



FLOOD RISK ASSESSMENT

for

Proposed demolition of two residential properties and
replacement with Light Industrial Units (Class E)
incorporating 6 Offices and storage
together with associated parking

At

Outfall Cottages
Dering Way
Gravesend
Kent DA12 2QH

on behalf of

Mr R Lawson

Document Control Sheet

Project Title Proposed demolition of two existing dwelling houses and reuse site for Light Industrial units (Class E) incorporating 6 offices and storage with associated parking.

Document Title Flood Risk Assessment

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 Flood Diagram
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 Correspondence – 14th April 2023

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1.0 EXECUTIVE SUMMARY

- 1.1 Tridax Ltd has been commissioned by Mr Lawson to undertake a Flood Risk Assessment for the proposed replacement of two existing residential dwellings with six commercial units comprised of storage at ground floor and offices at first floor together with associated parking. Planning approval has previously been granted by Gravesham Borough Council under application reference 20230165.
- 1.2 This Flood Risk Assessment Report (FRA) is prepared in accordance with the Technical Guidance to the National Planning Policy Framework (NPPF) and the Kent County Council Local Flood Risk Management Strategy ~ Guidance on Consultation. The Report takes into consideration Gravesham Borough Council's Water and Flood Risk together with the Environment Agency advice note and details the observations, calculates the probable flows that may be generated by the development and makes recommendations for the disposal of foul and surface water and identifies any special mitigation measures required to reduce the risks of flooding. A Flood Risk Assessment has previously been prepared by Edge-Enviro Services Limited to support the original planning application and is identified in Condition 2 as an approved document.
- 1.3 In preparing this Flood Risk Assessment, no further consultation has been undertaken with the Environment Agency other than inspection of the GOV.UK website regarding the extent of available information on flood risk at the site and reference to the Flood Risk Report prepared by Edge-Enviro Services Limited. The Environment Agency has confirmed that the site is in a Flood Zone 3 and considered to be 'High Risk'. Flood Mapping information is included in Appendix B together with correspondence dated 29 March 2021 received from the Environment Agency via the planning process which confirms that the finished floor level of the new building must be no lower than **5.34m AOD**. Further correspondence dated 14 April 2023 from the Environment Agency confirmed that they had no objections to the proposed development subject to the following planning condition and informative being applied to the planning permission.

Condition

The development shall be carried out in accordance with the submitted flood risk assessment ("Flood Risk Assessment (FRA) Outfall Cottages", by Edge-Enviro Services Ltd) and the following mitigation measures it details:

- *Finished floor levels shall be set no lower than 5.34 m above Ordnance Datum (AOD).*

These mitigation measures shall be fully implemented prior to occupation and subsequently in accordance with the scheme's timing/phasing arrangements. The measures detailed above shall be retained and maintained thereafter throughout the lifetime of the development.

- 1.4 Tridax Ltd consider that with the inclusion of the mitigation measures recommended within this report, and that prepared by Edge-Enviro Services Limited, the site is sustainable in terms of flood risk and that the proposals do not increase the risk to the neighbouring properties.

2.0 STATUS

- 2.1 This Report is prepared for the sole use of Mr Lawson and his agents in connection with the proposed development. No responsibility can be assumed for the Report if used by others.
- 2.2 For the purposes of the Contracts (Rights of Third Parties) Act 1999, nothing in this Report shall confer on any third party any right to enforce or benefit from any term of this Report

3.0 INTRODUCTION

Background

- 3.1 Tridax Ltd has been commissioned by Mr Lawson to prepare an updated Flood Risk Assessment for the proposed demolition of a pair of semi-detached residential dwellings and replacement with six commercial units comprised of storage at ground floor and offices at first floor together with associated parking. A Flood Risk Assessment has previously been prepared by Edge-Enviro Services Limited and approved in support of the original planning application 20230165. This report seeks confirmation that the Finished Floor Level of 5.34mAOD refers to the first-floor level which the offices will be located.

Site Location

- 3.2 The development site is located on the outskirts of Gravesham near the River Thames within a Southern Water Sewage works. The area immediately adjacent the site is comprised mainly with commercial industrial units. There is significant housing development in the surrounding areas of Denton, Milton and Chalk. The site is located at Ordnance Survey reference TQ 66583 73912 (566583mE, 173912mN). The total site area is 1,116m² (0.1116ha) and comprised of 734m² of permeable grass with the remaining 382m² laid out in impermeable surface finishes. The site location, aerial and block plans are extracted in Frames 1, 2, 3 and 4 below and identified on the Architects drawing included in Appendix A of this report.

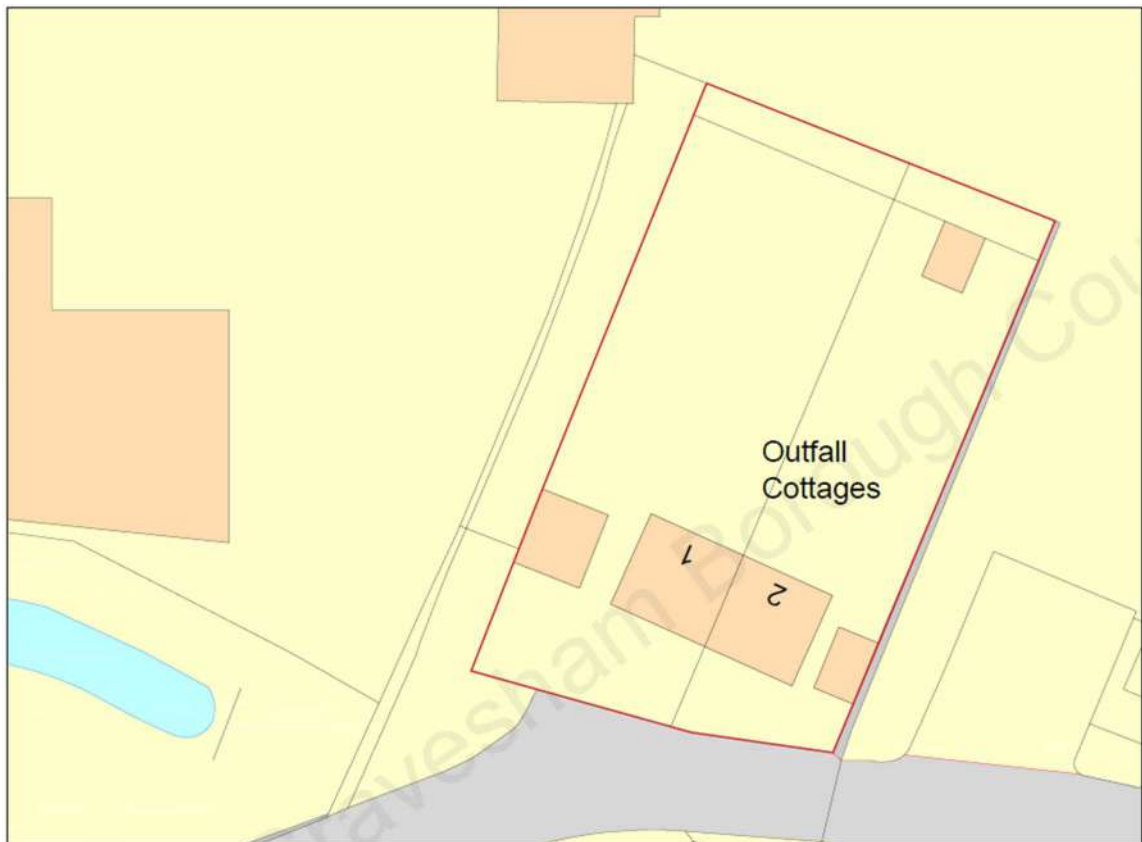


Frame 1 – Location Plan – Site Edged Red



3.3 1 and 2 Outfall Cottages (the site) are located on the outskirts of Gravesham near the River Thames within a Southern Water Sewage works. The area immediately adjacent the site is comprised mainly with commercial industrial units. Development of this site as previously agreed is in keeping with the development of the adjacent areas. The site is identified on the block plan

extracted in Frame 4 below. Access to the development site for pedestrians and vehicles is via Dering Way. The total site area is circa 1,116m² (0.1116ha)



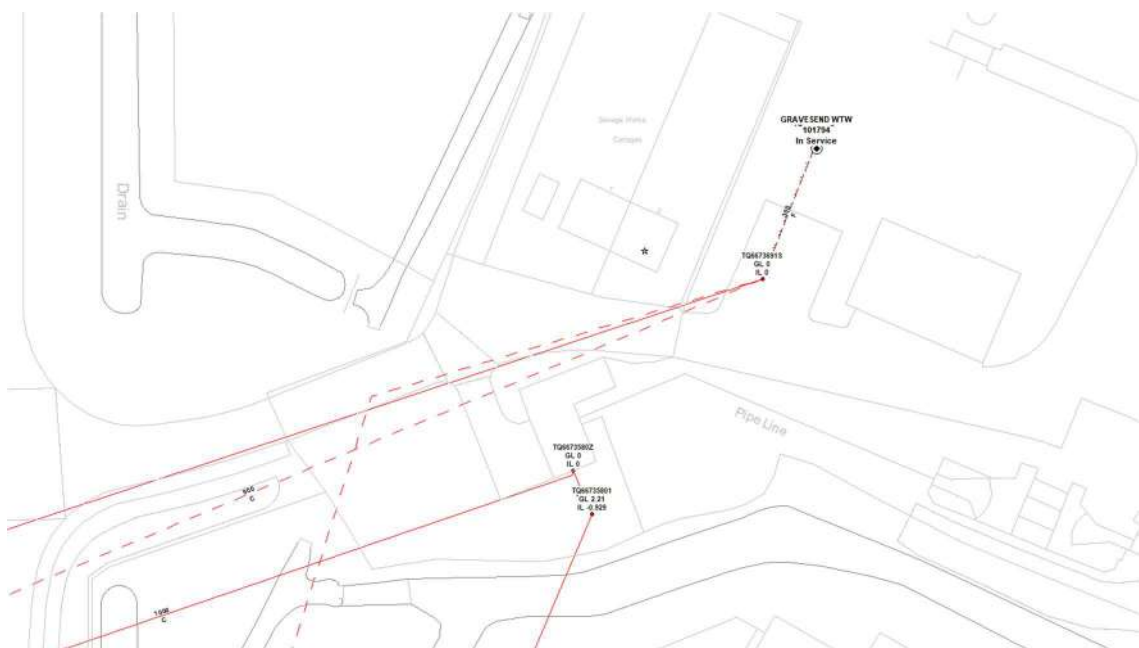
Frame 4 – Block Plan

3.4 An extract of the topographical survey is shown below as Frame 5. Ground levels at the position of the two properties are identified as 3.82mAOD. Levels at the site entrance (Southern Boundary) are 3.81mAOD rising to 3.86mAOD at the northern boundary.



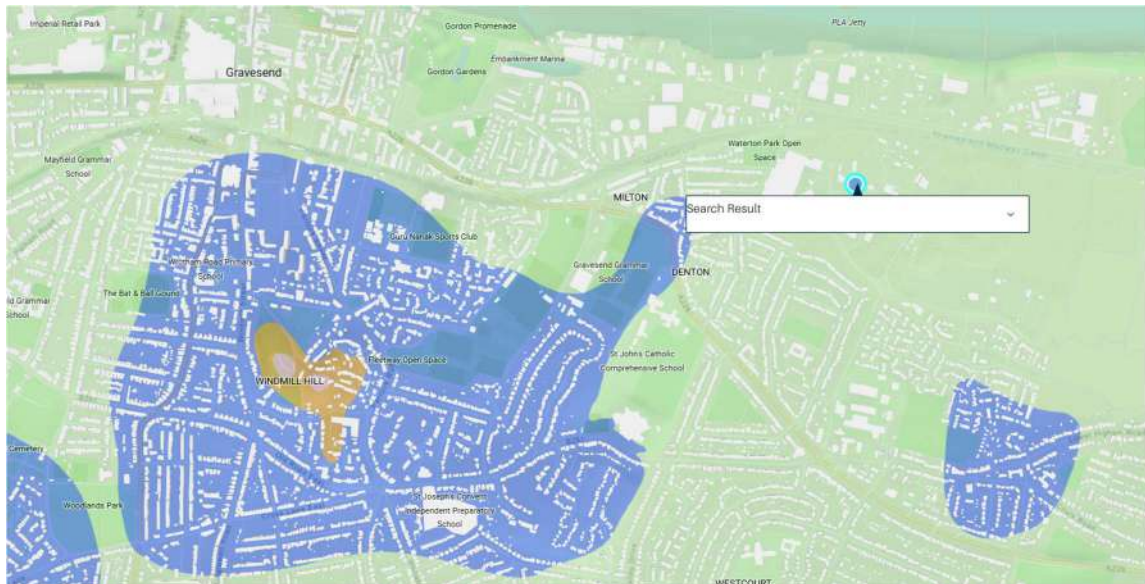
Frame 5 – Topographical Survey

3.5 Inspection of the public sewer records indicates that the site is adjacent the Gravesend WTW 101794. There are significant combined sewers identified adjacent the southern and eastern boundaries of the site together with associated pumping mains. There no public foul sewers identified at this location. There is a surface water sewer located approximately 35m north of the site's northern boundary in the Sewage Works site. It is possible that a sewer now deemed to be public could be crossing the development site. Therefore, should any sewer be found during construction works, an investigation of the sewer will be required to ascertain its ownership before any further works commence on site. No survey of the existing properties private drainage arrangements has been undertaken. Extracts of the public sewer records are extracted in Frame 6 below and included in Appendix C together with correspondence from Southern Water.



Frame 6 – Extract of Public Sewer Records (Site Edged Red)

- 3.6 Inspection of the Geological Map of Great Britain indicates that the site will be underlain with a Bedrock of Seaford Chalk Formation. There are superficial deposits of Alluvium – Silt recorded. Extracts of the Geological Map of Great Britain are shown in Frame 7 below.



Frame 7 – Extract of the Geological Map of Great Britain

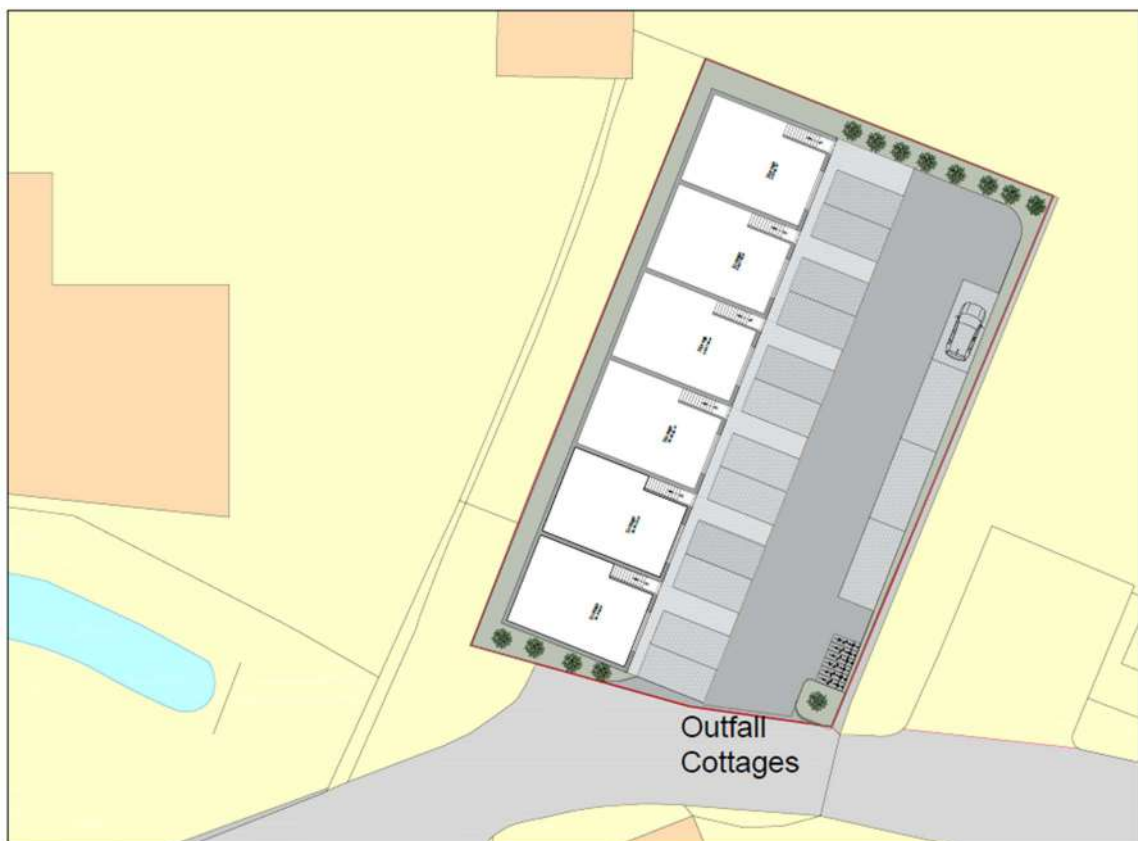
- 3.7 Soil infiltration tests have not been provided therefore the closest BGS boreholes to the site have been selected, at Gravesend sewage treatment works, to assess the soil conditions. Results are displayed in Frame 8 below. Based on these boreholes, the ground formation would be categorised as a mixture of clay, silt, and blue silty clay. This type of soil is generally deemed to have poor infiltration rates. Infiltration testing will be undertaken at the detailed design stage to obtain a better understanding of the ground conditions and determine if infiltration techniques will be a suitable option for surface water disposal.

		THICKNESS			DEPTH		
LITHOLOGICAL ASSOCIATION	NATURE OF STRATA <i>If measurements start below ground surface, state how far.</i>	Feet	Inches	Meters	Feet	Inches	Meters
2' lift	Made ground			2			2
	Soft silty clay/peat			10			12
	Light grey/Green Clay			5			17
	Dark Blue Clay			1.5			18.5
6' m —	Clay and Stones			1.5			20.0
7' 8 —	Sand and Gravel			5.5			25.5
	Bubble Chalk and Flints			3.5			29.0
ppr chalk	Chalk and Flints			47.0			76.0
RST							
3/82							

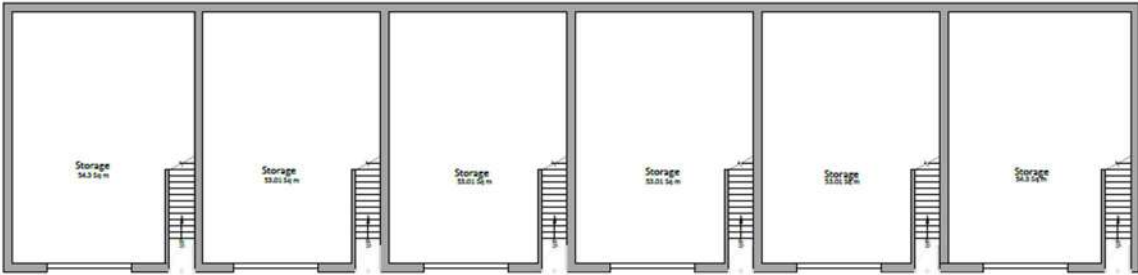
Frame 8 – Extract of BGS Borehole Report

Proposed Development

- 3.8 Planning Approval has been granted by Gravesham Borough Council under Application Ref 20230165 to demolish the existing pair of semi-detached dwellings and replace with Light Industrial Units (Class E) incorporating 6 offices and storage with associated parking. The details are identified on the Architects drawings enclosed within Appendix A and as extracted in Frames 9 – 14 shown below. The replacement commercial buildings will be positioned at 90 degrees to the footprint of the existing dwellings, along the western boundary. There will be an increase in the impermeable surface area that potentially generate surface water runoff. Should ground investigations reveal that infiltration techniques will work sufficiently then a SUD's solution will include for soakaways. However, if this is not achievable then a controlled discharge to the adjacent public combined system will be designed which will include suitable attenuation to be installed within the development site.

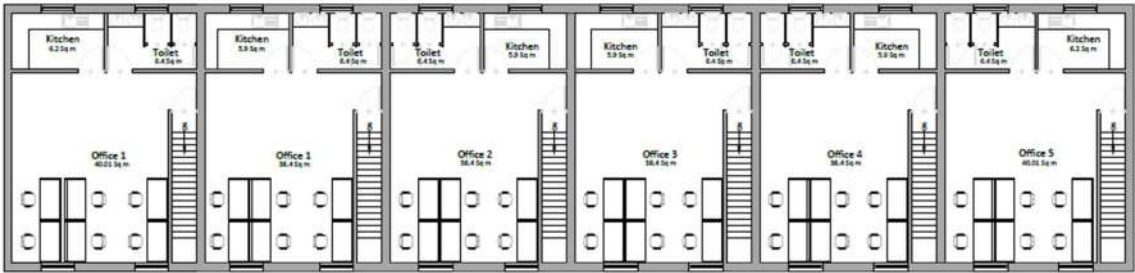


Frame 9 – Proposed Site Layout Plan



Frame 10 – Proposed Ground Floor Plan

Note! Only storage is provided at this level



Frame 11 – Proposed First Floor Plan

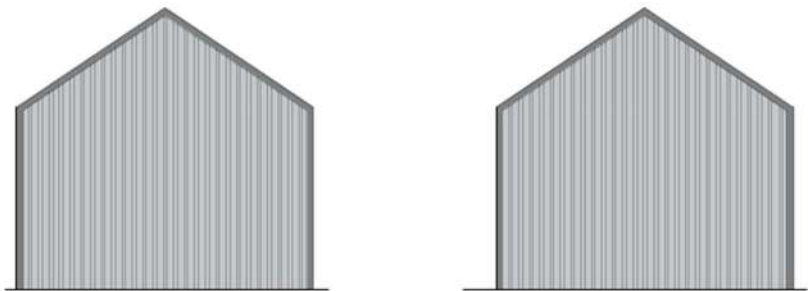
Note! Offices provided at this level



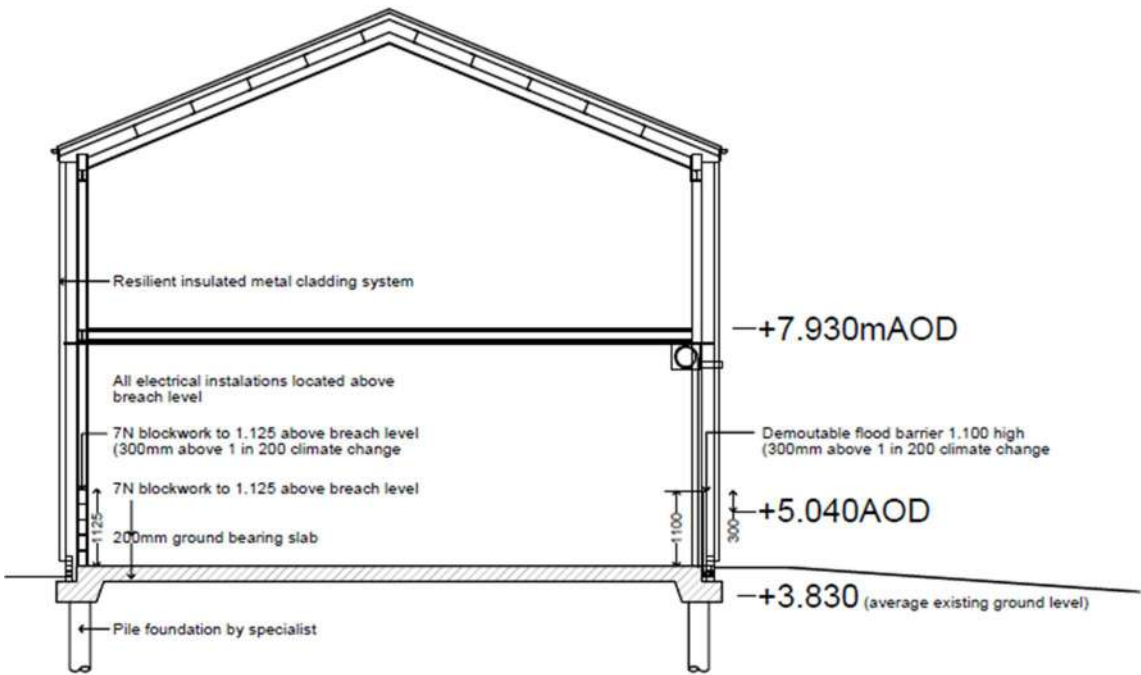
Frame 12 – Proposed Front Elevation



Frame 13 – Proposed Rear Elevation



Frame 14 – Proposed Side Elevations



Frame 15 – Proposed Section

- 3.9 With reference to the previously approved Flood Risk Assessment prepared by Edge-Enviro Services Limited and approved in support of the original planning application 20230165 we conclude the following.
- The current average ground level on the development site is circa 3.83mAOD.
 - The maximum predicted breach level is 5.04mAOD (200 year + climatic changes)
 - Floor levels are to be a minimum 300mm the above 200 year + climatic change level of 5.04mAOD.
 - Floor levels should therefore be set at a minimum 5.34mAOD.
 - The difference between required finished floor level of 5.34mAOD and the current ground level of 3.83mAOD is 1.51m.
 - Ideally all accommodation should be set above the extreme level. However, if it is not practical to raise the ground floor that high then it may be acceptable to use flood resilient construction on the ground floor and provide safe refuge on the first floor. In either case a robust warning and evacuation plan should be specified as the property would be rendered inaccessible by the floodwater
- 3.10 Generally, with this type of commercial development, the walls are finished with sheet cladding fixed to a steel frame system. However, the walls for this development will be built in 200mm thick concrete blockwork, tied in at slab level, and extend to at least 5.34mAOD and finished externally in sheet cladding. The ground floor will be raised and set at 4.43mAOD, 600mm above the current land level of 3.83mAOD. External land will be raised to enable suitable access to all units. Assuming that the first-floor level will be set at circa 3.5m above the ground floor level this will result in the FFL at first floor level being 7.93mAOD, in the region of 2.89m above the breach level of 5.04mAOD.
- 3.11 The construction of the new building will utilise flood resilient construction methods. The types of materials used in the construction of the development will be chosen to prevent or reduce the risk of structural damage caused by flood or surface water runoff to prevent the growth of wet rot spores. The ground floor is

to be constructed as a solid ground bearing slab (no void beneath), set at 4.43mAOD which is 0.91m below the level of 5.34mAOD set by the Environment Agency. Flood barriers will be installed over both entrances to the properties and extend to 5.34mAOD. This will create a sealed envelope to the 5.34mAOD should an extreme event occur.

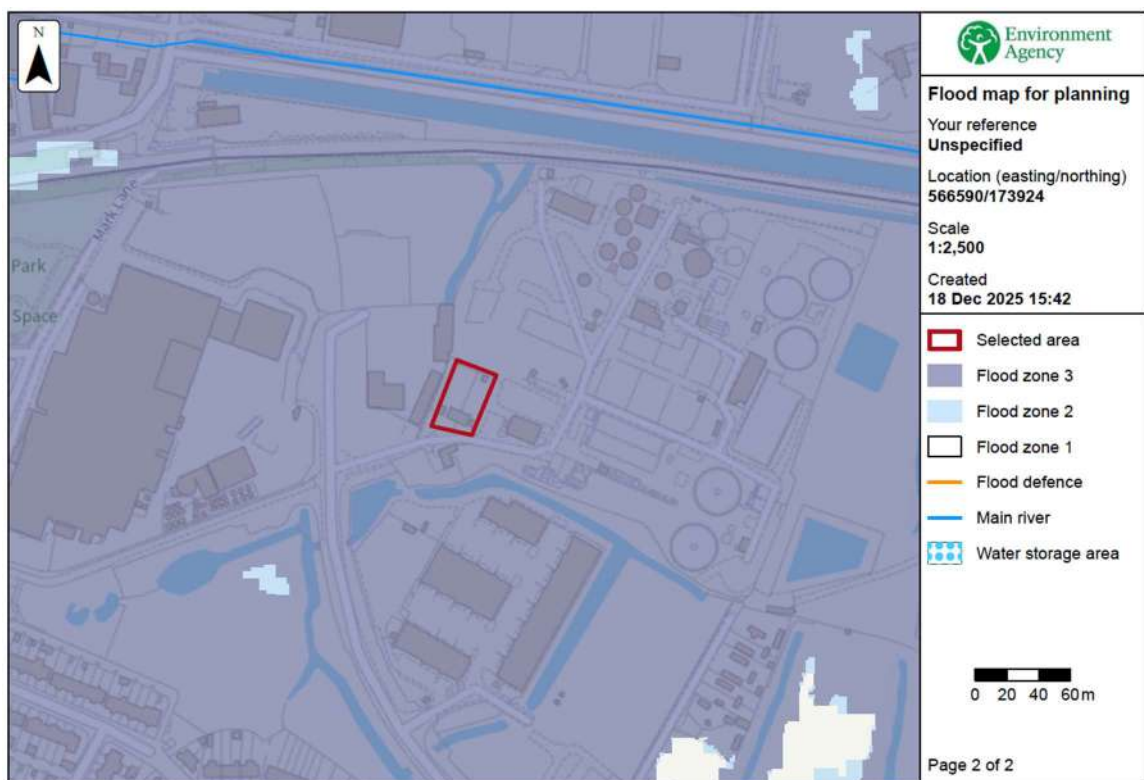
- 3.12 The Environment Agency recommends that finished floor levels (FFL) are set a minimum of 600mm above the design flood level if sleeping arrangements are provided at ground floor level or 300mm above the design flood level for all other habitable accommodation.
- 3.13 Surface water run-off from the new unit's roof and access road will be collected via a suitable network of drainage, including guttering and rainwater downpipes and discharge either via infiltration techniques within the site or have a controlled discharge to the adjacent combined sewer possibly reusing any suitable lateral connection from the existing properties. Details of the existing properties drainage arrangements are not currently available, but a survey will be undertaken to identify if the surface water runoff currently combines with the properties foul drainage or if it is dealt with separately. The foul and surface water drainage will be fully designed once planning is approved. There will be no impact on adjacent properties.
- 3.14 The foul drainage requirements will be designed in accordance with Building Regulations.

Requirement for Flood Risk Assessment

- 3.15 Flood risk is primarily regulated through planning policy. Key requirements with respect to flooding are outlined in the National Planning Policy Framework (NPPF) updated 12 December 2024.
- 3.16 The NPPF requires that an FRA should be submitted with planning applications for all sites over one hectare in area and all smaller sites within Flood Zones 2 and 3 to determine the risks of flooding at a development site (from all sources including rivers, the sea, sewers, and groundwater). An FRA is therefore an essential element in the overall acceptability of the proposed development in planning terms.
- 3.17 Guidance on the content of FRAs is contained in Technical Guidance to the National Planning Policy Framework which has been used to inform the scope and content of this FRA.
- 3.18 The primary resource for reviewing fluvial and tidal flood risks is via the Environment Agency (EA) indicative floodplain maps and analysis of their Product Data 4. These classify risks as follows:
- Flood Zone 1 (Low Probability): annual probability of flooding less than 1 in 1,000 (<0.1%);
 - Flood Zone 2 (Medium Probability): annual probability of flooding more than 1 in 1,000 (0.1%) but less than 1 in 100 (1%) for fluvial flooding or 1 in 200 (0.5%) for tidal flooding; and
 - Flood Zone 3 (High Probability): annual probability of flooding more than 1 in 100 (1%) for fluvial flooding or 1 in 200 (0.5%) for tidal flooding.
- 3.19 Inspection of the Environment Agency website and the previously approved Flood Risk Assessment Report confirms that the site lies within the outline of a Flood Zone 3 with land assessed to have annual probability of flooding more than 1 in 100 (1%) for fluvial flooding or 1 in 200 (0.5%) for tidal flooding.

Consultation

- 3.20 In preparing this Flood Risk Assessment, consideration has been given to the Flood Risk Assessment approved under planning reference 20230165 with recommendations and conclusions together with the Environment Agencies letter dated 14th April 2023 in which they confirmed that they had no objection to the proposed development subject to the planning condition and informative being applied as outlined in Section 1.3 above. As can be seen, consultation has been undertaken with the Environment Agency both at an initial contact and during the planning consultation stage. Extracted below in Frame 16 and included in Appendix B is the Flood Map for the area. The Environment Agency have confirmed that the site is in a Flood Zone 3. The information provided is based on the best data currently available.



Frame 16 – Extract of Environment Agency Flood Maps

- 3.21 The Environment Agency Flood Map shows the natural floodplain for areas at risk from river and tidal flooding. The floodplain is specifically mapped ignoring the presence and effect of defences. Although flood defences reduce the risk of flooding they cannot completely remove that risk as they may be over topped or

breached during a flood event. The Flood Zones produced by this model are made up of the combined risk from the defended and undefended scenarios to capture the full risk from still water and wave overtopping.

- 3.22 The Flood Map indicates areas with a 1% (0.5% in tidal areas) Annual Exceedance Probability (AEP): the probability of a flood of a particular magnitude, or greater, occurring in any given year and 0.1% AEP of flooding from rivers and /or sea in any given year. In addition, the map also shows the location of some flood defences and the areas that benefit from them. The site is shown to be in a Flood Zone 3 (High Probability) with land assessed to have annual probability of flooding more than 1 in 100 (1%) for fluvial flooding or 1 in 200 (0.5%) for tidal flooding.
- 3.23 Areas benefiting from flood defences are defined as those areas which benefit from formal flood defences specifically in the event of flooding from rivers with a 1% (1 in 100) chance in any given year or flooding from the sea with a 0.5% (1 in 200) chance in any given year. If the defences were not there these areas would be flooded. An area of land may benefit from the presence of a flood defence even if the defence has overtopped if the presence of the defence means that the flood water does not extend as far as it would if the defence were not there.
- 3.24 The flood map is intended to act as a guide to indicate the potential risk of flooding. When producing it the Environment Agency use the best available data at the time of completion, considering historic flooding and local knowledge. The flood map is updated on a quarterly basis to account for any amendments required.
- 3.25 Ideally all accommodation should be set above the extreme level. However, if it is not practical to raise the ground floor that high then it may be acceptable to use flood resilient construction on the ground floor and provide safe refuge on the first floor. In either case a robust warning and evacuation plan should be specified as the property would be rendered inaccessible by the floodwater.

- 3.26 The Environment Agency has confirmed that the breach level of 5.04mAOD (1 in 200 year + Climatic Change) is to be used and that finished floors should be raised a further 300mm. The Environment Agency recommends that the finished floor level should be set no lower than 5.34mAOD. The topographical survey has identified ground levels across the site to be in the region of 3.83mAOD. The ground floor level will be set at 4.43mAOD which is 600mm above the current land level. The ground floor will be utilised for storage (not habitable space). The First-floor level will be circa 7.93mAOD and used for offices. This will result in the first floor being in the region of 2.89m above the breach level of 5.04mAOD which will enable the occupants to remain safely within the property in an extreme event. This is a commercial development with no sleeping accommodation provided.
- 3.27 In the Environment Agency letter dated 14th April 2023 included in Appendix B of this report they state that the proposed development will only meet the National Planning Policy Framework's requirements (policy 167) if the following planning condition is included. See Frame 16 below.

Condition

The development shall be carried out in accordance with the submitted flood risk assessment ("Flood Risk Assessment (FRA) Outfall Cottages", by Edge-Enviro Services Ltd) and the following mitigation measures it details:

- Finished floor levels shall be set no lower than 5.34 m above Ordnance Datum (AOD).

These mitigation measures shall be fully implemented prior to occupation and subsequently in accordance with the scheme's timing/phasing arrangements. The measures detailed above shall be retained and maintained thereafter throughout the lifetime of the development.

Reason

To reduce the risk of flooding to the proposed development and future occupants.

Frame 17 – Extract of Environment Agency Condition

- 3.28 The Environment Agency has also included the Future Thames Barrier Informative extracted in Frame 18 below.

Future Thames Barrier Informative

The Thames Estuary 2100 Plan (the Plan) sets out how we and our partners can work together to manage tidal flood risk in the Thames Estuary, from now and into the next century. It is an adaptive plan, ensuring current standards of flood protection provided by the existing tidal defence system are maintained or improved taking into account the effects of climate change e.g. sea level rise. We expect the existing Thames Barrier to continue to protect London from tidal flooding up until 2070, but over the longer term the Plan, published in 2012, sets out the strategic direction and several options for managing tidal flood risk in the Thames Estuary.

Beyond 2070, the long term options to manage tidal flood risk include upgrading the existing Thames barrier at Woolwich, two potential locations for a replacement barrier (Gravesend Reach or Long Reach) or flood storage.

Currently, all options continue to be investigated and assessed given that the decision on a preferred option is not planned until about 2040 when such a decision will be informed by the data and information available at the time.

Although this is an inland site away from the River Thames, this ongoing work is something the developer should be aware of as their site may be impacted in the future, during the construction period, should the barrier be located in Gravesend Reach. We are not objecting to this application from a TE2100 perspective but instead providing this advice based on the proposal changing the site use from residential to commercial and the site being small at just over one hectares. We will contact the developer and landowners in the future should the Gravesend Reach area be taken forward as the preferred option. We would encourage the developer to regularly check www.gov.uk for further and up to date information.

Frame 18 – Future Thames Barrier Informative

4.0 NATIONAL PLANNING POLICY FRAMEWORK CONTEXT

- 4.1 Inspection of the Environment Agency Website identifies that the site lies within the outline of a Flood Zone 3 (High Probability) with land assessed to have annual probability of flooding more than 1 in 100 (1%) for fluvial flooding or 1 in 200 (0.5%) for tidal flooding. The mapping does not distinguish between high-risk areas and the functional floodplains, i.e. Flood Zones 3a and 3b.
- 4.2 The functional floodplain is defined by NPPF as land where water must flow or be stored in times of flood during events that have a probability of occurrence of 1 in 20 (5%) or greater in any one year. The Practice Guide to NPPF goes on to further clarify this by adding the following definitions.
- (a) Areas which would naturally flood with an annual exceedance probability of 1 in 20 (5%) or greater, but which are prevented from doing so by existing infrastructure or solid buildings will not normally be defined as functional floodplain.
 - (b) Developed areas are also not generally considered to comprise functional floodplains, however, areas such as car parks that have been designed to provide flood storage and conveyance function may be.
 - (c) The functional floodplain may also include areas intended to provide transmission and storage of water from other sources of flooding (e.g. surface water).
- 4.3 Based on the information that has been provided by the Environment Agency and reference to the Gravesham Borough Councils Flood Risk Assessment the site is identified as being located in a Flood Zone 3.
- 4.4 The SFRA is at the core of the NPPF (PPS25) approach. It provides essential information on flood risk, taking climate change into account, thereby allowing the LPA to understand risk across its district so that the Sequential Test can be properly applied. The need for LPAs to consider flood risk when preparing Local Development Documents (LDD) and to produce SFRAs is highlighted in

paragraphs 93 – 108 *‘Meeting the challenge of climate change, flooding and coastal change’*

- 4.5 **Flood Zones 1** – Low probability of flooding – This zone is assessed as having less than a 1 in 1000 annual probability of river or sea flooding in any one year. *If the site is less than 1 hectare then a site-specific FRA will only be required if it lies within an area defined by either the Critical Drainage Zone or the Overtopping Hazard Zone, or if it is identified by the Council as being a site with specific critical drainage problems or is located within 20m of a main river.*
- 4.6 **Flood Zone 2** – Medium probability of flooding – This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding or between 1 in 200 and 1 in 1000 annual probability of sea flooding in any one year. *A site-specific FRA will be required, and this will need to be prepared in accordance with the requirements set out in PPS25, paragraphs 10 - 13 and annex E.*
- 4.7 **Flood Zone 3** – High probability of flooding - This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding or 1 in 200 or greater annual probability of sea flooding in any one year. *A site-specific FRA will be required, and this will need to be prepared in accordance with the requirements set out in PPS25, paragraphs 10 - 13 and annex E.*

Flooding from Surface Water Runoff and Overland Flow

- 4.8 Overland flooding typically occurs in natural valley bottoms as normally dry areas become covered in flowing water and in low spots where water may pond. This flooding mechanism can occur almost anywhere but is likely to be of particular concern in any topographical low spot, or where the pathway for runoff is restricted by terrain or man-made obstructions.
- 4.9 Parts of the District have a very steep topography and are heavily urbanised. In addition, in many places surface water is discharged into the streams that flow through these towns. These streams flow predominantly in culverts through these densely populated urban areas and historically these have become

surcharged during extreme rainfall events. This has resulted in surface water flowing in streets, which has caused flooding to properties in the past.

Impact of Climate Change on the SFRA Study Area

- 4.10 The Environment Agency Flood Zone maps are based on current day sea levels and climate conditions; however, to gain an understanding of the impact of rising sea levels, the Flood Zone maps have been re-produced using the 2115 predicted extremes.
- 4.11 There are generally three significant policies in relation to flood risk which are:-
- 4.11.1 All development will be controlled so as not to give rise to flooding or surface, groundwater, or aquifer pollution. Surface water should be disposed of as close to source as possible or attenuated before discharge to a watercourse or surface water sewer. Surface water should not be allowed to enter the foul system.
- 4.11.2 Areas within Zones 2 and 3 at risk from fluvial flooding are identified on the Environment Agency Flood Map. Planning applications for development on sites of more than 1 hectare within these areas must be accompanied by a flood risk assessment appropriate to the scale of and nature of the development, the level of flood risk, and the protection afforded by the existing defences. Development in undeveloped areas at risk from fluvial flooding will only be permitted in exceptional circumstance. In developed areas at risk from fluvial flooding, development will only be permitted where appropriate flood defence measures are taken, and it can be demonstrated that there is no increased risk of flooding to other sites.
- 4.11.3 Generally the Local Authority will, in consultation with the Environment Agency, ensure that new developments safeguard existing tidal and fluvial defences. Where works are being carried out in proximity to a tidal or fluvial flood defence the Council will seek to safeguard and where possible extend public access to the waterfront and protect and enhance existing ecological features, the existing flood defences, and access to flood defence facilities for operational maintenance purposes.

- 4.12 Planning permission will be refused for residential development in areas at risk of fluvial or tidal flooding, as identified by the Environment Agency, unless it can be shown that the site is defended to an appropriate standard. Where a site is protected to an appropriate standard the development will be required to show appropriate measures to ensure the safety of the occupiers of the accommodation from flooding.
- 4.13 Generally, development will only be permitted where the District Planning Authority is satisfied that suitable sustainable urban drainage methods, or an alternative method as agreed with the drainage authority designed to mitigate any adverse effects of surface water run-off, are included as an integral part of the development and measures are proposed to ensure the future maintenance of such schemes.
- 4.14 According to Table 2 of the Technical Guidance to NPPF (see Frame 19 below), the site usage is considered to be 'Less Vulnerable', (offices/general industry/storage).

Essential Infrastructure	Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk, and strategic utility infrastructure, including electricity generating power stations and grid and primary substations.
Highly Vulnerable	- Police stations, Ambulance stations and Fire stations and Command Centres and telecommunications installations required to be operational during flooding. - Emergency dispersal points. - Basement dwellings. - Caravans, mobile homes and park homes intended for permanent residential use. - Installations requiring hazardous substances consent.¹⁹
More Vulnerable	- Hospitals. - Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. - Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs; and hotels. - Non-residential uses for health services, nurseries and educational establishments. - Landfill and sites used for waste management facilities for hazardous waste.²⁰ - Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	- Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non-residential institutions not included in 'more vulnerable'; and assembly and leisure. - Land and buildings used for agriculture and forestry. - Waste treatment (except landfill and hazardous waste facilities). - Minerals working and processing (except for sand and gravel working). - Water treatment plants. - Sewage treatment plants (if adequate pollution control measures are in place).

Frame 19- Extract of NPPF Table 2 - Land Use Vulnerability

- 4.15 Reference to Frame 20 below, Table 3 of the Technical Guidance to NPPF, the 'Less vulnerable' land use **does not** require the **exception test** performing for Flood Zone 3.

Vulnerability Classification (Refer Table 2)		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zones	Flood Zone 1	✓	✓	✓	✓	✓
	Flood Zone 2	✓	✓	Exception Test	✓	✓
	Flood Zone 3a	Exception Test	✓	✗	Exception Test	✓
	Flood Zone 3b	Exception Test	✓	✗	✗	✗

✓ Development is appropriate
✗ Development should not be permitted

Frame 20 - Extract of NPPF Table 3

Sequential Test

- 4.16 Local Planning Authorities (LPA) are encouraged to take a risk-based approach to proposals for developments in or affecting flood risk areas through the application of the Sequential Test and the objectives of this test are to steer new development away from high-risk areas towards those at lower risk of flooding. However, in some areas where developable land is in short supply there can be an overriding need to build in areas that are at risk of flooding. In such circumstances, the application of the Sequential Test is used to ensure that the lower risk sites are developed before the higher risk ones. The Sequential Test can be considered adequately demonstrated if both of the following criteria are met:

- The Sequential Test has already been carried out for the site (for the same development type) at the strategic level (Local Plan)
- The development vulnerability is appropriate to the Flood Zone

- 4.17 Based on the information that has been provided by the Environment Agency and determined by this assessment, the following functional floodplain test is applied.

Do predicted flood levels show that the site will be affected by an event having a return period of 1 in 20 years or less? **X**

Is the site defended by flood defence infrastructure that prevents flooding for events having a return period of 1 in 20 years or greater? **✓**

Does the site provide a flood storage or floodwater conveyance function? **X**

Does the site contain areas that are 'intended' to provide transmission and storage of water from other sources? **X**

Is site within the functional floodplain? (Zone 3b). **No**

This development site is NOT located in a functioning floodplain.

- 4.18 NPPF states that the Local Planning Authority should apply the sequential approach as part of the identification of land for development in areas at risk from flooding. The objective of the sequential test is to ensure that lower risk sites are developed before sites in higher risk areas. When applying the test, it is

extremely important to ensure that the subject site is only compared with sites that are available for development and are similar in size. This requires a comprehensive knowledge of development sites within the Dover District and is normally applied as part of the Local Development Framework process. However, when applying the test to sites that have not been assessed as part of the LDF it is often necessary to apply a site-specific test.

- 4.19 The second level of appraisal is through the application of the more detailed and refined flood risk information contained within the Strategic Flood Risk Assessments (SFRA). Such a document has been prepared for the Dover District and this has been referenced as part of this site-specific FRA.
- 4.20 The most detailed stage at which the sequential approach can be applied is at site-based level. Careful consideration can then be given to the sites' topography and development uses can provide opportunities to locate more vulnerable buildings on higher parts of the site and allow less vulnerable items such as recreation areas or car parking to be placed in higher risk areas.
- 4.21 **The development vulnerability is appropriate to the Flood Zone**

Exception Test

4.22 By reference to Table 3 of the NPPF (Frame 19 above) it can be seen that an Exception Test is **not** required. The remainder of this report will assess and recommend appropriate flood mitigation measures and assess the flood risk to and arising from the proposed development in order to ensure the following objectives have been met. Consideration is also given to the Flood Risk Assessment Report prepared by Edge-Enviro Services Ltd and previously approved under Planning Ref 20230165.

- Ascertain the impact of the proposed development on the flood risk in the surrounding area.
- Recommend appropriate flood mitigation measures in line with the recommendations of current best practice.
- Demonstrate that the development provides wider sustainability benefits to the community that outweigh flood risk.
- The development should be on developable, defined as a site that is in a suitable location for housing, or previously developed land.
- A Flood Risk Assessment must demonstrate that the development will be safe, without increasing flood risk elsewhere and where possible, will reduce flood risk overall.

5.0 ENVIRONMENTAL CONDITIONS

Topography

- 5.1 Topographical survey details identify that ground levels at the position of the two properties are 3.82mAOD. Levels at the site entrance (Southern Boundary) are 3.81mAOD rising to 3.86mAOD at the northern boundary.

Flood Defences

- 5.2 As confirmed in Edge-Enviro Services Ltd Flood Risk Assessment Report the site is identified on the Environment Agency Flood Map as benefiting from Flood Defences. It should be noted that the flood map (flood zones) at this location have been derived using a generalised computer modelling study completed in 2020 (using JFLOW modelling techniques) and would not necessary be aware of any localised walls or structures defending the site. The Environment Agency has taken the decision to retire the datasheet regarding 'Areas that benefit from flood defences' as they have concluded it no longer meets the needs and potentially creates a false sense of security for users.

Historical Flooding

- 5.3 Edge-Enviro Services Ltd Flood Risk Assessment Report confirms that there have been two historic flood events within a 1000m radius of the site of Outfall cottages. The first of these occurred at 130m from the site, between the 1st and 5th of February 1953. This was a Tidal event that resulted from the overtopping g of defences. Secondly, on the 14th of September 1968, at 271m from the site, channel capacity was exceeded causing a fluvial flood event. Neither of these recorded historic events affected the site in question of Outfall cottages.

Flood Hazards

5.4 Technical Guidance to NPPF identifies six potential sources of flooding and requires that all potential sources that could affect the proposed development are considered.

- Flooding from rivers or fluvial flooding
- Flooding from the sea or tidal flooding
- Flooding from land
- Flooding from groundwater
- Flooding from sewers
- Flooding from reservoirs, canals, and other artificial sources

5.5 Flooding from rivers or fluvial flooding

The site lies within the outline of a Flood Zone 3 (High Probability) with land assessed to have annual probability of flooding more than 1 in 100 (1%) for fluvial flooding.

5.6 Flooding from the sea or tidal flooding

The site lies within the outline of a Flood Zone 3 (High Probability) with land assessed to have annual probability of flooding more than 1 in 200 (0.5%) for tidal flooding

Rivers and the sea [More about your rivers and sea flood risk](#)

Yearly chance of flooding

Very low Low Medium High

Yearly chance of flooding between 2036 and 2069

Very low Low Medium High

What makes rivers and sea flooding more likely

Low-lying areas that are close to rivers or the sea are more likely to flood when water levels rise.

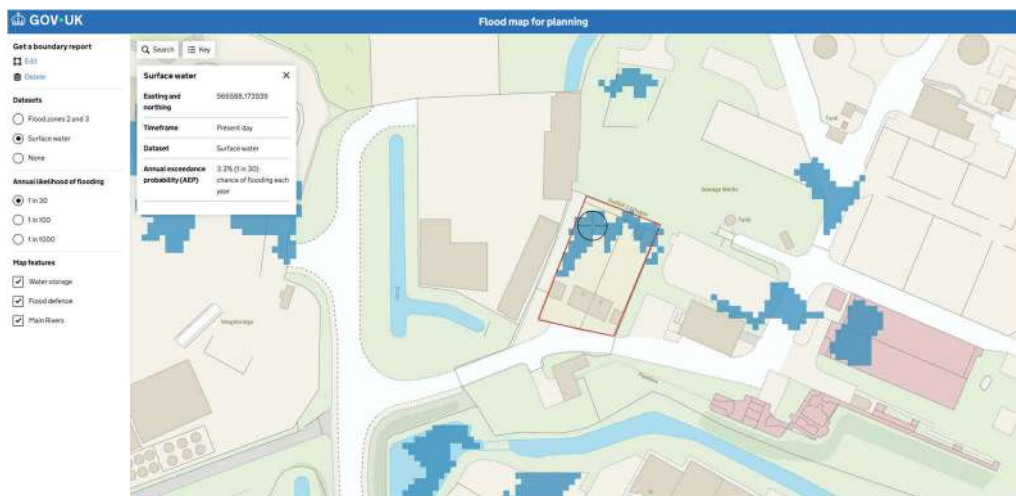
This information takes into account any flood defences.

► [Why flood defences cannot completely prevent flooding](#)

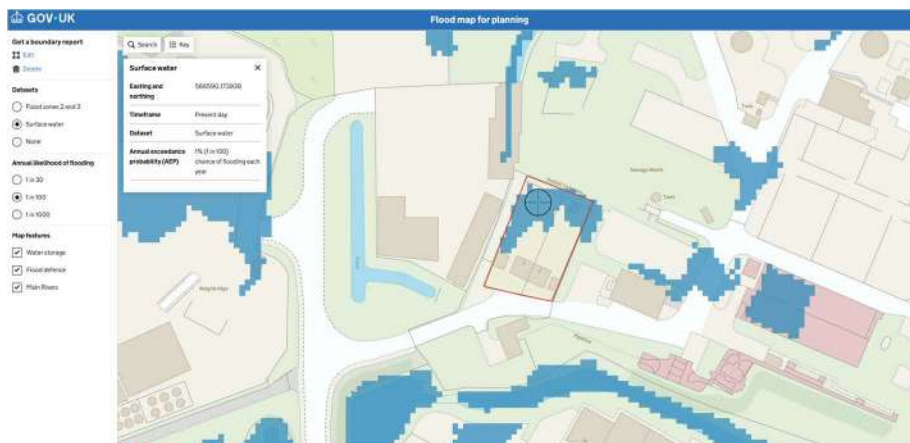
Frame 21 – Yearly flooding 2036 - 2069

5.7 Flooding from land

During times of extreme rainfall, surface water flows along the streets potentially resulting in water collecting in low-lying areas. Under normal conditions this surface water is managed via the highway drains, however, under extreme conditions these may become overwhelmed and consequently water can pond in these areas. Data provided by the Environment Agency and extracted below as Frame 22, 23 and 24, indicates that this site is at a **Low Risk** of surface water flooding.



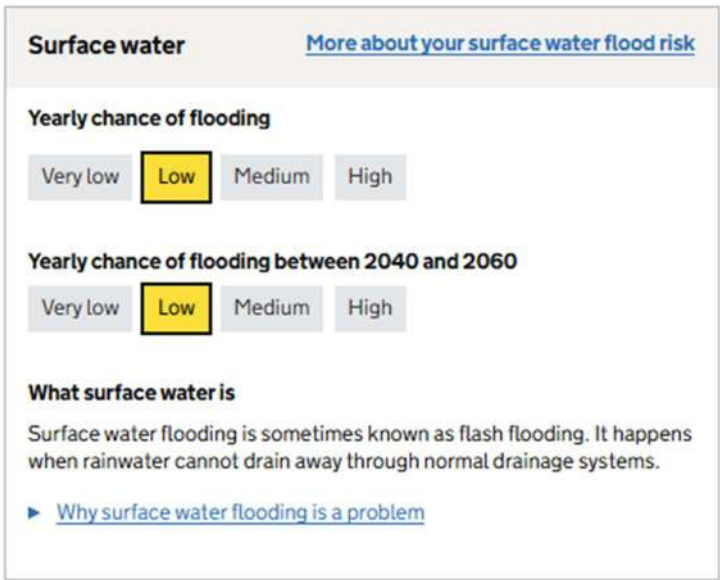
Frame 22 – Extent of Surface Water Flooding
(1 in 30 chance of annual flooding)



Frame 23 – Extent of Surface Water Flooding
(1 in 100 chance of annual flooding)



Frame 24 – Extent of Surface Water Flooding
(1 in 1000 chance of annual flooding)



Frame 25 – Yearly Chance of Flooding 2040 - 2060

5.8 Flooding from groundwater

British Geology Surveys website indicates the site is likely to be underlain by a Bedrock of Seaford Chalk Formation. There are superficial deposits of Alluvium – Silt recorded. The site is outside of a Groundwater flood alert area. The ground floor will be set at the external ground level therefore the risk from groundwater flooding will be **Medium**.

Groundwater

[More about your groundwater flood risk](#)

We use groundwater flood alert areas to check the risk of flooding from groundwater.

This location is outside of a groundwater flood alert area.

▼

[What this means](#)

This location is not part of a groundwater flood alert area. We do not monitor groundwater levels in this area.

There may still be a risk of groundwater flooding.

What groundwater is

Groundwater is the water that is usually held in rocks and soil underground.

Groundwater flooding happens when this water rises and flows above the surface.

Flooding from rivers is more likely when groundwater levels are high.

Frame 26 – Groundwater Risk

5.9 Flooding from sewers

The public sewer records identify that there are public combined sewers in close proximity to this site. The risk of flooding from sewers is considered to be **Medium**.

5.10 Flooding from reservoirs, canals, and other artificial sources

The site is not within the maximum extent of flooding from reservoirs.

Reservoirs: understand your flood risk

Your selected location: 1 Outfall Cottages, Dering Way, Gravesend, DA12 2QH

This information tells you the flood risk of the land around a building, not the building itself.

Flooding from reservoirs is unlikely in this area.

How we check an area's risk

We use predicted scenarios to understand the risk of flooding from reservoirs.

Flooding from reservoirs is extremely unlikely. We have an excellent reservoir safety record in the UK.

An area is considered at risk if people's lives could be threatened in the event of a dam or reservoir failure. There has been no loss of life due to a reservoir failing in the UK since 1925.

What to do

To prepare for the unlikely event of a dam or reservoir failure, make sure you can get [Emergency Alerts from the government](#).

Frame 27 – Other Flood Risks - Reservoirs

Risk and Controls

5.11 Considering the hazards identified above at the site, the following requiring consideration and/or mitigation measures.

- Flooding of any new property (Considered)
- Emergency egress through flood water (Considered)
- Displacement of flood water (Considered)
- Health & financial implications of flooding (Considered)
- Loss of mitigation measures during building lifetime (Considered)
- Flood Warning (Considered)

5.12 Flooding of new property

The ground floor level of these commercial units is for storage and general light industry use. The upper floor is for office use. The entrance doors on the front elevation will be set level with the external ground to permit vehicle and disabled access. The ground will be graded to fall away from these entrance doors. The external ground level adjacent the side and rear elevations will be set a minimum 150mm below the finished ground floor level therefore any flood water will be able to flow around and away from the property, so the risk of internal flooding is reduced.

5.13 Emergency egress through flood water

The site is not located on land above the 1% AEP level, therefore a dry escape route is not available. The first floor level is significantly above the extreme flood level where occupants can take refuge should an event occur therefore the avoiding the need for any specialist rescue by the Emergency Services or the need for wading through floodwater.

5.14 Displacement of flood water

The proposed development does increase the footprint slightly so there will be a reduction in the potential capacity of the storage zone although this is considered negligible.

5.15 Health & Financial Implications

The construction work will utilise flood resilient construction methods.

5.16 Loss of mitigation measures during the lifetime of the property

A copy of this report should be included with the 'New Homeowners Handbook' and any potential purchaser made aware of the mitigation measures included on the site and the long-term maintenance requirement.

5.17 Flood Warning

Whilst the probability of an event of sufficient magnitude to cause floodwaters to reach the levels discussed in this report is low, the risk of such an occurrence is always present. With the sophisticated techniques now employed by the Environment Agency to predict the onset of flood events the opportunity now exists for all occupants within the flood risk area to receive flood warnings. This forewarning could be sufficient to either allow occupants to evacuate the area or prepare themselves and the property for a flood event. It is therefore recommended that the Environment Agency's Floodline Service is contacted to find out if it is possible to register for Floodline Warnings Direct, which is a free service that provides flood warnings direct by telephone, mobile, fax or pager.

Off Site Impact

- 5.18 There is no increased risk associated with this development and there should be no impact on any neighbouring properties. There is potentially a minor increase in displaced flood water generated by this development.

Residual Risk

- 5.19 With the introduction of the controls discussed, the potential for harm to life or damage to property for this site is very low level.

6.0 SURFACE WATER DRAINAGE

Existing Discharge

6.1 The existing site characteristics are summarised as below.

Total Site Area	0.1116 hectares (1,116m ²)
Current Site Condition	Developed ~ 'Brownfield'
Existing Impermeable Area	382m ²
Proposed Impermeable Area	1,000m ²
Existing Surface Water	Discharges to soakaway/public sewer
Discharge Method	As existing.

Proposed Discharge

6.2 The requirement of NPPF is that the surface water run-off from the development proposal replicates the natural drainage characteristics of the pre-developed site. The intention is that surface water disposal will remain as it currently does and continue to either infiltrate within the site (subject to confirmation that infiltration techniques will be acceptable) or have a controlled discharge to the public drainage system. The public sewers adjacent the existing properties are identified to be combined drainage systems. The existing private drainage arrangements will need to be confirmed although it is assumed that foul and surface water combine to discharge to the public combined system. Should infiltration techniques not be acceptable at this location the installation of a controlled discharge and attenuation within the site will represent a major improvement to the control of surface water disposal. There will be no increase in surface water runoff from this site.

CONCLUSIONS AND RECOMMENDATIONS

- 7.0 The conclusions of this Flood Risk Assessment for the proposed demolition of a pair of semi-detached residential dwellings and replacement with six commercial units comprised of storage at ground floor and offices at first floor together with associated parking are as follows. This assessment demonstrates that by introducing the recommendations made in this report the development will be safe, without increasing flood risk elsewhere.
- 7.1 This development has previously been approved by Gravesham Borough Council under planning reference 20230165 and in Condition 2 lists approved drawings and documents for avoidance of doubt. The Flood Risk Assessment prepared by Edge-Enviro Services Limited which this report draws conclusions from and will now provide additional information for the mitigation measures required. Note! The recommendations mentioned in that report and approved under planning reference 2023016 are to be fully Implemented and added to/upgraded as recommended in this report.
- 7.2 The Flood Map identifies that part of the site lies within a Flood Zone 3 (High Risk) but defended by the Thames Tidal defences and therefore any possibility of flooding is considered a residual risk.
- 7.3 The development of commercial premises is classified as 'less vulnerable' use and replaces the existing dwellings which were 'more vulnerable' and represents a significant improvement in the use for this site. An exception test is not required for commercial development in a Flood Zone 3.
- 7.4 The footprint of the building envelope increases from the existing cottages (130m²) to the new commercial units (330m²). There will, therefore, be a reduction of 200m² in the potential storage for displaced water during an extreme event. This is however considered to be insignificant as this is a residual risk that would only happen in the event of a failure in the Thames barrier defences.
- 7.5 Ground levels at the position of the two properties are identified as 3.82mAOD. Levels at the site entrance (Southern Boundary) are 3.81mAOD rising to

3.86mAOD at the northern boundary. The proposed entrance level to the commercial units (finished ground floor level) will be 4.43mAOD which will be 910mm below the extreme level plus 300mm of 5.34mAOD required as a minimum finished floor level. The first-floor level will be set at 7.93mAOD which is 2.89m above the extreme 200 year + climatic change level of 5.04mAOD.

- 7.6 The footprint of the proposed commercial building (330m²) will be greater than the existing properties (130m²). Currently the site has 734m² of impermeable area which increases to a total of 1,000m². The increase in impermeable areas that generate surface water runoff will therefore increase surface water runoff Post-development although this will be controlled by the introduction of a suitable SUD's drainage design.
- 7.7 This development site is NOT located in a functioning floodplain.
- 7.8 The development vulnerability is appropriate to the Flood Zone and does not require a sequential test performing.
- 7.9 The site is identified to be at Low Risk of surface water flooding.
- 7.10 As this development is for new commercial units following the demolition of the existing properties there is scope for raising floor levels higher but unfortunately not above the predicted extreme flood level. The ground floor level of these commercial units will be used for storage and general light industry use. The upper floor is for office use. The entrance doors on the front elevation will be set level with the external ground to permit vehicle and disabled access. The ground will be graded to fall away from these entrance doors. The external ground level adjacent the side and rear elevations will be set a minimum 150mm below the finished ground floor level therefore any flood water will be able to flow around and away from the property, so the risk of internal flooding is reduced.
- 7.11 The Environment Agency letter dated 29th March 2021 states that the design flood level for this development is 5.34mAOD based on the 1 in 200 plus climatic change breach level of 5.04mAOD plus 300mm.

-
- 7.12 The Environment Agency letter dated 14th April 2023 states that they have no objections to the proposals subject to the Finished Floor Level being set no lower than 5.34mAOD and the future Thames Barrier informative being applied.
- 7.13 This is a commercial development. No sleeping arrangements are included at these premises.
- 7.14 The site does not offer areas above the extreme flood level. The occupants will need to be made aware of this and that safe refuge is provided at the first-floor level which is significantly above the predicted extreme level. This would limit the potential need for any specialist rescue by the Emergency Services. The internal route to the high-level refuge area is to be kept clear at all times and identified as escape routes. All habitants are to be made aware of these requirements.
- 7.15 The risks have been considered for the flooding hazards associated with site, with the following mitigation measures required.
- 7.16 A copy of this report should be included with the 'New Homeowners Handbook' and any potential future purchaser made aware of the mitigation measures included on the site and the long-term maintenance requirement.
- 7.17 The owners of the new properties are to be encouraged to register for 'Floodline' Warnings Direct. The Flood Risk Assessment prepared by Edge-Enviro Services Limited outlines Flood Warnings (evacuation and flood alert procedure) which is to be adhered to.
- 7.18 This report should be issued to the Environment Agency via the planning process and confirmation obtained that the mitigation measures including all finished floor levels are acceptable to minimise the risk to life and damage to the development and that drainage conditions are not worsened elsewhere because of this development.
- 7.19 The risks have been considered for the flooding hazards associated with site, with the following mitigation measures required in accordance with CLG2007.
-

-
- (a) The ground floor level of the commercial units is to be set no lower than **4.43m AOD**. It is intended that all entrances to the property will have good quality doors and suitable door guards/flood barriers installed across all openings on the ground floor level that will provide protection to 5.34mAOD in a flood event. Door guards/flood barrier examples are included in Appendix E.
 - (b) *Floors* – The ground floor will be of solid construction and bonded to the ground floor slab, which will provide an effective seal against water rising through the floor. Solid concrete floors generally suffer less damage than suspended floors and are less expensive and faster to restore following exposure to floodwater. Refer to Architects details in Appendix A.
 - (c) *Walls* – Will be constructed in 200mm thick concrete blockwork up to 5.34mAOD. The use of stud walls and plasterboard on the ground floor of the development should be avoided wherever possible as these absorb water and generally need to be removed and rebuilt after a flood event. Refer to Architects details in Appendix A.
 - (d) All external doors are to be of good quality and fitted with suitable seals to limit ingress of water should an extreme flood event occur.
 - (e) There will be no openings such as air bricks below the predicted extreme level to avoid ingress of water should an extreme event occur.
 - (f) *Services* - Boilers should be mounted on a wall above the level that floodwater is likely to reach i.e.5.44mAOD. Electricity sockets should be located at least one metre above floor (or well above likely flood level) with distribution cables dropping from an upper level. Service meters should also be at least one metre above floor level (or well above likely flood level) and placed in plastic housing.
 - (g) All flood prevention mitigation measures are to be regularly inspected and maintained.

Further guidance on flood resilient construction can also be found in the following links:

Government guidance on flood resilient construction

<https://www.gov.uk/government/publications/flood-resilient-construction-of-new-buildings>

CIRIA Code of Practice for property flood resilience

[https://www.ciria.org/Research/Projects_underway2/Code of Practice and guidance for property flood resilience .aspx](https://www.ciria.org/Research/Projects_underway2/Code_of_Practice_and_guidance_for_property_flood_resilience.aspx)

British Standard 85500 – Flood resistant and resilient construction

<https://shop.bsigroup.com/ProductDetail/?pid=000000000030299686>

Tridax Limited considers that with the inclusion of the above, the site is sustainable in terms of flood risk and that the proposals do not increase the risk to the neighbouring properties.

APPENDIX A

Drawings

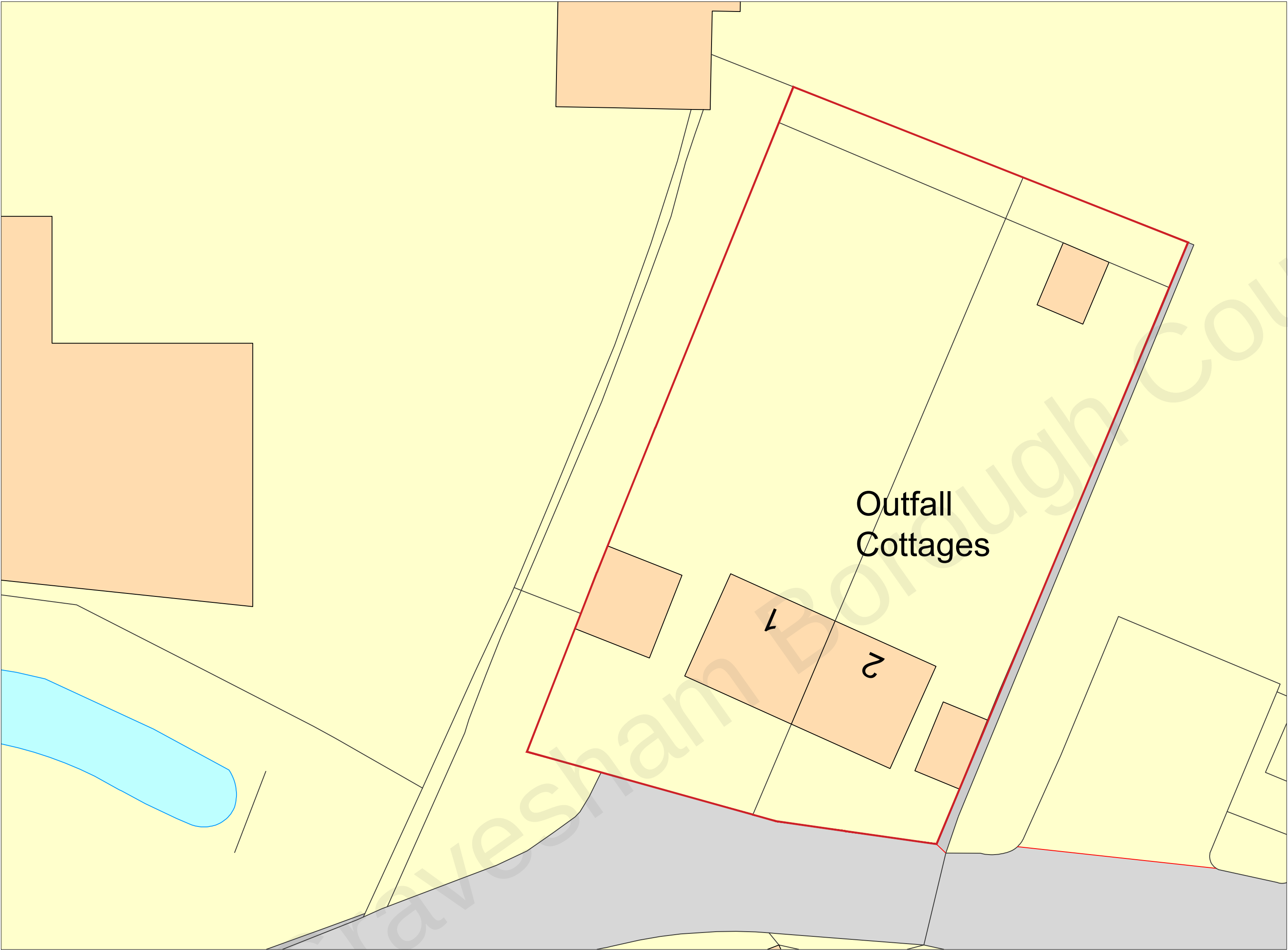
230201-001 – Existing Site Block Plan

230201-002 – Proposed Site Block Plan

230201-004 – Proposed Floor Plans

230201-005 – Proposed Elevations

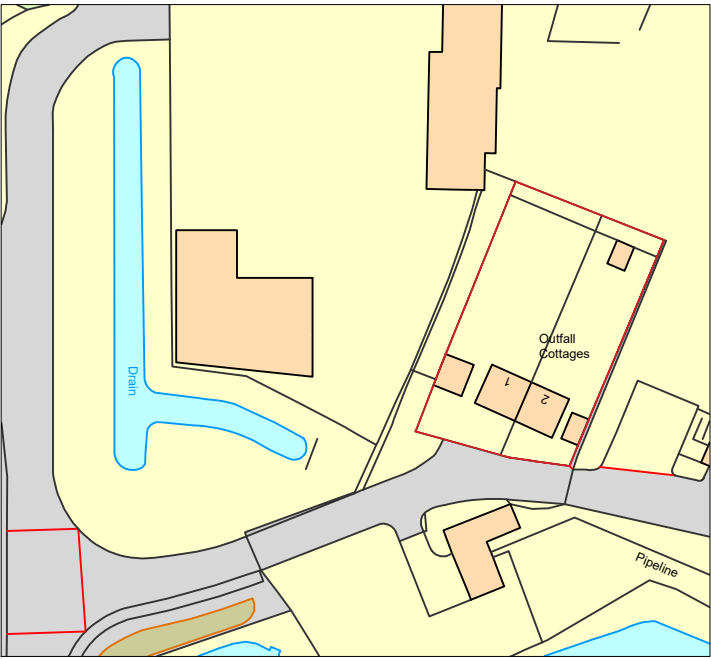
05/34/2025 -. Section Construction Detail



Existing Block Plan

Notes:

- Do not scale from this drawing.
- All dimensions to be verified on site and is in mm.
- Builder to verify all dimensions, heights and levels prior to commencement of work.
- All documents shall be checked to ensure that they are compatible by the contractor before construction commences. In the event of apparent ambiguity or contradiction the engineer and/ or architect shall be notified immediately.
- The contractor in preparing his estimate shall visit the site and acquaint himself with the problems involved.
- The contractor shall issue all statutory notices to the local Authority during progress and completion of works.



Location Plan



A	-	-	-/-/-
REV:	DESCRIPTION:	BY:	DATE:

STATUS: PLANNING

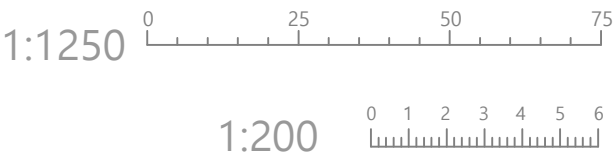
**BARRON
EDWARDS
STERLING**

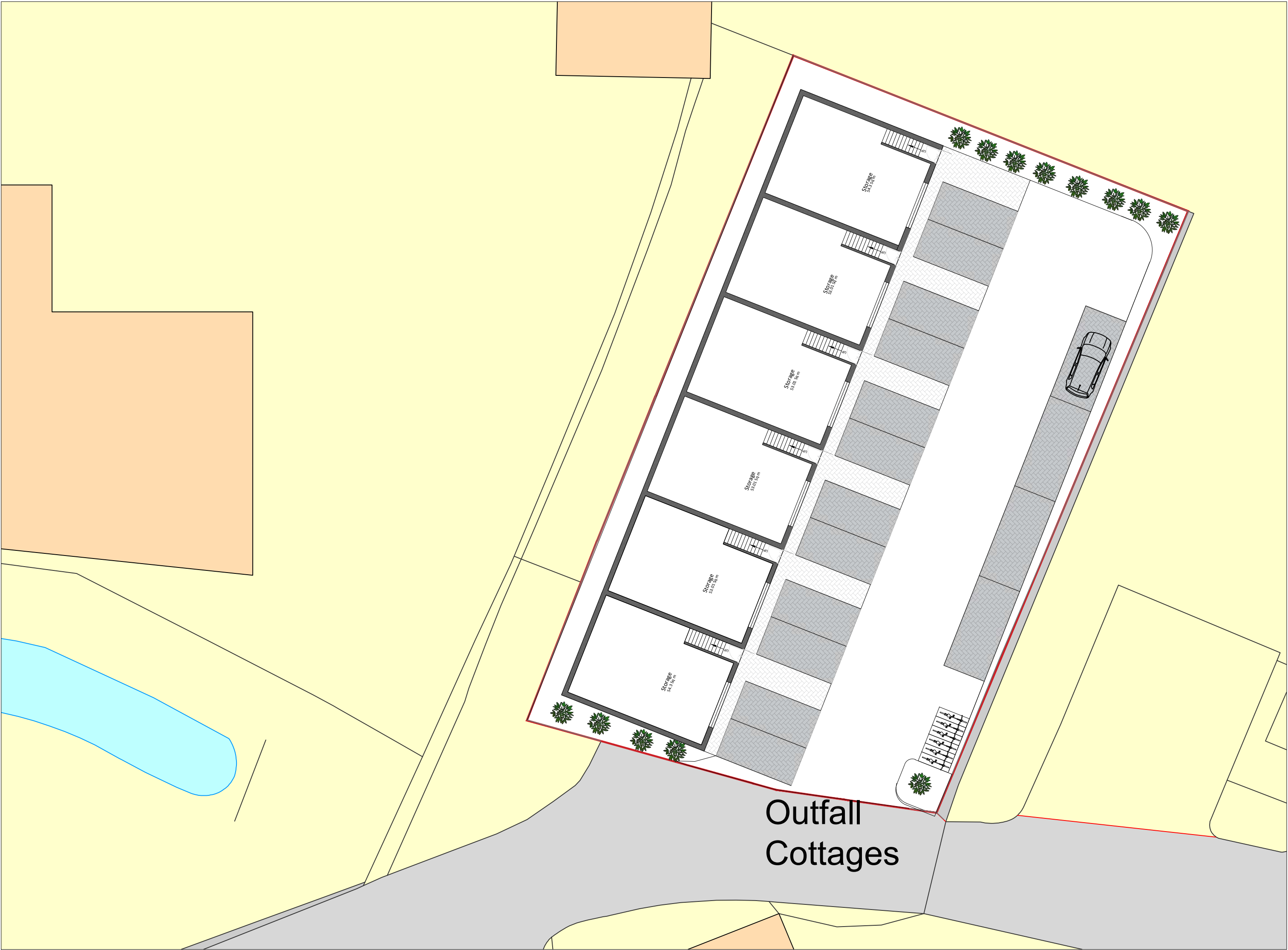
Whitehall Place
47 The Terrace,
Gravesend, Kent
DA12 2DL
01474 247 787
info@barronedwards.co.uk
www.barronedwards.co.uk

SITE:	Outfall Cottages Derring Way Gravesend DA12 2QH
-------	--

TITLE:	Existing Block Plan Location Plan ---
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SCALE AT A2: 1:100	DATE: 21/02/2023	DRAWN: HH
PROJECT NO: 230201	DRAWING NO: 001	REVISION: A





Proposed Block Plan

Notes:

- Do not scale from this drawing.
- All dimensions to be verified on site and is in mm.
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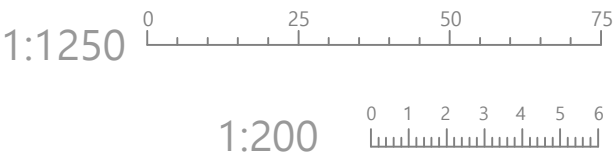
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REV:	DESCRIPTION:	BY:	DATE:

STATUS: PLANNING

Whitehall Place
47 The Terrace,
Gravesend, Kent
DA12 2DL
01474 247 787
info@barronedwards.co.uk
www.barronedwards.co.uk

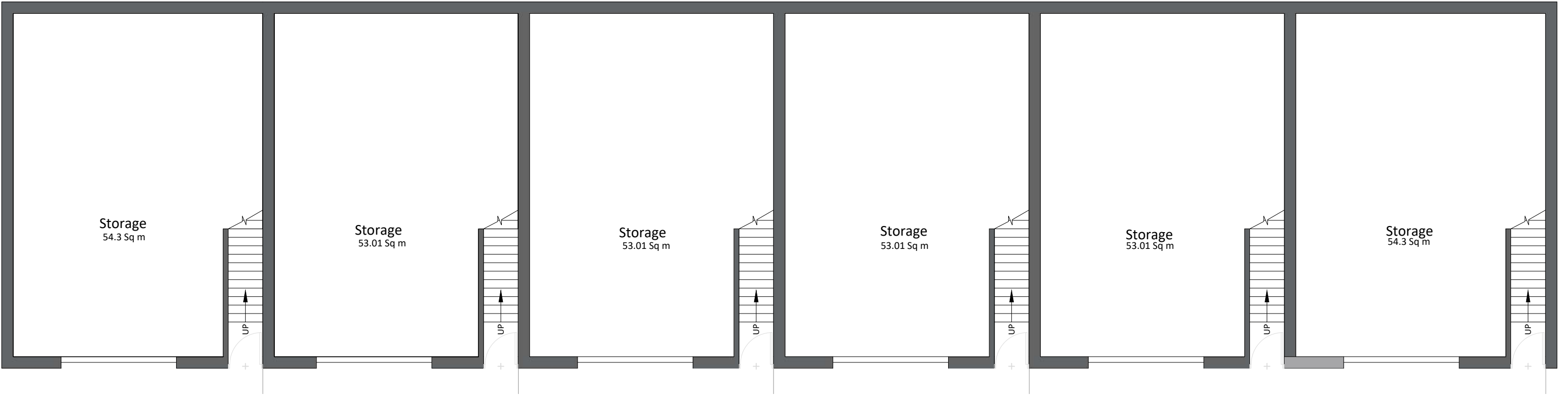
SITE:	Outfall Cottages Derring Way Gravesend DA12 2QH
TITLE:	Proposed Block Plan

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1:100	15/05/23	HH
PROJECT NO:	DRAWING NO:	REVISION:
230201	002	B

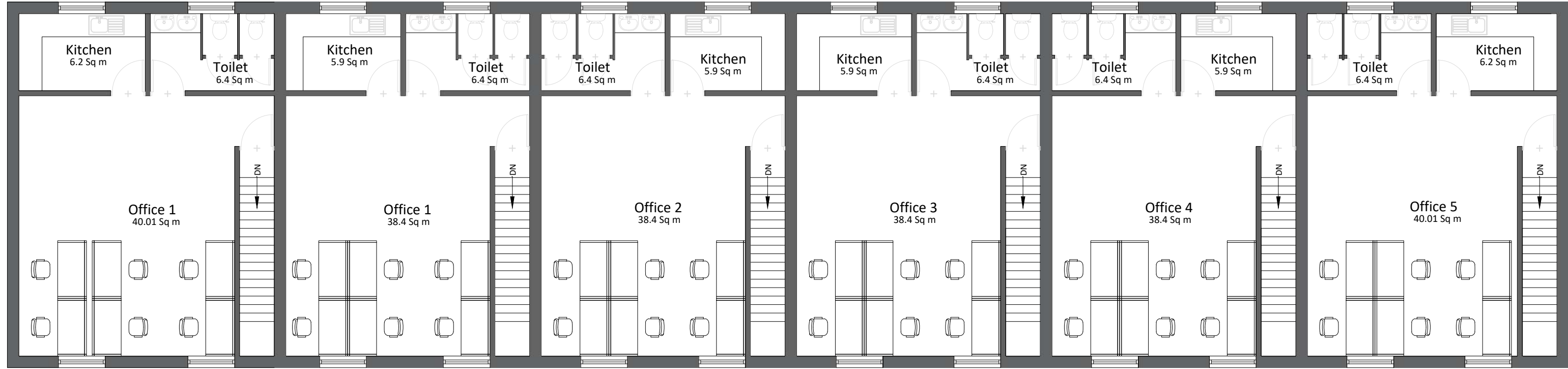


Notes:

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Ground Floor Plan



Mezzanine Floor Plan

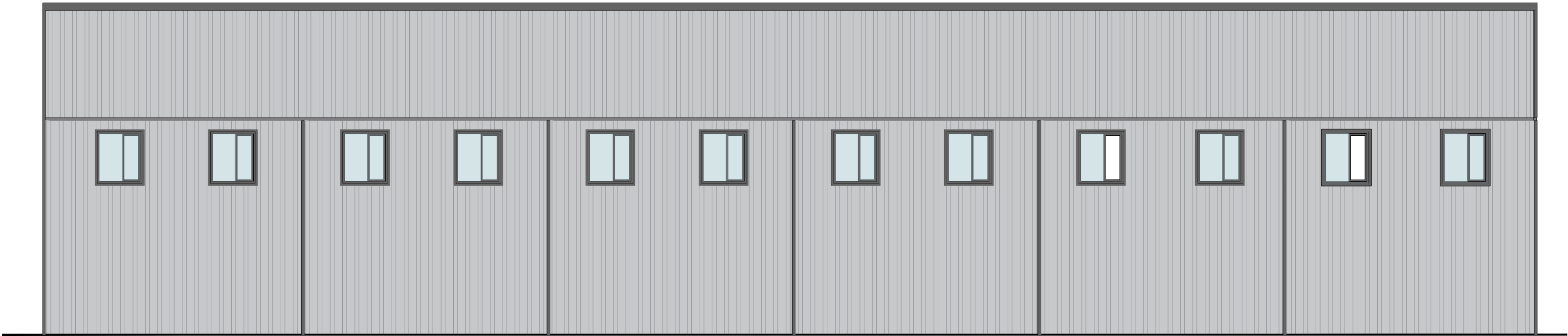
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STATUS: PLANNING

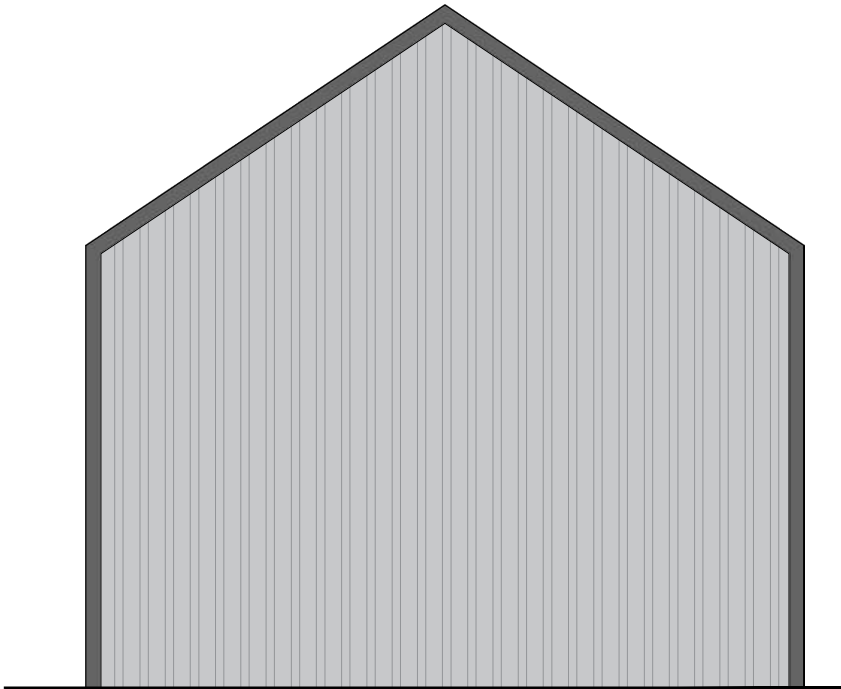
Whitehall Place
47 The Terrace,
Gravesend, Kent
DA12 2DL
01474 247 787
info@barronedwards.co.uk
www.barronedwards.co.uk

SITE:		Outfall Cottages Derring Way Gravesend DA12 2QH	
TITLE:		Proposed Floor Plans --- ---	

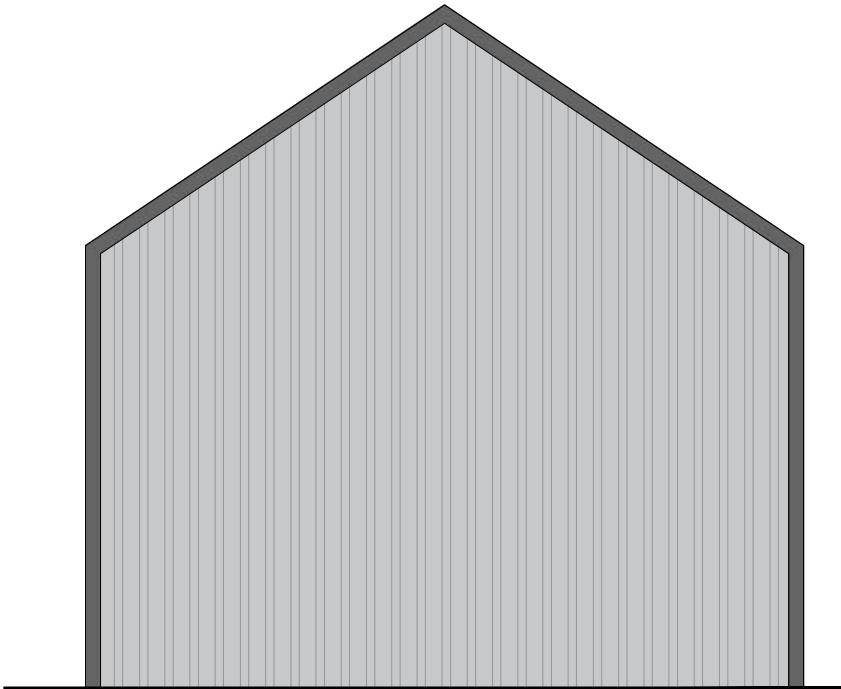
SCALE AT A2:	DATE:	DRAWN:
1:100	15/05/23	HH
PROJECT NO:	DRAWING NO:	REVISION:
230201	004	B



Rear Elevation



Side Elevation



Side Elevation

Notes:

- Do not scale from this drawing.
- All dimensions to be verified on site and is in mm.
- Builder to verify all dimensions, heights and levels prior to commencement of work.
- All documents shall be checked to ensure that they are compatible by the contractor before construction commences. In the event of apparent ambiguity or contradiction the engineer and/ or architect shall be notified immediately.
- The contractor in preparing his estimate shall visit the site and acquaint himself with the problems involved .
- The contractor shall issue all statutory notices to the local Authority during progress and completion of works.

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REV:	DESCRIPTION:	BY:	DATE:

STATUS:

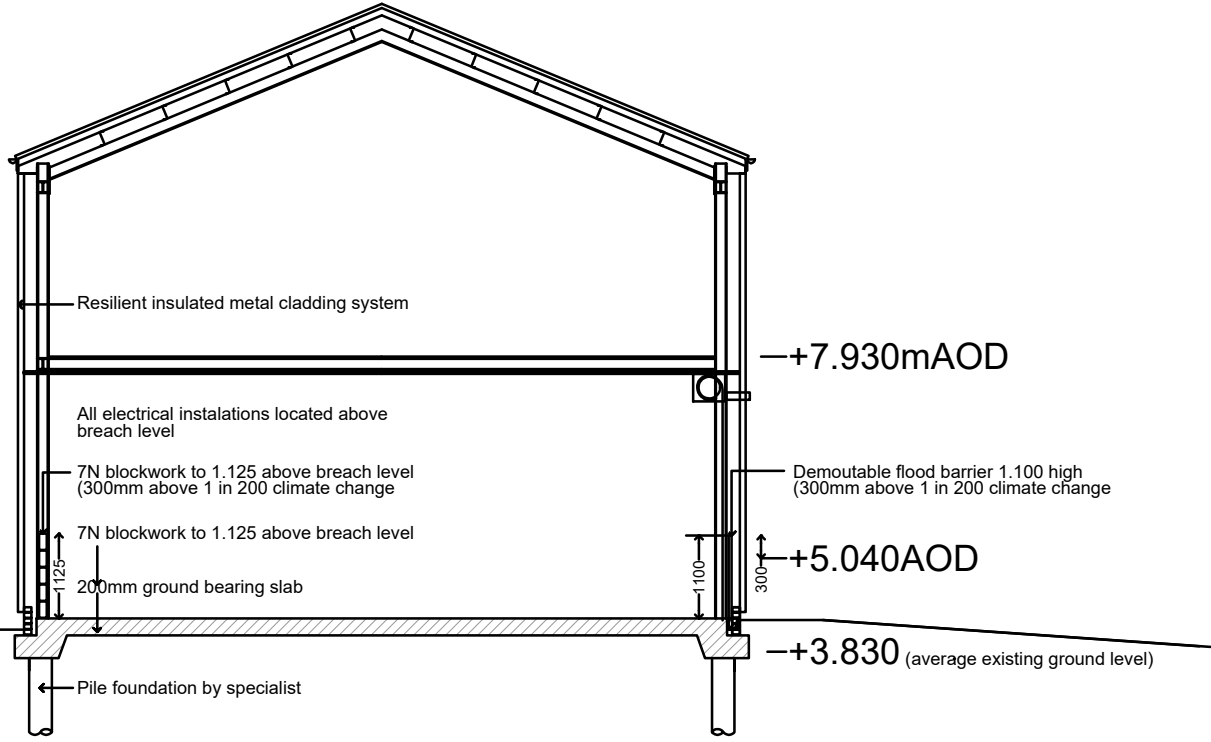
PLANNING

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01474 247 787
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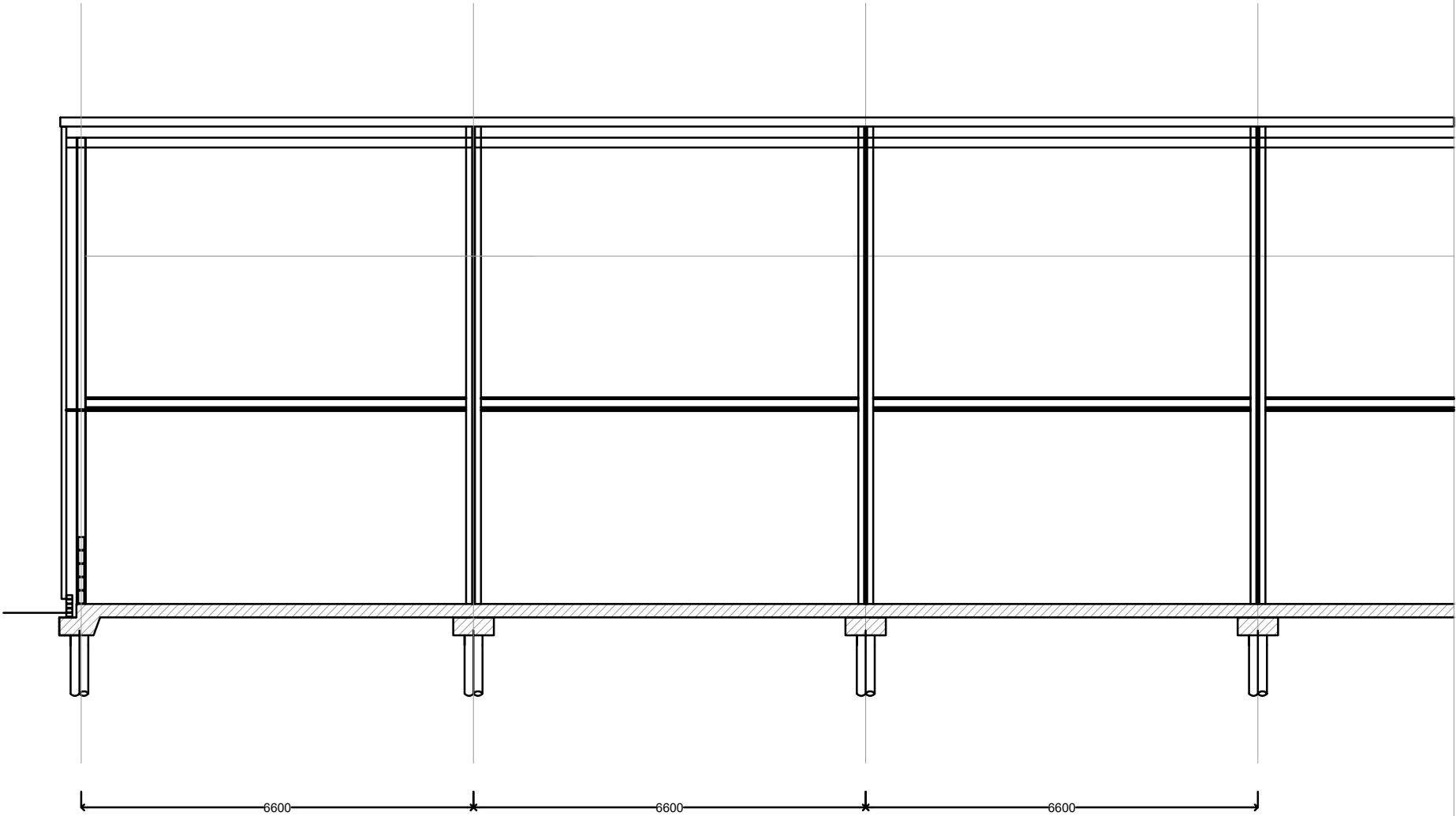
SITE:	Outfall Cottages Derring Way Gravesend DA12 2QH
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TITLE:	Proposed Elevation --- ---
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SCALE AT A2: 1:100	DATE: 15/05/23	DRAWN: HH
PROJECT NO: 230201	DRAWING NO: 005	REVISION: B



SECTION AA



SECTION BB

SECTIONS
1/100. A3



01304 619333 0788 7503636
theone@theonearchitect.com
The Old School, Tilmanstone, Kent. CT14 0JL



PROJECT	Proposed Development Site of Outfall Cottages Dering Way, Gravesend, Kent
TITLE	SECTIONS
CLIENT	
SCALE	
DATE	DECEMBER, 2025
DRAWING	05/34/2025
REVISION	A.

APPENDIX B

Environment Agency Details

Flood Map

Flood Diagram

Correspondence – 29th March 2021

Correspondence – 14th April 2023

Flood map for planning

Your reference	Location (easting/northing)	Created
Unspecified	566590/173924	18 December 2025 15:42

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

This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see <https://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.

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

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2025 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference

Unspecified

Location (easting/northing)

566590/173924

Scale

1:2,500

Created

18 Dec 2025 15:42

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

0 20 40 60m

If you live in an area that is at risk of flooding, there are things you can do to reduce the damage that a flood can do to your home. The illustration below shows some examples.

Electrical sockets

Raising electrical sockets, fuse boxes and associated wiring to at least 1.5 metres above ground floor level will limit the risk of them being damaged by water during a flood. You may be able to use them again once the water has receded and the electricity supply is restored. If rewiring, bring cables down the wall from the top to the raised socket so that cabling doesn't get affected. Controls and ventilation systems should also be well above floor level.

TV and hi-fi

Mount your TV or hi-fi and speakers on the wall.

Walls

Use lime-based plaster instead of gypsum on walls.

Flood sacks

These are a lighter, modern version of sandbags. The sacks need to be soaked in water so they expand, then placed around the entrances to your home to protect against flood water. If they have not been in contact with contaminated water, they can be left to dry and shrink and can be reused. They take up little storage and can be cost-effective.

Doors and windows

Install synthetic or waxed window frames and doors.

Kitchen units and appliances

Fit stainless steel, plastic or solid wood kitchen units rather than chipboard. White goods such as fridges should be raised on plinths.

Flooring

Lay ceramic tiles or rugs on your ground floor rather than carpets. Rugs can easily be removed and placed out of reach. Non-carpeted floors can be easier to clean once the water has subsided and are cheaper to replace.

Shelving

Place irreplaceable items, such as family photos or treasured possessions, on high mounted shelves.

Air brick covers

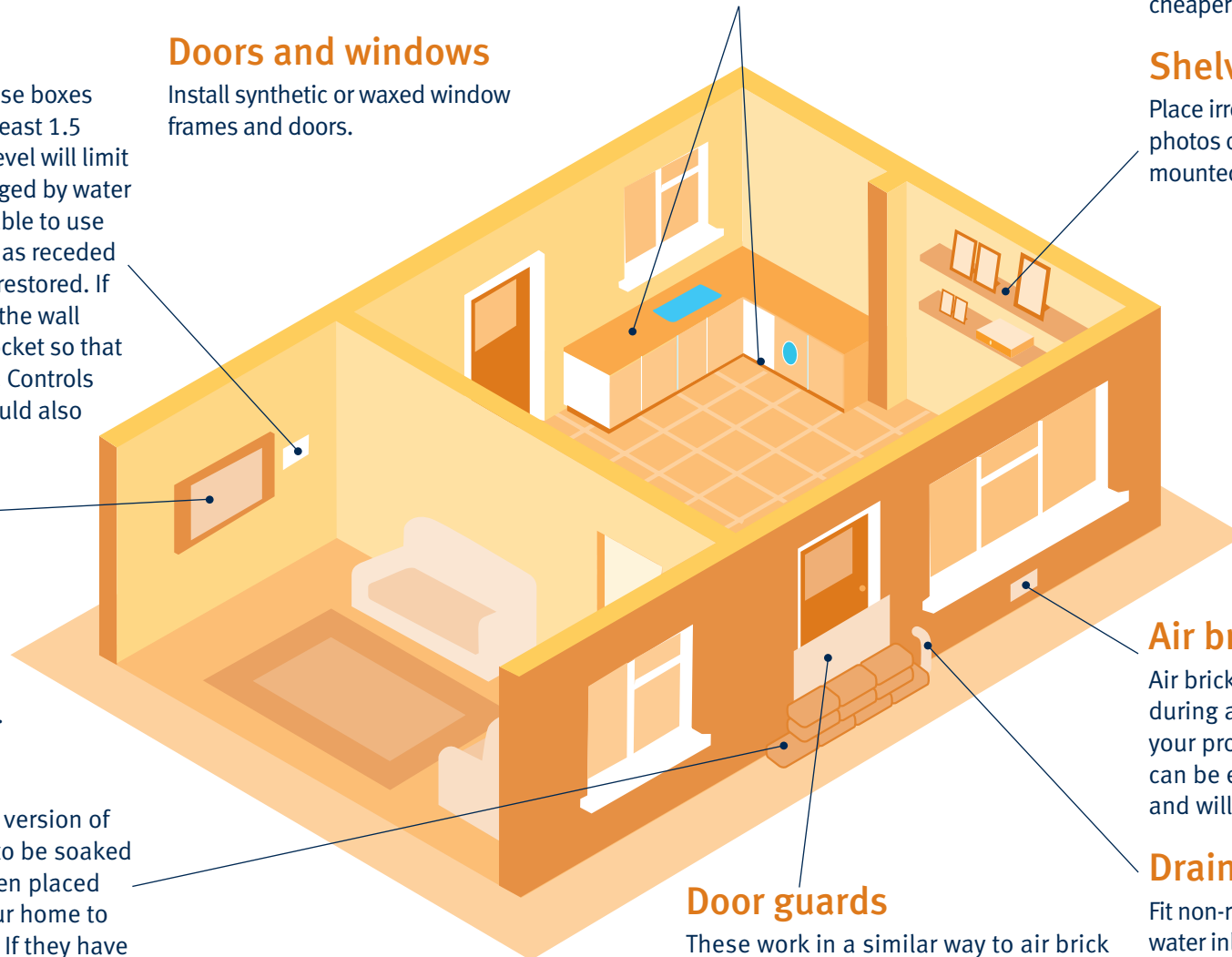
Air bricks are used for ventilation, but during a flood, they can let water into your property. The covers are airtight, can be easily attached to the air bricks and will prevent water entering.

Drains and pipes

Fit non-return valves to all drains and water inlet pipes.

Door guards

These work in a similar way to air brick covers but on a larger scale. They can be placed across the bottom of your external doors to hold back low levels of water.



Gravesham Borough Council
Development Control
Civic Centre Windmill Street
Gravesend
Kent
DA12 1AU

Our ref: KT/2020/126843/04-L01
Your ref: 20200184
Date: 29 March 2021

Dear Sir/Madam

Demolition Of The Two Existing Dwellinghouses And Use Of Site As Civil Engineering Business And Training Facilities (Class B2 General Industrial Use) Incorporating Four Office And Welfare Buildings, Associated Parking And Waste And Recycle Collection Area

Outfall Cottages, Dering Way, Gravesend, Kent

Thank you for consulting us on the above application.

Flood Risk

In the absence of an acceptable Flood Risk Assessment (FRA) we object to the grant of planning permission and recommend refusal on this basis for the following reasons.

Reason

The FRA submitted with this application does not comply with the requirements set out in paragraph 9 the Technical Guide to the National Planning Policy Framework.

The submitted FRA does not therefore, provide a suitable basis for assessment to be made of the flood risks arising from the proposed development. In particular, the submitted FRA fails to:

- consider the effect of a range of flooding events including extreme events on people and property.

The site is situated within flood zone 3, which is considered to be 'High Risk' but the site is currently defended by the Thames Tidal defences and therefore any possibility of flooding is considered a residual risk.

The FRA states that the breach level is 4.72m Above Ordnance Datum (AOD) and for that reason, the finished floor levels should be set at 5.04mAOD. This is not the correct level to use as this level, 4.72 m AOD, is referring to the 1 in 1000 breach level. The breach level that should be used is the 1 in 200 plus climate change level which is 5.04m AOD. Right now, the proposed finished floor level sits at 5.04mAOD. We advise the applicant to reconsider the finished floor level and raise it to 300mm above the 1 in 200 plus climate change breach level (5.04mAOD) which will be

Environment Agency

Orchard House Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH

Customer services line: 03708 506 506

Email: enquiries@environment-agency.gov.uk

www.gov.uk/environment-agency



INVESTOR IN PEOPLE



5.34m AOD.

We are pleased to see the details for the evacuation plan including to sign up to flood warnings. Please revisit your evacuation plan to take into account the correct breach level to be used (5.04 m AOD). Please note that any evacuation plan should provide suitable access and egress from the site and would need to be approved by the Local Planning Authority's (LPA's) Emergency Planning Department (EPD).

Overcoming our objection

You can overcome our objection by submitting an FRA which covers the deficiencies highlighted above and demonstrates that the development will not increase risk elsewhere and where possible reduces flood risk overall. If this cannot be achieved we are likely to maintain our objection to the application. Production of an FRA will not in itself result in the removal of an objection. We ask to be re-consulted with the results of the FRA. We will provide you with bespoke comments within 21 days of receiving formal reconsultation. Our objection will be maintained until an adequate FRA has been submitted.

Informative

We strongly recommend the use of flood proofing and resilience measures. Physical barriers, raised electrical fittings and special construction materials are just some of the ways you can help reduce flood damage.

To find out which measures will be effective for this development, the applicant must contact the building control department/equivalent department. In the meantime, if the applicant would like to find out more about reducing flood damage, visit the flood risk and coastal change pages of the planning practice guidance. The following documents may also be useful:

- Preparing for floods
<http://www.planningportal.gov.uk/uploads/odpm/4000000009282.pdf>
- Improving the flood performance of new buildings:
<http://www.communities.gov.uk/publications/planningandbuilding/improvingflood>

We do not normally comment on or approve the adequacy of flood emergency response procedures accompanying development proposals, as we do not carry out these roles during a flood. Our involvement with this development during an emergency will be limited to delivering flood warnings to occupants/users covered by our flood warning network.

The planning practice guidance to the National Planning Policy Framework states that, in determining whether a development is safe, the ability of residents and users to safely access and exit a building during a design flood and to evacuate before an extreme flood needs to be considered. One of the key considerations to ensure that any new development is safe is whether adequate flood warnings would be available to people using the development.

In all circumstances where warning and emergency response is fundamental to managing flood risk, we advise local planning authorities to formally consider the emergency planning and rescue implications of new development in making their decisions. As such, we recommend you consult with your emergency planners and the emergency services to determine whether the proposals are safe in accordance with the guiding principles of the Planning Practice Guidance (PPG).

We recommend for the occupants to sign up to the Environment Agency's Floodline Service. This can be done by calling 0345 988 1188.

Please do not hesitate to contact us should you require any further information.

Yours faithfully

Ms Laura Edwards

Planning Advisor

Direct dial 02084749079

Direct email KSLPLANNING@environment-agency.gov.uk

Gravesham Borough Council
Development Control
Civic Centre Windmill Street
Gravesend
Kent
DA12 1AU

Our ref: KT/2023/130603/01-L01
Your ref: 20230165
Date: 14 April 2023

Dear Katherine

Demolition Of The Two Existing Dwellinghouses And Use Of Site As Light Industrial Units (Class B1(C)) Incorporating 6 Offices And Storage With Associated Parking

2 Outfall Cottages, Dering Way, Gravesend, DA12 2QH

Thank you for consulting us on the above application. **We do not have any objections subject to the following planning condition and informative being applied to any planning permission granted.**

Flood Risk

The proposed development will only meet the National Planning Policy Framework's requirements (policy 167) if the following planning condition is included.

Condition

The development shall be carried out in accordance with the submitted flood risk assessment ("Flood Risk Assessment (FRA) Outfall Cottages", by Edge-Enviro Services Ltd) and the following mitigation measures it details:

- Finished floor levels shall be set no lower than 5.34 m above Ordnance Datum (AOD).

These mitigation measures shall be fully implemented prior to occupation and subsequently in accordance with the scheme's timing/phasing arrangements. The measures detailed above shall be retained and maintained thereafter throughout the lifetime of the development.

Reason

To reduce the risk of flooding to the proposed development and future occupants.

Future Thames Barrier Informative

The Thames Estuary 2100 Plan (the Plan) sets out how we and our partners can work together to manage tidal flood risk in the Thames Estuary, from now and into the next century. It is an adaptive plan, ensuring current standards of flood protection provided by the existing tidal defence system are maintained or improved taking into account the effects of climate change e.g. sea level rise. We expect the existing Thames Barrier to continue to protect London from tidal flooding up until 2070, but over the longer term the Plan, published in 2012, sets out the strategic direction and several options for managing tidal flood risk in the Thames Estuary.

Beyond 2070, the long term options to manage tidal flood risk include upgrading the existing Thames barrier at Woolwich, two potential locations for a replacement barrier (Gravesend Reach or Long Reach) or flood storage.

Currently, all options continue to be investigated and assessed given that the decision on a preferred option is not planned until about 2040 when such a decision will be informed by the data and information available at the time.

Although this is an inland site away from the River Thames, this ongoing work is something the developer should be aware of as their site may be impacted in the future, during the construction period, should the barrier be located in Gravesend Reach. We are not objecting to this application from a TE2100 perspective but instead providing this advice based on the proposal changing the site use from residential to commercial and the site being small at just over one hectares. We will contact the developer and landowners in the future should the Gravesend Reach area be taken forward as the preferred option. We would encourage the developer to regularly check www.gov.uk for further and up to date information.

Please do not hesitate to contact us should you require any further information.

Yours sincerely

Ms Laura Edwards

Planning Advisor

Direct dial 02084749079

Direct email KSLPLANNING@environment-agency.gov.uk

APPENDIX C

Southern Water Details

Correspondence dated 27th April 2023
Sewer Records



Head of Planning & Regeneration Services
Gravesham Borough Council
Civic Centre
Windmill Street
Gravesend
Kent
DA12 1AU

Your ref
20230165

Our ref
DSA000022794

Date
27/04/2023

Contact
Tel 0330 303 0119

Dear Sir/Madam,

Proposal: Demolition of the two existing dwellinghouses and use of site as Light Industrial units (Class E) incorporating 6 offices and storage with associated parking.

Site: 20230165: - Outfall Cottages, Dering Way, Gravesend, Kent.

Thank you for your letter dated 21/04/2023.

In determining the application, we ask that the Planning Authority take into account the provisions of Paragraphs 180, 182 and 183 of the National Planning Policy Framework (NPPF) regarding the proposed location of development in relation to existing uses that may be a source of pollution (in terms of odour). We apply a precautionary buffer zone for any development located within 500 metres of the boundary of a WWTW. The proposed development is located adjacent to the Gravesend Wastewater Treatment Works, and as such we have applied this requirement to our planning consultation response. Please contact Southern Water to discuss and agree the Scope of the odour assessment.

Due to the potential odour nuisance from a Wastewater Treatment Works, no sensitive development should be located within the 1.5 OdU odour contour of the WWTW. An Odour Assessment will need to be carried out by a specialist consultant employed by the developer to a specification that will need to be agreed in advance with Southern Water to identify and agree the 1.5 OdU contour. The service we provide to review the assessment and/or complete a site survey is chargeable, more information regarding our fees can be found on our website; Connection charging arrangements (southernwater.co.uk).

Southern Water requires a formal application for a connection to the public sewer to be made by the applicant or developer.

To make an application visit Southern Water's Get Connected service: developerservices.southernwater.co.uk and please read our New Connections Charging Arrangements documents which are available on our website via the following link: southernwater.co.uk/developing-building/connection-charging-arrangements

Southern Water, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX
southernwater.co.uk

Southern Water Services Ltd, Registered Office: Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX Registered in England No. 2366670



In situations where surface water is being considered for discharge to our network, we require the below hierarchy for surface water to be followed which is reflected in part H3 of the Building Regulations. Whilst reuse does not strictly form part of this hierarchy, Southern Water would encourage the consideration of reuse for new developments.

- Reuse
- Infiltration
- Watercourse
- Storm sewer
- Combined Sewer

Guidance on Building Regulations is here:

gov.uk/government/publications/drainage-and-waste-disposal-approved-document-h

Please note: There is 300 mm decommissioned public combined rising main crossing in the site.

It is possible that a sewer now deemed to be public could be crossing the development site. Therefore, should any sewer be found during construction works, an investigation of the sewer will be required to ascertain its ownership before any further works commence on site.

For further advice, please contact Southern Water, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX (Tel: 0330 303 0119).

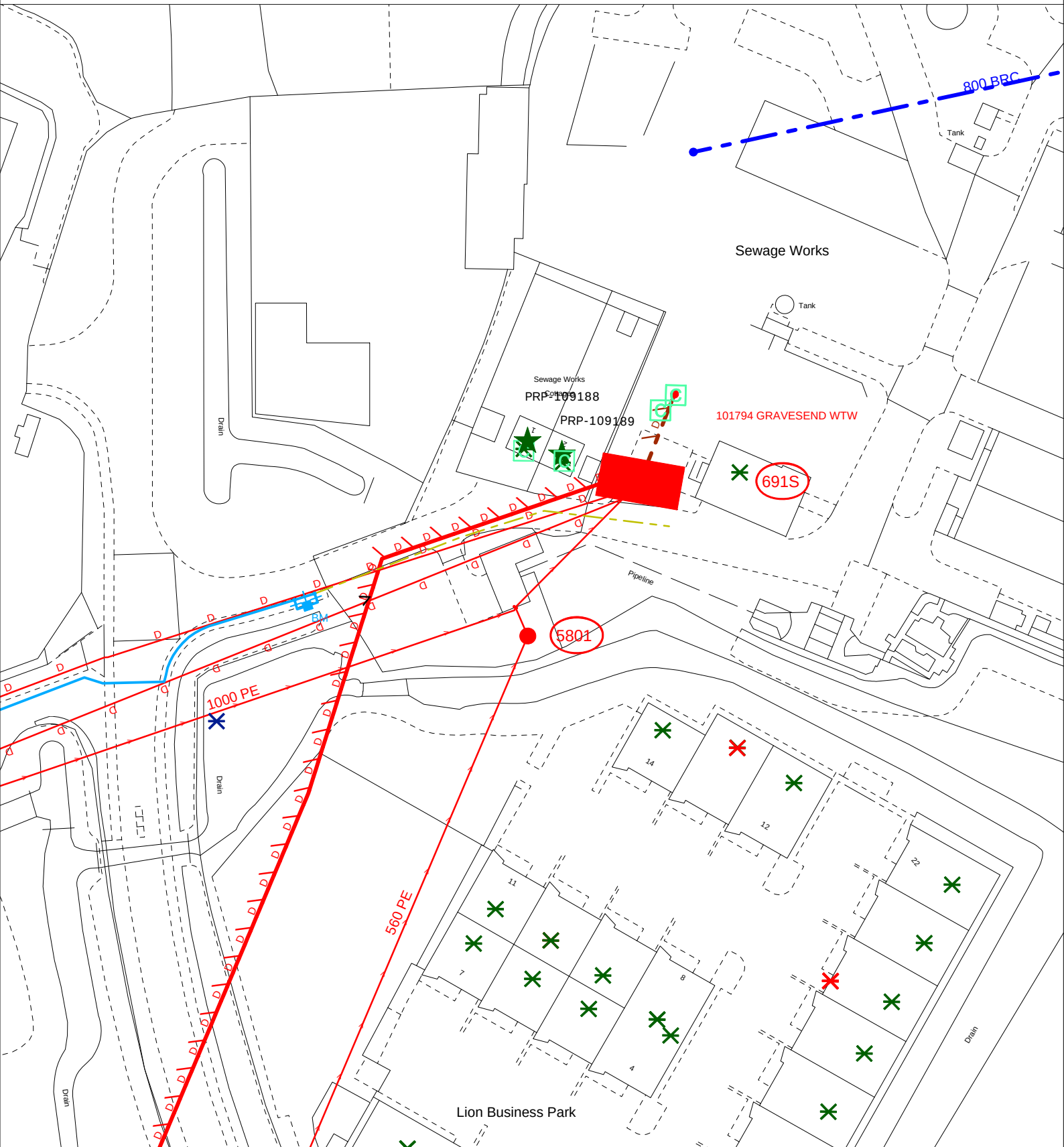
Website: southernwater.co.uk or by email at: SouthernWaterPlanning@southernwater.co.uk

Yours faithfully,

Future Growth Planning Team
Developer Services

southernwater.co.uk/developing-building/planning-your-development

SOUTHERN WATER



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.

Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. WU 298530

O.S. REF: TQ6673NE

Scale: 1:1000

Screen Print

WARNING: BAC pipes are constructed of Bonded Asbestos Cement

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



Printed By: vsveena

Date: 26-4-2023

Southern Water MapGuide Browser

Requested By:



APPENDIX D

Planning Approval



Application: 20230165

**TOWN AND COUNTRY PLANNING ACT 1990
THE TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE)
(ENGLAND) ORDER 2015 (AS AMENDED)**

NOTIFICATION OF GRANT OF PERMISSION TO DEVELOP LAND
--

To: **Mr Richard Lawson
C/O Ms Hanan Hassan, Barron Edwards Ltd
Barron Edwards, Whitehall Place
47 The Terrace
Gravesend
DA12 2DL**

TAKE NOTICE that the **GRAVESHAM BOROUGH COUNCIL**, the Local Planning Authority under the Town and Country Planning Acts, has **GRANTED PERMISSION** for development of land situate at:

**Outfall Cottages
Dering Way
Gravesend
Kent**

and being **Demolition of the two existing dwellinghouses and use of site as Light Industrial units (Class E) incorporating 6 offices and storage with associated parking**. Your application dated 27th March 2023 is permitted subject to the following:-

1. The development hereby permitted shall be begun not later than 3 years following the date of this permission.

Reason: In pursuance of Section 91 of the Town and Country Planning Act 1990, as amended by Section 51 of the Planning and Compulsory Purchase Act 2004.

2. The development hereby permitted shall be carried out in accordance with the following approved plans and particulars:

Application form;
Flood Risk Assessment by Edge-Enviro Services Ltd;
Drawing no. 001 Rev. A (Existing Block Plan, Location Plan);
Drawing no. 002 Rev. B (Proposed Block Plan);
Drawing no. 003 Rev. A (Existing Floor Plans and Elevations);
Drawing no. 004 Rev. B (Proposed Floor Plans); and
Drawing no. 005 Rev. B (Proposed Elevation).

Reason: For the avoidance of doubt and in the interests of proper planning.

3. **No development shall take place until a contaminated land assessment** (in accordance with the CLEA guidelines and CLR 11 methodology) and if necessary, an associated

remedial strategy, together with a timetable of works, has been undertaken and submitted to the Local Planning Authority for approval in writing.

- a) The contaminated land assessment shall include a desk study to be submitted to the Local Planning Authority for approval. The desk study shall detail the history of the site uses and propose a site investigation strategy based on the relevant information discovered by the desk study. The strategy shall be approved by the Local Planning Authority prior to investigations commencing on site.
- b) The site investigation, including relevant soil, soil gas, surface and groundwater sampling, shall be carried out by a suitably qualified and accredited consultant/contractor in accordance with a Quality Assured sampling and analysis methodology.
- c) A site investigation report detailing all investigative works and sampling on site, together with the results of analysis, risk assessment to any receptors and a proposed remediation strategy shall be submitted to the Local Planning Authority. The Local Planning Authority shall approve such remedial works as required prior to any remediation commencing on site. The works shall be of such a nature so as to render harmless the identified contamination given the proposed end-use of the site and surrounding environment including any controlled waters.
- d) Approved remediation works shall be carried out in full on site under a quality assurance scheme to demonstrate compliance with the proposed methodology and best practice guidance). If during any works contamination is encountered which has not previously been identified, then the additional contamination shall be fully assessed, and an appropriate remediation scheme agreed with the Local Planning Authority.
- e) Upon completion of the works, this condition shall not be discharged until a closure report has been submitted to and approved by the Local Planning Authority. The closure report shall include details of the proposed remediation works and the quality assurance certificates to show that the works have been carried out in full in accordance with the approved methodology. Details of any post remediation sampling and analysis to show the site has reached the required clean-up criteria shall be included in the closure report together with the necessary documentation detailing what waste materials have been removed from the site.
- f) Where applicable, a monitoring and maintenance scheme to include monitoring the long-term effectiveness of the proposed remediation over an agreed period of time, and the provision of reports on the same, must be prepared and approved in writing by the local planning authority.

Following completion of the measures identified in that scheme, and when the remediation objectives have been achieved, reports that demonstrate the effectiveness of the monitoring and maintenance carried out must be produced and submitted to the Local Planning Authority.

Reason: To ensure that, sufficiently early in the construction design process before any impacts are irreversible or unmanageable, any risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other off-site receptors, having regard to Policy CS19 of the Gravesham Local Plan Core Strategy 2014.

- 4. If, during development, contamination not previously identified is found to be present at the site then no further development (unless otherwise agreed in writing with the Local Planning Authority) shall be carried out until a remediation strategy detailing how this contamination will be dealt with has been submitted to and approved in writing by the Local Planning Authority. The remediation strategy shall be implemented as approved.

Reason: To prevent harm to human health and pollution of the environment in accordance with Policy CS19 of the Gravesham Local Plan Local Plan Core Strategy 2014.

5. The development shall be carried out in accordance with the submitted flood risk assessment ("Flood Risk Assessment (FRA) Outfall Cottages", by Edge-Enviro Services Ltd) and the following mitigation measures it details:

- Finished floor levels shall be set no lower than 5.34 m above Ordnance Datum (AOD).

These mitigation measures shall be fully implemented prior to occupation and subsequently in accordance with the scheme's timing/phasing arrangements. The measures detailed above shall be retained and maintained thereafter throughout the lifetime of the development.

Reason: To reduce the risk of flooding to the proposed development and future occupants in accordance with Policy CS18 of the Gravesham Local Plan Core Strategy 2014.

6. Notwithstanding the details included on the application form and approved plans, no development shall take place above ground level until details of the external materials to be used in the construction of the external surfaces of the development hereby permitted have been submitted to and approved in writing by the Local Planning Authority.

Reason: To ensure a satisfactory visual appearance in accordance with Policy CS19 of the Gravesham Local Plan Core Strategy 2014.

7. Prior to any above ground works taking place, and notwithstanding the details shown on the approved plans, a scheme of hard landscaping shall be submitted to and approved in writing by the Local Planning Authority. For the avoidance of doubt the details shall include but not be limited to the following:

- 1 proposed boundary treatments,
- 2 delivery /drop off areas,
- 3 hard surface finishes to the vehicle parking areas,
- 4 pedestrian accesses and amenity areas,
- 5 details of any retaining walls, steps, railings, walls, fencing, gates or other supporting structures,
- 6 details of the pedestrian access and circulation areas.

The works shall be completed in accordance with the approved details before any part of the development is brought into use and retained thereafter.

Reason: In the interests of visual amenity and to ensure a satisfactory standard of appearance upon the completion of the development in accordance with Policies CS12 and CS19 of the Gravesham Local Plan Core Strategy 2014.

8. Following the demolition of the existing dwellings and prior to any above ground works taking place, a soft landscaping scheme shall be submitted to and approved in writing by the Local Planning Authority, detailing the type and species of planting to be carried out within the site to include their quantity, size and arrangements for aftercare.

Any identified trees or plants that die, are damaged, removed or become diseased within five years from the first occupation of the development hereby permitted shall be replaced with a species of a similar size and species during the next available planting season. The landscaping works shall be carried out in accordance with the approved details before any part of the development is brought into use in accordance with an implementation programme to be submitted and approved in writing to the Local Planning Authority. The completed scheme shall be managed and/or maintained thereafter in accordance with an approved scheme of management and/or maintenance.

Reason: In the interests of visual amenity and to ensure a satisfactory standard of appearance upon the completion of the development in accordance with Policy CS19 of the Gravesham Local Plan Core Strategy 2014.

9. Prior to the first occupation of the development hereby permitted, details of refuse arrangements shall be submitted to and approved in writing by the Local Planning Authority. The submitted details shall ensure adequate provision for waste management, storage and disposal. The refuse arrangements approved pursuant to this condition shall be provided prior to the first occupation of the development and thereafter be maintained for such purposes at all times.

Reason: In order to ensure the development is served by suitable refuse arrangements in the interests of amenity and in accordance with Policy CS19 of the Gravesham Local Plan Core Strategy 2014.

10. The development hereby permitted shall not be occupied until details of the cycle storage facilities have been submitted to and approved in writing by the Local Planning Authority. These facilities shall be made available for use prior to first occupation of the development hereby permitted and retained for use by site users at all times thereafter.

Reason: In order to encourage options for sustainable travel in accordance with Policies CS11 and CS19 Gravesham Local Plan Core Strategy 2014.

11. The development hereby permitted shall not be brought into use until the car parking and turning areas shown on the approved drawings have been fully provided and made available for use. These facilities shall be retained for use at all times thereafter, and no development shall be carried out on the site in such a manner or in such a position as to preclude the use of or access to the reserved vehicle parking and turning areas.

Reason: To ensure sufficient vehicle provision is available to serve the development and in the interests of highway safety, in accordance with saved Policies P3 and T5 of the Gravesham Local Plan First Review 1994 and Policies CS11 and CS19 of the Gravesham Local Plan Core Strategy 2014.

13. Prior to the installation of any external lighting, details shall be submitted to and approved in writing by the Local Planning Authority. Any external lighting plan must demonstrate that the lighting has been designed in accordance with Bat Conservation Trust's 'Guidance Note 8 Bats and Artificial Lighting' guidelines (or subsequent editions/updates) and that artificial lighting will not adversely affect local wildlife. The external lighting shall be installed in accordance with the approved details and no additional lighting shall be installed without the prior permission in writing of the Local Planning Authority.

Reason: In order to limit the impact of the lighting on wildlife and amenity with regard to Policies CS12 and CS19 of the Gravesham Local Plan Core Strategy 2014.

14. No external storage of goods or materials in connection with the operation of the business units shall take place at any time within the open parts of the site including the customer/staff car parking areas.

Reason: In the interest of visual amenity and in accordance with Policy CS19 of Gravesham Local Plan Core Strategy 2014.

INFORMATIVES:-

1 CODE OF PRACTICE FOR CONSTRUCTION/DEMOLITION SITES WITHIN THE BOROUGH OF GRAVESHAM

This Code of Practice relates to all building sites in Gravesham and is given to ensure best practice is achieved equally throughout the borough. All aspects of the code apply to every building site and will only be altered on an individual basis if there are found to be special circumstances on that particular site. Any amendment made will be in writing by an authorised officer of the Environmental Health Department. The following circumstances are given where consideration will be given to a variation in the Code of Practice:-

- a) Where occupiers of noise sensitive properties are unlikely to be affected by the works.
- b) Where the work cannot be carried out during the hours specified because of the requirements of another authority such as the emergency services, utilities, traffic management authorities etc.
- c) Where the site location is isolated or where the works are in a mainly commercial/industrial area with few residential properties.

In all the above cases the onus will be on the applicants to provide written justification as to why the code should be varied. When making such a statement the applicant must include the following information where appropriate:-

- i) Location, nature and duration of works.
- ii) Measured/predicted noise levels and background levels.
- iii) Measured/predicted vibration levels.
- iv) Proximity and numbers of residential properties.
- v) Evidence of public consultation/information to persons likely to be affected.
- vi) Written evidence from the appropriate authority (in instances where b) above applies).

In order for adequate consideration to be given by this Council to a request for deviation from the Code of Practice, any proposal must be provided in writing to the Environmental Health Services Manager at least fifteen working days prior to the works starting.

On developments where construction/demolition is undertaken on contaminated land, work will be required to be carried out in a way which will be specified within conditions of the site's planning approval.

The requirements of this Code of Practice should prevent unnecessary disturbance to nearby residents. In the event of a nuisance being caused due to work not being carried out in an appropriate way, the council may take enforcement action to resolve the situation.

Please note compliance with Health and Safety requirements arising from construction/ demolition work shall be given priority over this Code of Practice.

BURNING OF MATERIAL

It is expected that no burning of materials shall take place on a construction or demolition site. Where the contractor is of the opinion that this is unavoidable he shall make representations to the council for consideration. No burning will be allowed to take place without written authority from a suitably authorised officer of the council. Any burning so authorised will be subject to strict controls which will include, amongst other matters, the following:-

- o A strict control on the amount of material burnt at any one time.
- o Burning is carried out under the direct and continuous supervision of the person responsible for the site or a person authorised to act on his behalf.
- o All material shall be kept dry prior to being burnt.
- o The wind shall be positively blowing away from nearby residential or other sensitive buildings. Where this is not possible burning shall take place in still weather.

NOISE AND VIBRATION

Where sensitive premises are likely to be affected by noise and/or vibration, all works and ancillary operations which are audible at the site boundary, or at such other place as may be agreed with the council, shall be carried out only between the following hours (these to be known as normal working hours) : -

Monday - Friday 08:00 - 18:00
Saturdays 08:00 - 13:00
Sunday and Bank Holidays. No works audible at the site boundary or any other place agreed by the council.

In addition to the above times the contractor may use up to one hour before and up to one hour after normal working hours for start up and close down of activities. Examples of these activities would be:

- a) Day to day maintenance, checking, lubrication and cleaning/washing down of plant and machinery.
- b) Refuelling of plant and machinery (from on-site storage facilities only).
- c) Deliveries and unloading.
- d) Site inspections and safety checks, but excluding any works necessary to make the working zone and/or construction site safe (which are to be undertaken within normal working hours).
- e) Arrival and departure of workforce and staff at the construction site, but only in so far as the arrival and departure times provide for the minimum time necessary to undertake the tasks allowed by these start up/close down activities.
- f) Site meetings.
- g) Site clean up.

NB The start up and close down periods are not to be regarded as an extension to the normal working day.

Where the site boundary/entrance is located adjacent to noise sensitive areas it must be ensured as far as possible that vehicles do not arrive on site outside the times laid out above. Where this is found not to be possible, drivers of vehicles arriving at the site before it is open must not leave the vehicle's engine running or cause other excessive noise/pollution whilst they are waiting.

On the site itself, best practicable means as defined in section 72 of the Control of Pollution Act 1974 to reduce noise to a minimum shall be employed at all times.

Compliance with BS5228 Part 1:1997 'Noise control on Construction & Open sites' is expected as a minimum standard. This requires amongst other things that all plant and machinery in use shall be properly silenced, maintained and used in accordance with the manufacturer's instructions.

Criteria and procedures for vibration control are assessed using different parameters as follows:

- * Vibration Dose Values (VDVs) are used to protect the occupants and users of buildings from disturbance. (VDVs are defined in BS 6841 and their application is discussed in BS 6472).
- * Peak Component Particle Velocity is used to protect buildings from risk of physical damage. These are assessed in accordance with BS 7385.

Best Practicable means shall be used to control vibration levels so that the following Vibration Dose Values measured on a normally loaded floor in accordance with BS 6472:1994 are not routinely exceeded as a result of works.

Building Type	Period	VDV (ms ^{-1.75})
Residential Buildings, Educational Establishments, Offices and similar	Normal working hours	0.4
Commercial	Normal working hours	0.8

Best Practicable Means shall be used to control Peak Component Particle Velocity measured at the base of any building in accordance with BS 7385 does not routinely exceed a level of 10 mm/s.

In instances where complaints of vibration are received within any adjacent property then the contractor shall immediately take all measures necessary to demonstrate that the vibration levels are below the limits shown in the paragraphs above.

Where the results of any monitoring indicate non-compliance with the limits stated above, the contractor shall immediately change the method of working, and/or the plant being used. Prior to the work recommencing, the contractor shall satisfactorily demonstrate that the new arrangements satisfy the vibration limits.

DUST

Dust suppression techniques shall be used on site where significant quantities of spoil or fine aggregates are stored and/or where the site location is such that it is likely persons living in residential properties are going to be affected by wind blown dust.

Spoil temporarily placed on site shall be located as far away from sensitive properties as possible. The height of stored material shall be kept as low as is practical and water sprayed onto the surface of the piles shall be used as appropriate to keep the surface damp.

Where longer term storage of fine aggregates and other potentially dusty material is necessary, suitable storage facilities shall be used where practicable in order to screen these materials from the wind. This stored material shall be located so that it is as far away from sensitive properties as possible and measures to prevent wind blown dust shall be adopted. These shall include:-

- * keeping the height of stock piles as low as possible,
- * using water sprays as appropriate whilst minimising the production of excessive runoff,
- * minimising the re handling of dry construction materials and spoil,
- * keeping the loading drop heights to as low as possible,
- * where appropriate applying the surfaces of roads on site with water sprays as necessary and/or using wheel-washing facilities.
- * all materials transported to and from the site shall be conveyed by suitable vehicles in enclosed containers or using other adequate wind shielding measures such as sheeting.

The person responsible for the site shall keep on site a daily log book which will be available to visiting authorised officers and shall list the following:-

- * the conditions on site,
- * whether any wind blown dust was visibly coming off the site,
- * what control measures were carried out, and
- * what the results of these were.

COMMUNICATION

It shall be a matter of priority for a contact name and telephone number to be set up in order to enable ready two-way communication and contact with the council and local residents. In cases where work likely to cause a disturbance is to be carried on out of normal working hours, the phone line would be manned whilst the work is ongoing.

LIGHTING

Where security and/or site lighting is used, this shall be located and directed or screened so that it does not cause undue intrusion to adjacent occupied residential properties, or sensitive areas, or constitute a road hazard, and shall be chosen to limit light pollution effects such as "glow in the sky".

2 MAINS DRAINAGE

The foul sewage shall be removed by means of the mains drainage system and not by the use of non-mains sewerage systems, unless connection to the drainage system is not reasonably

practicable. If foul sewage is to be removed using non-mains sewerage systems, a sewage treatment plant or septic tank system will be considered in preference to a cesspool. Such a system may require the prior consent of the Environment Agency under the terms of the Water Resources Act 1991. Applicants are therefore advised to discuss their requirements with the Environment Agency at the earliest opportunity. It should be ensured that the septic tank or cesspool is of adequate capacity to serve the proposed development and suitable access and hardstanding area shall be maintained to it on site.

3 DEVIATION FROM APPROVED PLANS

It is possible that any proposed deviation from the approved plans could be classed as a 'material' change requiring a further application/permission. In the event that any change is proposed, applicants are advised to seek advice from the Local Planning Authority [as proceeding without the necessary permissions could nullify this permission].

4 REASON FOR IMPOSITION OF PRE-COMMENCEMENT CONDITION

Pursuant to Articles 35 (1) and (2) of the Town and Country Planning (Development Management Procedure) (England) Order 2015, the Local Planning Authority is satisfied that the requirements of conditions 3 (including the timing of compliance) are so fundamental to the development permitted that such details must be submitted prior to the works commencing on site. The reason for this is due to the contamination risk. Due to the importance attached to these details, it is reasonable and necessary to seek full approval in advance of works commencing

5 AGREEMENT FOR IMPOSITION OF PRE-COMMENCEMENT CONDITION

In accordance with The Town and Country Planning (Pre Commencement Conditions) Regulations 2018 and paragraph 36 of the Planning Practice Guidance the Local Planning Authority has agreed in writing with the applicant on 15/05/2023 to the inclusion of the following pre-commencement conditions:

Condition 3 - Contaminated Land Assessment

6 BUILDING REGULATIONS CONSENT

The granting of planning permission is independent from the granting of Building Regulations consent (which may, or may not, be required). In the event of a change to the scheme granted planning permission being required to satisfy the Building Regulations, applicants are advised to seek advice from the Local Planning Authority [as proceeding without the necessary permissions could nullify this permission].

7 LIGHTING

Artificial lighting can cause a statutory nuisance under the Environmental Protection Act 1990. It is important that the applicants are not permitted to install external lighting that illuminate anything other than the ground within the curtilage of the new development in order to assist in preventing a nuisance from occurring.

8 FUTURE THAMES BARRIER

The Thames Estuary 2100 Plan (the Plan) sets out how the Environment Agency (EA) and their partners can work together to manage tidal flood risk in the Thames Estuary, from now and into the next century. It is an adaptive plan, ensuring current standards of flood protection provided by the existing tidal defence system are maintained or improved taking into account the effects of climate change e.g. sea level rise. The EA expect the existing Thames Barrier to continue to protect London from tidal flooding up until 2070, but over the longer term the Plan, published in 2012, sets out the strategic direction and several options for managing tidal flood risk in the Thames Estuary.

Beyond 2070, the long term options to manage tidal flood risk include upgrading the existing Thames barrier at Woolwich, two potential locations for a replacement barrier (Gravesend Reach or Long Reach) or flood storage.

Currently, all options continue to be investigated and assessed given that the decision on a preferred option is not planned until about 2040 when such a decision will be informed by the data and information available at the time.

Although this is an inland site away from the River Thames, this ongoing work is something the developer should be aware of as their site may be impacted in the future, during the construction period, should the barrier be located in Gravesend Reach. The EA are not objecting to this application from a TE2100 perspective but instead providing this advice based on the proposal changing the site use from residential to commercial and the site being small at just over one hectares. The EA will contact the developer and landowners in the future should the Gravesend Reach area be taken forward as the preferred option. The EA would encourage the developer to regularly check www.gov.uk for further and up to date information.

9 SOUTHERN WATER

Southern Water requires a formal application for a connection to the public sewer to be made by the applicant or developer.

To make an application visit Southern Water's Get Connected service: developerservices.southernwater.co.uk and please read our New Connections Charging Arrangements documents which are available on our website via the following link: southernwater.co.uk/developing-building/connection-charging-arrangements

In situations where surface water is being considered for discharge to our network, we require the below hierarchy for surface water to be followed which is reflected in part H3 of the Building Regulations. Whilst reuse does not strictly form part of this hierarchy, Southern Water would encourage the consideration of reuse for new developments.

- Reuse
- Infiltration
- Watercourse
- Storm sewer
- Combined Sewer

Guidance on Building Regulations is here: gov.uk/government/publications/drainage-and-waste-disposal-approved-document-h

Please note: There is 300 mm decommissioned public combined rising main crossing in the site.

It is possible that a sewer now deemed to be public could be crossing the development site. Therefore, should any sewer be found during construction works, an investigation of the sewer will be required to ascertain its ownership before any further works commence on site.

For further advice, please contact Southern Water, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX (Tel: 0330 303 0119). Website: southernwater.co.uk or by email at: SouthernWaterPlanning@southernwater.co.uk

10 STATEMENT OF POSITIVE AND PROACTIVE APPROACH TO DECISION-MAKING

In accordance with Article 35 (2) of the Town and Country Planning (Development Management Procedure) (England) Order 2015 (as amended), and paragraph 38 of the National Planning Policy Framework (NPPF) 2021, the Local Planning Authority has approached the assessment and determination of this application in a positive and creative way and, where appropriate, has worked pro-actively with the applicant to secure a development that is sustainable and that improves the economic, social and environmental conditions of the area, and that is in accordance with the Development Plan for the area.

Dated: 19 May 2023

NOTIFICATION TO APPLICANT

APPEALS TO THE SECRETARY OF STATE

- If you are aggrieved by the decision of your Local Planning Authority to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State under Section 78 of the Town and Country Planning Act 1990.
- If this is a **householder application*** which has been refused and you want to appeal against your Local Planning Authority's decision then you must do so within **12 weeks of the date of this notice**.
- For all other applications, refused or permitted, if you want to appeal against your Local Planning Authority's decision then you must do so within 6 months of the date of this notice.
- **For further information regarding Appeals and to make an application please click the relevant link:**
<https://www.gov.uk/appeal-householder-planning-decision>
<https://www.gov.uk/appeal-planning-decision>
- The Secretary of State can allow a longer period for giving notice of an appeal, but he will not normally be prepared to use this power unless there are special circumstances which excuse the delay in giving notice of appeal.
- The Secretary of State need not consider an appeal if it seems to him that the Local Planning Authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.
- In practice, the Secretary of State does not refuse to consider appeals solely because the Local Planning Authority based their decision on a direction given by him.

***Householder applications**

These are:

- (a) applications for planning permission for development of an existing dwellinghouse, or development within the curtilage of such a dwellinghouse for any purpose incidental to the enjoyment of the dwellinghouse, or
- (b) an application for any consent, agreement or approval required by or under a planning permission, development order or local development order in relation to such development

but does **not** include –

- (i) an application for change of use;
- (ii) an application to change the number of dwellings in a building.

PURCHASE NOTICES

If either the Local Planning Authority or the Secretary of State for the Environment refuses permission to develop land or grants it subject to conditions, the owner may claim that he/she can neither put the land to a reasonably beneficial use in its existing state nor can he/she render the land capable of a reasonably beneficial use by the carrying out of any development which has been or would be permitted.

In these circumstances, the owner may serve a purchase notice on the Council (District Council, London Borough Council or Common Council of the City of London) in whose area the land is situated. This notice will require the Council to purchase his interest in the land in accordance with the provisions of Part VI of the Town and Country Planning Act 1990.

APPENDIX E

Flood Barriers

Flood Barriers for Garages and Driveways



Nautilus 400: Your Premier Flood Defence Solution for Garages, Driveways, and More

As a leading provider of flood defence solutions in the UK, we specialise in the Nautilus 400 flood barrier system, renowned for its exceptional strength and ease of deployment. This system offers comprehensive protection for a wide range of openings, catering to both residential and commercial properties.

The Nautilus 400 is a robust and highly adaptable flood barrier designed to provide a quick and effective watertight seal against rising waters. It's an ideal choice for:

- **Garages and Driveways:** Our flood barriers are custom-fit for any size garage doorway or driveway, offering a perfect solution to protect your home or business from flooding. They are engineered for both immediate flood protection and long-term prevention.
- **Wider Doorways:** Effectively secures patio doors, shop fronts, factory doors, and roller shutter doors.
- **Large-Scale Openings:** Capable of defending expansive areas such as industrial premises, warehouses, and locations adjacent to rivers or the sea, handling even the most hostile and pounding water environments.

Key Features and Benefits of the Nautilus 400 System:

- **Unrivalled Robustness:** The Nautilus 400 is recognised as the most straightforward yet most robust flood barrier system available, designed to span wide distances and withstand significant water pressure.
- **Rapid Deployment & Easy Storage:** Engineered for quick assembly when flood warnings are issued and effortless dismantling and storage once the danger has passed.
- **High-Level Protection:** When deployed, the system forms a formidable barrier up to 1600mm high, capable of protecting any required span over 2500mm wide.
- **Innovative Sealing Technology (No Ground Bracket/Frame Required):**
 - The system cleverly eliminates the need for a ground bracket or frame.
 - A very thick ground gasket on the bottom flood panel is compressed down by the system to create a watertight seal directly to the ground.
 - This gasket is highly effective, accommodating ground undulations of up to 2-3mm to ensure a consistent seal.
- **Secure and Permanent Installation Components:**
 - **Vertical Rails:** Two permanently fixed, unobtrusive vertical rails are fitted on either side of the opening.
 - **Ground Sockets:** Pre-installed ground sockets allow for the quick and secure placement of demountable posts.
 - **Optimised Ground Sealing with Concrete Lintels:** For an ideal and impenetrable seal, our installation engineers can prepare the ground by setting reinforced concrete lintels into rapid-set concrete. The flood barrier panel then compresses its rubber ground gasket onto this level concrete lintel, forming a perfect watertight barrier.

The Nautilus 400 flood barrier system represents a sophisticated, durable, and user-friendly solution for comprehensive flood defence across the UK, ensuring peace of mind for both residential and commercial property owners.

Please see to two options available, the [Nautilus 400 Flood Barriers under 2500mm Wide](#) or the [Nautilus 400 Flood Barriers over 2500mm Wide](#), which are perfect for the job, with quick and easy deployment in minutes.

[Contact us](#) or get a free quotation and advice on our [Get a Quote!](#) page.



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Nautilus® 400 Flood Barriers over 2500mm Wide

These barriers can also double up to be used as floodwalls



Nautilus 400 Flood Barriers over 2500mm

Nautilus® 400: The Ultimate Demountable Flood Defence Barrier for UK Commercial & Industrial Premises

The Nautilus® 400 demountable flood defence barriers are presented as the ultimate flood protection solution, specifically designed for robust defence of **commercial and industrial premises** across the UK.



Key Features:

- **Ultimate Flood Protection:** This system is engineered to provide the highest level of flood defense, ensuring comprehensive safeguarding for business-critical operations and valuable assets.
- **Demountable and Removable:** The barriers are designed for temporary deployment, allowing them to be quickly installed when a flood threat emerges and easily removed when conditions are safe. This ensures unobstructed access during normal business operations.
- **Extensive Commercial & Industrial Use:** The Nautilus® 400 is perfectly suited for protecting a wide array of large or critical openings common in commercial and industrial settings, including:
 - Factories
 - Warehouses
 - Loading bays/docks
 - Large driveways
 - Garages (commercial vehicle garages, etc.)
 - And other vulnerable access points within a business or industrial complex.

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Flood defence barriers and other flood prevention products to protect your business are certainly a very good idea. Whether you're looking to reduce your insurance premiums or obtain refused insurance coverage. In any event, we would like to help you protect your property.

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Without a doubt, the easiest way to learn about our flood defence products is to watch any of our videos. You will find a one-minute video on each of our product pages.

This robust, removable flood barrier system spans 2.5 metres between demountable posts. The temporary flood barrier panels are much thicker than those of the Nautilus® 200. Therefore, the Nautilus® 400 is our strongest flood defence barrier system

- Suitable for residential, commercial and industrial properties.
- Designed with a watertight sealing system.
- Lightweight aluminium temporary flood barrier panels.
- Following the initial installation, assembly for the client is indeed quicker and simpler than the Nautilus® 200 system.
- Flood barriers for single doorways do not require demountable posts. Assemble in minutes by one person.
- Whereas a six-metre wide flood barrier uses two demountable posts and is assembled in seven minutes by one person. Please see the short video on this page.
- From flood warnings to flood protection in a matter of minutes, providing peace of mind.
- Afterwards, the flood barrier is dismantled and stored away easily, ready for the next flood event.
- Designed and manufactured in the UK to the highest standards.
- Competitively priced with speedy delivery.
- Supply-only option available.
- Undeniably, the survey and installation service provided by our highly experienced mitigation engineers is one of the best in the UK.
- Additionally, we provide exceptional ongoing customer support.
- To protect an area wider than 2.5 metres:
- Two permanently fixed vertical rails were installed on each side of the opening.
- Ground sockets are installed and protected by aluminium dust caps when the barrier is not in use.
- When a flood threatens, insert the demountable posts into the ground sockets, then slide in the horizontal aluminium panels. Then apply the compression system.
- The panels are each 400mm high.
- Flood barrier up to 1600mm high for assembly.
- Flood barrier of any required width created by installing demountable posts at every 2500mm.
- Each panel is 25mm in thickness.

The Nautilus 200 and Nautilus 300 systems hold the PAS 851188-1:2019 Accreditation, complying with the British Standard BS851188.

The Nautilus 400 is a more robust system. It is an enhancement of the 200 & 300 system and has been installed for more than 95% of our clients, including the councils on our About Us page.

BSI has confirmed that the 3 systems, Nautilus 200, Nautilus 300 and Nautilus 400, can be classed as a family of barriers, as they have the same matrix, so would include the 400 system.

The independent testing was done to the specification of BS851188 in February 2021, and the testing video can be seen [HERE](#).

It is worth checking with your local council to see if you may be eligible for a grant.

NAUTILUS 400 OVER 2500MM BROCHURE

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We can supply only or export flood barriers oversea with worldwide shipping.

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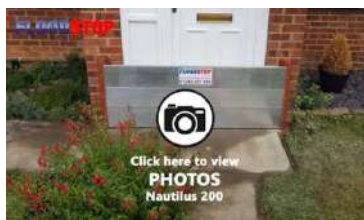
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Nautilus® 200 Flood Barriers under 1500mm Wide



Nautilus® 200 Demountable Flood Barriers

Targeted Flood Protection for Single Openings

The **Nautilus® 200 Demountable Flood Barriers**, developed by **Flood Defence UK**, are specifically engineered as a **temporary, removable flood protection system** for single doorways in homes, commercial premises, and industrial properties. Designed for ease of use and maximum reliability, these barriers provide peace of mind when flood threats arise.

These barriers are intended for **targeted application**, primarily to protect **individual doorways**. The **demountable design** ensures that the system can be quickly mounted in the event of flooding and easily removed afterwards, keeping access to the opening completely unobstructed under normal conditions.

One of the key advantages of the Nautilus® 200 is its ability to **span up to 1.5 metres** in width without the need for central support posts. This feature simplifies installation and ensures a clean, open space when the barrier is not in use. For wider doorways or openings that exceed 1.5 metres, customers should refer to the **Nautilus-200-over-1500** system, which uses a different configuration to handle the extended width.

Installation Process

The installation system comprises **two permanently fixed vertical rails**, mounted on either side of the doorway. These rails serve as guides for the barrier boards and remain in place at all times. When a flood is imminent, **horizontal aluminium flood boards** are slid into the rails. Once all panels are in place, a **compression system** is applied to form a secure, watertight seal, effectively blocking floodwater from entering the property.

Design and Performance

Each flood panel measures **200mm in height** and **16mm in thickness**, and multiple boards can be stacked to provide flood protection **up to 1200mm high**. The panels are made from **lightweight aluminium**, making



them easy for one person to handle. After the initial setup, the system can be **assembled in minutes**, ensuring a quick response to any flood warnings.

When no longer needed, the panels can be **easily dismantled and stored**, ready for future use. This makes the **Nautilus® 200** an extremely practical and reusable flood defence solution.

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The barrier system is **suitable for residential, commercial, and industrial properties**. It is designed and **manufactured in the UK to the highest standards**, offering both durability and peace of mind. The product is also **competitively priced**, with **speedy delivery** and a **supply-only option** available for those who prefer to install it themselves.

Customer Support and Expert Services

Flood Defence UK provides **exceptional customer service** along with access to **highly experienced mitigation engineers**, who offer a **survey and installation service** widely regarded as one of the best in the UK. Ongoing support is also available to assist with maintenance and future flood preparation.

Certified to the Highest Standards

Both the **Nautilus® 200 and Nautilus® 300** flood barrier systems hold **PAS 851188-1:2019 Accreditation**, meeting the **British Standard BS 851188**. This is a more advanced and current standard compared to previous versions such as PAS 1188-1:2014 and PAS 1188-4:2014. Notably, BS 851188 is the **standard recommended by the Environment Agency and local councils**.

Independent testing of the system was conducted to BS 851188 specifications in **February 2021**, and the official **testing video** is available to view <https://floodstop-uk.co.uk/nautilus-flood-barrier-test/>

Insurance and Grant Support

Investing in property flood protection can also be beneficial from an insurance standpoint, helping to **lower premiums** or gain coverage if you've previously been declined. Additionally, **local council grants** may be available to assist with funding. We recommend checking with your local authority to see if you qualify.

For a quick and clear overview of how the Nautilus® 200 works, be sure to watch our **1-minute demonstration videos** available on each product page.

NAUTILUS 200 UNDER 1500MM BROCHURE

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We can supply only or export flood barriers oversea with worldwide shipping.

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See Our Other Sizes of Barriers

[Nautilus 200 Flood Barriers over 1500mm Wide](#)

[Nautilus 400 Flood Barriers under 2500mm Wide](#)

[Nautilus 400 Flood Barriers over 2500mm Wide](#)

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Nautilus® Bespoke Flood Barrier Specials



Powder coating

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Flood Defence UK offers **Nautilus® flood barrier specials** that can be fully adapted and custom-designed to precisely fit the unique characteristics and specific flood protection needs of **any property in the UK**. This ensures a perfect fit and optimal performance, even for challenging installations.

The Role of "Packers" in Bespoke Solutions:

A key component commonly used in these "special" adaptations of the Nautilus® removable flood barrier system is the **packer**.

- **Material and Construction:** Packers are made from **aluminium** and are robustly **welded to the back of an aluminium side rail**. This integration ensures durability and a secure fit within the overall barrier system.
- **Function:** Their primary purpose is to **bring the temporary flood barrier forward** from the opening. This is crucial for clearing common architectural obstructions that might otherwise prevent the barrier from seating correctly or creating a watertight seal. Such obstructions include:
 - Door sills
 - Door handles
 - Security entry pads (keypads, intercoms, etc.)
 - Steps
 - Solves any other protrusions that would interfere with the flush installation of the barriers.

By utilising these bespoke solutions with integrated packers, Flood Defence UK can provide highly effective, customised flood defence that accounts for the specific structural nuances of individual homes and businesses, ensuring maximum protection.

Nautilus® flood barrier specials can be adapted and designed to fit any property or needs in the UK. Packers are the most commonly used for 'special' for the Nautilus® removable flood barrier component. Packers are aluminium, and they are welded to the back of an aluminium side rail. These are required to bring a temporary flood barrier forward to clear door sills, handles, security entry pads, steps etc.

Bespoke flood barriers and special fixtures for temporary demountable flood barriers and flood defence solutions. Designed and manufactured in the UK. We offer bespoke solutions to enable the installation of our flood barriers in tricky situations.

- Powder Coated Colours Available
- Angled side rails
- Tee Joints
- Packers fixed to the side rails
- 4 Way Joints
- 90 Degree Joints
- Others

Insurance and Grant Support

Investing in property flood protection can also be beneficial from an insurance standpoint, helping to **lower premiums** or gain coverage if you've previously been declined. Additionally, **local council grants** may be available to assist with funding. We recommend checking with your local authority to see if you qualify.

For a quick and clear overview of how the Nautilus® 200 works, be sure to watch our **1-minute demonstration videos** available on each product page.

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LAKE SIDE
FLOOD SOLUTIONS

**LAKE SIDE SELF-CLOSING
FLOOD BARRIER (SCFB)**



**PRODUCT DATA
SHEET**



LFS Self-Closing Flood Barrier (SCFB)

A unique, automatic flood defence system.
Effectively uses the problem to create the solution.

Specification:

- **Basin:** concrete, galvanised steel or stainless steel
- **Floating wall:** PUR foam core with a fiberglass or GRP outer layer
- **Walls:** reinforced with composite profiles and textile fiberglass; fabricated in 1m lengths
- **Connections of the walls:** reinforced rubber strip and stainless-steel mounting strips
- **Guide rails or guide slots** as end protection

PRODUCT DATA SHEET

Key features:

- **No energy required** – operates even in a power outage
- **No manpower** – automatically deployed
- **No storage** – in resting position, the SCFB is invisible and fully self-protected below ground
- **Short closing time** – and only deploys in the event of a flood
- **Low operational cost** – high quality elements, simple inspection



