



**PROPOSED CHANGE OF
USE TO HOUSE IN
MULTIPLE OCCUPATION
(HMO) AT 1-3 HOLLAND
ROAD, FELIXSTOWE,
SUFFOLK**

FLOOD RISK ASSESSMENT

FEBRUARY 2024

REPORT REF: 3382/RE/02-24/01

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CONTRACT

Evans Rivers and Coastal Ltd has been commissioned by Fina Group to carry out a flood risk assessment for a proposed change of use to House in Multiple Occupation (HMO) at 1-3 Holland Road, Felixstowe, Suffolk.

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The project will follow the commitment and objectives outlined in the Health and Safety Policy operated by Evans Rivers and Coastal Ltd. All employees will be equipped with suitable personal protective equipment prior to any site visits and a risk assessment will be completed and checked before any site visit. Other factors which have been taken into consideration are the wider safety of the public whilst operating on site, and the importance of safety when working close to a water source and highway. Any designs resulting from this project and directly created by Evans Rivers and Coastal Ltd will also take into account safety measures within a "designers risk assessment".

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1. INTRODUCTION

1.1 Project Scope

1.1.1 Evans Rivers and Coastal Ltd has been commissioned by Fina Group to carry out a flood risk assessment for a proposed change of use to House in Multiple Occupation (HMO) at 1-3 Holland Road, Felixstowe, Suffolk.

1.1.2 It is understood that this Flood Risk Assessment will be submitted to the Planning Authority as part of a planning application. Specifically, this assessment intends to:

- a) Consider the impacts of the 1 in 20 year, 1 in 200 year and 1 in 1000 year flood events (inclusive of climate change), in accordance with NPPF;
- b) Review any literature and guidance specific to this area;
- c) Determine the extents of the aforementioned NPPF Flood Zones across the site, together with depths of floodwater and hazard;
- d) Assess the risks to people and property and propose mitigation measures accordingly;
- e) Review existing evacuation and warning procedures for the area;
- f) Carry out an appraisal of flood risk from any other sources such as groundwater as required by NPPF;
- g) Report findings and recommendations.

1.1.3 This assessment is carried out in accordance with the requirements of the National Planning Policy Framework (NPPF) dated 2023. Other documents which have been consulted include:

- DEFRA/EA document entitled *Framework and guidance for assessing and managing flood risk for new development Phase 2 (FD2320/TR2)*, 2005;
- Communities and Local Government 2007. *Improving the Flood Performance of New Buildings*. HMSO.
- DEFRA/EA document entitled *The flood risks to people methodology (FD2321/TR1)*, 2006;
- EA *Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose*, 2008;
- National Planning Practice Guidance – Flood Risk and Coastal Change.
- UK Government’s climate change allowances guidance.
- Environment Agency guidance entitled *Flood risk assessments: Climate change allowances – East Anglia; Essex, Norfolk, Suffolk, Cambridgeshire and Bedfordshire*.
- Suffolk Coastal and Waveney District Strategic Flood Risk Assessment Level 1 (2018 SFRA) dated 2018.

- Suffolk Local Flood Risk Management Plan dated 2012.
- Suffolk County Council Preliminary Flood Risk Assessment dated 2011.
- Suffolk Shoreline Management Plan 2, Version 9 dated 2010.

2. DATA COLLECTION

2.1 To assist with this report, the data collected included:

- Ordnance Survey 1:10,000 street view map (Evans Rivers and Coastal Ltd OS licence number 100049458).
- 1:250,000 *Soil Map of Eastern England* (Sheet 4) published by Cranfield University and Soil Survey of England and Wales 1983.
- 1:625,000 *Hydrogeological Map of England and Wales*, published in 1977 by the Institute of Geological Sciences (now the British Geological Survey).
- 1:125,000 *Hydrogeological Map of Southern East Anglia* published in 1981 by the Institute of Geological Sciences (now the British Geological Survey).
- Product 6 flood level data provided by the Agency as ascii grid GIS files together with breach mapping (Appendix A).
- Filtered LIDAR data at 1m resolution.
- British Geological Survey Online Geology Viewer.
- British Geological Survey Groundwater Susceptibility Map.
- The tidal surge flood levels (without climate change) for the North Sea via <https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/CoastalDesignSeaLevels&Mode=spatial>
- Environment Agency defence information via <https://environment.data.gov.uk/asset-management/index.html>

3. SITE CHARACTERISTICS

3.1 Existing Site Characteristics and Location

3.1.1 The site is located at 1-3 Holland Road, Felixstowe, Suffolk. The approximate Ordnance Survey (OS) grid reference for the site is 629741 233942 and the location of the site is shown on Figure 1.

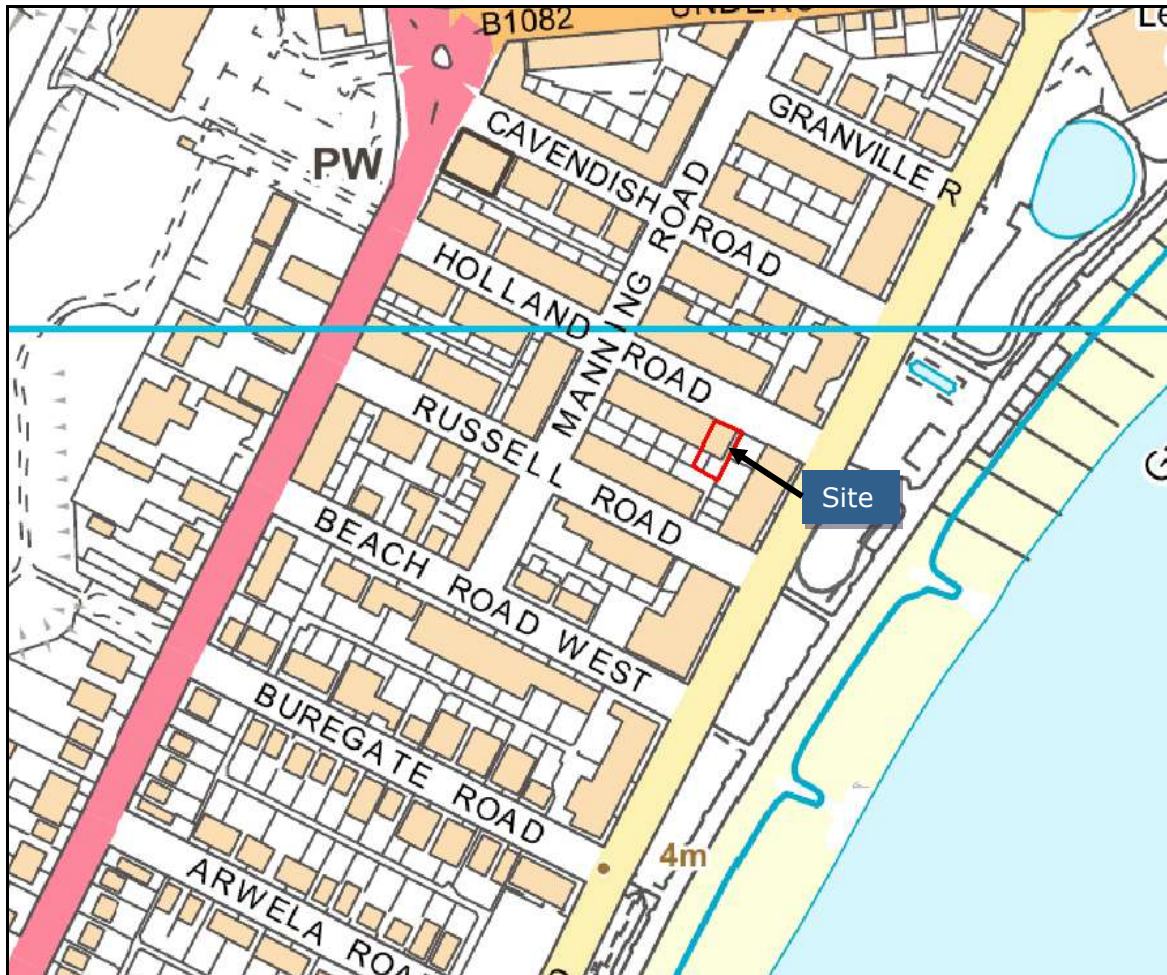


Figure 1: Site location plan (Source: Ordnance Survey)

- 3.1.2 The site comprises numbers 1-3 Holland Road which consists of a three-storey building used as a guest house.
- 3.1.3 The site is accessed from Holland Road adjacent to the north eastern frontage of the site as well as from the lane to the side and rear. The existing layout can be seen on Drawing Number 100001, 100002 and 100003.
- 3.1.4 Filtered LIDAR data at 1m resolution has been obtained in order to determine and illustrate the topography across the site and surrounding area (Figure 2).
- 3.1.5 The existing layout, site inspections and LIDAR data indicates that the ground floor of the building is set 100mm above external ground levels and at 3.60m AOD. The first floor is set as low as 6.20m AOD.



Figure 2: LIDAR survey data where higher ground is denoted as red, orange and yellow colours and lower areas denoted by blue and green colours

3.2 Site Proposals

- 3.2.1 It is the Client's intention to change the use of the building from a guest house to a House in Multiple Occupation (HMO).
- 3.2.2 The proposed site layout can be seen on Drawing Number 100001, 100002, 100003 and 200001.
- 3.2.3 Annex 3 of the NPPF confirms that the proposals are classified as a 'more-vulnerable' use.
- 3.2.4 Paragraph 014 of the NPPF Planning Practice Guidance states that "...change in use may involve an increase in flood risk if the vulnerability classification of the development is changed". It continues to state that a change of use can often present an opportunity to improve the flood resilience of existing development. The vulnerability classification will not change and will remain 'more-vulnerable'. Hence there will not be an increase in vulnerability classification at the site.
- 3.2.5 Paragraph 14 and 27 of the NPPG and paragraph 168 of the NPPF states that the Sequential Test does not usually apply to change of use applications.

4. BASELINE INFORMATION

4.1 Environment Agency Flood Zone Map

4.1.1 The Environment Agency’s Flood Zone Map (Figure 3) shows that the site is located within the NPPF defined Flood Zone 2 associated with the North Sea/River Stour/Orwell.

4.1.2 The extent of the flood zones do not take into account the presence of any formal flood defences, or other features which also act as informal flood defences.

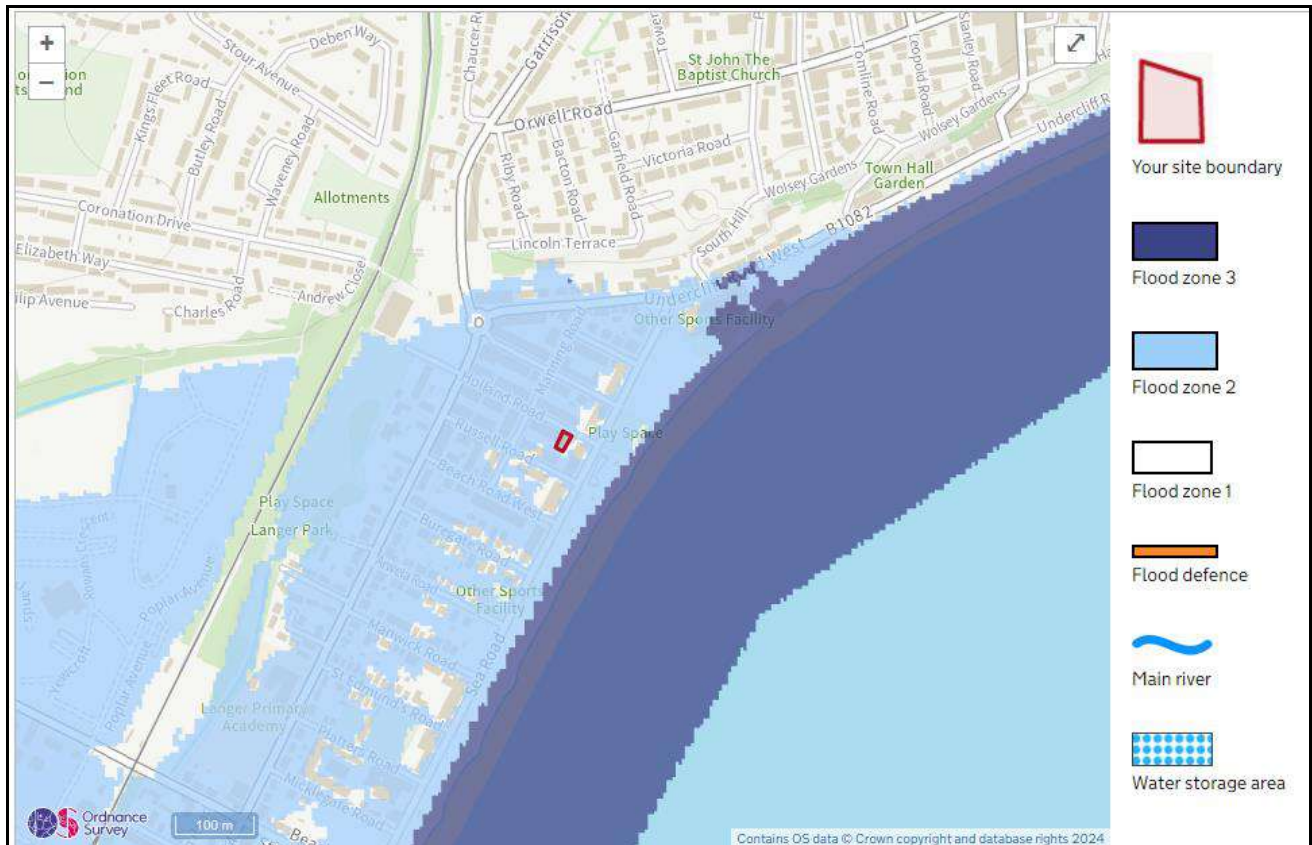


Figure 3: Environment Agency Flood Zone Map (Source: Environment Agency)

4.2 Flood Defences

4.2.1 The Environment Agency flood defence information via <https://environment.data.gov.uk/asset-management/index.html>, indicates that to the south west of the site and at the Port of Felixstowe the defences/raised quay headings are privately owned and set at 4.27m AOD.

4.2.2 Flood defences exist along the south eastern frontage of Felixstowe and comprise a concrete wall which has defects that would reduce the performance of the asset. The crest level of the defence has been recorded as low as 4.50m AOD.

4.2.3 The second generation Suffolk Shoreline Management Plan (SMP) dated 2010, in which the eastern and southern part of the coastal frontage is identified to be located in Policy Development Zone 7 and Management Units FEL19.2-19.5, indicates that the preferred coastal defence policy in the short to long term is a combination of Hold the Line and Managed Realignment (i.e. to 2105).

4.2.4 The second generation Essex and South Suffolk Shoreline Management Plan dated 2010, in which the south western part of the coastal frontage is identified to be located in Management Unit A (policy development zones A1), recommends that the preferred long term coastal defence policy is to hold the existing line to year 2105.

4.3 Environment Agency Flood Levels

4.3.1 Product 6 flood level data has been provided by the Agency as ascii grid GIS files and the levels at the site are summarised in Table 1. The raw GIS data has been taken from the Stour and Orwell modelling update.

Table 1: Tidal surge flood level data at the site

Location	1 in 20 year (mAOD)	1 in 20 year plus climate change (mAOD)	1 in 200 year (mAOD)	1 in 200 year plus climate change (mAOD)	1 in 1000 year (mAOD)	1 in 1000 year plus climate change (mAOD)
Undefended	N/A	3.91	N/A	4.92	3.37	5.30
Defended	N/A	N/A	N/A	4.93	N/A	5.30

N/A = Event modelled but water did not reach site

4.3.2 The UK Government’s climate change allowances guidance includes new tidal climate change allowances. It is understood from the EA guidance document entitled *Flood risk assessments: Climate change allowances – East Anglia; Essex, Norfolk, Suffolk, Cambridgeshire and Bedfordshire* dated March 2022 that for more vulnerable, highly vulnerable and essential infrastructure development the Upper End allowances should be used to assess the flood risk over the lifetime of the proposed development.

4.3.3 It is understood from the Agency that the Upper End climate change allowances applied over the 100 years lifetime of residential development to 2124 result in a flood level 0.38m higher than the climate change flood levels currently used in the existing modelling.

4.3.4 Therefore, applying the Upper End climate change increase of 0.38m results in a defended/undefended 200yrCC flood level of **5.31m AOD/5.30m AOD** and defended/undefended 1000yrCC flood level of **5.68m AOD/5.68m AOD**.

4.4 Flood Warning and Emergency Planning

4.4.1 The site is located within an Environment Agency Flood Warning area 054FWCDV4B1 - South Felixstowe, including The Port of Felixstowe and Landguard Point.

4.4.2 The Environment Agency has a target to issue flood alerts and warnings 9 hours ahead of the peak of the high tide. However, overtopping can occur in advance of the high tide further reducing the warning time. There is no target lead time for issuing severe flood warnings as these are mostly issued after flooding has already begun. Flood alerts are only issued during daylight hours.

4.4.3 Flood Alerts, Flood Warnings and Severe Flood Warnings are issued to residents and businesses within flood risk areas by the Agency’s *Floodline Warnings Direct* (FWD) service. This system is managed by the Environment Agency and dials out a message to the recipient when a particular category of flood warning is being advised. The message is conveyed by a constant ringing of the telephone or can alternatively be communicated to mobile phones and computers. The Flood Alert system operates during daylight hours, issuing flood warnings and alerts in conjunction with announcements on radio and

other media. Owners and occupiers of dwellings or businesses thought to be at risk can sign up to the scheme. **The owners must confirm details with the Agency and to sign up for these warnings.** The various flood warning codes can be seen on Figure 4.

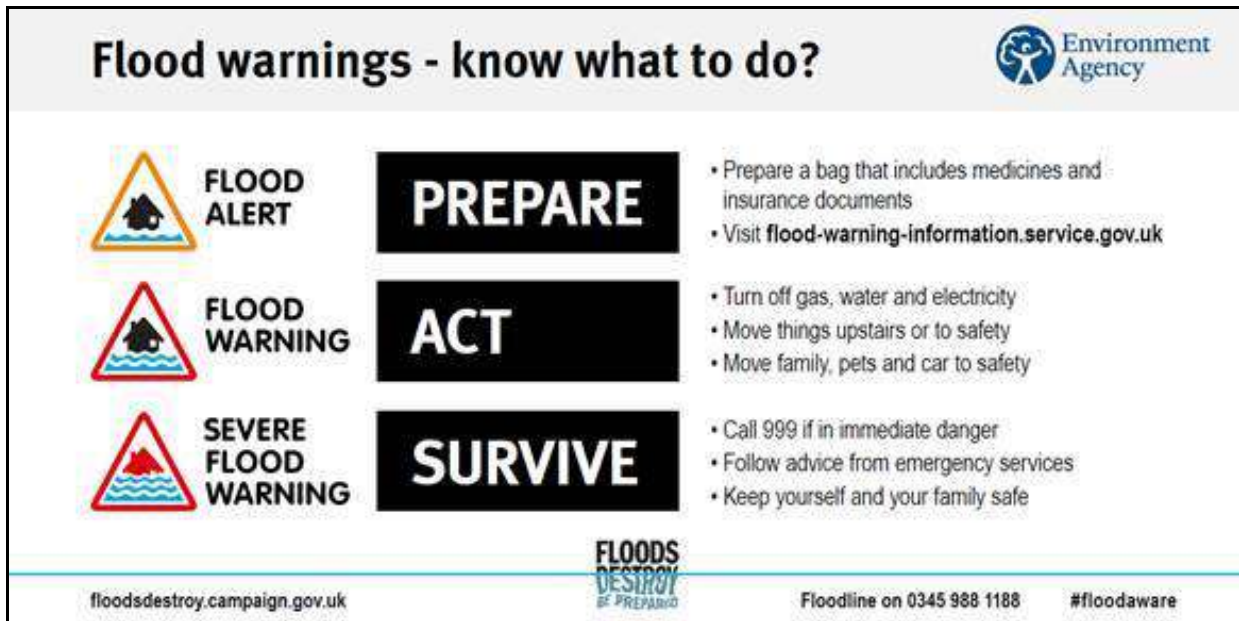


Figure 4: Flood warning codes (Source: Environment Agency)

4.4.4 It is understood that in the event of flooding, evacuation is managed by a multi-agency team in conjunction with the Police. The multi-agency team provides suitable premises for shelter, first aid, refreshments and possible transportation with consideration given to the elderly and vulnerable groups. It is essential that occupants produce robust Emergency Flood Plans to avoid putting themselves or emergency services at risk and that they do not rely solely on emergency services during the event.

5. TIDAL FLOOD RISK

5.1 Actual Flood Risk

5.1.1 The “defended” levels provided by the Agency in Table 1 reflect the flood level at the site taking into account the presence of flood defences. These levels can therefore be used to assess the “actual risk” to the site from overtopping of the defences. Table 2 shows the flood depth and hazard across the site.

5.1.2 In order to determine the flood hazard at the site the hazard categories outlined in Table 13.1 of *FD2320/TR2* (Figure 5 below), which is defined by the depth and velocity of the floodwater and the ability of people to evacuate once flooding occurs, has been used (assuming 0.5 m/s velocity). It should be noted that the white cells shown on Figure 5 denote a *Very low* hazard.

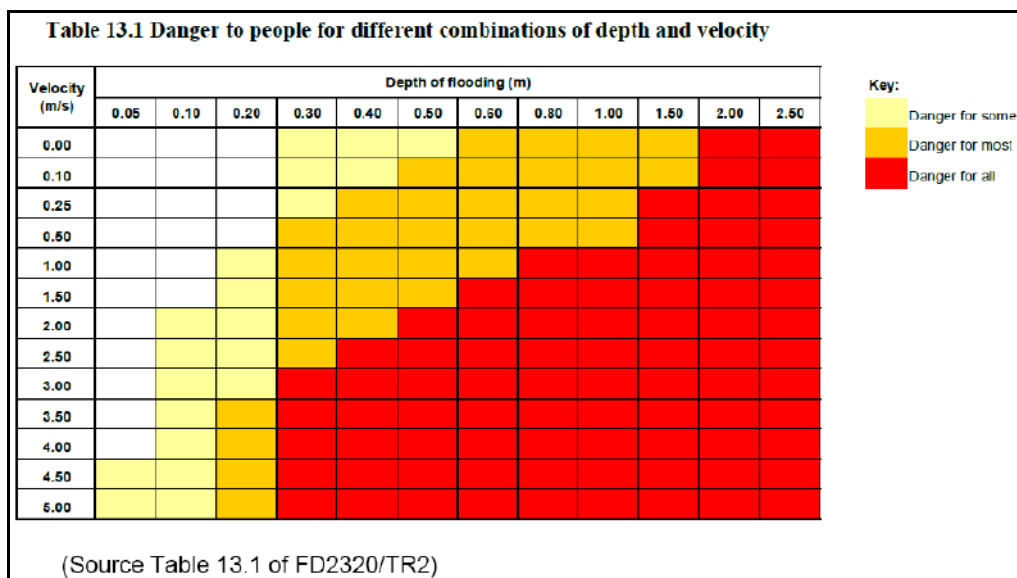


Figure 5: Hazard Classification

Table 2: Flood levels, depths and hazard at the site from overtopping

Location	1 in 20 year	Updated 1 in 20 year plus climate change	1 in 200 year	Updated 1 in 200 year plus climate change	1 in 1000 year	Updated 1 in 1000 year plus climate change
Defended	N/A	N/A	N/A	5.31m AOD	N/A	5.68m AOD
Flood Depth above ground floor level of 3.60m AOD (m)	N/A	N/A	N/A	1.71	N/A	2.08
Flood Depth above first floor level set as low as 6.20m AOD.	N/A	N/A	N/A	0	N/A	0
	<i>Very low hazard</i>					
	<i>Dangerous for Some</i>					
	<i>Dangerous for Most</i>					
	<i>Dangerous for All</i>					

5.1.3 Table 2 shows that flooding across the ground floor would only occur during the climate change 1 in 200 year event and climate change 1 in 1000 year event. Therefore, the “actual risk” to the site from overtopping is high during these events. Safe refuge would be provided across the first floor.

5.2 Residual Risk

5.2.1 The Agency has investigated the risk of flooding from overtopping and breach in the defences (Appendix A).

5.2.2 During the present day 1 in 200 year event and present day 1 in 1000 year event, the Agency’s map shows that the site is not affected.

5.2.3 During the climate change 1 in 200 year event the Agency’s maps show that floodwater would not reach the site.

5.2.4 During the climate change 1 in 1000 year event the depth would be 1m-1.50m and the hazard would be *Dangerous for Most*. Applying the climate change allowance of 0.38m increases the flood depth to 1.38m-1.88m.

5.2.5 Safe refuge would be provided across the first floor during all events.

6. TIDAL FLOOD RISK MITIGATION AND EVACUATION

6.1 Reducing Exposure to the Hazard

- 6.1.1 In order to assess and reduce the exposure to the hazard and the vulnerability to the hazard after the site has been developed, the guidance outlined in the DCLG/DEFRA/EA document entitled *Flood Risk Assessment Guidance for New Development Phase 2; Flood Risks to People, Phase 2; Improving the Flood Performance of New Buildings* has been consulted.
- 6.1.2 In accordance with the Agency's recommendations and Paragraph 002 of the NPPF Planning Practice Guidance, the "design" event for which mitigation measures should be designed to is the tidal defended updated climate change 1 in 200 year flood level of 5.31m AOD (i.e. this level is higher than the breach flood level).
- 6.1.3 The "extreme" tidal defended updated climate change 1 in 1000 year flood level is 5.68m AOD (i.e. this level is higher than the breach flood level).
- 6.1.4 Paragraph 004 of the NPPF Planning Practice Guidance states that the first preference is to avoid flood risk by raising floor levels above the design flood level.
- 6.1.5 Paragraph 069 of the NPPF Planning Practice Guidance continues to state that "Resistance and resilience measures are unlikely to be suitable as the only mitigation measure to manage flood risk, but they may be suitable in some circumstances, such as:
- water-compatible and less vulnerable uses where temporary disruption is acceptable and the development remains safe;
 - where the use of an existing building is to be changed and it can be demonstrated that the avoidance measures set out in paragraph 004 are not practicable and the development remains safe;
 - as a measure to manage residual flood risk from flood risk management infrastructure when avoidance measures have been exhausted.
- 6.1.6 The proposals comply with the second criterion above and it is not practical to set the floor level above the flood level (i.e. by a further 1.71m). Therefore, as discussed above, other mitigation measures such as resistance and resilience measures will be appropriate in this case.
- 6.1.7 The first floor is set above the "design" flood level and "extreme" flood level. Therefore, safe refuge during all flood events will be available at all times.

6.2 Differential Depth

- 6.2.1 During the design and extreme events the external depth of floodwater against the walls of the building would reach 1.71m and 2.08m respectively. Assuming that floodwater is restricted from entering the building somewhat by external doors and walls, the differential depth (i.e. the depth difference between the inside of the building and outside of the building) could therefore reach 1.71m and 2.08m respectively.
- 6.2.2 The DEFRA/EA document entitled *Improving the Flood Performance of New Buildings*, dated 2007, suggests that where the depth of floodwater is higher than 0.5m above the floor level within a building, there will be damage to internal finishes.

- 6.2.3 It is also stated in the aforementioned DEFRA/EA document that there is some damage to buildings if the depth differential between the outside and inside water levels exceeds 0.6m. Severe damage can occur if this reaches 1m even if the buildings are flood proofed.
- 6.2.4 In order to reduce this differential depth to safe limits, it is proposed that floodwater is allowed across the ground floor as part of a *Water Entry Strategy*.

6.3 Water Entry Strategy

- 6.3.1 In accordance with the ODPM guidance document *Preparing for Floods* and the aforementioned DCLG/DEFRA/EA document, a *Water Entry Strategy* aims to allow floodwater to enter the building and flood resilience techniques are incorporated across the ground floor to reduce the consequences of flooding. It is proposed that the mitigation measures are established up to the extreme climate change 1 in 1000 year flood level of 5.68m AOD.

Floors

- 6.3.2 Suitable floor finishes such as ceramic or concrete based flooring are recommended.

Walls

- 6.3.3 Suitable flood proofing measures will need to be incorporated within the walls up to the flood level. Insulation can be fitted externally as it is easily replaced. If cavity insulation is preferred then rigid closed cell materials should be used as they have a low moisture take-up.
- 6.3.4 Internal cement renders should be avoided as they prevent effective drying. Standard gypsum plasterboard could be used as a sacrificial material and can be removed after the flood. Lime-based plaster and ceramic tiles are also known to offer some resilience.

Fittings

- 6.3.5 Durable fittings which are not affected by floodwater could be used internally (e.g. plastic or stainless steel units). Wood fittings should be avoided; however sacrificial fittings can be installed which can then be replaced easily after the flood. There should be gaps behind the fittings to promote drainage and drying.

Services

- 6.3.6 It may not be practical to raise ground floor electrical sockets above the design flood depth, however, the mains supply of electric should be turned off in the event of a flood, and any boiler units should be placed as high as possible. Wiring for communications should also be insulated to prevent damage. Non-return valves are recommended to prevent back-flow of foul water.
- 6.3.7 It is recommended that after the event, a structural survey is carried out in order to assess any damage due to prolonged periods of flood water exposure. The CIRIA guidance document (C623) entitled *Standards for the repair of buildings following flooding* outlines the various approaches.




6.4 Reducing Vulnerability to the Hazard

- 6.4.1 It is understood that the police and other emergency services will assist in the evacuation to rest centres operated by the Council. People at the site will need to make a judgment themselves with regards to the flood hazard if evacuation is attempted and not solely rely on the emergency services.
- 6.4.2 It is recommended that the occupants liaise with the Agency in order to register with the Agency’s Flood Warnings Direct service and ensure that they are aware of the flood risk so that they have the option to evacuate upon receipt of a *Flood Warning* or upon the instruction of the emergency services.
- 6.4.3 The occupants should develop a *Family Flood Plan*. Further guidance is offered in the Environment Agency’s guidance document entitled *What to do before, during and after a flood*. The *Family Flood Plan* should consider, for example, information about vital medication needed and a *Flood Kit*.
- 6.4.4 A *Flood Kit* is a useful precautionary measure especially if evacuation from the site is prolonged. The kit should be stored in an accessible location to ensure that it is not affected by floodwater. The contents should also be checked every 6 months and items replaced if necessary.
- 6.4.5 It may be sensible to compile two *Flood Kit’s* to suit each eventuality. For example, a smaller kit could be compiled which would allow the occupants to carry it during evacuation. A larger kit could also be compiled which included additional food and beverage items in case of ongoing refuge within the property. Both kits should contain the necessary items as suggested below.

1. Important documents
2. Torch and batteries
3. Mobile phone (fully charged)
4. First-aid kit
5. Wind-up radio
6. Important telephone numbers
7. Bottled water
8. Non-perishable food provisions
9. Rubber Gloves and wellington boots
10. Medication or information relating to medication and its location
11. Blankets, warm clothes
12. Essential toiletries
13. Camera to record any damage
14. Emergency cash

Table 3: Flood Event Action Plan

Environment Agency Flood Warning Code	What to do!	Evacuate?
Flood Alert (Flooding Possible. Be aware/prepared! Watch Out).	<ul style="list-style-type: none"> • Monitor flood risk through media and Floodline Warnings Direct. • Locate family members and inform them of risk. If away from the site make assessment on risk if considering returning to site (i.e. how long it will take to return etc). 	<p>Not necessary.</p> <p>Occupants can evacuate themselves if they feel unsafe providing that they make a judgement in relation to any external</p>

 <p>FLOOD ALERT</p>	<ul style="list-style-type: none"> • Check flood kit, check occupants, check pets – BE PREPARED in case the situation gets worse. 	<p>flood hazard. Take flood kit, occupants and pets with you.</p>
<p>Flood Warning (Flooding of homes, businesses and main roads is expected. Act now!).</p>  <p>FLOOD WARNING</p>	<ul style="list-style-type: none"> • Maintain communication through Floodline Warnings Direct and the media. • Begin to implement Flood Plan. • Consider advice given from emergency services/Environment Agency. • Check insurance, Check flood kit, Check Pets. • Check alternative accommodation arrangements. 	<p>Occupants can evacuate themselves if they feel unsafe providing that they make a judgement in relation to any external flood hazard. Take flood kit, occupants and pets with you.</p> <p>People who do not evacuate should reside across first floor.</p> <p>No formal evacuation or rest centre set-up will be undertaken at this warning level, however, if flooding is experienced across the area emergency services will rescue people.</p>
<p>Severe Flood Warning (Severe flooding is expected. Imminent danger to life and property. Act now!).</p>  <p>SEVERE FLOOD WARNING</p>	<ul style="list-style-type: none"> • Leave site immediately if not already done so. • Take flood kit, occupants and pets with you. • Follow advice given by Emergency Services and Council. 	<p>Leave site according to advice given by Emergency Services and Council. Take flood kit, occupants and pets with you.</p> <p>If evacuation cannot be undertaken, people should reside across first floor with <i>flood kit</i> and maintain communication with the emergency services.</p>
<p>Warnings no longer in force (No further flooding is expected in the area. Be careful).</p>	<ul style="list-style-type: none"> • Return to site upon instruction from emergency services and assess any damage. • Contact insurance company depending on damage caused. • Beware of flood debris. 	<p>Not applicable, however site may be uninhabitable.</p> <p>Return to site upon instruction from emergency services as</p>

	<ul style="list-style-type: none"> • Do not touch sources of electricity. • Arrange for utilities to reconnect services. • Do not dispose of damaged property until your insurance company has agreed. 	floodwater may not have receded.
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6.5 Vulnerable Groups

6.5.1 The occupants at the site may include vulnerable groups such as elderly people, those with sensory or physical disabilities, minority ethnic groups, or the infirm. Priority will need to be given to these people during the flood event.

6.5.2 Vulnerable groups should be identified and priority should be given to these groups.

6.6 Safe Access/Egress

6.6.1 The hazard rating along the evacuation route (Figure 6) during the defended climate change 1 in 200 year event has been provided by the Agency in the GIS model files.

6.6.2 The flood hazard is calculated based on different combinations of floodwater depth and velocity, and subsequently by using the hazard equation as cited in the DEFRA/EA R&D Document *Framework and guidance for assessing and managing flood risk for new development Phase 2 (FD2320/TR2)*. The numerical hazard rating extracted from the model is then categorised into four degrees of flood hazard (Table 4) in accordance with Table 3.2 of *FD2321/TR1* and Table 4.2 of *FD2321/TR2*.

Table 4: Hazard to people categories (taken from Table 3.2 of *FD2321/TR1* and Table 4.2 of *FD2321/TR2*)

Hazard Rating	Degree of Flood Hazard	Description
< 0.75	Very low hazard	Caution "Flood zone with shallow flowing water or deep standing water"
0.75 – 1.25	Danger for Some	Dangerous for some (i.e. children) "Danger: Flood zone with deep or fast flowing water"
1.25 – 2.0	Danger for Most	Dangerous for most people (i.e. general public) "Danger: Flood zone with deep fast flowing water"
> 2.0	Danger for All	Dangerous for all "Extreme danger: flood zone with deep fast flowing water"

6.6.3 Figure 7 shows that the hazard to people would be a combination of *Dangerous for All*, *Dangerous for Most* and *Dangerous for Some* for 303m, then *Very low* thereafter.



Figure 6: Evacuation route in relation to the defended 200yrCC event

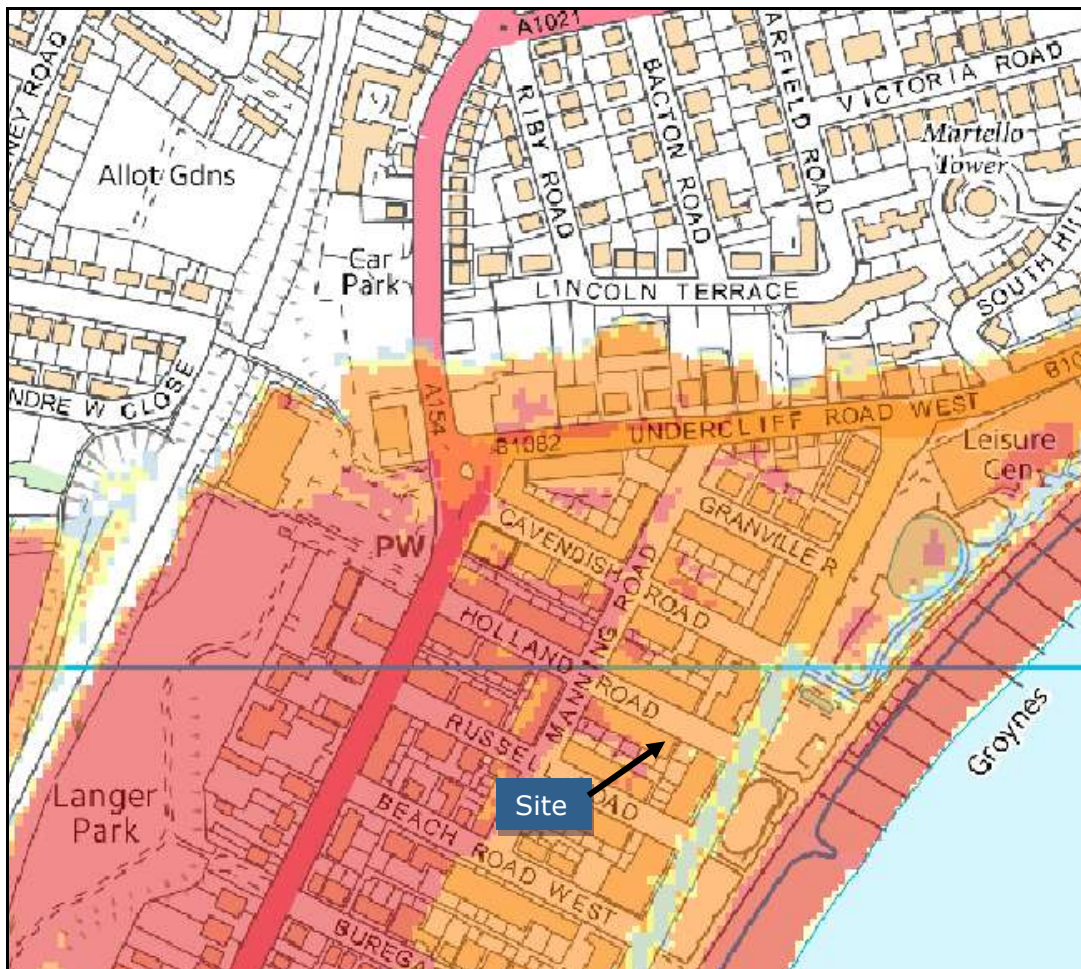


Figure 7: Hazard mapping in relation to defended 200yrCC flood extent (see Table 4 above for hazard classification)

6.7 Insurance

- 6.7.1 The Association of British Insurers (ABI) published a guidance document in 2012 entitled *Guidance on Insurance and Planning in Flood Risk Areas for Local Planning Authorities in England*.
- 6.7.2 The ABI guidance sets out the requirements of the insurance industry when considering flood risk and insurability of the property. The guidance suggests that properties should be protected for flood events up to the climate change 1 in 100 year event in order to access insurance at a competitive price.
- 6.7.3 The guidance also states that insurers would of course prefer to cover properties which are not at risk of flooding, however, for those properties which are at risk of flooding insurers would prefer that the properties are raised above the flood level, over resistance measures which prevent floodwater from entering the building, or resilience measures which allows floodwater to enter the building.
- 6.7.4 It is not practical to raise the ground floor level above the flood level, however, flood resilience measures have been proposed up to the climate change 1 in 1000 year event. Therefore, the ABI's requirement of protection during the climate change 1 in 100 year event will be exceeded and there will be a good chance of the property being insured at a competitive rate.

7. OTHER SOURCES OF FLOODING

7.1 Groundwater Flooding

- 7.1.1 In order to assess the potential for groundwater flooding during higher return period rainfall events, the Jacobs/DEFRA report entitled *Strategy for Flood and Coastal Erosion Risk Management: Groundwater Flooding Scoping Study*, published in May 2004, was consulted, together with the guidance offered within the document entitled *Groundwater flooding records collation, monitoring and risk assessment (ref HA5)*, commissioned by DEFRA and carried out by Jacobs in 2006.

Soil and Geology at the Site

- 7.1.2 It can be seen from the various soil and hydrogeological data, listed in Section 2, that the soils beneath the site comprise sand and gravel.

Groundwater Flooding Potential at the Site

- 7.1.3 There have been no recorded groundwater flood events across the area between 2000 and 2003, as indicated by the Jacobs study. The BGS Groundwater Flooding Susceptibility Map and Figure 07.10/3 of the 2018 SFRA indicates that there is "limited potential for groundwater flooding to occur".

7.2 Surface Water Flooding and Sewer Flooding

- 7.2.1 Surface water and sewer flooding across urban areas is often a result of high intensity storm events which exceed the capacity of the sewers thus causing them to surcharge and flood. Poorly maintained sewer networks and blockages can also exacerbate the potential for sewer flooding.
- 7.2.2 Figure 04.10/3 of the 2018 SFRA shows no historical surface water or sewer flood events at the site.
- 7.2.3 The Agency's Surface Water Flooding Map (Figure 8 and 9) and Figure 06.36/2 of the 2018 SFRA indicates that there is a very low surface water flood risk across the site and along Holland Road adjacent to the site (i.e. chance of flooding less than 1 in 1000 years).
- 7.2.4 As the surface water flood maps do not include a scenario which considers climate change, the low risk/1000yr flood event is used as a substitute for the 100yrCC event to provide a worst-case scenario.



Figure 8: Environment Agency Surface Water Flooding Map (Source: Environment Agency, 2024)

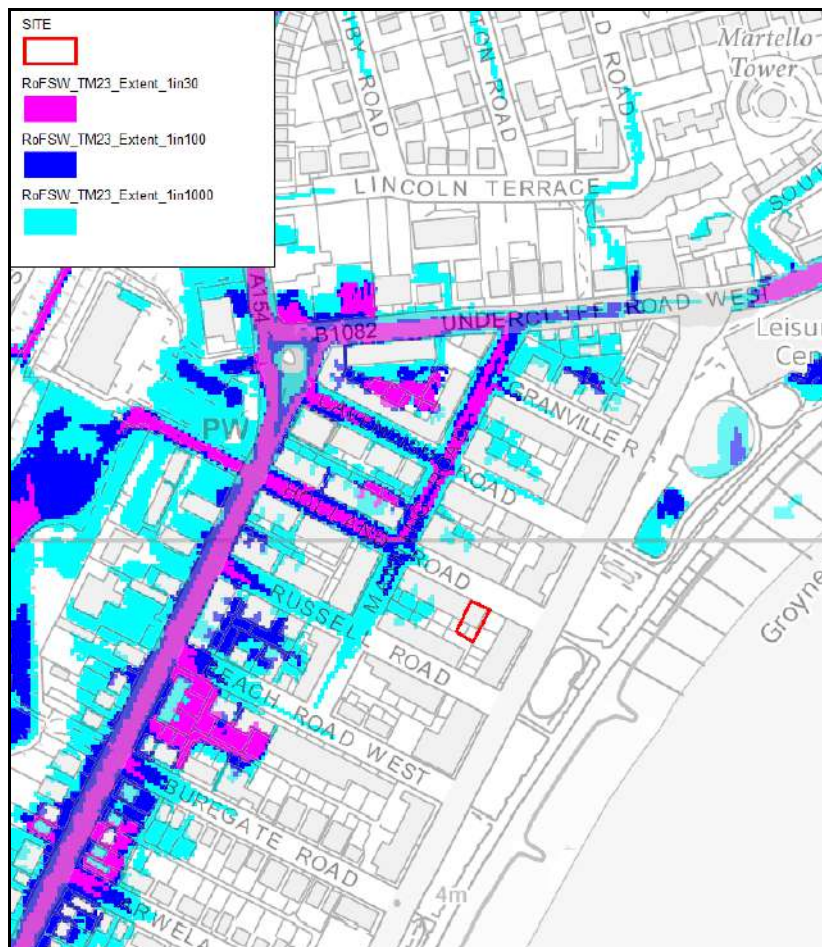


Figure 9: Environment Agency Surface Water Flooding Map (Source: Environment Agency, 2024)

7.3 Reservoirs, Canals And Other Artificial Sources

- 7.3.1 The failure of man-made infrastructure such as flood defences and other structures can result in unexpected flooding. Flooding from artificial sources such as reservoirs, canals and lakes can occur suddenly and without warning, leading to high depths and velocities of flood water which pose a safety risk to people and property.
- 7.3.2 The Environment Agency’s “Risk of flooding from reservoirs” map suggests that the site is not at risk from reservoirs or other artificial sources.

8. CONCLUSIONS

- The site is located within the NPPF Flood Zone 2 from a tidal surge event.
- The “actual risk” to the site from overtopping is high during the climate change 1 in 200 year event and climate change 1 in 1000 year event. There is no flooding across the site during other modelled defended events.
- Applying the Upper End climate change increase of 0.38m results in a design 200yrCC flood level of 5.31m AOD and extreme 1000yrCC flood level of 5.68m AOD.
- There is also a residual risk from a breach event during the climate change 1 in 200 year event and climate change 1 in 1000 year event.
- The ground floor is set at 3.60m AOD. The first floor is set as low as 6.20m AOD.
- A *Water Entry Strategy* should be adopted across the ground floor area of the building to reduce the differential depth to safe limits during the design and extreme event and to protect property.
- A warning and evacuation strategy has been developed within this assessment. It is proposed that the occupants register with the Agency’s *Flood Warnings Direct* and prepare a *Family Flood Plan*.
- Safe refuge is available during the peak of the flood event across the first floor.
- It is considered that there is a low risk of groundwater flooding at the site from underlying deposits and a very low surface water risk.

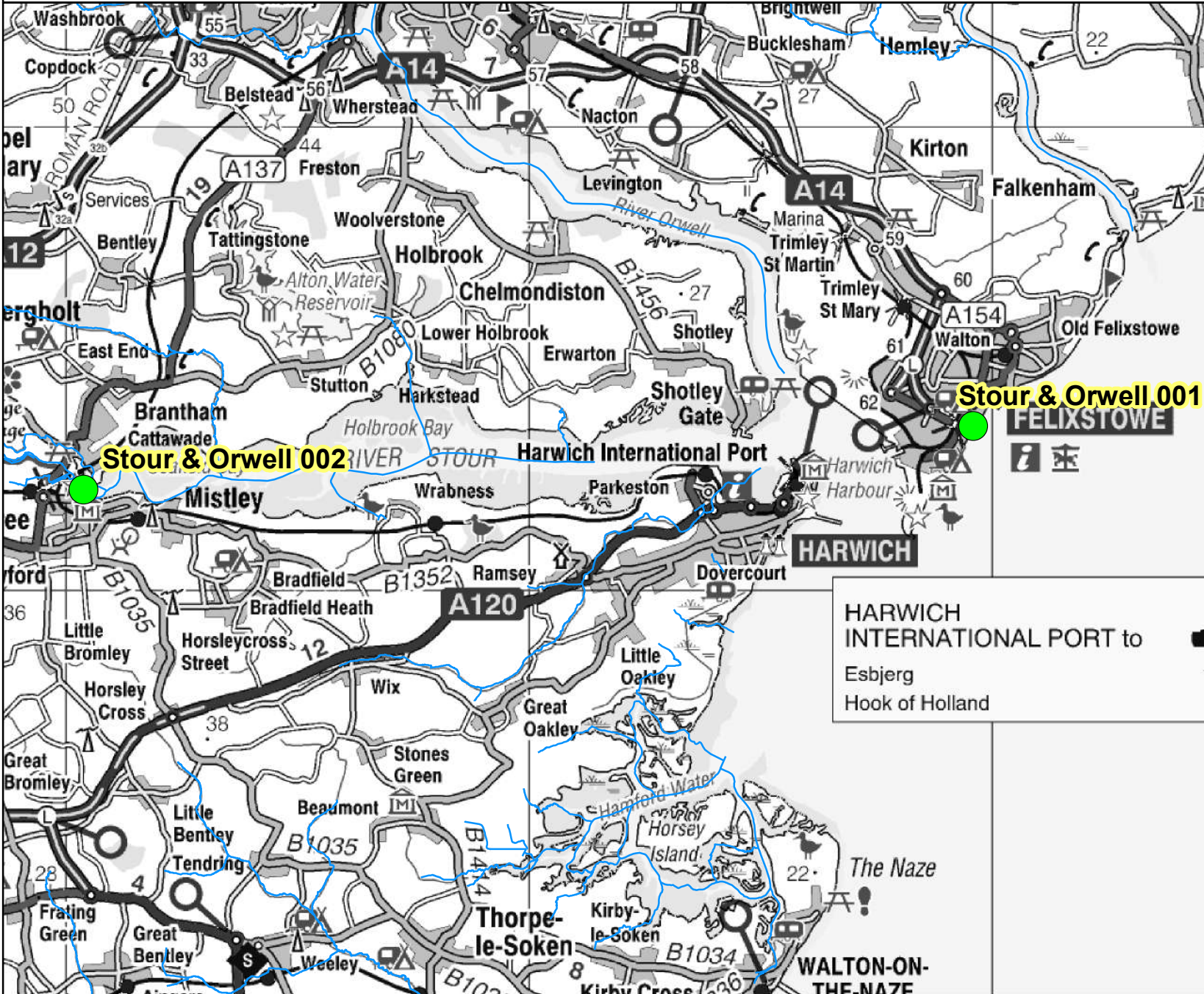
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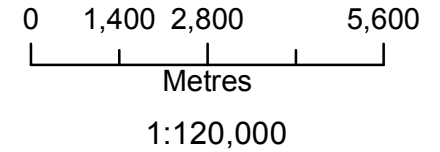
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APPENDIX A – EA BREACH DATA

Breach Hazard & Depth Mapping - Stour & Orwell Breaches



Environment Agency
Iceni House
Cobham Road
Ipswich
Suffolk
IP3 9JD



Legend

● Breach_Location

Main Rivers

This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of the flood water, and the maximum values of these are also mapped.

The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.

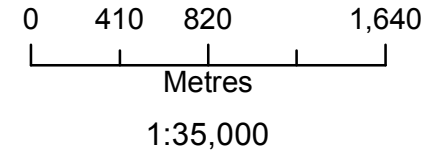
The map only considers the consequences of a breach, it does not make any assumptions about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains.

Please contact the Environment Agency for further information on emergency planning associated with flood risk in this area.

Breach Hazard Mapping - Stour & Orwell Breaches



Environment Agency
Iceni House
Cobham Road
Ipswich
Suffolk
IP3 9JD



Legend

Main Rivers

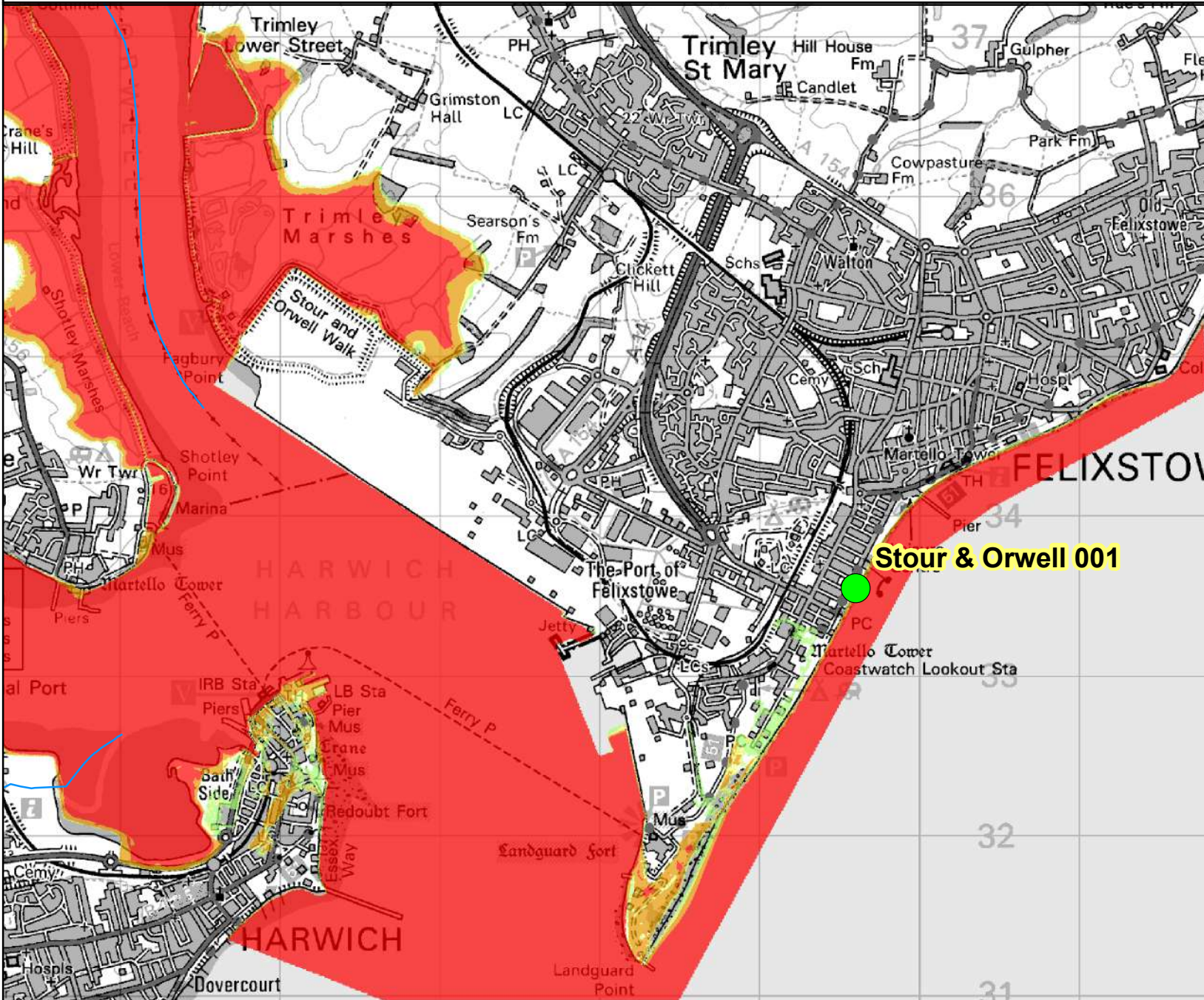


Breach_Location



Max Hazard - 200 Year Present Day

- Less than 0.75 (Low Hazard)
- Between 0.75 and 1.25 (Danger for Some)
- Between 1.25 and 2.00 (Danger for Most)
- Greater than 2.00 (Danger for All)



This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of the flood water, and the maximum values of these are also mapped.

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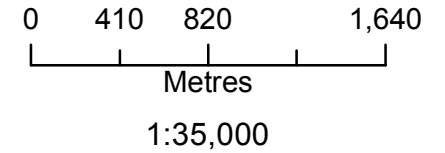
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Breach Hazard Mapping - Stour & Orwell Breaches



Environment Agency
Iceni House
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Ipswich
Suffolk
IP3 9JD



Legend

Main Rivers

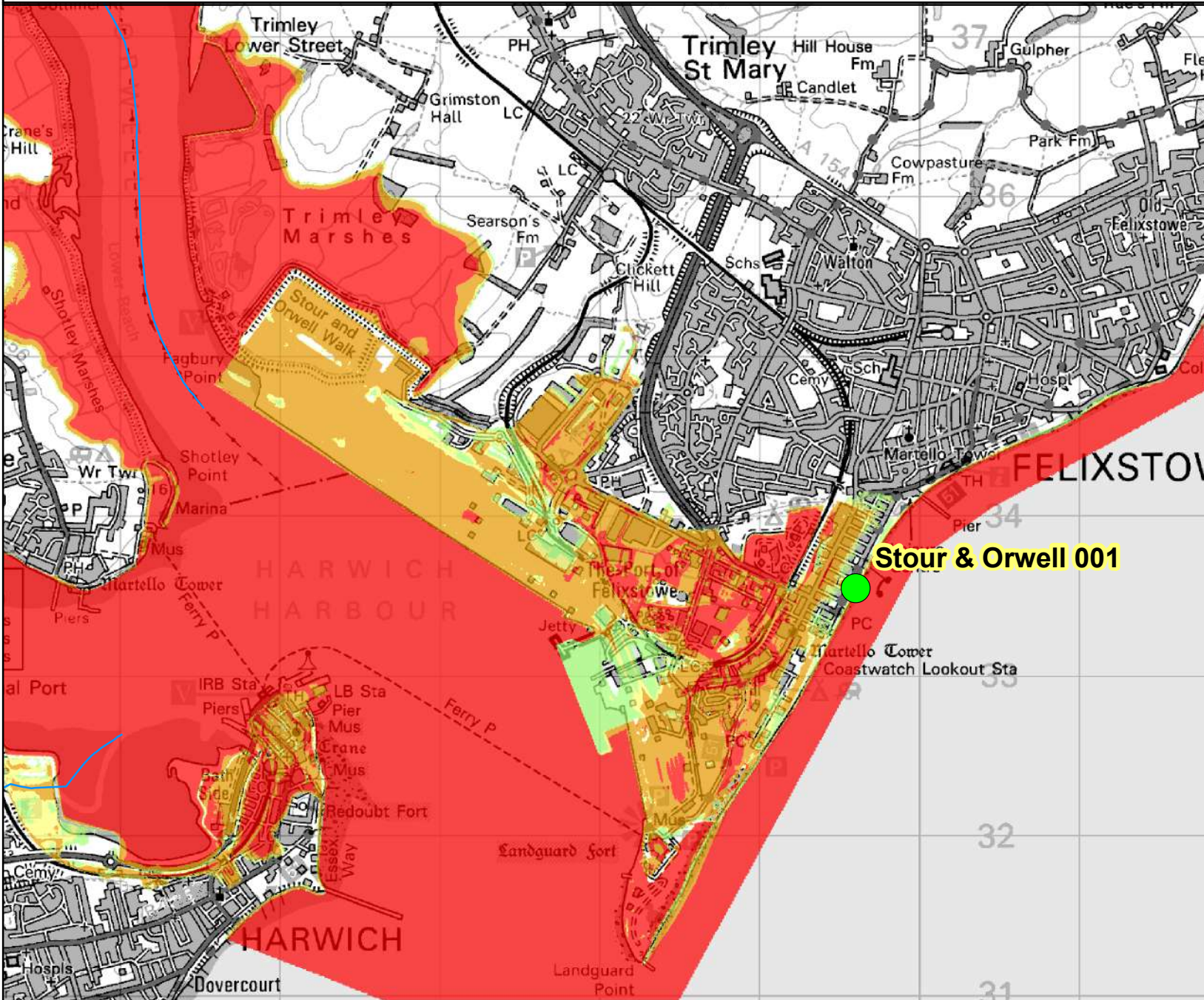


Breach_Location



Max Hazard - 200 Year Climate Change

- Less than 0.75 (Low Hazard)
- Between 0.75 and 1.25 (Danger for Some)
- Between 1.25 and 2.00 (Danger for Most)
- Greater than 2.00 (Danger for All)



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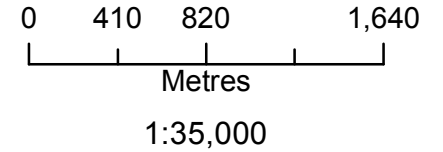
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Breach Hazard Mapping - Stour & Orwell Breaches



Environment Agency
Iceni House
Cobham Road
Ipswich
Suffolk
IP3 9JD



Legend

Main Rivers



Breach_Location



Max Hazard - 1000 Year Present Day

- Less than 0.75 (Low Hazard)
- Between 0.75 and 1.25 (Danger for Some)
- Between 1.25 and 2.00 (Danger for Most)
- Greater than 2.00 (Danger for All)



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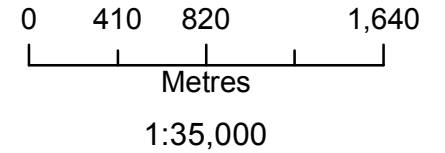
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Breach Hazard Mapping - Stour & Orwell Breaches



Environment Agency
Iceni House
Cobham Road
Ipswich
Suffolk
IP3 9JD



Legend

Main Rivers

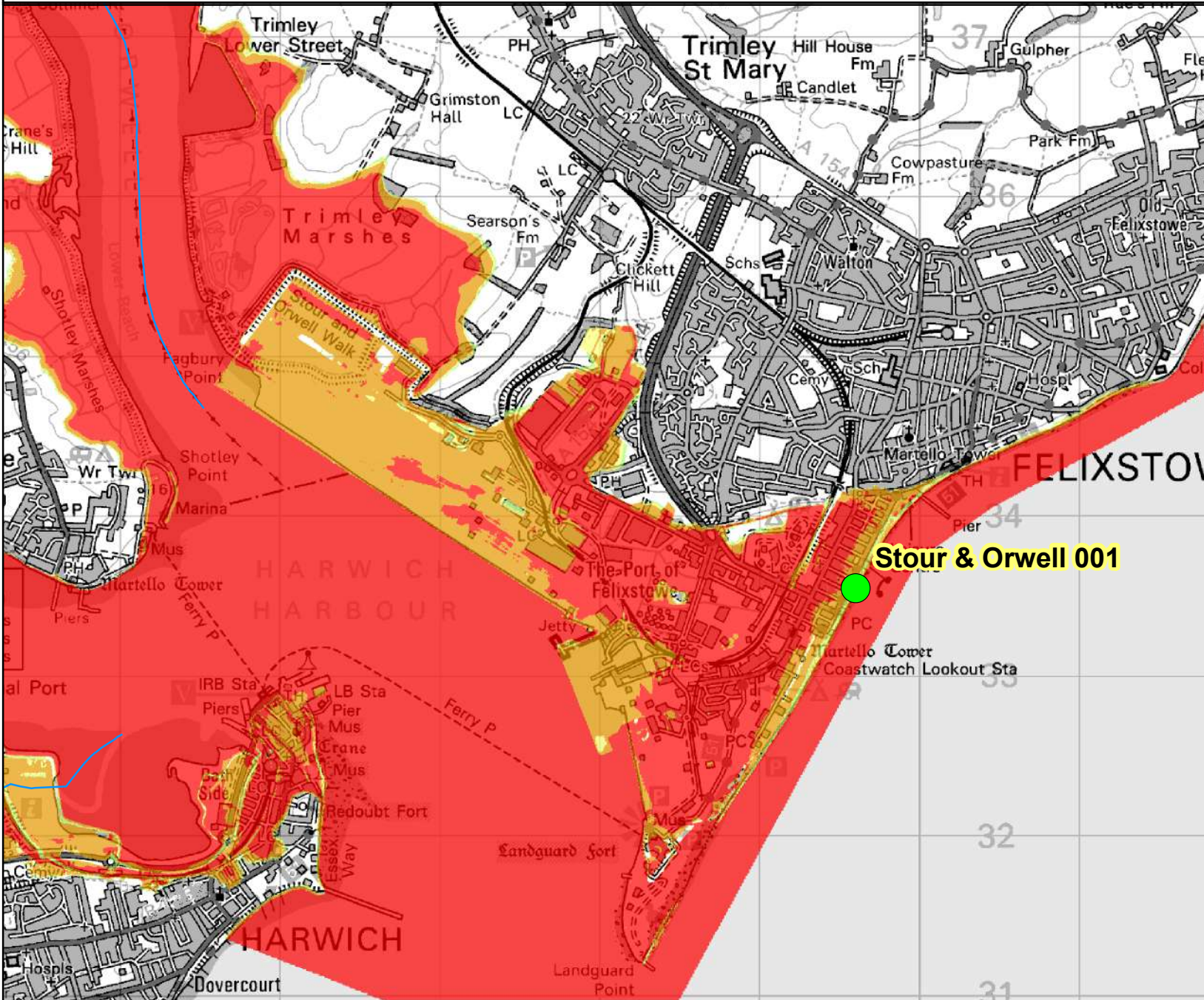


Breach_Location



Max Hazard - 1000 Year Climate Change

- Less than 0.75 (Low Hazard)
- Between 0.75 and 1.25 (Danger for Some)
- Between 1.25 and 2.00 (Danger for Most)
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Breach Depth Mapping - Stour & Orwell Breaches



Environment Agency
Iceni House
Cobham Road
Ipswich
Suffolk
IP3 9JD



0 410 820 1,640
Metres
1:35,000

Legend

Main Rivers

Breach_Location



Max Depth (m) 200 Year Present Day

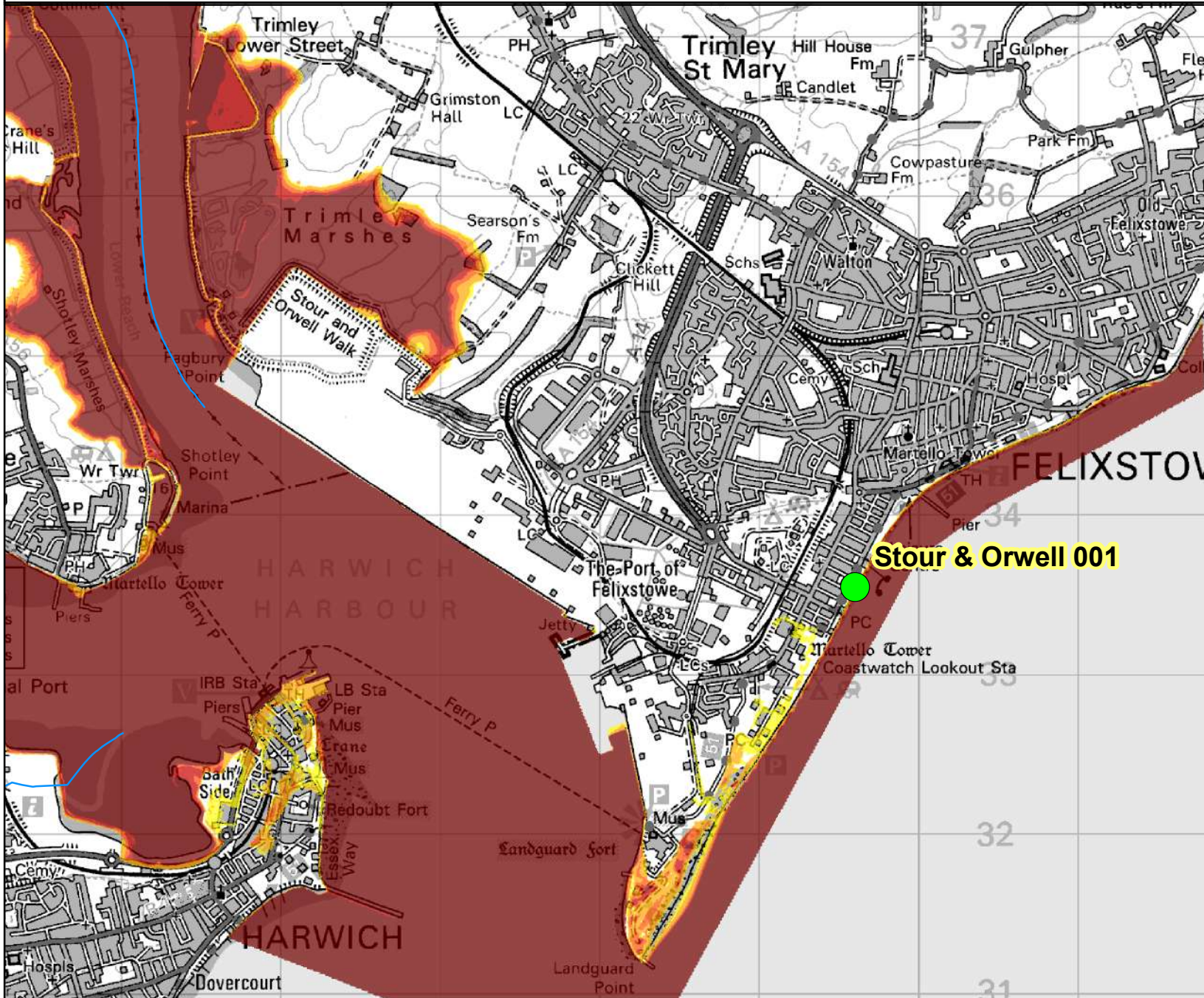
- 0 - 0.00000001
- 0 - 0.25
- 0.25 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00

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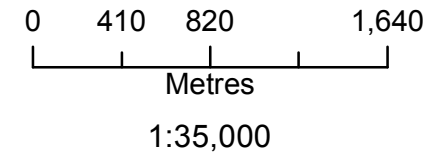
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Breach Depth Mapping - Stour & Orwell Breaches



Environment Agency
Iceni House
Cobham Road
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Suffolk
IP3 9JD



Legend

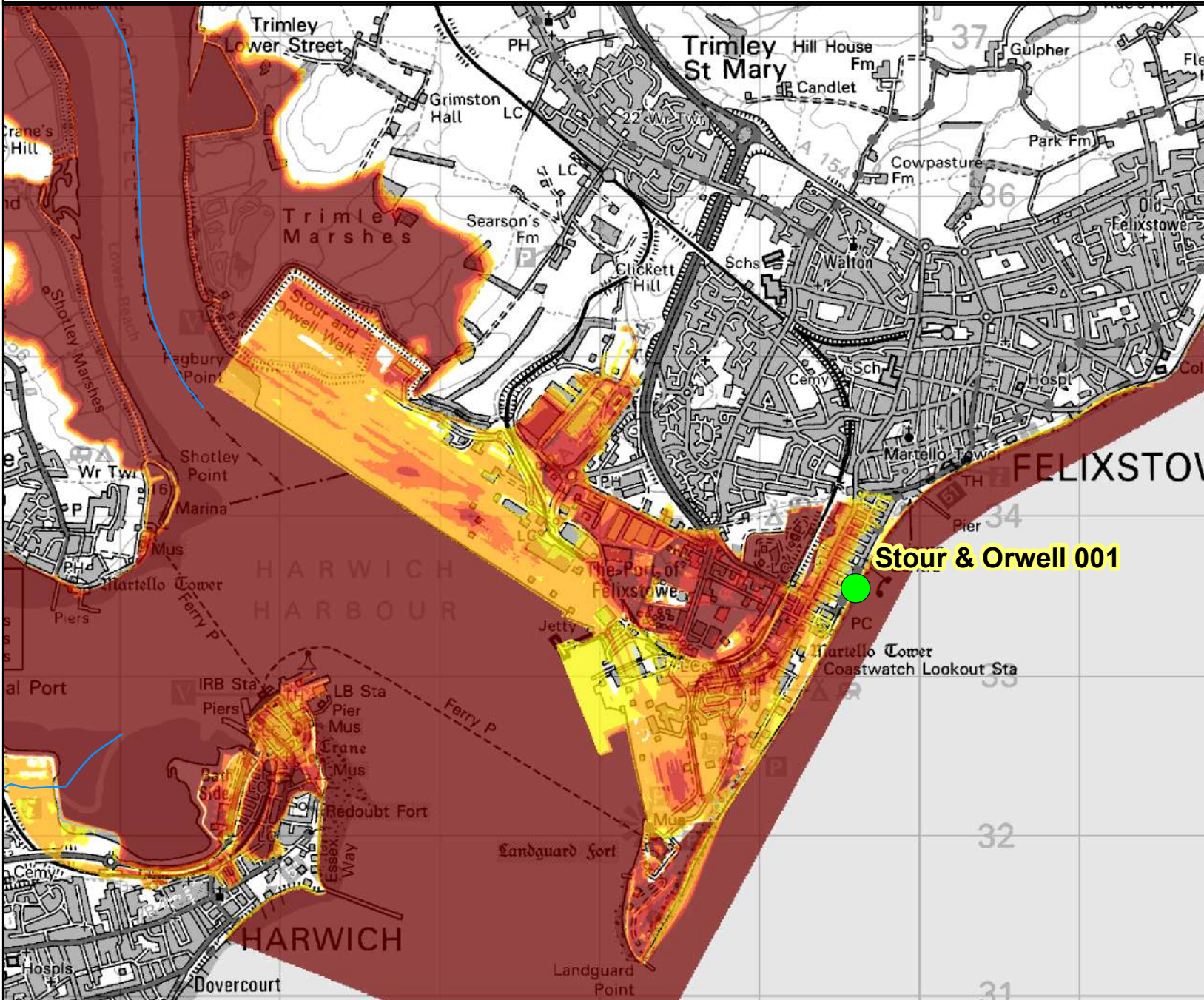
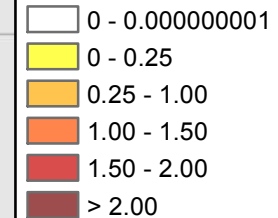
Main Rivers



Breach_Location



Max Depth (m) 200 Year Climate Change



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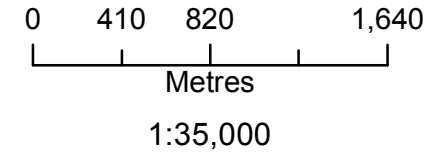
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Breach Depth Mapping - Stour & Orwell Breaches



Environment Agency
Iceni House
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Legend

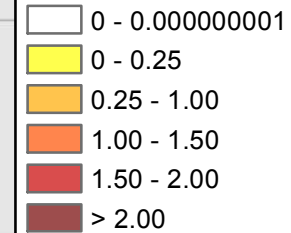
Main Rivers



Breach_Location



Max Depth (m) 1000 Year Present Day

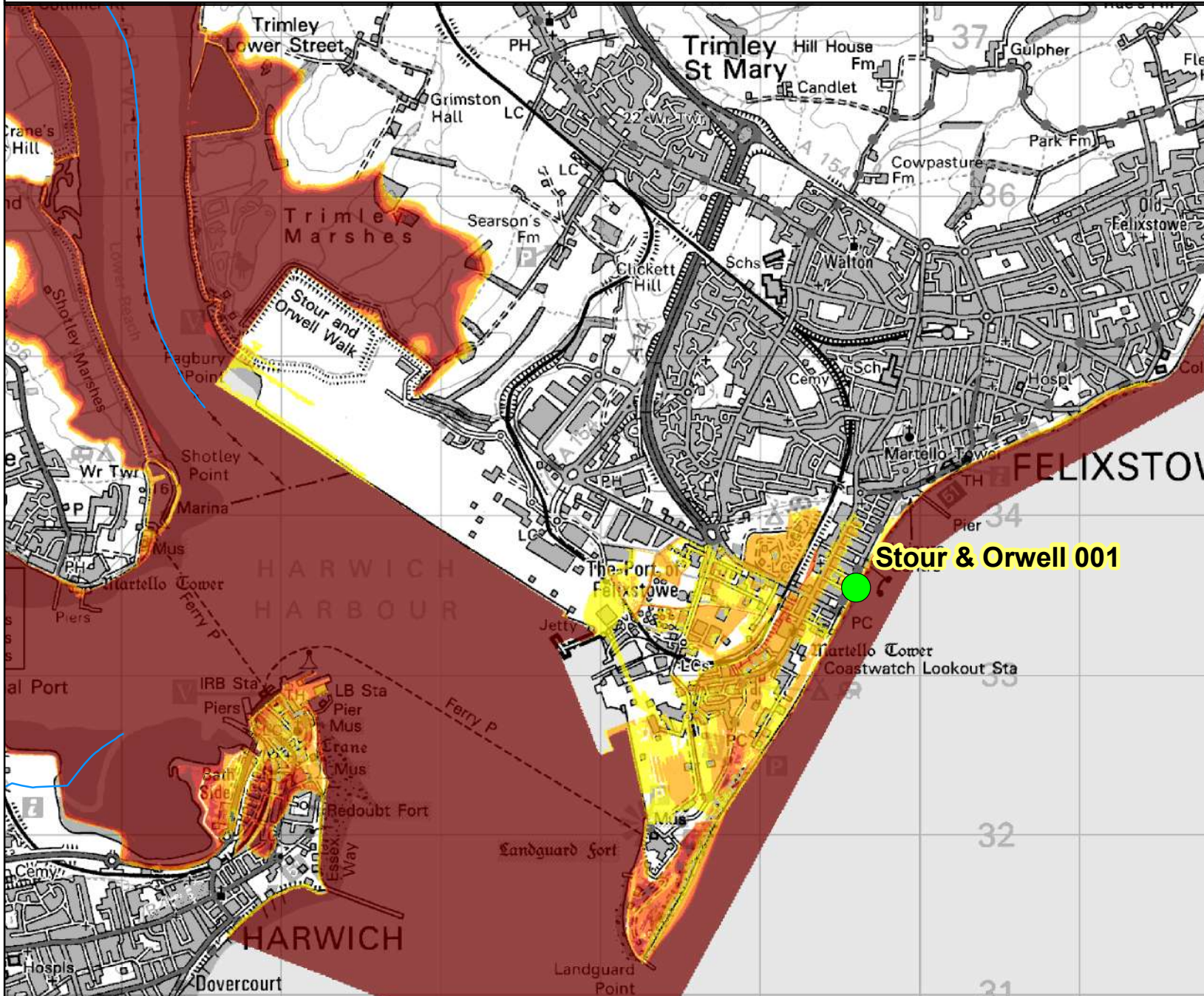


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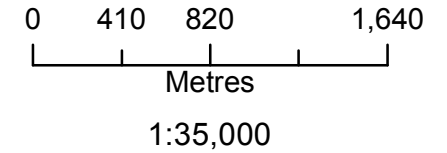
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Breach Depth Mapping - Stour & Orwell Breaches



Environment Agency
Iceni House
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Legend

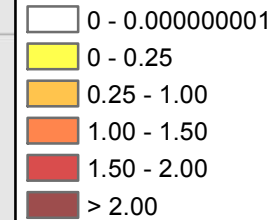
Main Rivers



Breach_Location



Max Depth (m) 1000 Year Climate Change

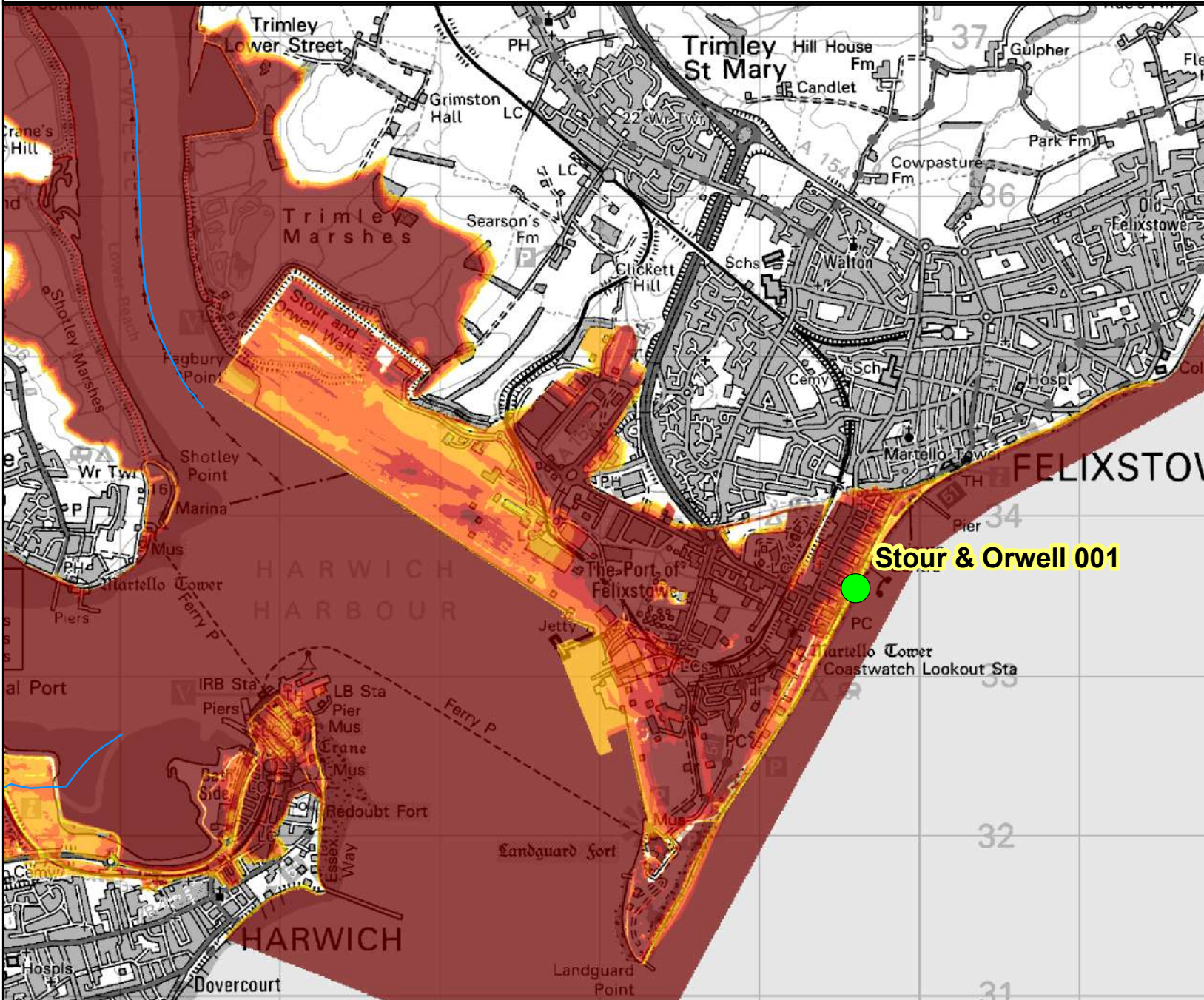


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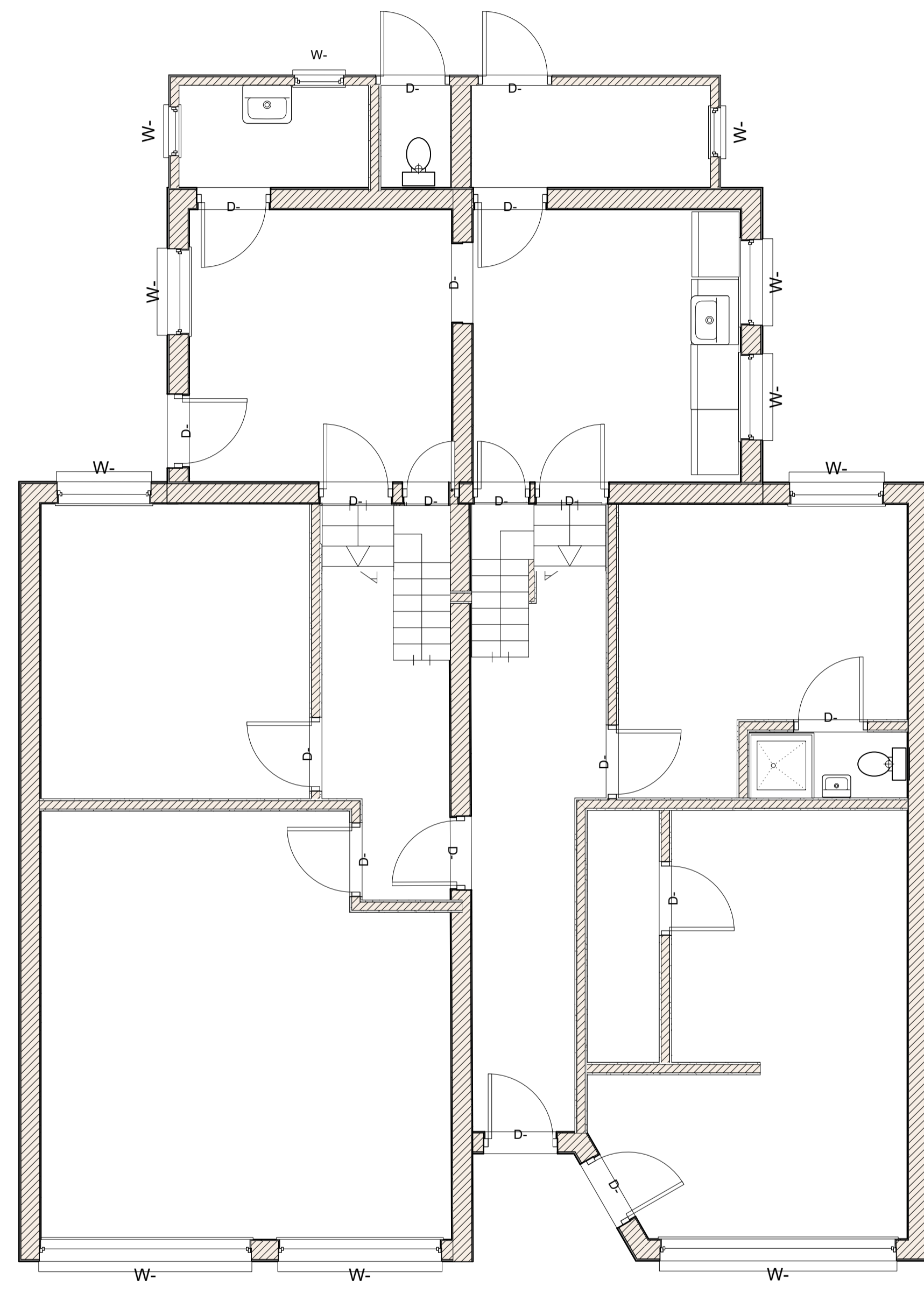
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Please contact the Environment Agency for further information on emergency planning associated with flood risk in this area.



DRAWINGS



1 Ground Floor - Existing
Scale: 1:50

A complete set of kitchen facilities consisting of the following items must be provided for every five persons:

Sink:
A stainless steel sink, integral drainer and a tiled splash-back, on a base unit. The sink must have constant supplies of hot and cold running water and be properly connected to the drains. The cold water must come directly from the rising water main. It must be possible to stand directly in front of the sink and to place utensils down on both sides of each.

Cooker:
A gas or electric cooker with four ring burners, oven and grill, that are capable of simultaneous use. The cooker is to be located away from doorways with a minimum of 300mm worktop to both sides and must be possible to stand directly in front of.

Electrical sockets:
At least three double 13amp electrical power points (in addition to those used for fixed appliances, such as washing machines/dishwashers etc).

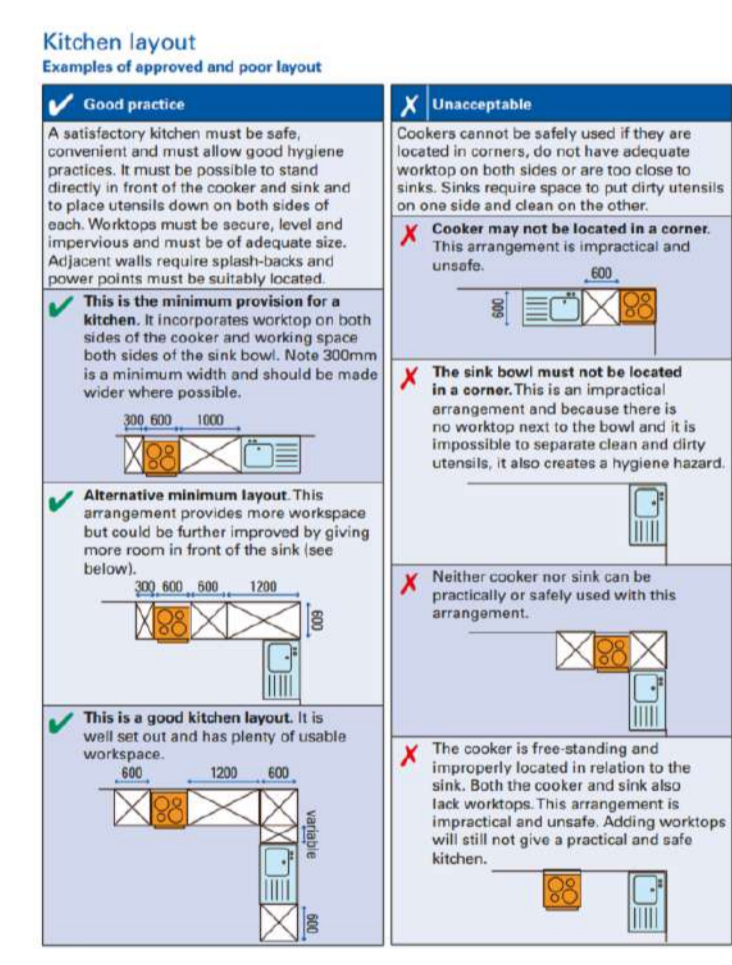
Worktop:
A kitchen worktop that is level, secure and impervious. The minimum dimensions are 1000mm length and 600mm width.

Storage:
A food storage cupboard for each occupant that is at least one 500mm wide base unit or a 1000mm wide wall unit. This may be provided within each occupant's room. (The space in the unit beneath the sink and drainer is not allowable for food storage).

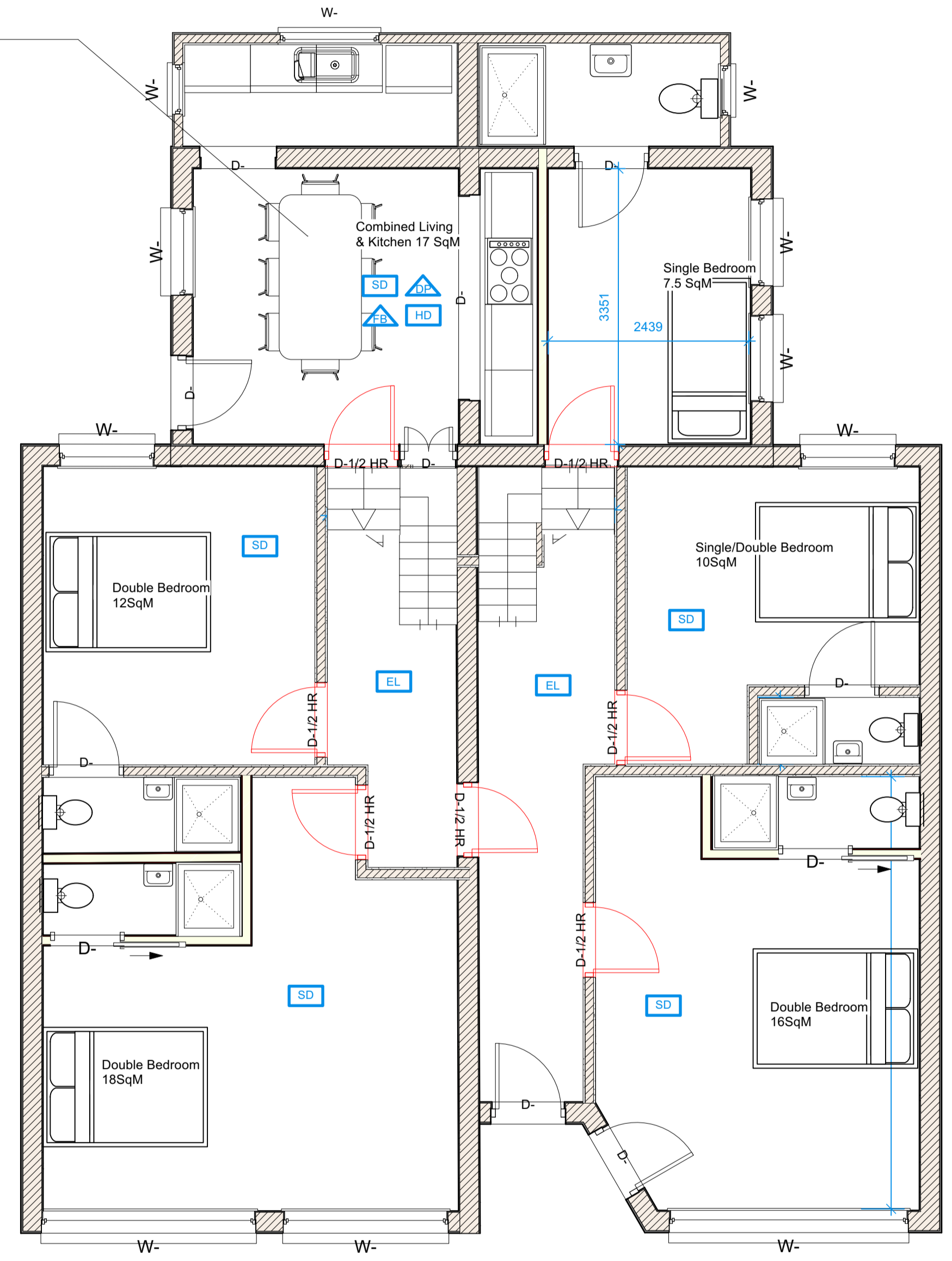
Fridge/Freezer:
A refrigerator with a minimum capacity of 130 litres plus a freezer with a minimum capacity of 60 litres. If not in the kitchen the fridge/freezer must be freely accessible and adjoining the kitchen.

Refuse disposal:
Adequate provision must be made for the collection storage and disposal of refuse.

Ventilation:
Mechanical ventilation to the outside air at a minimum extraction rate of 60 litres/second or 30 litres/second if the fan is sited within 300mm of the centre of the hob. This is in addition to any windows.



- = SMOKE DETECTOR
- = HEAT DETECTOR
- = EMERGENCY LIGHTING
- = DRY POWDER EXTINGUISHER
- = FIRE BLANKET
- = FOAM EXTINGUISHER
- = WATER EXTINGUISHER
- = 30 MINUTE FIRE WALL CONSTRUCTION
- = 30 MINUTE FIRE DOOR



2 Ground Floor - Proposed
Scale: 1:50

IMPORTANT INFORMATION

- All dimensions to be checked on site by Contractor prior to commencement of works. Contractor to report any discrepancies and await further instructions before proceeding.
- Roof Trusses, Block and Beam and Easijoints, must be physically on site measured and checked prior to ordering, we accept no responsibility or liability for the accuracy of the desktop plans submitted for planning and building control.
- We use Ordnance Survey digital maps for Topography and Boundaries, it is the responsibility of the Land Owner to ensure he owns all the land the proposed development uses, and obtain if necessary any easements required to carry out the proposed work.
- All building materials and techniques must be agreed to be compliant by Building Control prior to commencement.



Design Firm
Complete Planning and Sustainable Development Ltd
33 Malthouse Road
Manningtree
CO11 1BY

Project Title
HMO - The Norfolk Guest House
1-3 Holland Road, Felixstowe
IP11 1BA

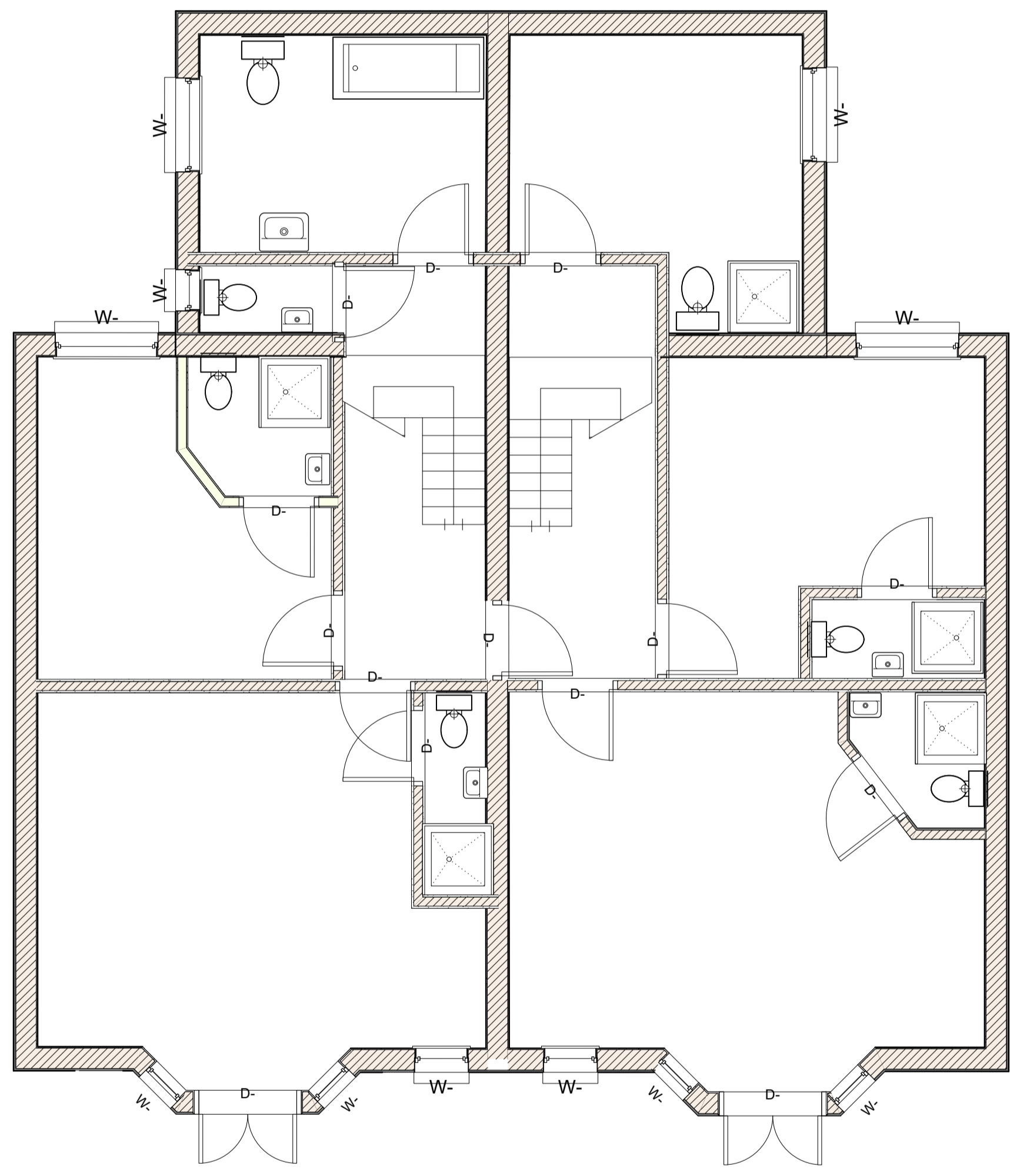
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Sheet Scale	Drawn By CP
Total Sheets 7	Reviewed By BP

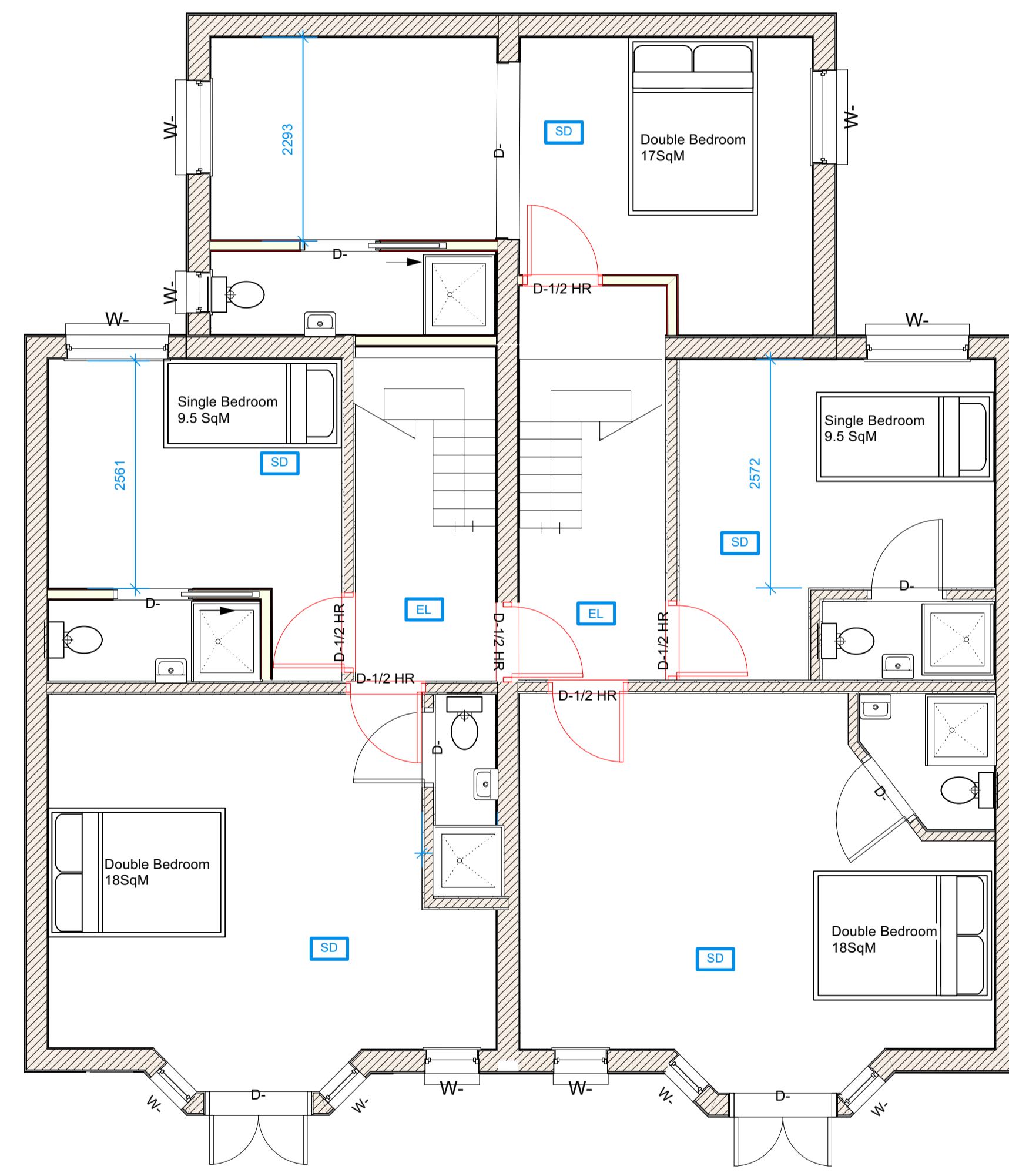
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Sheet No. 100001
Plan ID
IP111BA

Subsidiary
For Planning



1 First Floor - Existing
Scale: 1:50



2 First Floor - Proposed
Scale: 1:50

IMPORTANT INFORMATION

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Design Firm
Complete Planning and Sustainable Development Ltd
 33 Malthouse Road
 Manningtree
 CO11 1BY

Project Title
 HMO - The Norfolk Guest House
 1-3 Holland Road, Felixstowe
 IP11 1BA

Sheet Title
 First Floor Plan

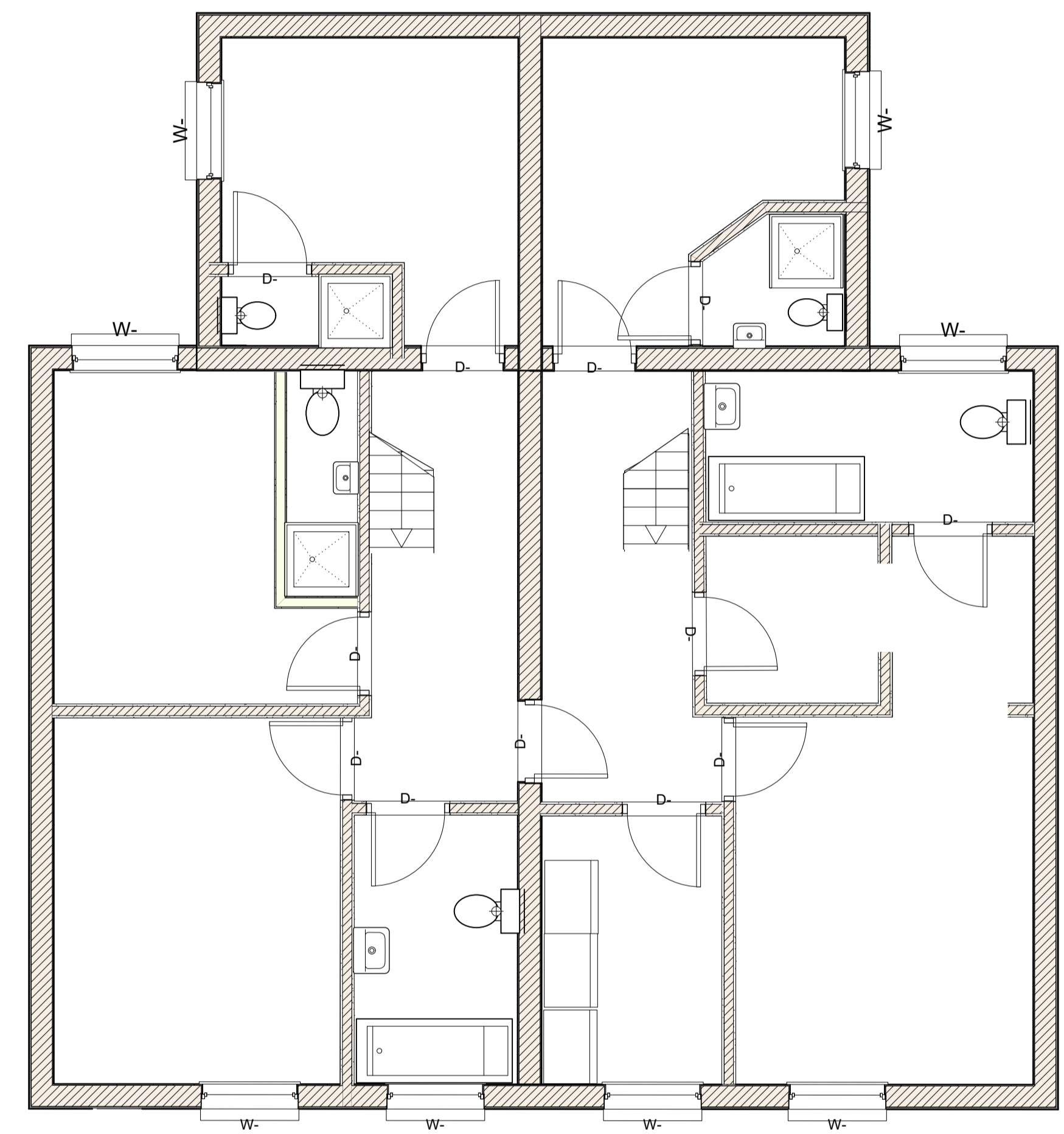
Sheet Scale	Drawn By CP
Total Sheets 7	Reviewed By BP

File Name
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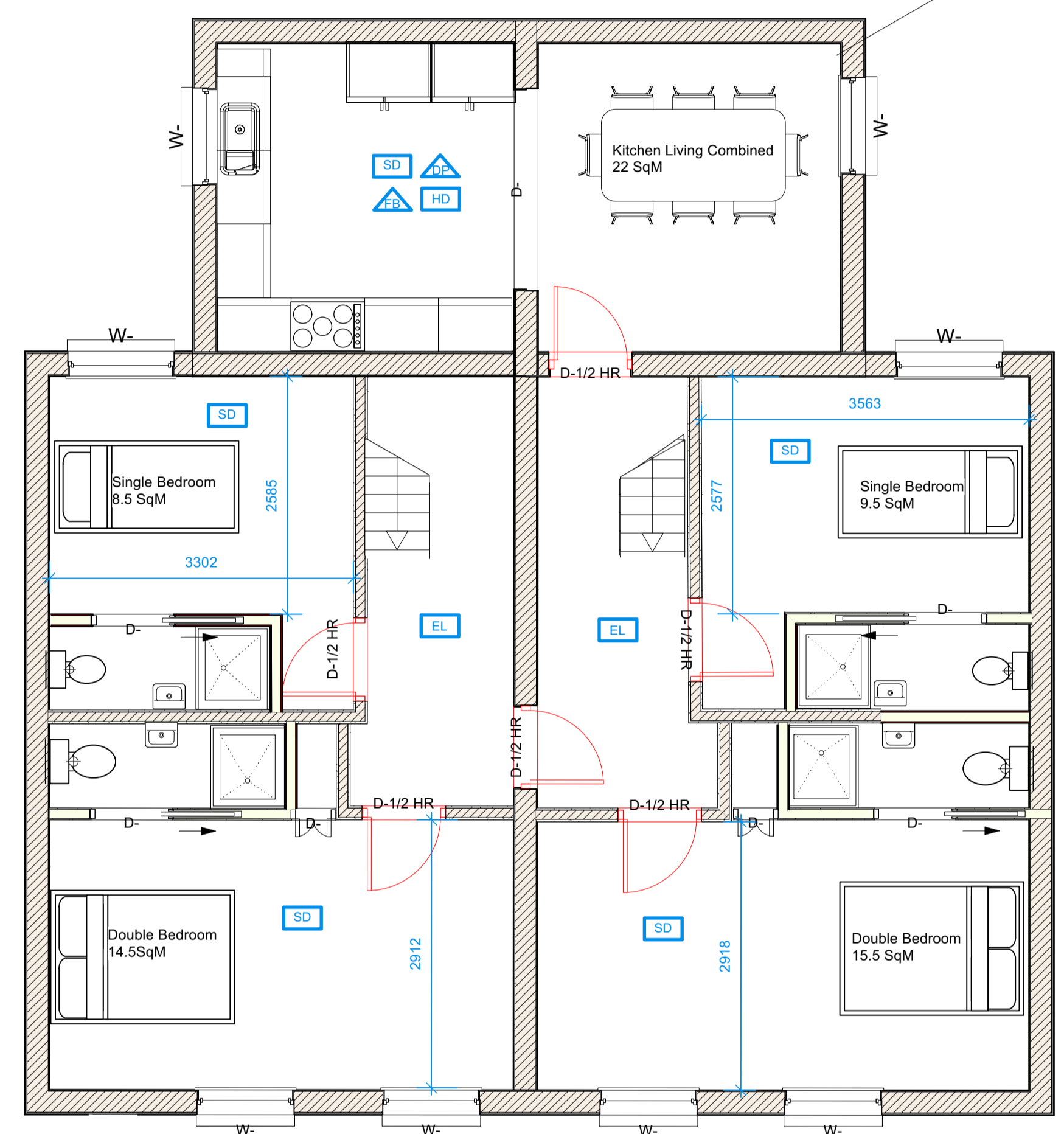
Sheet No. 100002
 Project
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Subsidiary
 For Planning

- SD = SMOKE DETECTOR
- HD = HEAT DETECTOR
- EL = EMERGENCY LIGHTING
- DP = DRY POWDER EXTINGUISHER
- FB = FIRE BLANKET
- FA = FOAM EXTINGUISHER
- WA = WATER EXTINGUISHER
- = 30 MINUTE FIRE WALL CONSTRUCTION
- D-1/2 HR = 30 MINUTE FIRE DOOR



1 **Second Floor - Existing**
Scale: 1:50



2 **Second Floor - Proposed**
Scale: 1:50

A complete set of kitchen facilities consisting of the following items must be provided for every five persons:

- Sink:**
A stainless steel sink, integral drainer and a tiled splash-back, on a base unit. The sink must have constant supplies of hot and cold running water and be properly connected to the drains. The cold water must come directly from the rising water main. It must be possible to stand directly in front of the sink and to place utensils down on both sides of each.
- Cooker:**
A gas or electric cooker with four ring burners, oven and grill, that are capable of simultaneous use. The cooker is to be located away from doorways with a minimum of 300mm worktop to both sides and must be possible to stand directly in front of.
- Electrical sockets:**
At least three double 13amp electrical power points (in addition to those used for fixed appliances, such as washing machines/dishwashers etc).
- Worktop:**
A kitchen worktop that is level, secure and impervious. The minimum dimensions are 1000mm length and 600mm width.
- Storage:**
A food storage cupboard for each occupant that is at least one 500mm wide base unit or a 1000mm wide wall unit. This may be provided within each occupant's room. (The space in the unit beneath the sink and drainer is not allowable for food storage).
- Fridge/Freezer:**
A refrigerator with a minimum capacity of 130 litres plus a freezer with a minimum capacity of 60 litres. If not in the kitchen the fridge/freezer must be freely accessible and adjoining the kitchen.
- Refuse disposal:**
Adequate provision must be made for the collection storage and disposal of refuse.
- Ventilation:**
Mechanical ventilation to the outside air at a minimum extraction rate of 60 litres/second or 30 litres/second if the fan is sited within 300mm of the centre of the hob. This is in addition to any windows

Kitchen layout	
Examples of approved and poor layout	
<p>✓ Good practice</p> <p>A satisfactory kitchen must be safe, convenient and must allow good hygiene practices. It must be possible to stand directly in front of the cooker and sink and to place utensils down on both sides of each. Worktop must be secure, level and impervious and must be of adequate size. Adjacent walls require splash-backs and power points must be suitably located.</p>	<p>✗ Unacceptable</p> <p>Cookers cannot be safely used if they are located in corners, do not have adequate worktop on both sides or are too close to sinks. Sinks require space to put dirty utensils on one side and clean on the other. This arrangement is impractical and unsafe.</p>
<p>✓ This is the minimum provision for a kitchen. It incorporates worktop on both sides of the cooker and working space both sides of the sink bowl. Note 300mm is a minimum width and should be made wider where possible.</p>	<p>✗ The sink bowl must not be located in a corner. This is an impractical arrangement and because there is no worktop next to the bowl and it is impossible to separate clean and dirty utensils, it also creates a hygiene hazard.</p>
<p>✓ Alternative minimum layout. This arrangement provides more workspace but could be further improved by giving more room in front of the sink (see below).</p>	<p>✗ Neither cooker nor sink can be practically or safely used with this arrangement.</p>
<p>✓ This is a good kitchen layout. It is well set out and has plenty of usable workspace.</p>	<p>✗ The cooker is free standing and impractically located in relation to the sink. Both the cooker and sink also lack worktop. This arrangement is impractical and unsafe. Adding worktop will still not give a practical and safe kitchen.</p>

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COMPLETE PLANNING

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Sheet Title
Second Floor Plan

Sheet Scale	Drawn By CP
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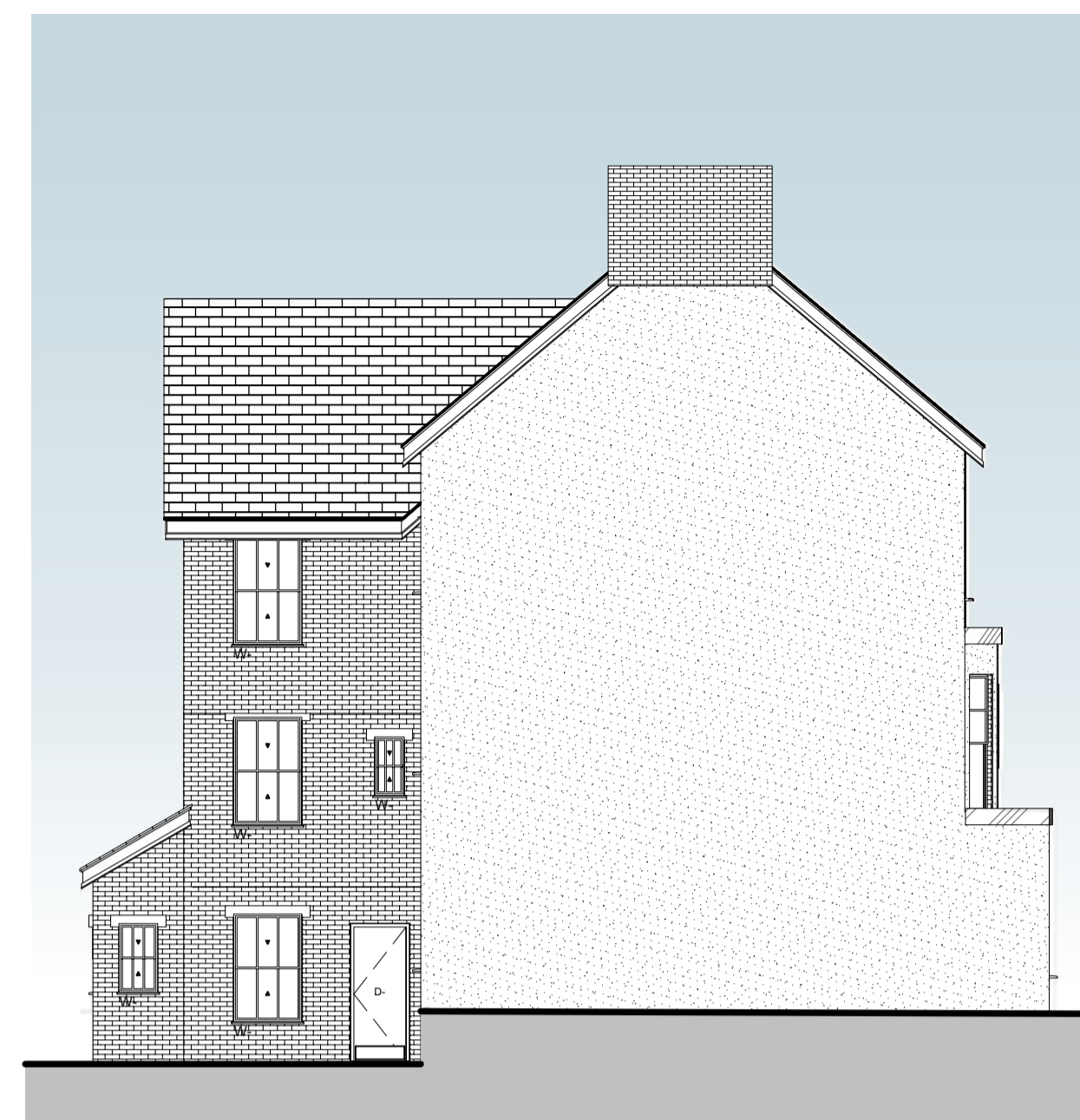
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Plan ID
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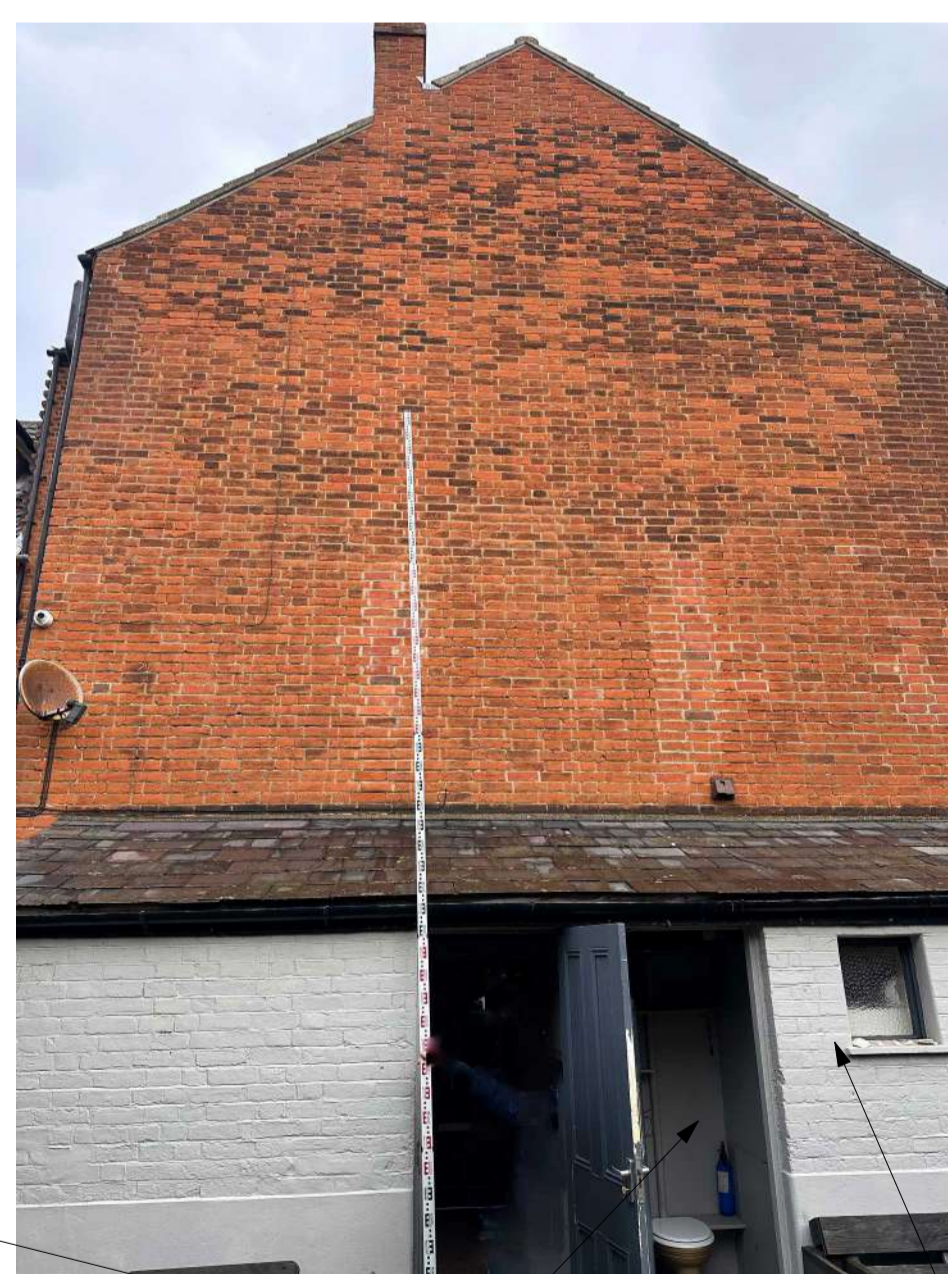
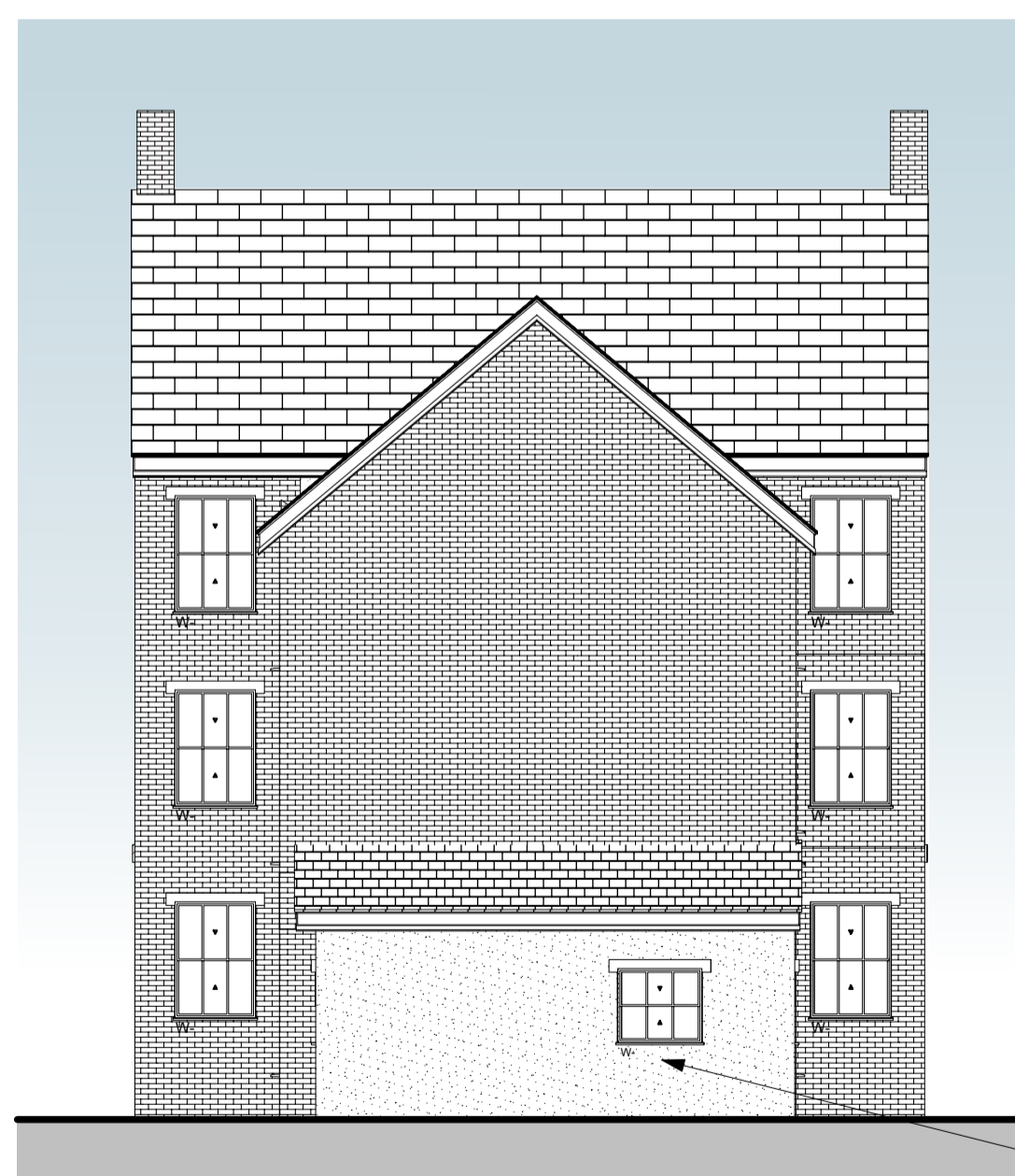
Subsidiary
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1 North Elevation - No Changes
Scale: 1:100



2 East Elevation - No Changes
Scale: 1:100



6 South - Removal of doors from rear lean-to
Scale: 1:100

Remove doors and increase window size



5 West Elevation - No Changes
Scale: 1:100

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Project Title
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Sheet Title
Elevations

Sheet Scale	Drawn By CP
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File Name
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Subsidiary
For Planning

