

Flood Risk Assessment

19 South Street, Havant, PO9 1BU

Mr S Schrier

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V2 May 2022

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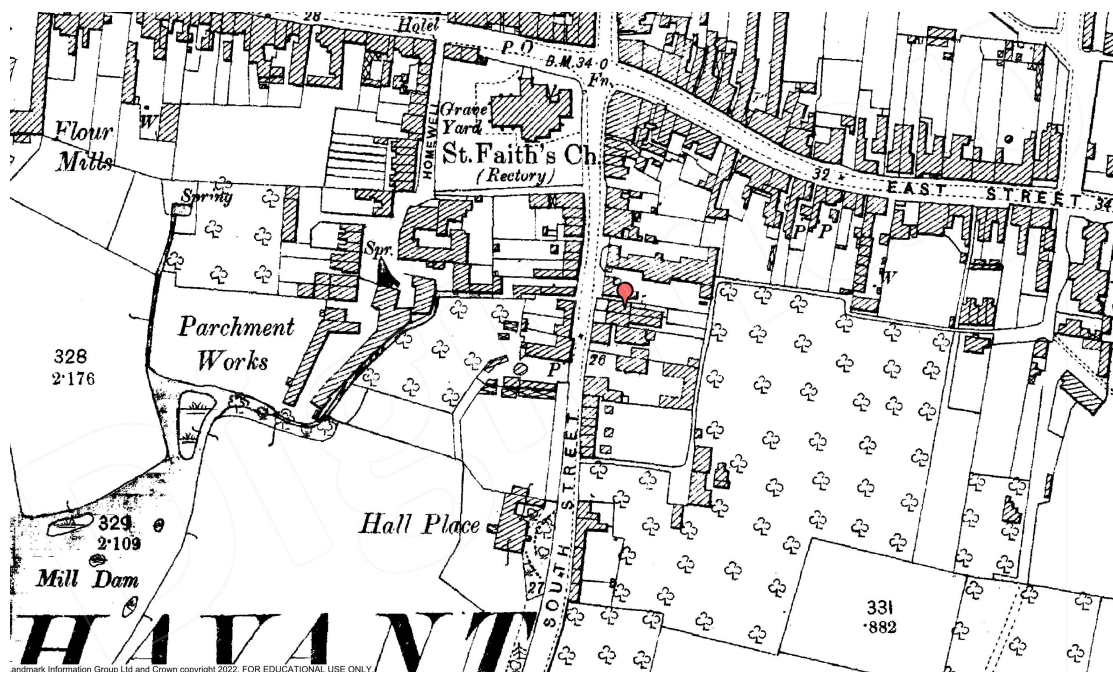
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1.0 Generally

- 1.1 This Flood Risk Assessment (FRA) forms part of a Full Planning Application to Havant Borough Council for a Change of Use from Class E to Class C3 under Prior Approval.
- 1.2 This FRA is being undertaken in line with the Technical Guidance to the National Planning Policy Framework (Table 3). Table 3 states that a site specific FRA and the Exception Test is required as the proposed use class is 'More Vulnerable' and partially within flood zones 2 and 3a.
- 1.3 No other purpose is anticipated or accepted. Copyright of this report remains with Critchley Architecture And Design Ltd.

2.0 Proposed Development

- 2.1 No. 19 South Street is a former private residence which was converted to partial office use during the 1980s. The rear ground floor was converted to office use in 2004. **Prior to conversion, historic maps show that the property had been in use as a private residence since at least 1890.**



1890's Historic Map

- 2.2 Following a lack of interest in the rental market for vacant office space, the owners wish to reinstate the former use.

- 2.3 The frontage of the application site is approximately 7.6m AOD. The forecourt slopes up to the front of the property with a level difference of 225m. The property itself is stepped up above ground level by 450mm. **The finished ground floor level is therefore approximately 8.275m AOD.**



3.0 Existing Site and Flood Conditions

- 3.1 The application site is on the eastern side of South Street, a short distance from the Homewell Spring that was historically the water source for parchment making in this area. The spring is located less than 100m to the north-west of the site.
- 3.2 The site slopes gradually towards the south and west. A site specific topographical survey has not been undertaken. The Ordnance Survey (OS) datum level for South Street is approximately 7.6m AOD. There are existing highways gullies to the front of the site in South Street.
- 3.3 Fluvial flooding: the Environment Agency's Flood Map shows that a small area of the site, the lowest point adjacent to South Street, is potentially at risk. This section of the site is currently at medium risk, with a 1 to 3.3% chance of river flooding each year. However, the majority of the site is considered to be at very low risk, with a less than 0.1% chance of flooding each year. The site is not affected by tidal flooding.
- 3.4 The closest NRFA station to the site is Lavant Stream at Leigh Park, which drains to the west beyond Park Road South. Records indicate a mean flow of 0.083 m³/s. For the Hermitage Stream at Havant, which drains much further to the west of the site, the mean flow is 0.238 m³/s. Homewell Spring is not included in NRFA data sets.
- 3.5 Surface water flooding: occurs when excess rainwater does not infiltrate into the ground, or it is not intercepted by urban drainage systems, and instead flows across the surface. The site is considered to be at high risk of surface water flooding from excess water run-off in South Street.
- 3.6 Further to 3.4 above, the site sits on a mix of loam and clay soils that have naturally high groundwater. Average annual rainfall for the area is 675-700mm per annum.

- 3.7 Groundwater flooding: occurs when water levels in the ground rise above the surface. There is no recorded history of groundwater flooding at the site. As above, the site is within an area with naturally high groundwater which drains to nearby Langstone Harbour. The site is within a 1C low productive aquifer.
- 3.8 Sewer flooding: occurs due to limited capacity or blockage in the sewer system causing backing up of storm water and effluent. There is no recorded history of sewer flooding at the site.
- 3.9 The site is not affected by tidal flooding or flooding from artificial sources.

4.0 Climate Change and Future Flood Conditions

- 4.1 The Environment Agency does not have modelled flood levels specifically for South Street, but has predicted them for the wider Lavant and Hermitage area. The highest predicted flood levels for the area are 7.793m AOD (100yr) and 7.842m AOD (1000yr).
- 4.2 Peak river flow allowances for the East Hampshire Management Catchment during the 2080s epoch are:
- Central - 37%
 - Higher - 51%
 - Upper – 88 %

For a 'more vulnerable' use within flood zones 2 and 3a the central allowance should be used. Based on data for Lavant Stream, the closest river to the site, this would translate to a future flow rate of 0.114 m³/s.

- 4.3 Given that Lavant Stream is some 270m from the subject site, it is not anticipated that this will negatively impact the subject site.
- 4.4 Peak rainfall allowance for the East Hampshire Management Catchment during 2070s epoch are:
- 3.3% annual exceedance rainfall event
 - Central - 25%
 - Upper – 40%
 - 1% annual exceedance rainfall event
 - Central - 25%
 - Upper – 45%
- 4.5 The upper end allowance of a 1% event would equate to 1015mm per annum.

- 4.6 The predicted cumulative rise in sea levels for the south east by 2125 is 1.2m (higher central allowance) to 1.6m (upper end allowance). This is not anticipated to affect the subject site.
- 4.7 The site is not considered to be at risk from future changes to offshore wind speed and wave height.
- 4.8 The greatest future flood risk to the site is therefore from higher rainfall causing an increase in surface water, combined with slow drainage drain to high groundwater levels.

5.0 Summary of Site Specific Flood Risk

- 5.1 The frontage of the subject site sits at approximately 242mm below modelled 1000 year flood levels. **The ground floor of the existing property sits at approximately 433mm above modelled 1000 year flood levels.**
- 5.2 The building is existing and requires no external works or increase in hardstanding. Surface water runoff and groundwater drainage will therefore not be adversely affected by the development.
- 5.3 The driveway at the front of the site slopes downwards towards South Street. It is therefore highly unlikely that the property itself would be affected by additional surface water.
- 5.4 There are existing highway gullies to the site entrance for the provision of excess surface water.
- 5.5 Experimental studies have found that the safety threshold for small cars is 300mm and an emergency vehicle is 600mm:

In order to determine the safety criteria of trafficability during flood events, flume experiments were conducted on prototype die-cast models of vehicles. Results recommended a safety threshold of fording depths of 0.3m for passenger cars (VW Golf) and 0.6m for emergency vehicles (such as ambulances).

(School of Civil Engineering and Geosciences, Newcastle University, Newcastle upon Tyne, UK)

The future flood depth at the site would be 242mm, therefore access to/from the subject site would be available by car and emergency vehicle both now and in the future.

6.0 Site Specific Exception Test

- 6.1 The purpose of the Exception Test is not to prevent development, but to ensure the risks have been properly assessed and that appropriate mitigation measures are provided.
- 6.2 As 1.2 above, The Exception Test is required as the proposals are for a 'more vulnerable use' within Zones 2 and 3a. As per table D.3 of PPS25 (Annex D):

Table D.3²²: Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability classification (see Table D2)		Essential Infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone (see Table D.1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	x	Exception Test required	✓
	Zone 3b 'Functional Floodplain'	Exception Test required	✓	x	x	x

- 6.3 For the Exception Test to be passed it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk. The development should be on previously-developed land or, if it is not on previously developed land, that there are no reasonable alternative sites. It should be demonstrated that the development will be safe, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.
- 6.4 The Exception Test (as 5.3 above):

1	Do the development proposals make a positive contribution to sustainable communities and to sustainable development objectives?
	Objective: To achieve successful and inclusive communities
Yes	Explain How: - The proposal will reinstate the original use of the property as a family home. Havant Borough Council is currently in a 5 year housing shortfall and this is a 'windfall' site that requires very little alteration to bring into active use. - The new development has good access to local facilities which can be accessed by foot, as well as local public transport. This reduces the need for journeys by car to/from the subject site.

	Objective 2: To ensure the delivery of high quality housing
Yes	Explain How: - The design will make best use of the available site and building assets.

2	Are the development proposals on developable land or where there are no reasonable alternatives on brownfield land?
Yes	Explain How: - The site has been in use since the 1900s, when the existing property was first built as a semi-detached private residence. In structure and design it still mirrors the adjacent private residence that is the other half of the semi-detached 'pair'. The property is therefore most suitable for reuse as a private residence.

3	Has a flood risk assessment been produced that demonstrates that the development is safe; the residual risks of flooding to people and property (including the likely effects of climate change) are acceptable and can be satisfactorily managed?
Yes	Explain How: - The development itself does not involve any new building work. - There are existing measures in place for predicted higher rainfall levels. - The maximum flood depth will be low enough for vehicles to gain access to/from the subject site, both now and in the future. - Finished floor levels within the property will be above maximum flood depth, both now and in the future. - Section 7.0 covers additional Mitigation Measures to reduce and manage risk of flooding from Rivers, Seas and Surface Water.

6.5 The summary, the proposals pass the exception test and the development site is considered to be safe from flooding both now, and in the future.

7.0 Mitigation Measures

7.1 Take low level protection measures:

- Seal service entry connections.

- Any new service outlets within the building to be a minimum of 450mm above floor level.
- External doors to have slotted jamb provisions for flood boards.
- All drain and service access covers at ground level to have locking covers and frames.
- Passively support the maintenance and improvements of the city's coastal defences.
- Ensure all bedrooms are at first floor level.
- Ensure design and layout of development minimises the risk to people and damage to property in the event of flooding
- Sign up to relevant flood warnings (Environment Agency, Floodline etc).
- Complete the 'Personal Flood Plan' as issued by the Environment Agency for in house management in case of inundation.
- Install remote location outdoor water and flood alarm to allow occupants for warning of flood depths on South Street.

Flood Map for Planning (Rivers and Sea) - Centred South Street, Havant - Created 22 April 2022



1: 10,000

0 Metres 250



Flood Map for Planning (Rivers & Sea)

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

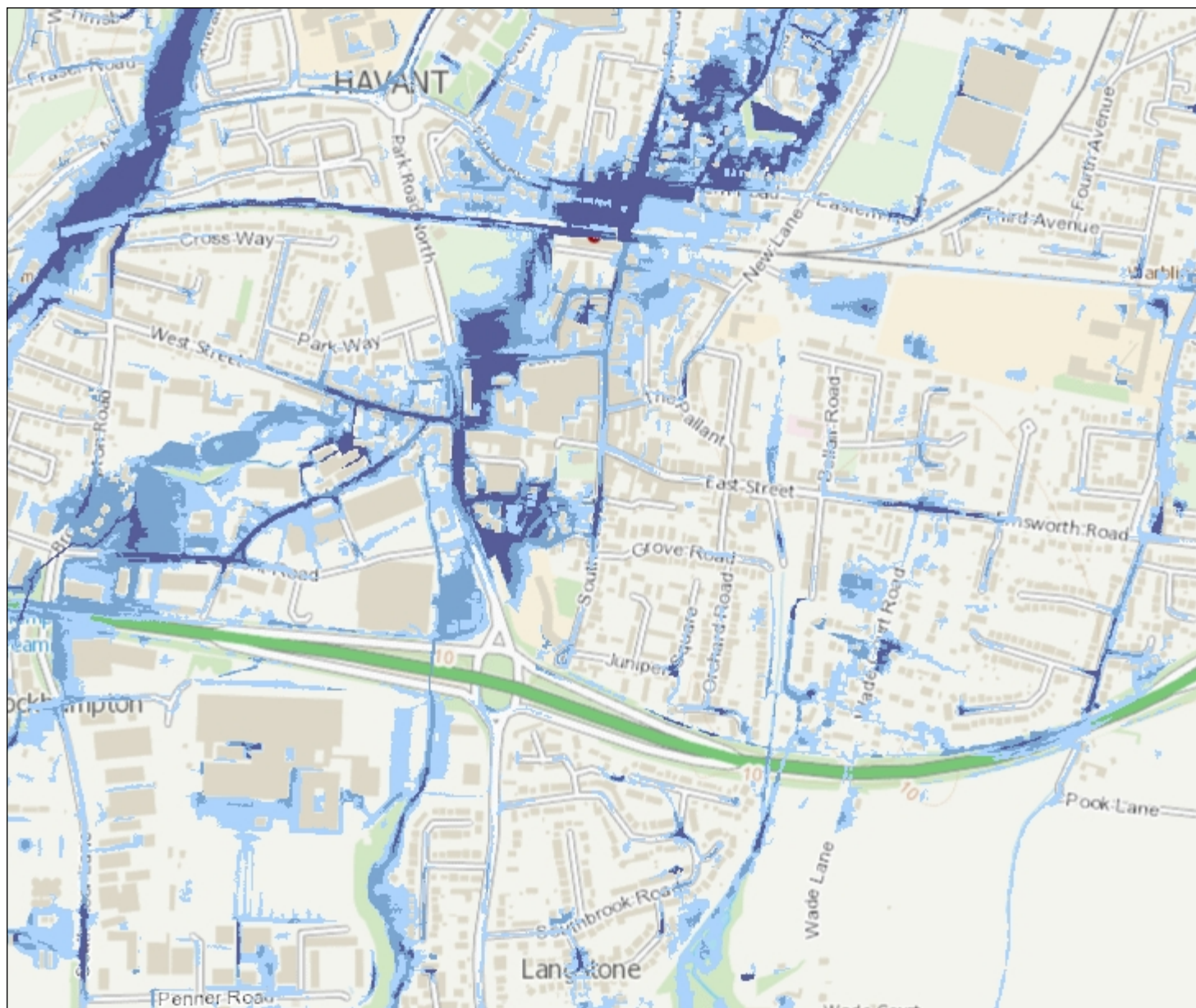
Flood Map Areas (assuming no defences)

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.

Risk of flooding from Surface Water - Centred South Street, Havant - Created 22 April 2022



1: 10,000

0 Metres 250



Likelihood of flooding from Surface Water

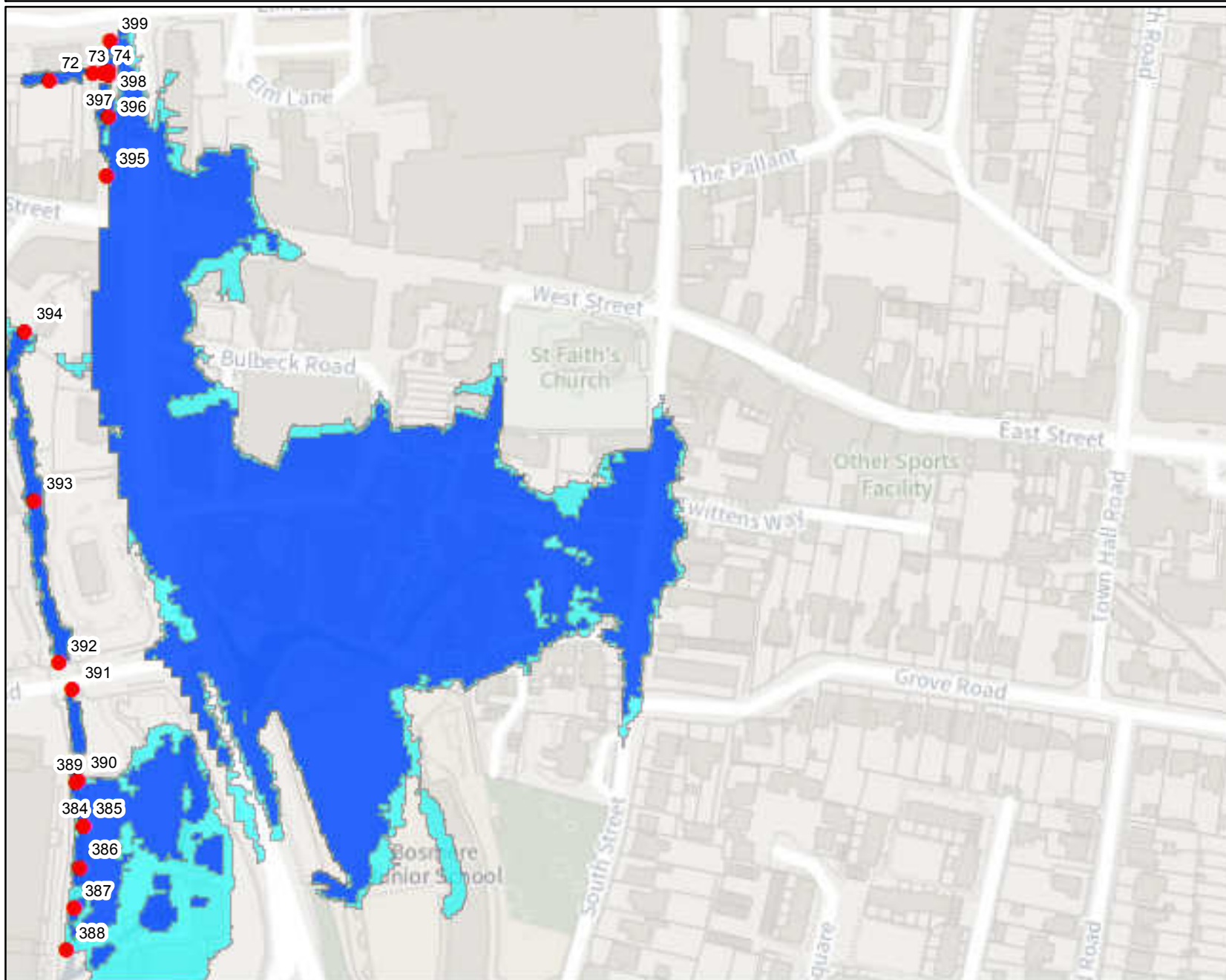
- High ($\geq 3.3\%$)
- Medium (3.3% - 1%)
- Low (1% - 0.1%)
- Very Low

Likelihood of flooding from Surface Water

- High: Greater than or equal to 3.3% (1 in 30) chance in any given year
- Medium: Less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year
- Low: Less than 1% (1 in 100) but greater than or equal to 0.1% (1 in 1,000) chance in any given year
- Very Low: Less than 0.1% (1 in 1,000) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on GOV.UK.

1D Modelled Flood Levels (Meters Above Ordnance Datum) Centred on South Street - Created 22 April 2022



Legend

- Lavant & Hermitage 1D Levels
- Lavant & Hermitage 100Yr (Flood Zone 3)
- Lavant & Hermitage 1000Yr (Flood Zone 2)

1:2,500 *
*when printed at A4.

0 40 80
Metres



Water Depths & Levels for South Street

ID	EASTING	NORTHING	100YR Level	100YR Level No Dam	1000YR Level	1000YR Level No Dam
72	471522.33	106359.83	7.718	0.736	7.773	0.831
73	471541.24	106362.84	7.75	0.736	7.8	0.831
74	471545.65	106362.97	7.774	0.736	7.825	0.831
384	471537.59	106027.62	6.269	4.829	6.539	8.951
385	471537.59	106027.62	6.269	4.835	6.539	8.963
386	471535.58	106009.49	6.162	4.851	6.517	9.141
387	471532.78	105990.93	6.098	4.868	6.504	9.567
388	471529.99	105972.4	6.029	4.862	6.487	11.814
389	471534.37	106047.33	6.328	4.812	6.574	8.956
390	471535.26	106048.06	6.33	4.778	6.576	8.61
391	471532.7	106088.25	6.453	3.57	6.615	6.007
392	471526.29	106100.24	6.463	3.427	6.65	5.866
393	471515.55	106172.42	6.968	3.343	7.129	5.269
394	471511.08	106248.05	7.687	1.018	7.808	1.018
395	471547.89	106317.38	7.781	1.018	7.837	1.018
396	471548.34	106343.15	7.784	1.018	7.838	1.018
397	471548.45	106361.85	7.776	1.035	7.826	1.035
398	471548.34	106363.83	7.776	1.369	7.826	1.469
399	471549.01	106377.13	7.793	1.369	7.842	1.47

* Levels in metres above Ordnance Datum Newlyn