =<br><b>2.60</b> | 2.00 + 1.0 =<br><b>3.00</b> | 3.00 + 1.0 =<br><b>4.00</b> | 4.00 + 1.0 =<br><b>5.00</b> | 5.00 + 1.0 =<br><b>6.00</b> |
| 2.0                             | 0.13 + 0.5 =<br><b>0.63</b> | 0.25 + 0.5 =<br><b>0.75</b> | 0.50 + 0.5 =<br><b>1.00</b> | 0.63 + 0.5 =<br><b>1.13</b>                                     | 0.75 + 1.0 =<br><b>1.75</b> | 1.00 + 1.0 =<br><b>2.00</b> | 1.25 + 1.0 =<br><b>2.25</b> | 1.50 + 1.0 =<br><b>2.50</b> | 2.00 + 1.0 =<br><b>3.00</b> | 3.50                        | 4.75                        | 6.00                        | 7.25                        |
| 2.5                             | 0.15 + 0.5 =<br><b>0.65</b> | 0.30 + 0.5 =<br><b>0.80</b> | 0.60 + 0.5 =<br><b>1.10</b> | 0.75 + 0.5 =<br><b>1.25</b>                                     | 0.90 + 1.0 =<br><b>1.90</b> | 1.20 + 1.0 =<br><b>2.20</b> | 1.50 + 1.0 =<br><b>2.50</b> | 1.80 + 1.0 =<br><b>2.80</b> | 3.40                        | 4.00                        | 5.50                        | 7.00                        | 8.50                        |
| 3.0                             | 0.18 + 0.5 =<br><b>0.68</b> | 0.35 + 0.5 =<br><b>0.85</b> | 0.70 + 0.5 =<br><b>1.20</b> | 0.88 + 0.5 =<br><b>1.38</b>                                     | 1.05 + 1.0 =<br><b>2.05</b> | 1.40 + 1.0 =<br><b>2.40</b> | 1.75 + 1.0 =<br><b>2.75</b> | 3.10                        | 3.80                        | 4.50                        | 6.25                        | 8.00                        | 9.75                        |
| 3.5                             | 0.20 + 0.5 =<br><b>0.70</b> | 0.40 + 0.5 =<br><b>0.90</b> | 0.80 + 0.5 =<br><b>1.30</b> | 1.00 + 0.5 =<br><b>1.50</b>                                     | 1.20 + 1.0 =<br><b>2.20</b> | 1.60 + 1.0 =<br><b>2.60</b> | 3.00                        | 3.40                        | 4.20                        | 5.00                        | 7.00                        | 9.00                        | 11.00                       |
| 4.0                             | 0.23 + 0.5 =<br><b>0.73</b> | 0.45 + 0.5 =<br><b>0.95</b> | 0.90 + 0.5 =<br><b>1.40</b> | 1.13 + 0.5 =<br><b>1.63</b>                                     | 1.35 + 1.0 =<br><b>2.35</b> | 1.80 + 1.0 =<br><b>2.80</b> | 3.25                        | 3.70                        | 4.60                        | 5.50                        | 7.75                        | 10.00                       | 12.25                       |
| 4.5                             | 0.25 + 0.5 =<br><b>0.75</b> | 0.50 + 0.5 =<br><b>1.00</b> | 1.00 + 0.5 =<br><b>1.50</b> | 1.25 + 0.5 =<br><b>1.75</b>                                     | 1.50 + 1.0 =<br><b>2.50</b> | 2.00 + 1.0 =<br><b>3.00</b> | 3.50                        | 4.00                        | 5.00                        | 6.00                        | 8.50                        | 11.00                       | 13.50                       |
| 5.0                             | 0.28 + 0.5 =<br><b>0.78</b> | 0.60 + 0.5 =<br><b>1.10</b> | 1.10 + 0.5 =<br><b>1.60</b> | 1.38 + 0.5 =<br><b>1.88</b>                                     | 1.65 + 1.0 =<br><b>2.65</b> | 3.20                        | 3.75                        | 4.30                        | 5.40                        | 6.50                        | 9.25                        | 12.00                       | 14.75                       |
| <b>Flood Hazard Rating (HR)</b> |                             | <b>Colour Code</b>          |                             | <b>Hazard to People Classification</b>                          |                             |                             |                             |                             |                             |                             |                             |                             |                             |
| Less than 0.75                  |                             |                             |                             | Very low hazard - Caution                                       |                             |                             |                             |                             |                             |                             |                             |                             |                             |
| 0.75 to 1.25                    |                             |                             |                             | Danger for some – includes children, the elderly and the infirm |                             |                             |                             |                             |                             |                             |                             |                             |                             |
| 1.25 to 2.0                     |                             |                             |                             | Danger for most – includes the general public                   |                             |                             |                             |                             |                             |                             |                             |                             |                             |
| More than 2.0                   |                             |                             |                             | Danger for all – includes the emergency services                |                             |                             |                             |                             |                             |                             |                             |                             |                             |

## UK locations:

---

London

Huddersfield

Birmingham

**Guildford**

## International locations:

---

Dubai



**Telephone** +44 (0)1276 700 400

**Email** [guildford@patrickparsons.co.uk](mailto:guildford@patrickparsons.co.uk)

**Online** [patrickparsons.co.uk](http://patrickparsons.co.uk)