



Consulting Civil Engineers

# Flood Risk Assessment

**23 Tower Street, Emsworth**

**For**

**Helyer Davies Architects Ltd**

Rev 2

Reference **C2376**

Date **19.01.2023**

## REVISION

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|          |                 |                                        |                 |           |           |

# 1 SITE AND DEVELOPMENT OVERVIEW

| DEVELOPMENT DESCRIPTION                               | EXISTING (PRE-DEVELOPMENT)                                                                           | PROPOSED (POST-DEVELOPMENT)                                                                                                                                                                                       |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Site Use</b>                                       | Residential (report ref: existing site coverage)                                                     | Residential                                                                                                                                                                                                       |
| <b>Development Use</b>                                | Residential (report ref: existing site use)                                                          | Residential (report ref: proposed site use)                                                                                                                                                                       |
| <b>Use Design Life</b>                                |                                                                                                      | 100 years (epoch 2123)                                                                                                                                                                                            |
| <b>Number of Dwellings</b>                            | 1                                                                                                    | 1                                                                                                                                                                                                                 |
| <b>EA Vulnerability Classification</b>                | More Vulnerable (ref: existing site vulnerability)                                                   | More Vulnerable (ref: proposed site vulnerability)                                                                                                                                                                |
| <b>Development Class</b>                              |                                                                                                      | Minor                                                                                                                                                                                                             |
| <b>County Planning Authority</b>                      | Hampshire County Council (HCC) (ref: district Council)                                               |                                                                                                                                                                                                                   |
| <b>District Planning Authority</b>                    | Havant Borough Council (HBC) (ref: district Council)                                                 |                                                                                                                                                                                                                   |
| <b>Local Sewer Authority</b>                          | Southern Water (ref: Local Sewer Authority)                                                          |                                                                                                                                                                                                                   |
| SITE CATCHMENT CHARACTERISTICS                        | DESCRIPTION                                                                                          | SOURCE                                                                                                                                                                                                            |
| <b>Management Catchment</b>                           | East Hampshire Management Catchment (report ref: River Basin Catchment)                              | <a href="https://environment.data.gov.uk/catchment-planning">https://environment.data.gov.uk/catchment-planning</a>                                                                                               |
| <b>Nearest Main Body</b>                              | Emsworth/Chichester Harbour                                                                          | <a href="https://environment.maps.arcgis.com/apps/MapSeries/">https://environment.maps.arcgis.com/apps/MapSeries/</a>                                                                                             |
| <b>Nearest Ordinary watercourse or surface waters</b> | None                                                                                                 | Online Mapping and topography                                                                                                                                                                                     |
| KEY FLOOD RISK AND DATA SOURCES                       | DATA TYPE                                                                                            | SOURCE                                                                                                                                                                                                            |
| <b>EA Fluvial and Tidal Planning Data</b>             | UK Government Flood Maps for Planning (ref: FMP)                                                     | <a href="https://flood-map-for-planning.service.gov.uk/">https://flood-map-for-planning.service.gov.uk/</a>                                                                                                       |
| <b>EA Surface Water Data</b>                          | DEFRA Risk of Flooding from Surface Water Sources GIS Data (ref: RoFSW)                              | <a href="https://environment.data.gov.uk/DefraDataDownload/?Mode=rofsww">https://environment.data.gov.uk/DefraDataDownload/?Mode=rofsww</a>                                                                       |
| <b>EA Long term Flood Risk</b>                        | UK Government Long term Flood Risk Maps (ref: LTFRM)                                                 | <a href="https://www.gov.uk/check-long-term-flood-risk">https://www.gov.uk/check-long-term-flood-risk</a>                                                                                                         |
| <b>Environment Agency Product 4/5 Data</b>            | Chichester Coastal Modelling (2D), completed by JBA Consulting in 2016 (report ref: EA Product Data) | EA                                                                                                                                                                                                                |
| <b>Historic Flood Risk Data</b>                       | DEFRA Historic Flood Outlines GIS Data                                                               | <a href="https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/HistoricFloodMap&amp;Mode=satial">https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/HistoricFloodMap&amp;Mode=satial</a> |
| <b>Strategic Flood Risk Assessment Data</b>           | PUSH SFRA (ref SFRA)                                                                                 | <a href="https://pcc.dynamicmaps.co.uk/MapThatPublic/Default.aspx">https://pcc.dynamicmaps.co.uk/MapThatPublic/Default.aspx</a>                                                                                   |
| <b>Local Flood Risk Assessment Data</b>               | (refer to SFRA)                                                                                      |                                                                                                                                                                                                                   |
| <b>Topographic Information</b>                        | DEFRA Opensource LIDAR Data                                                                          | <a href="https://environment.data.gov.uk/DefraDataDownload/?Mode=survey">https://environment.data.gov.uk/DefraDataDownload/?Mode=survey</a>                                                                       |
| <b>River or Sea Flood Risk Present</b>                | High                                                                                                 | Refer Section 3: Table 3                                                                                                                                                                                          |
| <b>Surface Water Flood Risk Present</b>               | Low                                                                                                  | Refer Section 3: Table 3                                                                                                                                                                                          |
| DESIGNATION                                           | FLOOD RISK DESIGNATION                                                                               | NOTE                                                                                                                                                                                                              |
| <b>Critical Design Flood Event (DFE)</b>              | <b>Tidal</b>                                                                                         | *Designation based on highest flood risk between River, Sea or Surface Water - Refer Section 3: Table 3                                                                                                           |

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## 2 INTRODUCTION

- 2.1 This report is a Flood Risk Assessment (FRA) for the proposed construction of a brick wall atop an existing seawall located at residential property located 23 Tower Street, Emsworth, PO10 7BH, at approximate Grid Reference: SU74950555 (see site location map, Figure 1).
- 2.2 This assessment is required under the National Planning Policy Framework (NPPF) and Local and District Councils given the location, scale and associated flood risks. This assessment has been undertaken solely to assess if the wall will negatively impact on existing flood risk. This FRA will also inform the Flood Risk Activity Permit (FRAP) required as the works will affect the existing seawall.

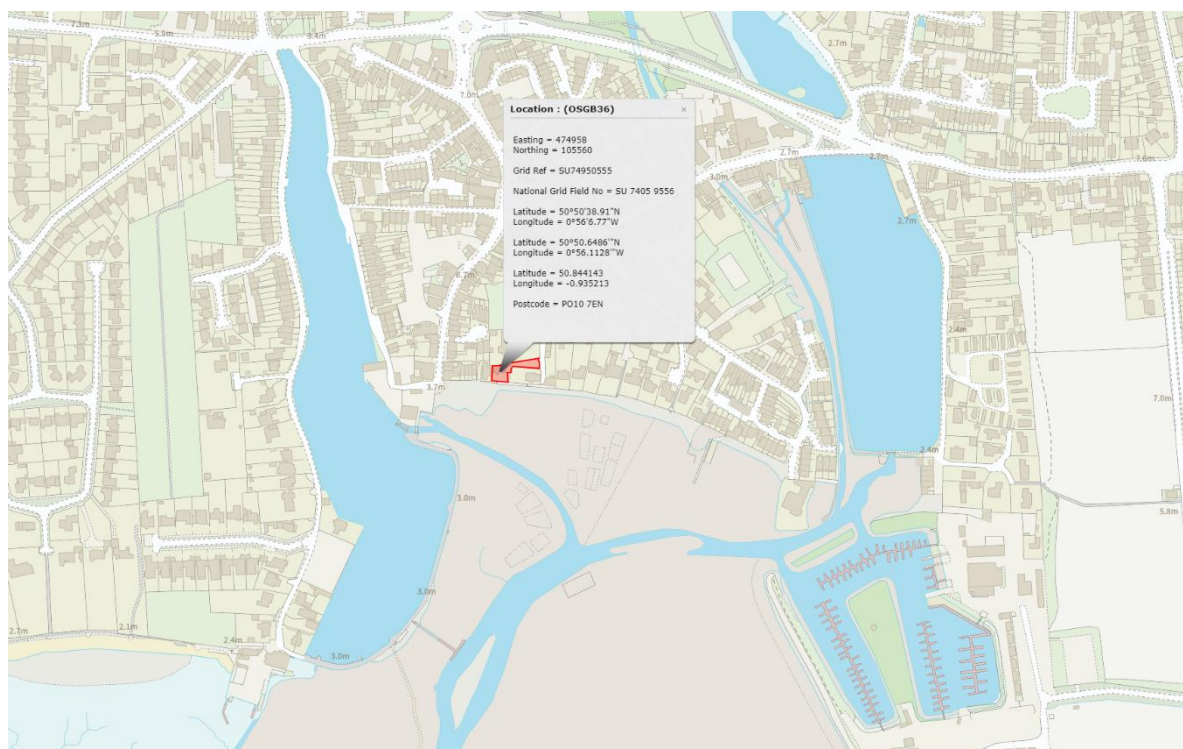


*Figure 1 - Site Location Plan (site bordered red) Source: Magic Map*

- 2.3 This FRA has been written in general accordance with the National Planning Policy Framework (NPPF) and its Planning Practice Guidance (PPG), Environment Agency (EA) Standing Advice, LFRMS, County SFRA and associated guidance. This FRA has relied upon publicly available information and data provided from the EA (where relevant). The interpretation of this data has been undertaken with the understanding of its accuracy and to a detail deemed suitable for this development type, location and relevant flood risk.
- 2.4 Where required, assumptions or extrapolation of the data may have been undertaken to estimate (in particular) climate change impacts or extreme flood extents. This is only undertaken where up-to date climate change modelling is not available.

## DEVELOPMENT PROPOSALS

- 2.5 The development proposals are for a new brick wall to be built up off of the existing concrete retaining seawall on the southern boundary. The wall's primary purpose is to reduce risk of falling from the garden, with a central opening to allowed continued access from the site. The proposed wall is not to be designed or proposed to be used as a flood defence.
- 2.6 The proposed brick wall is to have a level top, tying into the adjacent properties brick walls. Because of the slight fall in the land from west to east, the brick wall will vary in height along its length, from a minimum height of 1.10m (above existing ground levels) at the western edge of the wall, and a maximum height 1.410m at the eastern edge.

- 2.7 The purpose of this FRA is to review the risks and potential impact on flood risk as a result of the proposals, in context to the requirements the NPPF and the EA's information request.

## FLOOD RISK VULNERABILITY

- 2.8 This FRA has been undertaken with due regard to the statutory requirements of the NPPF (2022) and with reference to the Planning Practice Guidance (PPG) in relation to development and flood risk. This FRA has been undertaken to inform on the current flood risk to the site. Therefore, this FRA aims to ensure that the development proposals take into account the site-specific flood risk and to **avoid** inappropriate development in areas potentially at risk of flooding.
- 2.9 Annex 3 of the NPPF Flood Risk Vulnerability Classification provides guidance on assigning development vulnerability. A summary of this information is provided in Table 1.

*Table 1 – Extract from Annex 3 of the National Planning Policy Framework and Table 2: Flood risk vulnerability classification of PPG detailing Flood Risk Vulnerability Classification by use. (Existing Site Classification is Shaded Gray, Proposed Site specific classification shaded blue).*

| ESSENTIAL INFRASTRUCTURE                                                                              | HIGHLY VULNERABLE                                                             | MORE VULNERABLE                                                                                              | LESS VULNERABLE                                                                                           | WATER-COMPATIBLE                                         |
|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Essential transport infrastructure                                                                    | Police and ambulance stations; fire stations and telecom installations        | Hospitals                                                                                                    | Police, ambulance and fire stations which are not required to be operational during flooding.             | Flood control infrastructure.                            |
| Essential utility infrastructure which has to be located in a flood risk area for operational reasons | Emergency dispersal points.                                                   | Residential institutions such as residential care homes, prisons and hostels.                                | Buildings used for commercial purposes and of a non-residential nature                                    | Water transmission infrastructure and pumping stations.  |
| Wind turbines.                                                                                        | Basement dwellings.                                                           | Buildings used for dwelling houses and sleeping, drinking establishments                                     | Land and buildings used for agriculture and forestry.                                                     | Sewage transmission infrastructure and pumping stations. |
| Solar farms.                                                                                          | Caravans, mobile homes and park homes intended for permanent residential use. | Non-residential uses for health services, nurseries and educational uses                                     | Waste treatment (except landfill* and hazardous waste facilities).                                        | Sand and gravel working.                                 |
|                                                                                                       | Installations requiring hazardous substances consent.                         | Landfill* and sites used for waste management facilities for hazardous waste.                                | Minerals working and processing (except for sand and gravel working).                                     | Docks, marinas and wharves and Navigation facilities.    |
|                                                                                                       |                                                                               | Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan. | Water treatment and Sewage treatment works which do not need to remain operational during times of flood. | Ministry of Defence installations.                       |

- 2.10 The site is presently considered 'More Vulnerable' based on the classification uses within the NPPF. The development proposals will not increase or intensify use, by maintaining a single dwelling on the site.

### 3 FLOOD RISK ASSESSMENT SCOPE

- 3.1 Flood risk as defined by the NPPF, is a combination of the probability and the potential consequences of flooding. Areas at risk of flooding are those at risk of flooding from any source, now or in the future. Sources include rivers and the sea, direct rainfall on the ground surface, rising groundwater, overwhelmed sewers and drainage systems, reservoirs, canals and lakes and other artificial sources. Flood risk also accounts for the interactions between these different sources. This term is key to the application of the presumption in favour of sustainable development in paragraph 11 of the National Planning Policy Framework (NPPF).
- 3.2 The NPPF requires flood risk to be considered on all sites, however more detailed site-specific FRA's are required when one or more of the following criteria apply to the site:
- Where a site is affected by the **Design Flood Event** (DFE) from any source (typically the 1% AEP) for all proposals of any new development (including minor development and change of use); or
  - Greater than 1 ha in size and located in Flood Zone 1; or
  - Located in Flood Zone 1 where there are critical drainage problems or within a designated Critical Drainage Area (CDA) as notified to the LPA by the Environment Agency; or
  - Subject to a change of use to a higher vulnerability classification which may be subject to other sources of flooding; or
  - A Major planning application (i.e. more than 10 residential dwellings).
- 3.3 The NPPF designates that the '**Design Flood Event**' (DFE) is used to assess the suitability of a development proposal against the criteria of the NPPF. The design flood, is a flood event of a given annual flood probability, but is generally taken as:
- River flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year), typically shown as Flood Zone 3a as designated on the EA's Flood Map for Planning; or
  - Tidal flooding with a 0.5% annual probability (1 in 200 chance each year), typically shown as Flood Zone 3a as designated on the EA's Flood Map for Planning; or
  - Surface water flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year), typically shown as the Medium Risk of Surface Water flooding as designated on the EA's Long Term Flood Risk mapping,
- 3.4 In addition to assessing present day risk, the DFE also must be assessed to include and appropriate allowance for climate change (refer to Section 5 for climate change allowances) based on the site's geographical location, vulnerability and design life.
- 3.5 For the purpose of this FRA, the worst case DFE (whether this be from tidal, river or surface water sources), has been used to steer the recommendations of this report. Consideration of extreme events above that of the DFE have not been considered further beyond identifying these as residual risks.
- 3.6 Table 1 of the NPPF provides definitions of the Flood Zones, from low to high probability of river and sea flooding and also in regards to surface water flood risk. These Flood Zone Classification for the purpose of this FRA are:
- Flood Zone 1 - land assessed as having a less than a 1 in 1,000 annual probability (<0.1%);
  - Flood Zone 2 - land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river (1% – 0.1%), 1:100 year or greater of surface water flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year;
  - Flood Zone 3 - land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year. Flood Zone 3b is land have greater than 1 in 20 to 1 in 30 year annual probability of flooding.

3.7 Following an assessment from the various sources of flood risk for the DFE, this site-specific FRA has applied the key principles for decision making when flood risk is a consideration and includes in order of importance:

1. **Avoid** – This is to physically locating the development proposals to areas of lowest flood risk within the site and/or determined how to vertically place the proposals to such that more vulnerable uses are positioned above the design flood level (such as raising floor levels or placing more vulnerable uses on upper levels). Developers should refer to the BS 85500:2012-Flood resistant and resilient construction. Guide to improving the flood performance of buildings for applicable strategies);
2. **Control** - Planning authorities and developers can investigate measures to control the risk of flooding affecting the site (this may be through flood defences, flood gates, flood storage or other engineered solutions such as SUDS). This is rarely applied at the site level, and is mostly address through strategic and county level flood defence strategies. At this site level, typically this will be through applying a Water Exclusion or Water Entry strategy when design a building a or space.
3. **Mitigate** – Is the use of flood resistance and resilience measures to address any residual risks remaining after the use of the avoidance and control measures described above. Passive measures should be prioritised over active measures as they are likely to be more effective and more reliable. Flood Resilience is an approach to building design which aims to reduce flood damage and speed recovery and reoccupation following a flood. It uses a combination of flood resistance and recovery measures (referred to here as resilience measures), and is described in the industry-developed CIRIA Property Flood Resilience Code of Practice, which provides advice for both new-build and retrofit.
4. **Managing Residual Risk** – this will usually involve ensuring either safe access and egress is available from the safe in a DFE, Flood Warning Systems/Evacuation Plans are in place, safe refuge is on site during a DFE, the building is designed to account for flood loadings etc.
5. **Flood Risk is not increased elsewhere** – assuming all the above items can be address, it is critical that the development does not increase flood risk elsewhere as a result. Typically this is addressed by ensuring flood waters are not displaced (in surface water or river flood affected areas, the loss of floodplain storage is less likely to be a concern in areas benefitting from appropriate flood risk management infrastructure or where the source of flood risk is **solely** tidal.) or appropriate hydraulic modelling is provided in support of an application to demonstrate that flood risk is not increased outside of a site (such as through on site flood compensation or detailed site specific hydraulic modelling).

3.8 It should be noted, where up-to date flood risk or climate change models are not available, best efforts have been made to assess these risks and extrapolate the available data where necessary. However, this approach may require further detailed modelling if deemed necessary by the reviewing authorities. Detailed hydraulic modelling is deemed outside the scope of this report.

## SEQUENTIAL TEST/EXCEPTION TEST

3.9 For the purpose of this assessment, the application of the Sequential Test has been broken down into three levels. Passing the Sequential Test at the strategic level is a weighting of the risks versus benefit of a development against a wider criterion (such as meeting other sustainability targets, housing needs or other strategic planning goals) than just purely avoiding flood risk issues. However, the Sequential Test can also be applied at the site level, where development is steered towards lower areas of flood risk within a site boundary, and is much more objective in its assessment. For the purpose of this FRA, the assessment 'Level' of the Sequential Test are considered to be:

**Level 1** - At the high-level, this test is first implemented by local planning authorities (LPA) at the strategic planning scale. The Sequential Test is applied to steer local planning policy by directing particularly vulnerable new developments (e.g., residential, hospitals, mobile homes etc.) outside of the floodplain and for designating new land uses and future development areas.

**Level 2** - At the second instance, the Sequential Test is implemented for a specific development at the request of the LPA to assess other sites within an area defined by the LPA, this type of Sequential Test is present where there is a significant conflict between a proposed development and flood risk.

**Level 3** - The third instance, is where the Sequential Test is applied with the confines of the site, namely by steering development proposals to **avoid** areas of flood risk within a site itself.

3.10 Application of the first and second level of the Sequential Test is deemed outside the scope of this report.

3.11 Table 2 below presents a helpful guide in identifying the suitability of a site prior to applying Level 1 and 2 of the Sequential Tests and identifies when the Exception Test is required.

*Table 2 - The Sequential Test: Flood Risk Vulnerability and Flood Zone 'Compatibility' Table as specified by NPPF. Shaded cells denote the proposed re-development. Please note: ✓ means development is appropriate; x means the development should not be permitted and should be subject to a full sequential test. Refer to Table 2 for selected Flood Zone Designation*

| FLOOD RISK VULNERABILITY CLASSIFICATION |                                          | ESSENTIAL INFRASTRUCTURE | WATER COMPATIBLE | HIGHLY VULNERABLE       | MORE VULNERABLE         | LESS VULNERABLE |
|-----------------------------------------|------------------------------------------|--------------------------|------------------|-------------------------|-------------------------|-----------------|
| Flood Zone                              | <b>Zone 1</b>                            | ✓                        | ✓                | ✓                       | ✓                       | ✓               |
|                                         | <b>Zone 2</b>                            | ✓                        | ✓                | Exception Test Required | ✓                       | ✓               |
|                                         | <b>Zone 3a</b>                           | Exception Test Required  | ✓                | x                       | Exception Test Required | ✓               |
|                                         | <b>Zone 3b<br/>Functional Floodplain</b> | Exception Test Required  | ✓                | x                       | x                       | x               |

3.12 Based on the principles above, a development of this nature is considered appropriate and acceptable and full application of the Sequential Test or Exception Test is not deemed necessary at this time.

3.13 Therefore, this FRA presents the findings and recommendations for incorporation of flood resilient measures to improve long term flood resilience of the site as a result of the proposals.

3.14 The following sections undertakes further analysis of the data available from the Local and District Council and EA data sets relating to flooding from a number of sources.

3.15 Table 3 summarises the sites primary flood risk classifications and the source for the DFE. This designation is based on the EA's Flood Map for Planning (extract provided in Figure 2 ) and the EA's Long Term Flood Risk Maps (LTFRM): Risk of Flooding from Surface Water (RoFSW) (extract provided in Figure 3). Based on the EA's Flood Maps for Planning and the EA Product 4 data, the site is shown to be affected by Flood Zones 1, 2 and 3. The EA data confirms that flood risk from extreme tides is the dominant source of flood risk to the site.

3.16 Figure 3 shows that the site is wholly unaffected by surface water flooding across all modelled events. As such the site is considered to be at very low risk of surface water flooding and is likely to remain at low risk throughout its design life.

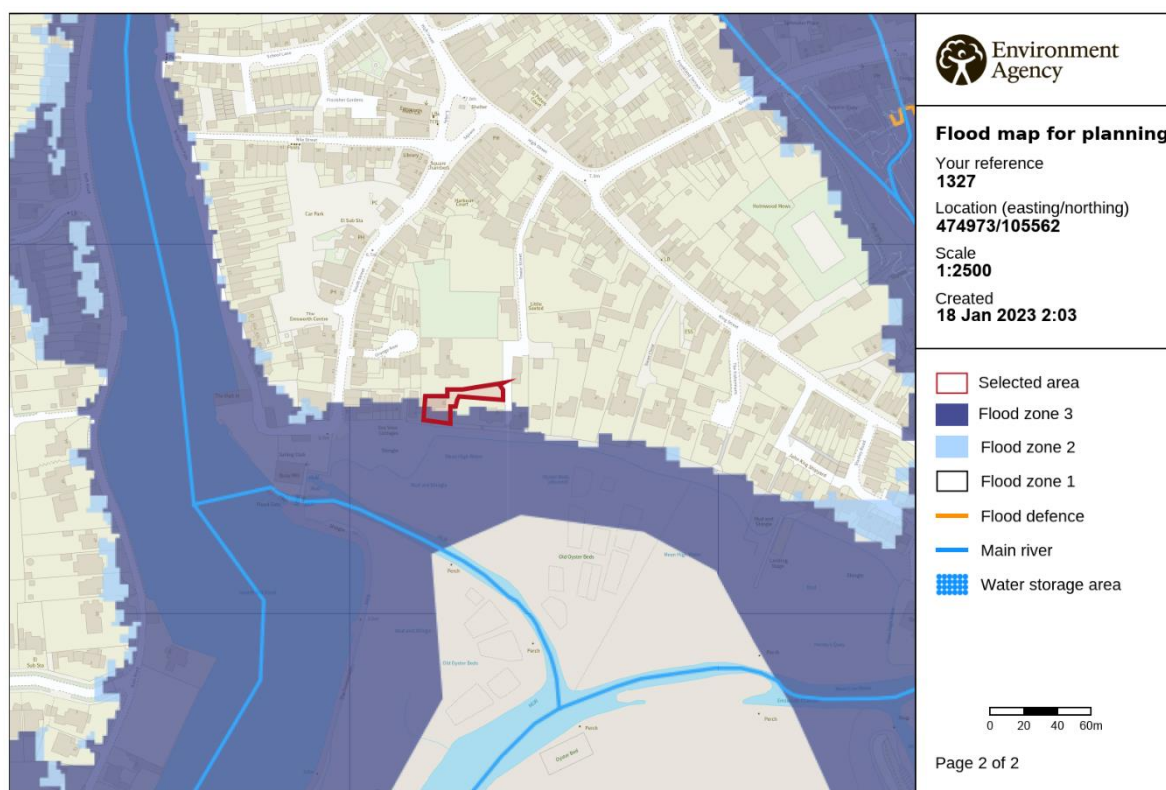
3.17 As fluvial flooding and surface water flood risk do not pose a risk to the site in the DFE, fluvial and surface water flood risk is not reviewed further within this FRA.

*Table 3 - Summarises the overall Flood Zone designation based on the highest rated flood risk from either rivers and sea or surface water.*

| FLOOD ZONE AND DFE SOURCE IDENTIFICATION SUMMARY |                                |                          |                                                  |
|--------------------------------------------------|--------------------------------|--------------------------|--------------------------------------------------|
|                                                  | FLOOD ZONES AFFECTING THE SITE |                          | DOMINANT SOURCE FOR THE DESIGN FLOOD EVENT (DFE) |
|                                                  | Flood Zone 2 (medium risk)     | Flood Zone 3 (high risk) | Source                                           |
| <b>River Or Sea</b>                              | Yes (Partial)                  | Yes (Partial)            | Sea/Tidal Flooding                               |
| <b>Surface Water</b>                             | No                             | No                       |                                                  |

*\*Flood Zone Designation for assessment is based on the highest flood risk from river, sea or surface water flooding taken from EA's Flood Map for Planning and EA's LTFRM:RoFSW*

3.18 Other sources of flooding have been considered in Section 6 below (such as groundwater and sewer flooding), but these are typically considered to be 'minor' sources of flood risk.



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Figure 2 extract from EA Flood Maps for Planning (Source: DEFRA)

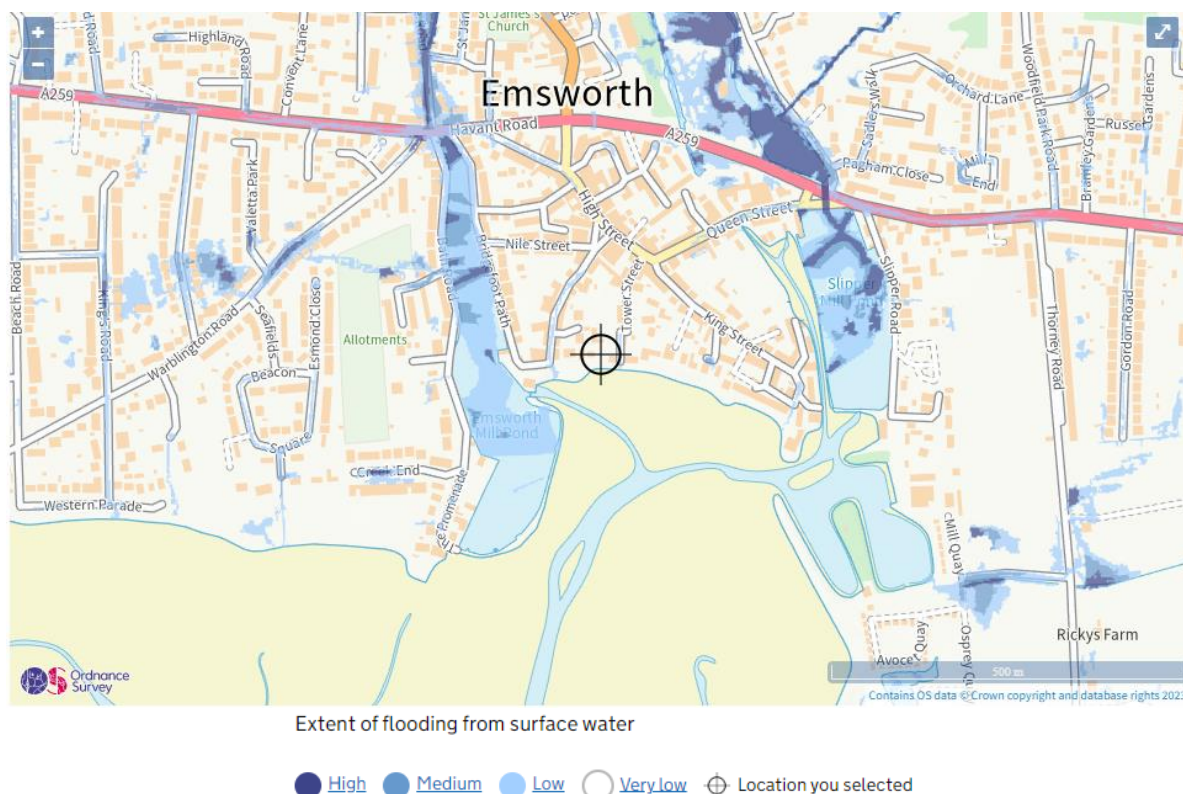


Figure 3 - extract from the EA's Long-Term Risk of Flooding from Surface Water (RoFSW) maps

## 4 LOCAL FEATURES

### SITE DESCRIPTION

- 4.1 23 Tower Street, also known as Seaview, is located in Emsworth, Hampshire. The site overlooks Chichester/Emsworth Harbour (Area of Outstanding Natural Beauty) and forms part of the waterfront which consists of primarily residential dwellings. The existing property is grade II listed and is also located in Emsworth Conservation Area.
- 4.2 The site is located immediately adjacent to the harbour and surrounded by flint and brick boundary walls and other buildings. The front elevation is notably prominent in the view of Emsworth waterfront as the site is elevated above the harbour. The site topography is relatively flat. Access to the property is via tower street to the east. At low tide, the site can be accessed via the existing steps which leads onto the foreshore.

### RIVERS, WATERCOURSES AND EXISTING DRAINAGE

- 4.3 The nearest major water body is the Emsworth Harbour (part of the larger Chichester Harbour). The Emsworth Harbour forms the sites southern boundary. The site is located within the East Hampshire Management Catchment.

### TOPOGRAPHY

- 4.4 Based on local LIDAR data and site levels, the site appears to be relatively flat. Along the southern boundary levels average 4mAOD, but fall slightly from west to east. The floor level of the existing dwelling is estimated to be c4.45mAOD.

### GEOLOGY & HYDROGEOLOGY

- a. The online British Geological Survey (BGS) (Figure 5) shows the site to be underlain by Lambeth Group - Clay, silt and sand. There are Beach and Tidal Flat Deposits - Clay, silt, sand and gravel superficial deposits



Figure 4 extract from BGS Bedrock and Superficial Deposits Mapping (source: BGS)

- 4.5 Table 4 below present a summary of the site hydrogeological classifications and considerations.

Table 4 - Summary of Hydrogeology Classifications (source Magic Map, BGS) – applicable classification shaded Blue

| HYDROGEOLOGY CLASSIFICATIONS DAF             |           |             |                   |
|----------------------------------------------|-----------|-------------|-------------------|
| <b>Aquifer Designation (Bedrock)</b>         | Principle | Secondary   | Unproductive      |
| <b>Aquifer Designation (Superficial)</b>     | Principle | Secondary   | Unproductive / NA |
| <b>Groundwater Vulnerability</b>             | High      | Medium      | Low               |
| <b>Located within Source Protection Zone</b> | Yes       | No          | N/A               |
| <b>Soluble Rock Risk</b>                     | Present   | Not Present | N/A               |

- 4.6 The *Environmental Agency's Groundwater Source Protection Zone Map* confirms that the site does not lie within a Source Protection Zone.

## FLOOD DEFENCES

- 4.7 The Environment Agency releases a range of flood asset information as Open Data through their AIMS Defence (Spatial Flood Defences) GIS mapping. They are the only comprehensive and up-to-date group of datasets in England that show flood defences currently owned, managed or inspected by the EA.
- 4.8 Figure 5 provides an extract from EA AIMS Defence data (2022). This data shows that there are flood defences raised in the vicinity along the southern boundary of the site in the form of a sea wall (Asset ID: 458638). This is maintained by a third party. The level of protection this seawall provides is unknown, however when reviewing the defended and undefended scenarios, it appears that the seawall may provide a very minor level of defence (i.e. 20mm). Therefore, given that the seawall is unlikely to provide significant benefit to the property (above the undefended situation), for the purposes of this assessment the site is considered undefended, with very limited to no residual flood risk in the event of a seawall failure.

AIMS Flood Defences. Centred PO10 7BH. Created 29/11/2022.

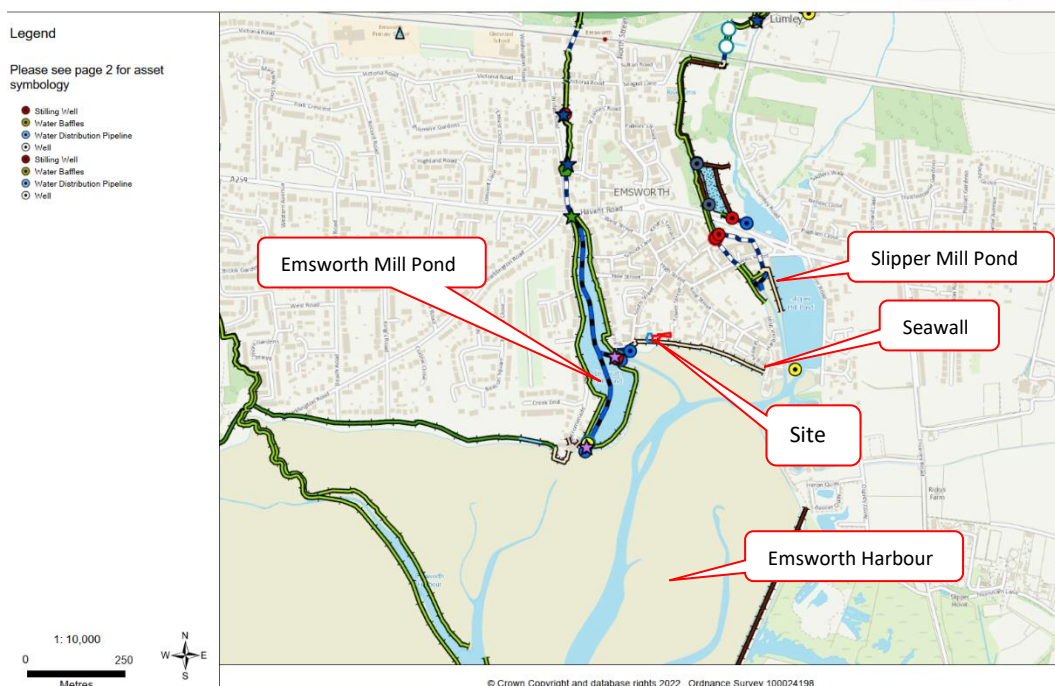


Figure 5 - Extract from EA AIMS Defence Dataset. Site edge red, defences shown in green.

- 4.9 It should be noted, that Sea View House is currently the only house along this section of the harbour which does not have an additional brick wall built up off the existing sea retaining wall (refer to drawings in Appendix 1 depicting the existing and proposed seawall treatment).

## 5 CLIMATE CHANGE

- 5.1 In 2022, the EA issued updated guidance on the impacts of climate change on flood risk in the UK to support the NPPF. This guidance sets out that peak rainfall intensity, sea level, peak river flow; offshore wind speed and extreme wave heights are all expected to increase in the future as a result of climate change.
- 5.2 The guidance acknowledges that in relation to certain factors there is considerable uncertainty with respect to the absolute level of change that is likely to occur. As such, in these instances, the guidance provides estimates of possible changes that reflect a range of different emission scenarios (Table 5).

*Table 5 - Extract from NPPF designating Flood Risk Climate Change Allowances by Flood Zone and Use. The developments required climate change probability scenario is highlighted blue*

| FLOOD ZONE | ESSENTIAL INFRASTRUCTURE     | HIGHLY VULNERABLE                   | MORE VULNERABLE                     | LESS VULNERABLE                     | WATER COMPTABLE          |
|------------|------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|
| 1/2        | Higher Central and Upper End | Higher Central and Upper End        | Central and Higher Central          | Central                             | None of these allowances |
| 3a         | Upper End                    | Development should not be permitted | Higher Central and Upper End        | Central and Higher Central          | Central                  |
| 3b         | Upper End                    | Development should not be permitted | Development should not be permitted | Development should not be permitted | Central                  |

- 5.3 Although the proposed wall is considered to be water compatible, it is not proposed to provide any additional flood protection to the dwelling as it will not be continuous across the whole frontage of the site. As such, this FRA has assessed flood risk to the site based on a More Vulnerable classification of the site.

### INCREASES IN SEA AND TIDAL LEVELS

- 5.4 There are a range of allowances for each river basin district and epoch for sea level rise. They are set out in *Table 1: sea level allowances by river basin district for each epoch in mm for each year (based on a 1981 to 2000 baseline) – the total sea level rise for each epoch is in brackets of the NPPF: Flood risk assessments: climate change allowances* and are based on percentiles. A percentile describes the proportion of possible scenarios that fall below an allowance level.
- 5.5 The allowances in the NPPF account for slow land movement. This is due to ‘glacial isostatic adjustment’ from the release of pressure at the end of the last ice age. The northern part of the UK is slowly rising and the southern part is slowly sinking. This is why net sea level rise is less for the north-west and north-east than the rest of the country.
- 5.6 For flood risk assessments and strategic flood risk assessments, sites should assess both the higher central and upper end allowances for more vulnerable developments. The EA have been consulted, and through their Product 4 data, they have provided climate change estimates up to 2115, however the NPPF requires climate change estimates to extend across a development’s lifetime, and this case this could be considered to by up to 2123.
- 5.7 As such, in the absence of more up to date data, this assessment has used the EA’s 1 in 200 (0.5% AEP) present day tidal event level of 3.49mAOD and added on the predicted yearly sea level rise from ‘*Table 1: sea level allowances by river basin district for each epoch in mm for each year (based on a 1981 to 2000 baseline) – the total sea level rise for each epoch is in brackets*’ of the NPPF based on the South East area, this is summarised in the table below:

*Table 6 - calculation table for determining the extreme sea level rise over the design life based on the EAs CFB data and NPPF Table 1, upper end*

| Calculation of extreme sea level over the design of the development |              |              |              |              | Total<br>100 years<br><br>1387.7mm |
|---------------------------------------------------------------------|--------------|--------------|--------------|--------------|------------------------------------|
| Design epoch                                                        | 2000 to 2035 | 2036 to 2065 | 2066 to 2095 | 2096 to 2125 |                                    |
| Years within Design epoch                                           | 16 years     | 29 years     | 29 years     | 27 year      |                                    |
| Yearly sea level rise                                               | 6.9mm        | 11.3mm       | 15.8mm       | 18.2mm       |                                    |
| Total within Design epoch                                           | 110.4mm      | 327.7mm      | 458.2mm      | 491.4mm      |                                    |

- 5.8 Based on the NPPF, the predicted Upper End extreme sea level is 4.88mAOD. This is estimated to be c.280mm higher than the 2115 0.5% AEP event presented in the Product 4 data.
- 5.9 As discussed above, the proposed wall will not be continuous (i.e. there will be a gap in the wall to allow continued access from the site). Therefore, the wall will not provide any additional flood protection. As such, by constructing the proposed wall, there is unlikely to be any change in flood risk to the site, as long as the wall is constructed appropriately and causes no damage to the existing sea wall.
- 5.10 A structural engineer has been engaged to design to the wall, engineering plans are included in Appendix 1. These plans should be included as part of this FRA in the submission of the FRAP.

## 6 SOURCES OF FLOOD RISK

- 6.1 In order to assist the implementation of the Governments NPPF, the EA has undertaken national scale flood risk mapping. This mapping takes into account a range of sources including flooding from rivers, sea, surface water and reservoir breach. Furthermore, each Council produces a Strategic (county scale) Flood Risk Assessments (SFRA) that aim to specifically identify local flood risk issues (such as critical drainage areas and local groundwater flooding).
- 6.2 The following section reviews both the EA data as well as the relevant information available from the SFRA.

### TIDAL (SEA)

- b. The EA have undertaken fluvial and tidal modelling of the nation's main rivers and sea/tidal areas in flood to support and ensure developments are steered away from flood prone areas or are designed to ensure risk to people is not increased as a result.
- 6.3 The EA's Flood Maps for Planning shows that the site is partially affected by Flood Zone 3 (0.5% AEP) and Flood Zone 2 (0.1% AEP) (tidal flooding only) along its southern boundary. It should be noted that the EA's Flood Maps for Planning do not allow for the presence of defences and so illustrate a conservative representation of flood risk from rivers or seas.

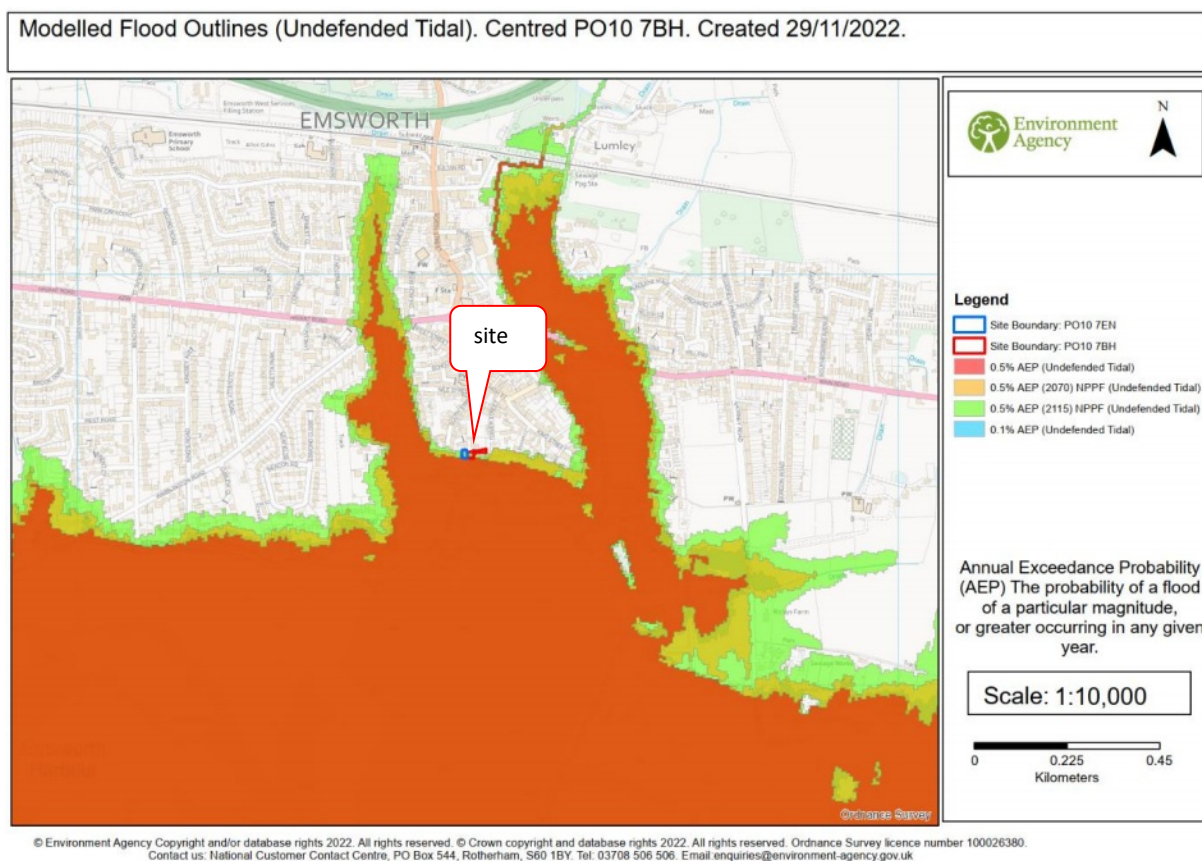


Figure 6 - EA Flood Map for Planning (source Environment Agency Flood Maps)

- 6.4 Figure 7 below provides an extract from the EA's Product 4 requested for the purpose of this FRA. The EA has provided data relating to a number of nodal points across the site to assess flood depths from a number of return periods. The EA have also provided climate change impacts to the 1% AEP (that is Flood Zone 3 extents for Fluvial flood risk), however these do not extend to 2123, and as such the NPPF's climate change allowances have instead been added to the present day baseline 0.5% AEP to estimate climate change tidal levels (refer to Section 5).
- 6.5 In the context to this site, Node points 7 and 8 most closely relate to the proposed wall location, with nodes 1 and 2 provide flood depths at and around the existing dwelling.

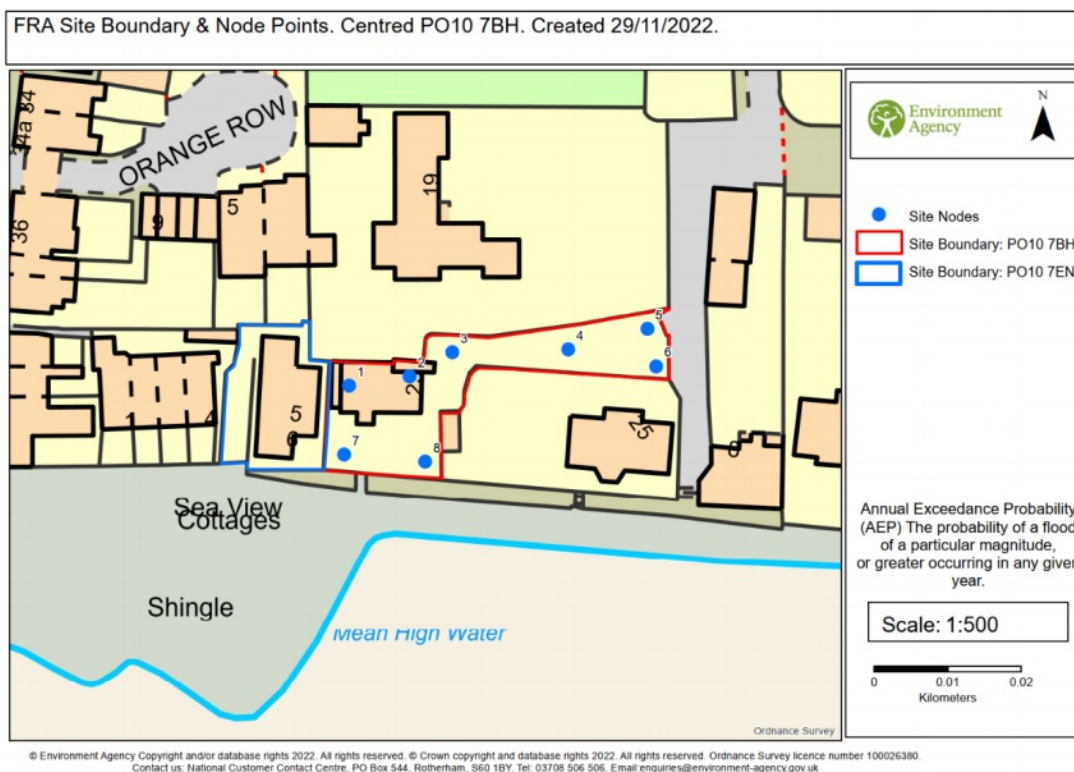


**Table 3: Water Depths: Tidal Undefended**

| Node Ref | NGR      |           | Modelled Flood Depths in Metres          |              |              |      |
|----------|----------|-----------|------------------------------------------|--------------|--------------|------|
|          | Eastings | Northings | Undefended Annual Exceedance Probability |              |              |      |
|          |          |           | 0.5%                                     | 0.5% (2070)* | 0.5% (2115)* | 0.1% |
| 1        | 474954   | 105563    | -                                        | -            | 0.10         | -    |
| 2        | 474962   | 105564    | -                                        | -            | 0.02         | -    |
| 3        | 474968   | 105568    | -                                        | -            | -            | -    |
| 4        | 474983   | 105568    | -                                        | -            | -            | -    |
| 5        | 474994   | 105571    | -                                        | -            | -            | -    |
| 6        | 474995   | 105566    | -                                        | -            | -            | -    |
| 7        | 474953   | 105554    | 0.39                                     | 0.49         | 0.95         | 0.43 |
| 8        | 474964   | 105553    | -                                        | -            | 0.47         | -    |

**Table 4: Water Depths: Tidal Defended**

| Node Ref | NGR      |           | Modelled Flood Depths in Metres        |              |              |      |
|----------|----------|-----------|----------------------------------------|--------------|--------------|------|
|          | Eastings | Northings | Defended Annual Exceedance Probability |              |              |      |
|          |          |           | 0.5%                                   | 0.5% (2070)* | 0.5% (2115)* | 0.1% |
| 1        | 474954   | 105563    | -                                      | -            | 0.09         | -    |
| 2        | 474962   | 105564    | -                                      | -            | 0.02         | -    |
| 3        | 474968   | 105568    | -                                      | -            | -            | -    |
| 4        | 474983   | 105568    | -                                      | -            | -            | -    |
| 5        | 474994   | 105571    | -                                      | -            | -            | -    |
| 6        | 474995   | 105566    | -                                      | -            | -            | -    |
| 7        | 474953   | 105554    | 0.39                                   | 0.49         | 0.98         | 0.42 |
| 8        | 474964   | 105553    | -                                      | -            | 0.39         | -    |

*Figure 7 - extract from the JFLOW Model 2006, with updated climate change runs completed by JBA Consulting in 2016.*

- 6.6 The EA data shows along the southern boundary flood depths could reach 3.49mAOD in the present day 0.5% AEP event (0.39m in depth), with only a very marginal increase in depth when considering the 0.1% AEP event. The data also shows that the area around the dwelling may be affected by up 100mm, however the existing dwelling has a raised FFL of approximately 4.45mAOD, and therefore it is unlikely that the dwelling itself would be inundated in this event.

## Impacts of Climate Change

- 6.7 Based on the NPPF, the predicted Upper End extreme sea level to the year 2123 is 4.88mAOD, equating to combined sea level rise of 1.38m (this is estimated to be c.280mm higher than the 2115 0.5% AEP event presented in the Product 4 data). In combination with the EA data, this could relate to a maximum flood depth at node 7 of 1.21m or 0.38m at node 1, in the 0.5% AEP 2123 design year. It could also be expected that the existing dwelling may be affected by up to 430mm of flooding in this event.
- 6.8 A review of available site level information and the architectural drawings provided (see Appendix 1), the proposed top of wall is estimated to be 5.0mAOD, and as such the wall could experience up to 1.4m of flooding. Because, the wall will not be continuous, tidal waters would be allowed to flow around the wall, and so the wall would not need to be designed to withhold one-sided hydraulic pressures, aside from wave loading.
- 6.9 Therefore, as long as the proposed wall can be constructed to withstand the tidal/sea surge hydraulic loadings and not affect the existing sea wall, the proposed wall is not expected to impact flood risk (either positive or negatively), to the site and to the surrounding properties.

## RESERVOIR FLOODING (BREACH)

- 6.10 Reservoirs with an impounded volume greater than 25,000 cubic metres are governed by the Reservoirs Act 1975 and are listed on a register held by the Environment Agency. The level and standard of inspection and maintenance required under the Act means that the risk of flooding from reservoirs is relatively low. Recent changes to legislation under the Flood and Water Management Act require the Environment Agency to designate the risk of flooding from these reservoirs.
- 6.11 Reservoir flooding is very different from other forms of flooding. It may happen with little or no warning and evacuation will need to happen immediately. The likelihood of such flooding is difficult to estimate, but it is less likely than flooding from rivers or surface water. The risk of inundation to the study area as a result of reservoir breach or failure of a number of reservoirs within the area was assessed as part of the National Inundation Reservoir Mapping (NIRIM) study. Maps of the flood extent can be found on the Government's Long term flood risk information website, Figure 8 shows an extract from this service, demonstrating that the site is at very low risk of flooding from any reservoir failures.



Figure 8 extract from EAs LFRM Reservoir Flood Risk (star marks approximate site location)

## HISTORICAL, SEWERS AND DRAINAGE

- 6.12 A common source of flooding is a result of sewer or other drainage infrastructure becoming surcharged and flooding. The SFRA does not directly present any records relating to sewer flooding directly impacting the site,

however, it does highlight that they can suffer from tide lock of rivers and any associated outfalls into these systems. This has been known in the past to cause flooding in a combined high tide/storm surge and rainfall event.

- 6.13 The SFRA present records relating to sewer flooding and provided by Southern Water. Figure 9 provides an extract from the PUSH SFRA showing recorded incidences of flooding. As can be seen, there are no records to suggest that the site has flooded (from sewers) in the past, or within 500m of the site.



Figure 9 - extract from SFRA – “Southern Water Observed Flood Incidents”

- 6.14 The Environment Agency has no record of sewer flooding to this property/area in the past. As such, it can be considered the risk of sewer flooding to the site is considered low.

## GROUNDWATER

- 6.15 Groundwater flooding is the emergence of groundwater at the ground surface or into subsurface voids arising as a result of:

- ⇒ abnormally high groundwater heads or flows;
- ⇒ the introduction of an obstruction to groundwater flow; or
- ⇒ the rebound of previously depressed groundwater levels.

- 6.16 Groundwater flooding usually occurs following a prolonged period of low intensity rainfall. As groundwater flow is much slower than surface flow, the flooding may not recede for long periods of time, typically weeks or even months. It is important to recognise the risk of groundwater flooding is typically highly variable and heavily dependent upon local geology, topography and weather conditions, as well as local abstraction regimes. Groundwater flooding is hard to predict and challenging to mitigate.

- 6.17 The PUSFH SRFA, shows that the site is in an area with moderate bedrock permeability (see Figure10). However, there have been no recorded incidences of groundwater flooding to the site, and given the proximity of the site to

the tidal zone, groundwater flooding would be tightly linked to tidal levels and flooding. As such, it is not anticipated that groundwater flooding would pose a risk to the development proposals at this time.

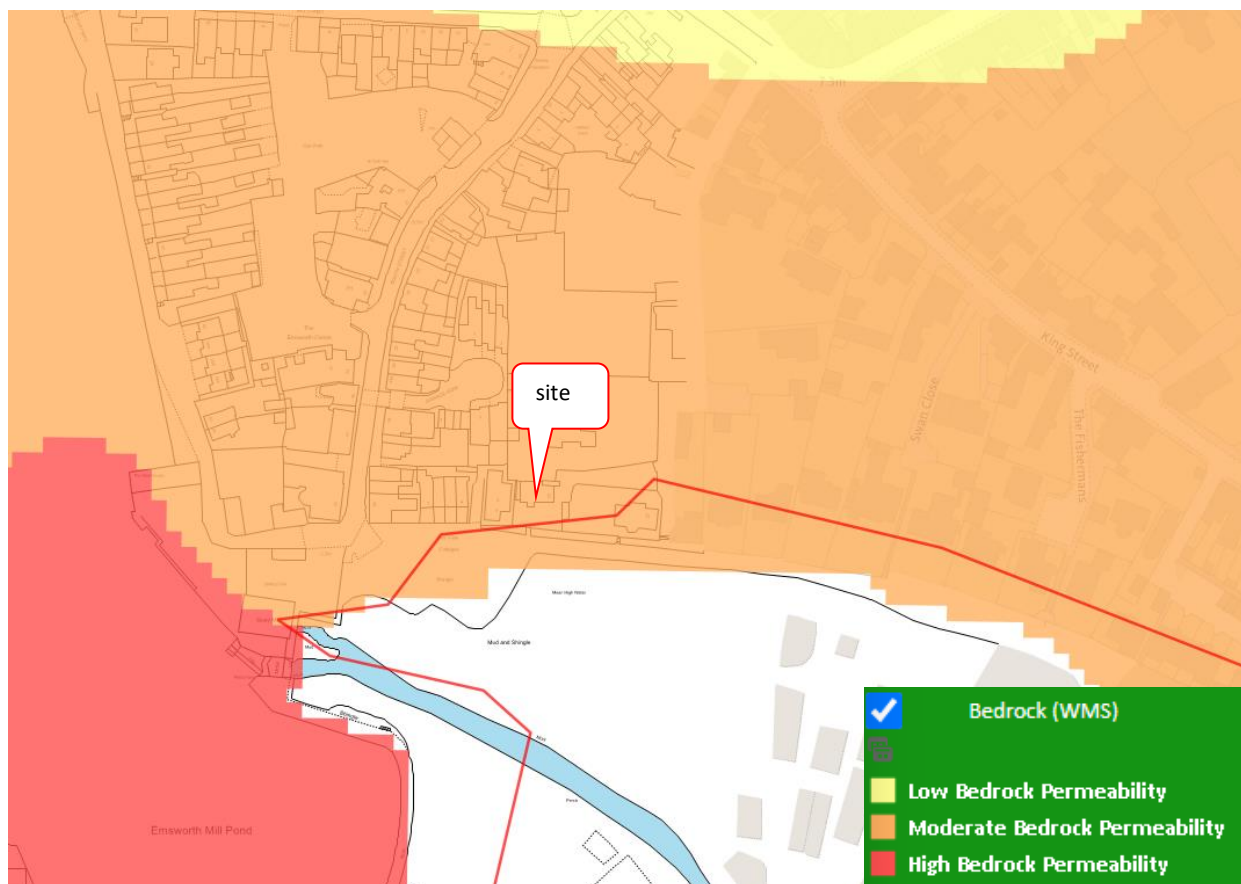


Figure 10 - Extract from the PUSH SFRA showing Bedrock Permeability

## Impacts of Climate Change

6.18 The potential effects of climate change on groundwater levels are uncertain. Greater seasonality in groundwater level fluctuation is a potential outcome under a pattern of higher winter rainfall and less summer rainfall. Broad predictions of the impacts of climate change on groundwater levels are difficult to make at the present time

## RESIDUAL RISKS

6.19 Residual risks are those remaining after applying the sequential approach to the location of development and taking mitigating actions. Examples of residual flood risk include:

- the failure of flood management infrastructure such as a breach of a raised flood defence, blockage of a surface water conveyance system, overtopping of an upstream storage area, or failure of a pumped drainage system;
- a severe flood event that exceeds a flood management design standard, such as a flood that overtops a raised flood defence, or an intense rainfall event which the drainage system cannot cope with.

6.20 The EA data shows that the existing seawall provides limited protection to the site, as such in the present situation there is limited risk to the site should the existing sea fail. The new wall will not be continuous, and as such tidal flood waters would continue to progress through the site as per existing.

## SUMMARY OF RISKS

6.21 Table 7 below summarises the generalised risk from the various sources of flooding assessed above, and if the site is at risk of a DFE from this source.

Table 7 - Summarising sources of flooding that affect the site up to the DFE. Critical DFE shaded blue

| Source of Flooding  | Flood Risk to Site | Is dwelling building itself at risk from the DFE                                                |
|---------------------|--------------------|-------------------------------------------------------------------------------------------------|
| Fluvial             | Very Low           | No                                                                                              |
| Tidal/Sea           | High               | Yes, however, the new wall will not change the existing flood risk to the dwelling or the site. |
| Surface Water       | Very Low           | No                                                                                              |
| Reservoir           | Very Low           | No                                                                                              |
| Groundwater         | Very Low           | No                                                                                              |
| Sewers and Drainage | Very Low           | No                                                                                              |

6.22 Section 7 below presents the proposed measures to avoid, control, mitigate, manage residual risk and ensure flood risk is not increased elsewhere, relevant to the DFE.

## 7 BUILDING AND DESIGN RECOMENDATIONS

- 7.1 The proposed brick wall is to have a level top/coping. Based on the site survey information, this level is expected to be c.5.0mAOD. Because the slight fall in the land from west to east this will require the wall to have a minimum height of 1.10m (above existing ground levels) at the western edge of the wall, and a maximum height 1.410m at the eastern edge.
- 7.2 The wall design and assessment process should include the following:
- A structural survey of the existing wall and assessment of its condition relevant to the site.
  - A Structural design that is sympathetic to the existing wall condition and considers the impact of its design on the structural integrity of the existing sea wall.
  - The proposed wall will need to be appropriately engineered, with material suitable for the use and exposure.
  - If possible, the wall should be designed and constructed to withstand wave/surge pressures up to 1.4m in height or 5.0mAOD, although this is not essential as the wall is not designed to provide additional flood defence and will not be continuous along its length.
- 7.3 The new wall will be subject to a Flood Risk Activity Permit (FRAP) to ensure that the works will not adversely be impacting upon existing flood defence infrastructure. The new wall will need to be properly designed and construction (Appendix 1 includes the proposed engineered wall design for the site).

## 8 SITE ACCESS AND EGRESS (FLOOD EVACUATION PLANNING)

- 8.1 To comply with the NPPF, all occupants should be able to make their way, unassisted by the Emergency Services, to dry land. This is known as ‘safe access to dry land’ and does not have to be dry, just not *hazardous* at the peak of the predicted critical 1% (1 in 100 year) plus climate change storm.
- 8.2 Table 13.1 of FD2320 shows the maximum depths/velocity combinations that are safe for 3 categories of user (occupant). The methodology for calculating “Flood Hazard” is reproduced below according to the methodology stated within the “Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purposes – Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1” (Figure 11).
- 8.3 For an access/egress route to be acceptable under the NPPF, the combination of flood depths, velocities and debris must be analysed.

| HR                       | Depth of flooding - d (m) |                     |                     |                                                                 |                     |                     |                     |                     |                     |                     |                     |                     |                     |
|--------------------------|---------------------------|---------------------|---------------------|-----------------------------------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|                          | DF = 0.5                  |                     |                     |                                                                 | DF = 1              |                     |                     |                     |                     |                     |                     |                     |                     |
| Velocity<br>v (m/s)      | 0.05                      | 0.10                | 0.20                | 0.25                                                            | 0.30                | 0.40                | 0.50                | 0.60                | 0.80                | 1.00                | 1.50                | 2.00                | 2.50                |
| 0.0                      | 0.03+0.5=<br>0.53         | 0.05+0.5=<br>= 0.55 | 0.10+0.5=<br>= 0.60 | 0.13+0.5=<br>= 0.63                                             | 0.15+1.0=<br>= 1.15 | 0.20+1.0=<br>= 1.20 | 0.25+1.0=<br>= 1.25 | 0.30+1.0=<br>= 1.30 | 0.40+1.0=<br>= 1.40 | 0.50+1.0=<br>= 1.50 | 0.75+1.0=<br>= 1.75 | 1.00+1.0=<br>= 2.00 | 1.25+1.0=<br>= 2.25 |
| 0.1                      | 0.03+0.5=<br>0.53         | 0.06+0.5=<br>= 0.56 | 0.12+0.5=<br>= 0.62 | 0.15+0.5=<br>= 0.65                                             | 0.18+1.0=<br>= 1.18 | 0.24+1.0=<br>= 1.24 | 0.30+1.0=<br>= 1.30 | 0.36+1.0=<br>= 1.36 | 0.48+1.0=<br>= 1.48 | 0.60+1.0=<br>= 1.60 | 0.90+1.0=<br>= 1.90 | 1.20+1.0=<br>= 2.20 | 1.50+1.0=<br>= 2.55 |
| 0.3                      | 0.04+0.5=<br>0.54         | 0.08+0.5=<br>= 0.58 | 0.15+0.5=<br>= 0.65 | 0.19+0.5=<br>= 0.69                                             | 0.23+1.0=<br>= 1.23 | 0.30+1.0=<br>= 1.30 | 0.38+1.0=<br>= 1.38 | 0.45+1.0=<br>= 1.45 | 0.60+1.0=<br>= 1.60 | 0.75+1.0=<br>= 1.75 | 1.13+1.0=<br>= 2.13 | 1.50+1.0=<br>= 2.50 | 1.88+1.0=<br>= 2.88 |
| 0.5                      | 0.05+0.5=<br>0.55         | 0.10+0.5=<br>= 0.60 | 0.20+0.5=<br>= 0.70 | 0.25+0.5=<br>= 0.75                                             | 0.30+1.0=<br>= 1.30 | 0.40+1.0=<br>= 1.40 | 0.50+1.0=<br>= 1.50 | 0.60+1.0=<br>= 1.60 | 0.80+1.0=<br>= 1.80 | 1.00+1.0=<br>= 2.00 | 1.50+1.0=<br>= 2.50 | 2.00+1.0=<br>= 3.00 | 2.50+1.0=<br>= 3.50 |
| 1.0                      | 0.08+0.5=<br>0.58         | 0.15+0.5=<br>= 0.65 | 0.30+0.5=<br>= 0.80 | 0.38+0.5=<br>= 0.88                                             | 0.45+1.0=<br>= 1.45 | 0.60+1.0=<br>= 1.60 | 0.75+1.0=<br>= 1.75 | 0.90+1.0=<br>= 1.90 | 1.20+1.0=<br>= 2.20 | 1.50+1.0=<br>= 2.50 | 2.25+1.0=<br>= 3.25 | 3.00+1.0=<br>= 4.00 | 3.75+1.0=<br>= 4.75 |
| 1.5                      | 0.10+0.5=<br>0.60         | 0.20+0.5=<br>= 0.70 | 0.40+0.5=<br>= 0.90 | 0.50+0.5=<br>= 1.00                                             | 0.60+1.0=<br>= 1.60 | 0.80+1.0=<br>= 1.80 | 1.00+1.0=<br>= 2.00 | 1.20+1.0=<br>= 2.20 | 1.60+1.0=<br>= 2.60 | 2.00+1.0=<br>= 3.00 | 3.00+1.0=<br>= 4.00 | 4.00+1.0=<br>= 5.00 | 5.00+1.0=<br>= 6.00 |
| 2.0                      | 0.13+0.5=<br>0.63         | 0.25+0.5=<br>= 0.75 | 0.50+0.5=<br>= 1.00 | 0.63+0.5=<br>= 1.13                                             | 0.75+1.0=<br>= 1.75 | 1.00+1.0=<br>= 2.00 | 1.25+1.0=<br>= 2.25 | 1.50+1.0=<br>= 2.50 | 2.00+1.0=<br>= 3.00 | 3.50                | 4.75                | 6.00                | 7.25                |
| 2.5                      | 0.15+0.5=<br>0.65         | 0.30+0.5=<br>= 0.80 | 0.60+0.5=<br>= 1.10 | 0.75+0.5=<br>= 1.25                                             | 0.90+1.0=<br>= 1.90 | 1.20+1.0=<br>= 2.20 | 1.50+1.0=<br>= 2.50 | 1.80+1.0=<br>= 2.80 | 3.40                | 4.00                | 5.50                | 7.00                | 8.50                |
| 3.0                      | 0.18+0.5=<br>0.68         | 0.35+0.5=<br>= 0.85 | 0.70+0.5=<br>= 1.20 | 0.88+0.5=<br>= 1.38                                             | 1.05+1.0=<br>= 2.05 | 1.40+1.0=<br>= 2.40 | 1.75+1.0=<br>= 2.75 | 3.10                | 3.80                | 4.50                | 6.25                | 8.00                | 9.75                |
| 3.5                      | 0.20+0.5=<br>0.70         | 0.40+0.5=<br>= 0.90 | 0.80+0.5=<br>= 1.30 | 1.00+0.5=<br>= 1.50                                             | 1.20+1.0=<br>= 2.20 | 1.60+1.0=<br>= 2.60 | 3.00                | 3.40                | 4.20                | 5.00                | 7.00                | 9.00                | 11.00               |
| 4.0                      | 0.23+0.5=<br>0.73         | 0.45+0.5=<br>= 0.95 | 0.90+0.5=<br>= 1.40 | 1.13+0.5=<br>= 1.63                                             | 1.35+1.0=<br>= 2.35 | 1.80+1.0=<br>= 2.80 | 3.25                | 3.70                | 4.60                | 5.50                | 7.75                | 10.00               | 12.25               |
| 4.5                      | 0.25+0.5=<br>0.75         | 0.50+0.5=<br>= 1.00 | 1.00+0.5=<br>= 1.50 | 1.25+0.5=<br>= 1.75                                             | 1.50+1.0=<br>= 2.50 | 2.00+1.0=<br>= 3.00 | 3.50                | 4.00                | 5.00                | 6.00                | 8.50                | 11.00               | 13.50               |
| 5.0                      | 0.28+0.5=<br>0.78         | 0.60+0.5=<br>= 1.10 | 1.10+0.5=<br>= 1.60 | 1.38+0.5=<br>= 1.88                                             | 1.65+1.0=<br>= 2.65 | 3.20                | 3.75                | 4.30                | 5.40                | 6.50                | 9.25                | 12.00               | 14.75               |
| Flood Hazard Rating (HR) |                           | Colour Code         |                     | Hazard to People Classification                                 |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| Less than 0.75           |                           |                     |                     | Very low hazard - Caution                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 0.75 to 1.25             |                           |                     |                     | Danger for some – includes children, the elderly and the infirm |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 1.25 to 2.0              |                           |                     |                     | Danger for most – includes the general public                   |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| More than 2.0            |                           |                     |                     | Danger for all – includes the emergency services                |                     |                     |                     |                     |                     |                     |                     |                     |                     |

Figure 11: Extracts from the Supplementary Note to FD2320/TR2 and FD2321/TR1 describing the methodology for calculating ‘Flood Hazard’ under the NPPF (Source: EA)

- 8.4 Figure 12 illustrates that FZ3 Undefined Flood Hazard for the site. This shows that the majority of the site is unaffected by the FZ3 event, and access/egress would remain wholly unaffected from the house to Tower Street.
- 8.5 If evacuation in a flood event is required, it is advised that users evacuate on to Tower Street via the site access, then proceed north away from the harbour. However, if deemed necessary or required, safe refuge is also available on site by taking refuge on the first floor of the existing dwelling.

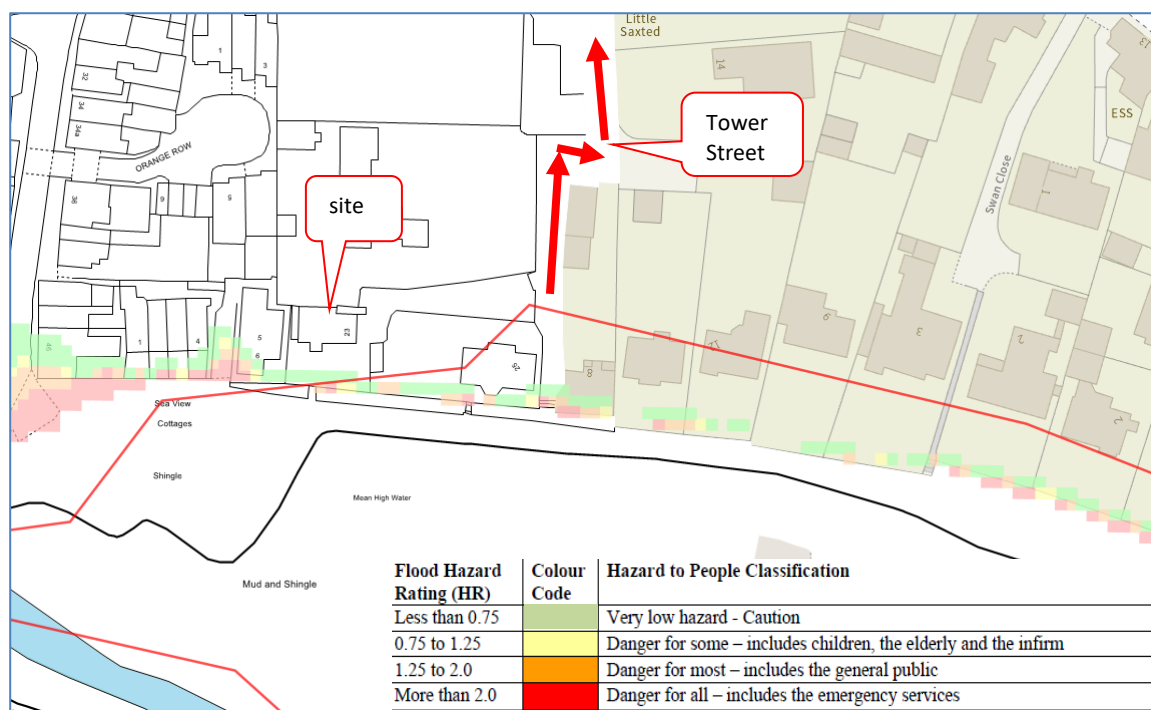


Figure 12 - EA RoFSW Hazard Mapping – Medium Risk of surface water flooding (source: Risk of Flooding from Surface Water (RoFSW)) - Red arrows designate suggested evacuation route.

8.6 Further information can be found on [www.environment-agency.gov.uk/floodline](http://www.environment-agency.gov.uk/floodline). General advice includes:

On receipt of a FLOOD ALERT, the individual property owners and occupiers should:

- ⇒ Monitor the situation via local media;
- ⇒ Make themselves aware of forecast local weather conditions;
- ⇒ Alert both current visitors, and those scheduled to arrive, of the situation;
- ⇒ Prepare to evacuate if necessary.

On receipt of a FLOOD WARNING, the individual property owners and occupiers should:

- ⇒ Follow advice to “go in, stay in, and tune in”;
- ⇒ Move all vehicles to an area outside of the potential flood extent, if safe to do so;
- ⇒ Alert scheduled visitors that they should seek alternative accommodation;
- ⇒ Be prepared to follow instruction from the Emergency Services.

On receipt of a SEVERE FLOOD WARNING, the individual property owners and occupiers should:

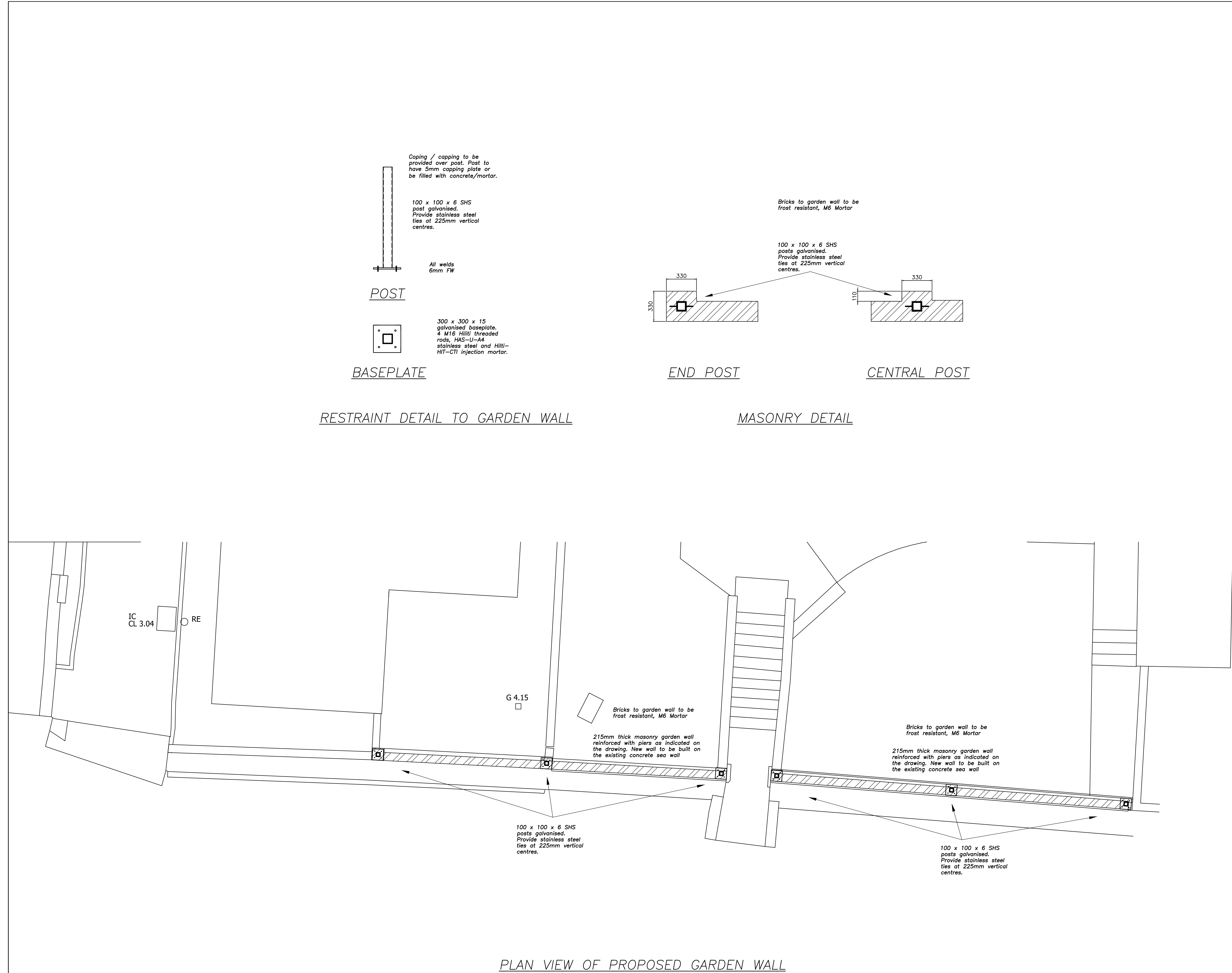
- ⇒ Follow advice to “go in, stay in, and tune in”;
- ⇒ Remain attentive to local media forecasts and news bulletins;
- ⇒ Do not evacuate unless instructed to do so by the Emergency Services;

8.7 If flood waters along the proposed evacuation route have exceed 25cm, site users are advised to seek advice from emergency services.

## 9 CONCLUSION

- 9.1 This report is a Flood Risk Assessment (FRA) for the proposed construction of a brick wall atop an existing seawall located at residential property located 23 Tower Street, Emsworth, PO10 7BH, at approximate Grid Reference: SU74950555 (see site location map, Figure 1).
- 9.2 This assessment is required under the National Planning Policy Framework (NPPF) and Local and District Councils given the location, scale and associated flood risks. This assessment has been undertaken solely to assess if the wall will negatively impact on existing flood risk. This FRA will also inform the Flood Risk Activity Permit (FRAP) required as the works will affect the existing seawall.
- 9.3 The development proposals are for a new brick wall to be built up off of the existing concrete retaining seawall on the southern boundary. The wall's primary purpose is to reduce risk of falling from the garden, with a central opening to allowed continued access from the site. The proposed wall is not to be designed or proposed to be used as a flood defence.
- 9.4 The proposed brick wall is to have a level top, tying into the adjacent properties brick walls. Because of the slight fall in the land from west to east, the brick wall will vary in height along its length, from a minimum height of 1.10m (above existing ground levels) at the western edge of the wall, and a maximum height 1.410m at the eastern edge.
- 9.5 Table 3 summarises the sites primary flood risk classifications and the source for the DFE. This designation is based on the EA's Flood Map for Planning (extract provided in Figure 2 ) and the EA's Long Term Flood Risk Maps (LTFRM): Risk of Flooding from Surface Water (RoFSW) (extract provided in Figure 3). Based on the EA's Flood Maps for Planning and the EA Product 4 data, the site is shown to be affected by Flood Zones 1, 2 and 3. The EA data confirms that flood risk from extreme tides is the dominant source of flood risk to the site.
- 9.6 Figure 3 shows that the site is wholly unaffected by fluvial and surface water flooding in all modelled events. As such the site is considered to be at very low risk of surface water flooding and is likely to remain at low risk throughout its design life.
- 9.7 Based on the NPPF, the predicted Upper End extreme sea level to the year 2123 is 4.88mAOD, equating to combined sea level rise of 1.38m (this is estimated to be c.280mm higher than the 2115 0.5% AEP event presented in the Product 4 data). In combination with the EA data, this could relate to a maximum flood depth at node 7 of 1.21m or 0.38m at node 1, in the 0.5% AEP 2123 design year. It could also be expected that the existing dwelling may be affected by up to 430mm of flooding in this event.
- 9.8 A review of available site level information and the architectural drawings provided (see Appendix 1), the proposed top of wall is estimated to be 5.0mAOD, and as such the wall could experience up to 1.4m of flooding. Because, the wall will not be continuous, tidal waters would be allowed to flow around the wall, and so the wall would not need to be designed to withhold one-sided hydraulic pressures, aside from wave loading.
- 9.9 Therefore, as long as the proposed wall can be constructed to withstand the tidal/sea surge hydraulic loadings and not affect the existing sea wall, the proposed wall is not expected to impact flood risk (either positive or negatively), to the site and to the surrounding properties.
- 9.10 A review of all other required sources of flood risk (including sewer and groundwater) has been undertaken, with this FRA finding flood risk from these sources is very low in the DFE and unlikely to affect the proposals.
- 9.11 Section 8 provides recommendations for the design of the proposed wall (with a proposed design included in Appendix 1), these, alongside the agreed details of the FRAP should be followed.
- 9.12 Therefore, based on the PPG and NPPF, and assuming the recommendations of this FRA are followed, it is considered that proposals on this site are appropriate.

## APPENDIX 1 – ARCHITECTURAL PROPOSALS



- GENERAL NOTES:**
1. ALL DIMENSIONS TO BE CHECKED ON SITE. ALL DETAILS AND DIMENSIONS RELATING TO THE SUB-CONTRACTOR'S OR SUPPLIER'S WORK MUST BE CHECKED AND AGREED BETWEEN THE SUB CONTRACTOR OR SUPPLIER AND THE GENERAL CONTRACTOR.
  2. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND ENGINEER'S DRAWINGS AND SPECIFICATIONS
  3. WORKS TO COMPLY WITH CURRENT CODES OF PRACTICE, BRITISH STANDARDS AND BUILDING REGULATIONS.
  4. FLOOR JOISTS 50X220 C24 JOISTS AT 400 CTS UNLESS OTHERWISE NOTED.
  5. DOUBLE UP STUDS WHERE JOISTS RUN PARALLEL TO JOISTS
  6. ALL INTERNAL WALLS STUD CONSTRUCTION UNLESS OTHERWISE NOTED.
  7. PROVIDE ENGINEERING BRICK PADSTONES TO STEEL BEAMS UNLESS OTHERWISE NOTED.
  8. LINTELS TO HAVE MIN 150MM BEARINGS AND TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURE'S INSTRUCTIONS.
  9. BLOCKWORK WALLS LONGER THAN 6 METRES IN LENGTH TO HAVE MOVEMENT JOINTS OR HAVE BED JOINT REINFORCEMENT IN ACCORDANCE WITH MANUFACTURER'S DETAILS TO AVOID CRACKING IN THE MASONRY.
  10. BRICKWORK WALLS OVER 12 METRES CONTINUOUS IN LENGTH TO HAVE MOVEMENT JOINTS OR BED JOINT REINFORCEMENT
  11. PROVIDE 30X5MM GALVANISED HORIZONTAL RESTRAINT STRAPS OF AT LEAST 1200MM LONG AT MAXIMUM 2000MM CENTRES. WHERE FLOOR JOISTS RUN PARALLEL TO THE WALL THE RESTRAINTS SHOULD BE FIXED TO AT LEAST 3 JOISTS. PROVIDE 38MM WIDE NOGGINS AT LEAST HALF THE DEPTH OF THE JOISTS TO FIX STRAPS TO OR PROVIDE RESTRAINT TYPE JOIST HANGERS WHERE APPROPRIATE.
  12. TRIMMERS TO BE BOLTED WITH M10 BOLTS AT MAXIMUM 1000MM CENTRES. M16 BOLTS TO BE USED FOR WIDTHS OF 150MM OR GREATER
  13. PROVIDE HEAVY DUTY JOIST HANGERS TO SUPPORT TRIMMERS
  14. PROVIDE ONE ROW OF STRUTS TO THE FLOOR JOISTS FOR SPANS BETWEEN 2.5 METRES TO 4.5 METRES. PROVIDE 2 ROWS FOR SPANS OVER 4.5 METRES
  15. DOUBLE UP FLOOR JOISTS BENEATH BATHS.
  16. PROVIDE TYPE 2 STAINLESS STEEL WALL TIES AT 900MM HORIZONTAL AND 450MM VERTICAL CENTRES (2.5 TIES PER SQUARE METRE MIN) PROVIDE TIES AT MAXIMUM 300MM VERTICAL CENTRES AT OPENINGS, UNBONDED EDGES AND MOVEMENT JOINTS.

|                                                                                                                                                                                       |                    |                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|
| REV                                                                                                                                                                                   | DATE               | DESCRIPTION    |
| CLIENT:                                                                                                                                                                               |                    |                |
| MR A & MRS J WINCH                                                                                                                                                                    |                    |                |
| ARCHITECT:                                                                                                                                                                            |                    |                |
| HD ARCHITECTS                                                                                                                                                                         |                    |                |
| JOB TITLE:                                                                                                                                                                            |                    |                |
| THE WINKLESHED<br>5-6 SEA VIEW TERRACE<br>EMSWORTH                                                                                                                                    |                    |                |
| DRAWING TITLE:                                                                                                                                                                        |                    |                |
| PROPOSED GARDEN WALL<br>ON EXISTING SEA WALL                                                                                                                                          |                    |                |
| DRAWING<br>NUMBER                                                                                                                                                                     | JOB No<br>6445     | DRG No<br>06   |
| SCALE                                                                                                                                                                                 | DRAWN BY<br>NS     | REV<br>.       |
| 1:50 @A1                                                                                                                                                                              | DATE<br>FEB 23     | ENGINEER<br>TS |
| WORK TO FIGURED DIMENSIONS ONLY                                                                                                                                                       | CHECKED BY<br>NDES |                |
| DE SILVA STRUCTURES<br>CONSULTING STRUCTURAL ENGINEERS<br>CITIBASE BRIGHTON<br>95 DITCHLING ROAD, BRIGHTON<br>EAST SUSSEX, BN1 4ST<br>TEL: (01273) 573802 www.desilvastructures.co.uk |                    |                |

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# DE SILVA

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PROJECT

WINKLESHED - SEA WALL

MADE BY

ADS

DATE

FEB 23

CHECKED BY

JOB NO

6445

SHEET NO

SW 1

PROPOSED 215- TRUNK WALL. BRICK.

HEIGHT OF WALL 5.1400m max.

ON FOR STALDARD GARDEN WALL TO  
BE GRINDLES - 1450m ALLOWED, EXIST.

HOWEVER WALL TO ALSO PROTECT  
AGAINST FALLS FROM HEIGHT WHEN  
THE TIDE IS OUT.

DESIGN FOR A BALUSTRADE WAS  
0.744m/- AT 1.1. DUTY 51m.

PROJECT

THE WINKLESHED, EMSWORTH

MADE BY

XADS

DATE

SEPT 22

CHECKED BY

JOB NO

6442

SHEET NO

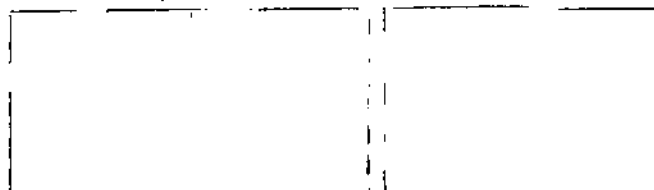
SW2

PROVIDE POSTS TO THE STEEL WALL TO  
PROVIDE RESTRAINT AGAINST LATERAL LOADS.

RAILUSTRIDE LINE LOAD =  $0.74 \text{ kN/m}$   
AT  $1.1 \text{ m}$ .

215mm THICK SOLID BRICK WALL TO BE USED

$0.74 \text{ kN/m}$  LINE LOAD



END OUTLET WALL JOINED AT  
ENDS IS SATISFACTORY

PROVIDE POSTS OR RESTRAINTS AT  
MAXIMUM JOINT CENTRE

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Cloud 3x0x6

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Job Ref : 6445

Sheet : 1 of 3

Made by :

Date : 28 September 2022 / Ver. 2021.16.14

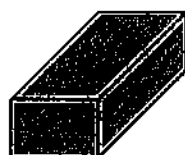
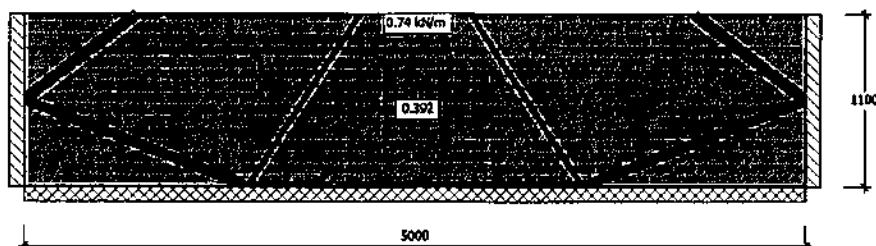
Checked :

Approved :

## Two Way Spanning, Laterally Loaded, Single-leaf Wall

### Design to BS 5628 : 2005

#### Brief 1

**Summary of Design Data**

|                       |                                                                                             |       |    |
|-----------------------|---------------------------------------------------------------------------------------------|-------|----|
| Wall Dimensions       | $h=1.100\text{ m}$ , $h_{ef}=1.100\text{ m}$ , $L=5.000\text{ m}$ , $L_{ef}=5.000\text{ m}$ |       |    |
| Support Conditions    | Bottom Cont., Top Free, Left Simple, Right Simple                                           |       |    |
| Single-leaf Wall (mm) | $t=215$ , $t_{ef}=215$                                                                      |       |    |
| Limiting Dimensions   | $L/h \leq 1350/t_{ef}$ , $L \leq 50 t_{ef}$ , $h \leq 50 t_{ef}$                            | 0.465 | OK |

**Wall Design**

|                                                     |                                                                                                                                     |                         |             |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------|
| Partial Safety Factor ( $\gamma_{mc}/\gamma_{mf}$ ) | Construction Normal, Unit Manufacture Special                                                                                       | 3.1/3                   | Table 4a/4b |
| Unit Material                                       | Clay water absorption 7% to 12%, Standard Bricks, $\gamma=20\text{ kN/m}^3$<br>Designated compressive strength 15 N/mm <sup>2</sup> |                         |             |
| Mortar Material                                     | M2/(iv), 2 N/mm <sup>2</sup>                                                                                                        |                         |             |
| Compressive Strength ( $f_k$ )                      | Standard Bricks                                                                                                                     | 3.6 N/mm <sup>2</sup>   | Table 2     |
| Section Properties                                  | Area=2150 cm <sup>2</sup> /m, $Z_p=7704\text{ cm}^3/\text{m}$                                                                       |                         |             |
| Flexural Strength $f_{kp}$ (Perpendicular)          |                                                                                                                                     | 1 N/mm <sup>2</sup>     | Table 3     |
| Flexural Strength $f_{kb}$ (Parallel)               | $f_{kb}=0.35$ , $g_d=0.009\text{ N/mm}^2$ , $f_{kb}=f_{kb}+0.9 g_d \gamma_{mf}$                                                     | 0.374 N/mm <sup>2</sup> | Table 3     |
| Critical axial compressive case                     | $1.4(\gamma_{tk} h)$                                                                                                                |                         |             |
| Max local stress @                                  | $X=0\text{ m}$ , $Y=0.66\text{ m} < f_k/\gamma_{mc}$                                                                                | 0.03 N/mm <sup>2</sup>  | OK          |
| Critical axial buckling case                        | $1.4(\gamma_{tk} h)$                                                                                                                |                         |             |
| Max axial buckling force @                          | $X=2.5\text{ m}$ , $Y=0.66\text{ m}$ averaged over width of 2.15 m                                                                  | 6.62 kN/m               |             |
| Capacity reduction factor top, $\beta$              | $e_x=0.0\text{ mm}$ , $h_{ef}=1100\text{ mm}$ , $t_{ef}=215.0\text{ mm}$ , $t=215.0\text{ mm}$                                      | 1.000                   |             |
| $Fr=\beta \cdot f_k \cdot t_k / \gamma_{mc}$        | $1.000 \times 3.6 \times 215 / 3.1$                                                                                                 | 249.7 kN/m              |             |
| $F_d/F_r$                                           | $6.6 / 249.7$                                                                                                                       | 0.027                   | OK          |
| $M_r=f_{kp} \cdot Z_p / \gamma_{mf}$                | $1.0 \times 7704 / 3$                                                                                                               | 2.568 kN.m/m            |             |
| $M_r=f_{kb} \cdot Z_b / \gamma_{mf}$                | $0.374 \times 7704 / 3$                                                                                                             | 0.96 kN.m/m             |             |

**Design for Lateral Loads**

|                           |                          |                         |    |
|---------------------------|--------------------------|-------------------------|----|
| Design Lateral Load $W_d$ | 1.4 $W_x$                | 0.000 kN/m <sup>2</sup> |    |
| Yield Line Analysis       | Load Factor, $\lambda_p$ | 2.553                   |    |
| $U_t=1/\lambda_p$         | $1/2.553$                | 0.392                   | OK |

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PROJECT

THE WINKLESSED, BOWSWORTH.

MADE BY

ADD:

DATE

SEPT 22

CHECKED BY

JOB NO

6445

SHEET NO

EW4

POST TO SUPPORT LINE LOADS

DESIGN AS A CANTILEVER.

$P.L.s \ 0.74 \times 5 = 3.7 \text{ MW AT 1.1.}$

THIS CASE IS CONSERVATIVE AS  
ACTUAL LOAD WILL BE REDUCED DUE  
TO CANTILEVER RESISTANCE. (WALL ONLY  
FAILS BY 10% WHEN DESIGNED AS A  
CANTILEVER)

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Cloud 3e0e6

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Job Ref : 6445

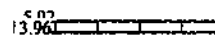
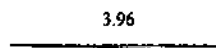
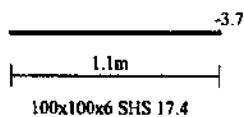
Sheet : 1525

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Date : 17 February 2023 / Ver. 2021.16.14

Checked : NADS

Approved :



**All Loading Cases**  
**Load Diagram - Bending Moment - Shear Force**

**P1**  
**Summary of Data**

**Member Properties**

Span 1

M ... ..

A 22.17E-4

E 205.0E6

100x100x6 SHS 17.4 [S 275]

Ix 323.2E-8

G 78.85E6

Iy 323.2E-8

J 513.0E-8

**Member Loading**

Span 1

L1 PY -003.700 1.100 ( kN,m )

**Support Conditions**

NODE 1

UT Rs 1 1 1 1 1 1

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Cloud 3e0c6

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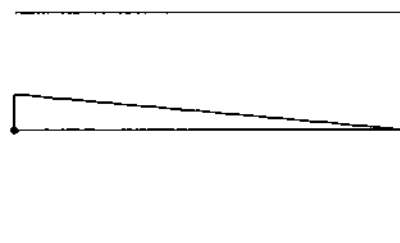
Checked : NADS

Approved :

**Axial with Moments (Member)****P1: Span 1****Span 1 in Load Case 1****Member Loading and Member Forces**

Loading Combination : 1 UT + 1.4 DI + 1.6 LI

LI PY -003.700 1.100 ( kN,m )

**Member Forces in Load Case 1 and Maximum Deflection from Load Case 2**

| Span No. | Axial Force (kN) | Shear Force (kN) |      | Bending Moment (kN.m) |      | Maximum Moment (kN.m @ m) | Maximum Deflection (mm @ m) |
|----------|------------------|------------------|------|-----------------------|------|---------------------------|-----------------------------|
|          |                  | End1             | End2 | End1                  | End2 |                           |                             |
| 1        | 0.00C            | 5.92             | 0.00 | -6.51                 | 0.00 |                           | 0.48 @ 0.467                |

**Classification and Properties (BS 5950: 2000)**

Section (17.4 kg/m) 100x100x6 SHS 17.4 [S 275]

Class = F<sub>n</sub>(b/t, d/t, p<sub>y</sub>, F, M<sub>x</sub>, M<sub>y</sub>) 13.67, 13.67, 275, 0, 6.512, 0

Auto Design Load Cases

1

(Axial: Non-Slender)

Plastic

**Moment Capacity Check Mc**F<sub>v</sub>/P<sub>v</sub> 5.92 / 182.903 =

0.032 Low Shear

Mc = p<sub>y</sub>.S<sub>xx</sub> ≤ 1.2 p<sub>y</sub>.Z<sub>xx</sub> 275 x 77.61 ≤ 1.2 x 275 x 64.64 =

21.331 kN.m

MA/Mc -6.512 / 21.331 =

0.305 OK

**Equivalent Uniform Moment Factor m<sub>LT</sub>**m<sub>LT</sub> Cantilever

1 Table 18

**Lateral Buckling Check Mb**

Mb = Mc

Section not susceptible to lateral torsional buckling

21.331 kN.m

MA/(Mb/m<sub>LT</sub>)

1.6512 / 21.331

0.305 OK

**Deflection Check - Load Case 2**

Cantilever δ ≤ Span/180

2.48 ≤ 1100 / 180

2.48 mm OK

PROJECT

WINDLESLED - SEA WALL.

MADE BY

ADS

DATE

FEB 22

CHECKED BY

JOB NO

6442

SHEET NO

SW7

CONSIDER EY 14 BOLTS -  
2 BOLTS

$$F_t = \frac{4.1 \times 10^6}{2 \times 200} = 10.26 \text{ kN} \cdot \text{T.}$$

$F_t = 2.7/2 = 1.35 \text{ kN} \cdot \text{V} \cdot \text{SAY. (MASONRY WILL TRANSFER SHEAR)}$

3 BOLTS

$$F_t = \frac{4.1 \times 10^6}{3 \times 200} = 6.9 \text{ kN} \cdot \text{T.}$$

$F_t = \frac{2.7}{3} = 1.2 \text{ kN} \cdot \text{V. SAY. (MASONRY WILL TRANSFER SHEAR)}$

USE MULTI-HIT-CTI INJECTION MORTAR.

SURFACE EX CRACKED AND NOT CRACKED CONCRETE DRY AND WATER SATURATED

PROVIDE STAINLESS STEEL REINFORCED ROD TO AVOID POSSIBLE CORROSION ISSUES.

ANCHORS

M12 - 110mm EMBEDMENT - CONCRETE - USE EDGE DISTANCE

M16 - 120mm EMBEDMENT, 90mm - 50mm EDGE DISTANCE

RECOMMENDED BARS: NOT CRACKED CONCRETE (1.4E06)

M12 - 13.1 kN · T,  $V = 12 \text{ kN}$

M16 - 25.9 kN  $V = 22.4 \text{ kN}$

> 10.3

HAS-A-A4 - STAINLESS STEEL.

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WIMBORNE - SEA WALL

MADE BY

ADS

DATE

FEB 23

CHECKED BY

JOB NO

6448

SHEET NO

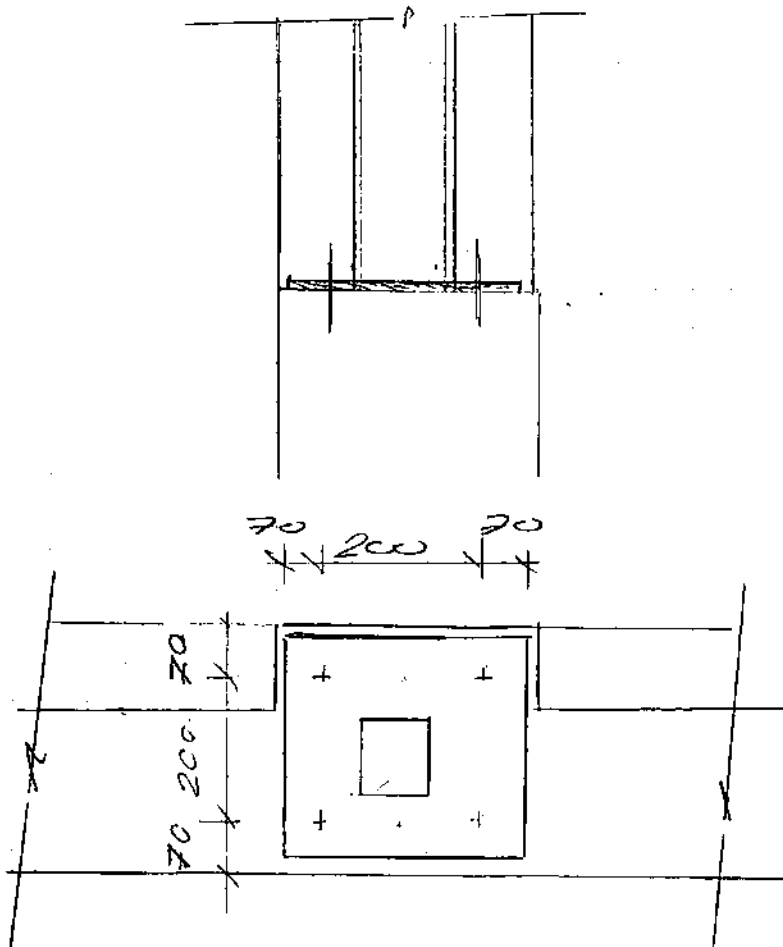
SW8

BASE FIXING

BENDING MOMENT: 6.5 kNm act

= 4.1 kNm service

TOP OF WALL FINISHES: 2400 - 4500



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PROJECT

WINDLESTAD, SEA WALL.

MADE BY

L.D.S.

DATE

22.2.22

CHECKED BY

JOB NO

6442

SHEET NO

SW9

1) CHECK MASS IN SANDPILE.

$$10.3 \times 1.6 \times 0.1 = 1.64 \text{ kN/m}$$

$$A_s = 272 \text{ mm}^2$$

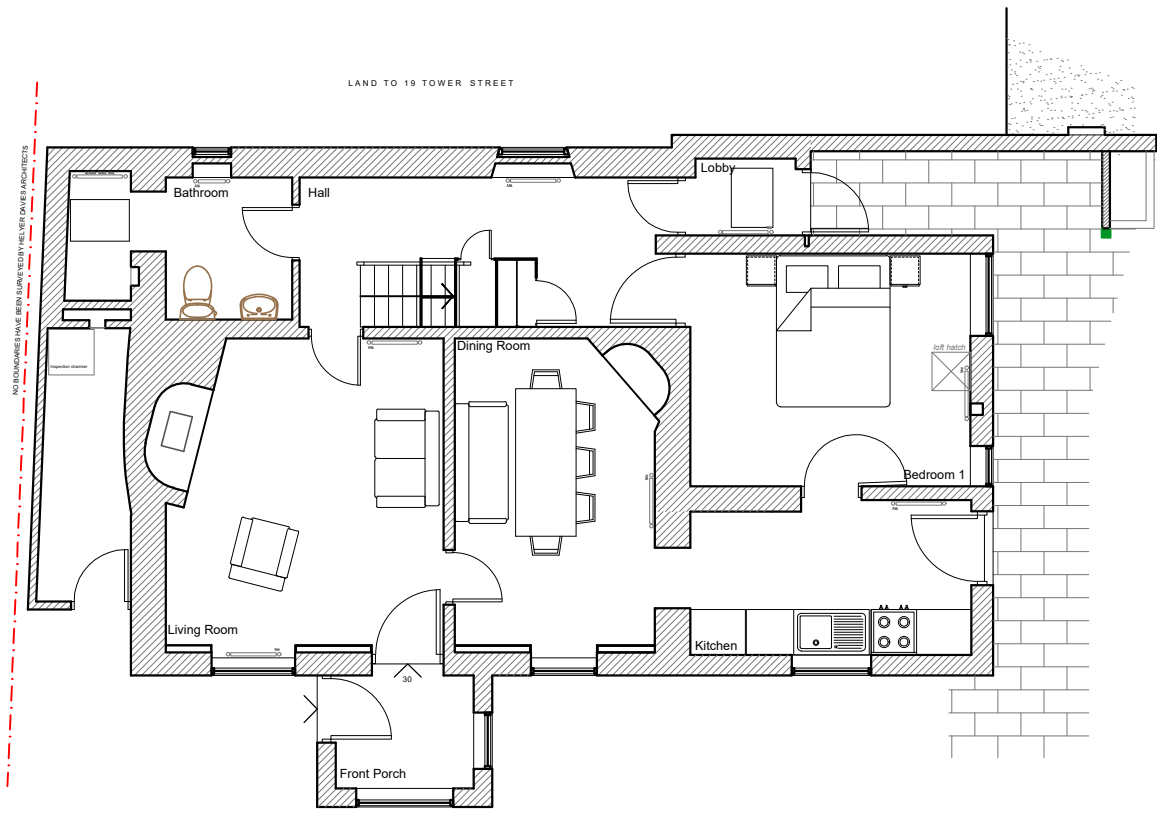
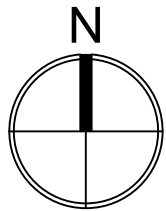
$$t = \sqrt{\frac{1.64 \times 10^6 \times 6}{272 \times 250}} = 12 \text{ mm}$$

USE 15mm PLATE

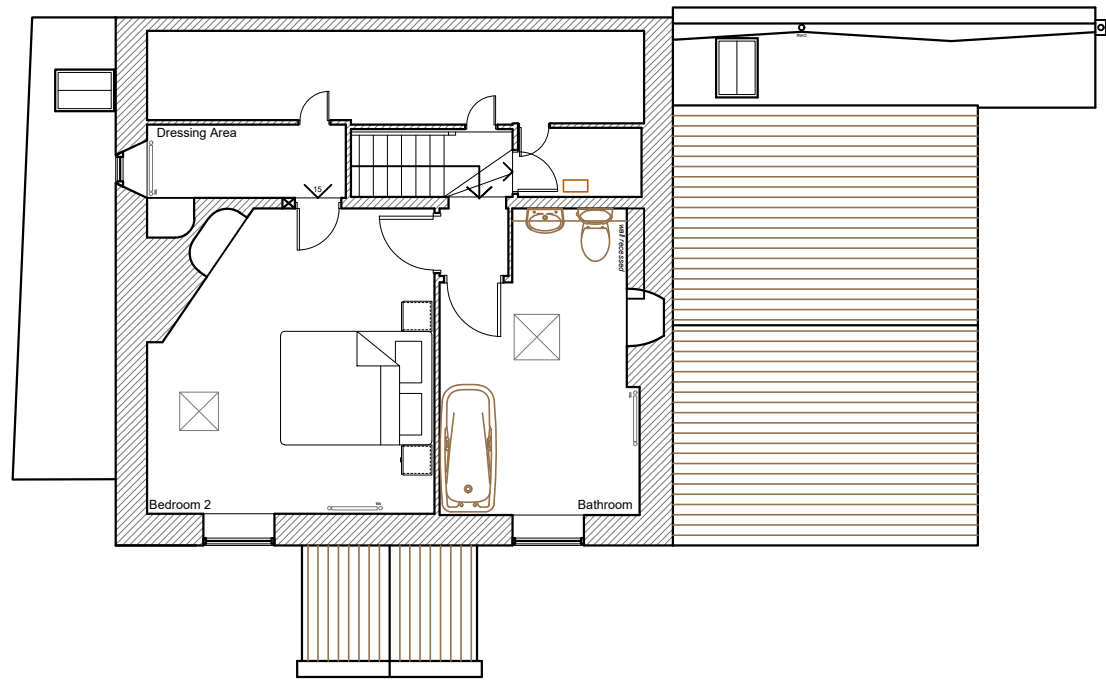
$$\text{Mass} = \frac{250 \times 15^2 \times 272}{6} = 2.6 \text{ kN/m} > 1.64 \text{ kN/m}$$

SEAVIEW, 23 TOWER STREET, EMSWORTH  
EXISTING

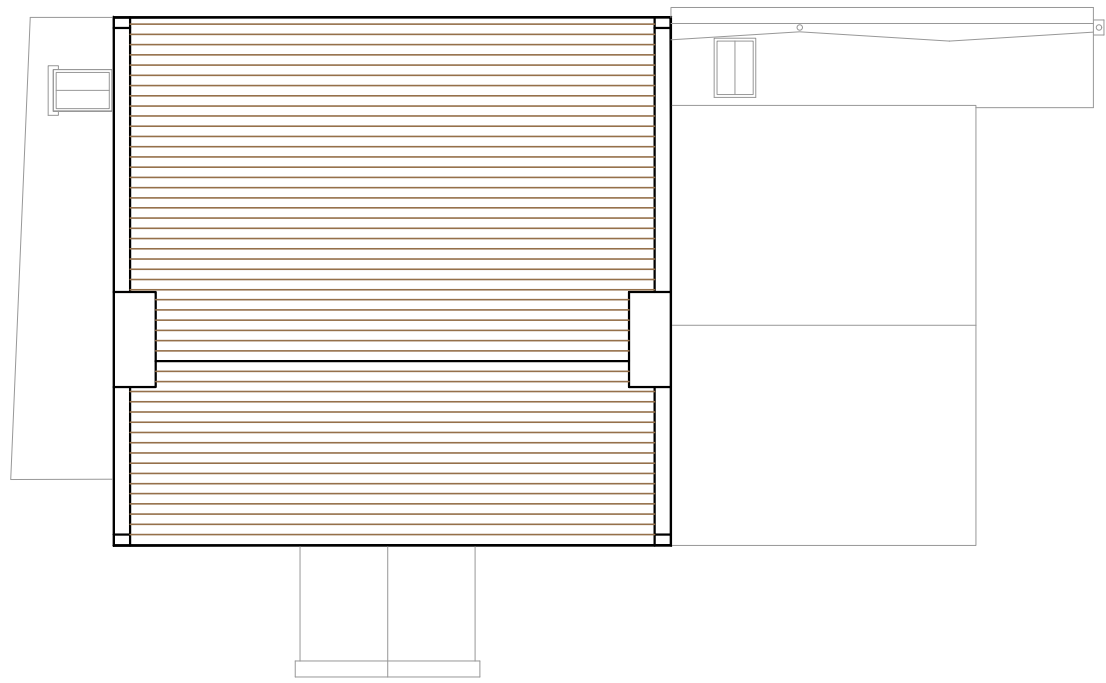
NOTES:  
Dimensions to be checked on site before commencing work.  
Any discrepancies shall be reported to the architect immediately.  
Do not scale from these drawings except for planning purposes.  
Use figured dimensions only.  
Where applicable this drawing is to be read in conjunction with other consultants' drawings.  
All drawings to be read in conjunction with specification and all other drawings including structural engineer and mechanical and electrical drawings / specification



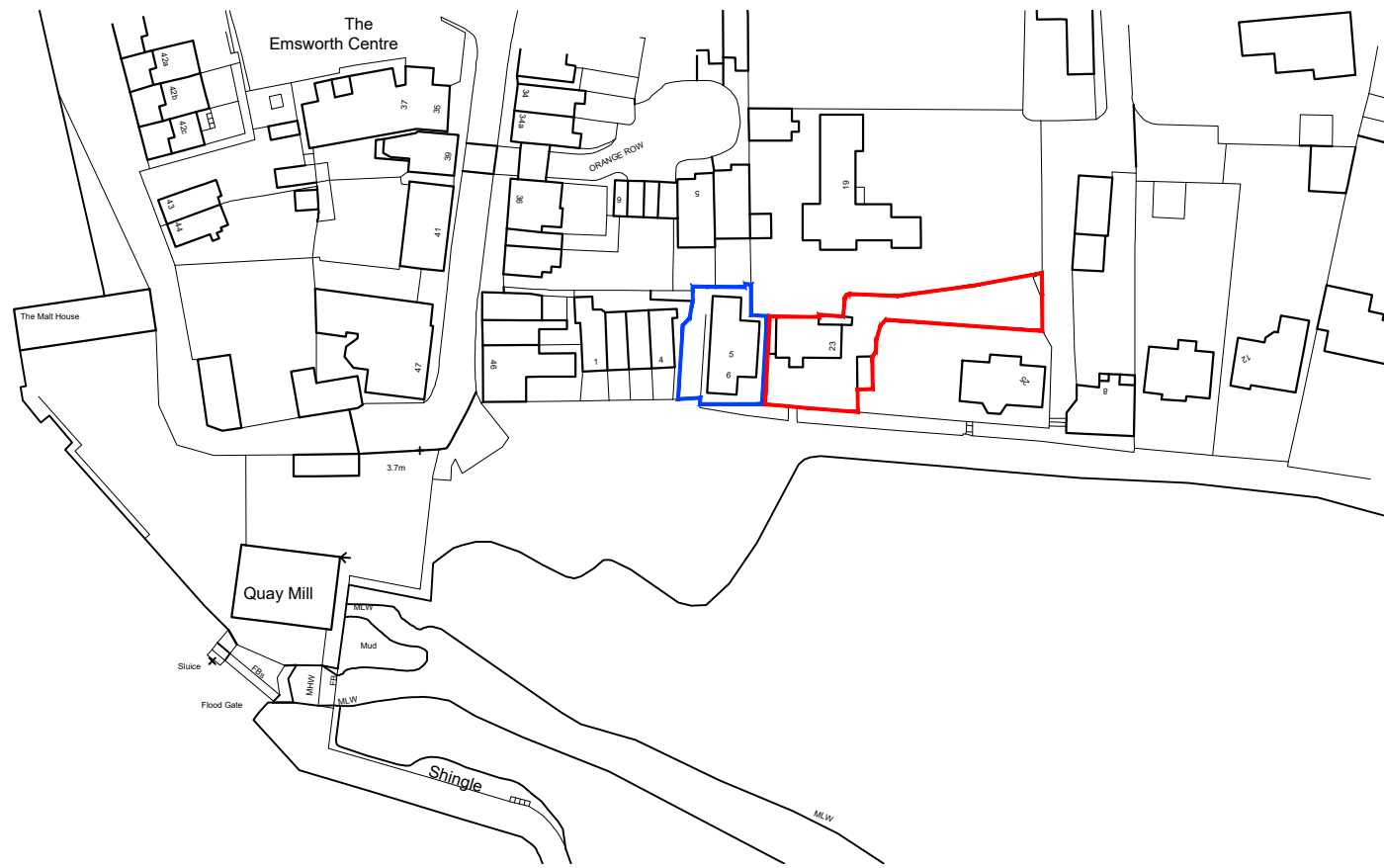
GROUND FLOOR  
1:100



FIRST FLOOR  
1:100



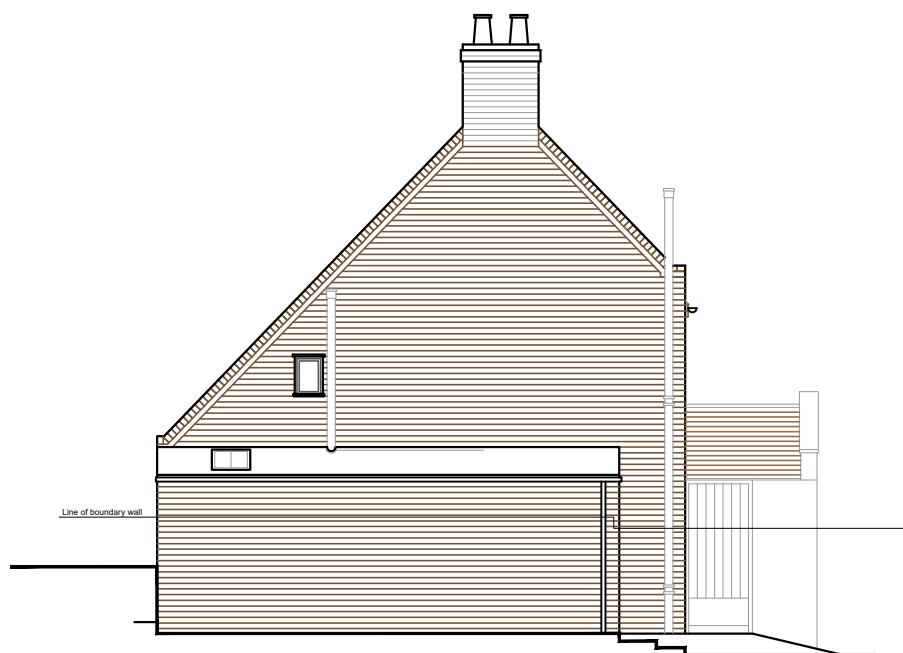
ROOF PLAN  
1:100



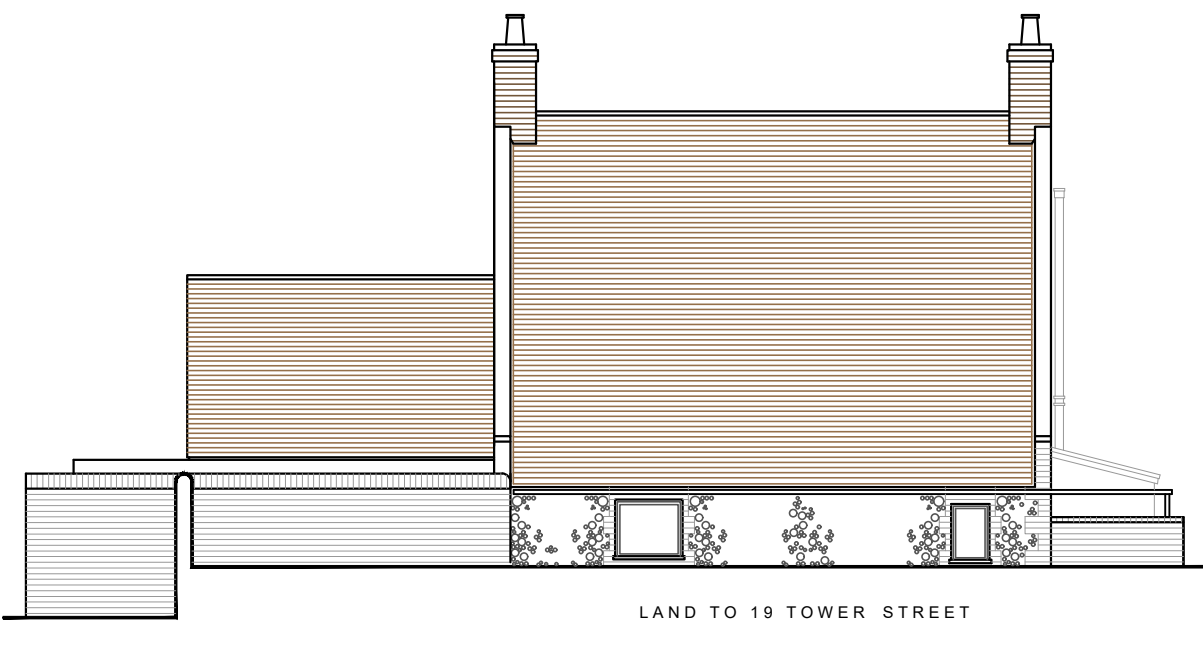
SITE LOCATION PLAN  
1:1250  
Ordnance Survey (c) Crown Copyright 2021. All rights reserved. Licence number 100022432



FRONT ELEVATION  
[south] 1:100



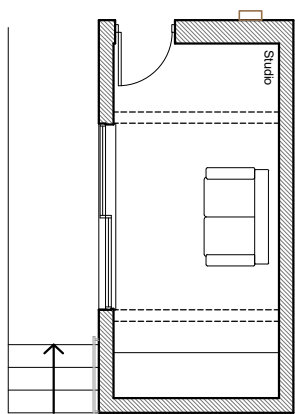
SIDE ELEVATION  
[west] 1:100



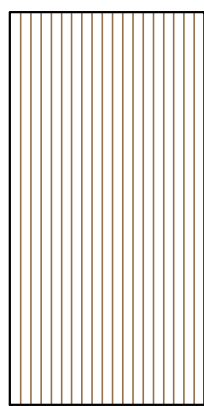
REAR ELEVATION  
[north] 1:100



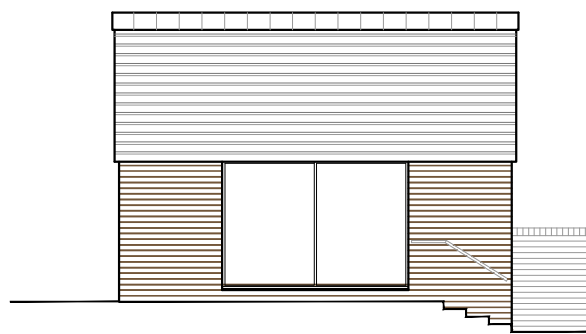
SIDE ELEVATION  
[east] 1:100



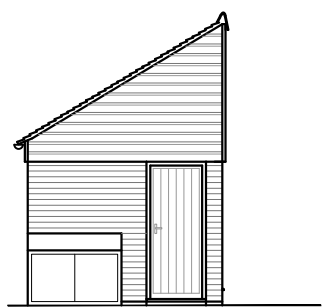
GROUND FLOOR  
1:100



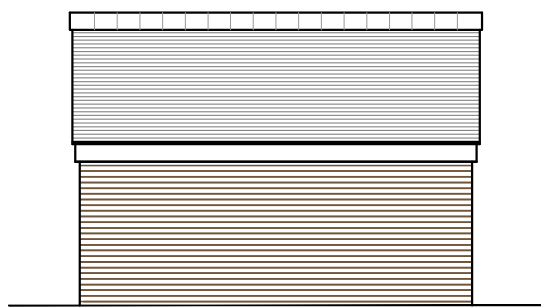
ROOF PLAN  
1:100



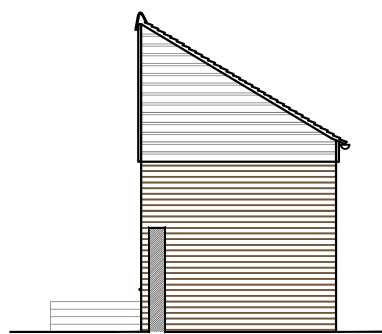
FRONT ELEVATION  
[west] 1:100



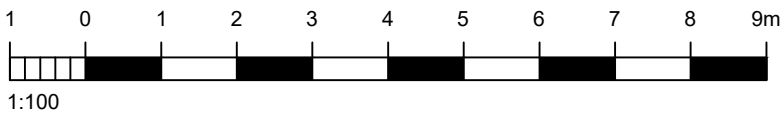
SIDE ELEVATION  
[north] 1:100



REAR ELEVATION  
[east] 1:100



SIDE ELEVATION  
[south] 1:100



| REV | DATE | AMENDMENT | DRAWN |
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|     |      |           |       |

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01243 370 715  
www.hdarchitects.co.uk mail@hdarchitects.co.uk

PROJECT  
Seaview  
23 Tower Street  
Emsworth

DRAWING  
Existing  
SCALE  
as noted @ A1

|                            |               |
|----------------------------|---------------|
| DATE<br>JUNE 2022          | DRAWN<br>TW   |
| DRAWING NUMBER<br>22088-01 | REVISION<br>* |

SEAVIEW, 23 TOWER STREET, EMSWORTH  
PROPOSED

NOTES:

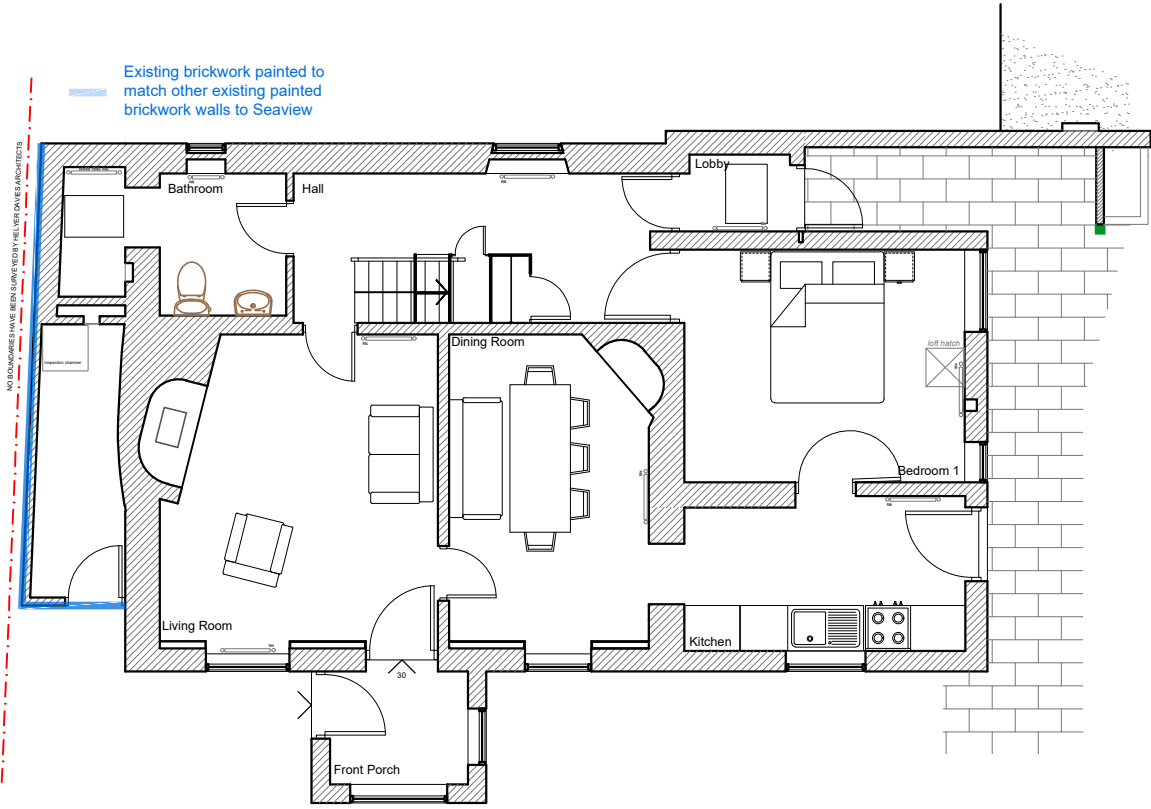
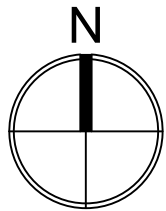
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Do not scale from these drawings except for planning purposes.

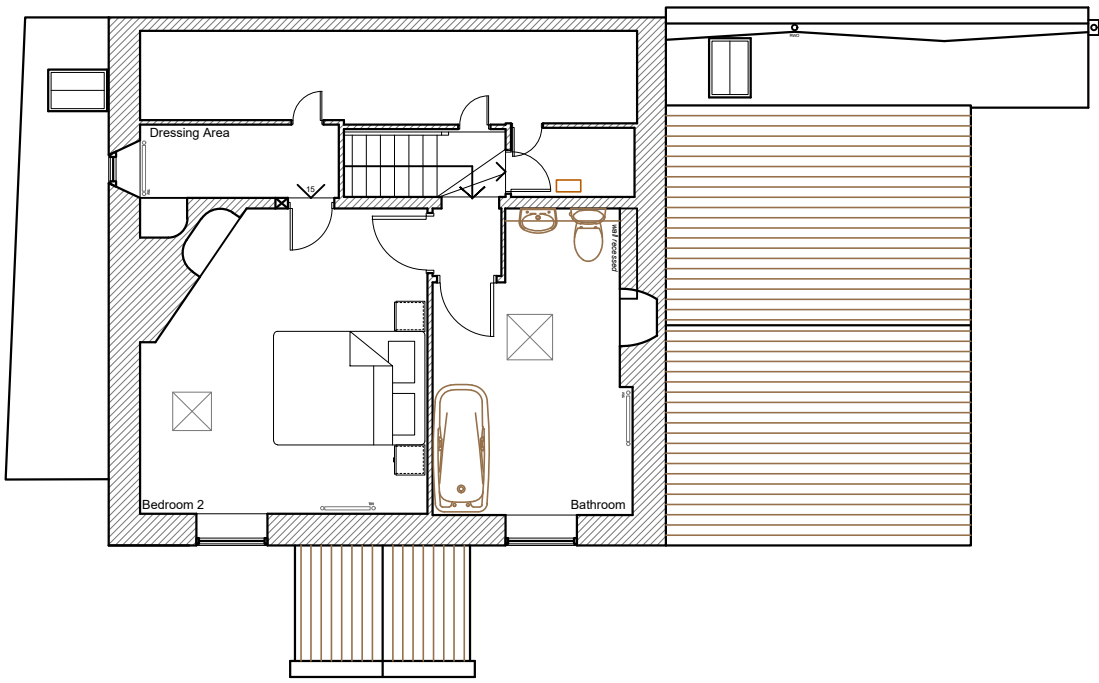
Use figured dimensions only.

Where applicable this drawing is to be read in conjunction with other consultants' drawings.

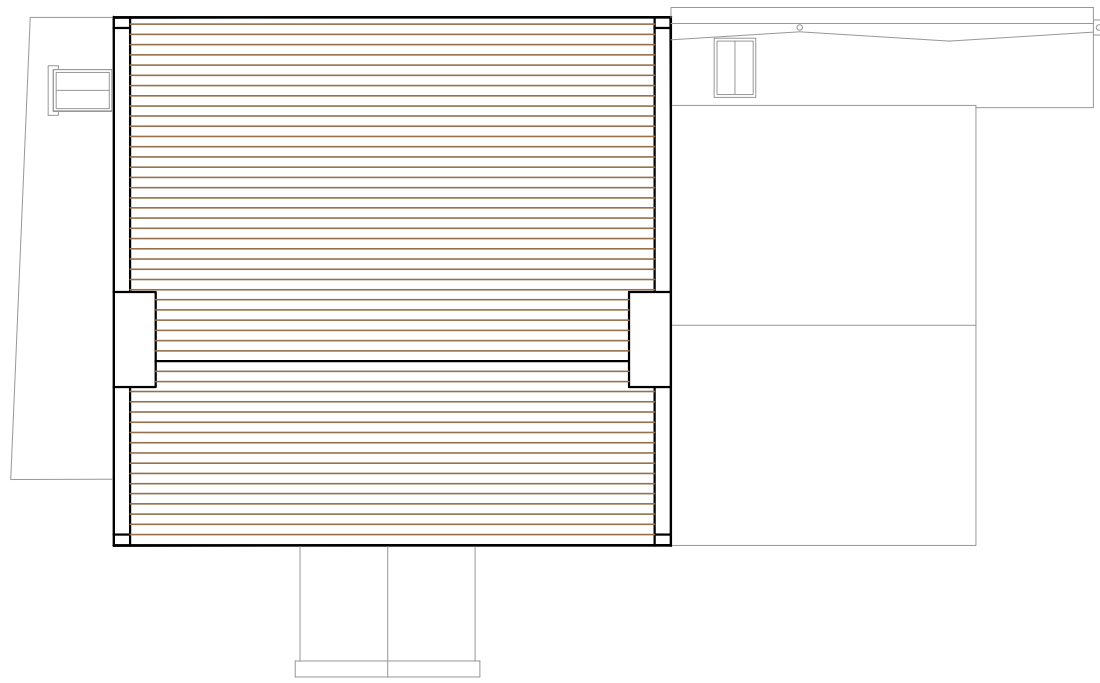
All drawings to be read in conjunction with specification and all other drawings including structural engineer and mechanical and electrical drawings / specification



GROUND FLOOR  
1:100



FIRST FLOOR  
1:100



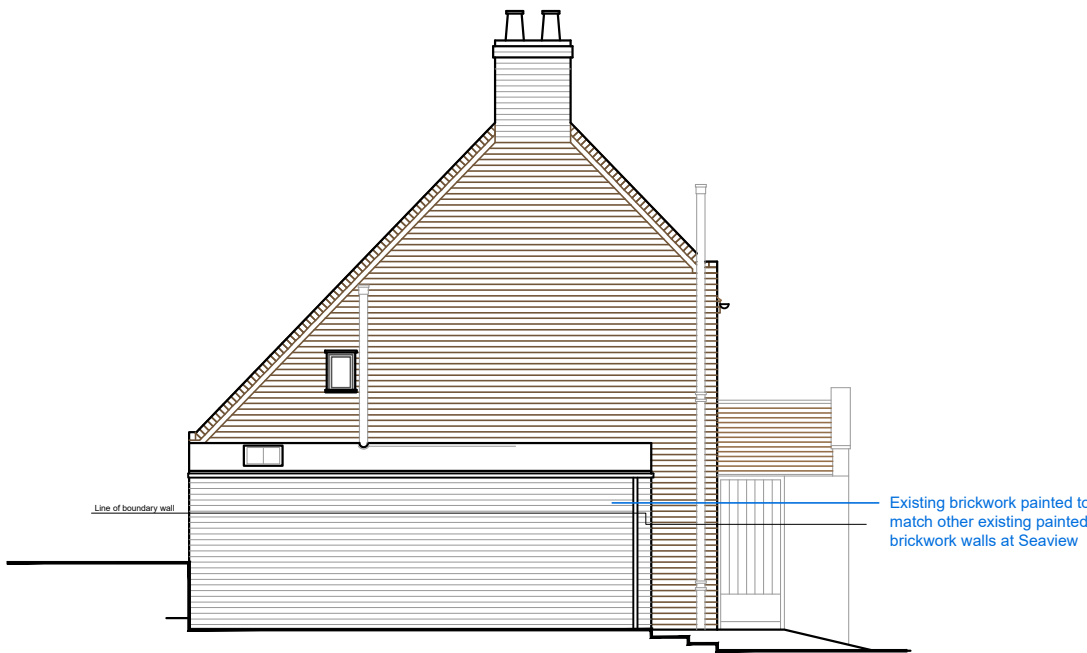
ROOF PLAN  
1:100



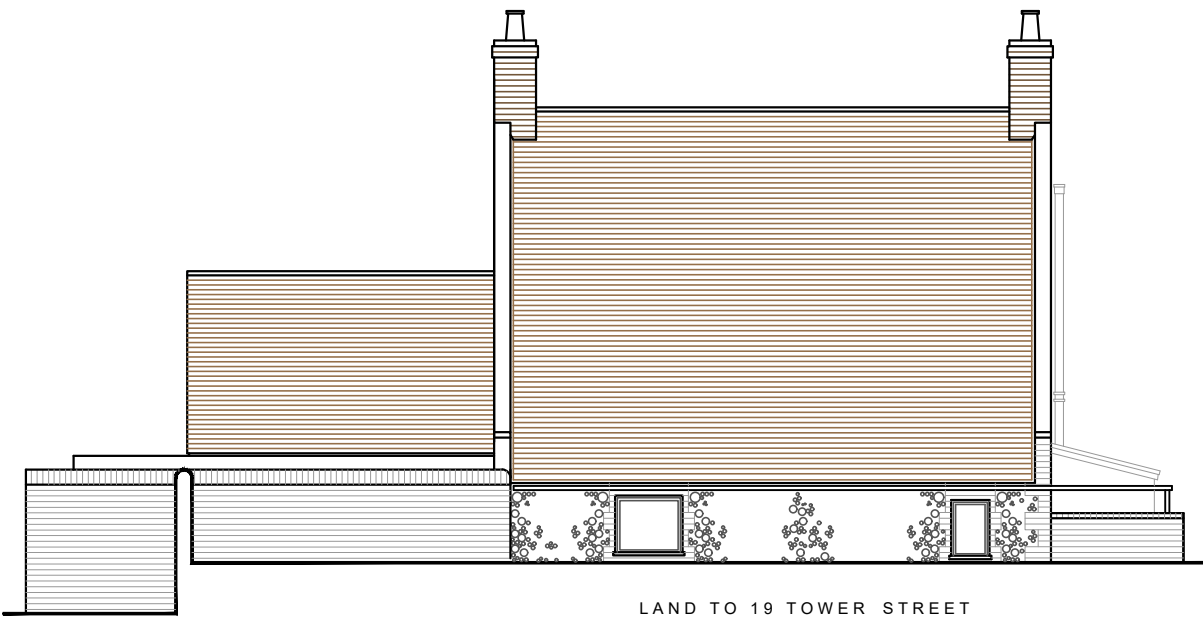
BLOCK PLAN  
1:500  
Ordnance Survey (c) Crown Copyright 2021. All rights reserved. Licence number 100022432



FRONT ELEVATION  
[south] 1:100



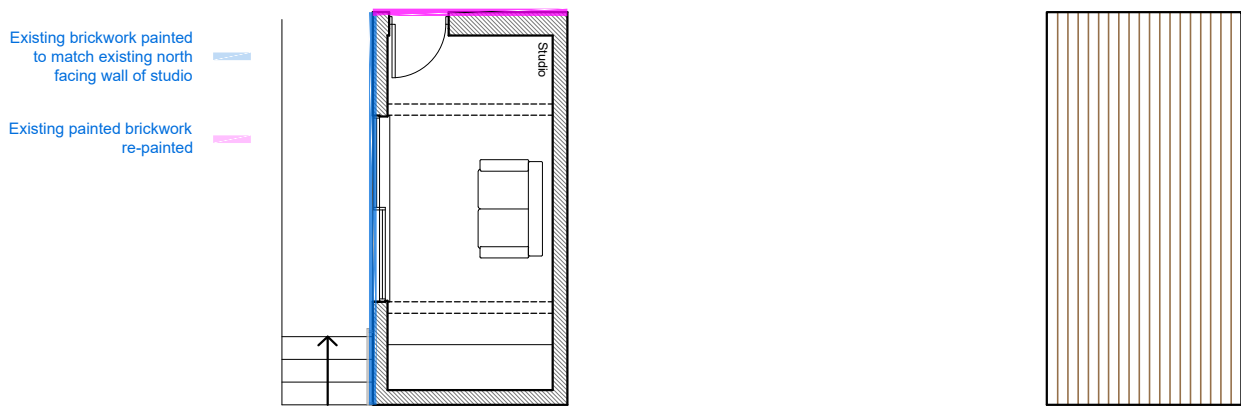
SIDE ELEVATION  
[west] 1:100



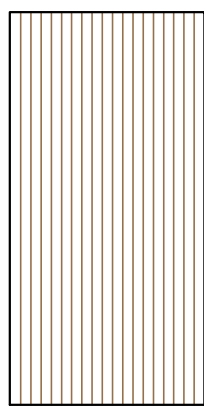
REAR ELEVATION  
[north] 1:100



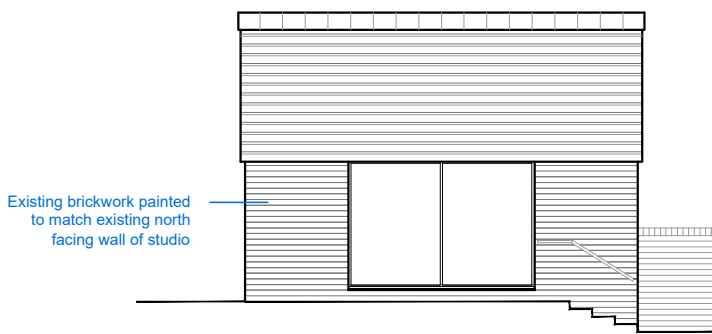
SIDE ELEVATION  
[east] 1:100



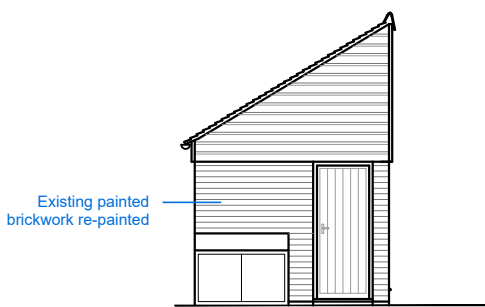
GROUND FLOOR  
1:100



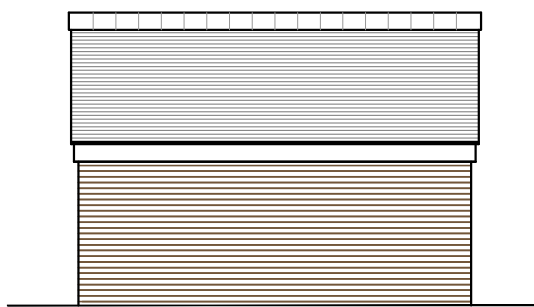
ROOF PLAN  
1:100



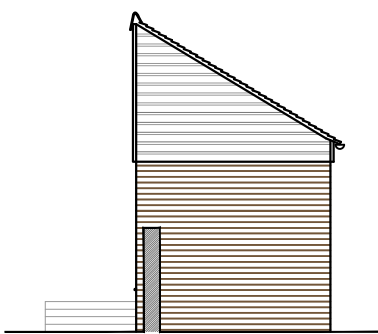
FRONT ELEVATION  
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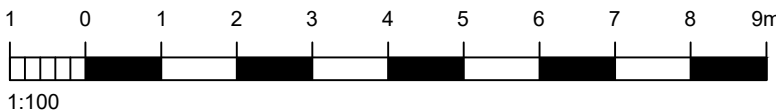
SIDE ELEVATION  
[north] 1:100



REAR ELEVATION  
[east] 1:100



SIDE ELEVATION  
[south] 1:100



| REV | DATE | AMENDMENT | DRAWN |
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PROJECT  
Seaview  
23 Tower Street  
Emsworth

DRAWING  
Proposed

SCALE  
as noted @ A1

|                            |               |
|----------------------------|---------------|
| DATE<br>JUNE 2022          | DRAWN<br>TW   |
| DRAWING NUMBER<br>22088-02 | REVISION<br>* |

# THE WINKLESHED, EMSWORTH PROPOSED

**NOTES:**

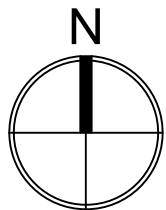
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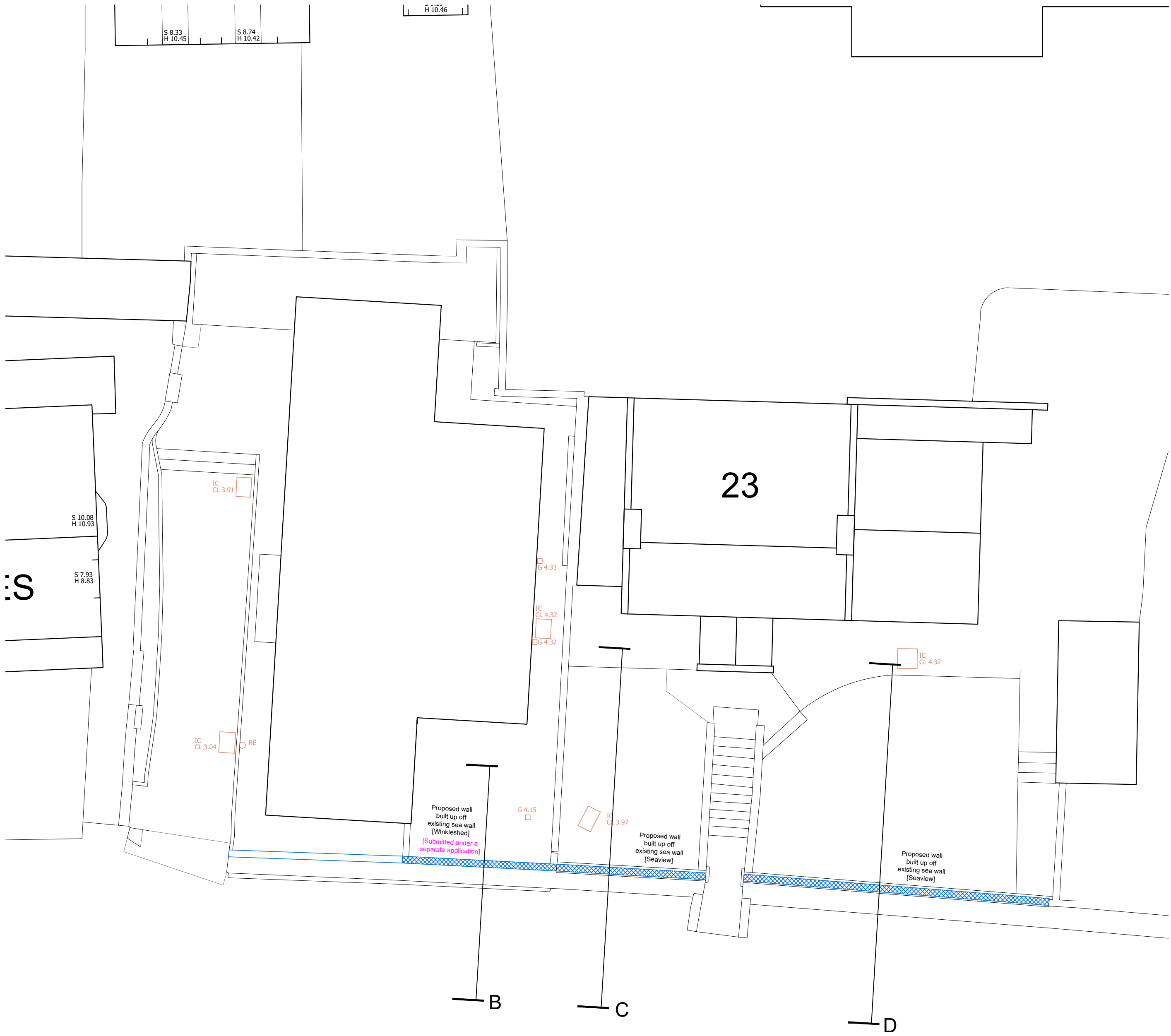
All drawings to be read in conjunction with specification and all other drawings including structural engineer and mechanical and electrical drawings / specification



**APPROVED SOUTH ELEVATION [REF: 20/00219 & 20/00220]**  
1:100



**PROPOSED SOUTH ELEVATION**  
1:100



# PROPOSED SITE PLAN

1:100

|     |      |           |       |
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| REV | DATE | AMENDMENT | DRAWN |

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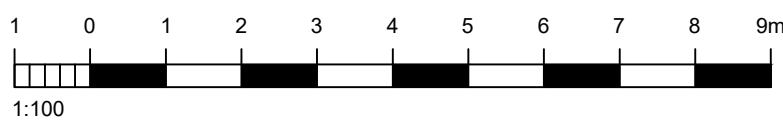
**Helyer Davies Architects Ltd**  
1 The Old Flour Mill,  
Ensworth, PO10 7BT  
01243 370 715

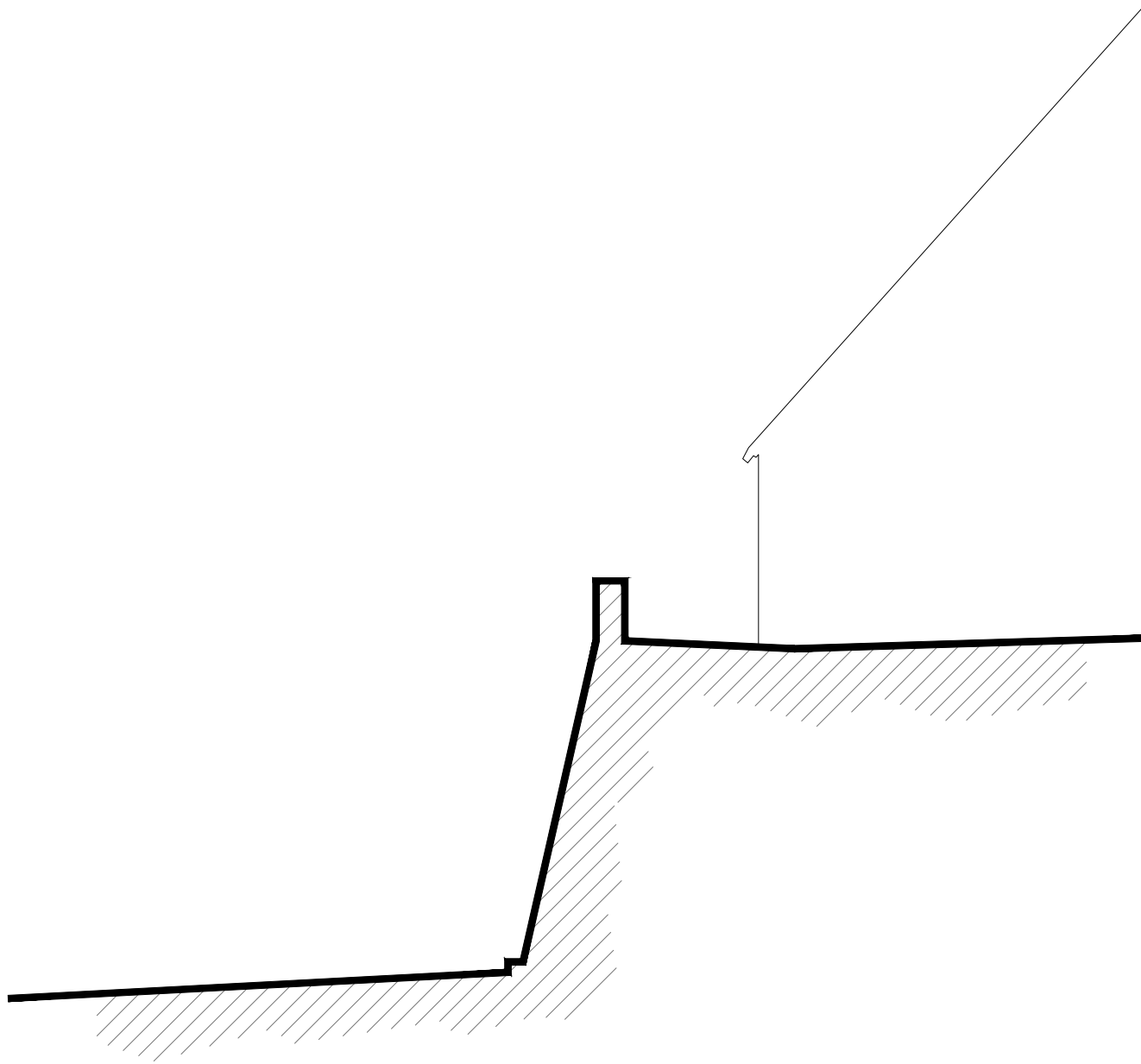
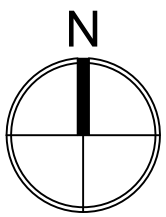
[www.hdarchitects.co.uk](http://www.hdarchitects.co.uk)    [mail@hdarchitects.co.uk](mailto:mail@hdarchitects.co.uk)

PROJECT  
Seaview  
23 Tower Street  
Emsworth

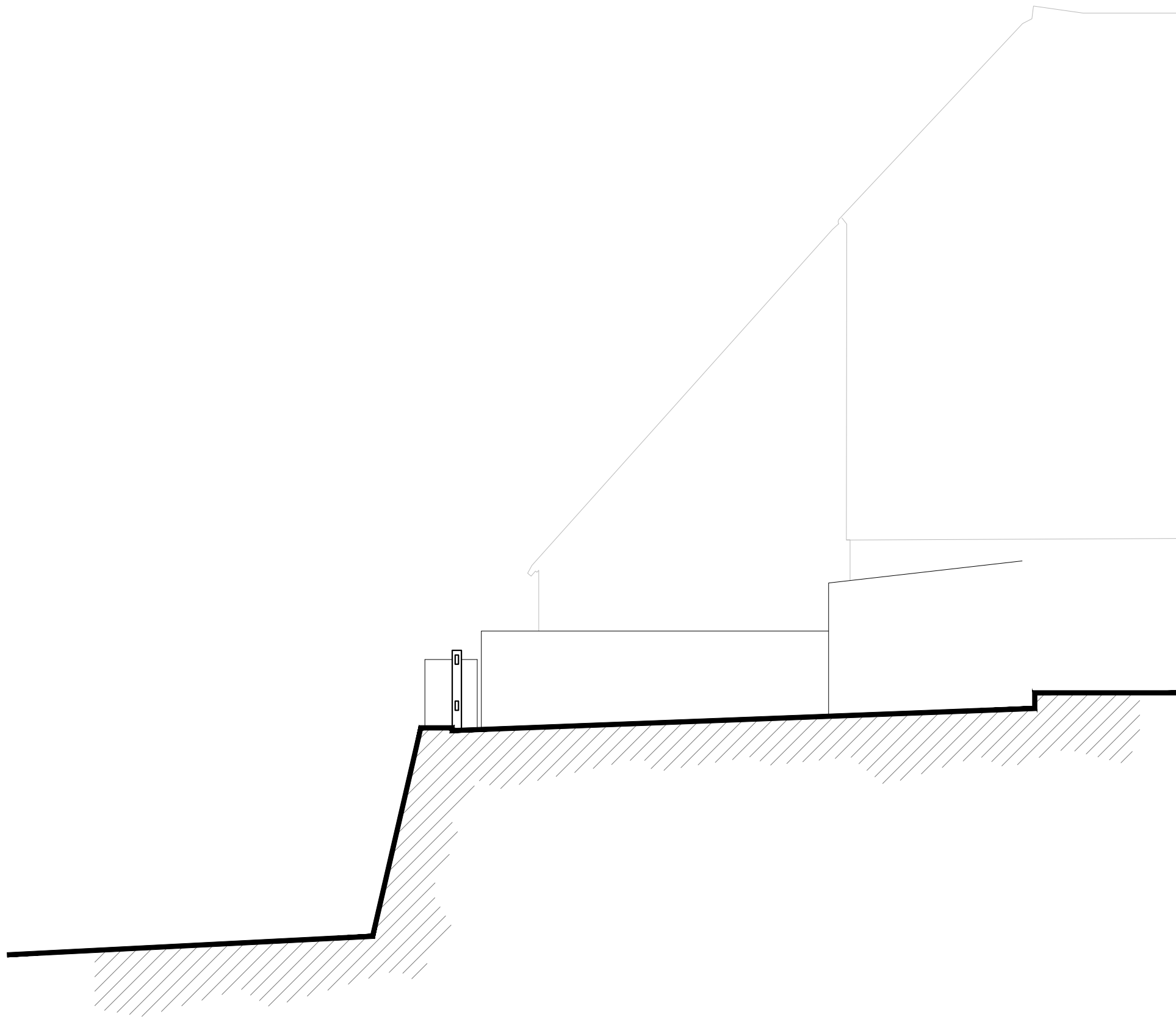
|                                    |               |
|------------------------------------|---------------|
| DRAWING                            | SCALE         |
| Existing/Proposed;<br>Street Scene | as noted @ A1 |

|                |           |          |    |
|----------------|-----------|----------|----|
| DATE           | JUNE 2022 | DRAWN    | TW |
| DRAWING NUMBER |           | REVISION |    |
| 22088-03       |           | *        |    |

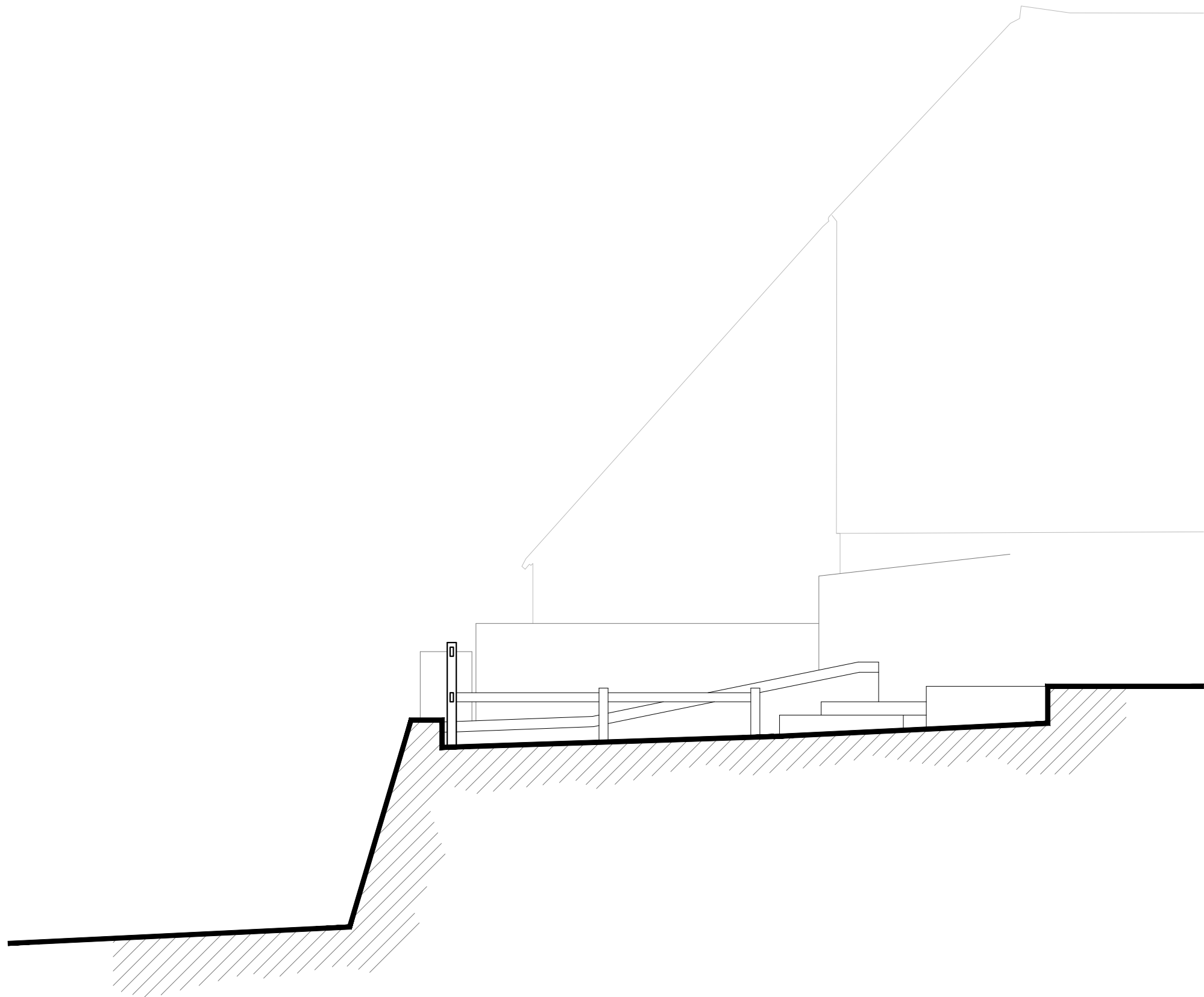




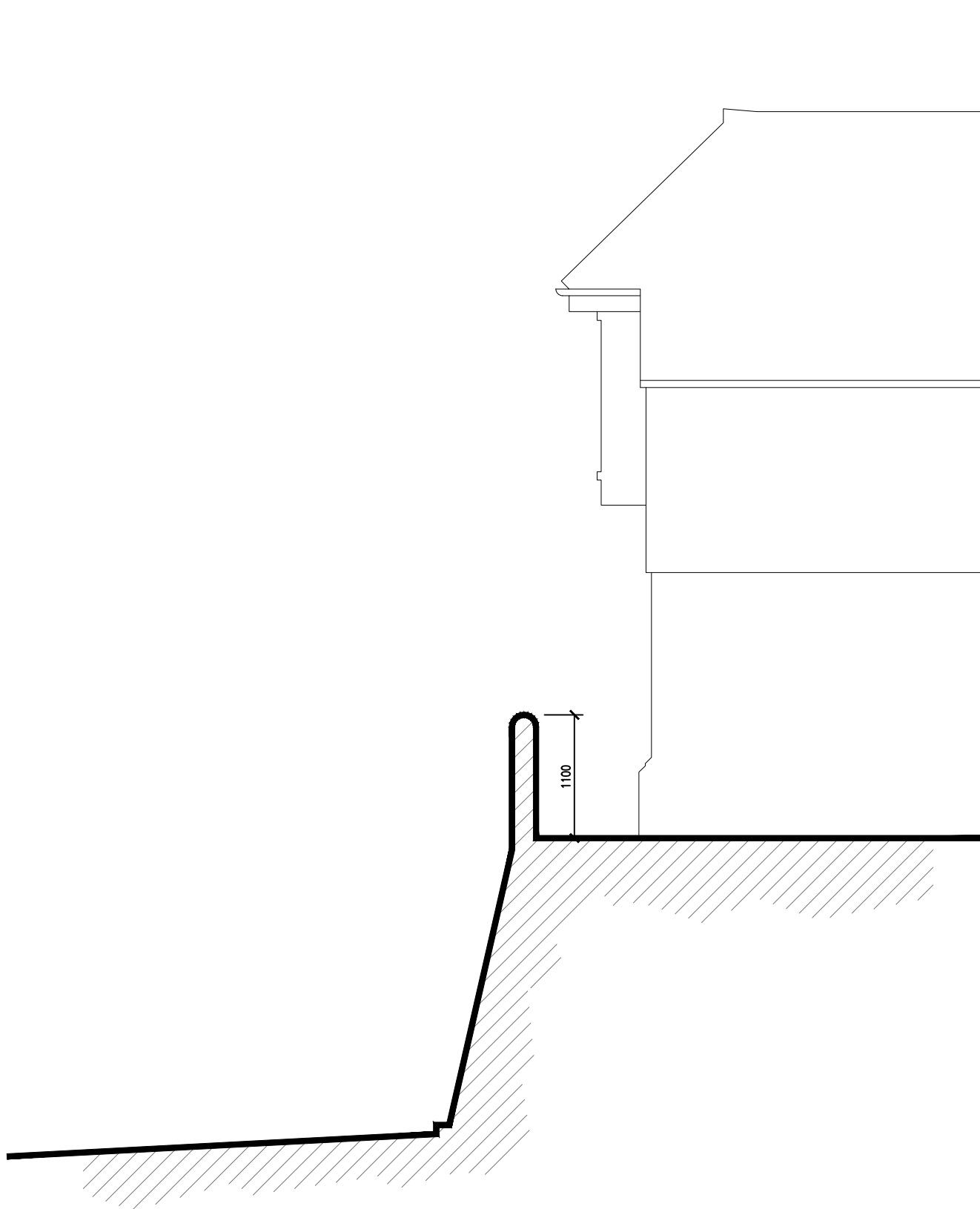
SECTION B  
1:50



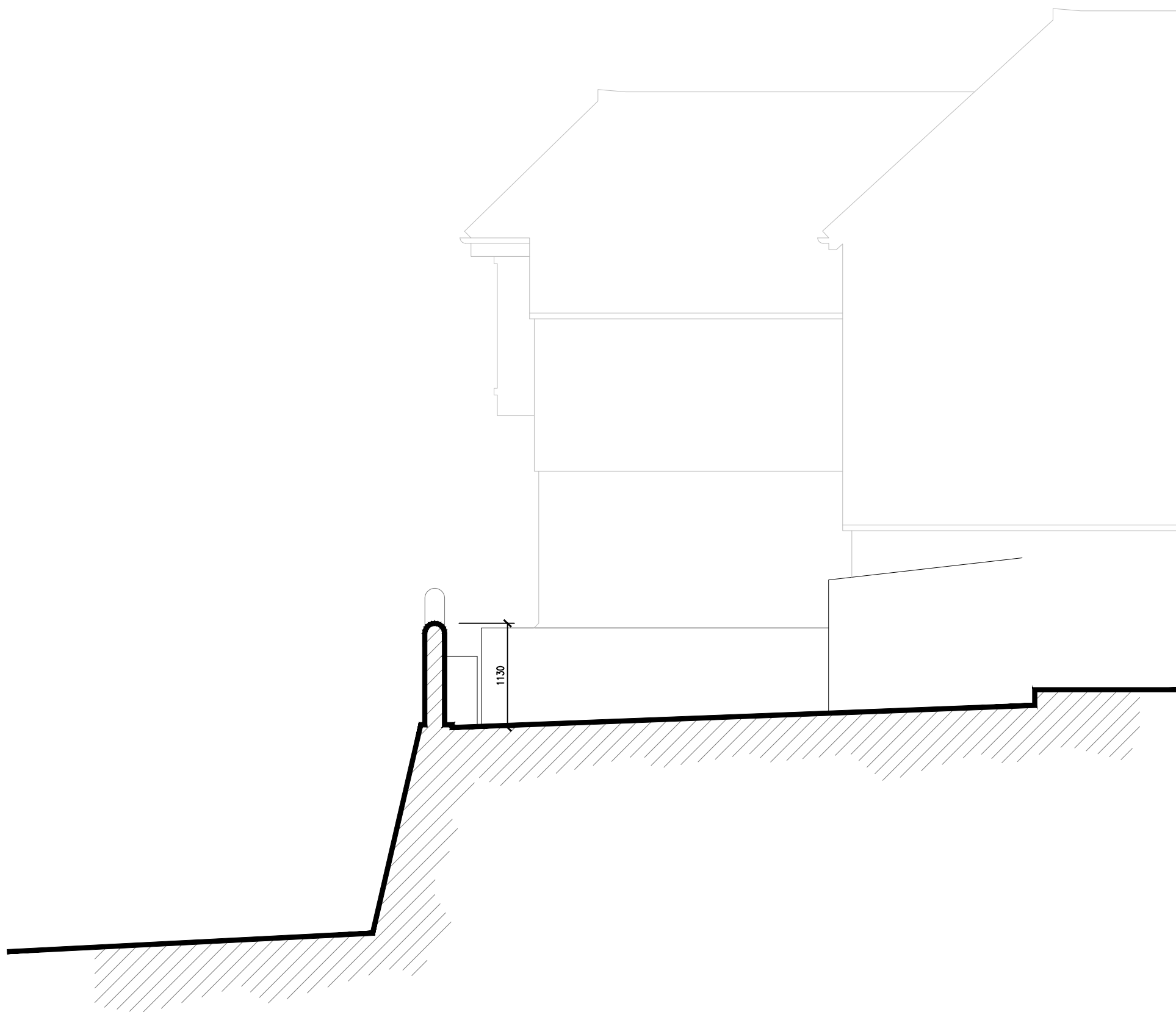
SECTION C  
1:50



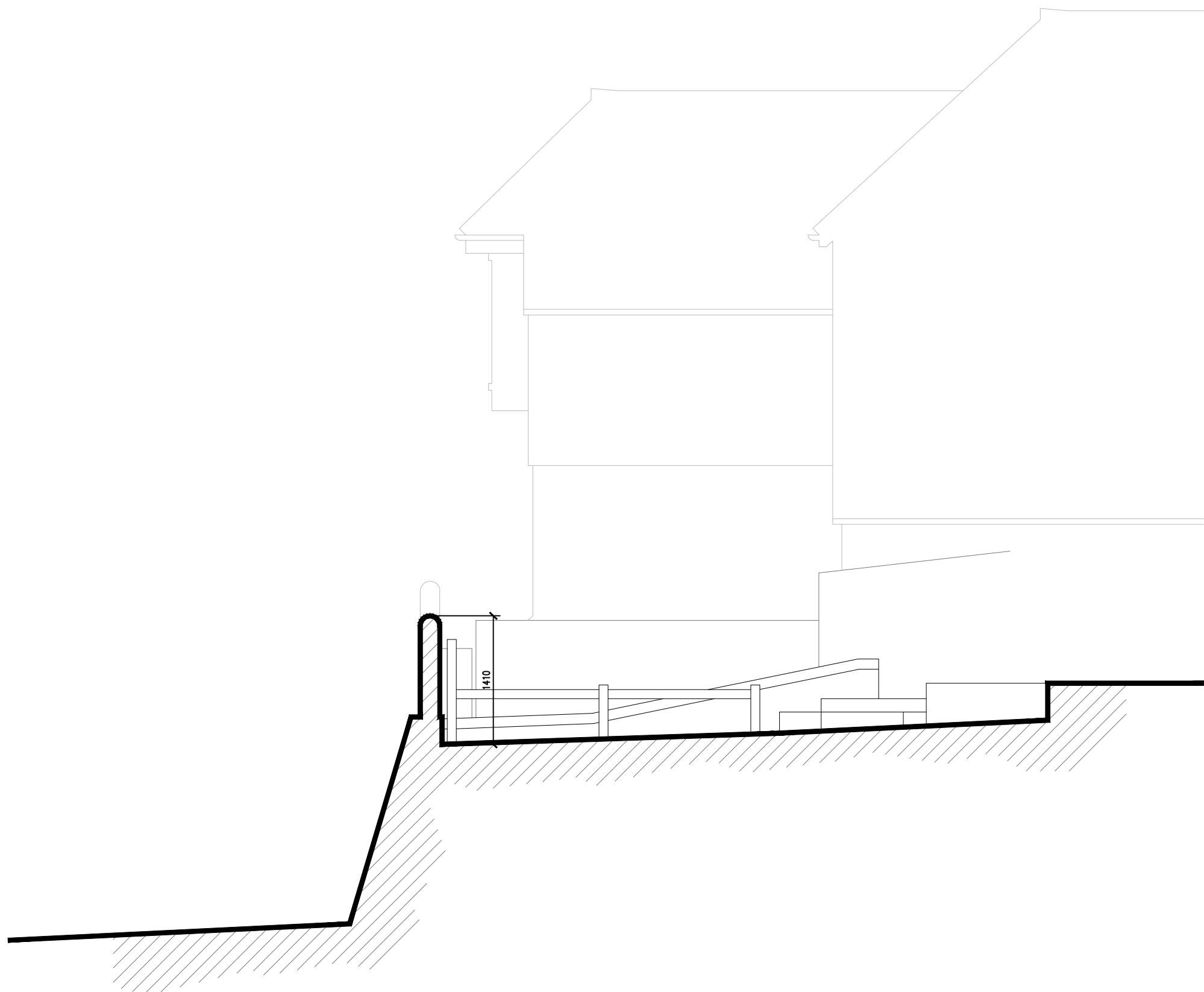
SECTION D  
1:50



SECTION B - PROPOSED  
1:50



SECTION C - PROPOSED  
1:50



SECTION D - PROPOSED  
1:50

NOTES:  
Dimensions to be checked on site before commencing work.  
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| REV | DATE | AMENDMENT | DRAWN |
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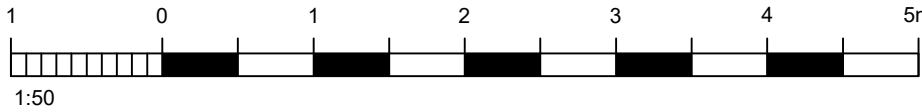
mail@hdarchitects.co.uk

PROJECT  
Seaview  
23 Tower Street  
Emsworth

DRAWING  
Proposed;  
Existing/Proposed sections  
through Sea Wall

SCALE  
as noted @ A1

|                |           |          |    |
|----------------|-----------|----------|----|
| DATE           | JUNE 2022 | DRAWN    | TW |
| DRAWING NUMBER | 22088-04  | REVISION | *  |



THE WINKLESHED, EMSWORTH  
PROPOSED

NOTES:

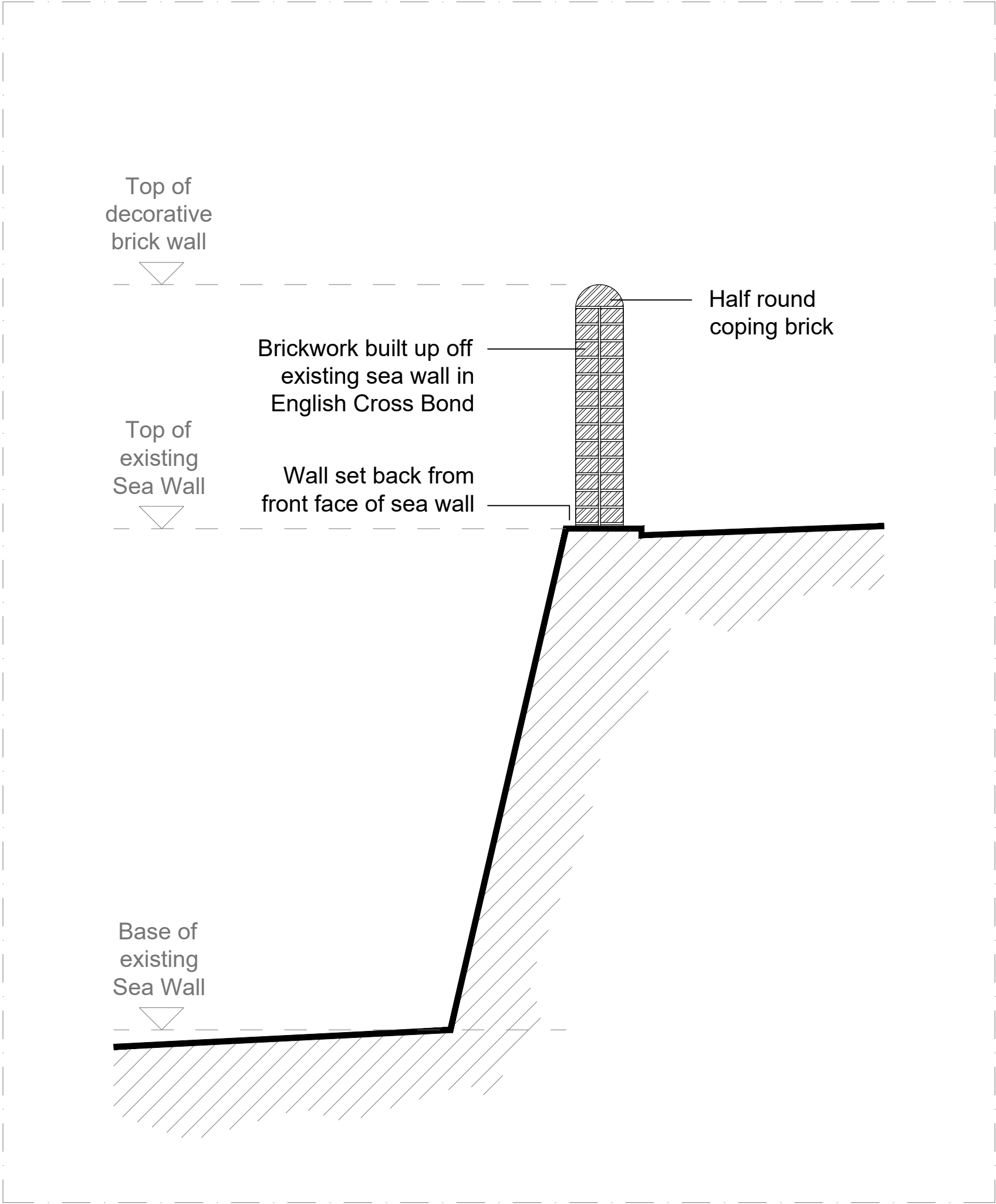
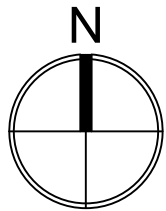
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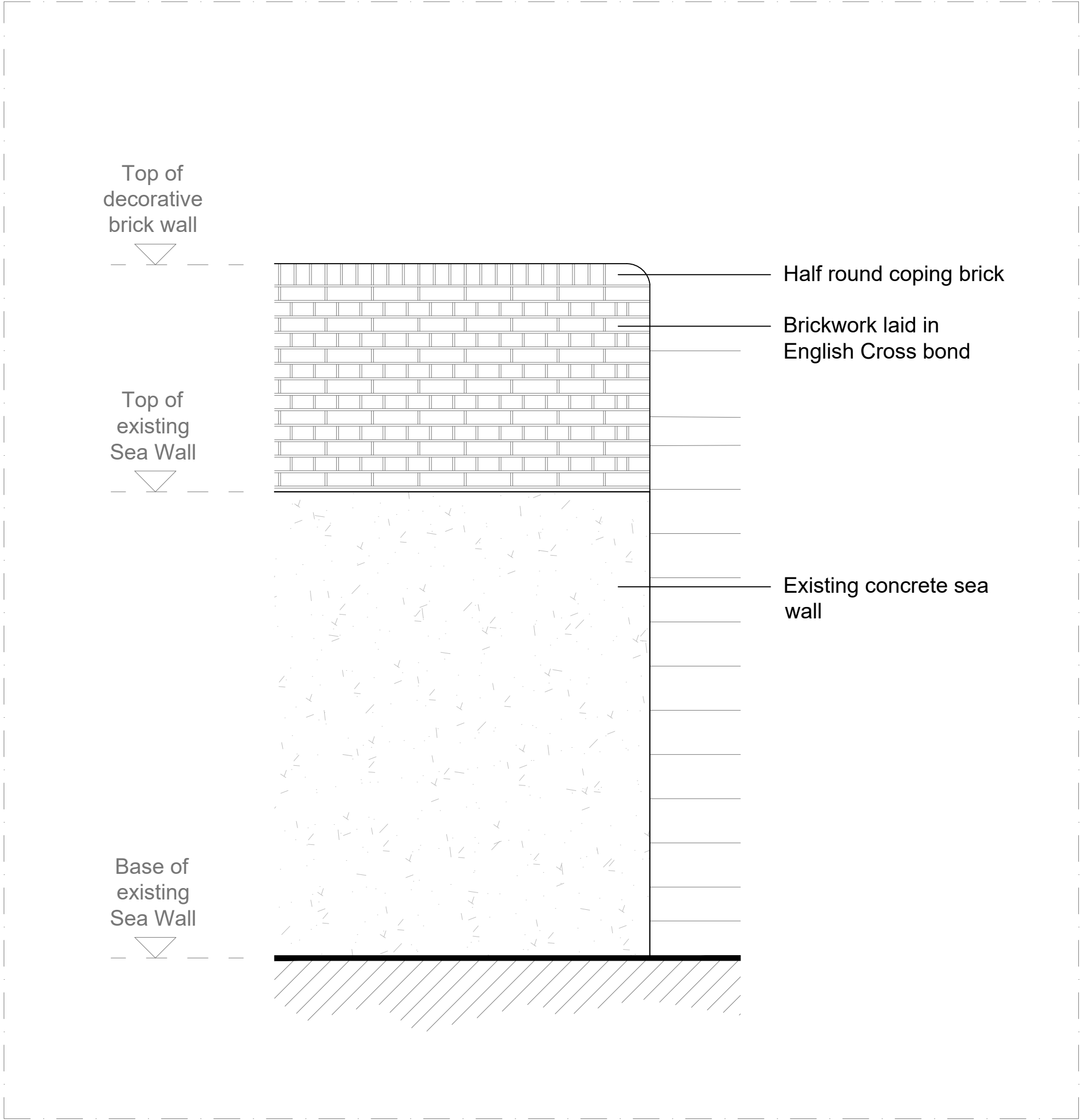
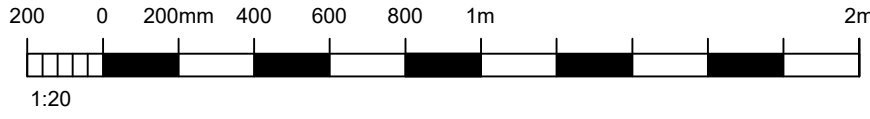
Use figured dimensions only.

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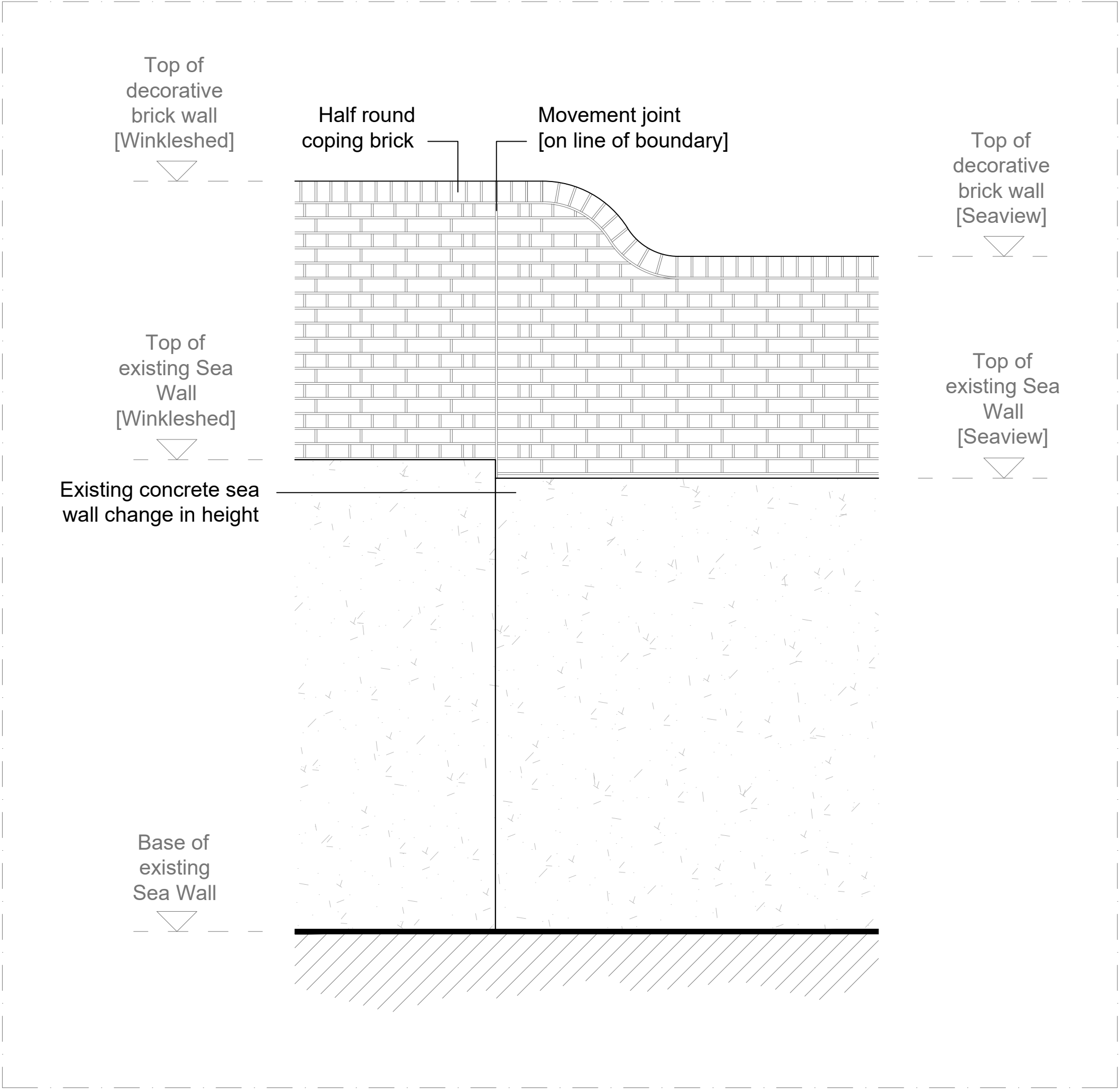
All drawings to be read in conjunction with specification and all other drawings including structural engineer and mechanical and electrical drawings / specification



TYPICAL SECTION  
1:20



TYPICAL ELEVATION  
1:20



TYPICAL ELEVATION  
1:20

| REV | DATE | AMENDMENT | DRAWN |
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|     |      |           |       |

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PROJECT  
Seaview  
23 Tower Street  
Emsworth

DRAWING  
Proposed;  
Sea Wall Typical details

SCALE  
as noted @ A1

|                |           |          |    |
|----------------|-----------|----------|----|
| DATE           | JUNE 2022 | DRAWN    | TW |
| DRAWING NUMBER | 20101-05  | REVISION | *  |

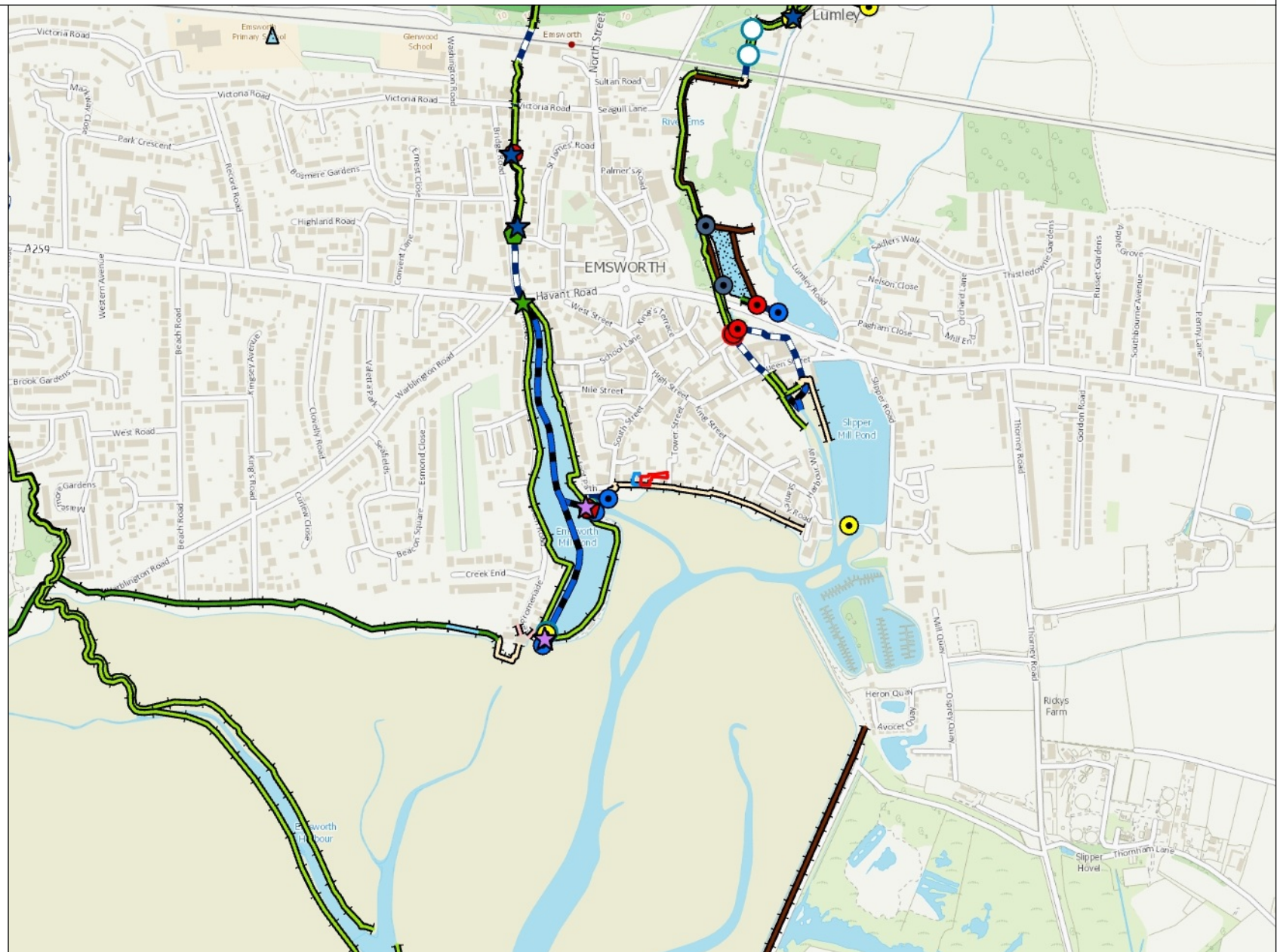
## APPENDIX 2 – EA DATA

# AIMS Flood Defences. Centred PO10 7BH. Created 29/11/2022.

## Legend

Please see page 2 for asset  
symbology

- Stilling Well
- Water Baffles
- Water Distribution Pipeline
- Well
- Stilling Well
- Water Baffles
- Water Distribution Pipeline
- Well



### Point Structures

-  Borehole
-  Central Pier
-  Control Gate
-  Debris Screen
-  Draw Off Tower
-  Fish or Eel Barrier
-  Fish Pass
-  Inspection Chamber
-  Outfall
-  Ramp
-  Security Screen
-  Slipway
-  Steps
-  Stilling Basin
-  Vortex Flow Control

### Linear Structures

-   Debris Boom
-   In Channel Stoplogs
-   Pier
-   Weir
-  Other type or not defined

### Defences

-  Embankment
-  Wall
-  Flood Gate
-  Demountable Defence
-  Bridge Abutment
-  Engineered High Ground
-  Natural High Ground
-  Cliff
-  Promenade
-  Quay
-  Beach
-  Barrier Beach
-  Dunes
-  Spillway

### Channels

-  Open Channel
-  Complex Culvert
-  Simple Culvert

### Instruments

-  CCTV Camera System
-  Flood Warning System
-  Gauge Board
-  Instrumentation
-  Piezometer
-  Rain Gauge
-  Telemetry System
-  Other type or not defined

### Buildings and Compounds

-  Control Building
-  Gauging Station Building
-  Pump House
-  Storage Location
-  Other type or not defined

### Channel Crossings

-   Bridge
-   Utility Services Crossing
-  Other type or not defined

### Beach Structures

-   Breakwater
-   Groyne

### Land

-  Water Storage Area
-  Other type or not defined

### Point Aids to Navigation

-  Beacon
-  Buoy
-  Dolphin
-  Navigation Signage
-  Other type or not defined

### Linear Aids to Navigation

-   Navigation Boom
-  Other type or not defined

Ryan Hofman  
CGS Civils  
Richard Cobden House  
Lion Street  
Chichester  
West Sussex  
PO19 1LW

**Our ref:** SSD283215  
**Date:** 29/11/2022

Dear Ryan Hofman,

**Enquiry Regarding Product 4 for Flood Risk Assessment for 23 Tower Street, Emsworth, PO10 7BH.**

Thank you for your enquiry which was received on 03 October 2022.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004. The information is attached.

The information on Flood Zones in the area relating to this address is as follows:

**The site is in an area located within Flood Zones 1, 2 and 3 as shown on our Flood Map for Planning (Rivers and Sea).**

*Note - This information relates to the area that the above named property is in and is not specific to the property itself as it is influenced by factors such as the height of door steps, air bricks or the height of surrounding walls. We do not have access to this information and is not currently used in our flood modelling.*

Flood Zone definitions can be found at [www.gov.uk/guidance/flood-risk-and-coastal-change#Table-1-Flood-Zones](http://www.gov.uk/guidance/flood-risk-and-coastal-change#Table-1-Flood-Zones)

**Flood Defences**

There are flood defences raised in the vicinity of the site in the form of a sea wall (Asset ID: 458638). This is maintained by a third party.

**Model Information**

The model used was the Chichester Coastal Modelling (2D), completed by JBA Consulting in 2016.

**Flood History**

We hold no record of previous flooding events affecting this site.

Please note our records are not comprehensive and may not include all events. I recommend contacting the Lead Local Flood Authority, **Hampshire County Council** or the Local Authority, **Havant Borough Council** for a more comprehensive flood history check.

## [FRA advisory text](#)

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                        | Product 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Description                                 | Detailed Flood Risk Assessment Map for <b>23 Tower Street, Emsworth, PO10 7BH.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Licence                                     | <a href="#">Open Government Licence</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Information Warnings                        | <p>The flood risk data provided is based on existing EA hydraulic models with an allowance for climate change. Please note the climate change allowances provided are not up to date. These were updated on 27 July 2021.</p> <p>You should refer to '<a href="#">Flood risk assessments: climate change allowances</a>' for the most up to date allowances. You will need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.</p>                                                                                                  |
| Information Warning - OS background mapping | <i>The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.</i> |
| Attribution                                 | <p>Contains Environment Agency information © Environment Agency and/or database rights.</p> <p>Contains Ordnance Survey data © Crown copyright 2020 Ordnance Survey 100024198.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Data Available Online

Many of our flood datasets are available online:

- Flood Map For Planning ([Flood Zone 2](#), [Flood Zone 3](#), [Flood Storage Areas](#), [Flood Defences](#), [Areas Benefiting from Defences](#))
- [Risk of Flooding from Rivers and Sea](#)
- [Historic Flood Map](#)
- [Current Flood Warnings](#)

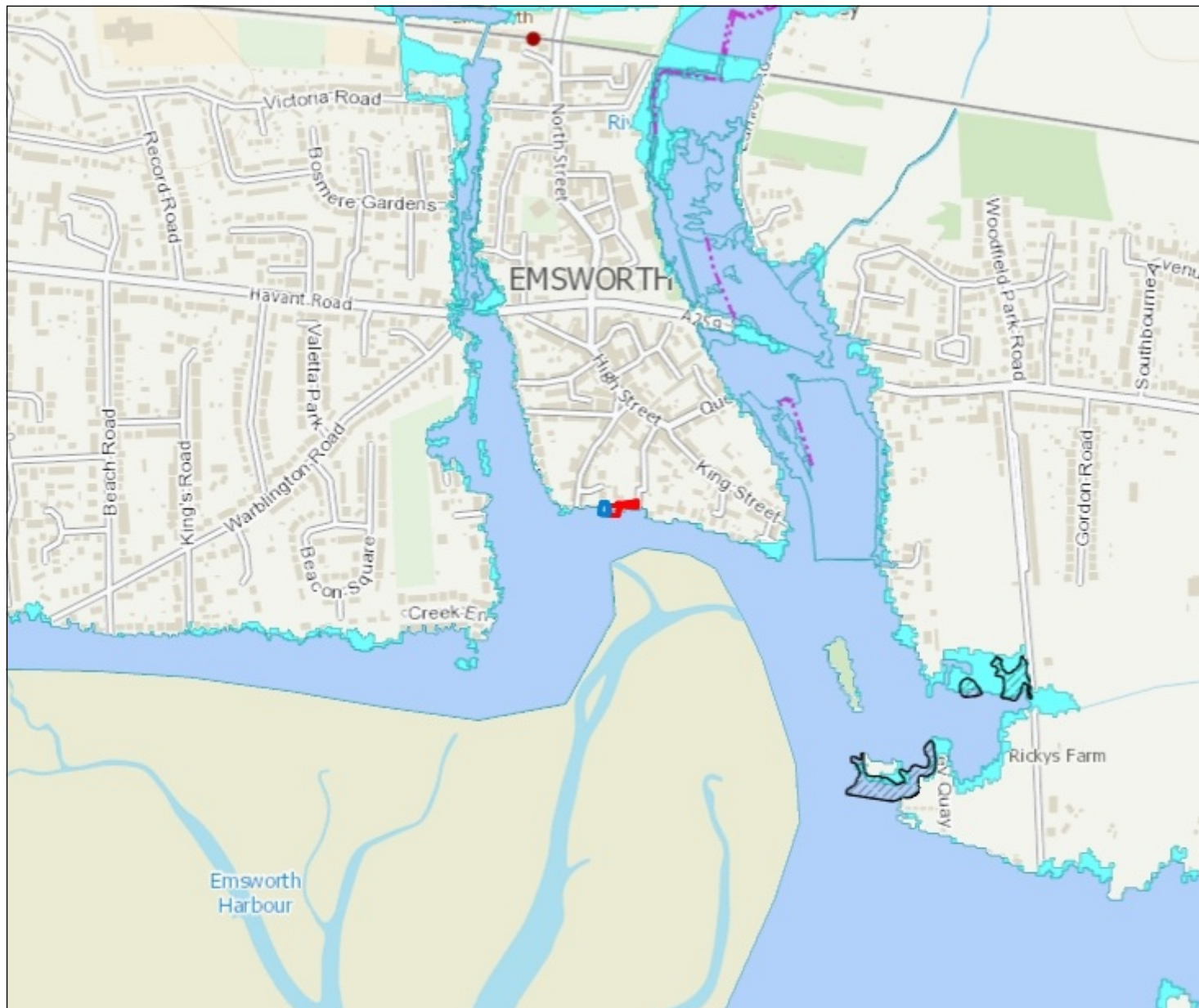
Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Yours sincerely,

**Amy O'Donnell**

Partnership and Strategic Overview West Sussex, Solent and South Downs  
**Environment Agency** | Guildbourne House, Chatsworth Road, Worthing, West  
Sussex, BN11 1LD

# Flood Map for Planning (Rivers and Sea). Centred PO10 7BH. Created 29/11/2022.



1: 10,000

0 Metres 250



## Flood Map for Planning (Rivers & Sea)

- Defences
- Flood Storage Areas
- Areas benefiting from flood defences
- Flood Zone 3
- Flood Zone 2

### Flood Map Areas (assuming no defences)

**Flood Zone 3** shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

**Flood Zone 2** shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.



# Flood map for planning

Your reference  
**1327**

Location (easting/northing)  
**474973/105562**

Created  
**18 Jan 2023 2:03**

**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 [www.gov.uk/guidance/flood-risk-assessment-standing-advice](https://www.gov.uk/guidance/flood-risk-assessment-standing-advice))

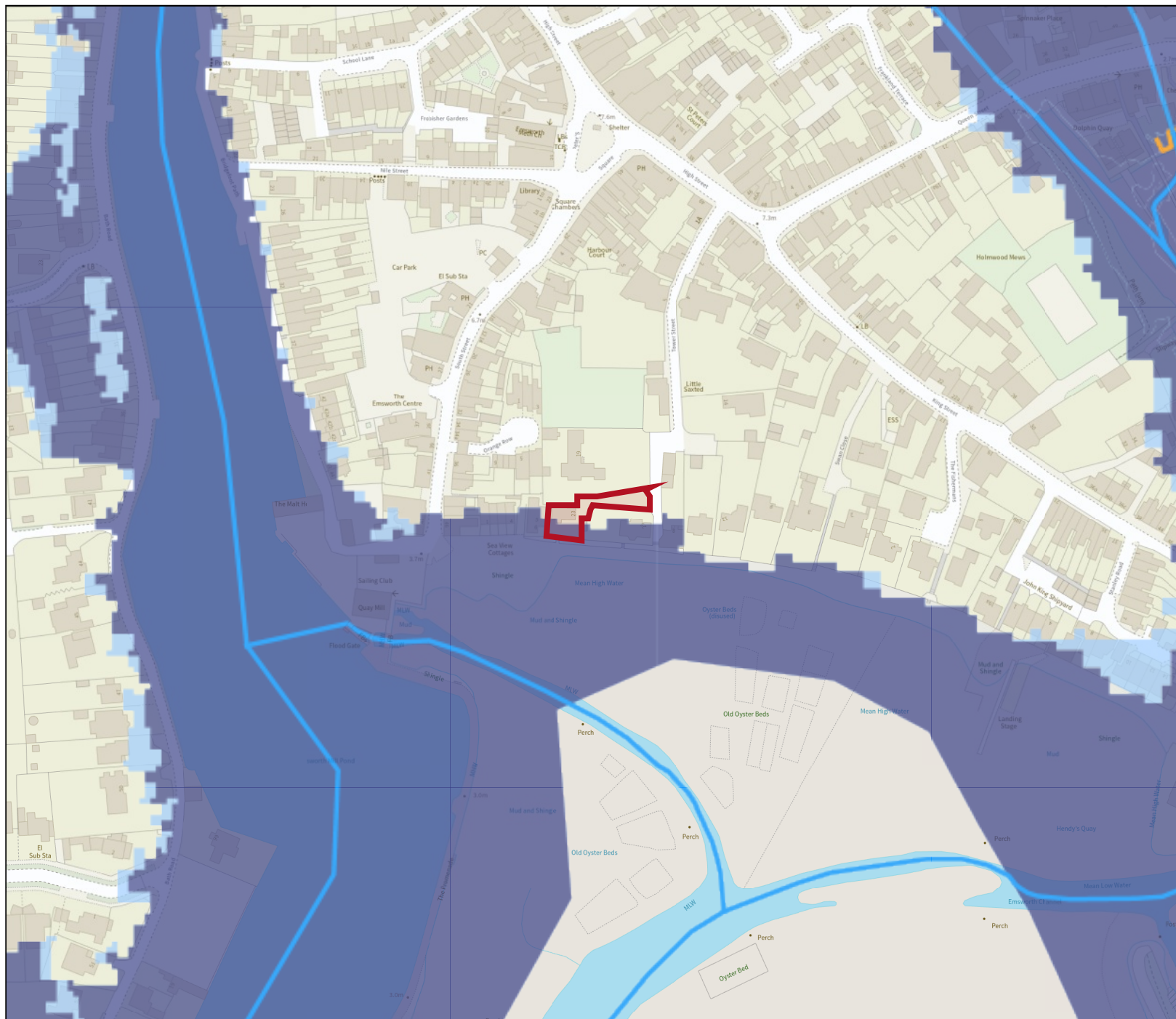
## Notes

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 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



## Flood map for planning

Your reference  
**1327**

Location (easting/northing)  
**474973/105562**

Scale  
**1:2500**

Created  
**18 Jan 2023 2:03**

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

  
0 20 40 60m

## **Use of Environment Agency Information for Flood Risk Assessments**

### **Important**

The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:

<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.

We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

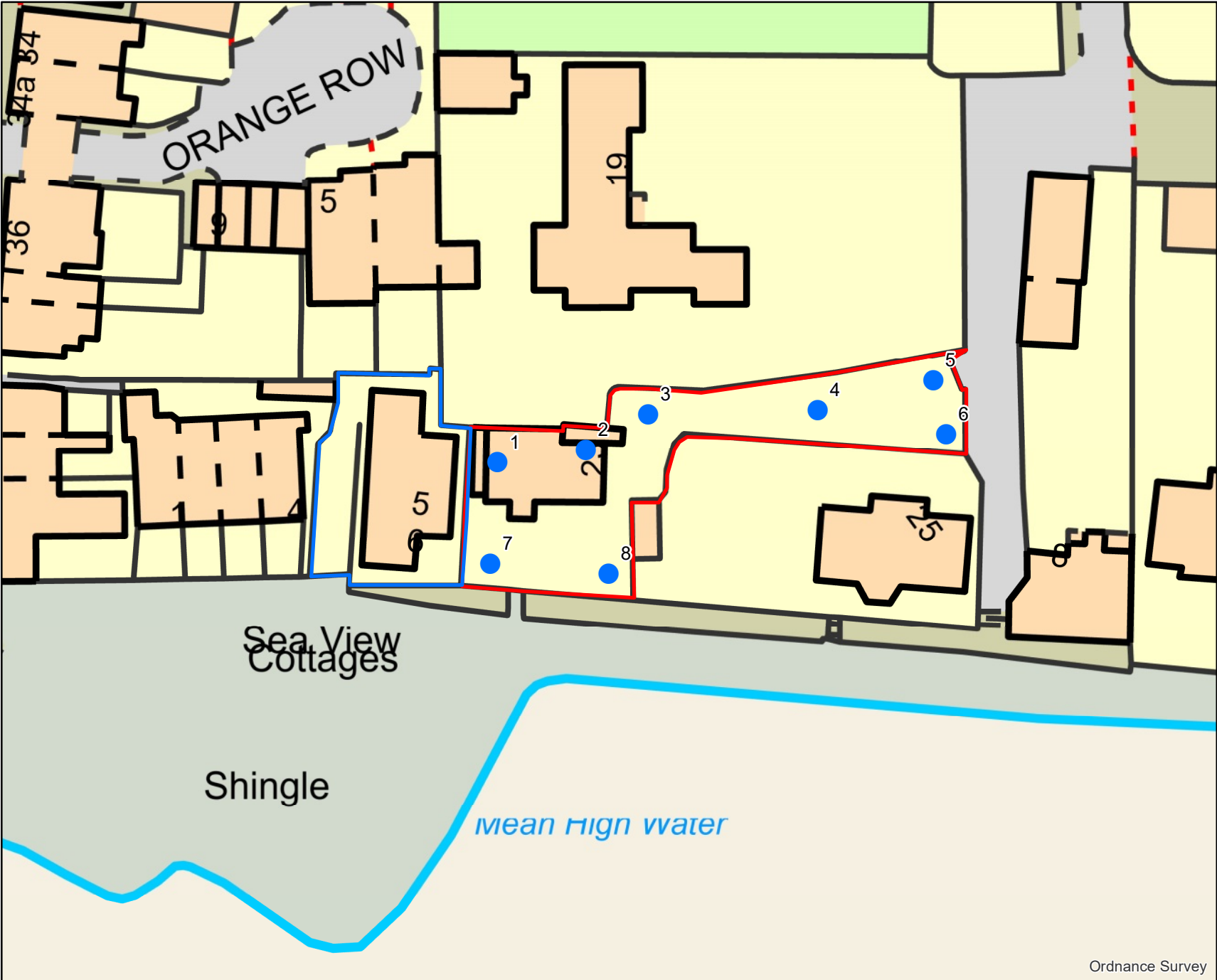
In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:

<https://www.gov.uk/flood-risk-assessment-standing-advice>  
<http://planningguidance.planningportal.gov.uk/>

You should also consult the Strategic Flood Risk Assessment or other relevant materials produced by your local planning authority.

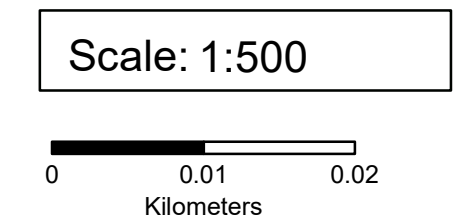
You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment (FRA) where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or surface water runoff. Information produced by the local planning authority referred to above may assist here.
3. Where a planning application requires an FRA and this is not submitted or is deficient, the Environment Agency may raise an objection.



- Site Nodes
- Site Boundary: PO10 7BH
- Site Boundary: PO10 7EN

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.



**Product 4 Flood Risk Data Requested by:** CGS Civils

**Site:** 23 Tower Street, Emsworth, PO10 7BH

**Table 1:** Water Levels: Tidal Undefended

| Node Ref | NGR      |           | Modelled Flood Levels in Metres AOD      |              |              |      |
|----------|----------|-----------|------------------------------------------|--------------|--------------|------|
|          |          |           | Undefended Annual Exceedance Probability |              |              |      |
|          | Eastings | Northings | 0.5%                                     | 0.5% (2070)* | 0.5% (2115)* | 0.1% |
| 1        | 474954   | 105563    | -                                        | -            | 4.58         | -    |
| 2        | 474962   | 105564    | -                                        | -            | 4.58         | -    |
| 3        | 474968   | 105568    | -                                        | -            | -            | -    |
| 4        | 474983   | 105568    | -                                        | -            | -            | -    |
| 5        | 474994   | 105571    | -                                        | -            | -            | -    |
| 6        | 474995   | 105566    | -                                        | -            | -            | -    |
| 7        | 474953   | 105554    | 3.49                                     | 3.97         | 4.58         | 3.67 |
| 8        | 474964   | 105553    | -                                        | -            | 4.58         | -    |

**Table 2:** Water Levels: Tidal Defended

| Node Ref | NGR      |           | Modelled Flood Levels in Metres AOD    |              |              |      |
|----------|----------|-----------|----------------------------------------|--------------|--------------|------|
|          |          |           | Defended Annual Exceedance Probability |              |              |      |
|          | Eastings | Northings | 0.5%                                   | 0.5% (2070)* | 0.5% (2115)* | 0.1% |
| 1        | 474954   | 105563    | -                                      | -            | 4.60         | -    |
| 2        | 474962   | 105564    | -                                      | -            | 4.60         | -    |
| 3        | 474968   | 105568    | -                                      | -            | -            | -    |
| 4        | 474983   | 105568    | -                                      | -            | -            | -    |
| 5        | 474994   | 105571    | -                                      | -            | -            | -    |
| 6        | 474995   | 105566    | -                                      | -            | -            | -    |
| 7        | 474953   | 105554    | 3.47                                   | 3.96         | 4.60         | 3.62 |
| 8        | 474964   | 105553    | -                                      | -            | 4.60         | -    |

**Table 3:** Water Depths: Tidal Undefended

|          | NGR      |           | Modelled Flood Depths in Metres          |              |              |      |
|----------|----------|-----------|------------------------------------------|--------------|--------------|------|
|          |          |           | Undefended Annual Exceedance Probability |              |              |      |
| Node Ref | Eastings | Northings | 0.5%                                     | 0.5% (2070)* | 0.5% (2115)* | 0.1% |
| 1        | 474954   | 105563    | -                                        | -            | 0.10         | -    |
| 2        | 474962   | 105564    | -                                        | -            | 0.02         | -    |
| 3        | 474968   | 105568    | -                                        | -            | -            | -    |
| 4        | 474983   | 105568    | -                                        | -            | -            | -    |
| 5        | 474994   | 105571    | -                                        | -            | -            | -    |
| 6        | 474995   | 105566    | -                                        | -            | -            | -    |
| 7        | 474953   | 105554    | 0.39                                     | 0.49         | 0.95         | 0.43 |
| 8        | 474964   | 105553    | -                                        | -            | 0.47         | -    |

**Table 4:** Water Depths: Tidal Defended

|          | NGR      |           | Modelled Flood Depths in Metres        |              |              |      |
|----------|----------|-----------|----------------------------------------|--------------|--------------|------|
|          |          |           | Defended Annual Exceedance Probability |              |              |      |
| Node Ref | Eastings | Northings | 0.5%                                   | 0.5% (2070)* | 0.5% (2115)* | 0.1% |
| 1        | 474954   | 105563    | -                                      | -            | 0.09         | -    |
| 2        | 474962   | 105564    | -                                      | -            | 0.02         | -    |
| 3        | 474968   | 105568    | -                                      | -            | -            | -    |
| 4        | 474983   | 105568    | -                                      | -            | -            | -    |
| 5        | 474994   | 105571    | -                                      | -            | -            | -    |
| 6        | 474995   | 105566    | -                                      | -            | -            | -    |
| 7        | 474953   | 105554    | 0.39                                   | 0.49         | 0.98         | 0.42 |
| 8        | 474964   | 105553    | -                                      | -            | 0.39         | -    |

All levels taken from: Chichester Coastal Modelling (2016), by JBA Consulting.

Produced on: 29/11/2022

**\* The flood risk data provided is based on existing EA hydraulic models with an allowance for climate change. Please note the climate change allowances provided are not up to date. These were updated on 27 July 2021. You should refer to ['Flood risk assessments: climate change allowances'](#) for the most up to date allowances. You will need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.**

**There is no additional information or health warnings for these levels/depths or the model from which they have been produced.**

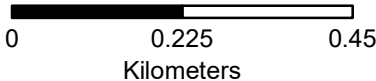


**Legend**

- Site Boundary: PO10 7EN
- Site Boundary: PO10 7BH
- 0.5% AEP (Defended Tidal)
- 0.5% AEP (2070) NPPF (Defended Tidal)
- 0.5% AEP (2115) NPPF (Defended Tidal)
- 0.1% AEP (Defended Tidal)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000



Ordnance Survey



Environment  
Agency



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**Legend**

-  Site Boundary: PO10 7EN
-  Site Boundary: PO10 7BH
-  0.5% AEP (Un defended Tidal)
-  0.5% AEP (2070) NPPF (Un defended Tidal)
-  0.5% AEP (2115) NPPF (Un defended Tidal)
-  0.1% AEP (Un defended Tidal)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

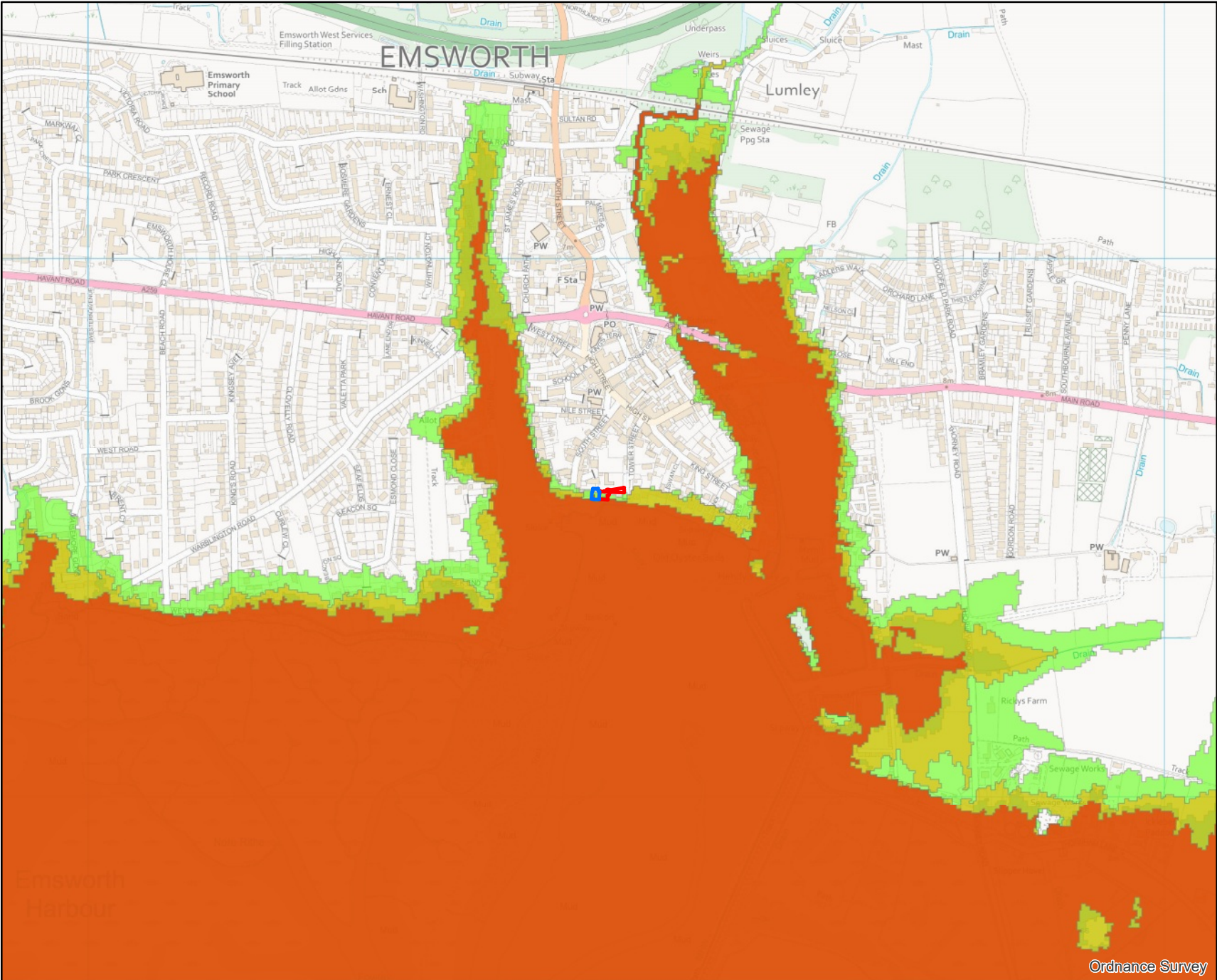
Scale: 1:10,000



00.2250.45

Kilometers





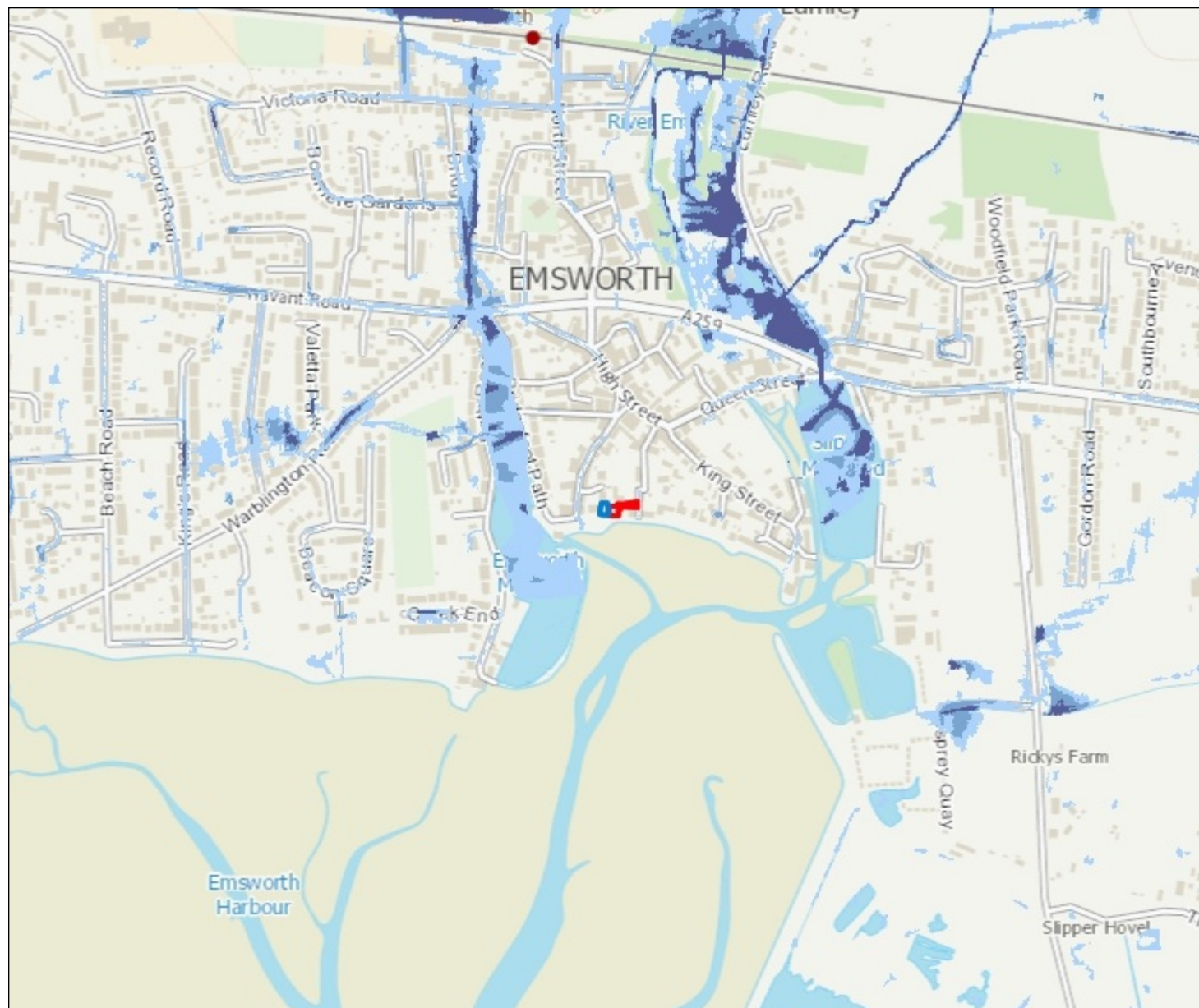
# Recorded Flood Outlines. Centred PO10 7BH. Created 29/11/2022.

## Legend

 All recorded flood outlines



# Risk of flooding from Surface Water. Centred PO10 7BH. Created 29/11/2022.



1: 10,000

0 Metres 250



## Likelihood of flooding from Surface Water

- High ( $\geq 3.3\%$ )
- Medium (3.3% - 1%)
- Low (1% - 0.1%)
- Very Low

## Likelihood of flooding from Surface Water

- High: Greater than or equal to 3.3% (1 in 30) chance in any given year
- Medium: Less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year
- Low: Less than 1% (1 in 100) but greater than or equal to 0.1% (1 in 1,000) chance in any given year
- Very Low: Less than 0.1% (1 in 1,000) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on GOV.UK.

# Solent & South Downs Area

## Pre-application Advice Note

September 2019

This document sets out the environmental issues we will consider when providing our planning application consultation advice to Local Councils. It can be used by applicants, developers and consultants at the pre-planning stage.

## Fluvial Flood Risk

**Development must be safe and should not increase the risk of flooding.**

You can view a site's flood zone on the Flood Map for Planning on our website: <https://flood-map-for-planning.service.gov.uk>

If your proposed development is located within flood zone 2 or 3 you should consult the Flood Risk and Coastal Change pages of the National Planning Policy Guidance (NPPG)  
<http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/>

Here you can determine whether the flood risk vulnerability of your proposed development and the flood zone are compatible. You can also establish if there are flood risk sequential test and exception test requirements for your proposed development. In the first instance we recommend the developer/applicant liaises with the Local Planning Authority (LPA) to undertake the Sequential Test in accordance with the National Planning Policy Framework (NPPF).

If your proposed development is located within flood zone 2 or 3 and its vulnerability and flood zone are considered acceptable under the NPPG then a site specific Flood Risk Assessment (FRA) is required to support any subsequent planning application. This is required by paragraph 163 of the NPPF: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/6077/2116950.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf)

Guidance on the content of a site specific FRA can be found in the NPPG and online: <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>

More detailed flood risk modelling data is available to help you produce a FRA please contact our Customers and Engagement team at [SSDenquiries@environment-agency.gov.uk](mailto:SSDenquiries@environment-agency.gov.uk).

## Climate Change Allowances

On 19 February 2016, we published new guidance for planners and developers on how to use climate change allowances in a site-specific FRA: <https://www.gov.uk/guidance/flood-risk-assessments-climatechange-allowances>

## Groundwater Quality

**Development must not cause pollution to the water environment.**

### Source Protection Zones

We have defined Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used across the country for public drinking water supply. These zones are more sensitive to contamination from activities that might cause pollution in the area. The closer the activity, the greater the risk.



SPZ1s are the areas designated as most at risk from contamination and development activities and in these areas we may consider it inappropriate for development to discharge foul or surface water into the ground.

To see if your proposed development is located within a Source Protection Zone, please use our online map: <https://magic.defra.gov.uk/>

## Contaminated Land

The NPPF takes a precautionary approach to land contamination. Before the principle of development can be determined, land contamination should be investigated to see whether it could preclude certain development due to environmental risk or cost of remediation. Where contamination is known or suspected, a desk study, site investigation, remediation and other works may be required to enable safe development.

## Pollution

If the proposed development use has the potential to pollute ground or surface water receptors then an assessment to establish whether the risk of pollution is acceptable or can be mitigated will be required within any planning application.

## Foul Drainage

When drawing up wastewater treatment proposals for any development, the first presumption is to provide a system of foul drainage discharging into a public sewer to be treated at a public sewage treatment works (those provided and operated by the water and sewerage companies). This should be done in consultation with the sewerage company of the area prior to the submission of a formal planning application.

If connection to a public sewage treatment plant is not feasible, a package sewage treatment plant may be considered. If you would like further advice please call 03708 506 506.

## Cemeteries

The development of new cemeteries in areas where groundwater vulnerability is high should be avoided, except where the thickness and nature of the unsaturated zone, or the impermeable formations beneath the site, protect groundwater; or where the long-term risk is mitigated by appropriate engineering methods.

## Main Rivers

### Ecology

In accordance with the National Planning Policy Framework (NPPF), any development proposal should avoid significant harm to biodiversity and seek to protect and enhance it. Opportunities to incorporate biodiversity in and around the development will be encouraged.

Your scheme should be designed with a naturalised buffer zone of at least 8 metres from the main river to protect and enhance the conservation value of the watercourse and ensure access for flood defence maintenance.

This buffer zone should be managed for the benefit of biodiversity for example by the planting of locally appropriate, UK native species. The buffer zone should be undisturbed by development with no fencing, footpaths or other structures. This buffer zone will help provide more space for flood waters, provide improved habitat for local biodiversity and allows access for any maintenance requirements.

To identify any Main Rivers in proximity to your proposed development please see our Main Rivers Consultation Map: <http://apps.environment-agency.gov.uk/wiyby/151293.aspx>

customer service line  
03708 506 506

[www.gov.uk/environment-agency](http://www.gov.uk/environment-agency)

incident hotline  
0800 80 70 60

floodline  
0345 988 1188

## Culverting

The Environment Agency is likely to oppose culverting as it is damaging to the ecological integrity of the river channel and its corridor and acts as a barrier to the movement of wildlife, including fish and may also increase flood risk. If the proposal will impact an existing culvert the Environment Agency may oppose planning consent for development either over, or within 8 metres of an existing culvert. Wherever possible, existing culverts should be removed and the river channel and bankside habitat reinstated to restore the ecological continuity of the river channel and its corridor.

## Water Framework Directive (WFD)

Any marine works below MHWS require an assessment of possible impacts on Water Framework Directive (WFD). The assessment should include all elements of the works that fall within, or have the potential to affect, a WFD water body and any of the protected areas therein (including Bathing Waters and Shellfish Waters).

The WFD assessment should follow the 'Clearing the Waters for All' guidance available at <https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters>

Where appropriate, a WFD Assessment should assess any potential impacts and demonstrate that the required enhancements will be delivered. In some cases the requirements of a WFD assessment can be incorporated into an Environmental Impact Assessment (EIA). Any development that has the potential to cause deterioration in classification under WFD or that precludes the recommended actions from being delivered in the future is likely to be considered unacceptable to us.

## Permits & Consents

### Environmental Permitting Regulations

To see if your proposed development requires an Environmental Permit under the Environmental Permitting Regulations please refer to our website: <https://www.gov.uk/guidance/check-if-you-need-an-environmental-permit>

From 6 April 2016 an Environmental Permit is required for any proposed works or structures, in, under, over or within 8 metres of the top of the bank of designated Main River, and within 16 metres of a tidal defence.

### Ordinary Watercourse Consent

The prior written consent of the relevant Lead Local Flood Authority is required for the erection of any flow control structures, culverting or diversion of ordinary watercourses, including streams, land drains and ditches.

### Marine Licence

A marine licence may be required for any activities at the mean high water spring tide up to the territorial limit. This also includes the waters of every estuary, river or channel where the tide flows at mean high water spring tide.

Any development must demonstrate how adverse impacts on migratory fish, bathing waters, shellfish waters, designated sites, protected and priority species and habitats will be avoided, minimised, mitigated and if necessary compensated for. Works within or affecting a Water Framework Directive (WFD) waterbody will need to demonstrate that compliance with WFD objectives will be achieved. 'Clearing the Waters for All' provides guidance on how the impacts on WFD should be addressed, and should be used when preparing an assessment, including the screening and scoping of activities. <https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters>

## Further pre-application options

The information provided above details generic information which may or may not be applicable to your development. We are able to provide more detailed and bespoke advice and answer technical questions for a charged fee of £100 per person per hour +VAT.

If you are interested in finding out more about this service, please email:

[planningssd@environment-agency.gov.uk](mailto:planningssd@environment-agency.gov.uk)

We can explain this service and provide you with a bespoke quote for further pre-application advice that you may require please see .gov - <https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

## Please note

*Please note that the view expressed in this letter by the Environment Agency is in response to the enquiry only and does not represent our final view in relation to any future planning application made in relation to this site.*

*We reserve the right to change our position in relation to any such application.*

*As part of this preliminary response we have not technically reviewed any documents. This opinion is based on the information submitted and current planning policy and guidance.*

If you have any questions please contact the Solent & South Downs Sustainable Places team:

[planningssd@environment-agency.gov.uk](mailto:planningssd@environment-agency.gov.uk)

## To make a request for data

Please submit your request for data to [ssdenquiries@environment-agency.gov.uk](mailto:ssdenquiries@environment-agency.gov.uk). You should get the information within 20 working days. We will tell you when to expect the information if we need more time.

There are many datasets available online at [www.data.gov.uk](http://www.data.gov.uk) including flood maps, historic landfill, waste exemptions, consented discharges to controlled waters, and much more.

customer service line  
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