



Flood Risk Assessment for Planning

Prepared for:

Mr Couzens

June 2021

Our reference:

90456-Curnow-LangbrookClose

Location:

11 Langbrook Close

Langston

Havant

PO9 1RS



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1. Key Facts

1.1 Flood Risk Posed:

- EA Flood Zone 3, 2 and 1 (High, Medium and Low Risk).
- The risk would appear to be predominantly fluvial and originate from the Langstone Mill Channel which borders the site to the west.
- Risk of pluvial flooding would appear to be low to medium.
- Risk of groundwater and sewer surcharge flooding would appear to be low.

1.2 Flood Risk Mitigation:

- The proposal is for a minor extension, and will not increase the vulnerability of the site or introduce any separate or additional units.
- No additional bedrooms proposed at ground floor level.
- Floor levels within the extension will be set no lower than existing adjacent floor levels.
- Flood proofing of the extension will be incorporated as appropriate.
- Safe escape from the site can be provided.
- The applicant will register with the free Environment Agency Floodline Warnings Direct service.

Assuming accordance with these flood risk management measures, Unda Consulting Limited consider the proposed application to be suitable in flood risk terms.

2. Introduction

Unda Consulting Limited have been appointed by Mr Couzens (hereinafter referred to as “the applicant”) to undertake a Flood Risk Assessment for the proposed development at 11 Langbrook Close, Langston, Havant, PO9 1RS (hereinafter referred to as “the site”). The purpose of the study is to support a planning application for the proposed development.

This report presents our findings based on the readily available information and data relating to the site and surrounding drainage area.

The site appears to be located within Flood Zones 3, 2, and 1 as defined by the Environment Agency (EA) on their Flood Map for Planning. Under the National Planning Policy Framework (NPPF), a FRA is required if a proposed development:

- includes building or engineering works in Flood Zone 2 or 3;
- includes building or engineering works on land classified by the Environment Agency as having critical drainage problem;
- changes the use of land or buildings in a location at risk of flooding from rivers or the sea, or with critical drainage problems;
- changes the use of land or buildings in a way that increases the flood vulnerability of the development where it may be subject to other sources of flooding;
- is larger than 1 hectare.

The assessment should demonstrate to the Local Planning Authority (LPA) and EA how flood risk will be managed now and over the development’s lifetime, taking climate change into account, and with regard to the vulnerability of its potential users.

- whether the proposed development is likely to be affected by current or future flooding from any source;
- whether it will increase flood risk elsewhere;
- whether the measures proposed to deal with these effects and risks are appropriate.

3. Existing Situation

3.1 Site Usage:

The site is an existing residential property. Aerial imagery of the site and surrounding area is presented below in Figure 1, and the site location is shown in Figure 2.



Figure 1: Aerial imagery of site and surrounding area (Source: Google Earth)



Figure 2: Site Location Plan (Source: Ordnance Survey)

3.2 Topography:

Environment Agency LiDAR has been used to assess the topography across the site and wider area. Light Detection and Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground surface. Up to 100,000 measurements per second are made of the ground, allowing highly detailed terrain models to be generated at high spatial resolutions. The EA's LIDAR data archive contains digital elevation data derived from surveys carried out by the EA's specialist remote sensing team. Accurate elevation data is available for over 70% of England. The LiDAR technique records an elevation accurate to $\pm 0.3\text{m}$ every 2m. This dataset is derived from a combination of our full dataset which has been merged and re-sampled to give the best possible coverage. The dataset can be supplied as a Digital Surface Model (DSM) produced from the signal returned to the LIDAR (which includes heights of objects, such as vehicles, buildings and vegetation, as well as the terrain surface) or as a Digital Terrain Model (DTM) produced by removing objects from the Digital Surface Model.

1m horizontal resolution LiDAR remotely sensed digital elevation data suggests that the ground topography on site ranges from approximately 4.61mAOD to 5.00mAOD.

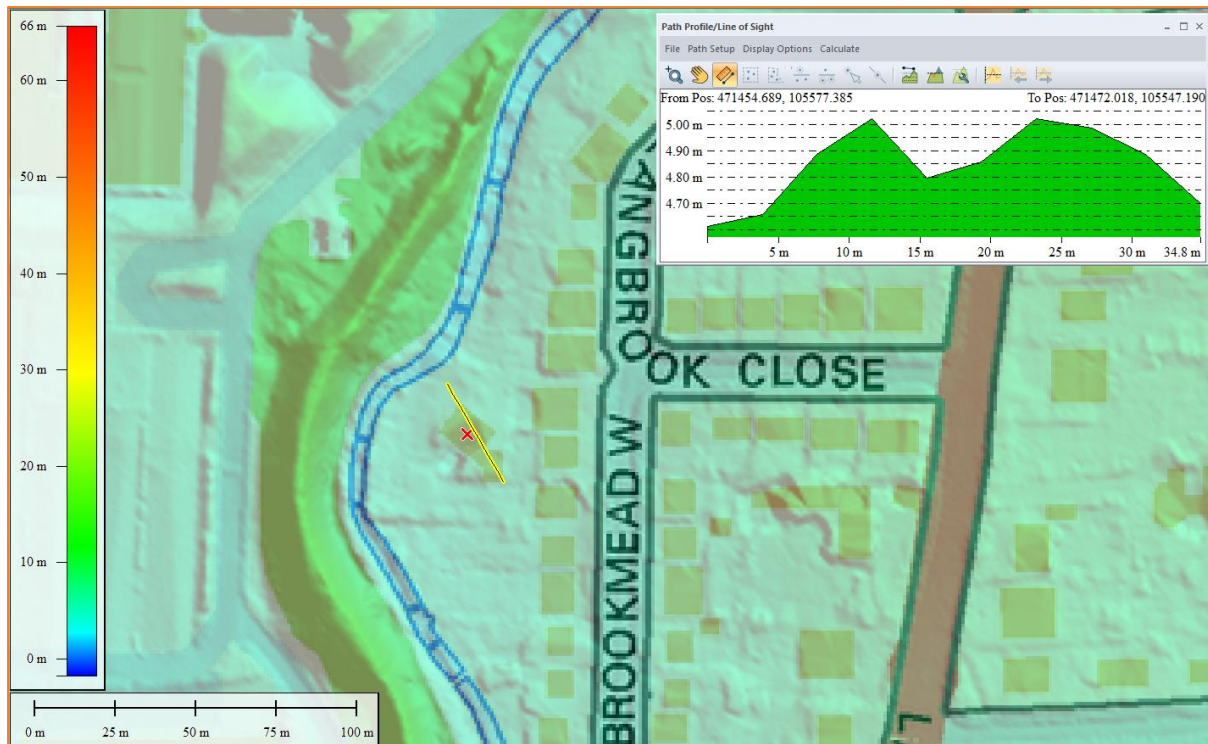


Figure 3: 1m resolution LiDAR DTM showing topographic levels across the site (transects runs from northwest to southeast) (Source: EA LiDAR, OS Mapping overlain)

3.3 Geography and Soil:

The British Geological Survey (BGS) Map indicates that the bedrock underlying the site is Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation And Portsdown Chalk Formation (Undifferentiated) - Chalk, with superficial deposits of Alluvium - Clay, Silt, Sand And Gravel and River Terrace Deposits (Undifferentiated) - Sand, Silt And Clay.

The soil type in the area taken from the UKSO Website is River Loam soil parent material, with a sand to sandy loam soil texture.

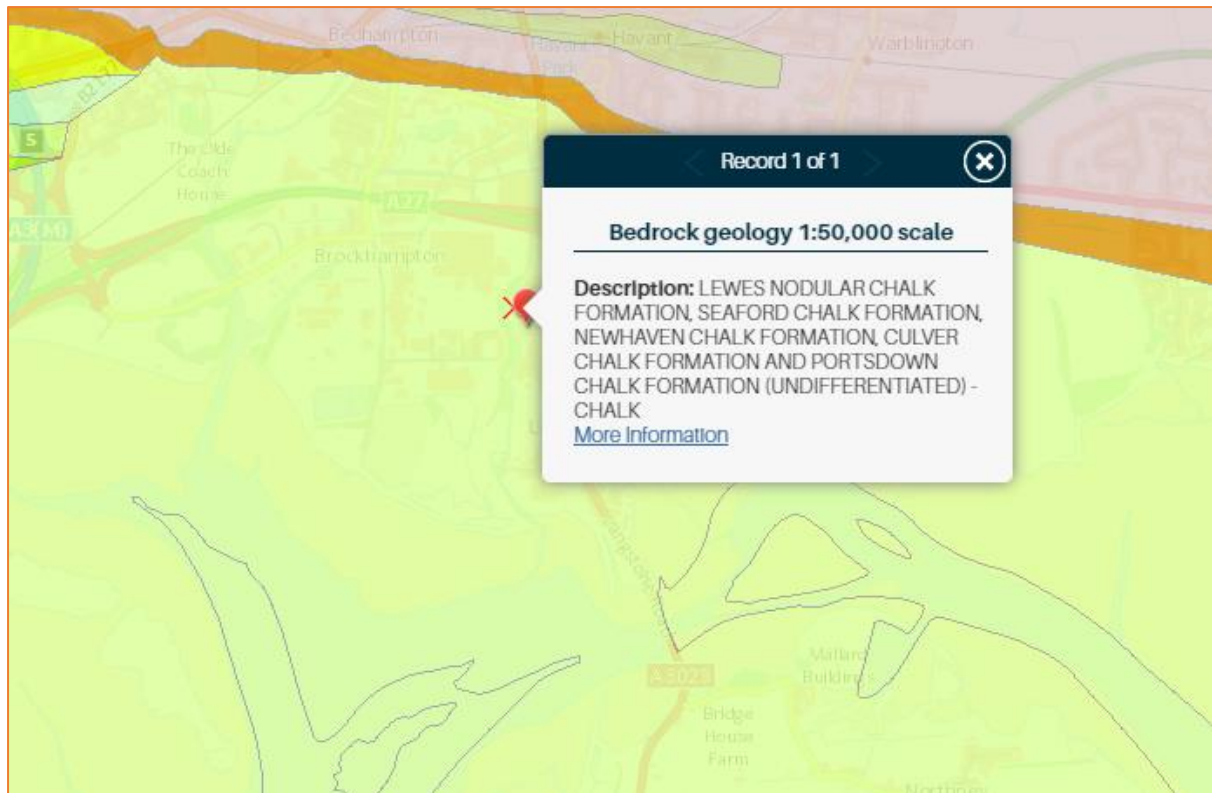


Figure 4: Geology (Source: BGS)

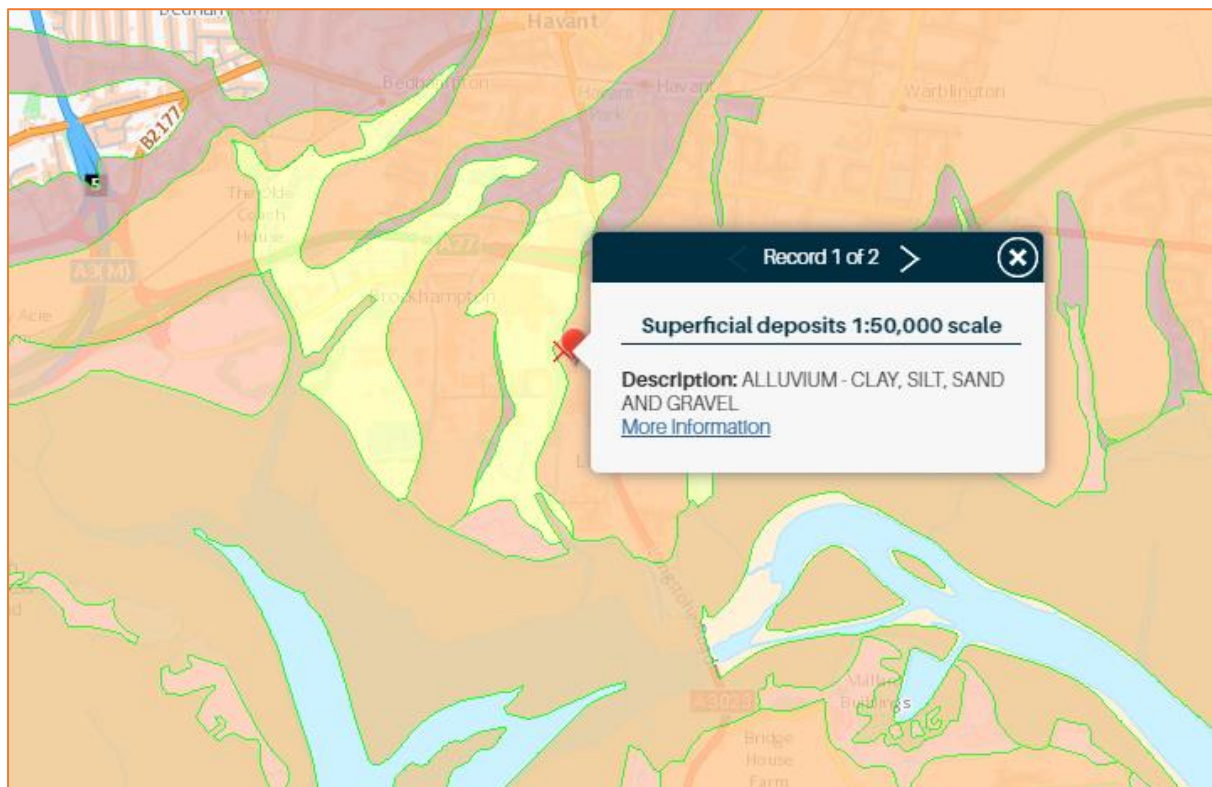


Figure 5: Superficial deposits (Source: BGS)

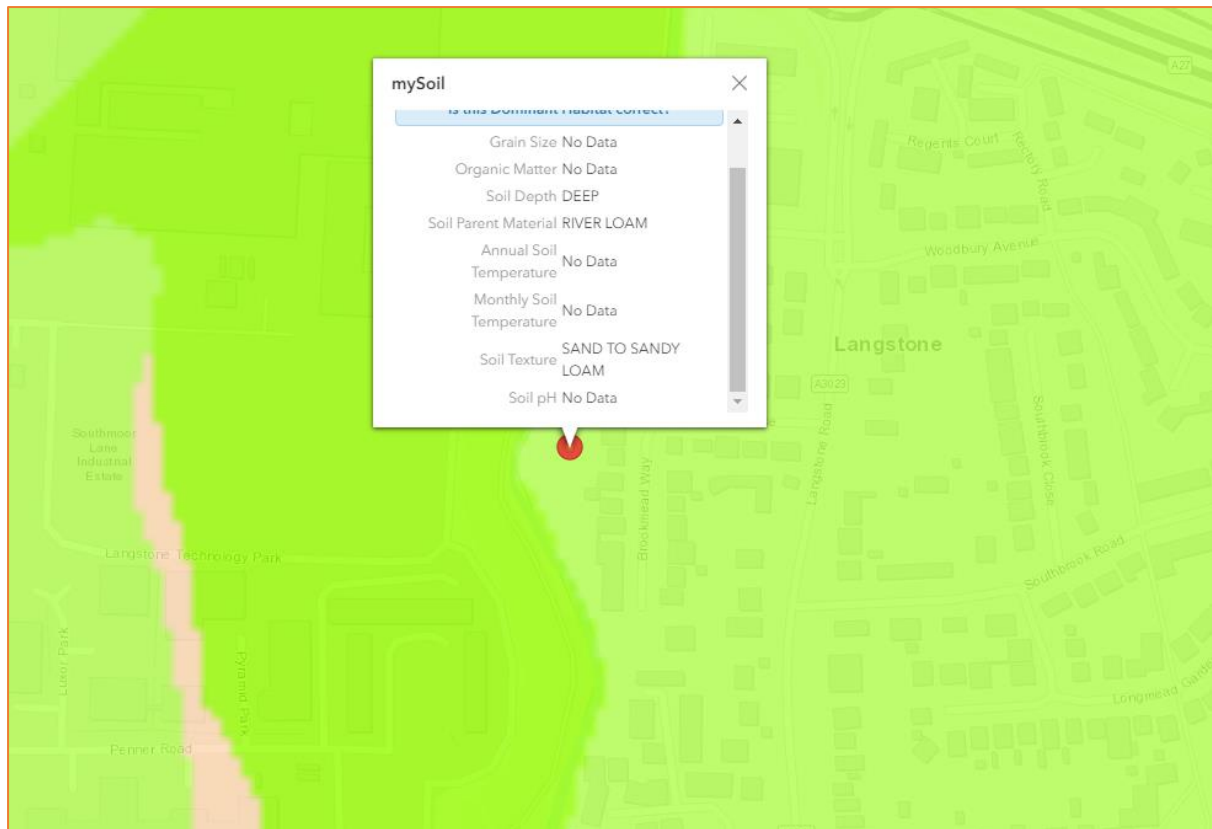


Figure 6: Soil Types (Source: UKSO)

4. Development Proposal

The proposed planning application is for a single storey extension to house a sun room and shower. See Appendix.

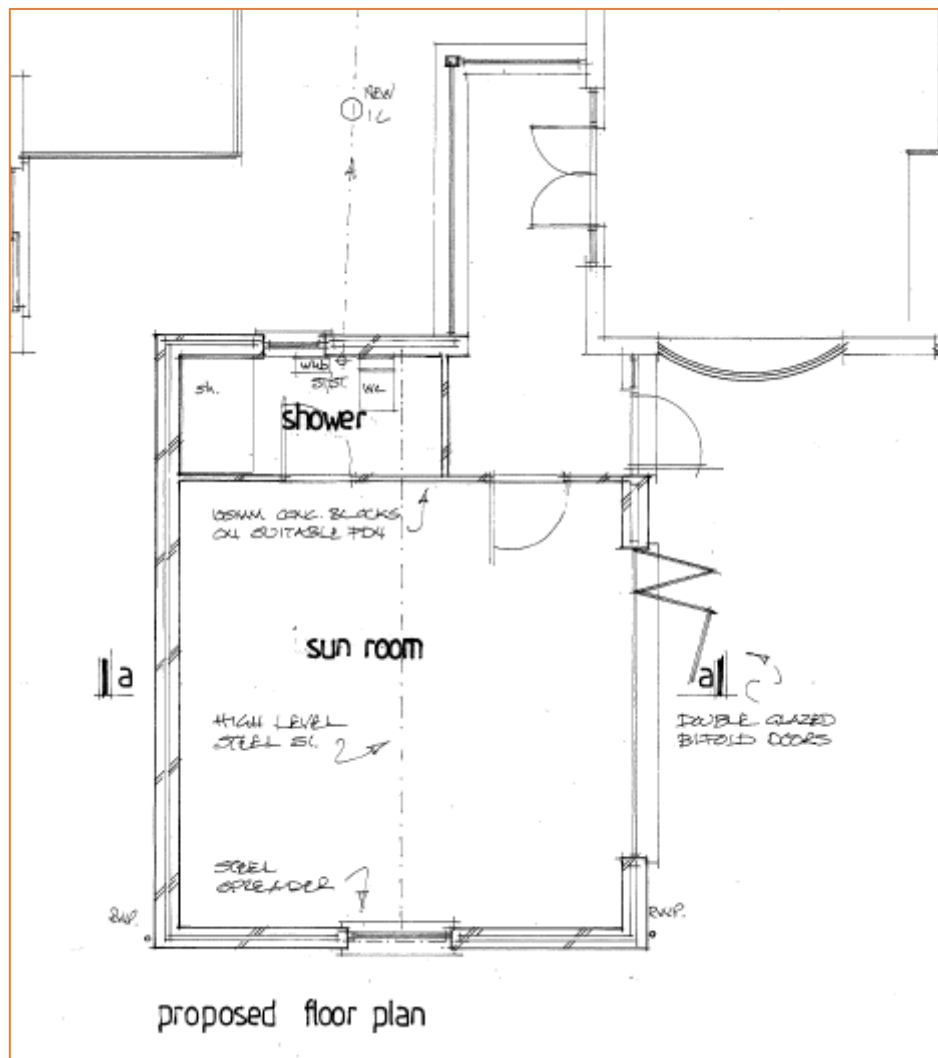


Figure 7: Proposed ground floor layout (Source: Thorns Young Architectural)

The existing house and proposed extension are residential, and therefore the lifetime of the proposed development is assumed to be 100 years.

5. Assessment of Flood Risk

5.1 Flood Zones:

Within planning, Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's Flood Map for Planning (Rivers and Sea), available on the Environment Agency's website.

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)

Table 1: Flood Zones

The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.

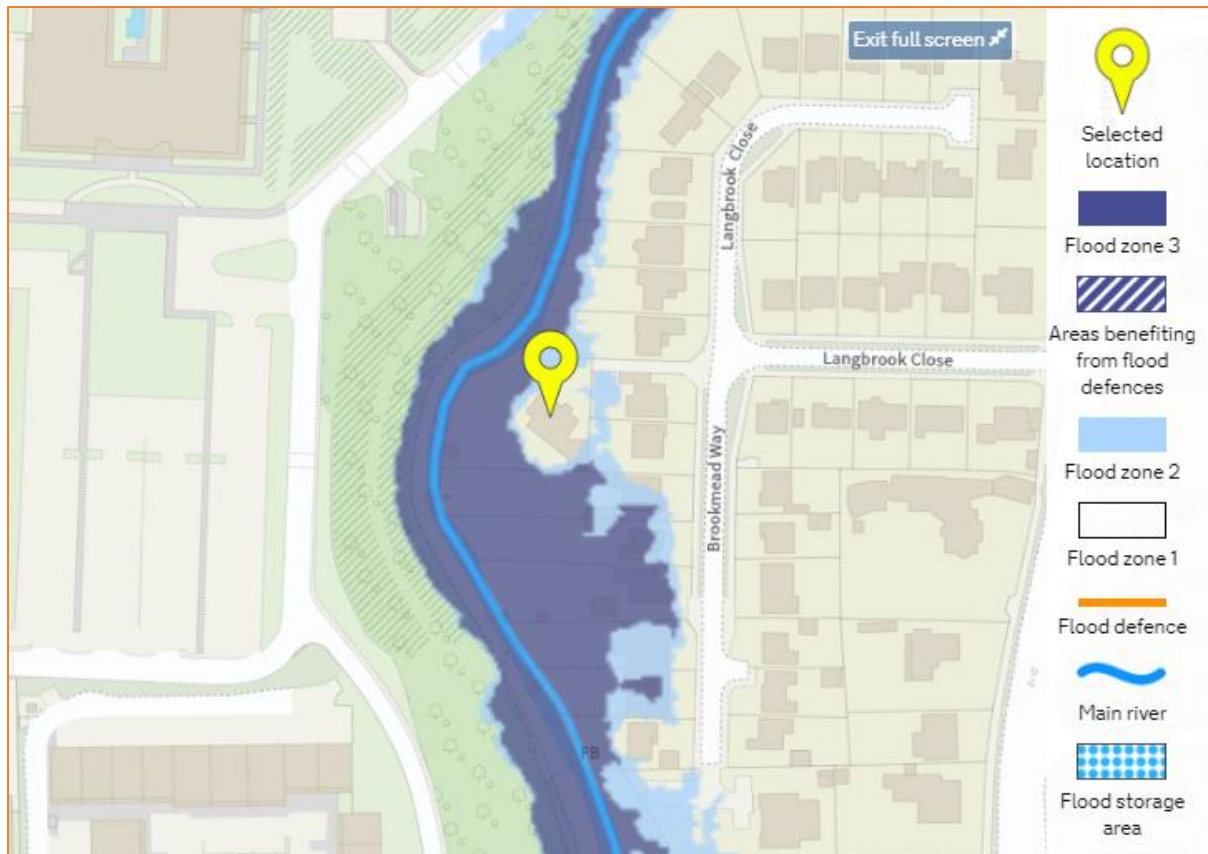


Figure 8: Environment Agency Flood Map for Planning (Rivers and Sea) (Source: EA)

The site is located within Flood Zones 3, 2 and 1 (High, Medium, Low Probability), which means it is defined as land having between a greater than 1 in 100 and less than 1 in 1000 annual probability of fluvial flooding.

The risk would appear to be predominantly fluvial and originate from the Langstone Mill Channel which borders the site to the west.

5.2 Fluvial

5.2.1 Langstone Mill Channel

The Langstone Mill Channel is also part of the River Lavant. The River Lavant is a winterbourne that rises at East Dean and flows west to Singleton, then south past West Dean and Lavant to Chichester. From east of Chichester its natural course was south to the sea at Pagham, but the Romans diverted it to flow around the southern walls of Chichester and then west into Chichester Harbour.

5.2.2 Detailed flood modelling:

The EA has provided 1D modelled flood levels from the Havant Flood Mapping Study that was carried out by Atkins in 2008 and included the 2010 dam update (EA ref: SSD/212102).

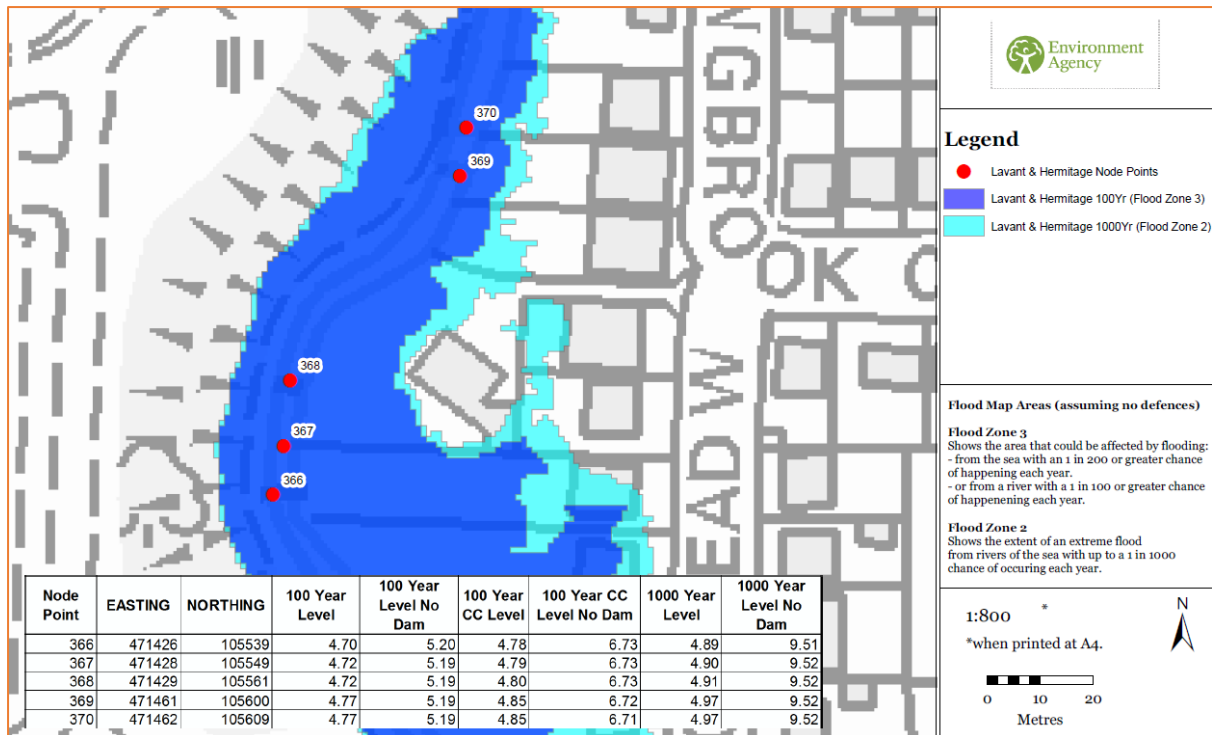


Figure 9: Environment Agency modelled 1D flood levels (Source: EA)

Node 369 is the closest upstream in-channel node to the site. A modelled 1:100 year and 1:1000 year flood level of 4.77mAOD and 4.97mAOD respectively have been provided. Comparison of these modelled flood levels with topographic site levels (4.61mAOD to 5.00mAOD) shows that the site is partially below the modelled flood levels provided.

A modelled 1:100 year flood level with allowance for climate change of 4.85mAOD has been provided. No information has been provided by the EA about the Havant Flood Mapping Study, however given the age of the model (2010 update) it is assumed that a 20% increase in river flows is used for climate change. The site lies within the South East River Basin District, where the Upper End and Higher Central climate change allowances are a 105% and 45% increase in river flows respectively. No modelled flows have been provided by the EA, and as such a stage-discharge relationship cannot be derived.

The Environment Agency flood risk assessment: climate change allowances guidance states that for minor development, the 'Basic approach can be applied where an allowance can be added to the design flood peak levels to account for potential climate change impacts. For the South East River Basin District, an allowance of 850mm can be added for the Higher Central, and 1400mm for the Upper End climate change allowances. The 1:100 year flood level with Higher Central and Upper End allowances for climate change are therefore 5.62mAOD and 6.17mAOD respectively. Comparison of these modelled flood levels with topographic site levels (4.61mAOD to 5.00mAOD) shows that the site could be inundated with between 0.62m to 1.01m for the Higher Central climate change allowance and 1.17m to 1.56m for the Upper End climate change allowance.

5.2.3 Flood defences:

The flood defences on the Langstone Mill Channel are private flood defences to the 1:40yr standard. It is understood that the Havant Flood Mapping Study also includes a Dam.

5.2.4 Residual risk (breach or overtopping of flood defences):

Breaching of flood defences can cause rapid inundation of areas behind flood defences as flow in the river channel discharges through the breach. A breach can occur with little or no warning, although they are much more likely to concur with extreme river levels or tides when the stresses on flood defences are highest. Flood water flowing through a breach will normally discharge at a high velocity, rapidly filling up the areas behind the defences, resulting in significant damage to buildings and a high risk of loss of life. Breaches are most likely to occur in soft defences such as earth embankments although poorly maintained hard defences can also be a potential source of breach.

Overtopping of flood defences occurs when water levels exceed the protection level of raised flood defences. The worst case occurs when the fluvial or tidal levels exceed the defence level as this can lead to prolonged flooding. Less severe overtopping can occur when flood levels are below defence levels, but wave action causes cyclic overtopping, with intermittent discharge over the crest level of the defence. Flood defences are commonly designed with a freeboard to provide protection against overtopping from waves. The risk from overtopping due to exceedance of the flood defence level is much more significant than the risk posed by wave overtopping. Exceedance of the flood defence level can lead to prolonged and rapid flooding with properties immediately behind the defences at highest risk.

In the event of the flood defences in place being breached (failure) or overtopped (exceedance) the site may be at risk of inundation. Modelled 1:100 year and 1:1000 year flood levels have been provided by the EA – excluding the Dam. These are 5.19mAOD and 9.52mAOD respectively, which are up to 0.58m and 4.91m above site levels respectively.

5.2.5 Historical flood events:

The EA have no records of flooding at the site previously.

5.3 Pluvial (Surface Water):

Pluvial (surface water) flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.

In 2013 the EA, working with Lead Local Flood Authorities (LLFAs), produced an updated Flood Map for Surface Water. It is considered to represent a significant improvement on the previous surface water flood maps available, both in terms of method and representation of the risk of flooding. The modelling techniques and data used are considerably improved, and also incorporated locally produced mapping where this is available to represent features best modelled at a local scale.

The Flood Map for Surface Water assesses flooding scenarios as a result of rainfall with the following chance of occurring in any given year (annual probability of flooding is shown in brackets):

- 1:30 (3.3%)
- 1:100 (1%)
- 1:1000 (0.1%)

The mapping below shows the Risk of Flooding from Surface Water centred on the site. Please note that the EA do not consider this information suitable to be used to identify the risk to individual properties or sites. It is useful to raise awareness in areas which may be at risk and may require additional investigation.

The EA Risk of Flooding from Surface Water Map suggests that the site lies within an area of “Low” to “Medium” risk of flooding from surface water.

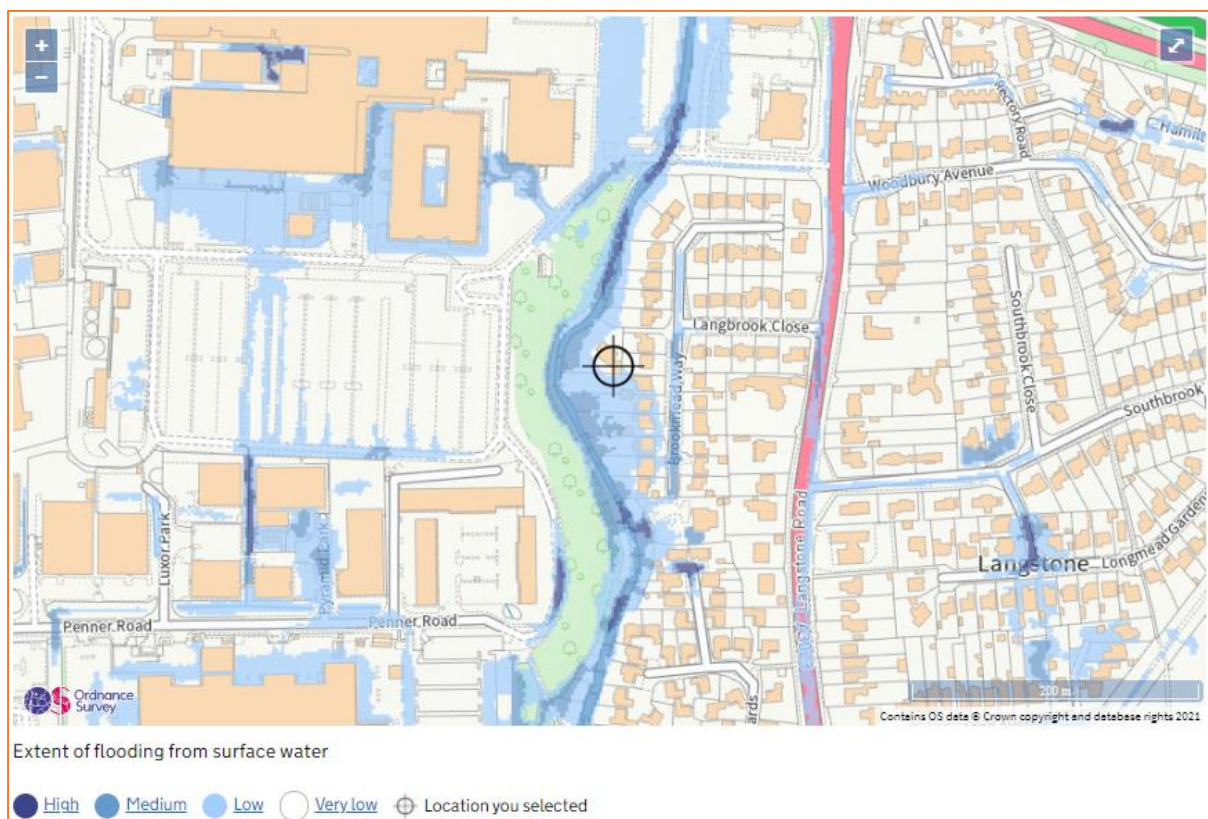


Figure 10: Extract from Environment Agency RoFSW map (Source: EA)

5.4 Groundwater:

Groundwater flooding occurs as a result of water rising up from the underlying rocks or from water flowing from abnormal springs. This tends to occur after much longer periods of sustained high rainfall. Higher rainfall means more water will infiltrate into the ground and cause the water table to rise above normal levels. Groundwater tends to flow from areas where the ground level is high, to areas where the ground level is low. In low-lying areas the water table is usually at shallower

depths anyway, but during very wet periods, with all the additional groundwater flowing towards these areas, the water table can rise up to the surface causing groundwater flooding.

Groundwater flooding is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as chalk or sandstone, or may be localised sands or river gravels in valley bottoms underlain by less permeable rocks. Groundwater flooding takes longer to dissipate because groundwater moves much more slowly than surface water and will take time to flow away underground.

The PUSH SFRA mapping shows the site to lie within an area with High Bedrock Permeability.

No records of groundwater flooding in the vicinity of the site have been provided.

5.5 Sewer Surcharge:

Sewer flooding occurs when the sewer network cannot cope with the volume of water that is entering it. It is often experienced during times of heavy rainfall when large amounts of surface water overwhelm the sewer network causing flooding. Temporary problems such as blockages, siltation, collapses and equipment or operational failures can also result in sewer flooding.

All Water Companies have a statutory obligation to maintain a register of properties/areas which have reported records of flooding from the public sewerage system, and this is shown on the DG5 Flood Register. This includes records of flooding from foul sewers, combined sewers and surface water sewers which are deemed to be public and therefore maintained by the Water Company. The DG5 register records of flood incidents resulting in both internal property flooding and external flooding incidents. Once a property is identified on the DG5 register, water companies can typically put funding in place to address the issues and hence enable the property to be removed from the register. It should be noted that flooding from land drainage, highway drainage, rivers/watercourses and private sewers is not recorded within the register.

The PUSH SFRA mapping shows no Southern Water observed flooding records in the vicinity of the site.

5.6 Other Sources:

The EA Risk of Flooding from Reservoirs Map suggests that the site lies outside of the "Maximum extent of flooding" from reservoir failure. The EA also advise on their website that reservoir flooding is extremely unlikely. All major reservoirs have to be inspected by specialist dam and reservoir Engineers. These inspections are monitored and enforced by the EA themselves. The risk to the site from reservoir flooding is therefore minimal and is far lower than that relating to the potential for fluvial flooding to occur.

No further information has been provided to suggest the site is susceptible to from the failure of reservoirs, canals or other artificial infrastructure from the risk of flooding.

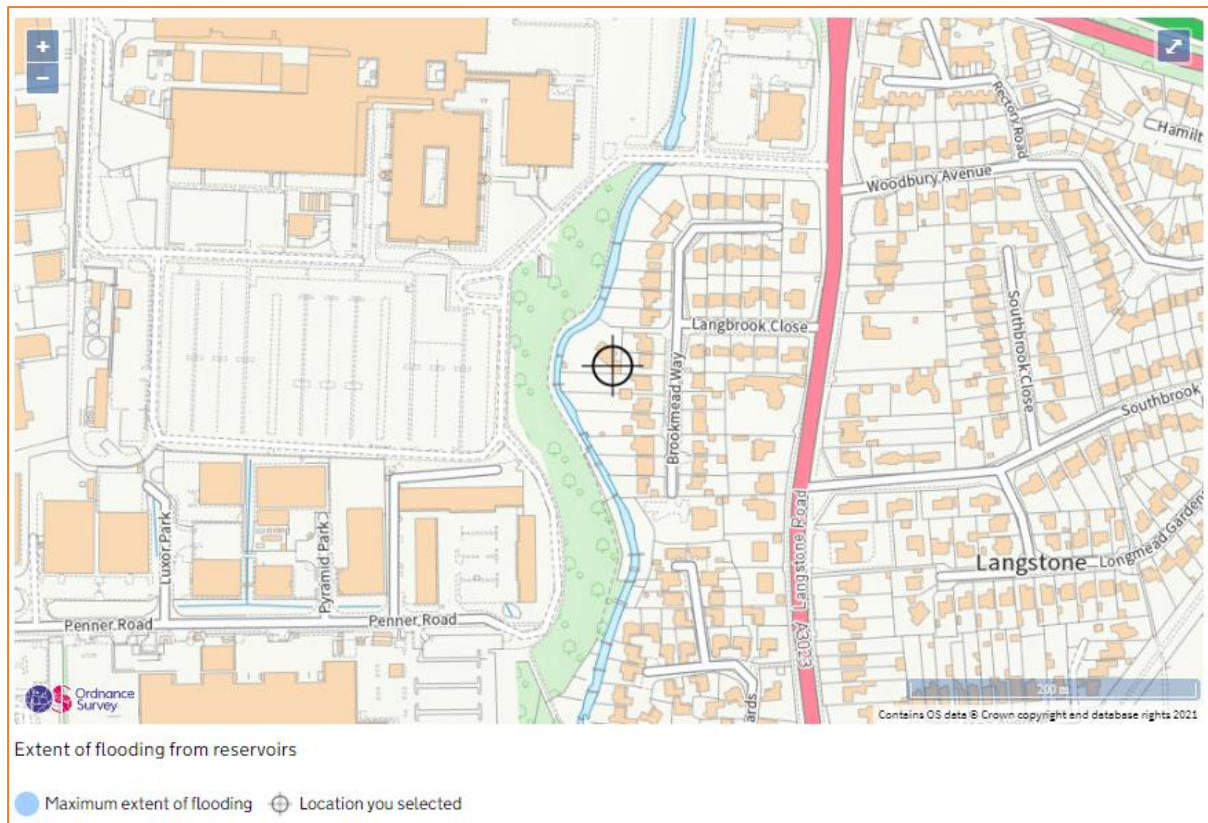


Figure 11: Extract from Environment Agency Risk of Flooding from Reservoirs Map (Source: EA)

6. Flood Risk Management

6.1 Vulnerability to flooding:

The NPPF classifies property usage by vulnerability to flooding.

The existing site usage is classified as "more vulnerable" throughout, as it is a residential property. Post development, the site will remain "more vulnerable", as the application is for a single storey extension to house a sun room and shower.

Accordingly, it is considered that the vulnerability of the site as a whole has not increased post development. There will be no introduction of additional or separate units, no sub-division, and no intensification of usage.

6.2 EA Standing Advice:

The EA Standing Advice guidance is for domestic extensions and non-domestic extensions where the additional footprint created by the development does not exceed 250m². It should not be applied if an additional dwelling is being created, e.g. a self-contained annexe or additional commercial unit.

The development is considered to fit within the EA Standing Advice for domestic extensions.

6.3 Physical Design Measures:

The applicant has confirmed that the finished floor level of the extension will be set no lower than the existing floor levels. No additional bedrooms are proposed at ground floor level. To help protect against flooding during extreme events, the applicant has agreed to implement flood resistant design measures into the proposed extension.

To help protect against flooding during extreme events, the applicant has agreed to implement flood resistant design measures into the proposed ground floor extension. These measures could include the following where possible:

- Solid concrete ground floor, with waterproof membrane;
- Waterproof screed used on floors;
- Closed-cell foam used in wall cavities;
- Exterior ventilation outlets, utility points and air bricks fitted with removable waterproof covers;
- Plumbing insulation of closed-cell design;
- Non-return valves fitted to all drain and sewer outlets;
- Manhole covers secured;
- Anti-syphon fitted to all toilets;

- Install demountable flood defence barriers to defend ground level doorways and low windows.

6.4 Safe Escape and Flood Action Plan:

The NPPF and Local Policy require that a route of safe escape be provided from the property. The proposed escape route (depicted by a red dashed line) can be seen in the figure below. This route is entirely outside of Flood Zones 3 and 2 when using the Environment Agency Flood Map for Planning (Rivers and Sea).

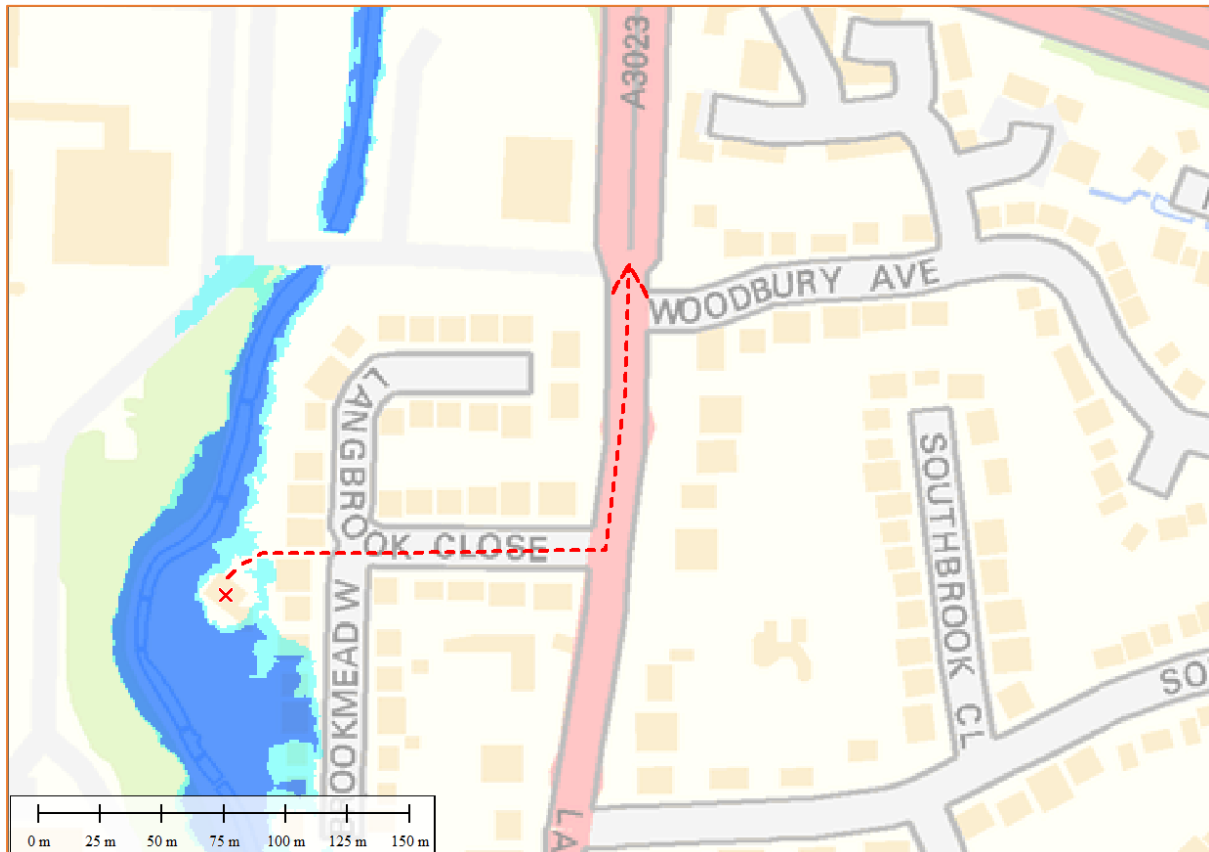


Figure 12: Proposed route of safe escape (Source: EA)

The EA is responsible for issuing flood warnings. Flood warnings are issued to the emergency services and local authorities. Both private individuals and organisations can sign-up to receive warnings via phone, text or email. This system of receiving warnings is currently voluntary.

Advice regarding severe flood warnings will generally be given during weather forecasts on local radio and TV. In the case of extreme events, warnings can also be disseminated via door to door visits by the police or locally appointed flood wardens.

The applicant has agreed to subscribe to the EA's flood warning service. The site falls within the Havant Town Centre on the Lavant Stream Flood Warning Area.

The flood warning service has three types of warnings that will help you prepare for flooding and take action:

Flood Warning	Flood Alert	Flood Warning	Severe Flood Warning
			
What it means?	Flooding is possible. Be prepared.	Flooding is expected. Immediate action required.	Severe flooding. Danger to life.
When it's used?	Two hours to two days in advance of flooding.	Half an hour to one day in advance of flooding.	When flooding poses a significant threat to life.
What to do?	Be prepared to act on your flood plan. Prepare a flood kit of essential items. Monitor local water levels and the flood forecast on our website.	Move family, pets and valuables to a safe place. Turn off gas, electricity and water supplies if safe to do so. Put flood protection equipment in place.	Stay in a safe place with a means of escape. Be ready should you need to evacuate from your home. Co-operate with the emergency services. Call 999 if you are in immediate danger.

Table 2: EA Flood Warning Service

The applicant has prepared the following flood plan to protect life and property during a flood event:

Before a flood:

- Find out if you are at risk of flooding.
- Find out if you can receive flood warnings.
- Prepare and keep a list of all your important contacts to hand or save them on your mobile phone.
- Think about what items you can move now and what you would want to move to safety during a flood such as pets, cars, furniture, and electrical equipment.
- Know how to turn off gas, electricity and water supplies.
- Prepare a flood kit of essential items and keep it handy. It can include copies of important documents, a torch, a battery-powered or wind-up radio, blankets and warm clothing, waterproofs, rubber gloves and a first aid kit including all essential medication.
- Consider buying flood protection products such as flood boards and airbrick covers to help reduce flood water getting into your property.

During a flood:

- Tune into your local radio station on a battery or wind-up radio.
- Fill jugs and saucepans with water.
- Grab your flood kit - if you have prepared one.
- Collect blankets, torch, first aid kit, medication and food.
- Move important documents, personal items, valuables, and lightweight belongings upstairs or to high shelves.
- Raise large items of furniture, or put them in large bags if you have them.
- Move people, outdoor belongings, cars and pets to higher ground.
- Switch off water, gas and electricity at mains when water is about to enter your home. Do not touch sources of electricity when standing in water.
- Fit flood protection products, if you have them, for example flood boards, airbrick covers, sandbags.
- Put plugs in sinks and baths. Weigh them down with a pillowcase or plastic bag filled with soil.
- If you do not have non-return valves fitted, plug water inlet pipes with towels or cloths.
- Move your family and pets upstairs or to a high place with a means of escape.
- Listen to the advice of the emergency service and evacuate if told to do so.
- Avoid walking or driving through flood water. Six inches of fast-flowing water can knock over an adult and two feet of water can move a car.

After a flood:

- If you have flooded, contact your insurance company as soon as possible.
- Take photographs and videos of your damaged property as a record for your insurance company.
- If you don't have insurance, contact your local authority for information on grants and charities that may help you.
- Flood water can contain sewage, chemicals and animal waste. Always wear waterproof outerwear, including gloves, wellington boots and a face mask.
- Have your electrics, central heating and water checked by qualified engineers before switching them back on.

6.5 Off-Site Impacts:

6.5.1 Fluvial floodplain storage:

The NPPF requires that where development is proposed in undefended areas of floodplain, which lie outside of the functional floodplain, the implications of ground raising operations for flood risk elsewhere needs to be considered. Raising existing ground levels may reduce the capacity of the floodplain to accommodate floodwater and increase the risk of flooding by either increasing the depth of flooding to existing properties at risk or by extending the floodplain to cover properties normally outside of the floodplain. Flood storage capacity can be maintained by lowering ground levels either within the curtilage of the development or elsewhere in the floodplain, in order to maintain at least the same volume of flood storage capacity within the floodplain.

In undefended tidal areas, raising ground levels is unlikely to impact on maximum tidal levels so the provision of compensatory storage should not be necessary.

For development in a defended flood risk area, the impact on residual flood risk to other properties needs to be considered. New development behind flood defences can increase the residual risk of flooding if the flood defences are breached or overtopped by changing the conveyance of the flow paths or by displacing flood water elsewhere. If the potential impact on residual risk is unacceptable then mitigation should be provided.

The site is situated in Flood Zones 2 and 3 when using the Environment Agency Flood Map for Planning (Rivers and Sea). The proposal is for a minor domestic extension, which fits within the EA Standing Advice. Accordingly, there will be no unacceptable loss of fluvial floodwater.

6.5.2 Surface Water Drainage:

The development will utilise Sustainable Urban Drainage (SuDs) design in accordance with the NPPF for Planning Applications hierarchy as follows:

1. Store rainwater for later use;
2. Infiltration techniques;
3. Attenuate rainwater by storing in tanks for gradual release;
4. Discharge rainwater direct into watercourse;
5. Discharge rainwater into surface water sewer;
6. Discharge rainwater into a combined sewer;
7. Attenuation of rainwater in ponds or open water features with controlled discharge into the local watercourse.

All surface water runoff generated by the proposed development up to 1:100 year rainfall event (plus climate change) will be stored on site, prior to being discharged.

Due to the scale of the development, a full Surface Water Drainage Strategy is not required at this stage of planning.

7. Sequential and Exception Test

The Sequential Test aims to ensure that development does not take place in areas at high risk of flooding when appropriate areas of lower risk are reasonably available. The site is situated in Flood Zones 3, 2 and 1 when using the Environment Agency Flood Map for Planning (Rivers and Sea). The proposed development is considered to be 'more vulnerable' (residential), but the proposal is for a minor extension, and will not increase the vulnerability of the site or introduce any separate or additional units.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	✗	Exception Test required	✓	✓
Zone 3b	Exception Test required	✗	✗	✗	✓

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

The Sequential and Exception Tests do not need to be applied to minor developments and changes of use.

8. Discussion and Conclusions

Unda Consulting Limited have been appointed by Mr Couzens to undertake a Flood Risk Assessment for the proposed development at 11 Langbrook Close, Langston, Havant, PO9 1RS. The purpose of the study is to support a planning application for the proposed development.

This report presents our findings based on the readily available information and data relating to the site and surrounding drainage area.

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The risk would appear to be predominantly fluvial and originate from the Langstone Mill Channel which borders the site to the west.

The EA has provided 1D modelled flood levels from the Havant Flood Mapping Study that was carried out by Atkins in 2008 and included the 2010 dam update (EA ref: SSD/212102).

Comparison of the modelled 1:100 year and 1:1000 year flood levels with topographic site levels (4.61mAOD to 5.00mAOD) shows that the site is partially below the modelled flood levels provided.

Comparison of the modelled climate change flood levels with topographic site levels shows that the site could be inundated with between 0.62m to 1.01m for the 1:100 year plus Higher Central climate change allowance and 1.17m to 1.56m for the 1:100 year plus Upper End climate change allowance.

The EA Risk of Flooding from Surface Water Map suggests that the site lies within an area of "Low" to "Medium" risk of flooding from surface water.

Additionally, the risk of flooding posed to the site by groundwater and sewer surcharge flooding would appear to be low.

The EA Standing Advice guidance is for domestic extensions and non-domestic extensions where the additional footprint created by the development does not exceed 250m². It should not be applied if an additional dwelling is being created, e.g. a self-contained annexe or additional commercial unit.

The development is considered to fit within the EA Standing Advice for domestic extensions.

The finished floor level of the extension will be set no lower than the existing floor levels. No additional bedrooms are proposed at ground floor level. To help protect against flooding during extreme events, the applicant has agreed to implement flood resistant design measures into the proposed extension.

In summary:

- Site is situated within Flood Zones 3, 2 and 1.
- Risk of pluvial flooding would appear to be low to medium.
- Risk of groundwater and sewer surcharge flooding would appear to be low.
- The proposal is for a minor extension, and will not increase the vulnerability of the site or introduce any separate or additional units.
- No additional bedrooms proposed at ground floor level.
- Floor levels within the extension will be set no lower than existing adjacent floor levels.
- Flood proofing of the extension will be incorporated as appropriate.
- Safe escape from the site can be provided.
- The applicant will register with the free Environment Agency Floodline Warnings Direct service.

Assuming accordance with these flood risk management measures, Unda Consulting Limited consider the proposed application to be suitable in flood risk terms.

Unda Consulting Limited

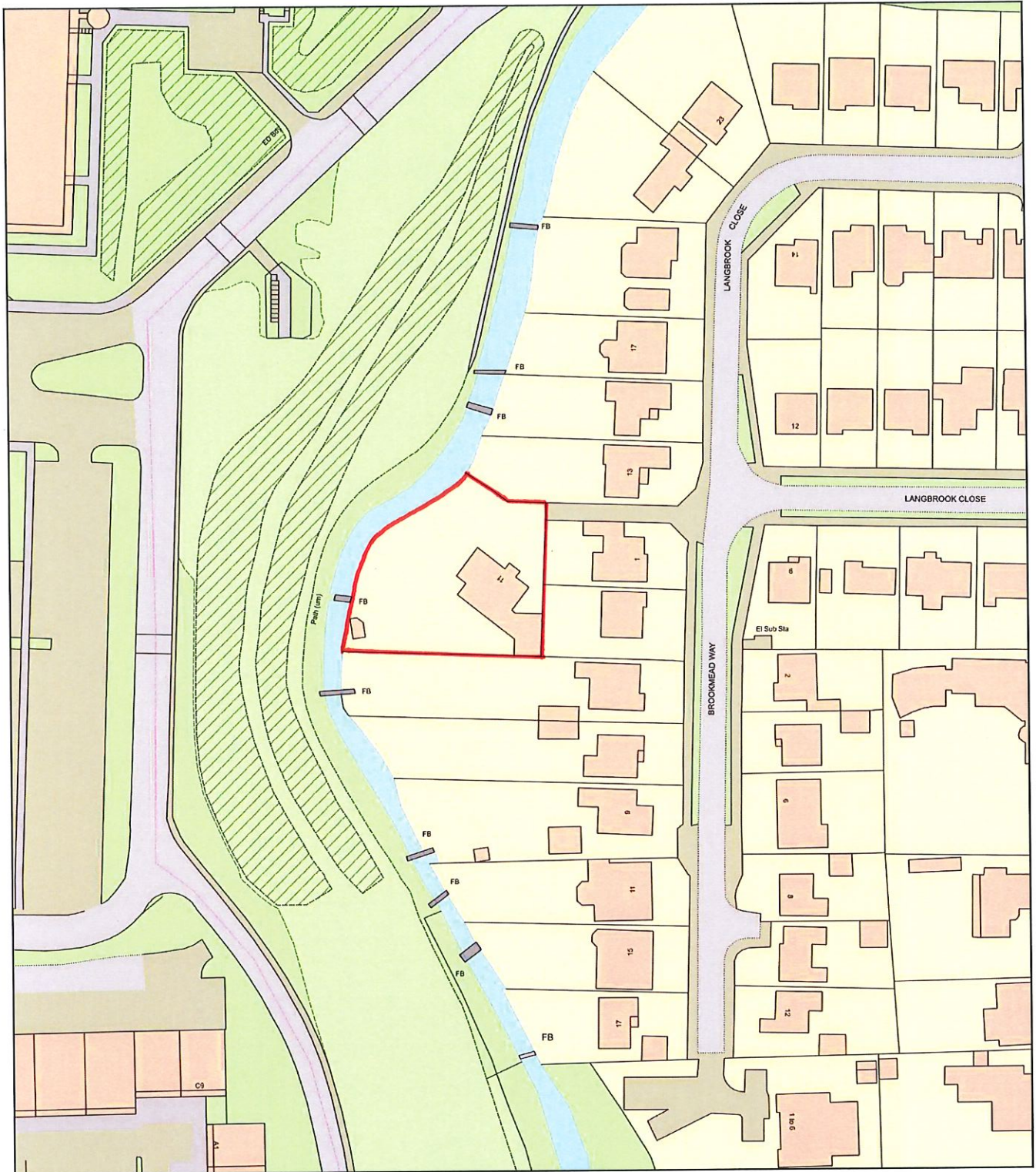
E. Bouet, Bsc (Hons)

E. Jeffery, Msci (Hons)

Appendix

- Existing and Proposed Plans.
- Environment Agency Flood Data response.

11 Langbrook Close, Langstone



0 50
Metres



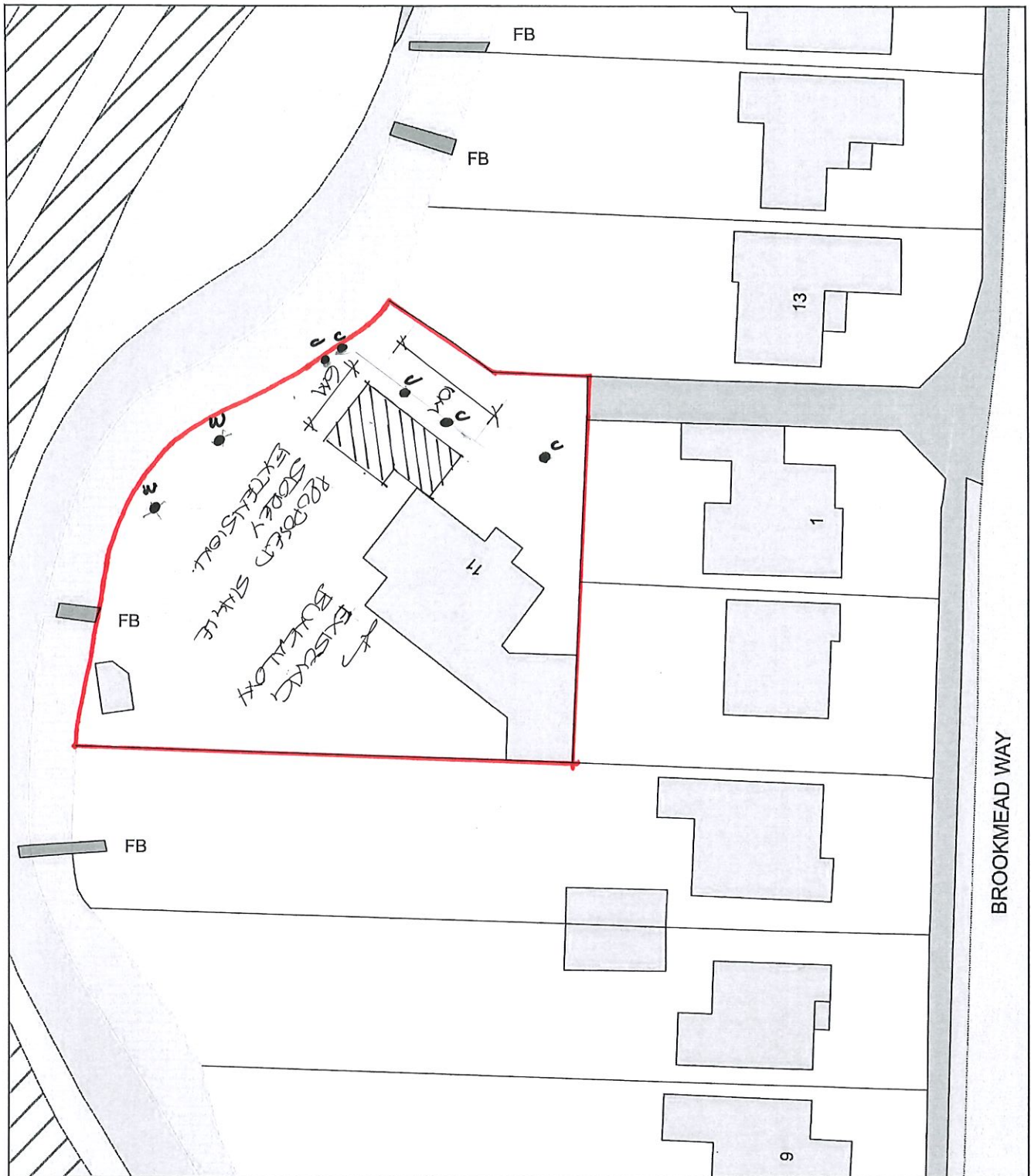
Plan Produced for: Thorns Young Architectural

Date Produced: 06 Oct 2020

Plan Reference Number: TQRQM20280092929146

Scale: 1:1250 @ A4

11 Langbrook Close, Langstone



Plan Produced for: Thorns Young Architectural

Date Produced: 06 Oct 2020

Plan Reference Number: TQRQM20280092820865

Scale: 1:500 @ A4

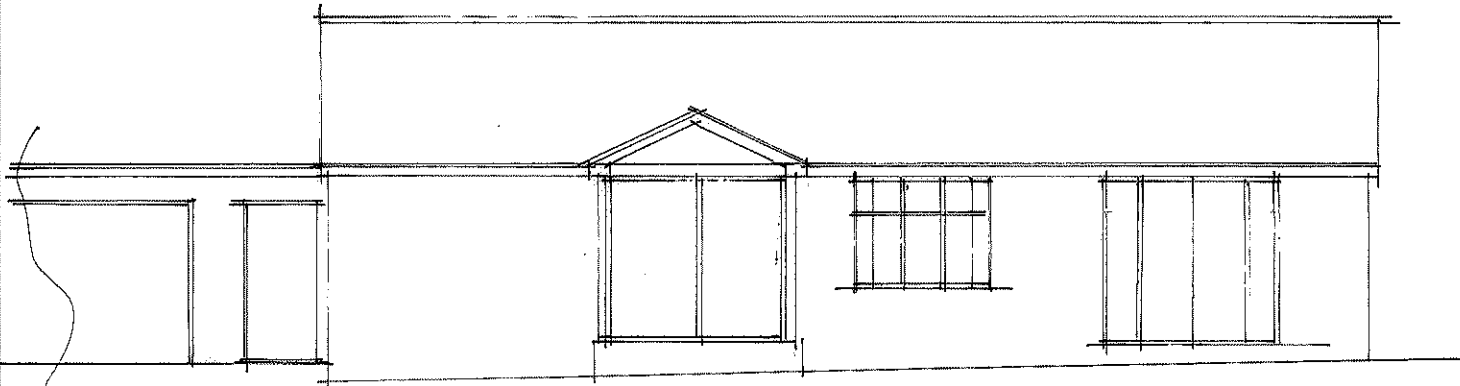
EXISTING LINTOLS AND FOUNDATIONS TO LOADBEARING WALLS TO BE EXPOSED FOR LOCAL AUTHORITY INSPECTION AND APPROVAL AS REQUIRED. NORMALLY AT THE START OF WORKS WHEN DRAINAGE RUNS ARE CHECKED.

CONTRACTOR IS TO CONFIRM THAT ALL NECESSARY LOCAL AUTHORITY APPROVALS HAVE BEEN OBTAINED BEFORE COMMENCING WORKS. COMMENCEMENT OF ANY WORKS PRIOR TO THIS IS ENTIRELY AT THE CLIENTS OR CONTRACTORS RISK. CHANGES TO THE SCHEME CARRIED OUT WITHOUT THE SURVEYORS APPROVAL MAY INVALIDATE THEIR LIABILITY.

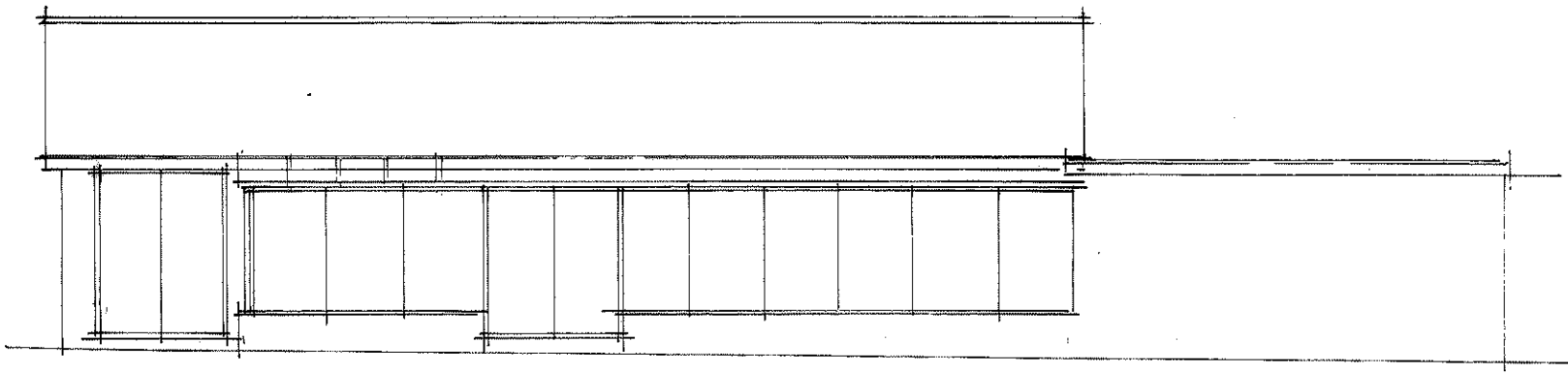
ALL DIMENSIONS TO BE CHECKED ON SITE. ANY DISCREPANCIES ARE TO BE MADE KNOWN TO THE SURVEYOR AS SOON AS POSSIBLE.

SEE STRUCTURAL CALCULATIONS FOR STEEL OR TIMBER DETAILS. THE CONTRACTOR IS TO SITE MEASURE ALL STRUCTURAL MEMBERS AND/OR STAIRCASE, BEFORE ORDERING.

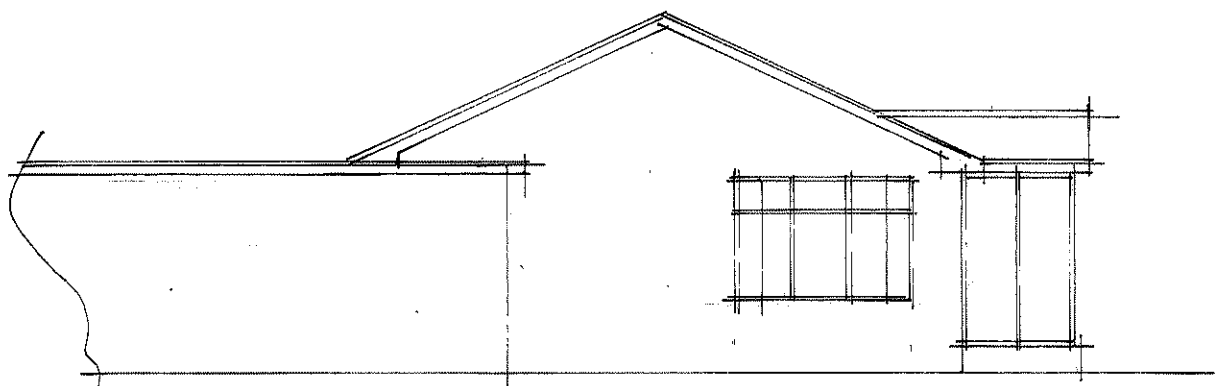
THE PROPERTY OWNERS ARE TO ENSURE THAT ANY/ALL REQUIREMENTS OF THE PARTY WALL ACT ARE COMPLIED WITH. ADVICE CAN BE OBTAINED FROM THE SURVEYOR.



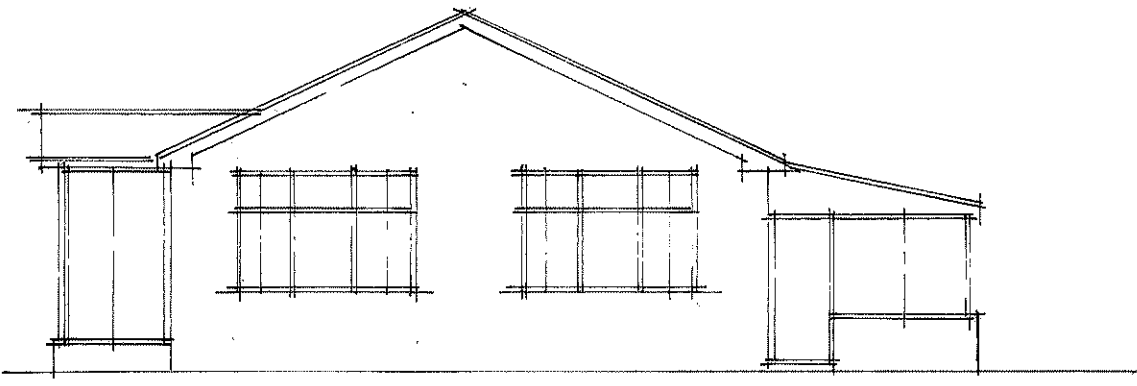
north



south



east



west

Foundation concrete trench fill, 600mm wide to min depth of 1 metre or to suit local ground conditions. (in clay soils min depth 1.2 metres x 600mm wide) or to below invert level of any adjacent drain run.

Floor 50mm screed on 100mm concrete slab on Celotex GA4070 insulation batts turned up at perimeter, on 1,200G damp proof membrane continuous with new and existing damp proof course, on minimum 100mm well consolidated hardcore with 50mm sand blinding. fit 100mm diam pvc ducts under slab terminating in 225x75mm airbricks to vent existing timber subfloors when required.

External walls 112mm facing bricks to match existing as closely as possible, 50mm cavity to Celotex CW4040 on 100mm lightweight concrete block (Celcon Solar, Thermalite Turbo, or similar rated) inner skin with render and set finish. (overall cavity 90mm) Insulated catnic lintols over new openings. Close cavities at eaves with non-combustible material. Tooth into existing walls and maintain all cavities. Wall ties to be at 750mm ctrs horizontally and 450mm ctrs vertically and staggered. 'Catnic' or similar vertical cavity thermal closers at openings. External perimeter of door and window openings to be sealed with a suitable airtight sealant.

Partitions 100mm concrete blockwork on suitable foundation. Render and set both sides.

Steelwork: And Timbers, see structural calcs or notes for sizes. Minimum bearing 100mm on concrete padstones, prestressed concrete lintols or metal bearing plates. Encase in minimum two layers 12.5mm plasterboard for half hour fire resistance when fitted at floor levels. Lengths of steels to be site measured to include bearings. All timbers to be C24 grade minimum. Fabrication details to be provided to Building Control if required.

Opening window areas to be minimum 1/20th of enclosed floor areas. All new windows to be fitted with minimum 8000sq.mm. trickle vents per room. Maximum area of double glazed window not to exceed 20% of floor areas side facing windows above ground level to be obscure and fixed below 1.7m.

New windows: new double glazed windows to have minimum U value of 1.6w/m²k. Doors to have a min U value of 1.80w/msq.k. Toughened glass in glazed doors and windows in critical locations, i.e.: alongside doors. Seal around window-wall joint with mastic sealant. Double rafters as roof light trimmers if applicable.

Main extension roof, concrete tiles on battens on breathable felt on 150 x 50mm joists at 400mm centres. Strap down with 1.00m x 32mm galv. ms straps at max 1.20m ctrs. Around perimeter.

Roof insulation: roof to be insulated with two layers of 150mm fibreglass insulation quilt. One layer laid between ceiling joist and one layer laid over in opposite direction. Maintain roof ventilation with 25mm continuous air to eaves and vent tiles to apex as shown.

Drainage all drainage to BS EN752 plus approved doc H 100mm diam. PVC drain ware minimum fall 1-40 in 150mm concrete surround to new or existing inspection chamber on existing run. Bridge with concrete lintols over where passing beneath new walls and flexible packing surround. Exact position, invert and direction of all existing drains to be determined and agreed on site PRIOR to commencement of works.

Flat roof: Three layer built up felt to BS747 cp144 pt3 on Celotex XR4120 decking on firrings and 125x50mm joists at 400mm centres. 12.5mm foil back plasterboard ceiling. Seal warm roof from existing vented roof space at join if applicable. Flat covering should achieve AA, AB or AC clarification for fire protection.

Plumbing all to BS EN 2056 plus approved doc H 38mm diam. waste from shower. 32mm diam. Waste from wash hand basins, all with rodding access on changes of direction and with deep seal traps. Run to new stubstack.

Rain water goods: run new 100mm diam pvc rain water guttering and 70mm diam downpipes to 1.0cu.m. soakaways formed min 5m from building via big and 100mm diam drainware.

New inspection chamber sizes to suit invert of drains minimum sizes 600 x 450mm internal with 103mm semi engineering brickwork sides 215mm where invert exceeds 1000mm, built up from 150mm concrete slab base and fit medium duty cover and frame.

All new electrical works to be designed, installed, inspected and tested in accordance with BS7671 (IEE 18th Ed) the works are to be undertaken by an installer registered under a suitable self certification scheme or by a suitably qualified person with a certificate of compliance produced to building control upon completion of the works.

Lighting Fit high efficacy light fittings minimum one per four new fittings. Any recessed ceiling lights to be 30minute fire resisting.

Ceilings: 12.5mm foil back plasterboard on 150 x 50mm joists at 400mm centres with 100mm glass fibre quilt between joists and Celotex GA4090 batts over the joists. Bolt and dog tooth washers at joints. Fit baffle boards at eaves to maintain clear air flow.

Drainage all drainage to BS EN752 plus approved doc H 100mm diam. PVC drain ware minimum fall 1-40 in 150mm concrete surround to new or existing inspection chamber on existing run. Bridge with concrete lintols over where passing beneath new walls and flexible packing surround. Exact position, invert and direction of all existing drains to be determined and agreed on site PRIOR to commencement of works.

Fit mechanical extract fans to any new wc and bathroom areas rated at min 15lit/sec

A	Date	Revision
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THORNS YOUNG ARCHITECTURAL		
THORNS-YOUNG LTD CHARTERED BUILDING CONSULTANTS Website: www.thornsyoun.co.uk		
Fareham 21 Middle Road Park Gate SO31 7GH Tel: (01329) 888 322	Portsmouth 232 London Road North End PO2 9JQ Tel: (02392) 672 883	
Client MR. L. COUZENS		
Job Title 11 LANGE BROOKE CLOSE LANCASTER LANCASHIRE		
Drawing Title EXISTING ELEVATIONS. CONSTRUCTION NOTES.		
Scale 1:100		
Date OCT 20	Drawn by CMC	
Drg. No. 4164: 20: 2		Rev.

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Principal Contractor is to ensure all materials and workmanship complies with Regulation 7 of the Building Regulations whether or not specifically stated on these drawings. It is the Principal Contractor's duty to ensure all works on site are approved by an appointed Building Control body.

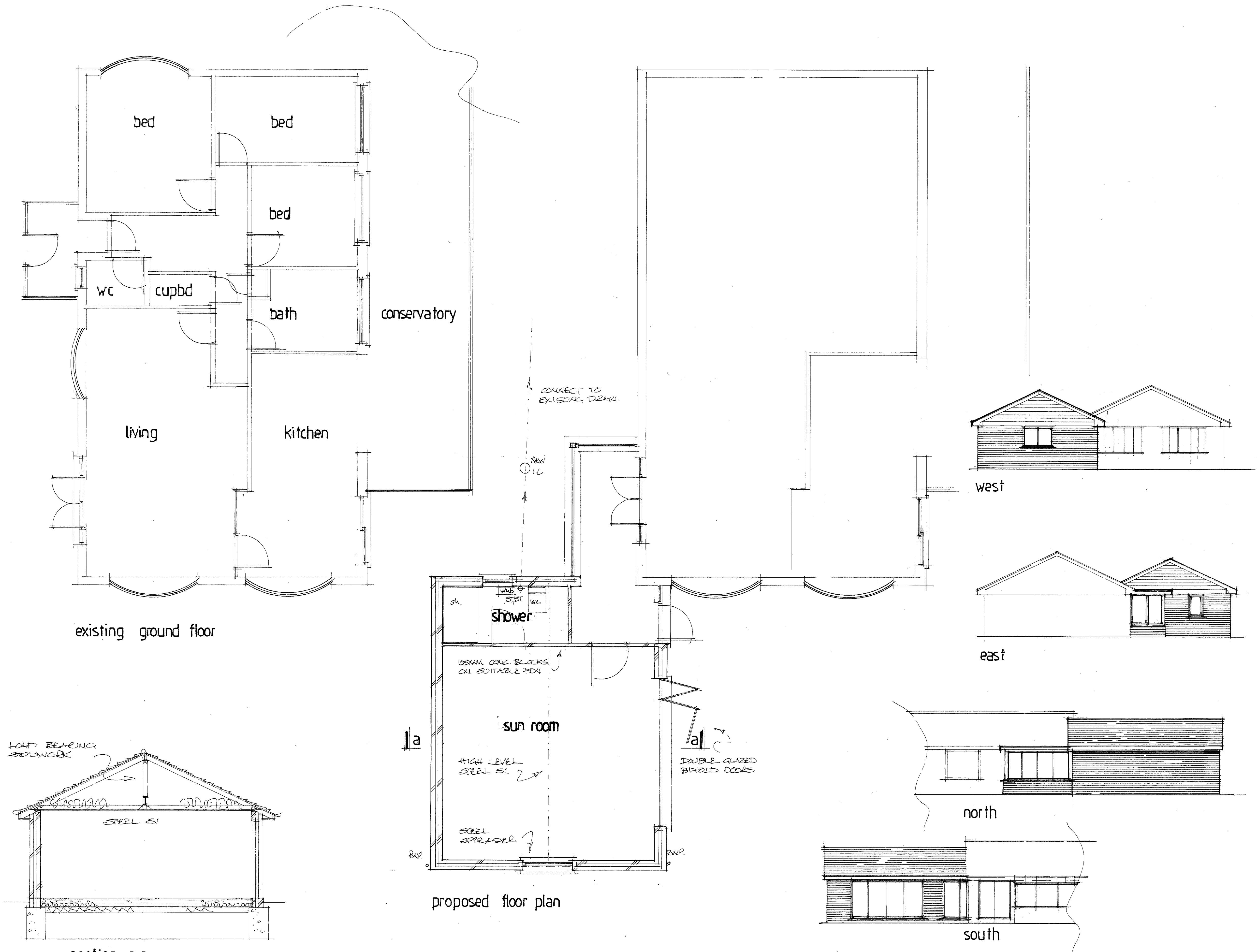
Principal Contractor is to ensure dimensions are taken on site before procurement of any materials works proceeding. Structural members are not to be ordered scaling from this drawing.

Principal Contractor to ensure full compliance with the amended CDM Regulations (2015) if the project requires.

This drawing, unless noted, does not represent compliance with the Party Wall Act 1996 and if required, all agreements are to be in place before works commence.

It is the Principal Contractor's responsibility to ensure Planning/Building Control approvals are in place prior to works commencing. Should works commence prior to relevant approvals Thorns-Young Architectural accepts no responsibility.

Do not scale from this drawing except for the purpose of Local Authority Planning department.



A	Date	Revision

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Client

MR. L. COZZERS.

Job Title

11, LARKBROOKE CLOSE
LARKSTADE
HARVEST.

Drawing Title

PROPOSED REAR/SIDE
EXTENSION.

Scale 1:50 + 1:100

Date OCT. 2020 Drawn by CML

Drg. No.	Rev.
4164:20:1	A

Modelled 1D Flood Levels (in m AoD) Centred on Langbrook Close - Created 18 May 2021



Legend

- Lavant & Hermitage Node Points
- Lavant & Hermitage 100Yr (Flood Zone 3)
- Lavant & Hermitage 1000Yr (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 an 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.

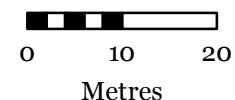
Flood Zone 2

Shows the extent of an extreme flood from rivers of the sea with up to a 1 in 1000 chance of occurring each year.

Node Point	EASTING	NORTHING	100 Year Level	100 Year Level No Dam	100 Year CC Level	100 Year CC Level No Dam	1000 Year Level	1000 Year Level No Dam
366	471426	105539	4.70	5.20	4.78	6.73	4.89	9.51
367	471428	105549	4.72	5.19	4.79	6.73	4.90	9.52
368	471429	105561	4.72	5.19	4.80	6.73	4.91	9.52
369	471461	105600	4.77	5.19	4.85	6.72	4.97	9.52
370	471462	105609	4.77	5.19	4.85	6.71	4.97	9.52

1:800

*when printed at A4.



Defences Centred on Langbrook Close - Created 18 May 2021



Legend

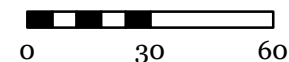
ASSET_ID

104218

104219

1:1,849 *

*when printed at A4.



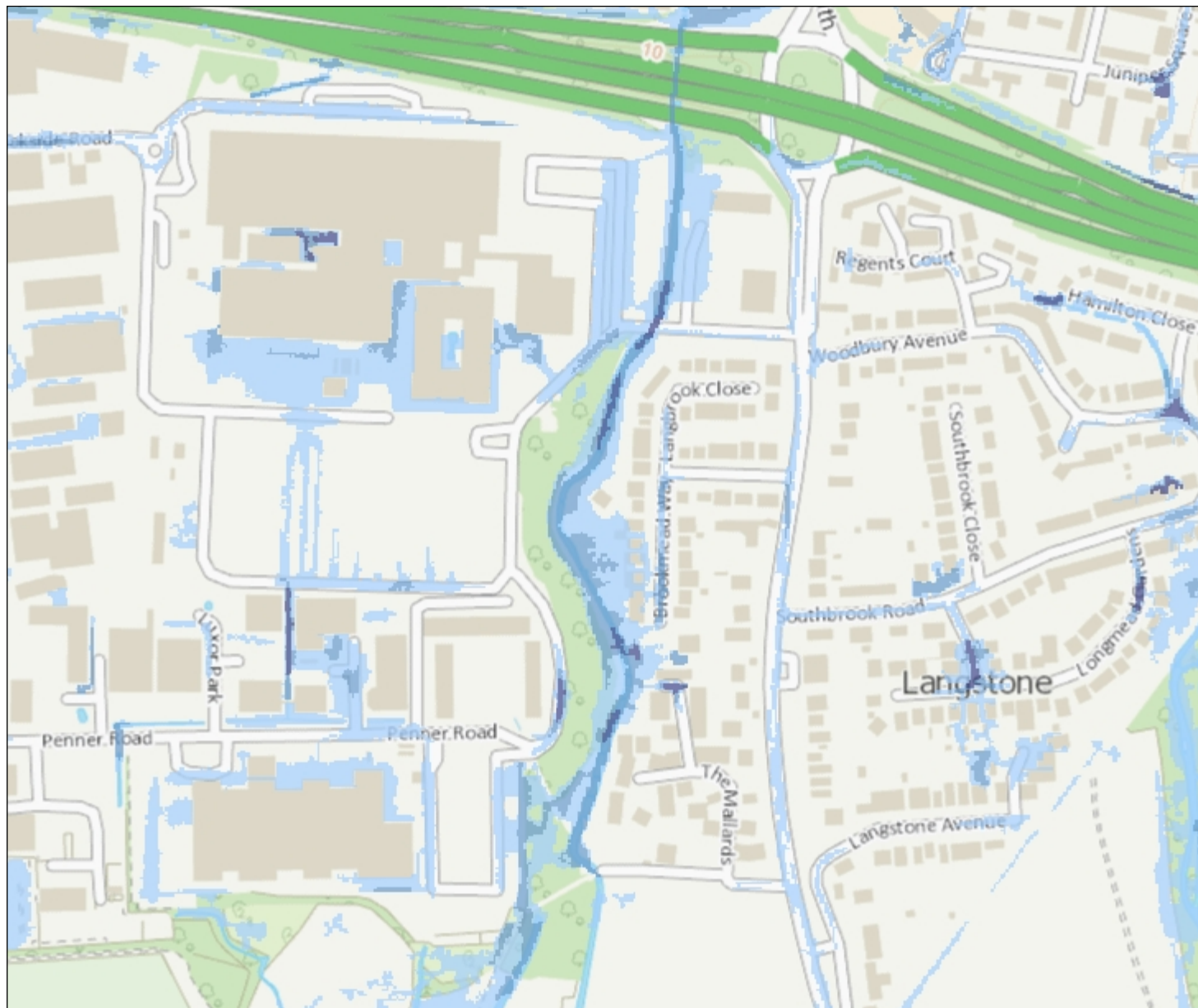
Metres



Asset Id	Asset Sub-type	Length (m)	Asset Maintainer	Actual Condition	Standard of Protect (Years)	Last Inspection Date
104218	high_ground	907.14	private	Fair	40	05/05/2020
104219	high_ground	931.97	private	Fair	40	05/05/2020

Risk of flooding from Surface Water - Centred on Langbrook Close

Created 19 May 2021



1: 5,000

0 Metres 125



Likelihood of flooding from Surface Water

- Flood Extent 1 in 30
- Flood Extent 1 in 100
- Flood Extent 1 in 1000

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.