



REPLACEMENT DWELLING
3 THE HARD
ELMER
WEST SUSSEX

FLOOD RISK ASSESSMENT
TO ACCOMPANY PLANNING APPLICATION
FOR DEMOLITION AND REPLACEMENT OF EXISTING DETACHED DWELLING,
AND THE PROVISION OF NEW PARKING AND LANDSCAPING.

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Sloane & Brown Ltd
Unit 3B Woodhorn Business Centre
Woodhorn Lane
Oving Chichester
West Sussex PO20 2BX

1.0 INTRODUCTION

- 1.1 This Flood Risk Assessment has been prepared for Ms D Huang in support of and accompanying a full planning application for the demolition of an existing detached dwelling to facilitate the construction of a new dwelling with provision of ancillary structures within the rear garden, new parking areas and landscaping at 3 The Hard, Elmer, West Sussex.
- 1.2 The FRA concerns flood risk and has been prepared generally in accordance with the technical Guidance of the National Planning Policy Framework (NPPF), July 2018.
- 1.3 The drawings supporting this Flood Risk Assessment are located in Appendix A and are as follows:
- 789 SU001 Site Topographical Survey
 - 789 PL001 Proposed floor plans, location plan and site plans
 - 789 PL002 Proposed elevations, sections and roof plan
- 1.4 An enquiry was made to the Environment Agency in July 2018 for a Product 4 for Flood Risk Assessment for Site Address. This document has been utilised to assess the flood risk for the site and to assist in the designing of the proposed replacement dwelling to mitigate the flood risk to the occupants of said dwelling.

2.0 SITE HISTORY

- 2.1 There is no previous recorded flood risk assessment history available for the site. Planning consent was granted in 2019 for a very similar proposal.

3.0 THE SITE

- 3.1 The site is located on the south side of The Hard which is located in the south east corner of the Elmer Sands Estate in Middleton on Sea, West Sussex. The site has an approximate area of 615m².
- 3.2 There is a single storey residential dwelling of non traditional construction on the site. The building is in a poor state of repair and has been vacant for a number of months.
- 3.3 The coastline in this area has the benefit of significant sea defences maintained by the Environment Agency which are subject to ongoing improvements and comprise timber groynes, rock revetments and a raised earth bank immediately south of the site and offshore rock islands to absorb wave energy before it reaches the revetments.
- 3.4 It is understood that the rock revetment is being extended in an easterly direction and the shingle reprofiled as part of the ongoing improvements by the Environment Agency.
- 3.5 The top of the earth bank to the south of the site is in excess of 5.5m above ordnance datum (AOD).

4.0 TOPOGRAPHY

- 4.1 The ground levels on the site adjacent to the existing dwelling vary between a low point of 1.97m and a high point of 2.09m AOD. The floor level of the existing dwelling is 2.12m AOD.
- 4.2 The front of the site is adjacent to The Hard with levels indicated as 2.04m AOD. The rear boundary of the site has levels indicated as 2.05m AOD.
- 4.3 There is a raised bund running across the site at approximately midpoint which rises from the average 2.04 / 2.05m level up to 3.24m AOD, and this forms a secondary line of defence from flood waters if the primary sea defence are overtopped.

5.0 PROPOSED DEVELOPMENT

- 5.1 The proposed development comprises the demolition of the existing two / three bedroom non-traditional dwelling and the construction of a new three bedroom dwelling in a similar location on the site.
- 5.2 The proposed dwelling is located to the north of the site between the adjacent two storey dwellings located to the west (2 The Hard) and the east (4 The Hard).
- 5.3 The existing single storey dwelling has a site footprint of 98m².
- 5.4 The existing dwelling has a solid concrete drive on the west side running the length of the dwelling from the road.
A concrete patio is laid across the width of the site to the front and rear of the dwelling. The non-porous concrete areas have a combined footprint of 120m².
- 5.5 There is a timber shed / garage structure offering ancillary storage to the dwelling to the south west of the dwelling.
- 5.6 The proposed two storey dwelling has a site footprint of 93m².
- 5.7 The proposed ancillary building providing non-habitable accommodation has a site footprint of 18m².
- 5.8 The proposed paved areas comprising the access drive, parking, terraces and ramps are proposed as porous paved areas. The combined footprint of the porous paved areas is 165m².
- 5.9 The remaining areas of the site will remain as areas of soft landscaping comprising grass and domestic plants and shrubs.
- 5.10 The proposed dwelling will comprise ground floor reception rooms and first floor bedrooms and bathroom facilities. The finished ground floor level of the proposed dwelling is proposed at 2.85m AOD which is approximately 705mm above the finished floor level of the existing dwelling - see recommendations.

6.0 FLOODING HISTORY

- 6.1 The site is shown to lie within Flood Zone 3 on the Environment Agency's flood map as indicated in the Environment Agency's Product 4 information in Appendix B. The Flood Zone 3 is as indicated on the flood map but with the land benefitting from sea defences (and ongoing improvements) along the immediate and wider coastline.
- 6.2 We have no records of recent flooding incidents affecting the building itself, but it is known that the area has flooded in the past from overtopping of the coastal defences. Major improvements to the defences were carried out approximately 20 years ago which, together with the recent and ongoing improvements to the revetments, have significantly helped to reduce wave action and littoral drift.
- 6.3 The rock islands and revetment require minimal maintenance and it is likely that they will remain in place protecting the coast adjacent to the site for the foreseeable future.
- 6.4 The Environment Agency prediction for the extreme 1 in 200 year surge tide level at this site is expected to rise to around 5.0m AOD by the year 2115 due principally to the effect of climate change. The rise in sea level will affect the performance of the offshore rock islands and will allow greater wave heights to reach the coastline to the south of the site. However ongoing improvements to the stone revetments facing the earth bund, which already has an average height in excess of 5.2m, will be necessary in order to maintain the current levels of protection offered to properties in The Hard and the wider area of Elmer Sands.

7.0 FOUL AND SURFACE WATER DRAINAGE

- 7.1 The replacement dwelling will be drained to the public sewer in The Hard via the existing connection located in the north east of the site. The foul sewers in the area are known to suffer from groundwater infiltration. The replacement dwelling will utilise modern water saving devices and sanitary fittings and is unlikely to generate additional flow compared to the existing dwelling.
- 7.2 There are no public surface water sewers in the local vicinity of the site. The building will therefore need to drain to soakaways, which given the potentially high water tables and lying ground water, would be subject to a number of measures to mitigate the flood risk. It is proposed to install a 6500 litre rainwater harvesting system with intelligent water management, auto mains switch over and auto refresh cycles for recycling surface water for the purposes of toilet flushing and clothes washing. The secondary use of surface water will reduce the demand on any installed soakaway system. The rainwater harvesting tank will require an overflow which in turn will discharge to a shallow 400mm geo cellular soakaway to the rear of the site a minimum of 5m away from the proposed dwelling. The geo cellular soakaway will be subject to a percolation test on site to BRE 365. The rainwater collection downpipes will discharge into sealed gullies to protect the soakaway and prevent contamination. An emergency overflow drain will be located at the rear of the soakaway and discharge under extreme conditions into the adjacent surface water sewer in the footpath adjacent to the rear boundary.

- 7.3 All paved areas to the perimeter of the proposed dwelling will be porous in nature allowing for rainwater infiltration through all hard surfaces allowing for natural drainage round the site. This will spread the demand for drainage across the site rather than focussing it into specific locations and soakaways.

8.0 CONCLUSIONS AND RECOMMENDATIONS

- 8.1 The site is shown to lie within Flood Zone 3 and a specific flood risk assessment has therefore been carried out in accordance with the current Technical Guidance to the NPPF.
- 8.2 The flood risk has shown that the proposed replacement dwelling will be sited on ground with a ground level of around 2.04m AOD. The current prediction for the 1 in 200 year surge tide level at the site is 5.0m AOD in the year 2115 and it is therefore important that floor levels are maintained as high as reasonably practicable. The existing dwelling has a floor level of 2.12m AOD with all habitable accommodation located on the ground floor, most importantly the bedrooms. Bedrooms are considered to be of higher risk than other habitable rooms within a dwelling. The proposed dwelling has an increased floor level of 2.85m to the ground floor which raises the existing level in excess of 700mm. The provision of all bedrooms at first floor at a level of 5.7m AOD significantly reduces the flood risk to the occupants of the proposed dwelling and raises the bedroom accommodation above the predicted 2115 surge tide level. Therefore the proposed dwelling offers a much higher level of protection than that offered to the existing dwelling. The existing raised bund within the rear garden will not be affected by the proposals.
- 8.3 The surface water drainage will be taken via a rainwater harvesting system to a shallow geo cellular soakaway designed to comply with the minimum standards required by the Building Regulations and incorporating silt traps. An emergency overflow will be provided to the existing surface water sewer at the rear of the southern boundary.
- 8.4 Foul drainage will be to the existing public foul water sewer in The Hard.
- 8.5 Whilst maintaining ground floor levels at 2.12m AOD would represent no detriment to the existing situation, tidal flood levels are predicted to rise as a result of climate change, the extent of which is uncertain. It is therefore recommended that the new dwelling is designed with ground floor levels of 2.85m AOD and first floor levels of 5.5m AOD and designed in accordance with good practice in flood risk areas, employing appropriate floor resistance and resilience measures.
- 8.6 Registration with the Environment Agency's Floodline warning system is also advised.



APPENDIX A – Drawings

SU001	Topographical Survey and Existing Plans and Elevations
PL001	Proposed Floor Plans, Site and Location Plans
PL002	Proposed Elevations, Sections and Roof Plan



Appendix B – Environment Agency Product 4

Fluvial & Tidal undefended and defended water levels and water depths – 2 pages

Site Node Points OS Extract plan

Flood Map for Planning (Rivers and Sea)

Defended Modelled Flood Outlines - Tidal

Undefended Modelled Flood Outlines – Tidal

Undefended Modelled Flood Outline – Fluvial

Undefended Modelled Flood Outline – Fluvial with increases for Climate Change