

**DEVELOPMENT OF OFFICE BUILDING
AND BOAT STORE ADJACENT TO
YACHTHAVEN, HAYLING ISLAND**

FLOOD RISK ASSESSMENT

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INTRODUCTION

Instructions were received on 25 May 2025 to carry out a retrospective Flood Risk Assessment for some of the buildings on this site.

Previously we have carried out a preliminary FRA outlining proposals relating to flood risk on the site. This FRA was issued on 2nd January 2012 and led to the approval and construction of the houses on the site and the buildings as covered by this FRA report.

We believe that a Planning Application is being submitted in connection with the proposed renovations/re-development of this site. The planning consultants/Architects working on behalf of the developer have asked for a Flood Risk Assessment in accordance with the current recommendations given in the National Planning Policy Framework, which has now superseded PPS25, to submit with the planning application.

Following a desk study and discussions with the environment agency, this report has been prepared to determine the risk of flooding on the site for the proposed development and to put forward recommendations to protect the development and its users from any potential flood risk.

THE SITE AS EXISTING

Appendix B contains a location plan for the site. The proposed development on the site can be found at grid reference SU 729 018.

Appendix C contains a topographical survey drawing showing levels across the site. The levels were taken using an ordnance survey benchmark. The drawing shows existing levels around the office are 3.100-3.200m AOD and around the boat store are 3.200-3.300m AOD. The as built site level drawing in Appendix E show the office building has an FFL of 3.600m AOD and the boat store an FFL level of 3.300m AOD.

The existing site was previously used for industrial marine purposes. The area of the site where the office and boat store have been constructed are nearer the sea edge, this area was previously used for boat repairs with a small boat birth directly adjacent to the shore.

THE PROPOSED DEVELOPMENT

Appendix C contains plans showing the As built development of the office and boat store. The office has been raised approximately 0.4m above the existing ground level with stepped access as required. The boat store is more or less at existing ground level as access is required easily via large openings for boats and trolleys. The office and boat stores will be drained via the storm and foul water system as designed for the whole development including the new houses to the Eastern side of the site.

POLICY BACKGROUND

The Government's sustainable development strategy makes it a requirement to assess appropriate forms of developments for areas at risk of flooding. This is to avoid any unnecessary increase in the requirement for flood defences. A requirement of the National Planning Policy Framework is that developers making planning applications on sites that are potentially at risk from flooding should consult with the Environment Agency, and where appropriate produce a flood risk assessment (FRA). The Environment Agencies flood matrix was consulted and showed that a flood risk assessment is appropriate for this site.

FLOOD RISK MAPS AND AVAILABLE INFORMATION

Appendix D contains a copy of the Environment Agency Flood Map for this area. According to the Environment Agency's flood maps, the site falls within Flood Zone 3, indicating a high probability of flooding from the sea. This classification necessitates a detailed FRA and adherence to the Sequential and Exception Tests as outlined in the National Planning Policy Framework (NPPF).

The primary flood risk to the site is from tidal sources. The Strategic Flood Risk Assessment (SFRA) for Havant Borough indicates that areas along the coast, including parts of Hayling Island, are susceptible to tidal flooding, especially under future climate change scenarios.

Climate change is expected to exacerbate flood risks due to sea-level rise and increased storm intensity. The SFRA includes projections for future flood extents, indicating that areas currently within Flood Zone 3 may experience more frequent and severe flooding events.

Surface water flooding is a secondary concern. The SFRA identifies areas on Hayling Island that are at risk from surface water accumulation during heavy rainfall events. However, the specific risk to the site from surface water flooding is considered lower compared to tidal risks.

The risk of groundwater flooding at the site is considered low, given the site's coastal location and sandy soil composition, which facilitates drainage.

EFFECT ON EXISTING DRAINAGE STRATEGY

The drainage system on the site has been designed for a 1in100 year storm event and were installed as part of the main development in 2012. Appendix F of this report contains the drainage details as installed for this part of the site. The attenuation system installed will mean that flood risk on the site is not affected by the office building and boat stores.

SEQUENTIAL AND EXCEPTION TEST

The total area of the proposed development site is less than 1 hectare. The EA flood risk matrix was consulted for a 1 hectare operational development in flood zone 3 with 'Less vulnerable' as office and boat storage only. The following standing advice is appropriate for the development. The sequential test therefore is not required. This area of the site was also previously used for marine based activities and therefore the usage of this area of the site has effectively not changed.

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	*	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	*	*	*

Key: ✓ Development is appropriate.
* Development should not be permitted.

Fig.2: Technical Guidance to the NPPF: Table 3

The exception test requires to prove that developments provide wider sustainability benefits to the community that outweigh flood risk. It also states that the development should, where possible, be on developable, previously developed land. This site has previously been used as an industrial area with marine based activities. Consultation with NPPF table 3 shows that the development is appropriate with regard to the exception test. It is also of note that the development is to be constructed on land that has been previously developed and used for marine based industrial use.

Guidance also states that "small non-domestic extensions with a footprint of less than 250 square metres" are exempt from the sequential test. Whilst the office and boat store are not residential the office has a floor area of 154m² and the boat store an area of 164m².

RISK ASSESSMENT

Discussions have been held with the Environment Agency. The advice from the Environment Agency was that the development lies within flood zone 3. This means the site is within an area which has a greater than 1 in 200 (0.5%) annual chance of sea flooding. The buildings are for non-domestic use but the level of the predicted flood water is 3.42m AOD for the 200 year flood event (This has been confirmed via the product 4 appended to this report). When allowing the 1.21 required climate change factor for the cumulative rise between 200 and 2125 the flood level rises to 4.14m AOD. When allowing 0.5m for wave action this would give a level 4.64m AOD.

Any flooding on the site will be caused by the sea inundating the site from the South. There are no significant flood defences in this area of Hayling Island so flood defences cannot be relied upon to protect the site. EA information shows no recorded recent flood events have occurred on the site.

It is usual for the Environment Agency to require a free board of 600mm above the maximum predicted flood water level on domestic properties but these buildings are for marine industrial use only. This would indicate a finished floor level (FFL) of 4.73m AOD. This level is not achievable or required for non-domestic industrial use.

The boat store FFL is at 3.300m AOD, this could mean up to 1.34m, when allowing for wave heights could be present on site. However during this scenario, the site would be evacuated to the North where areas outside the flood zone are easily accessible along the access road to the site. The building itself is an industrial steel framed building with a concrete slab ground floor so would not be damaged other than easily replaceable secondary items.

The office FFL is at 3.600m AOD, this could mean up to 1.04m, when allowing for wave heights could be present on site. However during this scenario, the site would be evacuated to the North where areas outside the flood zone are easily accessible along the access road to the site. The building itself is a modular constructed structure built on concrete raft foundations. If the building was damaged during a flood event it could easily be replaced on its original foundations which would not be damaged during a flood event.

Access to and from the site during the extreme flood event would be along the access road which leads to Copse Lane. The first, approximately, 50m of access road is within flood zone 1 and not at risk from flooding. The remaining length of access road is within flood zone 2 as are the houses already built on the site. This means that the effect of the flood water level of 4.140m AOD was considered along the length of access road within flood zone 2 to ensure that access could be gained to and from the site during a flood event. As the access road is even further in land than the houses it is not deemed necessary to consider significant wave effects during the access exercise.

The levels along the access road range from approximately 4.000 to 4.600m AOD. This access road varies in construction from some tarmac areas to a gravel track; therefore it was feasible during the original site construction to slightly raise the

access road levels to comply with the minimum level that would allow access during a flood event.

It is desirable to provide completely dry access to and from the site during an extreme flood event, however where this is not feasible a commonly used rule of thumb provided by the EA is to allow a maximum of 250mm water depth on the access, which will still allow emergency vehicles to a

Water Depths & Levels for SU7286801817

Point	Water Depth (Metres)		Water Surface Level (mAOD*)		Ground Level
	0.5% Annual Probability/1 in 200 Year (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year (Flood Zone 2)	0.5% Annual Probability/1 in 200 Year (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year (Flood Zone 2)	
1	No Data	0.14	No Data	3.60	3.46
2	0.19	0.36	3.42	3.59	3.23
3	0.22	0.40	3.41	3.59	3.19
4	0.01	0.01	3.73	3.73	3.72
5	0.16	0.34	3.41	3.59	3.25
6	0.19	0.36	3.42	3.59	3.23
7	0.26	0.43	3.42	3.59	3.16
8	0.43	0.61	3.41	3.59	2.98
9	0.38	0.56	3.41	3.59	3.03
10	0.51	0.68	3.42	3.59	2.91

* Levels in metres above Ordnance Datum Newlyn

ccess the site during a flood. This equates to a minimum access road level of 3.90m. Appendix E shows existing levels and proposed levels on the access road where adjustments were undertaken to provide the minimum level of 4.250m AOD. This was achieved by adding additional aggregate to the access road to increase levels.

CONCLUSIONS AND RECOMMENDATIONS

The predicted maximum flood water level at this development has been determined as 4.140m AOD using guidance from the Environment Agency. The maximum high water level on the site will be 4.640m AOD when allowing for waves. The predicted high water level, caused by waves, will only be sustained for very short periods due to tidal action. The existing flood defences in the area of the site are currently not able to defend against the predicted flood event.

The buildings on site subject to this report are non-domestic industrial buildings with a marine based activities, consisting an office and boat storage building, the buildings are classed as 'less vulnerable'. The site is deemed appropriate regarding sequential and exception tests. The buildings are also constructed using flood resilient methods and are easily repairable/replaceable should a flood event occur. Due to the previous marine based industrial usage of the site the flood risk has not increased due to the proposed use of the site going forward.

The access road to and from the development has been designed to allow access to and from the site during a flood event. Therefore levels in some areas of the access road have been raised to provide the minimum access road level noted earlier in this report, this is an improvement on the previous access/egress from the site prior to the development during a flood event.

The site should be registered with the environment agency online flood warning system and floodline telephone service to give warnings of any possible flood events. Local radio and television services should also be used for the same reason. Some warning of severe weather may also be available from the Met Office using its severe weather warning service. As the tidal event likely to cause flooding on this site is predictable the floodline will give warnings of potential flood events.

The site is primarily at risk from tidal flooding. The already installed foul and storm water drainage system has been designed to deal with the runoff without effecting flood risk on the site.

ELVIN GOMERY

B.Eng (Hons.)

For and On Behalf of Cowan Consultancy

DAVID BUTTON

B.Sc. (Eng), C.Eng., M.I.C.E.

For and On Behalf of Cowan Consultancy

APPENDIX A

LOCATION PLAN

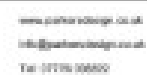
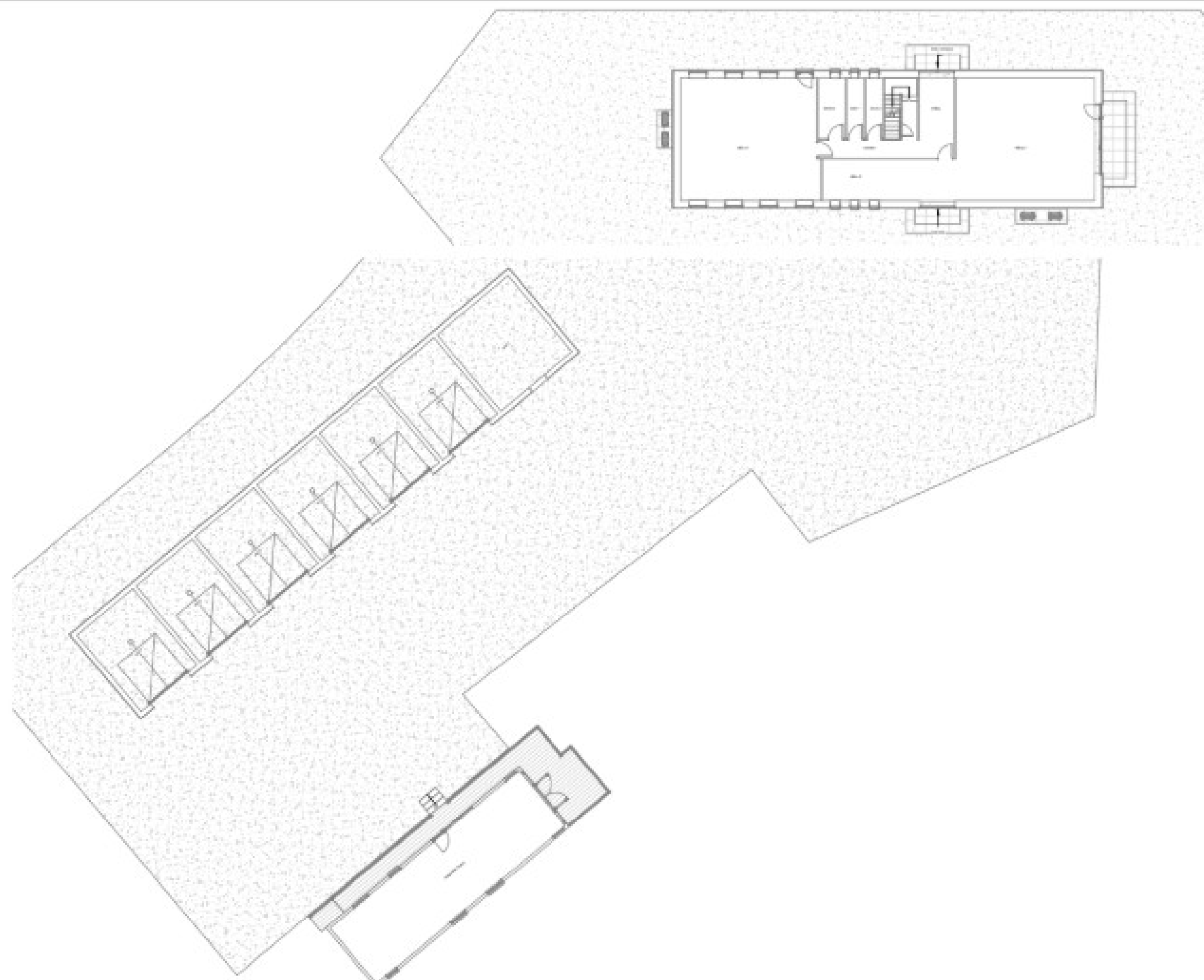
APPENDIX B

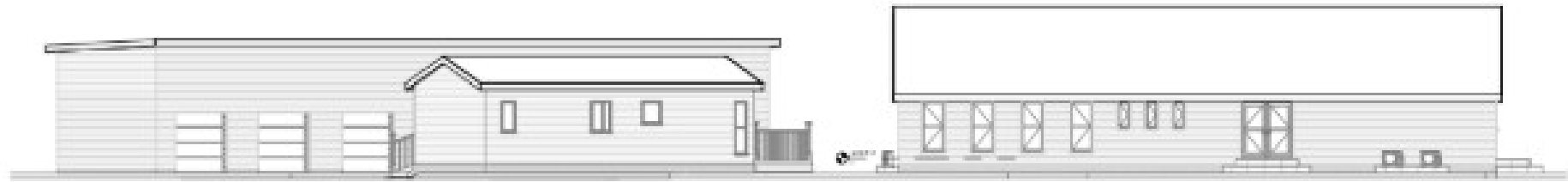
TOPOGRAPHICAL SURVEY PLAN



APPENDIX C

AS BUILT DEVELOPMENT DETAILS

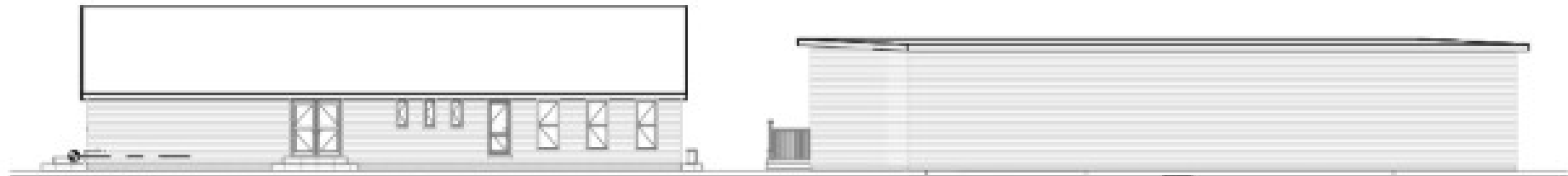
Parkers Design Limited - No.3 - PD09 6444Project Number:



Existing Elevation-Front



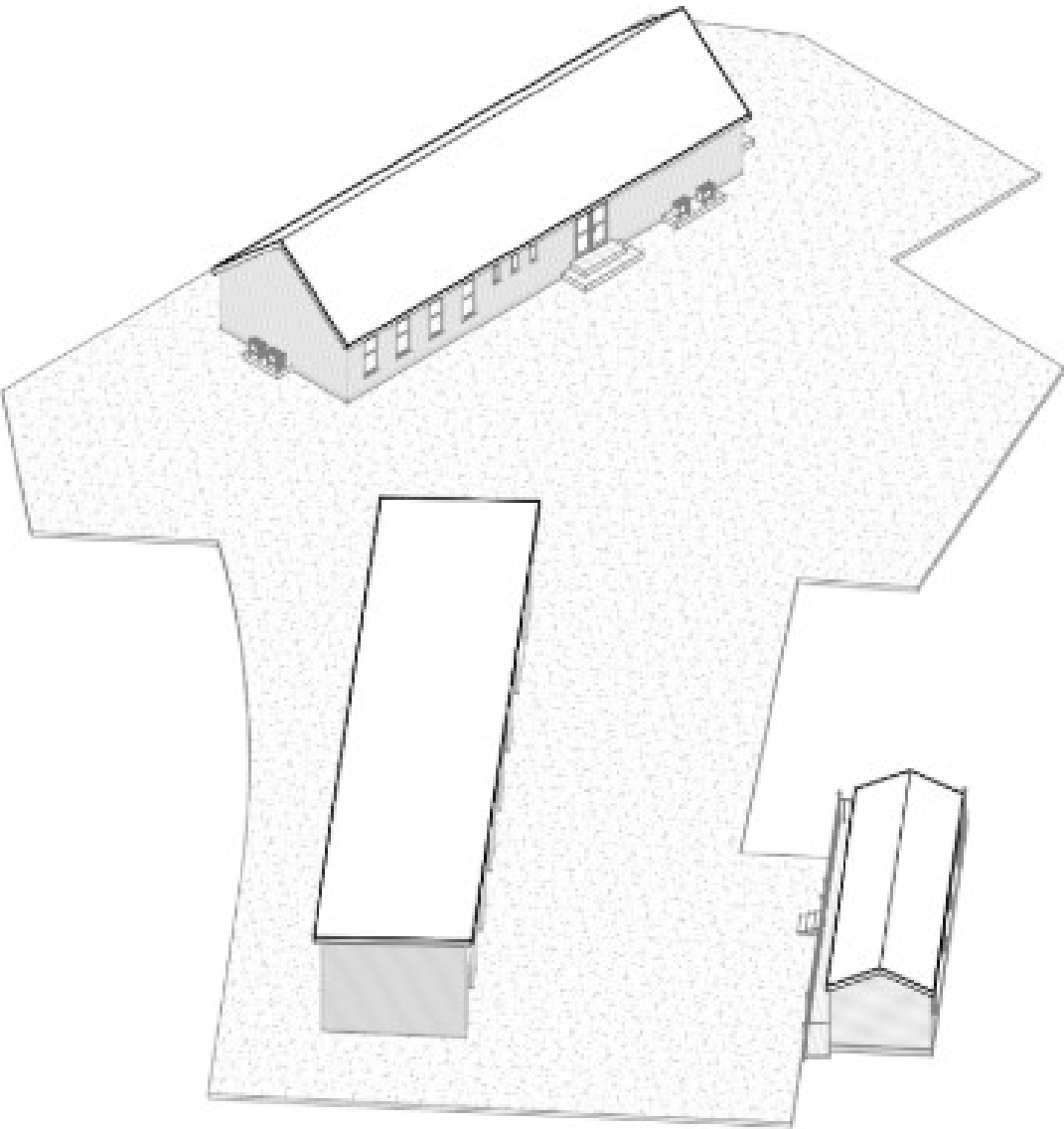
Proposed Elevation-Front



Existing Elevation-Rear



Proposed Elevation-Rear

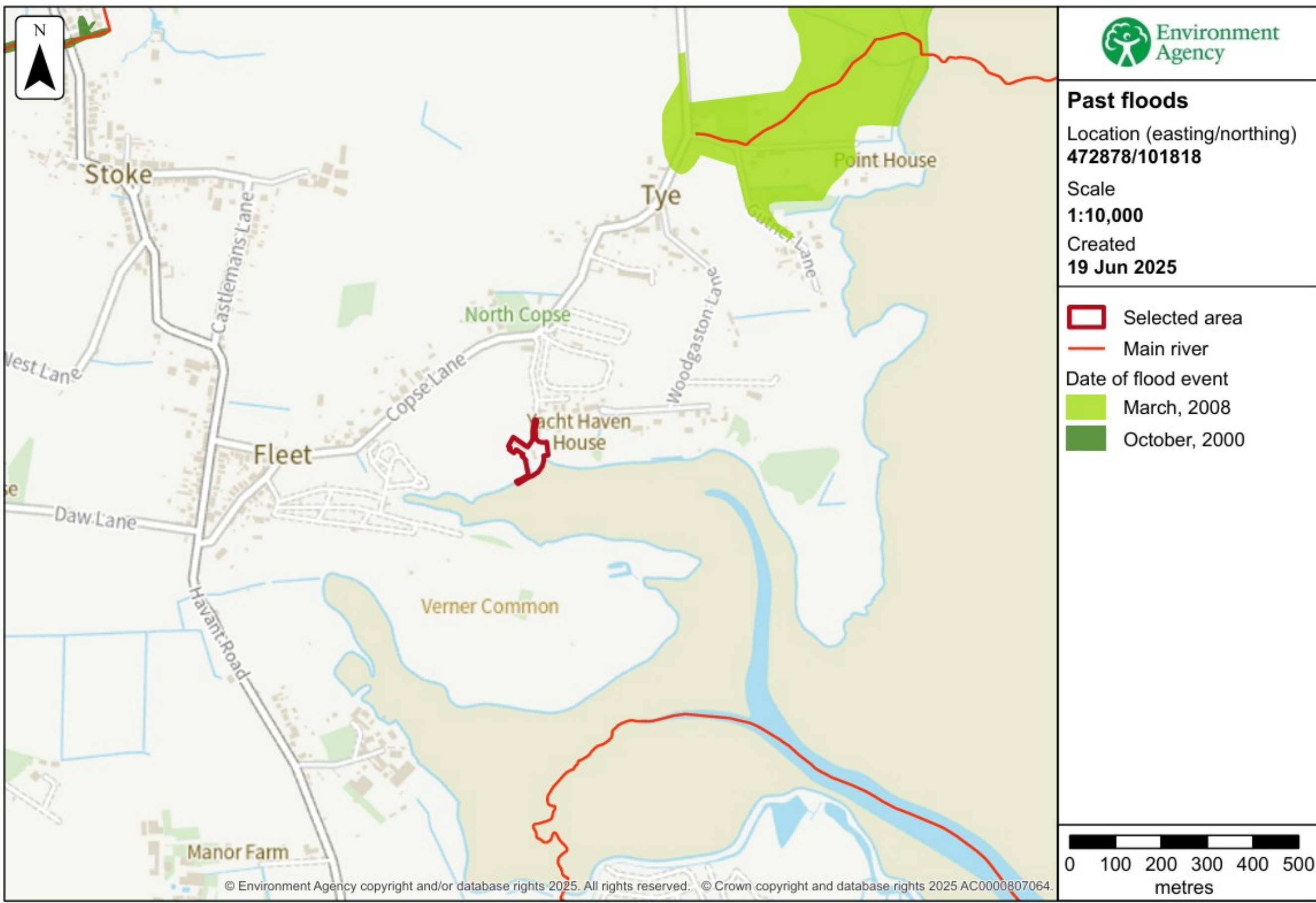


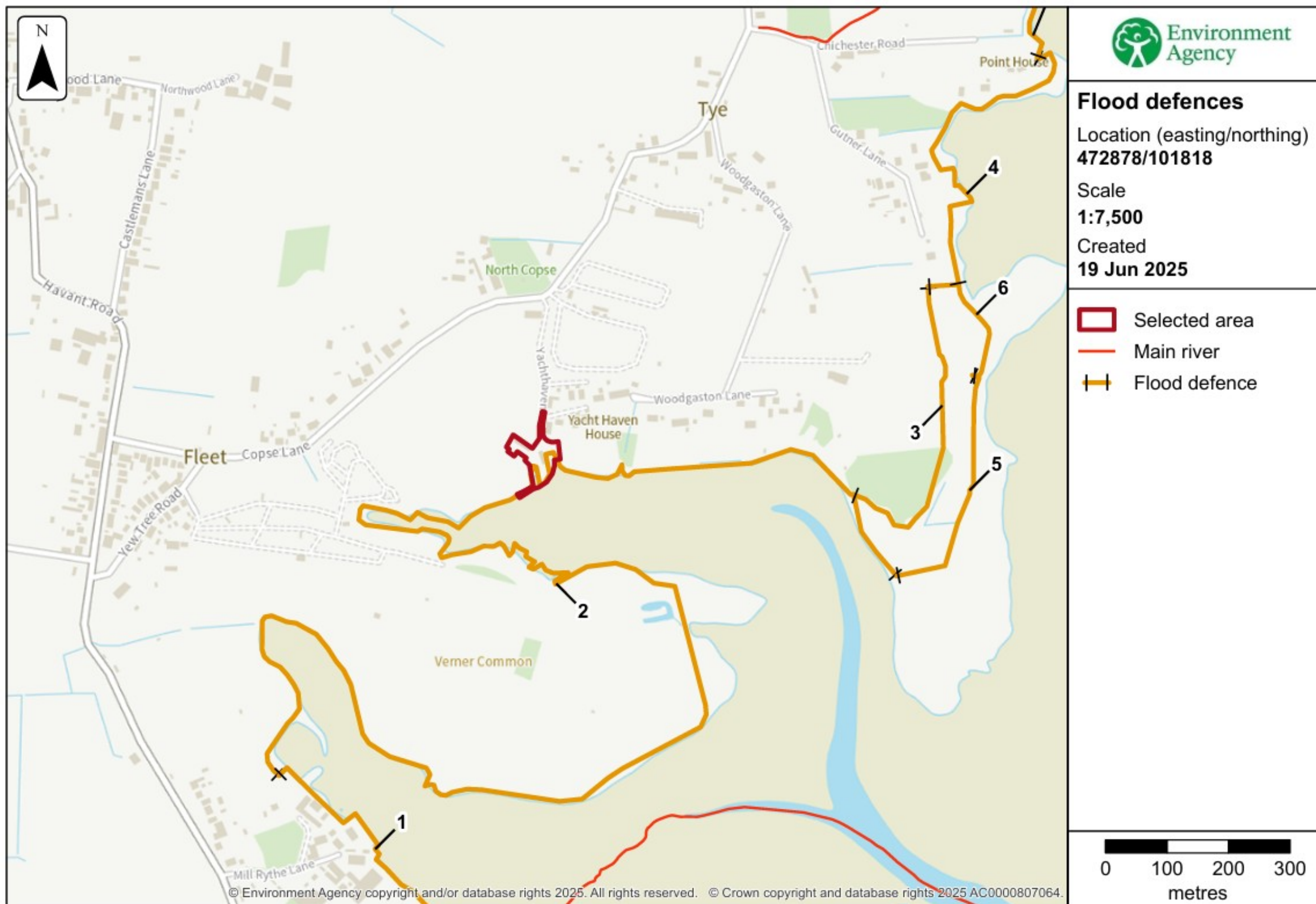
Proposed 3D 2

APPENDIX D

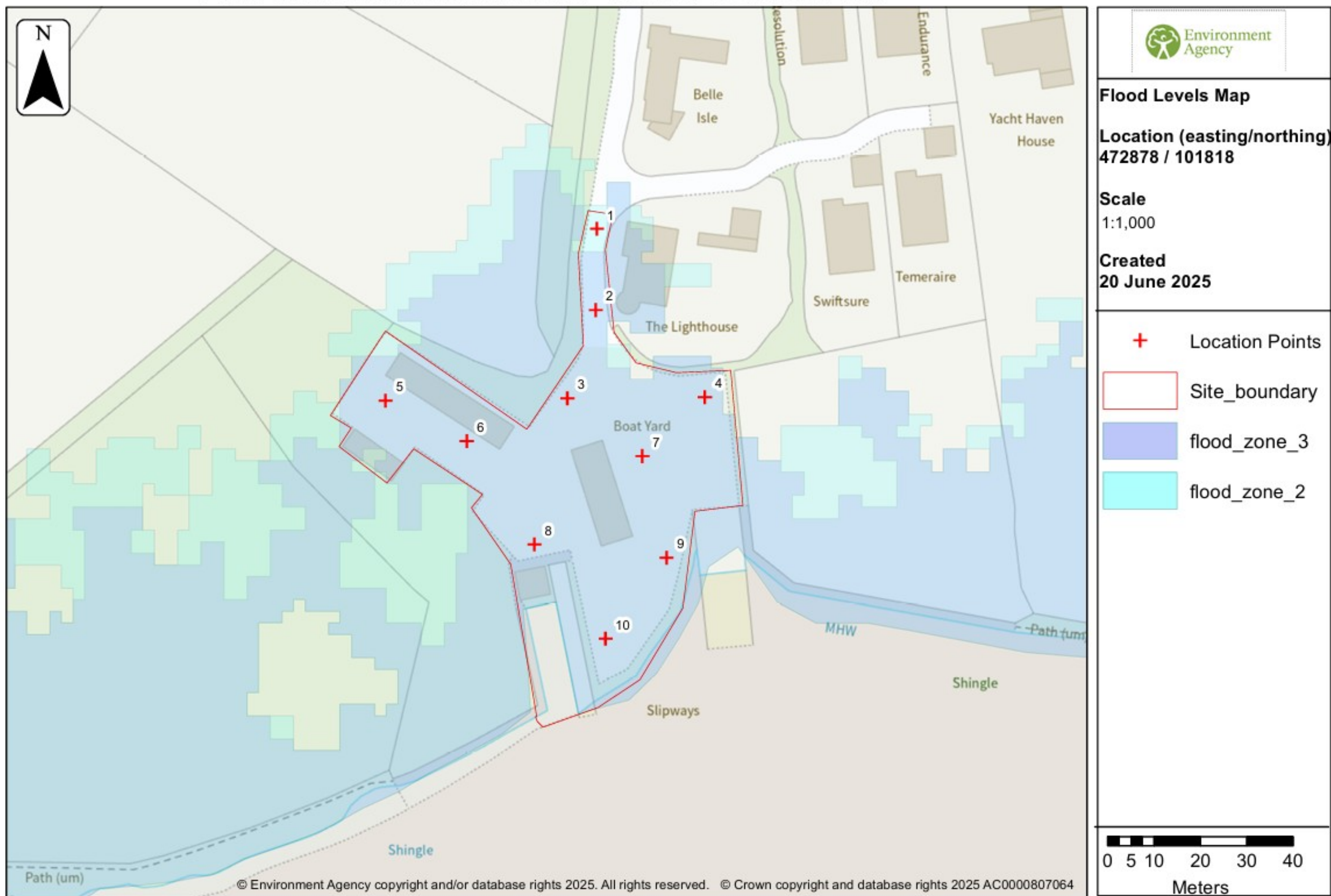
ENVIRONMENT AGENCY
FLOOD MAP







2018 East Solent Coastal Model - Centred SU7286801817



Water Depths & Levels for SU7286801817

Point	Water Depth (Metres)		Water Surface Level (mAOD*)		Ground Level
	0.5% Annual Probability/1 in 200 Year (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year (Flood Zone 2)	0.5% Annual Probability/1 in 200 Year (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year (Flood Zone 2)	
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9	0.38	0.56	3.41	3.59	3.03
10	0.51	0.68	3.42	3.59	2.91

* Levels in metres above Ordnance Datum Newlyn

APPENDIX E

AS BUILT SITE LEVELS AND BUILDING FFLS



1. This drawing is to be read in conjunction with all relevant Engineers and Architects drawings, and the Specification.
2. All dimensions are in millimetres unless noted otherwise. All levels are in Metres Above an arbitrary datum and not to Ordinance Datum.

- | Paving | |
|---|---|
|  | Detail 1 - Tarmac main site entrance access road |
|  | Detail 2 - New black paved off-weigh / access road |
|  | Detail 3 - Boat yard (Construction to be confirmed) |
|  | Grading levels (Ratios where not noted different) |
|  | Proposed ponds (Where different from existing) |
|  | Position of block paver self edging (See details) |
|  | Position of kerbing type TBC (See details) |
|  | Position of flash edging type TBC |

17.10.17	EG	SECTION LINES ADDED			PR
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Date	By	Revision	Ch'd	Ch'd's	Ref
1/1/2010	1/1/2010	1/1/2010	1/1/2010	1/1/2010	1/1/2010

PRELIMINARY

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Client: Alpine Homes Ltd.

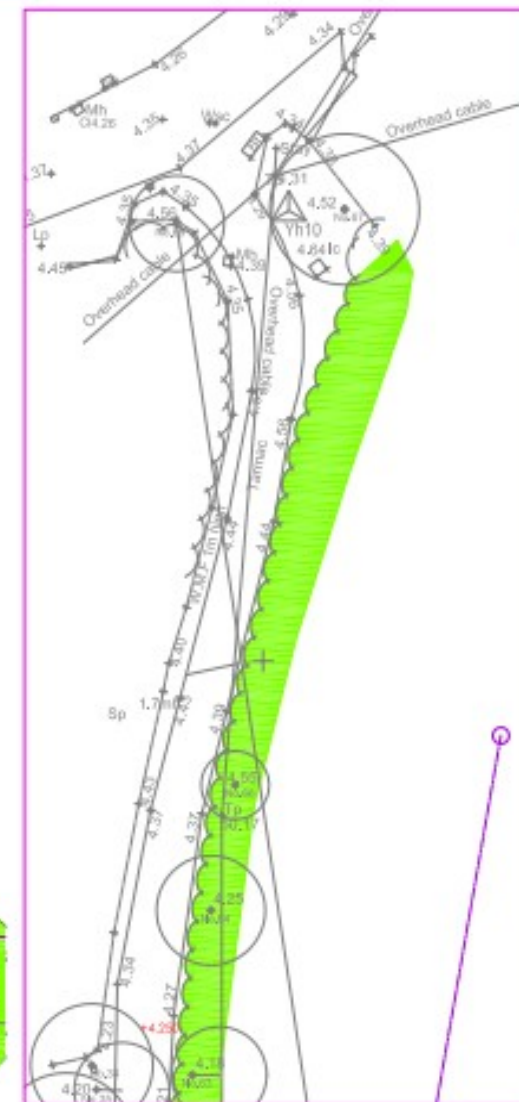
Project	Yachthaven Site Cape Lane, Hayling Island
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External Works General Arrangement
Drawing 2 of 2

Date	July 17	Scale	1/250	Org. No.
Drawn	EG	Ch'd	Gr'd	393579-201P

APPENDIX F

AS BUILT DRAINAGE DETAILS



NOTES

1. This drawing is to be read in conjunction with all relevant Engineers and Architects drawings, and the Specification.
2. All dimensions are in millimetres unless noted otherwise. All levels are in Metres Above an arbitrary datum and not to Ordnance Datum.
3. In accordance with CDM Regulations 2001 the Contractor is to:
 - Notify HSE of works.
 - Comply with the requirements of Health and Safety Plan (if applicable)
 - Provide risk assessments and method statements for all potential hazards relevant to this project.
4. The main contractor shall be responsible for the setting out and accuracy of all dimensions. He shall satisfy himself that the information given is correct and any discrepancies should be noted to the Engineer immediately.
5. DO NOT SCALE. If discrepancy or query arises on dimensions consult Engineer.
6. The Contractor is responsible for specifying product and codes and ordering of drainage materials.
7. All drainage to be installed to BS5955 P66 and in strict accordance with the manufacturers instructions.
8. All PVCu drainage products to conform to BS EN1401 & Kite mark certified in accordance with specification.
9. All drainage pipes on this draw to be 100mm unless shown otherwise. Min. falls 1/80 for foul and 1/100 for storm drainage.
10. Cover grades are in accordance with BS497 Pt 1 Cover Grades :- D400 - carriageways. B125 - carriageways for slow traffic. A15 - inaccessible to vehicles.
11. Sewer runs and manholes to be adopted are to be in accordance with Sewers for Adoption, 5th Edition.
12. Any drainage laid less than 600mm below FGL to be covered with minimum 150mm Gen 3 grade concrete to half diameter.
13. No foul drainage sewer connection works to be undertaken, foul water to be stored and removed once a month by tanker.
14. Soakaways to be a minimum of 5.0m from new buildings.
15. Provide 100x100 POC lintel max span 650mm where s/w exit the building.
16. ACO channels installed and bedded to manufacturers requirements.



STORM WATER SLIDS / ATTENUATION TANK DESIGN NOTES

Refer to Cowan Consultancy storm water drainage design calculations for further details:

Existing site run off during design storm
= 16.97 L/s (366.5 m³)

Proposed site run off after development during design storm
= 32.33 L/s (698.4 m³)

Therefore run off from site at storm water discharge position will be limited to the existing site design storm run off using a flow control device such as Tubosider.

An attenuation tank has been sized to temporarily store the required storm water on site as noted on the drainage plans and within the noted Cowan Consultancy storm water design calculations.

Date	By	Revision	SWB	SWB Ref
Status				
PRELIMINARY				
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Client: Alpine Homes Ltd.				
Project: Yacht Haven Site Cape Lane, Hayling Island				
Title: Drainage General Arrangement Drawing 1 of 2				
Date	July 17	Scale	1/250	Drawn
By	ED	SWB	SWB	393579-100P3