



BRIGHT PLAN CIVILS

**FISCAL HOUSE, 2 HAVANT ROAD,
EMSWORTH PO10 7JE**

**CONVERSION OF EXISTING OFFICES TO
RESIDENTIAL ACCOMMODATION**

Flood Risk Assessment & Drainage Strategy
Report

Prepared on Behalf of

Paul & Elaine Munday Property Rentals

D2048/FRA1.0

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1 INTRODUCTION

1.1 Background

- 1.1.1 Bright Plan Civils is instructed by Paul & Elaine Munday Property Rentals to prepare a Flood Risk Assessment & Preliminary Drainage Strategy Report to support a planning application for the Conversion of Existing Offices to Residential Accommodation at Fiscal House, 2 Havant Road, Emsworth PO10 7JE, Emsworth.
- 1.1.2 This report has been undertaken in accordance with National Planning Policy Framework (NPPF) and The Planning Practice Guidance on the use of SuDS for achieving sustainable development.
- 1.1.3 The proposed development will involve the construction of a residential apartment building - as demonstrated within the preliminary site layout, contained within **Appendix A** of this report.
- 1.1.4 In preparing this report, Bright Plan Civils has referred to the following documents and information:
- Environment Agency Product 4 Response
 - Environment Agency Flood Maps for Planning
 - Long Term Flood Risk Information; Flood Risk Maps
 - Southern Water and Local Authority Drainage Records
 - Local Planning Authority and Lead Local Flood Authority Strategic Flood Risk Assessments
 - British Geological Survey & Records
- 1.1.5 This document has been prepared to propose assess drainage constraints and propose a drainage strategy that is appropriate for the design life of the development, without causing offsite impacts from runoff in a design event.
- 1.1.6 This report has been prepared for the benefit of the named Client only.

1.2 Site Location and Description

- 1.2.1 The property is in a residential area of Emsworth, within the Borough of Havant. It is bordered by residential Warblington Road to the west, Havant Road to the north, residential property to the south, and Waterside URC to the east.
- 1.2.2 A topographical survey of the site has been undertaken and provided by the client. It is included in **Appendix B** of this report. The topographical survey shows that the site levels fall from 3.87mAOD in the south west corner of the site to the north with a low point of 3.06mAOD within the courtyard.
- 1.2.3 The existing site buildings are drained by gully and pipe drainage, presumed to connect into the existing public surface water drainage system.
- 1.2.4 The nearest watercourse is the Main River (unknown name) that discharges into Slipper Mill Pond opposite Bath Road from the site (approx. 20 metres from the site boundary). In addition, the River Ems which runs south into coastal Chichester Harbour approximately 275m east of the site.
- 1.2.5 The nearest surface water feature is Slipper Mill Pond which runs adjacent to the site, approximately 20m to the east.

- 1.2.6 The existing site has a total area of approximately 900m (0.09 Ha), and consists of entirely hardstanding impermeable areas – as demonstrated in the topographic survey.

1.3 Ground Conditions

- 1.3.1 In the absence of a site-specific geotechnical investigation, reference has been made to the British Geological Survey (BGS) website.

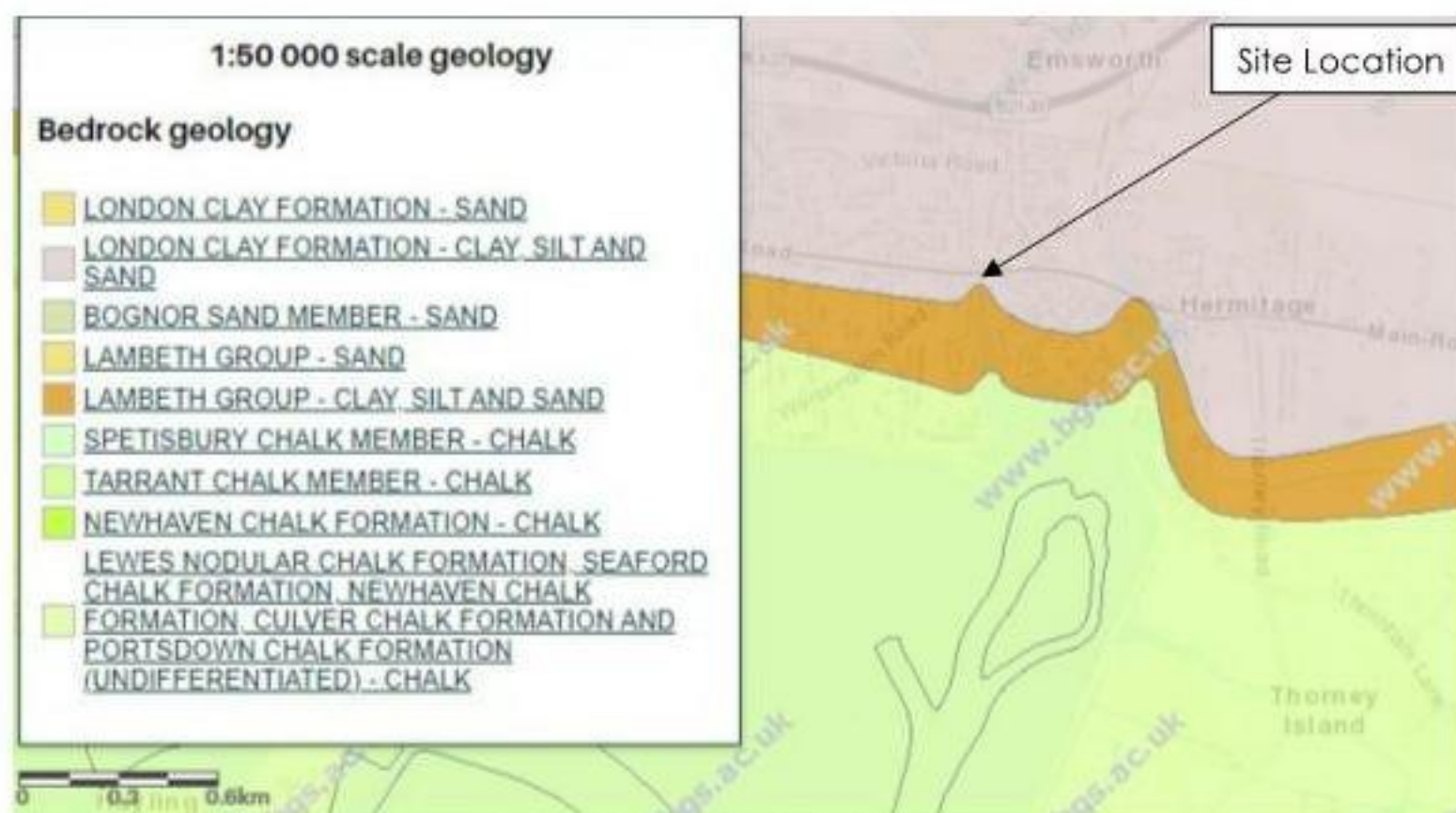


Figure 1. BGS website Bedrock geology

- 1.3.2 The BGS geology viewer states that the bedrock geology is likely to consist of 'London Clay Formation – Clay, Silt and Sand', as seen in **Figure 1**.

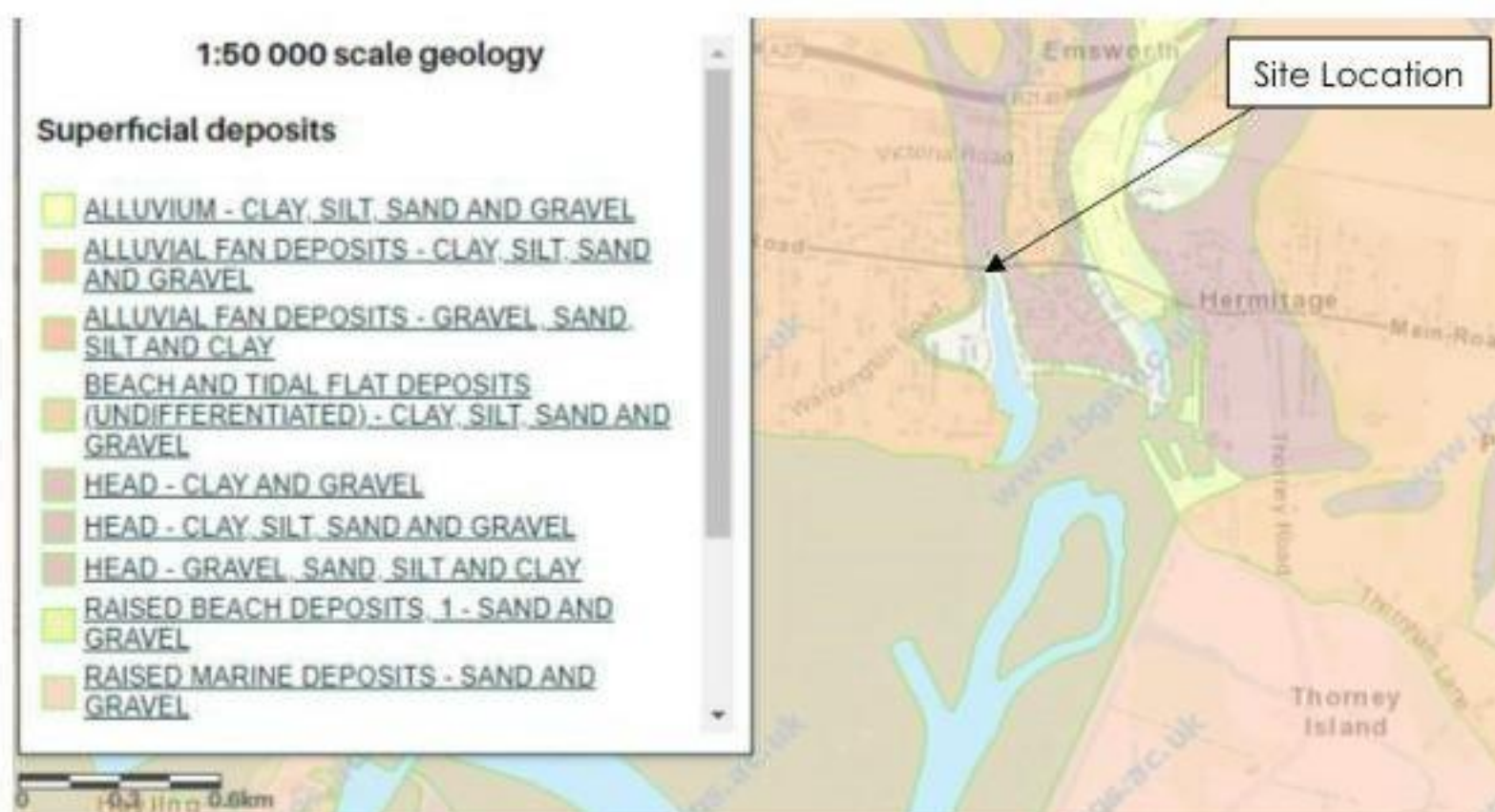


Figure 2. BGS website superficial deposits

1.3.3 Superficial Deposits are recorded as 'Head – Clay and Gravel', as seen in **Figure 2**.

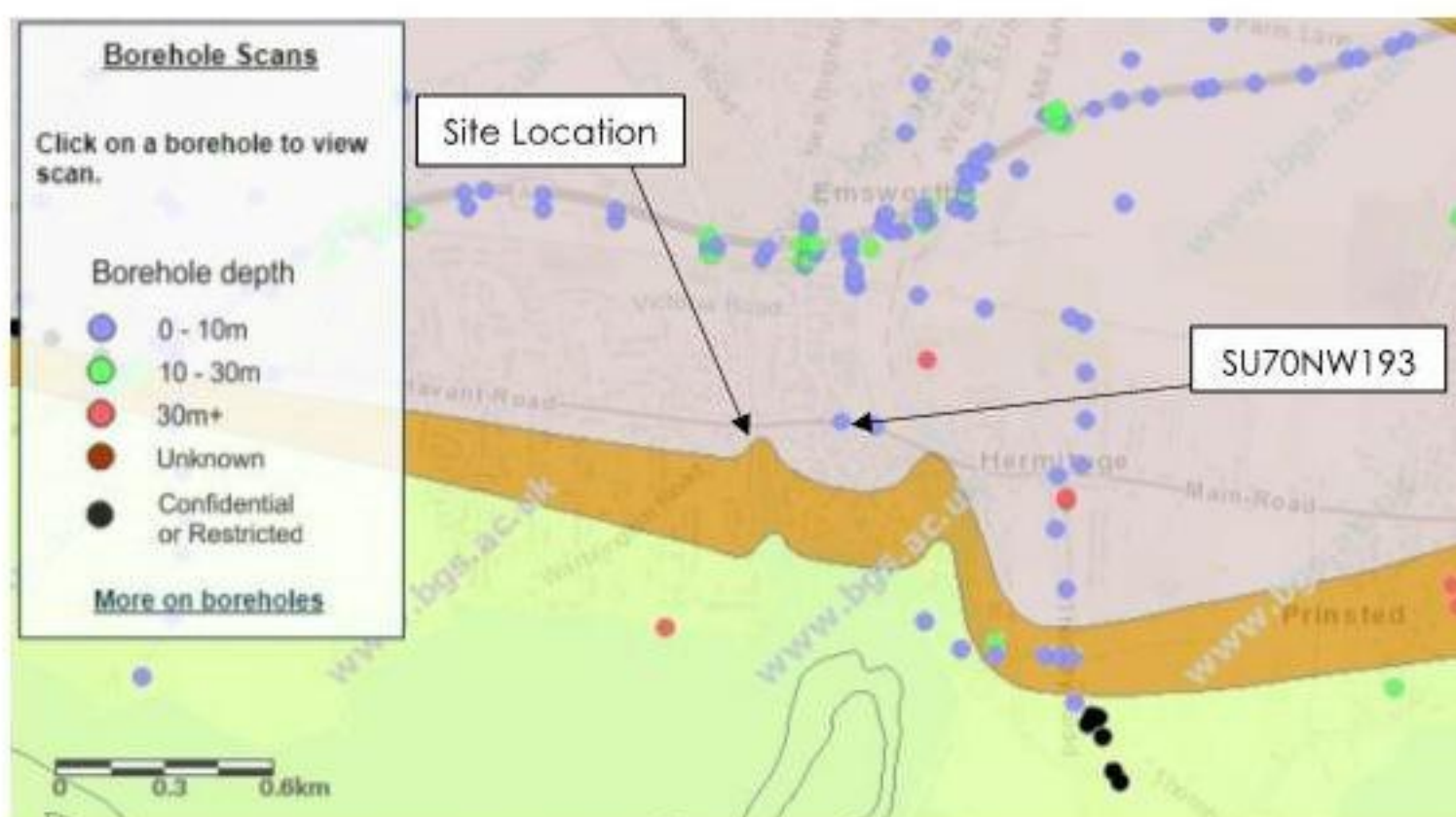


Figure 3. BGS website borehole locations

- 1.3.4 Historic borehole records from the Single Onshore Boreholes Index (SOBI) on the BGS website have also been reviewed in the absence of a site-specific geotechnical investigation, as depicted in **Figure 3**.
- 1.3.5 A borehole at the Emsworth New Bridge, 270m east of the site was assessed in comparison to the site, as seen in **Figure 3**. This borehole has similar geotechnical strata according to the BGS online mapping.
- 1.3.6 The borehole has a recorded depth of 5.9m and confirms the presence of 'stiff brown CLAY' to a depth of 4.0metres, underlain by further layers of MUDSTONE and CLAY.
- 1.3.7 A copy of the BGS records reviewed can be found within **Appendix C** of this report.

1.4 Groundwater

- 1.4.1 The recorded BGS borehole at Emsworth New Bridge recorded groundwater at 1.2mbgl.
- 1.4.2 The Urban South Hampshire PUSH SFRA indicates that areas at risk of groundwater flooding are north of the borough where highly permeable geology meets lower permeability geology and is reflected by historical incident records. The PUSH SFRA Flood Mapping indicated no recorded groundwater flood incidents in the vicinity of the site. Extracts from the SFRA can be found within **Appendix D**.
- 1.4.3 Mapping managed by MAGIC (magic.defra.gov.uk) provides geographic information concerning the natural environment from across government. This mapping tool has been referred to in order to confirm whether the site is located within either any groundwater source protection zones or groundwater vulnerability zones.
- 1.4.4 The site is situated within an 'Unproductive' Aquifer for Bedrock stratum and a 'Secondary A' Aquifer for Superficial Drift stratum, as seen in **Figure 4**. This refers to drift deposits only that exhibit variable permeability and may provide groundwater storage or supply at a local or strategic level.



Figure 4. DEFRA Aquifer Designation Map

- 1.4.5 The Groundwater Vulnerability Map (**Figure 5**) confirms that the site falls within a 'Medium-High' and 'Medium-Low' groundwater vulnerability zone with Soluble Rock Risk.



Figure 5. DEFRA Groundwater Vulnerability Map

- 1.4.6 The site is not indicated as within or in the vicinity of any Drinking Water Safeguard Zone or a Source Protection Zone.

1.5 Existing Drainage

- 1.5.1 The local Water Authority is Southern Water, who provide sewerage services within the area. Public sewer records have been obtained from Southern Water, as contained within this report in **Appendix E**.

- 1.5.2 Surface Water:

- (a) The Southern Water public sewer records (**Appendix E**) show public surface water sewers along Warblington Road and Havant Road adjacent to the site.

- (b) An existing public surface water manhole at the junction with Warblington Road is adjacent to the site frontage, and demonstrates cover level as 3.07mAOD and pipe invert level as 2.17mAOD.
- (c) The existing building is drained by rainwater pipes. The connection route of this drainage is not currently confirmed.
- (d) It is not confirmed if the existing garden areas have any formal drainage, and is assumed to drain via a combination of infiltration and runoff.
- (e) The nearest surface water feature is Slipper Mill Pond which runs adjacent to the site, approximately 20m to the east.
- (f) The nearest watercourse appears is an ordinary watercourse 330m northwest of the site, the River Ems which runs south into coastal Chichester Harbour 400m southeast of the site.

1.5.3 Foul Water:

- The Southern Water public sewer records (**Appendix E**) show public foul water sewers along Warblington Road, Havant Road and Bath Road adjacent to the site
- At present, there is no confirmation of the foul water connection from the site, and investigation is required to establish connection arrangements of the proposed development to the existing public foul sewer. It is expected that there is an existing connection into the foul water sewer network adjacent to the site.

1.5.4 Highway Drainage:

- (g) Havant Road (A259) and Warblington Road appear to be drained by highway gullies.

2 PROBABILITY

2.1 Sources of Information

2.1.1 The NPPF requires that all sources of flooding are considered being Tidal, Fluvial, Pluvial, Groundwater, Sewers and Man-made reservoirs/canals.

2.1.2 The likelihood of the site flooding has been established by reviewing the following information:

- Environment Agency Flood Maps for Planning
- Long Term Flood Risk Assessment Surface Water Flood Risk Maps
- Long Term Flood Risk Assessment Reservoir Flood Risk Maps
- Local Authorities Strategic Flood Risk Assessment
- Consultation with Local Authority/Lead Local Flood Authority

2.2 Flood Maps and Modelling

2.2.1 The Environment Agency's Product 4 Response provided flood maps for rivers, sea and surface water as seen in Appendix F.

2.2.2 The Product 4 shows the site location within Flood Zone 3. It states there is no data regarding 1% Annual Probability.

2.2.3 Flood levels for 3 No. nodes on the site have been taken from the Fluvial Levels Map, completed by The Environment Agency.

2.2.4 When the modelled flood fluvial levels are considered in comparison with the topographic survey, there is potential for flooding of up to 200mm at the site.

Point	Water Surface Level (mAOD*)		Ground Level	Water Depth (metres)	
	1% Annual Probability/1 in 100 Year (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year Present Day (Flood Zone 2)		1% Annual Probability/1 in 100 Year (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year Present Day (Flood Zone 2)
1	No Data	3.25	3.08	No Data	0.17
2	No Data	3.25	3.18	No Data	0.07
3	No Data	3.15	3.13	No Data	0.02

2.2.5 Of the information provided by the Environment Agency, as detailed above, Node 1 is located on the western side on the current site building on Warblington Road. Nodes 2 and 3 are located in the site courtyard.

2.2.6 In addition, Flood levels for 7 No. nodes on the site have been taken from the Tidal Levels Map, completed by The Environment Agency. Three of these have been provided in the table below.

Point	Water Surface Level (mAOD*)		Ground Level	Water Depth (metres)	
	0.5% Annual Probability/1 in 200 Year (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year Present Day (Flood Zone 2)		0.5% Annual Probability/1 in 200 Year (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year Present Day (Flood Zone 2)
1	No Data	3.69	3.69	No Data	0.00
4	No Data	3.70	3.67	No Data	0.03
7	3.50	3.68	3.21	0.29	0.47

2.2.7 Of the information provided by the Environment Agency, as detailed above, Node 1 is located in the southeast corner, Node 4 is on the northwest boundary at the vehicular access, and Node 7 is to the north of the site.

2.2.8 When the modelled tidal flood levels are considered in comparison with the topographic survey, there is potential for flooding of up to 450mm at the site in a 2 in 100 year (0.5% AEP) storm event, and up to 650mm flooding in a 1 in 1000 year event (0.1% AEP) storm event.

2.2.9 The Product 4 Response does not include an allowance for climate change, and therefore an allowance needs to be factored in to allow for an assessment of flood risk for the lifetime of the development (100 years).

2.2.10 Climate change allowances are set out for the following:

- peak river flow
- peak rainfall intensity
- sea level rise
- offshore wind speed and extreme wave height

2.2.11 The site is located within the Arun and Western Streams Management Catchment, and the following peak river flow climate change allowances are provided by the Environment Agency for the catchment.

Epoch (period of time)	Central Allowance	Higher Allowance	Upper Allowance
2020s	11%	16%	27%
2050s	13%	19%	36%
2080s	25%	36%	64%

2.2.12 As per the Environment Agency guidance for more vulnerable development in flood zones 2 and 3a, the central allowance should be utilised. This represents a 25% increase in peak river flow for the lifetime of the development, and while it is not possible to quantify the potential increase in fluvial flood levels the building as a result of climate change without extensive 2D hydraulic modelling (unreasonable to scope of development), it is clear that there is an increased risk of fluvial flooding as a result of climate change.

2.2.13 As a result, it is recommended that a 300mm conservative allowance is considered above maximum fluvial flood levels – assuming a maximum fluvial flood level of 3.55mAOD in a 0.1% AEP flood event.

2.2.14 The Environment Agency provide sea level allowances by river basin district for each epoch (with a calculation made using the per year allowance for a 2022 baseline). The table below demonstrates the the total sea level rise in the South East river basin district, per epoch, in metres.

South East	2022 to 2035	2036 to 2065	2066 to 2095	2096 to 2122	Cumulative risk from 2022 to 2122
Higher Central	0.075m	0.261m	0.348m	0.354m	1.04m
Upper End	0.090m	0.339m	0.474m	0.491m	1.39m

2.2.15 This indicates an increase in maximum tidal flood levels of between 1.04m and 1.39m over the next 100 years. This would represent an increase in the tidal flood levels to between 4.55mAOD and 4.9mAOD for a 0.5% AEP tidal flood event.

2.2.16 The PUSH Strategic Flood Risk Assessment (SFRA), produced by Atkins in 2007, also indicated extreme water levels for Chichester Harbour as 4.5mAOD for a 0.5% AEP tidal flood event, for the year 2115.

2.2.17 Although there are also wind and wave allowances for climate change, the site is located significantly within an estuary that it is not considered these would have a significant effect on the site location.

2.2.18 The Environment Agency's on-line Flood Maps for Planning (rivers and sea) show that the site is located within Flood Zones 2 and 3a. The flood zones are also confirmed by information and mapping obtained from The Environment Agency following consultation, which is consistent within other flood risk mapping reviewed.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

2.2.19 **Figure 6** also shows that the site is at 'low' to 'high' risk of flooding from rivers or sea.



Figure 6. Long Term Flood Risk Map; Flood risk from rivers or the sea

2.2.20 **Figure 7** shows that the north of the site is at low risk of surface water flooding, with much of the rest of the site at very low risk of surface water flooding. There is however medium to high risk of surface water flooding within the adjacent highways, although this would appear to be less than 300mm in a low risk flood scenario, which would not inhibit access or egress from the site.



Figure 7. Long Term Flood Risk Map; Flood risk from surface water

2.2.21 **Figure 8** shows that the site is not at risk of flooding from reservoirs.



Figure 8. Long Term Flood Risk Map; Flood risk from reservoirs

2.3 Strategic Flood Risk Assessment

- 2.3.1 The Urban South Hampshire PUSH SFRA identified the site location as at high susceptibility to groundwater, located within Flood Zone 3a and located wholly within a Flood Warning Area.
- 2.3.2 The site is shown to have a 'low risk' rating for Flood Zones 2 and 3 Undefended Hazards, at very low risk of surface water flooding (small isolated area at low risk within the site, low to high risk within the adjacent highway), outside of the Climate Change (Year 2115) Fluvial Flood Zone 3 but within the Climate Change (Year 2115) Tidal Flood Zones 2 & 3.
- 2.3.3 Extracts are included in **Appendix D**.
- 2.3.4 As this development is only for a change of use, a Sequential Test and Exception Test would not be required.

2.4 Historic Flooding

- 2.4.1 The Environment Agency were consulted regarding historic flooding at the site, and online information from Department for Environment, Food & Rural Affairs (DEFRA), Hampshire County Council and Havant Borough Council was investigated for details of historic flooding in the vicinity of the site.
- 2.4.2 The DEFRA recorded flood outlines on environment.data.gov.uk demonstrate a recorded flood outline along the watercourse corridor of the main river to the east of the site, including along the length of Bridge Road to the north and Bath Road to the east, and across the adjacent Havant Road where the watercourse passes under the road. This was shown to affect the site frontage, however the flood extents do not indicate flooding within the site area.
- 2.4.3 The PUSH SFRA Flood Mapping indicated no records of Southern Water observed flooding in the vicinity

of the site, and no recorded groundwater flood incidents in the vicinity of the site.

2.4.4 Extracts are included in **Appendix D**.

2.5 Summary of Flood Risk

2.5.1 The potential sources of flooding are:

Source of Flooding	Level of Risk
Rivers and Coastal	High The site is within Flood Zones 2 and 3a, however is shown to be at increased risk of tidal flooding for the lifetime of the development as a result of climate change and rising extreme tidal levels.
Surface Water	Low-Very low The long-term flood risk for surface water is classified as 'Low' to the north of the site with much of the rest at 'very low' risk. Surface water flooding within the adjacent highway is 'high' with depths indicated to be a maximum of 900mm.
Groundwater	Medium BGS records found the site to be situated above variable permeability strata. Nearby borehole logs found presence of groundwater 1.2mbgl. The Portsmouth City Council SFRA did not indicate the site area as susceptible to groundwater flooding.
Sewers	Medium There are surface water sewers within the area, and no reports of sewer flooding found. The high risk of surface water flooding within the adjacent highway could indicate areas of highway drainage at risk of being surcharged, however.
Artificial Sources	None The site is not shown to be at risk of flooding due to artificial sources.

3 PROPOSED DEVELOPMENT

3.1 Description of Development

- 3.1.1 The proposed development will involve the Conversion of Existing Offices to Residential Accommodation, with associated landscaping as demonstrated within **Appendix A**.
- 3.1.2 The existing use of 'Building used for financial, professional, offices etc' is classified as 'less vulnerable' development whilst 'Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels' is classified as 'more vulnerable' development to the classification (Flood Risk and Coastal Change Table 2) and requires an Exception Test in Flood Zone 3a (Flood Risk and Coastal Change Table 3).
- 3.1.3 The proposals are for a change of use, and as such a Sequential test is not required, this Flood Risk Assessment will provide flood mitigation measures to address the existing and future flood risk to the development.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	✓	Exception Test Required	✓	✓	✓
Flood Zone 3a†	Exception Test Required †	✗	Exception Test Required	✓	✓
Flood Zone 3b*	Exceptions Test Required *	✗	✗	✗	✓*

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

- 3.1.4 The proposed development will decrease the hardstanding area of the site; reducing the rate of run-off generated by the site, with an area of existing building and hardstanding converted into soft landscaping garden areas. The surface water drainage of the site will follow existing principles as the proposals are only for a change of use to the existing buildings.

4 SEQUENTIAL AND EXCEPTION TESTS

4.1 Sequential Test

- 4.1.1 The Flood Maps for Planning show that generally the development area is primarily within Flood Zone 2 and 3. Residential development within Flood Zone 2 is considered acceptable, whilst an Exception Test would be required to be passed for residential development within Flood Zone 3.
- 4.1.2 As the development is only for a Change of Use, a Sequential Test and Exception Test would not be required. The local planning authority will however consider what changes of use are acceptable with regards to the National Planning Policy Framework and taking into account the Strategic Flood Risk Assessment. This is likely to depend on whether development can be designed to be safe and that there is safe access and egress.

4.2 Exception Test

- 4.2.1 Although the proposals are only for Change Of Use and do not require an Exception Test, the principles of NPPF have been considered with respect to safe site use, access and egress.
- 4.2.2 Table 3 within Paragraph 067 of Flood Risk and Coastal Change confirms that developments classified as "More Vulnerable" require an Exception Test for Flood Zone 3a. The proposed development is in Flood Zone 3a due to the risk of flooding from the culverted river.
- 4.2.3 In order to demonstrate the requirements are met with reference to Paragraphs 102 & 103 of NPPG Flood Risk and Coastal Change we summarise as follows:
- 4.2.4 Paragraph 102 quotes 'If, following application of the Sequential Test, it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied if appropriate. For the Exception Test to be passed:
- *it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared*
- 4.2.5 The proposals will not increase flood risk to or from the development, and mitigation measures will reduce flood risk to occupants. The development will benefit the community by providing housing at a disused former office space. On review the local area would appear to be predominantly residential and so the proposals would match the existing character.
- *a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall*
- 4.2.6 The Flood Risk Assessment demonstrates that the proposed development will reduce the site impermeable area and does not increase the rate or volume of run off generated by the site. This ensures that the development has a beneficial impact on surface water flood risk to and from the proposals. There is no proposed construction that would impact on fluvial or tidal flood risk to or from the development.
- 4.2.7 Flood Mitigation measures will be proposed to ensure that the Change of Use is safe for its lifetime for the proposed residential occupants.

- 4.2.8 Paragraph 103 states 'When determining planning applications, local planning authorities should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where, informed by a site-specific flood risk assessment following the Sequential Test, and if required the Exception Test, it can be demonstrated that:'
- *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.*
- 4.2.9 The proposals are for a Change of use to an existing building and therefore this will not increase flood risk elsewhere, and is not subject to sequential assessment.
- *development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and it gives priority to the use of sustainable drainage systems.'*
- 4.2.10 As discussed in Section 6, Flood Mitigation measures will be proposed that ensure the development is appropriately flood resilient. In addition, safe access and egress routes will be provided where necessary so that any residual risk to future residents can be safely managed. A Flood Evacuation Plan (FEP) template is provided in **Appendix F**.
- 4.2.11 As the development is partially within Zones 2 and 3, it is therefore recommended that the occupants of the development are subscribed to the Environment Agency's flood warning scheme and there is provision of a Flood Evacuation Plan to determine what actions occupants should take leading up to and during a nearby flood event. The Flood Plan would consider further the specific requirements with regard to access and egress.
- 4.2.12 The development does not consider use of sustainable drainage systems, as there is only a Change of Use of an existing building and no new hardstanding areas. The proposals will reduce site runoff however by proposing new areas of soft landscaping.

5 PROPOSED DRAINAGE STRATEGY

5.1 Surface Water

- 5.1.1 The proposed Change of Use will not introduce any new buildings or areas of hardstanding, so no new surface water drainage proposals are required.
- 5.1.2 The site will continue to utilise the existing surface water drainage infrastructure, which is understood to be conventional gully and pipe drainage to the public surface water sewer network.
- 5.1.3 It is worth noting that the proposals will reduce site runoff by introducing a new area of soft landscaping where an area of building and hardstanding currently exists.

5.2 Foul Water Drainage

- 5.2.1 The proposed foul drainage will utilise the existing site foul infrastructure, and as such there are no proposed changes to the foul drainage strategy.
- 5.2.2 Post development, there will be an estimated increase in peak foul water flows as a result of the Change in Use, with 0.05 l/s from the proposed residential unit (based on Design & Construction Guidance). This is likely to be offset by the reduction in surface water runoff from the site.
- 5.2.3 It is not expected that any marginal increase in foul discharge will impact the foul sewer network capacity, however, the infrastructure and connection charges (OFWAT Charging Rules) place the onus on the sewerage undertaker to reinforce their network should there no longer be sufficient capacity to serve the new development. Funding for this is provided by revised charging arrangements for infrastructure and connection charges for each dwelling constructed comprising a Network Reinforcement Charge and Site-Specific Charges. The revised charging arrangement (funded by the developer) covers alterations to the Existing Sewer Network and the sewerage undertaker remains responsible for the cost of reinforcing their Strategic Assets. The developer is responsible for connecting the development to the public sewer network.

6 RESIDUAL RISK AND MITIGATION

6.1 Residual Risk

6.1.1 The following residual risks have been identified in relation to the proposed development:

- i. Flooding of buildings within flood zone.
- ii. Increased flood risk as a result of climate change.

6.2 Mitigation

6.2.1 Consideration has been taken to the residual risks stated in Section 6.1, and the following mitigation measures are proposed:

- i. The Environment Agency Product 4 response indicates the site is subject to 1 in 200 year flood levels 3.50mAOD (Flood Zone 3) and 1 in 1000 year flood levels of 3.70mAOD. The existing floor levels are approximately 3.20mAOD, and these cannot be altered as the proposal is for a Change of Use to an existing building. The building is therefore at risk of 300mm flooding in a design event, as well as a residual risk of up to 500mm flooding. In accordance with "Improving the Flood Performance of New Buildings – Flood Resilient Construction", produced for Communities and Local Government and the Environment Agency, May 2007, as well as in accordance with standing advice and Flood Resilient Construction guidance (<https://www.gov.uk/government/publications/flood-resilient-construction-of-new-buildings>) (<https://www.gov.uk/guidance/flood-risk-assessment-standing-advice#extra-flood-resistance-and-resilience-measures>), the following mitigation measures are proposed accordingly:
 - a. Flood resistance measures; which look to keep water out of the building when flood depths are up to 300mm. This includes tanking and waterproof construction, to be considered as retrofit measures to the building as part of the Change of Use, as well as the use of impermeable building materials to at least 300mm. This will look to keep water out of the building in a 1-in-200 year event, and would result in minimal damage or deformation. People could also leave their house and follow the evacuation plan in this scenario.
 - b. Flood resistance measures; in addition, use of floodgates across doors could prevent flood ingress to entrances.
 - c. Flood resilience measures; where flood depths exceed 300mm, impacts could be minimised by use of flood resilient materials such as lime plaster, raising air bricks, positioning NRVs and services at 1.0m height from FFL, raising potential hazards and/or damage above modelled flood levels, and design of the proposed building layout to allow access to all spaces to permit drying and cleaning. This would minimise damage to building in an extreme flood event above a 1-in-200 year scenario.
- ii. The impact of climate change is predicted to result in an increase to design flood levels over the lifetime of the development, to between 4.5mAOD and 4.9mAOD. This would result in flooding to the property of between 1.3m and 1.7m. Further mitigation measures are required to ensure that the site is safe for use for the lifetime of the development, including:

- a. Installation of a sump and pump, to allow draining away of internal flooding in coordination with flood gates.
- b. All proposed bedrooms to be located on the higher floors of the property.
- c. Installation of non-return valves of all soil pipes to prevent back-flow.
- d. Development of an emergency escape plan, inclusive of recommendations on seeking refuge at higher levels and of when and how to utilise a safe route of access and escape to ground above the estimated flood level, which connects the site to an area away from flood risk. This is to include provision of a Flood Warning and Flood Alert System. A Flood Evacuation Plan (FEP) template is provided in **Appendix F**.

7 FLOOD RISK MANAGEMENT

7.1 Safe Access and Egress

- 7.1.1 The proposed site partially development falls within Flood Zones 2 and 3a, however the access to the site is primarily from Warblington Road, which is within Flood Zone 1.
- 7.1.2 At times of flooding, access and egress to the site could continue via the existing access point on Warblington Road, which is elevated at 3.8mAOD – above predicted flood levels. Access to higher ground should climate change induced flooding cause predicted flood levels to exceed this is available by leaving the site via the Warblington Road access and headed due southwest, where levels quickly exceed the possible future flood levels of 4.5-4.9mAOD.
- 7.1.3 Should residents need to seek refuge within the property, the upper storeys of the building will remain elevated above all predicted flood levels for the lifetime of the development.

7.2 Flood Warning

- 7.2.1 The site is at risk of fluvial and tidal flooding therefore there is a need for a Flood Evacuation Plan (FEP). This should consider the provision of a Flood Warning and Flood Alert System. A Flood Evacuation Plan (FEP) template is provided in **Appendix F**.

8 OFFSITE IMPACTS

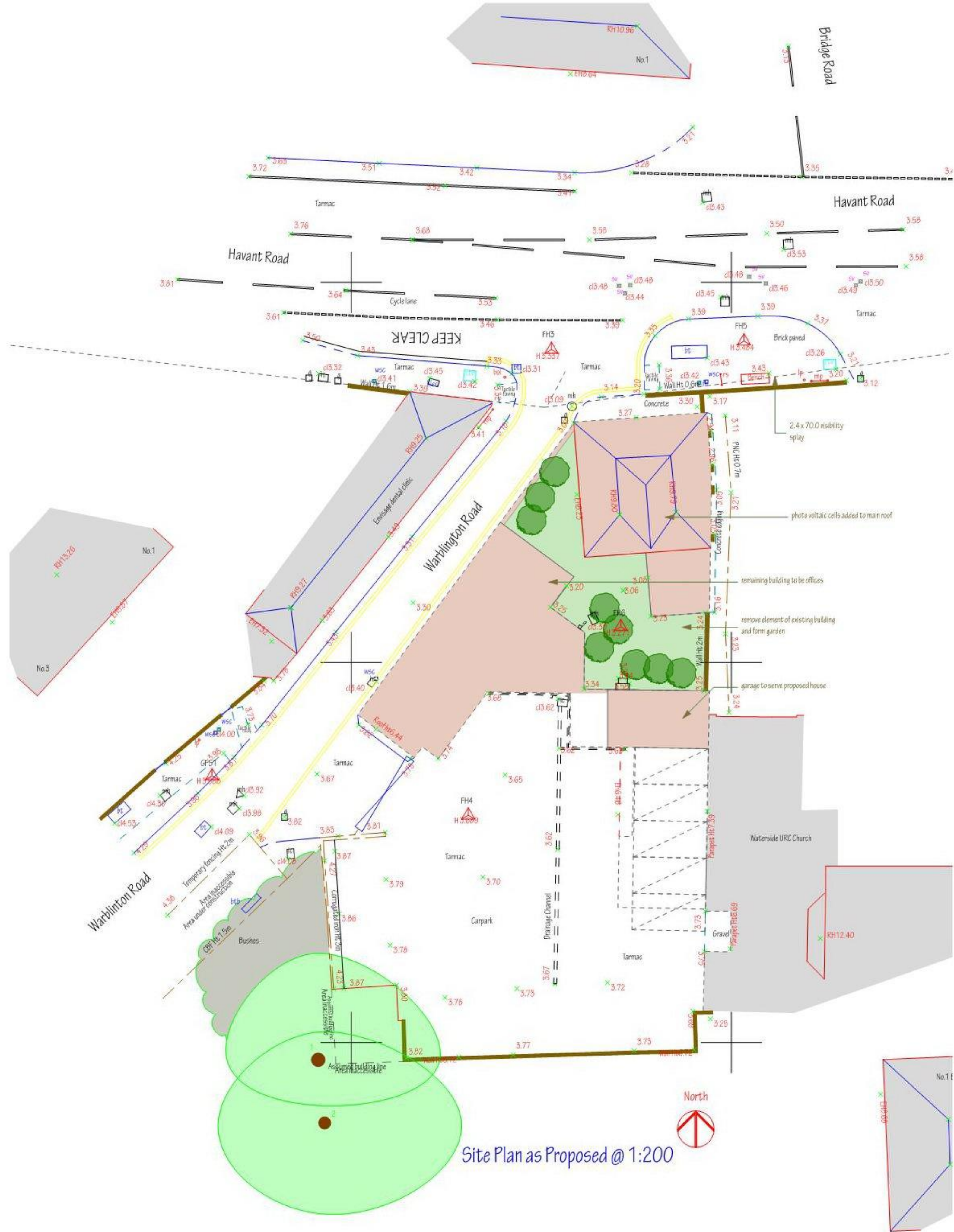
- 8.1.1 The proposed development will not result in any increase in runoff from the site, and therefore will not cause an increase in flood risk offsite.
- 8.1.2 Post development foul water flows will contribute a negligible increase to the sewer network compared to the previous use – it is expected that the foul sewer flow from the proposed residential property will be 0.05l/s.

9 SUMMARY

- 9.1.1 This site-specific report is based on the EA Product 4 Response, Flood Maps, Public Sewer Records, BGS records, and the local SFRA mapping and guidance.
- 9.1.2 The existing site consists of residential offices.
- 9.1.3 The topographical survey shows that the existing site levels fall from 3.87mAOD in the south west corner of the site to the north with a low point of 3.06mAOD within the courtyard.
- 9.1.4 The existing site buildings are drained by gully and pipe drainage, presumed to connect into the existing public surface water drainage system.
- 9.1.5 The nearest watercourse is the Main River (unknown name) that discharges into Slipper Mill Pond opposite Bath Road from the site (approx. 20 metres from the site boundary). In addition, the River Ems which runs south into coastal Chichester Harbour approximately 275m east of the site.
- 9.1.6 The proposed development comprises the Change of Use of an office building into a residential property.
- 9.1.7 The development lies within Flood Zones 1, 2 and 3a, and is subject to increased future flood risk as a result of extreme sea level increases. Flood mitigation measures and the consideration of safe access and egress has been considered in order to address the safe use of the development for its lifetime. A Flood Evacuation Plan (FEP) template is provided within the appendices.
- 9.1.8 The wastewater from the proposed development will discharge to the public foul sewer network, with connection arrangement to be confirmed subject to site investigation.
- 9.1.9 The completion of the development will not increase flood risk on or off the site, and appropriate flood mitigation has been proposed to ensure the site is safe for use, access and egress for the lifetime of the development.

APPENDICES

Appendix A Preliminary Site Layout



Fiscal House, 2 Havant Road, Emsworth P010 7JE
Location Plan @ 1:1250

NOTES:
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All dimensions must be checked on site prior to the commencement of construction
and the Architect notified of any discrepancy. Figured dimensions are to be used in
preference to scaled dimensions. The Local Planning Authority may scale from this
drawing as the only exception. No deviation from the drawing will be permitted without
the written consent of the Architect.

REVISIONS				Date
Issue No	Change	By	Checked	
01	1	Planning		12/11/2020

PURPOSE OF ISSUE

INFORMATION

DESIGN

TENDER

CONSTRUCTION

EDWARD CAUSH + ASSOCIATES

ARCHITECTS

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phone 023 92 384477

fax 023 92 361582

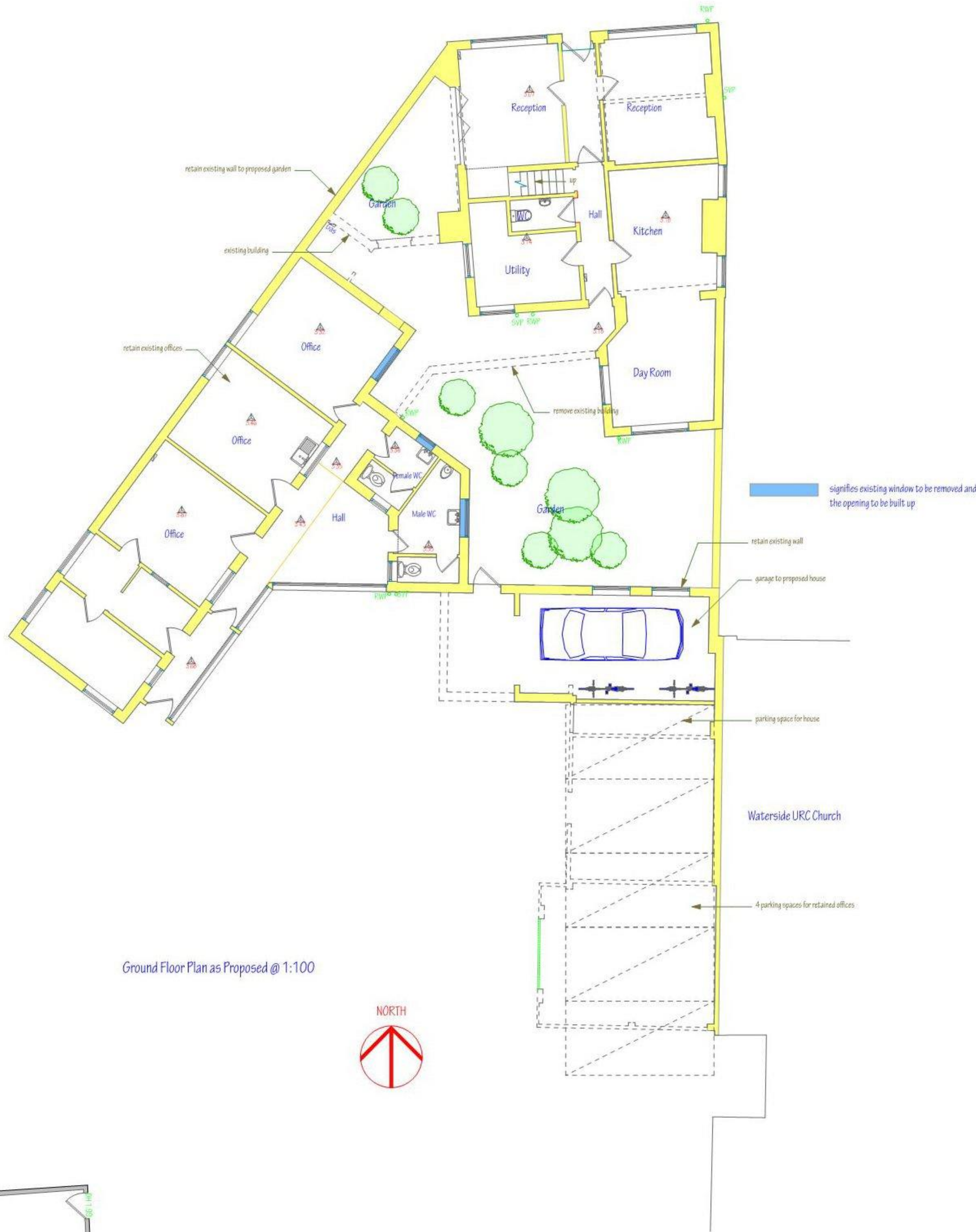
email: eca@south-down.demon.co.uk

CLIENT
Mr & Mrs P A Munday

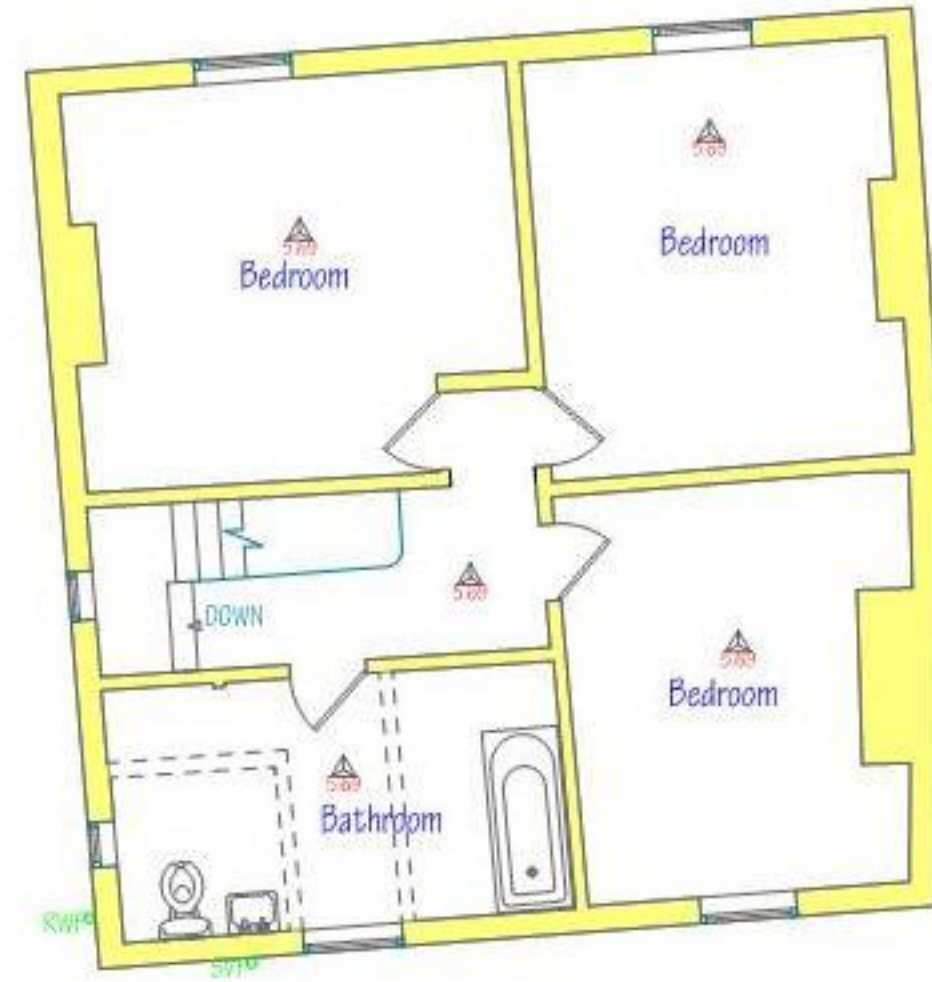
JOB TITLE
Fiscal House
2 Havant Road
Emsworth
Hampshire
P010 7JE

DRAWING TITLE
Site Plan as Proposed

SCALE	DATE	
1:1250 & 200 @ A2	24-09-2019	
DRAWN BY	CHECKED BY	
EC		
DRAWING NUMBER	LAYOUT ISSUE	DRWG REVISION
12:1089:L(2-)102	05	A



Ground Floor Plan as Proposed @ 1:100



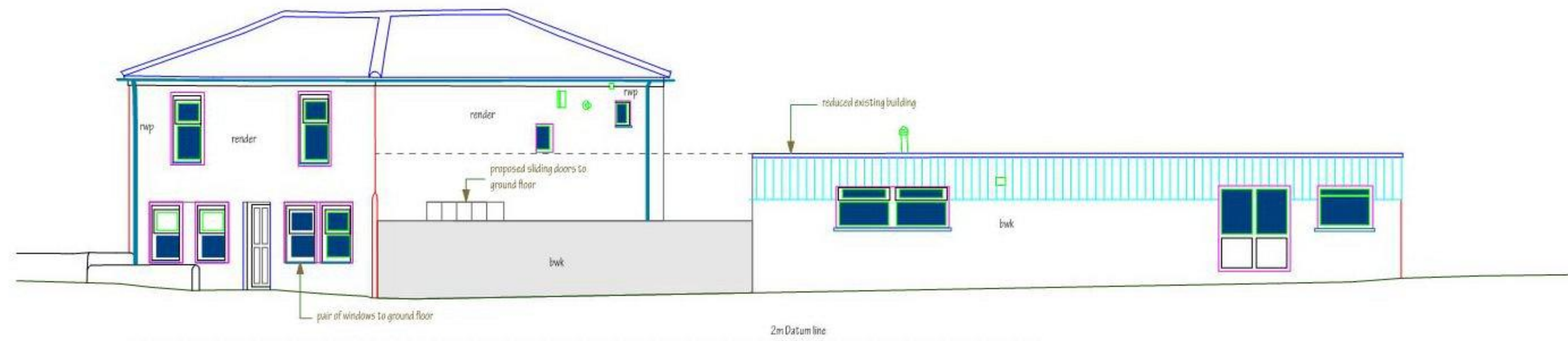
First Floor Plan as Proposed @ 1:100



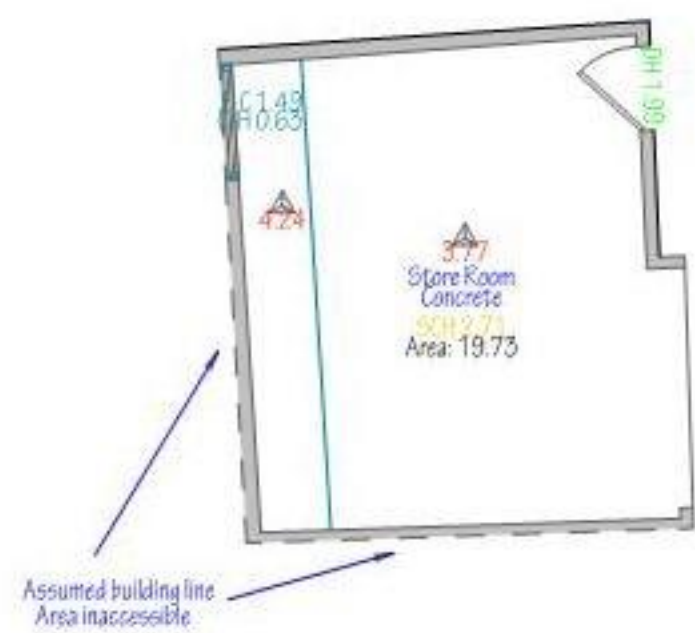
Fiscal House, 2 Havant Road, Emsworth PO10 7JE
Location Plan @ 1:1250



North Elevation as Proposed



West Elevation as Proposed

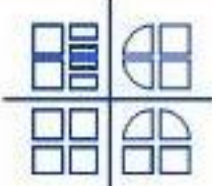


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REVISIONS

Issue No	Revision No	Change/Notes	Date
1	1	Initial Issue	19/09/2019

PURPOSE OF ISSUE
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CLIENT
Mr & Mrs P A Munday

JOB TITLE
Fiscal House
2 Havant Road
Emsworth
Hampshire
PO10 7JE

DRAWING TITLE
Proposed Floor Plans, Elevations &
Location Plan

SCALE
1:1250 & 100 @
A1

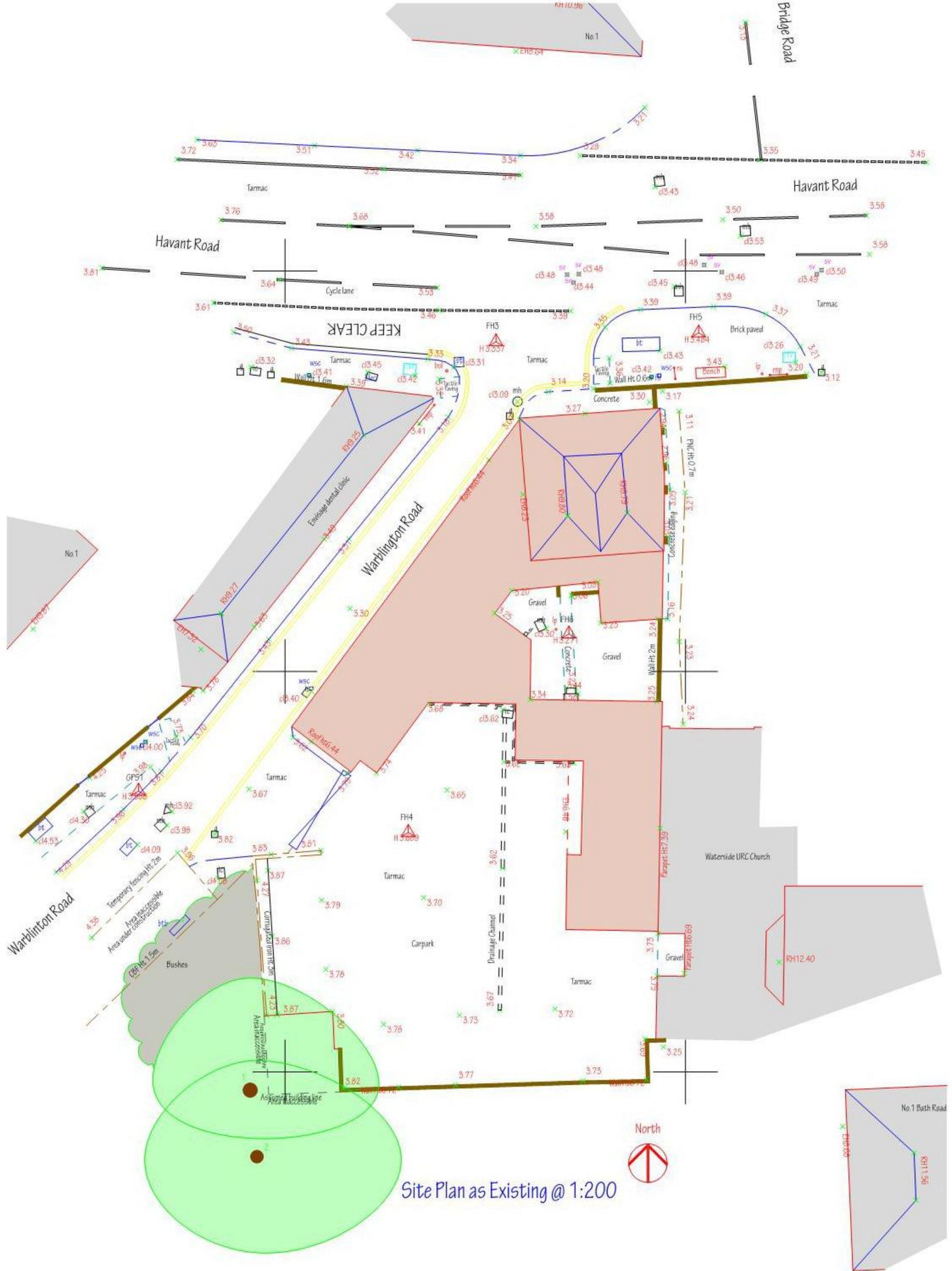
DATE
25-09-2019

DRAWN BY
EC

CHECKED BY

DRAWING NUMBER	LAYOUT ISSUE	ORIGIN REVISION
12:1089:L(2)-101	02	A

Appendix B Topographic Survey



Site Plan as Existing @ 1:200



Fiscal House, 2 Havant Road, Emsworth P010 7JE
Location Plan @ 1:1250

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Issue No	Change	By	
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PURPOSE OF ISSUE

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2 Havant Road
Emsworth
Hampshire
P010 7JE

DRAWING TITLE
Site Plan as Existing

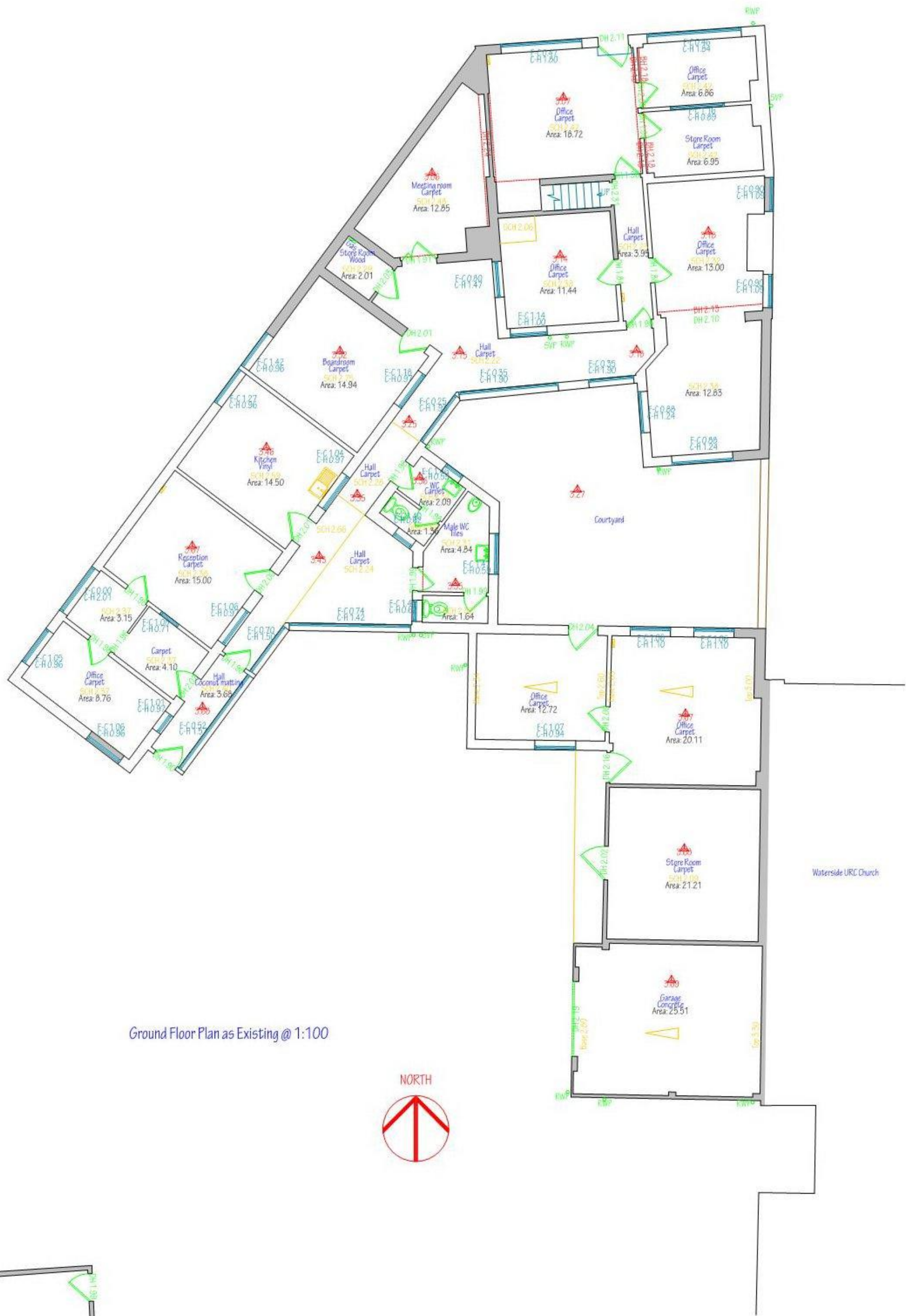
SCALE
1:1250 & 200 @ A2

DATE
25.09.2019

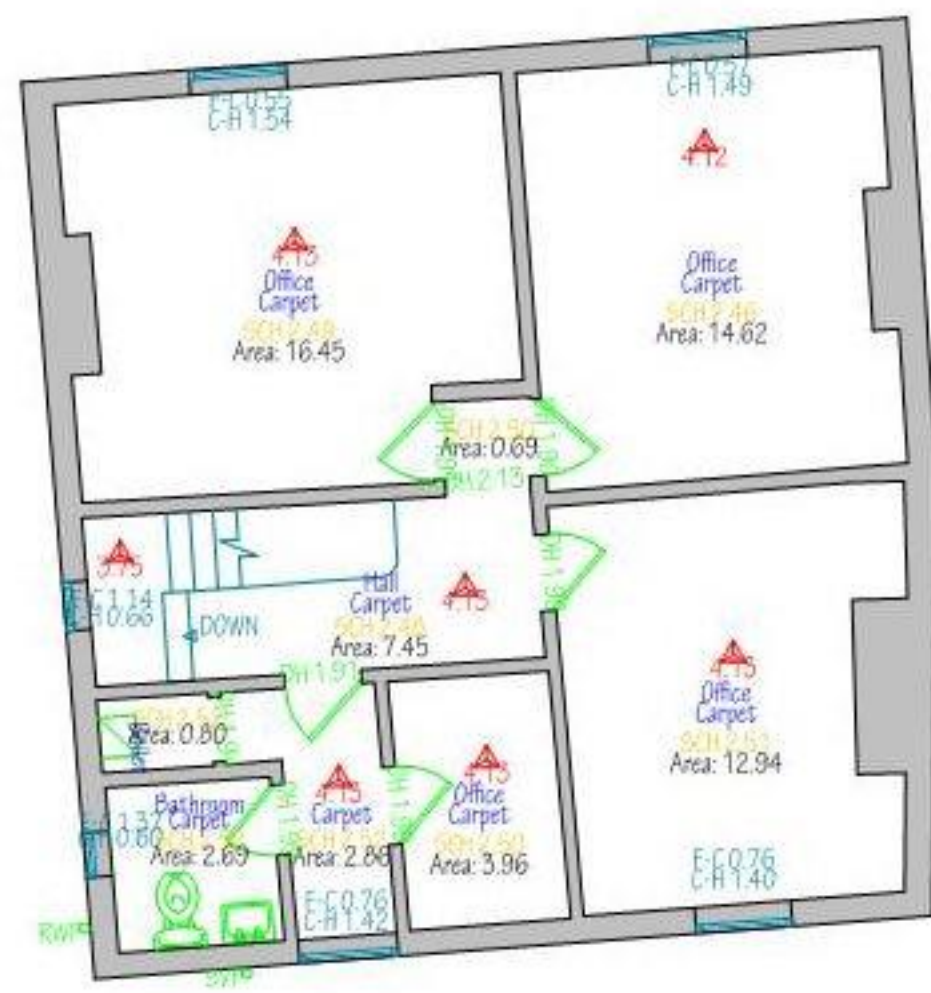
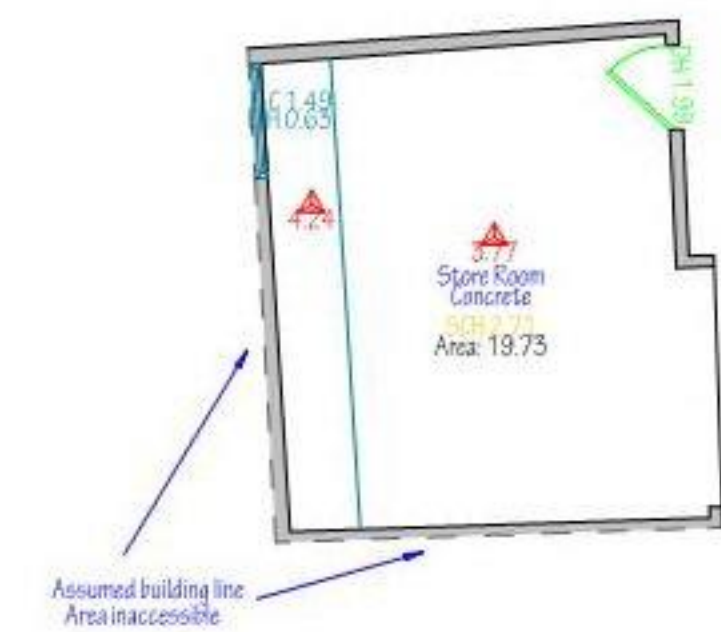
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EC

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DRAWING NUMBER	LAYOUT ISSUE	DRWG REVISION
12:1089:L(2-)002	04	01



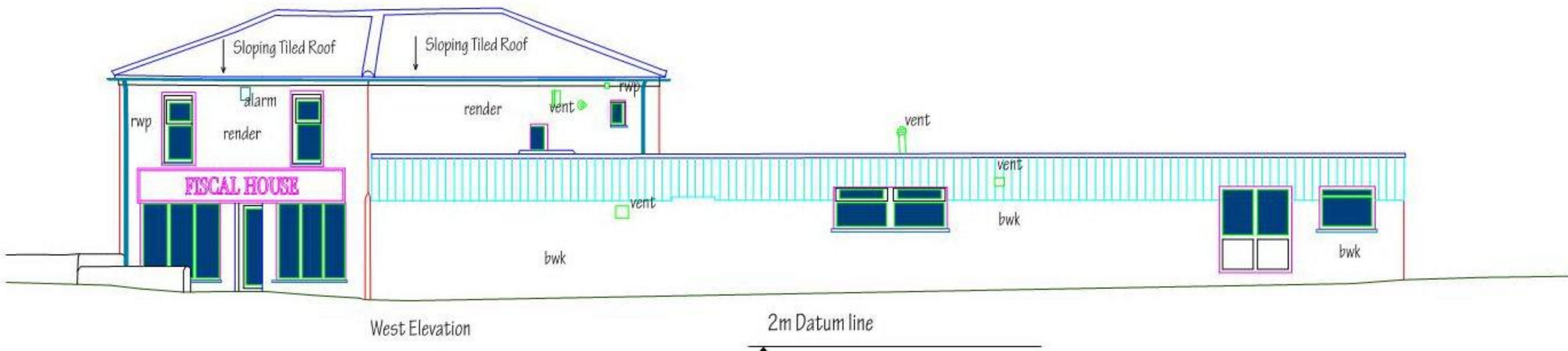
Ground Floor Plan as Existing @ 1:100



First Floor Plan as Existing @ 1:100



Fiscal House, 2 Havant Road, Emsworth PO10 7JE
Location Plan @ 1:1250

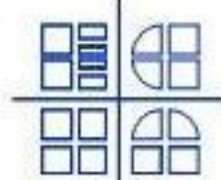


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the written consent of the Architect.

REVISIONS

Issue No	Revision	Change/Notes	Date
01	01		18/07/2020

PURPOSE OF ISSUE
INFORMATION
DESIGN
TENDER
CONSTRUCTION



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CLIENT
Mr & Mrs P A Munday

JOB TITLE
Fiscal House
2 Havant Road
Emsworth
Hampshire
PO10 7JE

DRAWING TITLE
Existing Floor Plans, Elevations &
Location Plan

SCALE
1:1250 & 100 @
A1

DATE
25/09/2019

DRAWN BY
EC

CHECKED BY

DRAWING NUMBER	LAYOUT ISSUE	ORIGIN REVISION
12:1089:L(2)-001	03	01

Appendix C Geotechnical Information

SU 70NW/193
7499 0589

CONTRACT No. 4277

BOREHOLE RECORD

CONTRACT EMSWORTH

DATE STARTED 2/1/68 FINISHED 5/1/68

BOREHOLE No. 1

OPERATOR C. Nesbitt

ORDNANCE DATUM LEVEL 22.74

TYPE OF PENETRATION TEST -

TYPE OF BORING Shell & Auger

WEIGHT - DROP -

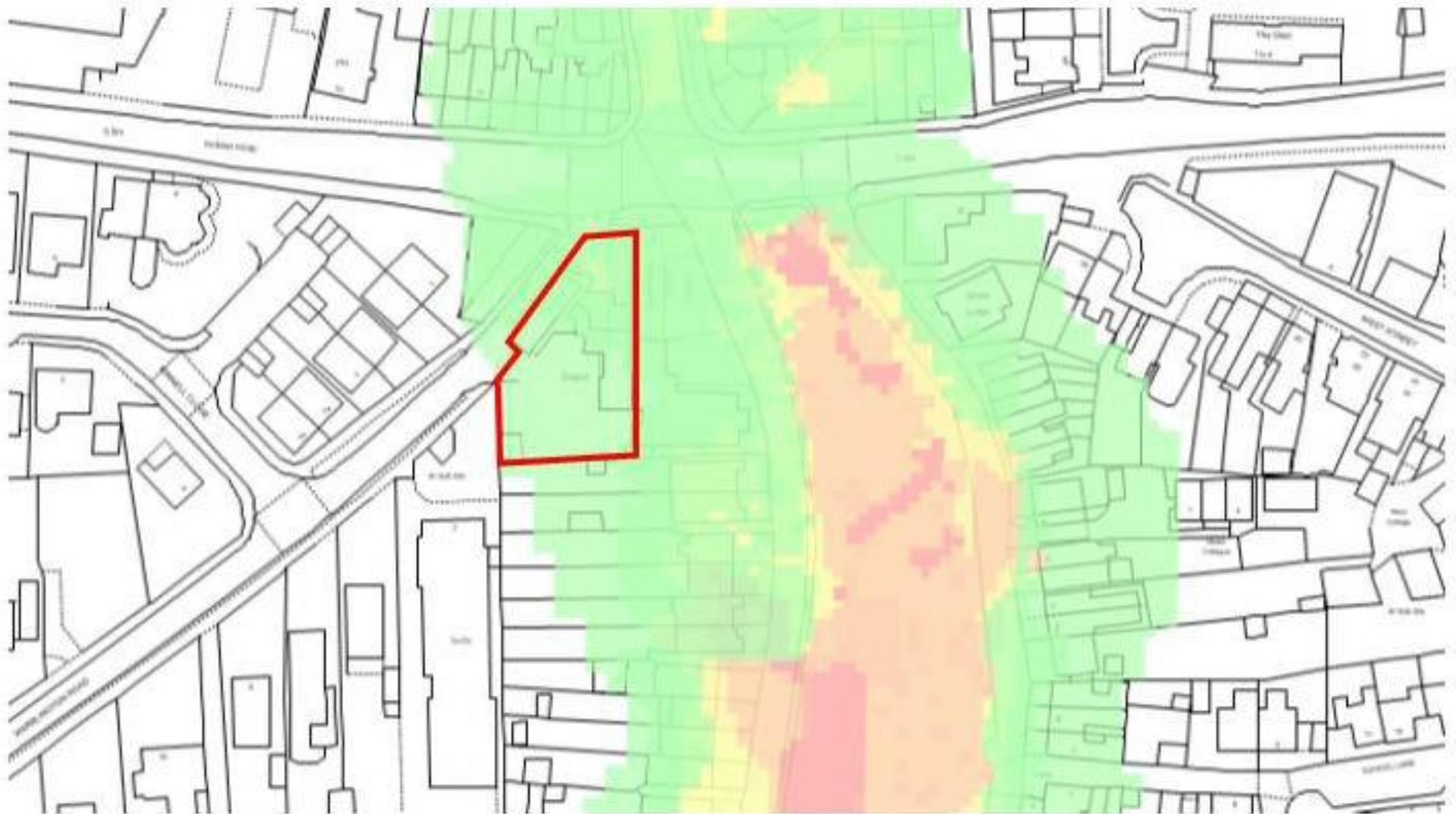
DIAMETER OF BORING 6"

STANDING WATER LEVEL 4'0"

REMARKS

Depth Feet	O.D. Level	Type & No. of Sample	Boring Details			Legend	Description of Material and Observations	
			Penetration	Lining	Water			
							Fill material with tarmac surface	Made 0.8m
5					S.W.L.		Stiff brown clay.	
		U4/5-0'						
10							Stiff brown sandy clay	
		U4/10-0'						LC
15							Hard grey mudstone	
							Hard grey clay.	
		U4/18-0'						
20			Borehole terminated.					5.3m
								2.5m
								2.1-8.5
							mapping suggests some Drift over	

Appendix D LLFA & LPA Consultation and Extracts



Flood Hazard Map (Low)



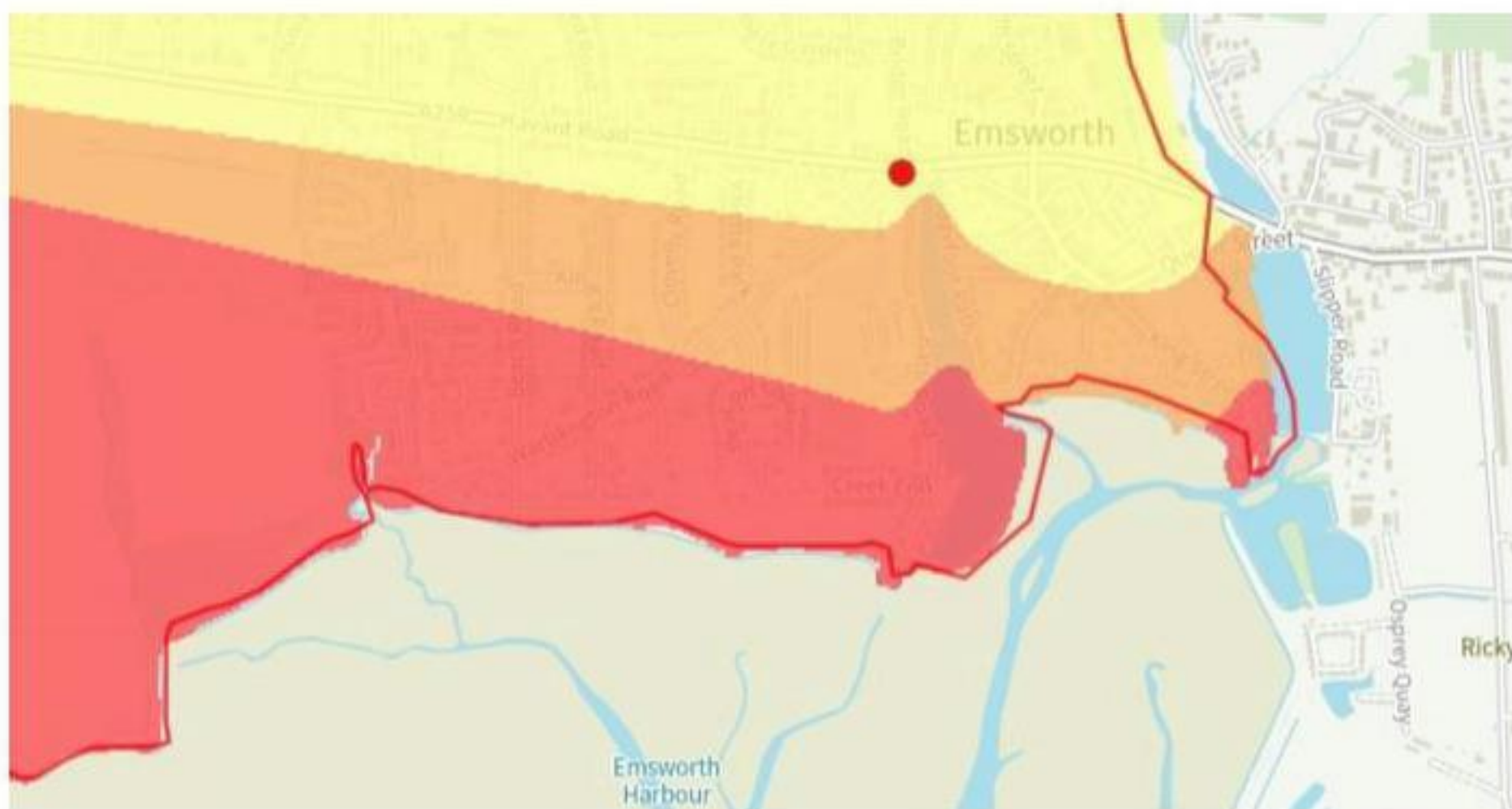
Surface Water Flood Risk (very Low to Low)



Fluvial Flood Zone 3 – year 2115

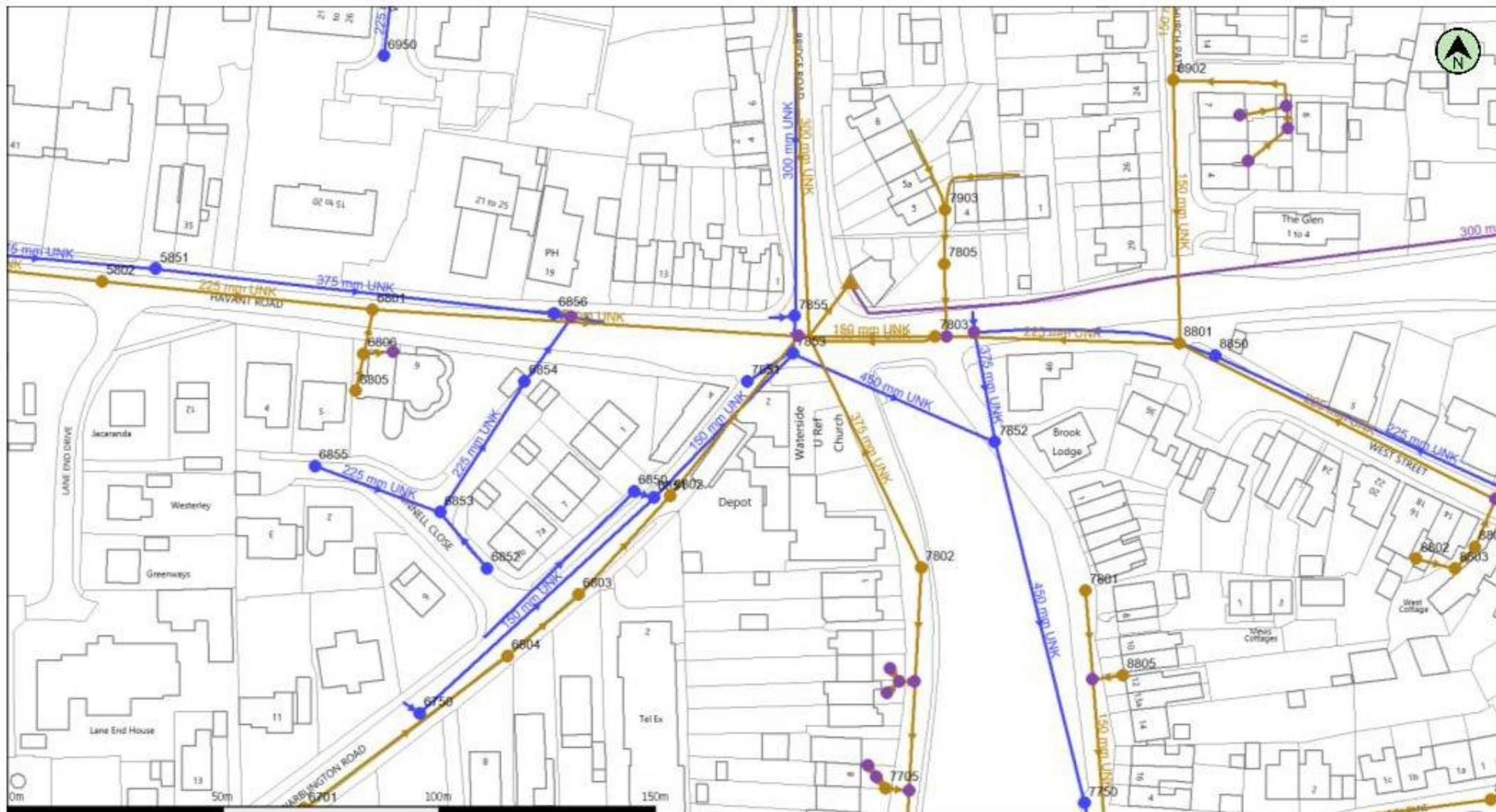


Tidal Flood Zones 2 & 3 – year 2115



Bedrock Permeability (Low)

Appendix E Public Sewer Records



(c) Crown copyright and database rights 2022 Ordnance Survey 100031673

Date: 21/02/22

Scale: 1:1250

Map Centre: 474716,105861

Data updated: 17/01/22

Our Ref: 787401 - 1

Wastewater Plan A4

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2022 Ordnance Survey 100031673. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.



searches@bpcivils.co.uk

D2043



Appendix F Flood Evacuation Plan Template



BRIGHT PLAN CIVILS

Flood Evacuation Plan

This is a template produced by Bright Plan Civils for consideration and completion by the Developer and/or Occupant

The proposals by Bright Plan Civils are not legally binding and are only intended as guidance based on Environment Agency Data & National Planning Policy Framework (NPPF).

Introduction

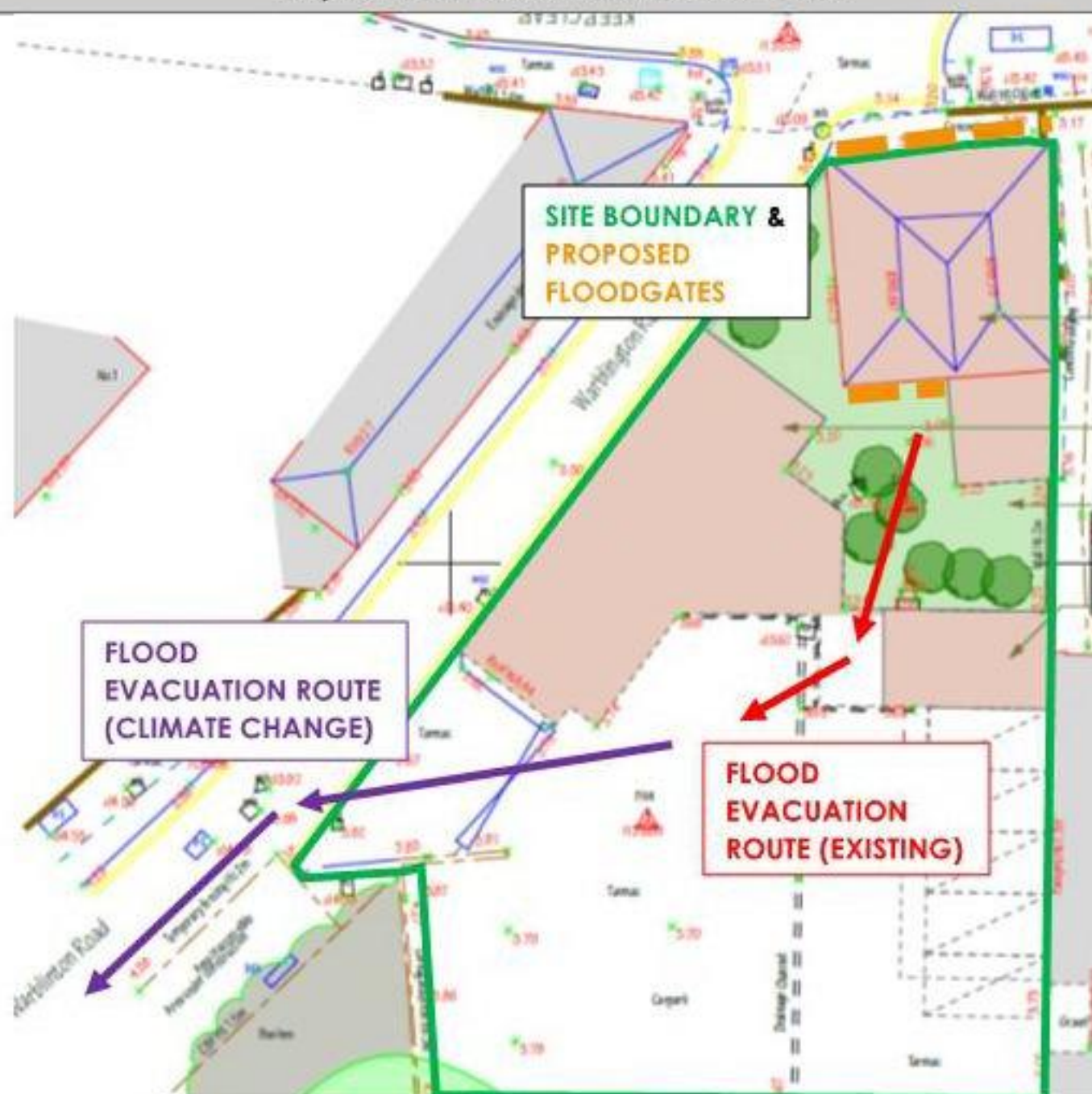
This plan is to ensure the effective flood mitigation and evacuation of the residential property at 2 Havant Road, Emsworth PO10 7JE.

This plan is to be followed to ensure the site is evacuated in sufficiently quickly and safely.

Situation

This plan is intended to provide users with the knowledge and preparedness for actions whenever there is an Environment Agency Flood Alert, Flood Warning, or otherwise knowledge of expected flood risk to the site.

Proposed Site Location & Evacuation Route



Predicted Flood Extents & Emergency Services Access



Flood Risk Assessment & Flood Preparation

The site lies within Flood Zones 1, 2 and 3a, and is at risk of flooding to the north of the site where the proposed change of use property is located in a 1 in 200 year flood event. It is also at potential increased flood risk as a result of climate change.

The upper floors of the building are above the flood level but the ground level is below. It is possible that during a flood event, access and egress will be through shallow water. During an extreme flood event or a climate induced flood event, access and egress would be restricted and it is recommended that evacuation were to be followed prior to flood levels reach a dangerous level.

It is recommended that evacuation of the building takes place prior to a predicted flood event but should you find yourself in the building, on the upper floors, during a flood event you should decide if it is safe for you to enter the flood water. It may be more appropriate for you to remain in the building.

It is also recommended that the ground floor benefits from a flood warning alarm attached to a drain within a ground floor well – this would inform evacuation or other necessary actions such as contact of emergency services.

Protection: Flood barriers are to be installed on the buildings at risk from flooding to allow some protection, intended to prevent internal flooding in some events, and allow extra time for evacuation in an extreme flood scenario. Although flood barriers should be installed at all times of flood warning or expected flooding, the site should also be evacuated as a precaution whenever it is apparent that flooding is imminent (i.e. seen on the lower Havant Road adjacent the proposed residential property).

Preparation: Subscription to the EA Flood Warning & Flood Alert Service will allow occupants to be aware of possible expected flood events, in order to have flood barriers ready for deployment and be prepared in advance for any necessary evacuation.

Flood Warnings

The Environment agency flood risk early warning system contacts the primary designated number. Should they be unavailable, the secondary number is contacted.

Contact Name (1st): _____ Number: _____
 Contact Name (2nd): _____ Number: _____

The property can be signed up the Environment Agency Flood Warning Scheme (<https://fwd.environment-agency.gov.uk/app/olr/home>) 0845 988 1188.

Warning	Message	Timing	Action on Alert
 FLOOD ALERT	Flooding is possible. Be prepared.	2 hours to 2 days in advance of flooding.	- Be prepared for flooding. - Prepare a flood kit. - Check flood barriers are ready for deployment.
 FLOOD WARNING	Flooding is expected. Immediate action required.	Half an hour to 1 day in advance of flooding.	- Act now to protect your property. - Block doors with flood barriers, and cover airbricks and other ventilation holes. - Move pets and valuables to a safe place. - Keep a flood kit ready. - Move any critical equipment and information to a safe location.
 SEVERE FLOOD WARNING	Severe flooding. Danger to life.	When flooding poses a significant threat to life and different actions are required.	- Be ready should you need to evacuate from the property. - Co-operate with the emergency services and call 999 if you are in immediate danger.
Warning Removed	No further flooding is currently expected for your area.	Issued when a flood warning is no longer in force.	- Flood water may still be around and could be contaminated. - If you've been flooded, ring your buildings and contents insurance

			company as soon as possible.
Action On Alert			
Flood Alert	• Person(s) responsible for receiving flood warnings to keep up to date with the situation by watching local television news or tuning in to your local radio station on a portable radio • Decide how flood alerts and the decision to evacuate will be communicated and obtain help and equipment to do this if required • Keep a list of important contacts to hand or store them on your mobile phone • Consider who will need extra support during a flood event • Think about if there is anything that you want to keep particularly safe (high value) that you can move now to a safer location (as high as possible in your property) • Know how to turn off the gas, water and electricity • Prepare a Flood Kit, which could contain warm and waterproof clothing, a torch, a portable radio (battery or wind up), rubber gloves, a first aid kit (containing all important medication), food, bottled water and blankets together with a copy of important documents		
Flood Warning	• Keep up to date with the situation by tuning in to your local radio station on a portable radio • Keep your Flood Kit close to hand • Move important items to a safe place (high shelf if possible) • Move people and vehicles to higher ground and Fit flood protection items (door barriers) • Do not assume that the emergency services will be able to assist, they may be helping more vulnerable people • Switch off gas, water and electricity supplies (do not touch electrical item if they are wet or if you are standing in water) • Listen to and act upon the advice given by Emergency Services and evacuate if instructed • Avoid walking or driving through floodwater. 150mm (6 inches) depth of fast flowing water is enough to knock over an adult and 600mm (2 foot) of water can move a car		
Warning Removed	• Make sure it is safe to re-enter your property. Wait for the Environment Agency to state that no flood warning is in force and for the Emergency Services to confirm that it is safe to re-enter. • Floodwater can contain bacteria and harmful substances including sewage so protect yourself by wearing rubber gloves, eye protection, waterproof boots and waterproof over-clothes before entering any areas affected by floodwater.		

	- If your property was damaged by floodwater, contact your insurance company. You may be covered if you incur accommodation costs due to not being able to stay in your property - Take photographs to record any damage to pass on to your insurance company - Get a qualified electrician to check your electrics and a qualified engineer to check your heating system before switching them back on
--	---

Utilities Contacts

Company/Type	Contact No.	Account No.	Switched Off (Y/N)	Notes (e.g. location of cut-off)
Electricity				
Gas				
Water				
Southern Water				
Telephone				
Insurance				
Landlord				

Documentation Control

This document is to be completed and kept up-to-date by the building owner and provided to all occupants for consideration, further completion and guidance.

This document is to be reviewed on January 1st every three years

Version Control

Version No.		Issued on (Date)		Valid Until (Date)	
Version No.		Issued on (Date)		Valid Until (Date)	
Version No.		Issued on (Date)		Valid Until (Date)	
Version No.		Issued on (Date)		Valid Until (Date)	
Version No.		Issued on (Date)		Valid Until (Date)	

Conditions and Limitations

1. This report does not constitute a design document. It is the duty of the project designers, to confirm the content of this report and to design the scheme in accordance with their own research and other extraneous parameters.
2. This report is produced for the named Client and must not be relied upon by any third parties, without the express prior written permission of Bright Plan Civils.
3. The copyright of this report remains the property of Bright Plan Civils.
4. Unless specifically stated otherwise in the report, any recommendations for works given in the report are to be confirmed or modified as appropriate at design stage.
5. Under the Construction (Design & Management) Regulations, latest edition, the Client has obligations for ensuring the Health & Safety arising from any construction work. If it is proposed to proceed with construction works, based upon information or recommendations contained in this report, these regulations probably apply. Further details of any issues arising from our report or the client's obligations generally are available on request