Flood Risk Assessment for Planning

Prepared for:
Kokoro JV Management Ltd

August 2024

Location:
6 Warwick Street
Worthing
West Sussex
BN11 3DL

Our reference:
94628-Kokoro-WarwickSt



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Document Issue Record

Project:	Flood Risk Assessment for Planning
Client:	Kokoro JV Management Ltd
Application:	Set out of vacant Class E unit to form a sushi and hot food café with new kitchen and external extractor system and new shop signage.
Location:	6 Warwick Street, Worthing, West Sussex, BN11 3DL
Our reference:	94628-Kokoro-WarwickSt
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1. Key Facts

1.1 Flood Risk Posed:

- The site is situated partially within Flood Zones 3, 2 and 1 when using the Environment Agency Flood Map for Planning (Rivers and Sea).
- Risk would appear to be predominantly tidal and originate from the English Channel.
- EA Risk of Flooding from Surface Water Map suggests that the site lies in an area of "Low" risk of flooding from surface water.
- No records of historic flooding having affected the site itself.
- No further information has been provided to suggest that the site has flooded from groundwater or sewer surcharge flooding.

1.2 Flood Risk Mitigation:

- No increase in built footprint, new basements, lowering of floor levels, residential accommodation, or increase in vulnerability classification is proposed.
- No additional units at the site are proposed.
- The proposed development fits within EA Standing Advice for non-domestic extensions.
- No loss of floodplain storage.
- Flood proofing will be incorporated as appropriate.
- Due to the nature of the development, existing drainage arrangements will be retained.
- The site owner will register with the free Environment Agency Floodline Alert 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 Kokoro JV Management Ltd (hereinafter referred to as "the applicant") to undertake a Flood Risk Assessment for the proposed development at 6 Warwick Street, Worthing, West Sussex, BN11 3DL (hereinafter referred to as "the site"). The FRA has been undertaken in accordance with the National Planning Policy Framework (NPPF) and the associated technical guidance.

The purpose of the study is to support a planning application for the proposed development.

The site appears to be located partially within Flood Zones 1, 2 and 3 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 problems;
- 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 existing site is a vacant Class E unit.

Existing site plans are provided in the report Appendix.



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



Figure 2: Site Location Plan (Source: Applicant)

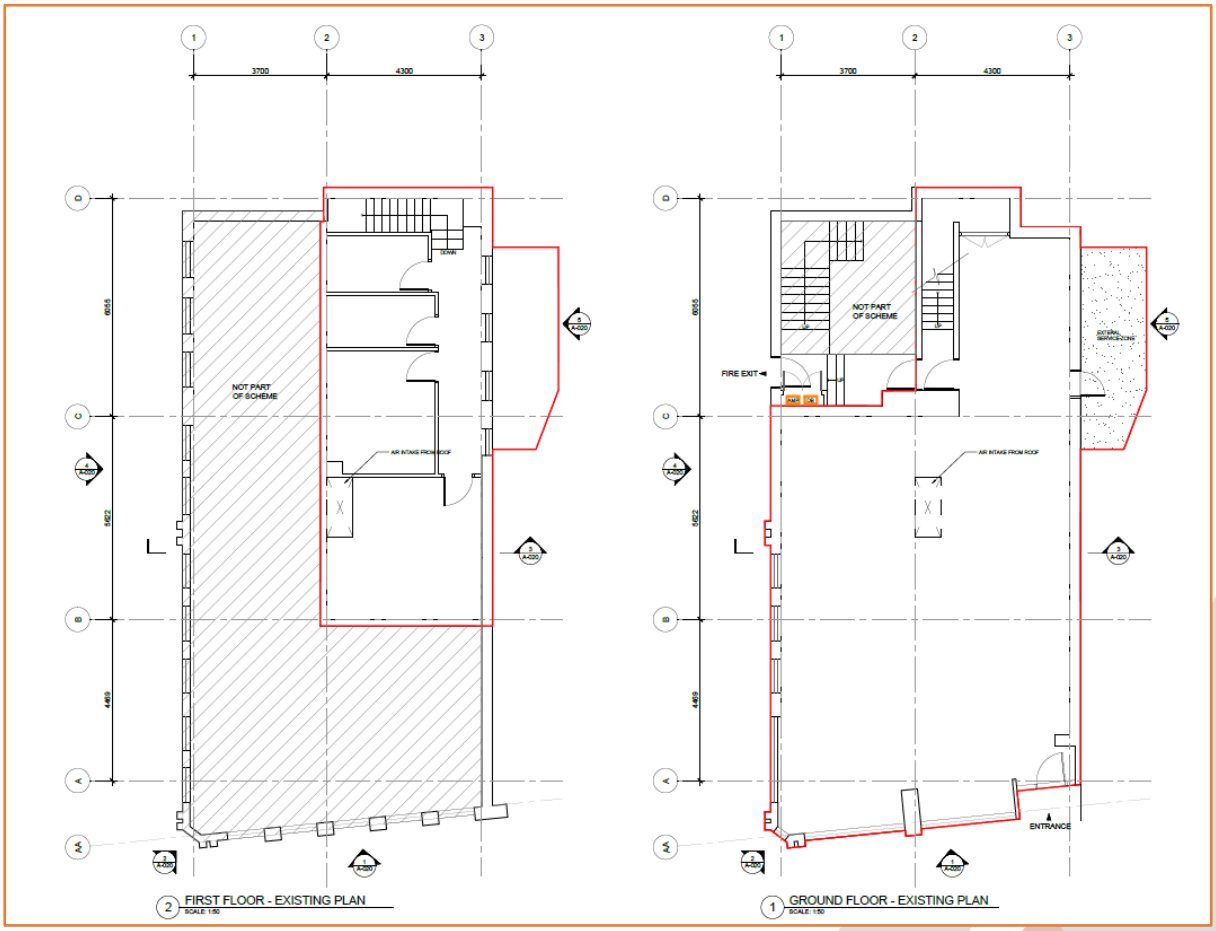

Figure 3: Existing Floor Plans (Source: Applicant)



Figure 4: Front view of 6 Warwick Street (Source: Online sales particulars)

3.2 Geography:

The site is located approximately 200m inland of the English Channel.

3.3 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 +0.3m every 2m. This dataset is derived from a combination of the 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. 1.0m horizontal resolution DTM LiDAR data has been used for the purposes of this study.

LiDAR remotely sensed digital elevation data suggests that the ground topography ranges between approximately 5.014mAOD to 5.52mAOD.

3.4 Geology and Soil:

The British Geological Survey (BGS) Map indicates that the bedrock underlying the site is Lewes Nodular Chalk Formation – Chalk. Superficial deposits underlying the site are of River Terrace Deposits (undifferentiated) - Sand, Silt and Clay.

The soil type taken from the UK Soil Observatory is relatively deep soils from sand loess soil parent material with a soil texture of silt to sand.

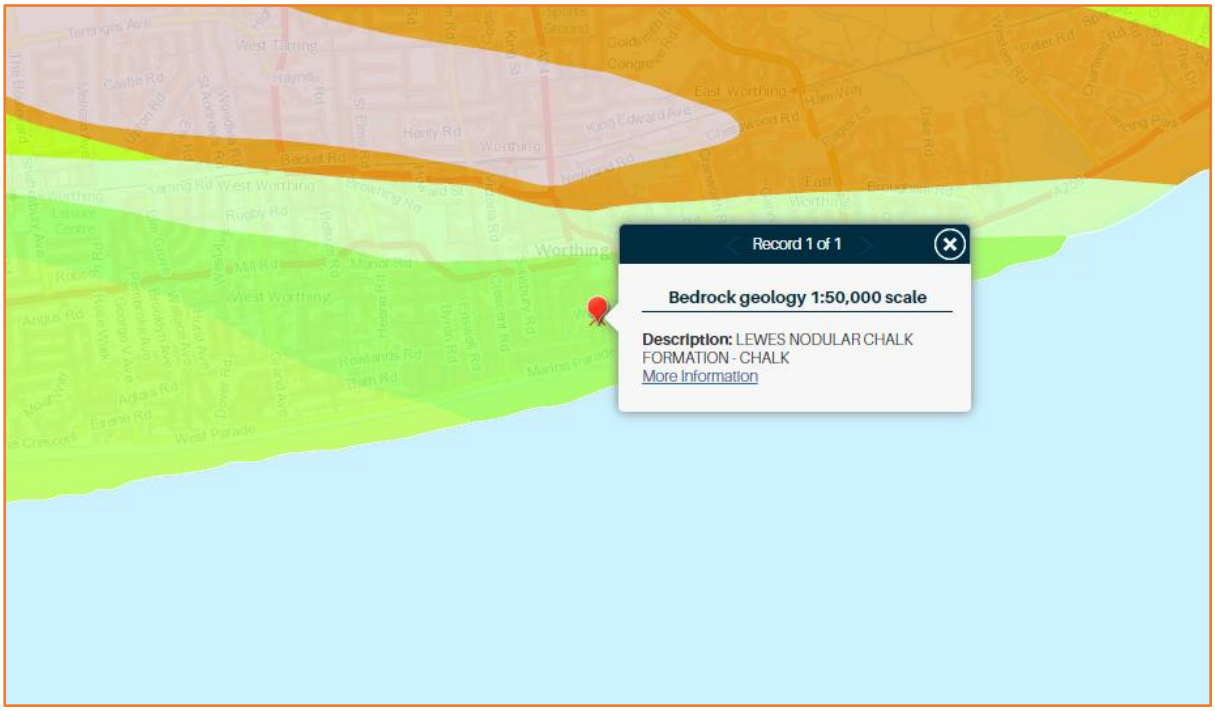

Figure 5: Local bedrock geology (Source: BGS)

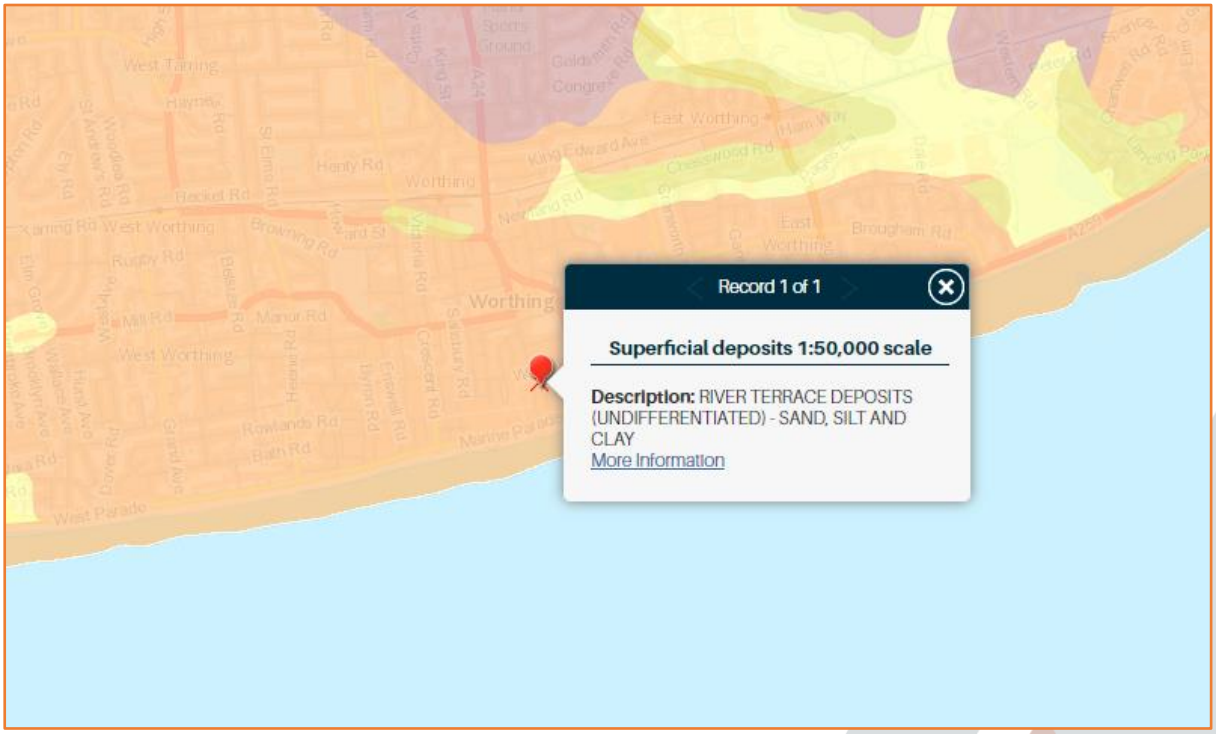

Figure 6: Superficial deposits geology (Source: BGS)



Figure 7: Local soil types (Source: UKSO)

4. Development Proposal

The proposed planning application is for the set out of vacant Class E unit to form a sushi and hot food café with new kitchen and external extractor system and new shop signage – minor non-residential extension.

No increase in built footprint, new basements, lowering of floor levels, residential accommodation or increase in vulnerability classification is proposed. In addition, no additional units are proposed.

Proposed plans can be found in the report Appendix.

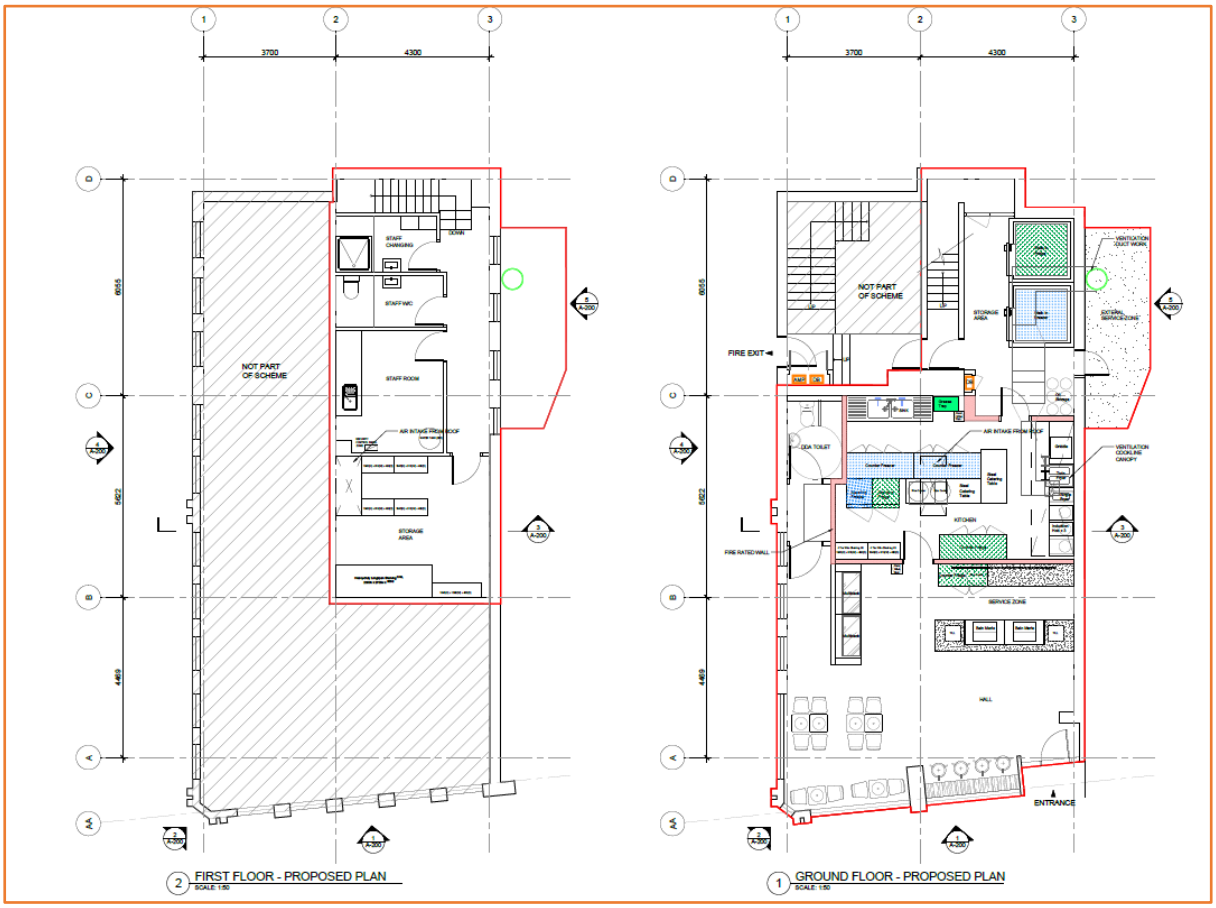

Figure 8: Proposed Floor Plans (Source: Applicant)

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.

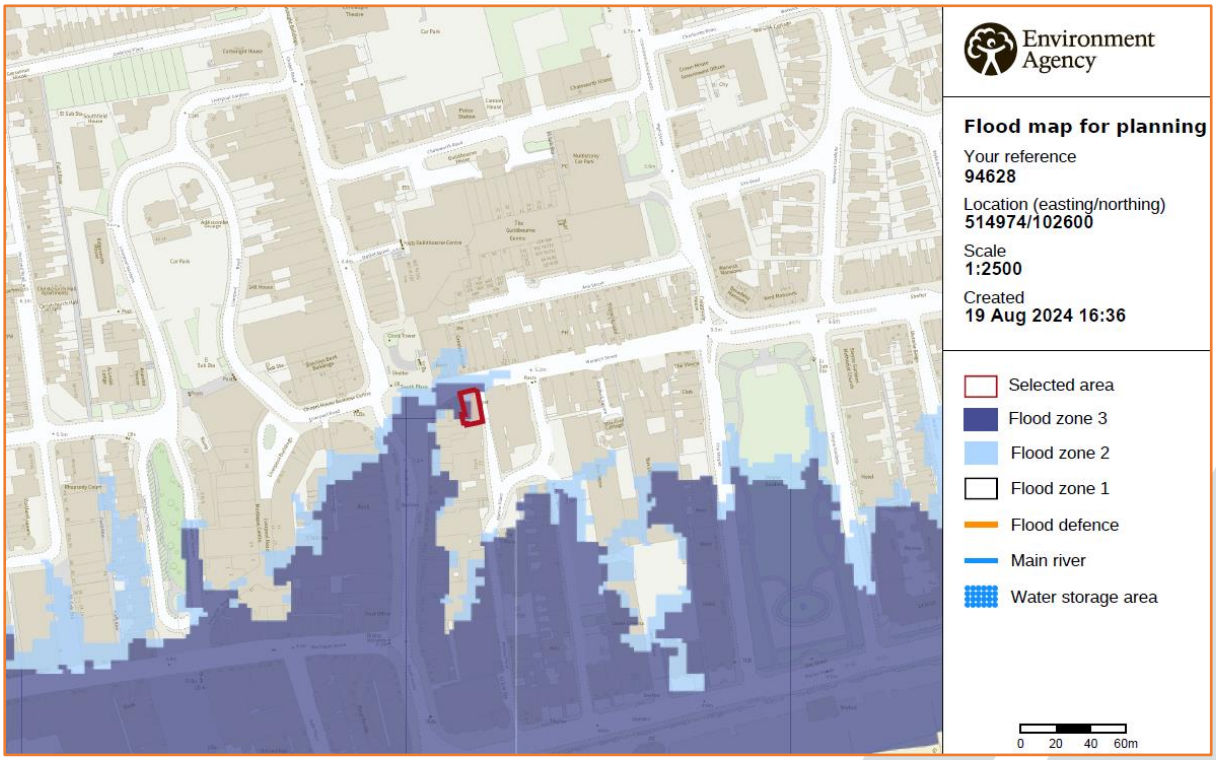

Figure 9: Environment Agency Flood Map for Planning (Rivers and Sea) (Source: EA)

The site is located partially within Flood Zones 3, 2 and 1 (High, Medium and Low Probability), which means it is defined as land having between a greater than 1 in 200 and less than 1 in 1000 annual probability of tidal flooding.

The risk would appear to be predominantly tidal and originate from the English Channel.

5.2 Tidal (English Channel):

The English Channel (The Channel) is the body of water that separates southern England from northern France, and joins the southern part of the North Sea to the Atlantic Ocean. It is about 560km long and varies in width from 240km at its widest to 33.1km in the Strait of Dover. It is the smallest of the shallow seas around the continental shelf of Europe, covering an area of some 75,000km^2.

Uniquely, The Channel acts as a funnel that amplifies the tidal range from less than a metre as observed at sea to more than 6 metres as observed in the Channel Islands, the west coast of the Cotentin Peninsula and the north cost of Britany. The time difference of about 6 hours between high water at the eastern and western limits of the Channel are indicative of the tidal range being amplified further by resonance. Some areas along the south coast are particularly vulnerable to severe storms moving from the Atlantic eastwards along the English Channel.

5.2.1 Modelled Flood Levels and Events:

Modelled flood levels and extents have been requested from the EA for use within this report.

5.2.2 Flood Storage Areas:

Flood Storage Areas are areas that act as a balancing reservoir, storage basin or balancing pond. Their purpose is to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel. It may also delay the timing of a flood peak so that its volume is discharged over a longer time interval. Flood storage areas do not completely remove the chance of flooding and can be overtopped or fail in extreme weather conditions.

According to Environment Agency data, there are no Flood Storage Areas located in close proximity to the site.

5.2.4 Flood Defences:

A flood defence or EA Asset is any man-made or natural feature – such as a raised defence, retaining structure, channel, pumping station or culvert – that performs a flood defence or land drainage function.

The 2024 Adur and Worthing Strategic Flood Risk Assessment (SFRA) states that the current long-term plan is to 'Hold the Line', with works proposed to manage and mitigate the risk of coastal erosion and flooding. The Hold the Line/Sustain policy means that policy is in place, to at worst, maintain the current level or upgrade the level of protection provided by existing coastal defences for the foreseeable future.

Coastal defences on the Worthing coastline include a shingle beach over sand, timber and rock groynes and at some locations there are concrete seawalls or rock revetments.

Therefore, given that flood risk provided by the local defences (which are council maintained) protect the development site from tidal flooding and policy is in place to maintain that level of defence (worst case), the site is therefore deemed to be protected now and into the future.

5.2.5 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.

Flood defences act to defend the site from direct inundation, but there is residual risk from each (failure) and overtopping (exceedance) of flood defences.

The Adur and Worthing seafront is heavily protected by a series of coastal defences in the form of a sand and shingle beach and groynes. These assets are maintained by Adur and Worthing District Councils.

Wave overtopping is one of the principal mechanisms of flooding for the coastal frontage. Allowing for wave-overtopping increases the extent of flooding. The 2024 Adur and Worthing SFRA states that the Marine Parade area of Worthing is at risk of wave overtopping of defences.

5.2.6 Historical Flood Events:

The EA hold records of historic flood events from rivers and the sea. The EA map flooding to land, not individual properties. Their historic flood event record outlines are an indication of the geographical extent of an observed flood event. Their historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.

The EA has provided information to suggest that flooding has occurring the surrounding area including the overtopping of sea defences in 1980, and local drainage and surface water issues in 1960's. However, none of these historical recorded events have appeared to have affected the site.

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):

- High: Greater than or equal to 3.3% (1 in 30) chance in any given year (3.3%)
- 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

The mapping below shows the Risk of Flooding from Surface Water centred on the site. Please note that the EA to 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 in an area of “Low” risk of flooding from surface water.

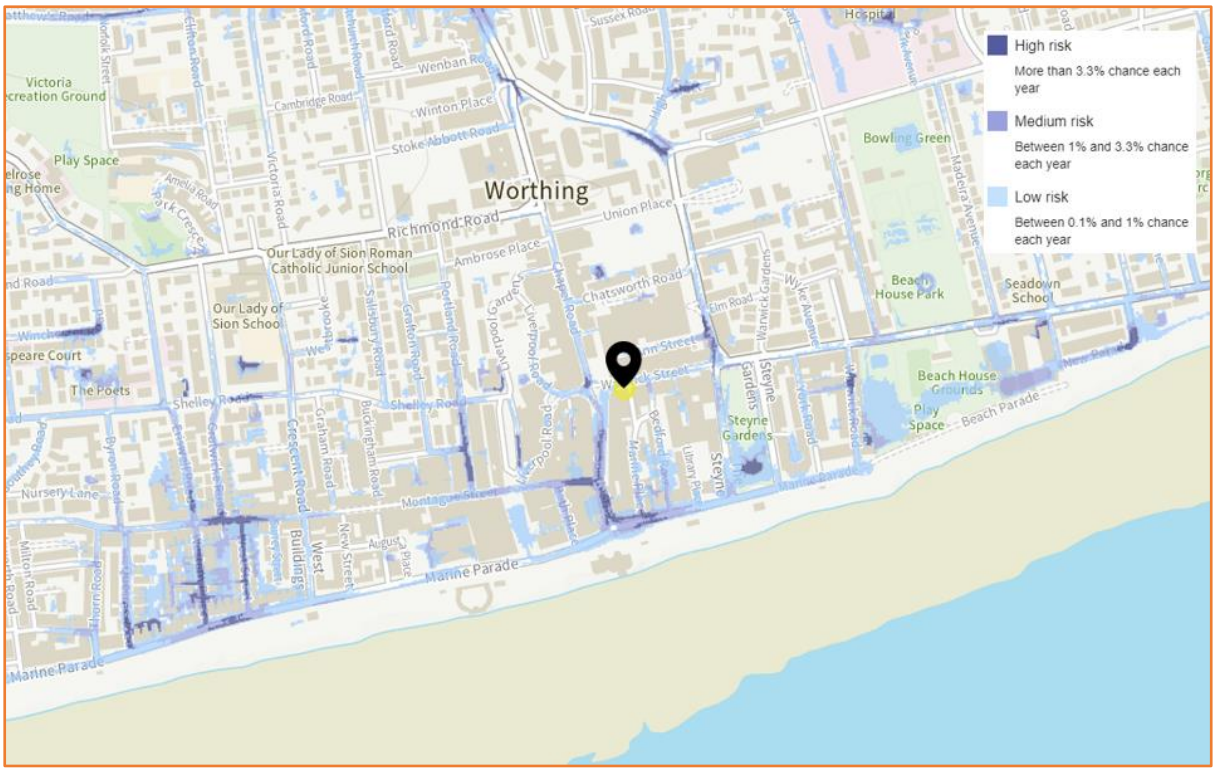

Figure 10: Extract from Environment Agency Surface Water Flood Map (Source: EA)

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 2024 Adur and Worthing SFRA shows the site is located in an area where groundwater levels are between 0.5m and 5m below the ground surface.

No information has been provided to suggest that the site has flooded from groundwater flooding previously.

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.

According to the 2024 Adur and Worthing SFRA, the site's postcode area (BN11 3) has 12 recorded incidents of sewer flooding, which occurred between January 2013 and May 2023.

No information has been provided to suggest that the site has flooded from sewer surcharge flooding previously.

5.6 Other Sources:

Reservoirs with an impounded volume in excess of 25,000 cubic metres (measured above natural ground level) are governed by the Reservoirs Act and are listed on a register held by the Environment Agency. The site lies outside the maximum inundation extent on the EA Reservoir Inundation Map. The EA also advise on their website that reservoir flooding is extremely unlikely. There has been no loss of life in the UK from reservoir flooding since 1925. All major reservoirs have to be inspected by specialist dam and reservoir Engineers. In accordance with the Reservoirs Act 1975 in England, 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 / tidal flooding to occur. The Environment Agency Reservoir Flood Map illustrated below, illustrates the largest area that might be flooded if the storage area were to fail and release the water it is designed to hold during a flood event.

Records of flooding from reservoirs and canals are erratic as there is no requirement for the Environment Agency to provide information on historic flooding from canals and raised reservoirs on plans. In particular, the NPPF does not require flood risk from canals and raised reservoirs to be shown on the Environment Agency flood zones.

Overflows from canals can be common as they are often fed by land drainage, and often do not have controlled overflow spillways. Occasionally, major bank breaches also occur, leading to rapid and deep flooding of adjacent land.

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

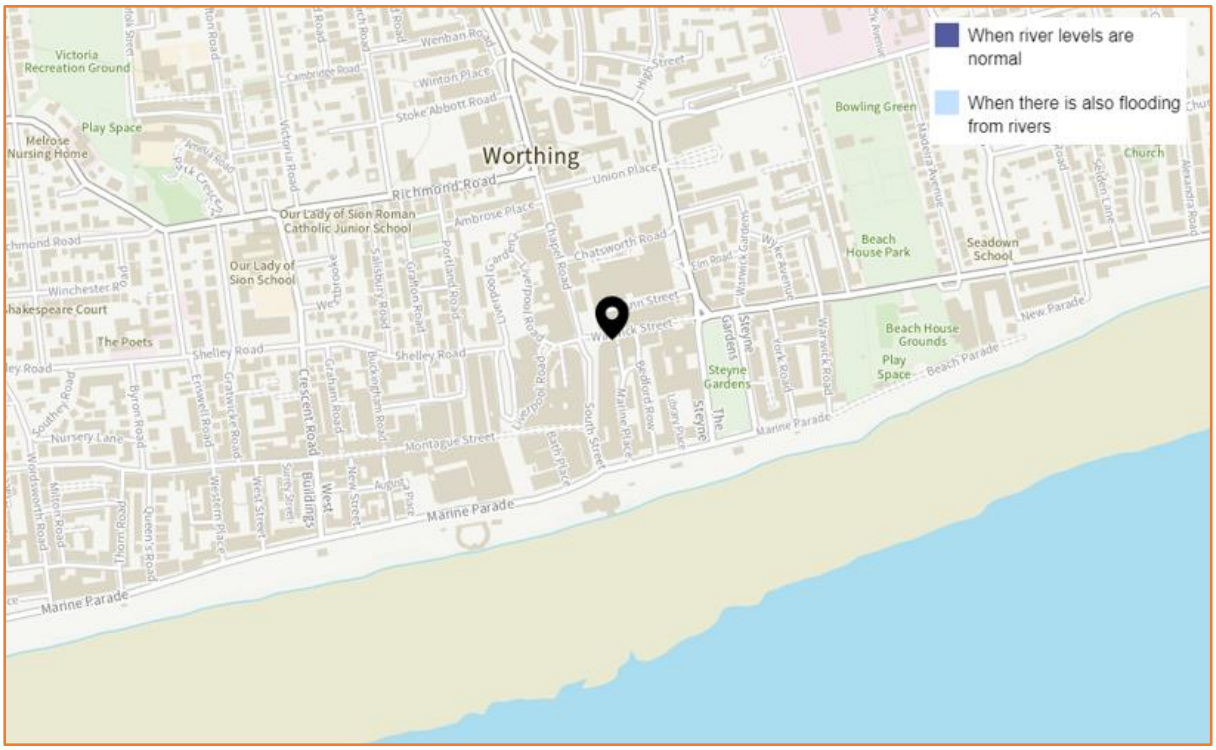

Figure 11: Extract from Environment Agency Reservoir Flood Map (Source: EA)

6. Flood Risk Management

6.1 Vulnerability to Flooding:

The NPPF classifies property usage by vulnerability to flooding.

The existing site is a vacant Class E unit.

Post development, the site will become a sushi and hot food café, which is classified as "less vulnerable". No increase in built footprint, new basements, lowering of floor levels, residential accommodation or increase in vulnerability classification is proposed. In addition, no additional units are proposed.

Accordingly, it is considered that the vulnerability of the site as a whole will not increase post development.

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 250m^2. It should not be applied if an additional dwelling is being created, e.g. a self-contained annexe or additional commercial unit.

The proposed application is for the set out of vacant Class E unit to form a sushi and hot food café with new kitchen and external extractor system and new shop signage.

No increase in built footprint, new basements, lowering of floor levels, residential accommodation or increase in vulnerability classification is proposed. In addition, no additional units are proposed.

Therefore, the proposed development is considered to fit within the EA's Standing Advice for non-domestic extensions.

6.3 Physical Design Measures:

The application is for the set out of vacant Class E unit to form a sushi and hot food café with new kitchen and external extractor system and new shop signage. There will be no increase in built footprint, new basements, lowering of floor levels, residential accommodation or increase in vulnerability classification. Given the application is for the set out of the existing building, it is not possible to raise floor levels.

To help protect against flooding during extreme events, the applicant has agreed to implement flood resistant design measures into the proposal, in consultation with the Local Authority building control department. These measures can include the following:

- Using flood resistant materials that have low permeability to at least 600mm above ground level;

- Making sure any doors, windows or other openings are flood resistant to at least 600mm above ground level;
- Using flood resilient materials (for example lime plaster) to at least 600mm above ground level;
- By raising all sensitive electrical equipment, wiring and sockets to at least 600mm above ground level;
- Making it easy for water to drain away after flooding such as installing a sump and a pump;
- Making sure there is access to all spaces to enable drying and cleaning;
- Ensuring that soil pipes are protected from back-flow such as by using non-return valves

A flood proof door should be installed for external ground floor level doors, or demountable flood defence barrier to defend lower ground level doorways and low windows if a flood door is not practical or other planning constraints prevent it.

6.4 Safe Escape and Flood Action Plan:

The site is situated partially within Flood Zones 1, 2 and 3 when using the Environment Agency Flood Map for Planning (Rivers and Sea).

Tidal flooding from storm surges is well understood and tidal storm surges are monitored and predicted. As such, it is unlikely that the site would flood unexpectedly without sufficient flood warning for evacuation.

The tidal cycles generally dictate 6 hours between the peak and trough of the tidal cycle, and as such after a likely maximum of 6 hours water will be able to drain from the site. The duration of any tidal flooding would be likely to be limited to a period of a few hours around high water.

Flood warning notices will be erected around the site to inform site users of the risk of flooding, and the flood warning and evacuation measures.

In the event of a flood alert being issued, site users would be advised to not visit the site until the flood alert had been lifted.

Site users should follow the warning and evacuation procedure detailed in the following section.

6.5 Flood Warning:

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 EA issue flood warnings/alerts to specific areas when flooding is expected. It is recommended that the applicant registers online with the free Environment Agency Floodline Warnings/Alert

Direct service at www.gov.uk/sign-up-for-flood-warnings to receive flood warnings by phone, text or email.

The applicant has agreed to subscribe to the EA's flood alert/warning service.

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

6.6 Flood Plan:

It is recommended that the applicant and future owners and landlords of the property prepare a flood plan to protect life and property during a flood event:

Before a flood:

- 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.
- Know how to turn off electricity and water supplies to the site.
- 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

During a flood:

- Activate the evacuation plan and evacuate the site.
- Remove cars from the site if there is sufficient warning and the water levels are not rising rapidly.
- Switch off water and electricity for the site.
- Tune into your local radio station on a battery or wind-up radio.
- 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 and water checked by qualified engineers before switching them back on.

6.7 Off-Site Impacts:

6.7.1 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 partially within Flood Zones 3, 2 and 1 when using the Environment Agency Flood Map for Planning (Rivers and Sea). The proposed development is the set out of vacant Class E unit to form a sushi and hot food café with new kitchen and external extractor system and new shop signage – minor non-residential extension. No increase in built footprint is proposed. In addition, the application site is situated within an area of tidal flood risk.

As such, there will be no loss of floodplain storage incurred by this development.

6.7.2 Surface Water Drainage:

The development will utilise Sustainable drainage systems (SuDS) design in accordance with the NPPF for Planning Applications and the drainage 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.

The proposal is for the set out of vacant Class E unit to form a sushi and hot food café with new kitchen and external extractor system and new shop signage – minor non-residential extension. There will be no increase in impermeable surfacing post-development.

In light of this, the proposed development will continue to utilise the existing drainage arrangements on site.

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 Sequential Test is applied to developments in areas identified as being at risk of any source of flooding now or in the future. The Sequential Test ensures that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account.

The sequential approach is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. This means avoiding, so far as possible, development in current and future medium and high flood risk areas considering all sources of flooding including areas at risk of surface water flooding. Other forms of flooding need to be treated consistently with river and tidal flooding in mapping probability and assessing vulnerability, so that the sequential approach can be applied across all areas of flood risk.

The site is situated partially within Flood Zones 3, 2 and 1 when using the Environment Agency Flood Map for Planning (Rivers and Sea). The EA Risk of Flooding from Surface Water Map suggests that the site lies in an area of "Low" risk of flooding from surface water.

Post development, the site will become a sushi and hot food café, which is classified as "less vulnerable".

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	X	Exception Test required	✓	✓
Zone 3b	Exception Test required	X	X	X	✓

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

Using the table above, the proposed application is considered to be suitable within Flood Zones 3, 2 and 1. The Sequential and Exception Tests do not need to be applied to minor developments and changes of use (this application is for 'minor development' – a non-domestic extension).

8. Discussion and Conclusions

Unda Consulting Limited have been appointed by Kokoro JV Management Ltd (hereinafter referred to as "the applicant") to undertake a Flood Risk Assessment for the proposed development at 6 Warwick Street, Worthing, West Sussex, BN11 3DL. The FRA has been undertaken in accordance with the National Planning Policy Framework (NPPF) and the associated technical guidance.

The purpose of the study is to support a planning application for the proposed development.

The existing site is a vacant Class E unit.

Post development, the site will become a sushi and hot food café, which is classified as "less vulnerable". No increase in built footprint, new basements, lowering of floor levels, residential accommodation or increase in vulnerability classification is proposed. In addition, no additional units are proposed.

Accordingly, it is considered that the vulnerability of the site as a whole will not increase post development.

The site is located partially within Flood Zones 3, 2 and 1 (High, Medium and Low Probability), which means it is defined as land having between a greater than 1 in 200 and less than 1 in 1000 annual probability of tidal flooding.

The risk would appear to be predominantly tidal and originate from the English Channel.

Modelled flood levels and extents have been requested from the EA for use within this report.

According to Environment Agency data, there are no Flood Storage Areas located in close proximity to the site.

Flood defences act to defend the site from direct inundation, but there is residual risk from each (failure) and overtopping (exceedance) of flood defences.

The EA have no records of historical flooding affecting the site itself.

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

The risk to the site from groundwater, sewer surcharge and reservoir flooding would appear to be low.

Flood warning notices will be erected around the site to inform site users of the risk of flooding, and the flood warning and evacuation measures. In the event of a flood alert being issued, site users would be advised to not visit the site until the flood alert had been lifted.

To help protect against flooding during extreme events, the applicant has agreed to implement flood resistant design measures into the proposal, in consultation with the Local Authority building control department.

The applicant has confirmed that:

- No increase in built footprint, new basements, lowering of floor levels, residential accommodation, or increase in vulnerability classification is proposed.

- No additional units at the site are proposed.
- The proposed development fits within EA Standing Advice for non-domestic extensions.
- No loss of floodplain storage.
- Flood proofing will be incorporated as appropriate.
- Due to the nature of the development, existing drainage arrangements will be retained.
- The site owner will register with the free Environment Agency Floodline Alert Direct service.

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

Appendix

- Existing and Proposed Plans;
- EA Flood Map for Planning.

KOKORO

Drawing Title

WORTHING
LOCATION PLAN

DRAWING NUMBER

A-001 REV 01

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KEY

SITE EXTRACTION

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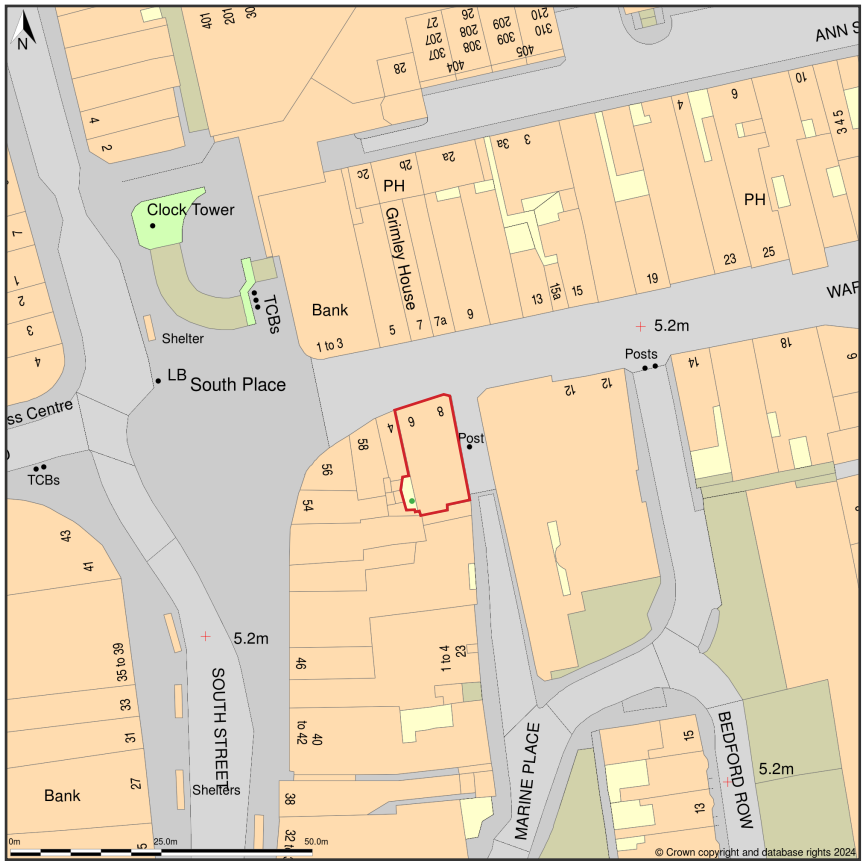
6 Warwick Street, Worthing, West Sussex, BN11 3DL



Location Plan shows area bounded by: 514903.69, 102532.88 515045.11, 102674.3 (at a scale of 1:1250), OSGridRef: TQ1497 260. The representation of a road, track or path is no evidence of a right of way. The representation of features as lines is no evidence of a property boundary.

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KOKORO

Drawing Title

WORTHING
BLOCK PLAN

DRAWING NUMBER

A-002 REV 01

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SITE EXTRACTION

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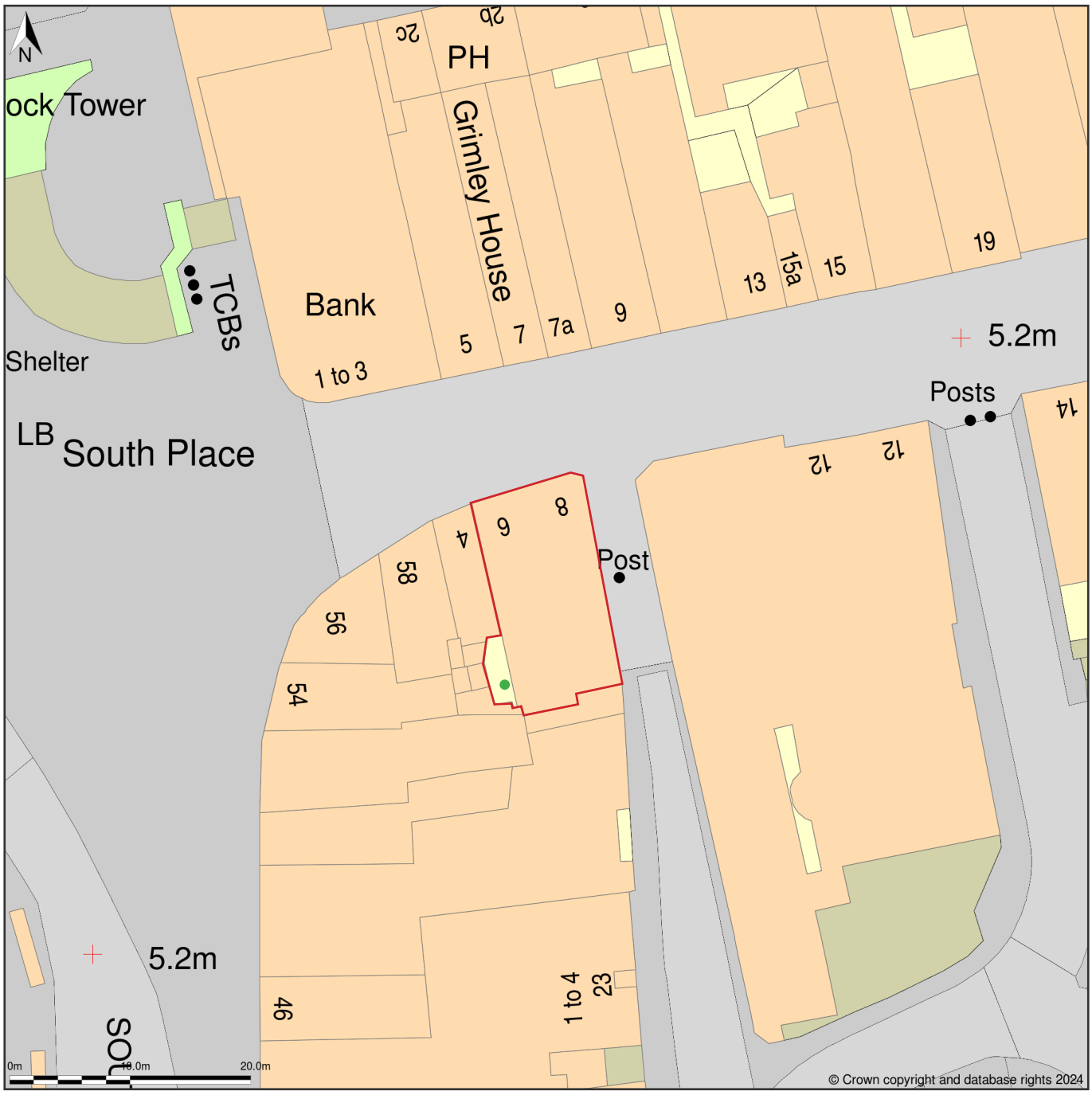

Site Plan (also called a Block Plan) shows area bounded by: 514929.38, 102558.69 515019.38, 102648.69 (at a scale of 1:500), OSGridRef: TQ1497 260. The representation of a road, track or path is no evidence of a right of way. The representation of features as lines is no evidence of a property boundary.

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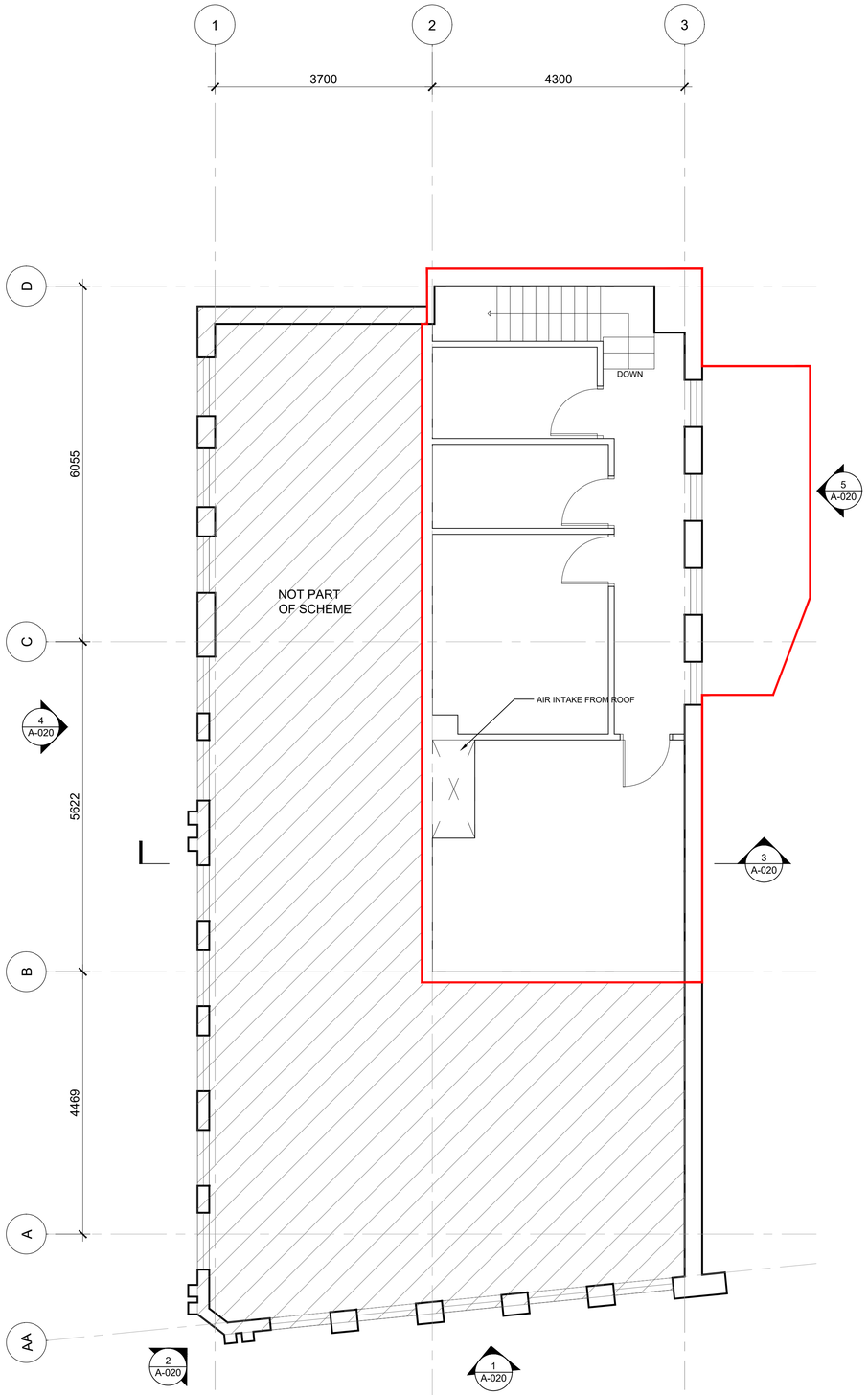
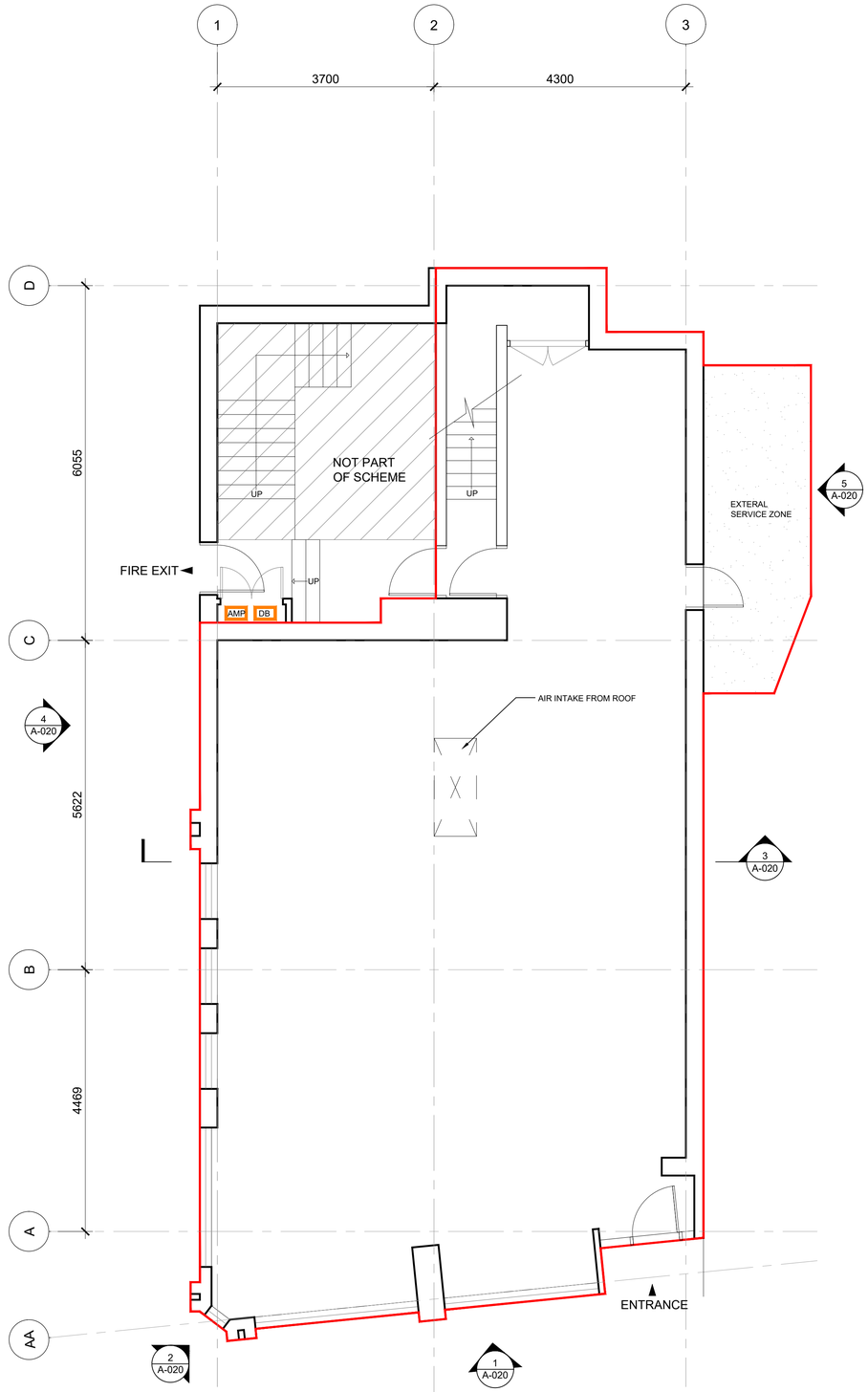


2 FIRST FLOOR - EXISTING PLAN
SCALE: 1:50



1 GROUND FLOOR - EXISTING PLAN
SCALE: 1:50

0 1.25M 2.5M 5M
SCALE: 1:50

KOKORO

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No.	Issue	Date
03.	PLANNER COMMENTS UPDATE	15 AUG, 2024
02.	PLANNING	12 AUG, 2024
01.	LL APPROVAL	05 AUG, 2024



Key Plan

Date of issue	05 AUGUST, 2024
Scale	1:50 @ A1
Project Number	24003

Drawing Title

WORTHING
EXISTING PLANS

DRAWING NUMBER

A-010 REV 01

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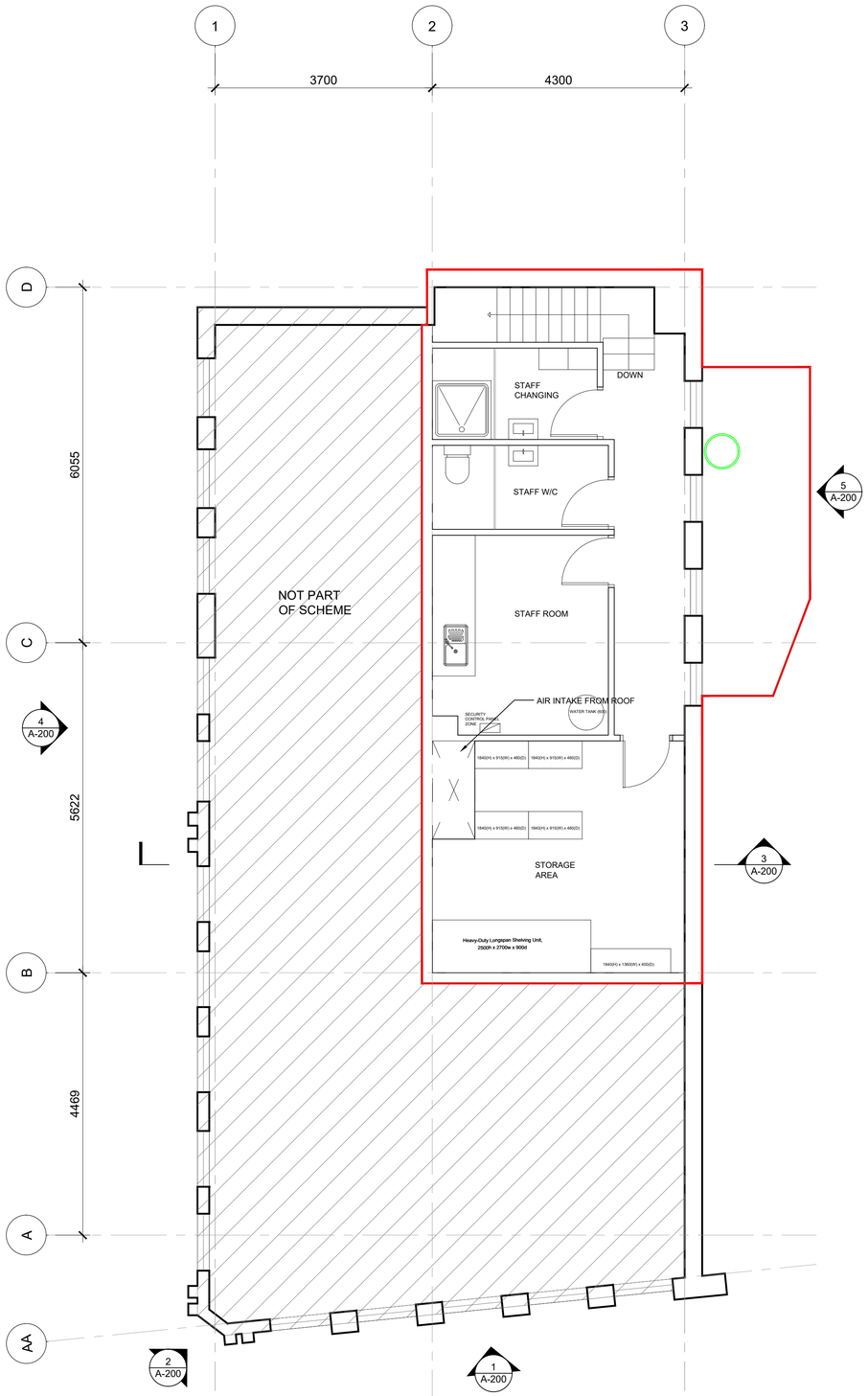
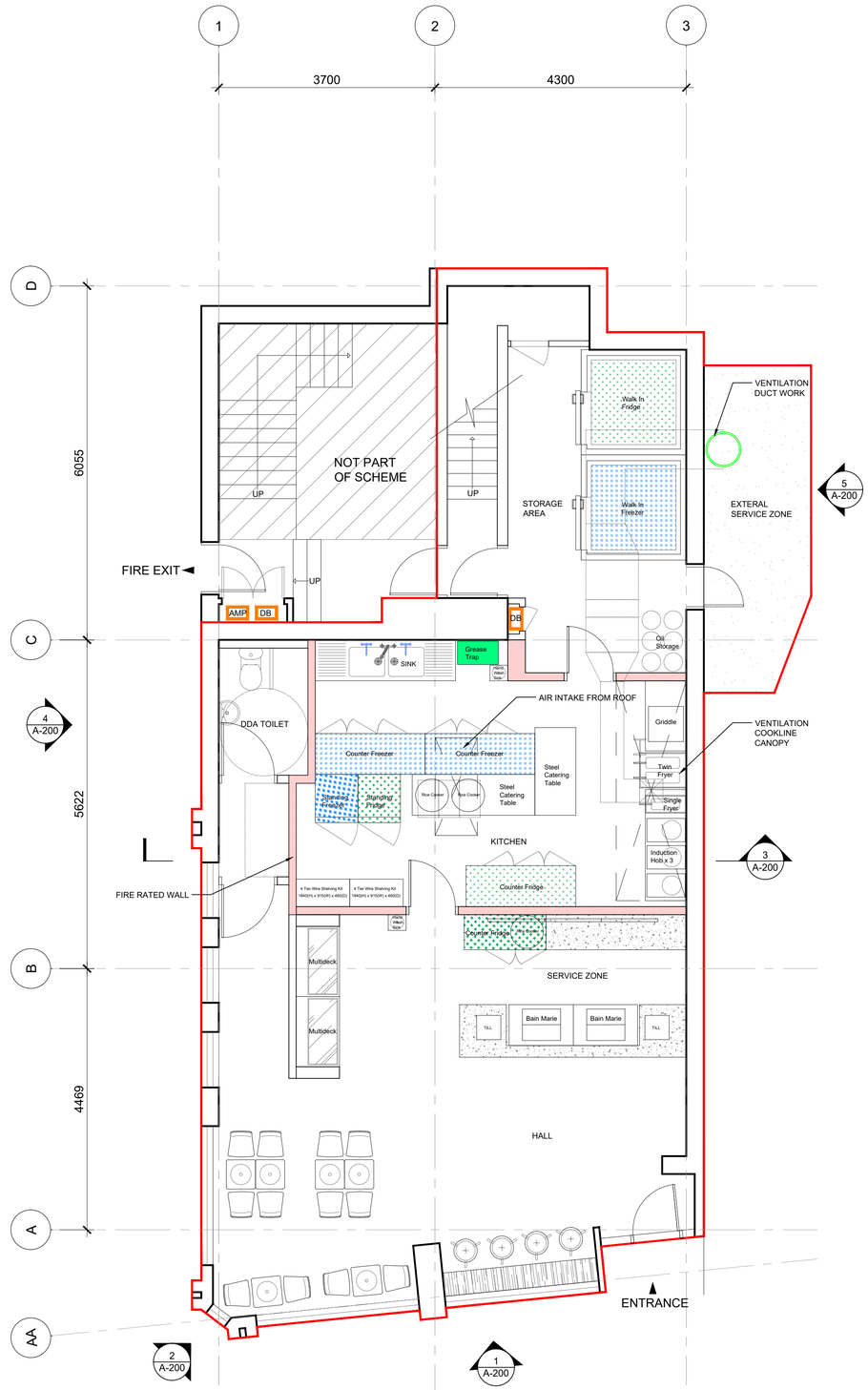
Filename: C:\Users\yoont\OneDrive\Desktop\WORTHING\20240805_WORTHING.dwg Plotted by: Timmy Yoon Plot Time: 8/14/2024 10:19 PM



2 FIRST FLOOR - PROPOSED PLAN
SCALE: 1:50



1 GROUND FLOOR - PROPOSED PLAN
SCALE: 1:50

0 1.25M 2.5M 5M
SCALE: 1:50

KOKORO

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01.	LL APPROVAL	05 AUG, 2024



N

Key Plan

Date of issue	05 AUGUST, 2024
Scale	1:50 @ A1
Project Number	24003

Drawing Title

WORTHING
PROPOSED PLANS

DRAWING NUMBER

A-100 REV 01

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Flood map for planning

Your reference	Location (easting/northing)	Created
94628	**514974/102600**	**19 Aug 2024 16:36**

Your selected location is in flood zone 3
– an area with a high probability of flooding.

This means:

- you may need to complete a flood risk assessment for development in this area
- you should ask the Environment Agency about the level of flood protection at your location and request a Flood Defence Breach Hazard Map (You can email the Environment Agency at: enquiries@environment-agency.gov.uk)
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (find out more at www.gov.uk/guidance/flood-risk-assessment-standing-advice)

Notes

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

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

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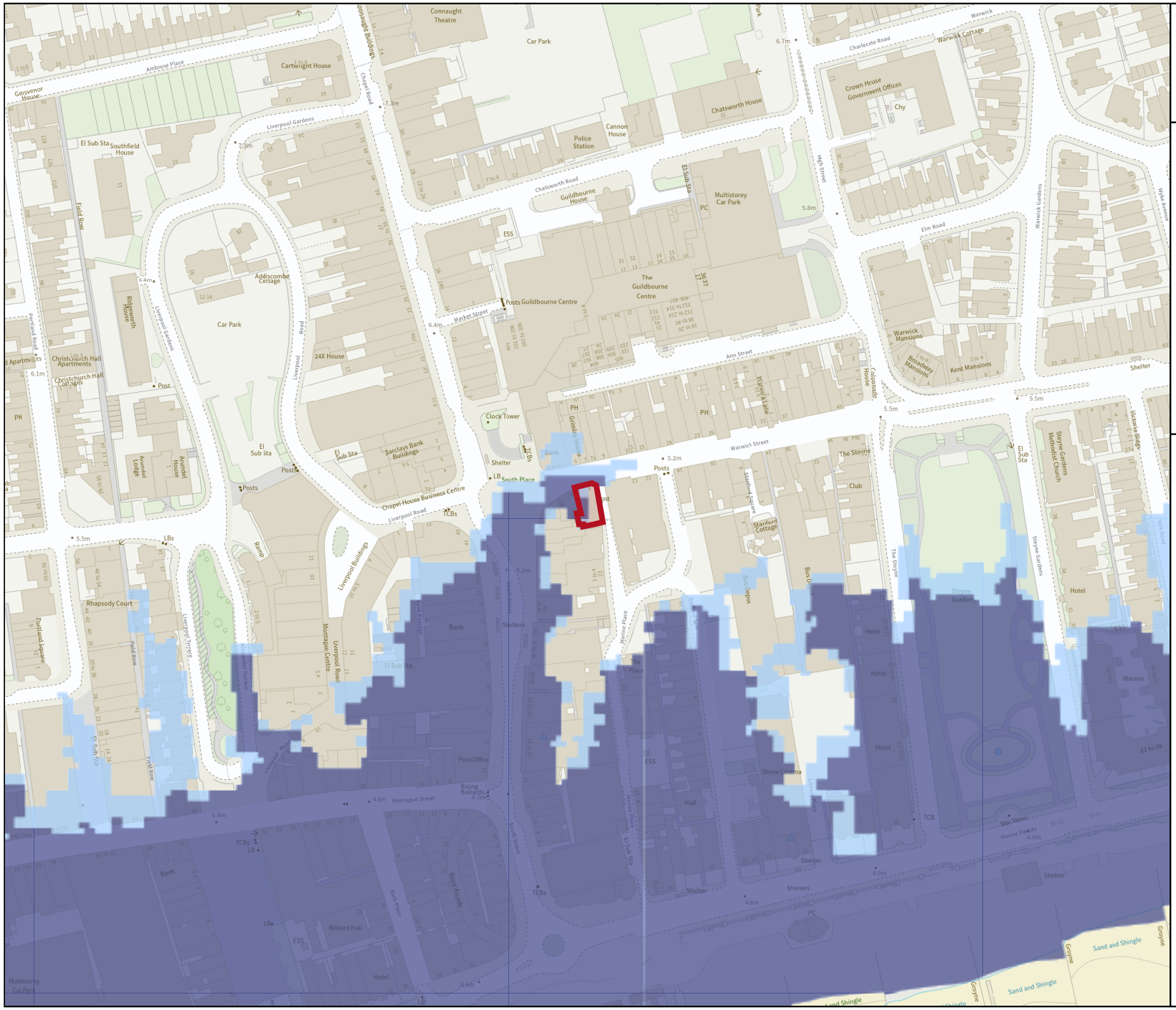

Environment Agency

Flood map for planning

Your reference
94628

Location (easting/northing)
514974/102600

Scale
1:2500

Created
19 Aug 2024 16:36

- Selected area
- Flood zone 3
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 20 40 60m

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